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AN ANALYSIS OF TOTAL PROJECT IMPACT
1976
Tampa ASAP Analytic Study #1

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16. Abstract

The impact of Tampa ASAP countermeasure activities on drinking-driving behavior and alcohol-related (A/R) motor vehicle accidents in Hillsborough County was assessed. Evaluation focused on a number of proxy measures of A/R accidents because the availability of accident BAC data changed significantly over time. These proxy measures were total, reported A/R, nighttime and weekend monthly frequencies of both fatal and injury accidents. Pre-ASAP (1/70 - 2/72) data were compared with post-ASAP (3/72 - 12/76) data for evidence of a change in drift or change in level in accident frequencies coincident with the onset of ASAP operations. These changes were compared with changes in relevant complementary data within Hillsborough County (e.g., nighttime vs. daytime accidents) and with changes in available state-wide accidents (less Hillsborough County). There was no evidence that ASAP had effected a reduction in any of the proxy measures.

Data from ASAP sponsored roadside surveys were used to assess the impact of ASAP on drinking-driving behavior. There was a significant decline in the proportions of drunk drivers (BAC $\geq$ .10) participating in the surveys during the ASAP operational period averaging .685% per year between 8 p.m. and 4 a.m. and 1.096% per year between midnight and 4 a.m. on those weekends during which the surveys were conducted.

It was concluded that after five years of ASAP countermeasure activity there has been a significant decline in the proportions of drunk drivers on the road and that the decline has not had a noticeable effect on A/R accidents.

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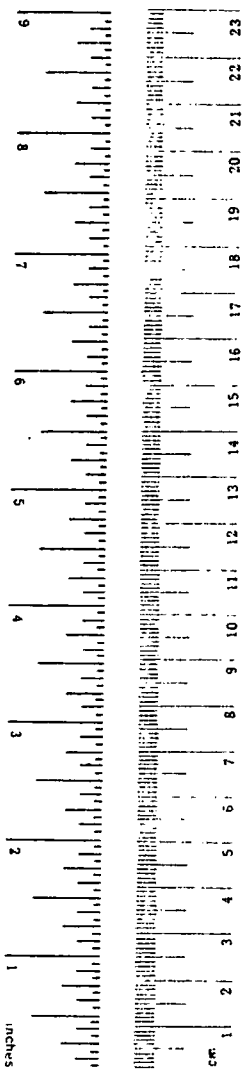
METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
	LENGTH			
in	inches	*2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
	AREA			
in^2	square inches	6.5	square centimeters	cm^2
ft^2	square feet	0.09	square meters	m^2
yd^2	square yards	0.8	square meters	m^2
mi^2	square miles	2.6	square kilometers	km^2
	acres	0.4	hectares	ha
	MASS (weight)			
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
	VOLUME			
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft^3	cubic feet	0.03	cubic meters	m^3
yd^3	cubic yards	0.76	cubic meters	m^3
	TEMPERATURE (exact)			
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

*1 in = 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures, Price $2.25, SD Catalog No. C13.10:286.



Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
	LENGTH			
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
	AREA			
cm^2	square centimeters	0.16	square inches	in^2
m^2	square meters	1.2	square yards	yd^2
km^2	square kilometers	0.4	square miles	mi^2
ha	hectares (10,000 m^2)	2.5	acres	
	MASS (weight)			
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
	VOLUME			
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m^3	cubic meters	35	cubic feet	ft^3
m^3	cubic meters	1.3	cubic yards	yd^3
	TEMPERATURE (exact)			
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F

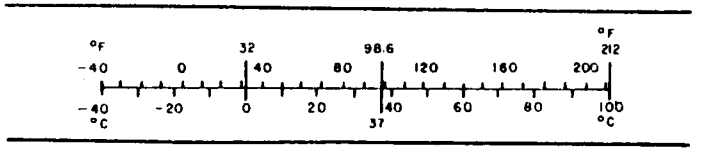


TABLE OF CONTENTS

TABLE OF CONTENTS (Cont.)

LIST OF TABLES AND FIGURES

Tables

LIST OF TABLES (Cont.)

Figures

LIST OF FIGURES (Cont.)

AN ANALYSIS OF TOTAL PROJECT IMPACT

Analytic Study #1, 1976

Executive Summary

The Tampa Alcohol Safety Action Project (ASAP) is a community-wide traffic safety program combining countermeasure activities in law enforcement, the courts, diagnosis and referral, rehabilitation, and public information and education. The primary objective of ASAP was to reduce the incidence of drinking-driving on the highway, thus reducing alcohol-related (A/R) motor vehicle accidents.

The purpose of the present study was to determine whether Tampa ASAP has attained its primary objective during the five years of its operation (1972 - 1976). This was accomplished through analysis of accident patterns within the ASAP area of Hillsborough County and through analysis of driver BAC data obtained from ASAP sponsored roadside surveys.

Accident Data: Because the availability of accident BAC data fluctuated considerably over the years for which analyses were conducted, evaluation focused on a number of proxy measures of A/R accidents. These proxy measures consisted of total, "reported" A/R, nighttime, and weekend fatal accidents and total, "reported" A/R, nighttime, and weekend injury accidents. Monthly pre-ASAP (1/70 - 2/72) accident frequencies were compared with post-ASAP (3/72 - 12/76) accident frequencies via a non-linear transfer function model. These time series of accident data were examined for changes in drift (rates of increase or decrease) and changes in level following the month ASAP went into effect (3/72). A generally significant decrease in the level of accident frequencies following the speed limit change to 55 mph in December, 1973 was accounted for in all accident analyses. Analysis of all proxy measures indicated no significant changes in accident patterns coincident with the onset of ASAP operations.

Differences in drift and level changes between proxy measures and complementary data (e.g., nighttime vs. daytime accidents) were analyzed to institute a measure of control for vehicle mileage changes within Hillsborough County. Further control was provided by comparisons of Hillsborough County total and nighttime fatal accidents with total and nighttime fatal accidents in the balance of Florida. Results of these comparisons revealed no differences indicative of an ASAP impact on accidents.

BAC Data: BAC data obtained from January roadside surveys were used as measures of drinking-driving behavior in Hillsborough County. Two methodological approaches to analysis of roadside survey data were taken. The first was to make comparisons between the pre and post ASAP data. Comparisons were made of the baseline (1/72) vs. operational (1/73 - 1/77) data as well as the "baseline" (1/72 + 1/73) vs. operational (1/74 - 1/77) survey data. The second approach

was to examine the linear trend over the six January surveys in the proportions of drivers who had been drinking and who were legally intoxicated. Comparisons of pre-ASAP and post-ASAP BAC data via Kolmogorov-Smirnov two sample tests gave no evidence of changes in the overall BAC distributions. Analyses of the proportions of drivers who had been drinking (BAC $\geq$ .01) also showed no evidence of an ASAP effect. Analyses of the proportions of drivers who were legally intoxicated (BAC $\geq$ .10) indicated a significant reduction in proportions during the ASAP operational period when the pre-ASAP period was defined as data from the 1/72 and 1/73 surveys. During the "baseline" period 6.99% of the survey participants responding between 8:00 pm and 4:00 am and 10.62% of the participants responding between midnight and 4:00 am had BAC's of .10 or more. These percentages were 3.90 and 5.99 respectively during the operational (1/74 - 1/77) period, reductions of 3.09% and 4.63%. Analyses of trends over the six January surveys in the proportions of drivers who were legally intoxicated also indicated a significant decline in proportions. This decline averaged .685% per year for drivers participating in the surveys between 8:00pm and 4:00 am and 1.096% per year for drivers responding between midnight and 4:00 am. There was no significant linear trend in the proportions of drivers who had been drinking.

No significant differences in the BAC distributions of fatally injured drivers between the baseline (1/70 - 2/72) and ASAP operational (3/72 - 12/76) periods were found. There were significant fluctuations in the availability of BAC data on fatally injured drivers during the period of time examined, seriously jeopardizing the validity of these comparisons. There was a significant tendency toward lower BAC levels of drivers arrested for A/R offenses during the ASAP operational period. During the operation period 48.63% of the individuals arrested for A/R offenses had BAC's of .16 or below compared to 33.11% during the baseline period. These changes were attributed to the increase in selective law enforcement and the large increase in A/R offense arrests during the Tampa ASAP operational period.

It was concluded that after five years of ASAP countermeasure activity, there has been a significant decline in the percentage of drunk drivers on the road averaging .685% per year between 8:00 pm and 4:00 am and 1.096% per year between midnight and 4:00 am although there has been no change in the overall incidence of drinking and driving (primarily indicating no change in the proportions of drivers with BAC's between .01 and .09). The decline in the proportions of intoxicated drivers has not had a noticeable effect on alcohol-related accidents in Hillsborough County.

I. INTRODUCTION

The Tampa Alcohol Safety Action Project (ASAP) was one of 35 community and statewide demonstration projects funded by the Office of Driver and Pedestrian Programs of the National Highway Traffic Safety Administration. Federal funding of Tampa ASAP operations began in January of 1972 and was terminated at the end of December, 1976. The primary objective of the Tampa ASAP was to reduce the incidence of drinking and driving on the highway by placing special emphasis on the identification, apprehension, and rehabilitation of problem drinker drivers, thereby reducing the number of alcohol-related traffic accidents and the resulting death, injury and property damage in Hillsborough County, Florida.

In order to achieve project objectives, Tampa ASAP coordinated the efforts of existing community agencies responsible for traffic safety and alcohol treatment/retraining. Where necessary, community efforts were supplemented and new countermeasures were instituted. Project Management efforts were directed toward the organization of countermeasure activities such that they functioned together as an efficient drinking-driving control system.

A detailed description of Tampa's judicial/rehabilitation system structure and case flow is provided in Section I.A. below, and brief descriptions of specific ASAP countermeasures are presented in Section I.B. The objectives of the present analytic study are discussed in Section I.C.

A. Overview of Judicial/Rehabilitation System Structure and Case Flow

An illustration of the Tampa judicial/rehabilitation system and case flow is presented in Figure 1. This illustration emphasizes the system as it existed at the end of 1976, with major changes occurring throughout the operational period being noted. In the text below, the case flow is described and atypical procedures are discussed where appropriate.

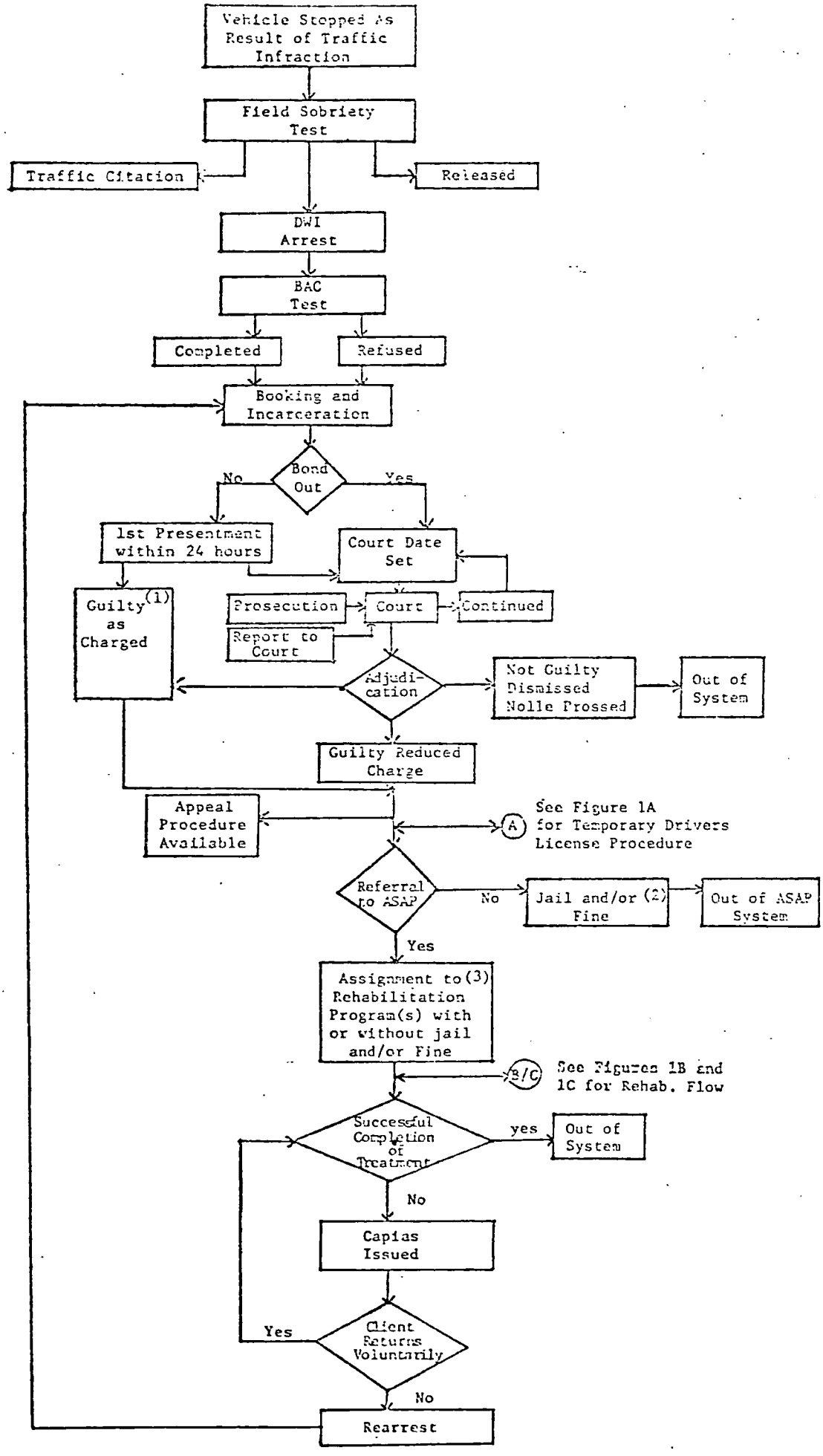
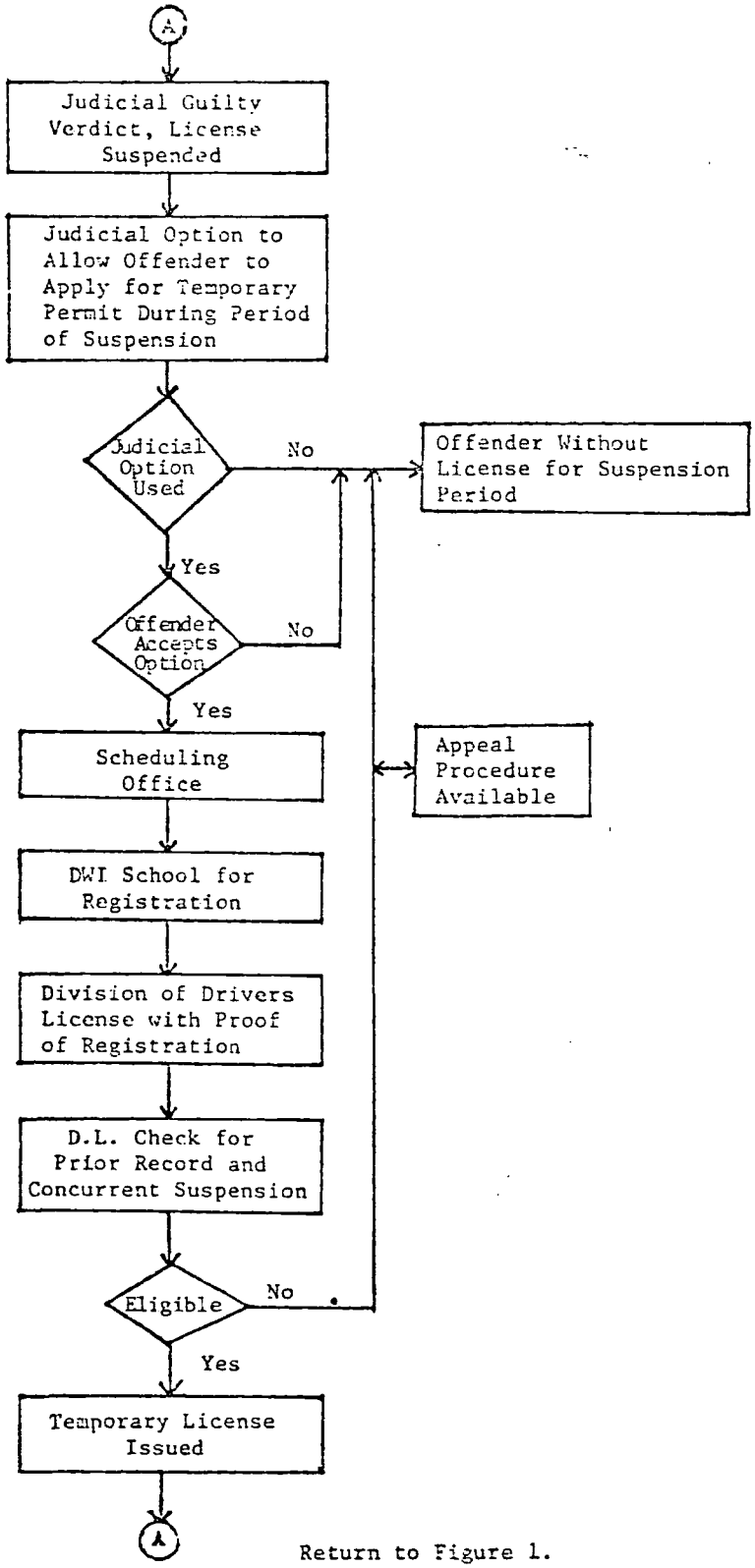


FIGURE 1

Judicial/Rehabilitation System Flow
Tampa ASAP

TEMPORARY DRIVERS LICENSE PROCEDURE (4)



Return to Figure 1.

FIGURE 1A

FLOW FOR ALL NON-RESEARCH DESIGN CLIENTS

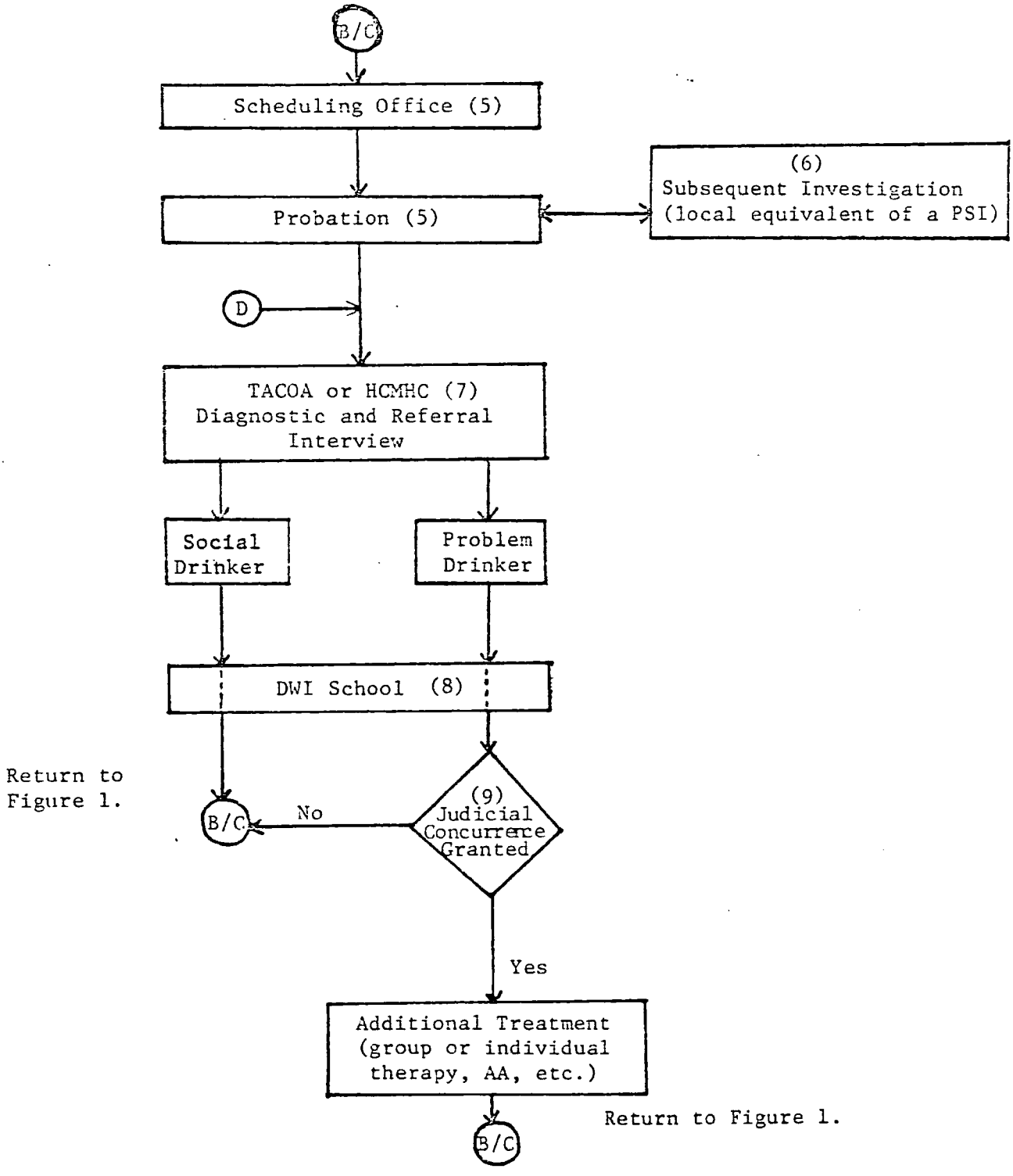


FIGURE 1B

FLOW FOR ALL RESEARCH DESIGN CLIENTS:
Six-Months Court Orders Only

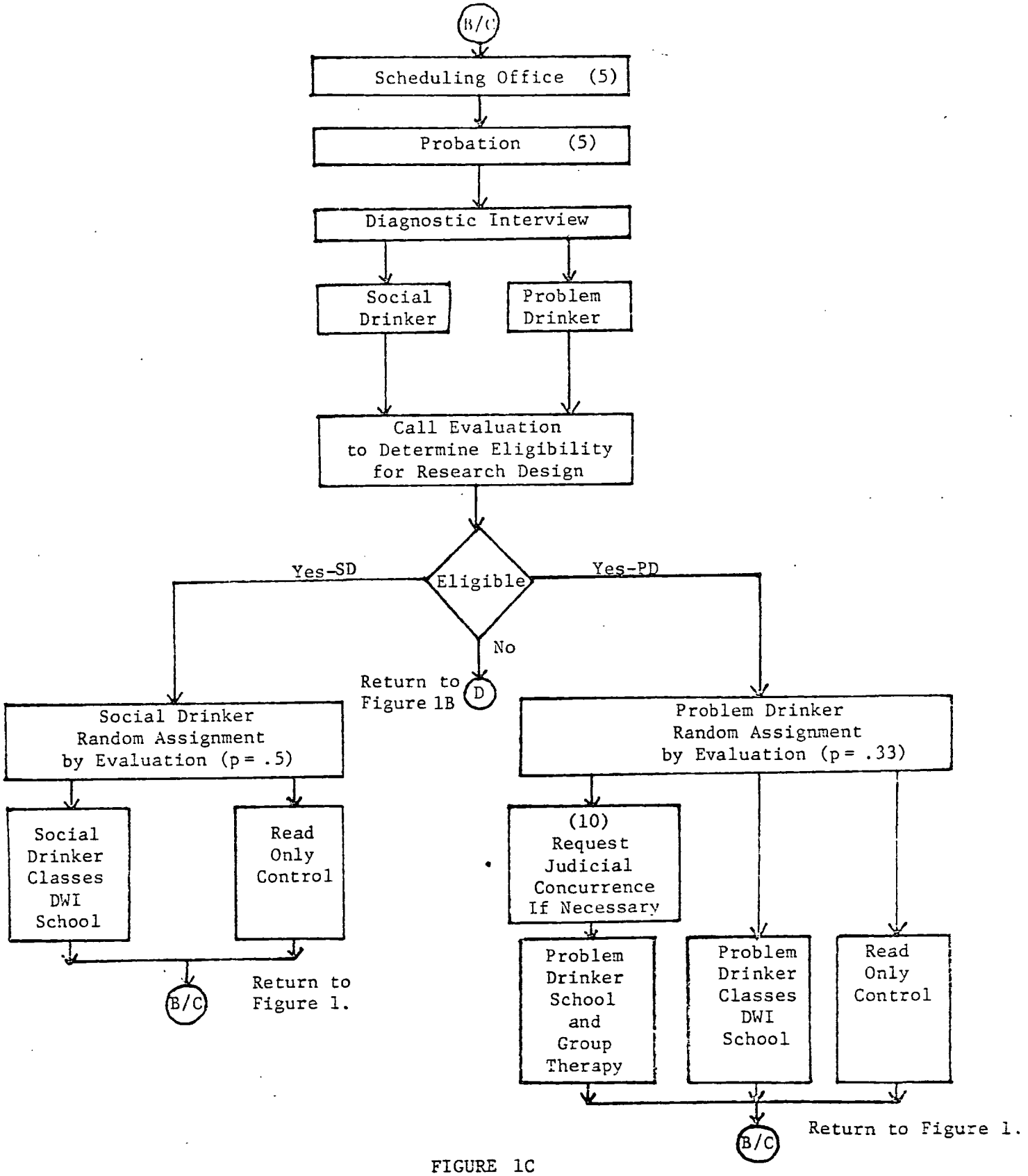


FIGURE 1C

NOTES FOR JUDICIAL/REHABILITATION SYSTEM FLOW CHART

(1) To December 31, 1974· "Guilty" typically meant that adjudication was withheld and the defendant was referred to probation (and possible diagnosis/rehabilitation). Where concurrent referrals to probation were absent, "guilty" meant a formal, recorded DWI conviction.

January 1, 1975 forward: Mandatory adjudication law takes effect, all quilty dispositions are recorded convictions.

(2) Convicted individuals could be assessed jail and/or fine with or without probation (or probation only until 7/1/75).

(3) Most clients were court ordered to the diagnostic unit with subsequent referral to DWI school, and if appropriate, additional treatment. A few clients, however, were referred directly to DWI school.

(4) Effective 1/1/75 forward. Procedure was independent of any court ordered treatment referrals.

(5) Probation was actual until 7/1/75 when State eliminated misdemeanor probation. After 7/1/75, judges selected Phase I or II court orders providing six months "unsupervised" probation or a Phase III court order providing two years of "unsupervised" probation. Monitoring of compliance with court order was left to the treatment agencies.

ASAP-sponsored scheduling office became operational 10/1/74. Prior to this time scheduling was done by probation officers. Between 10/1/74 and 7/1/75 (when probation was eliminated) clients went from court to the scheduling office (for assignment to diagnostic interview), and then to probation. After 7/1/75 clients went directly from the scheduling office to the diagnostic interview. Scheduling for DWI school and additional treatment was done by the diagnostic unit.

(6) Eliminated 7/1/75.

(7) To 10/30/74: While shown preceding DWI school, it could have occurred either before, during, or after school.

Beyond 10/30/74: It always occurred prior to school.

Diagnostic agency changed from TACOA to HCMHC in 9/75.

(8) After 11/74, separate curricula were used for social and problem drinkers.

(9) Judicial concurrence for treatment (in addition to DWI school) was required at the judges' discretion. Requests for concurrence were initiated at the diagnostic interview.

(10) Clients remained in research design groups (school + therapy) whether or not judicial concurrence was received.

All arrests for driving while intoxicated (DWI) originated with the halting of a vehicle after the observation of a traffic infraction. Florida's law requires probable cause, which is routinely demonstrated by a traffic infraction. After the field sobriety test (typically; finger-to-nose, picking up coins, walking, balance), the motorist was either given a traffic citation, released, or informed that he was under arrest for DWI and would be transported to jail. At the Central Breath Testing Laboratory adjacent to the jail facility, a blood alcohol concentration (BAC) test was offered and either completed, or a refusal was noted. This being completed, the individual was booked and incarcerated. The individual's auto was impounded. The Tampa Police required impounding while the Florida Highway Patrol had the option of releasing the car to an authorized individual (with the owner's permission). In the case of release of the auto, the recipient was either in the auto at the time of arrest, or arranged to pick up the car at the scene of the arrest.

After booking, the offender had the option to bond. Time restrictions prior to bond varied, but averaged two hours minimum. If the offender was able to post bond, he was released. He was reminded that the court date on his citation was binding, but should he decide to change it he could do so through the "Violations" office. The court date entered on the citation was usually six weeks from the date of arrest. Those who did not bond out were brought before the judge within 24 hours. At that point (commonly called "First Presentment") a plea was taken. If the plea was guilty, the case was disposed of at that time, in the same manner which applied to dispositions of guilty at any other point in the process. If a not guilty plea was entered, a court date was set, and the decision was made concerning the individual's release from incarceration. If the judge did not feel release was warranted, the trial date was set (usually within two weeks), and the person returned to jail. It should be noted that only the judge and probation staff were present at First Presentments. Neither law enforcement nor prosecution were required to attend.

Assuming a court date had been set, a non-jury trial took place on that date with law enforcement, prosecution and defense attorneys present. Unless a continuation was granted, the case was adjudicated and sanctions were imposed in one court session. Mandatory adjudication for alcohol-related (A/R) offenses became effective January 1, 1975. This particular change in the State law had a profound effect upon Hillsborough County residents. Prior to that date, judges traditionally withheld adjudication of DWI charges, enabling them to treat the defendant as though he was found guilty (and thus enforce court-ordered rehabilitation), without the guilty verdict and subsequent points being added to the individual's driving record maintained in Tallahassee. Under that structure, the defendant kept his driver's license. Defendants frequently lost their driving privileges and had the conviction entered on their driving record if they failed to comply with the conditions of court-ordered rehabilitation programs.

The chief criticism of the adjudication withheld procedure was that the individual did not have an official record of the DWI conviction. Thus, second offenders were rare, and law enforcement as well as other interested individuals were able to document a series of instances where individuals had been arrested and processed for alcohol-related offenses many times in the past, but because of the adjudication withheld structure, had continued to maintain their driver's license. In addition, the State of Florida has a "habitual offender" act, which automatically terminates the driving privilege based upon a series of offenses within specific time periods. Depending upon the offenses involved, that law can result in either a one year or five year revocation. Obviously, the ability of that law to fulfill its intent was severely weakened by the absence of convictions being recorded on the driving record.

With mandatory adjudication, an additional offense was added to the Florida statutes. That offense was "driving with an unlawful blood alcohol level" (UBAC in local nomenclature), which carried lesser penalties. Intended as an option when the blood alcohol level

was between .05 and .10, the eventual language of the statute allowed plea bargaining in the .05 to .20 range. The DWI statute was altered to include per se guilt at .20. The "presumptive" nature of .10 remained in the DWI statute.

Beginning on June 16, 1975, the Tampa ASAP provided traffic court judges with a "Report to Court" form at each non-jury DWI trial. This form, shown in Appendix A, indicated the current arrest BAC (or refusal) for each offender as well as prior DWI arrests and prior court referrals to treatment/retraining programs, thus supplementing the information provided by the State DMV standard records check. The judges utilized these data in determining appropriate sanctions, and in particular rehabilitation referrals.

Although the vast majority of court trials were non-jury, procedures were available for obtaining a trial by jury. Furthermore, a guilty decision, regardless of the type of traffic court session in which it occurred, could be appealed in higher courts. The procedures for obtaining a jury trial and appealing a judicial decision are delineated in Appendix B of this report.

Included in the mandatory adjudication statute which became effective in the State of Florida on January 1, 1975, was a procedure by which a defendant could obtain a temporary driver's license should the defendant be convicted of an alcohol-related offense after the first of the year. Figure 1A presents this procedure in graphical form. (All guilty verdicts for alcohol-related offenses after January 1, 1975 carried with them mandatory license suspensions). In such cases, a judicial option existed for allowing the defendant to apply for a temporary driving permit during the period of suspension. It is important to note that the temporary driver's license procedure was independent of any court ordered treatment referral which required a six month or two year "unsupervised" probationary period and a diagnostic interview (unless the judge chose to bypass the interview and order the individual directly into the DWI school). Evaluation has no data on the frequency with which judges exercised the temporary

permit option, but the general impression was that the option was used in the majority of cases.

Once a judge had decided to use the option open to him, he presented to the defendant a form for obtaining the temporary permit. At this point, the defendant had the option to comply with the regulations on the form, or simply to ignore them. If the defendant chose not to apply for his temporary license, he was of course without a license for the period of suspension.

For those defendants who applied for their temporary license, they first visited the scheduling office (if court-ordered rehabilitation was also part of the judicial disposition) or went directly to the DWI school. Once at the school, the defendant obtained a short form indicating his registration. This form was taken to the Division of Drivers License and presented to the licensing examiner along with the form received from the judge. Driver license examiners routinely checked all individuals so applying. If the driving record indicated there were no concurrent suspensions, or that the defendant had not been refused the privilege of driving for any other reason, the individual was judged eligible and issued a temporary permit.

The temporary permit procedure was not a carte blanche arrangement; rather, specific criteria had to be met in order to comply with the Department of Highway Safety and Motor Vehicles procedures, as specified in State law. The most frequent reason for issuing the temporary permit was "business purposes only". "Business purposes only" was interpreted locally to include travel to and from work, in addition to such necessary activities as grocery shopping and attendance at any court-ordered rehabilitation.

Individuals denied the temporary permit by the driver license examiner did have the option of appealing through the court to the Department of Highway Safety and Motor Vehicles. When such appeal was made, the Department of Highway Safety and Motor Vehicles held

a hearing within 14 days of the date of the appeal to determine the eligibility status of the client. During the 14 day period, a complete background investigation was made on the client, and that information was used during the hearing to make the decision regarding the issuance of a temporary permit.

The period of suspension after conviction of an alcohol-related offense varied. If the defendant was convicted of first offense DWI, the suspension period was 90 days. If the individual was convicted of UBAC the suspension period was 30 days. There have been some as yet undocumented reports which indicated that some individuals convicted of UBAC simply chose not to exercise the option of applying for a temporary permit for the 30 day suspension. In the absence of court-ordered rehabilitation, they successfully avoided attendance at the school in this fashion.

If a judge decided to assign a guilty offender to ASAP rehabilitation programs prior to 1/1/75, the typical judicial procedure for assuring the client's cooperation was to withhold adjudication and place the client on probation. Punitive sanctions, typically fines, were assessed at the judge's discretion. In this manner, attendance at the diagnostic interview, DWI school, and any additional treatment recommended by the ASAP-sponsored diagnostic unit were incorporated into the conditions of probation, and thereby given the status of court-ordered requirements. Two types of probation/court orders were used specifying either unsupervised or supervised (reporting) probation.

Under this situation, probation could function as the enforcement arm of the court, requiring attendance at school, the interview, etc., and issuing rearrest orders for non-compliance. Probation personnel also appeared at all probation revocation hearings (the inevitable result of a rearrest order properly served), and reported the individual's progress through rehabilitation, and recommended continuation of probation or revocation. Revocation typically resulted in jail, fine, loss of license or all three, and the guilty verdict being entered on the driving record.

After 1/1/75, all ASAP clients were formally convicted of DWI or UBAC and placed on either supervised or unsupervised probation (at the discretion of the court). During the first six months of 1975 there were probation officers available to monitor the progress of convicted DWI offenders through the rehabilitation programs. In actuality, however, there was little active monitoring of DWI cases by the State Probation and Parole Office. When the State eliminated all misdemeanor probation after 7/1/75, the monitoring of compliance with court order requirements was left totally to the treatment agencies.

The capias issuance procedure was developed by the Tampa ASAP to enforce court-ordered participation in the rehabilitation system. Initiated during the third quarter of 1975, the ASAP capias process replaced and expanded the monitoring and enforcement functions performed by the State Probation and Parole Office.

When a client failed to show or dropped out of a rehabilitation program, or failed to show up at the ASAP Scheduling Office or the diagnostic and referral interview, the responsible agency sent an affidavit of non-compliance to the ASAP. ASAP staff members prepared the capias and carried it, with a copy of the affidavit, to Tampa Police Department Violations Office where they were signed by a Deputy Clerk of the Court.

The capiases were typically served by a Deputy of the Sheriff's Office who picked them up daily at the TPD Violations Office. If an individual was located, he was arrested for contempt of court (a non-bondable offense), taken to Central Booking, and incarcerated until his hearing. Judges hearing capias cases were provided with a copy of the ASAP affidavit of non-compliance for each defendant as well as information indicating what the defendant specifically failed to do, the ASAP treatment recommendation, and other relevant information which could assist judges in returning clients to their appropriate place in the ASAP rehabilitation system.

It was not always necessary to arrest a client to accomplish the objectives of the capias process. It was quite common for a client upon learning that a warrant had been issued for his arrest, to report voluntarily to the appropriate treatment agency. In such cases the capias was withdrawn.

Shortly before the elimination of misdemeanor probation a new set of court orders was designed. The three types of court orders in use from the second quarter of 1975 through July of 1976, called Phase I, II, and III, are shown in Appendix C. All three court orders required attendance at the ASAP-sponsored diagnostic interview and DWI school. The Phase I and II court orders specified six months of unsupervised probation. Clients violating the conditions of the court order were in contempt of court. Phase I and II court orders differed in only one respect: if additional alcohol treatment (beyond school) was determined to be appropriate for Phase I clients, the treatment recommendations had to receive judicial concurrence. Concurrence was obtained through an administrative procedure in which the judges periodically reviewed Phase I court orders received from ASAP. On a Phase II court order all treatment recommendations made by the diagnostic counselors automatically became part of the court order and judicial concurrence was not necessary. The Phase III court order was similar to the Phase II in that judicial concurrence was not necessary, however the Phase III court order provided two years of unsupervised probation.

Tampa ASAP made recommendations concerning the appropriate court orders for DWI offenders on the Report to Court. ASAP recommended Phase I for first time offenders with BAC's less than .15. Phase II was recommended for individuals with BAC's $\geq$ .15 and/or prior DWI arrests but with no prior ASAP treatment experience. Phase III court orders were recommended for individuals with prior ASAP treatment experience. All court orders were implemented, of course, at the discretion of the presiding judge.

Although the traffic court judges frequently placed clients on Phase I court orders automatically requiring judical concurrence,

subsequent requests for concurrence were rarely denied. Consequently, in August of 1976 ASAP revised the court orders to expedite the referral process. The revised Phase I six-months court order no longer required judicial concurrent for treatment referrals unless the judge specifically indicated this requirement on the court order. The revised Phase II court order was essentially equivalent to the old Phase III specifying two years of unsupervised probation. The revised court orders are shown in Appendix D.

Guilty individuals who were not referred to the ASAP rehabilitation system typically received a license, suspension, a fine, and occasionally a jail sentence. Until 7/1/75, non-referred individuals could be put on active probation with or without punitive sanctions. Furthermore, effective 1/1/75 non-referred individuals were often given the opportunity to obtain a temporary driving permit by voluntarily enrolling in DWI school, as previously discussed.

For court-referred clients, the normal (non-research design) case flow is depicted in Figure 1B. The ASAP-sponsored Scheduling Office became operational as of 10/1/74. Prior to this time the scheduling of ASAP clients was performed by probation officers. Between 10/1/74 and 7/1/75 clients went from court to the Scheduling Office (where they were assigned a date for the diagnostic interview), and then to probation. After 7/1/75 clients went directly from the scheduling office to the diagnostic interview. Scheduling for DWI school and additional treatment was done by the diagnostic unit.

The subsequent investigation completed by probation (shown in Figure 1B) was not directly used by ASAP, but was used by probation and the court, particularly where revocation hearings were involved, or where the individual was a repeat offender. This procedure was eliminated along with all misdemeanor probation functions in 7/1/75.

The primary source of referral decisions in the Tampa ASAP was the diagnostic and referral interview conducted by the Tampa Area

Council on Alcoholism (TACOA) until September, 1975, at which time this function was assumed by the Hillsborough Community Mental Health Center (HCMHC), Alcoholism Services Division. This interview was approximately one hour in duration.

Prior to June, 1975, the determination of drinking problem severity was primarily based on the results of the Mortimer-Filkins questionnaire and interview and the client's BAC at time of arrest. With the initiation of the ASAP Report to Court, prior arrest and prior treatment data were made available to the diagnostic counselors. The end product of the diagnostic process was the classification of clients as social or problem drinkers. Upon completion of the diagnostic portion of the interview, all ASAP clients were scheduled to attend alcohol safety school conducted by DWI Counterattack, Inc. After 11/74 separate curricula were used for social and problem drinkers. Special classes were also available for illiterate, Spanish speaking, and youthful offenders. The diagnostic counselors also made a determination as to the most appropriate alcohol treatment alternative (beyond school) for problem drinker clients. When required, judicial concurrence with treatment recommendations had to be obtained before clients could be officially scheduled into rehabilitation programs. If concurrence was not granted, the clients' participation in the ASAP rehabilitation system ended with the successful completion of DWI school.

It should be mentioned that although Figure 1B shows the diagnostic and referral interview preceding DWI school, prior to 10/30/74 it could have occurred either before, during, or after school. In this situation clients were usually referred directly to DWI school from the courts and the probation office. However, after 10/30/74, the interview always occurred prior to school.

Figure 1C illustrates the temporary modifications of the normal case flow and treatment decision process necessitated by the requirements of Tampa ASAP's rehabilitation research design. This research design, applicable only for clients on six-months court orders, was in effect from January, 1975 through June, 1976. Upon completion of

each diagnostic interview, the counselor called the ASAP evaluation group to determine the client's eligibility for inclusion in the research design. Much of this pre-screening process was accomplished by the diagnostic counselor during the course of the interview. For example, if a client was determined to be illiterate or Spanish speaking, or if a client had previously participated in court enforced rehabilitation programs he was excluded from the research design. The evaluation staff made a confirmatory search of the client files for previous participation in treatment/retraining programs, answered any questions a counselor might have had about the criteria for eligibility, and then made the final decision to include or not include an individual in the research design.

Social drinkers included in the design were then assigned by ASAP evaluation on a random (equal probability) basis to DWI school social drinker classes, or to a special "read only" minimum exposure condition in which individuals received educational materials to be read at home.

Problem drinker design clients were assigned on a random basis to DWI school problem drinker classes, to "read only", or to problem drinker classes plus group therapy. The therapy program was the short term didactic and group therapy conducted by HCMHC: Alcoholism Services Division.

Those individuals not eligible for the research design were referred to the treatment/retraining programs determined appropriate by the diagnostic counselors, as was discussed with Figure 1B.

Judicial System Re-Organization: The most significant departure from the system described in Figure 1 existed prior to January 1, 1973. Prior to that date, three independent court systems were in effect in Hillsborough County. The Municipal Courts processed all misdemeanor arrests made by the Tampa Police Department, while the Justice of the Peace Courts processed all misdemeanor arrests made by other law enforcement agencies. Circuit Courts handled jury

trials and felony cases. Separate booking facilities and jails also existed. Court consolidation created by a constitutional amendment made all courts State courts, subject to State rules and procedures and abolished all Municipal and JP courts.

B. Specific Countermeasure Descriptions

Law Enforcement: Tampa's selective enforcement countermeasure consisted of two squads, one attached to the Tampa Police Department which operated within the Tampa city limits, and the other attached to the Florida Highway Patrol which operated in the remainder of the county and on all interstate highways. The selective enforcement countermeasure became operational in March, 1972.

The TPD-SE squad comprised 11 law enforcement officers in total, nine patrolmen, one Corporal and one Sergeant. All costs associated with the Tampa Police Department SE squad were funded by Tampa ASAP through December 31, 1976.

The FHP-SE squad consisted of a total of 10 officers, nine troopers and one Sergeant. All costs associated with the Florida Highway Patrol SE squad were provided by Tampa ASAP through September, 1974. On October 1, 1974 the funding responsibility for the SE squad was accepted by the Florida Highway Patrol and the SE squad became part of a regular rotating detail within the local Highway Patrol contingent. The FHP-SE squad was disbanded in mid-July 1976.

All vehicles were marked one-man units assigned to individual officers. These vehicles were not generally available for department fleet use except in cases of local emergency such as riot control and natural disaster.

Both SE units varied the patrol unit time frame and duration throughout the time period covered by this report. In general, hours of operation were between 8:00 p.m. and 4:00 a.m. Thursday, Friday, and Saturday.

In support of the selective enforcement countermeasure ASAP funded a technical position in which an individual officer was made responsible for administering BAC tests for the SE squads. This procedure was replaced on February 14, 1975 by a new Central Breath Testing Facility. The ASAP-funded Central Breath Testing Facility was staffed by seven civilian operators and serviced all law enforcement officers in Hillsborough County.

ASAP Judicial Funding: Beginning May 1, 1973, ASAP funds were provided for three prosecutors in the Traffic Division of the State Attorney's Office, specifically to handle alcohol-related cases and in particular ASAP alcohol-related cases. Tampa ASAP did not create new prosecution positions, but rather provided financial assistance to existing positions; leaving the total number of prosecutors unchanged, but reducing the financial responsibility of the State. This situation changed little in 1974, with the exception that the Traffic Division of the State Attorney's Office varied in size from three prosecutors (which was its total strength in 1973) to four prosecutors for eight months of 1974, three prosecutors for three months, and five prosecutors for one month in 1974, for an overall average of 3.8 positions. The special prosecution countermeasure was terminated after 1974.

During the last six months of 1973 and the first six months of 1974, the Tampa ASAP funded a nin-man unit within the State Probation and Parole Office to deal specifically with DWI cases referred to ASAP rehabilitation. Complete descriptions and performance analyses of the special probation and prosecution countermeasures can be found in Chappell, J. E., and Blount, W. R., An analysis of judicial system performance, GTASAP Technical Report 122875:CT, December 28, 1975.

ASAP funds were expended in 1975 and 1976 for the maintenance of the judicial/rehabilitation tracking system, a client file used by ASAP Management to produce the Report to Court.

A judicial seminar was conducted in early May, 1975 under the direction of Tampa ASAP and Indiana University. Representatives of ASAP treatment modalities, the medical community, the legal profession, the legislature, and the probation office were contributors to the seminar.

Diagnosis, Referral and Rehabilitation: After arrest and conviction, an offender may be ordered to attend a diagnostic interview and participate in rehabilitation/retraining programs at the discretion of the presiding judge.

The diagnostic and referral interview was originally conducted by the Tampa Area Council on Alcoholism (TACOA) between October, 1971 and September, 1975. In September, 1975 the diagnostic/referral function was assumed by the Hillsborough Community Mental Health (HCMHC) Alcoholism Services Division. ASAP funds initially supported diagnostic and referral activities in 1971 and 1972; however, this process began self-supporting through fixed client fees in 1973.

Virtually all individuals completing the diagnostic interview were referred to alcohol safety school conducted by DWI Counterattack which began operations in May, 1971. Throughout 1975, separate curricula were used for social and problem drinkers. In addition, special classes were available for illiterate, Spanish speaking, and youthful offenders. From October, 1971 to January, 1972, treatment referrals (beyond school) were primarily to Alcoholics Anonymous (AA) and vocational rehabilitation. Beginning in January, 1972, TACOA referred clients to several community based, usually group oriented, alcohol treatment programs. Tampa ASAP funded one of these group therapy modalities. When HCMHC began conducting diagnostic interviews in September, 1975, the majority of treatment referrals beyond alcohol safety school were to HCMHC group therapy programs. The school and other modalities are described in Appendix E.

Public Information and Education: Public information and education activities included an information center, a speaker's bureau, a special program in the public school, a series of "ASAP briefings" at MacDill Air Force Base, and a campaign directed at the general population of Hillsborough County utilizing both the print and non-print media. The public information and education countermeasure became active in January, 1972.

C. Study Objectives

The purpose of the present study is to determine whether the Tampa ASAP has attained its primary objective during the operational period (1972 through 1976). Specifically, two principal evaluative questions are addressed: 1) Has the entire ASAP system effected a reduction in alcohol-related accidents relative to historical patterns? and 2) Has the Tampa ASAP system reduced the incidence of drinking and driving in Hillsborough County from pre-ASAP levels?

The remainder of this study is divided into three parts. Sections II and III address the above evaluative questions and Section IV presents conclusions drawn from the data analyses.

II. ANALYSIS OF ACCIDENT DATA

A. Methodology

1. Performance Measures

Two general categories of automobile accidents were subject to analysis: those involving fatal injuries and those involving only non-fatal injuries. Property damage accidents were not analyzed in the present study for several reasons. First, inspection of 1975 data revealed that only 6% of all property damage accidents could be identified as alcohol related, compared to 12% of all injury accidents and 48% of all fatal accidents. Secondly, it was reasonable to assume that the occurrence of property damage accidents were reported with less consistency than accidents involving death and personal injury. Finally, a previous analysis of property damage accidents (data through 1974) gave no indication of project impact. In fact, property damage accidents steadily increased through December, 1974.

As previously stated, the goal of the Tampa ASAP was the reduction of alcohol-related (A/R) fatal, injury, and property damage automobile accidents. Unfortunately (from an evaluation viewpoint), one of the effects of the ASAP program was to change the "measurement" of A/R accidents. Tampa ASAP evaluation considered an accident to be alcohol-related if it met one of the following conditions: 1) A driver was arrested for an A/R offense (whether or not a BAC was available; 2) A positive BAC ($\geq$ .01) was reported (whether or not the driver was arrested); and 3) Officer judgment of alcohol involvement alone. These criteria were applied consistently to all baseline and operational data. A previous report (Reis, 1976) indicated that 48.2% of all A/R accidents were identified by criterion (2) and 43.2% by criterion (3) for 1973 accident data. Criterion (2) gives the strongest evidence of alcohol involvement, but the proportion of accident BAC's available has fluctuated over time. For example, the proportion of BAC's available from fatally injured drivers has been

77%, 30%, 67%, 34%, 65%, 85%, and 82% for the years 1970 to 1976 respectively. Since the trend in 1975 and 1976 has been toward relatively greater percentages of BAC's obtained from fatally injured drivers, it is reasonable to expect a relatively greater number of fatal accidents identified as alcohol related in these years. While criterion (2) may or may not have been subjected to an ASAP generated influence, criterion (3) almost certainly was subjected to an ASAP generated influence. Law enforcement officers may have become more cognizant of factors indicative of alcohol involvement and consequently identified proportionately more accidents as A/R during the ASAP operational period than prior to its existence. Thus, there is not only a disparity between reported or "measured" A/R accidents and actual or "true" A/R accidents, but the above discussion describes how the "measurement" itself has changed over the years. This factor which is identified as an instrumentation change by Campbell and Stanley (1963) jeopardizes the validity of any analysis of A/R accident data. Thus proxy measures (whose "measurement" does not change over time) of A/R accidents must be utilized in assessing project effectiveness.

The present study assessed the impact of Tampa ASAP on total fatal and total injury accidents and three subsets of these accident categories. The three subsets were: A/R accidents (as previously discussed), nighttime accidents (those accidents occurring between 8 p.m. and 4 a.m., and weekend accidents (those accidents occurring between 8 p.m. Friday and 4 a.m. Monday). The latter two accident subsets were selected because epidemiological evidence has indicated that these time periods have a disproportionate amount of drinking-driving activity and alcohol-related accidents. Furthermore, ASAP selective enforcement units were operational during the evening hours and could, therefore, be expected to have their greatest impact on nighttime accidents.

ASAP impact on accidents within the entire Tampa ASAP area of Hillsborough County was assessed. Impact on only those accidents

occurring within the Tampa city limits was assessed on a preliminary basis and results were not reported in this volume. The non-Tampa portion of Hillsborough County is considerably larger than Tampa in terms of land area and much of it is rural, although the two areas did have roughly equivalent populations at the end of 1974. Since the law enforcement situation in the two areas was therefore somewhat different, with Florida Highway patrolmen covering more miles per A/R citation and making fewer A/R arrests than Tampa police officers, it was felt that combining Tampa and Hillsborough County less Tampa data could possibly mask an ASAP effect occurring within the city limits. However, the preliminary analyses mentioned above comparing Tampa and Hillsborough County less Tampa total fatal accidents, total injury accidents, A/R injury accidents, nighttime injury accidents and weekend injury accidents showed no significant differences. It should also be noted that other subsets of fatal accidents within the Tampa city limits contained frequencies considered too low to support reliable statistical analysis and were omitted from the preliminary comparisons.

State-wide fatal accident data were obtained from the Department of Highway Safety and Motor Vehicles, Division of Florida Highway Patrol. These data were used to make comparisons between fatal accidents occurring within Hillsborough County and the balance of the state. Statewide injury data on a monthly basis were not available for months prior to January, 1972 and therefore were not utilized in this report.

Project impact analyses based on the various subsets of accident data described above are presented in the following order:

FATAL ACCIDENTS

Total Fatal Accidents

Hillsborough County
State-wide Data Comparisons

A/R Fatal Accidents
Hillsborough County, Non A/R Comparisons

Nighttime Fatal Accidents
Hillsborough County, Daytime Comparisons
State-wide Data Comparisons

Weekend Fatal Accidents
Hillsborough County, Weekday Comparisons

INJURY ACCIDENTS

Total Injury Accidents
Hillsborough County

A/R Injury Accidents
Hillsborough County, Non A/R Comparisons

Nighttime Injury Accidents
Hillsborough County, Daytime Comparisons

Weekend Injury Accidents
Hillsborough County, Weekday Comparisons

2. Research Design and Statistical Analysis

Project impact on accidents was assessed by examining the pattern of monthly accident frequencies from January 1970 to December, 1976. For evaluation purposes, this time series of accidents was interrupted by Tampa ASAP in March, 1972. It was during March that the Selective Enforcement countermeasure became active, at which time the entire ASAP system could be considered fully operational.

The general analytic approach was to compare the baseline (pre-ASAP) accident frequencies with the operational (post-ASAP) accident frequencies and determine if changes occurred in the frequency patterns coincident with the onset of ASAP operations. Two basic change hypotheses were framed and tested concerning the specific nature of changes that may have occurred as a result of ASAP activity. First, a change in the level of the accident

frequencies at the point of interrup was hypothesized. This suggestion assumes an immediate ASAP impact on accident frequencies which will be manifested by a drop in frequencies at the point ASAP began. Second, a change in the trend or drift of accident frequencies over time following the onset of ASAP was hypothesized. This premise assumes that ASAP will have a gradually increasing impact as more people become aware of the drinking-driving message, more people are arrested for DWI, more people go through ASAP sponsored DWI "schools", etc. This hypothesis is the most plausible of the two and the one to which an evaluator should direct the most attention. These changes are illustrated by the experimental series depicted in Figure 2. A change in level (ω_{03e}) refers to the vertical distance between the pre and post ASAP trend lines at the ASAP interrupt (actually at time point 26 or February, 1972). A change in drift (ω_{04e}) refers to the difference in slope (rate of change) of the pre and post ASAP data. Figure 2 also exemplifies an hypothetical effect of the speed limit change which took place during the operational period of ASAP (December 10, 1973 to be exact). Since this variable could confound an ASAP effect, an evaluator must partial out or "account for" a possible speed limit effect. To this end, an hypothesis of immediate change in level of accident frequencies was framed. An hypothesis of gradual change as a result of the speed limit change did not seem reasonable since the interrupt project (changing the speed limit) was immediate and constant and it was considered safe to assume that virtually all motorists knew of the change within a short period of time. This second interrupt separates the entire time series into three regions: baseline (months 1-26); pre-speed-change operational (months 27-47); and post speed-change operational (months 48-84)- regions I - III respectively.

Direct inferential tests for the change hypothesis of interest were based on the transfer function techniques described by Box and Tiao (1975) using discrete transfer function models of the following general form:

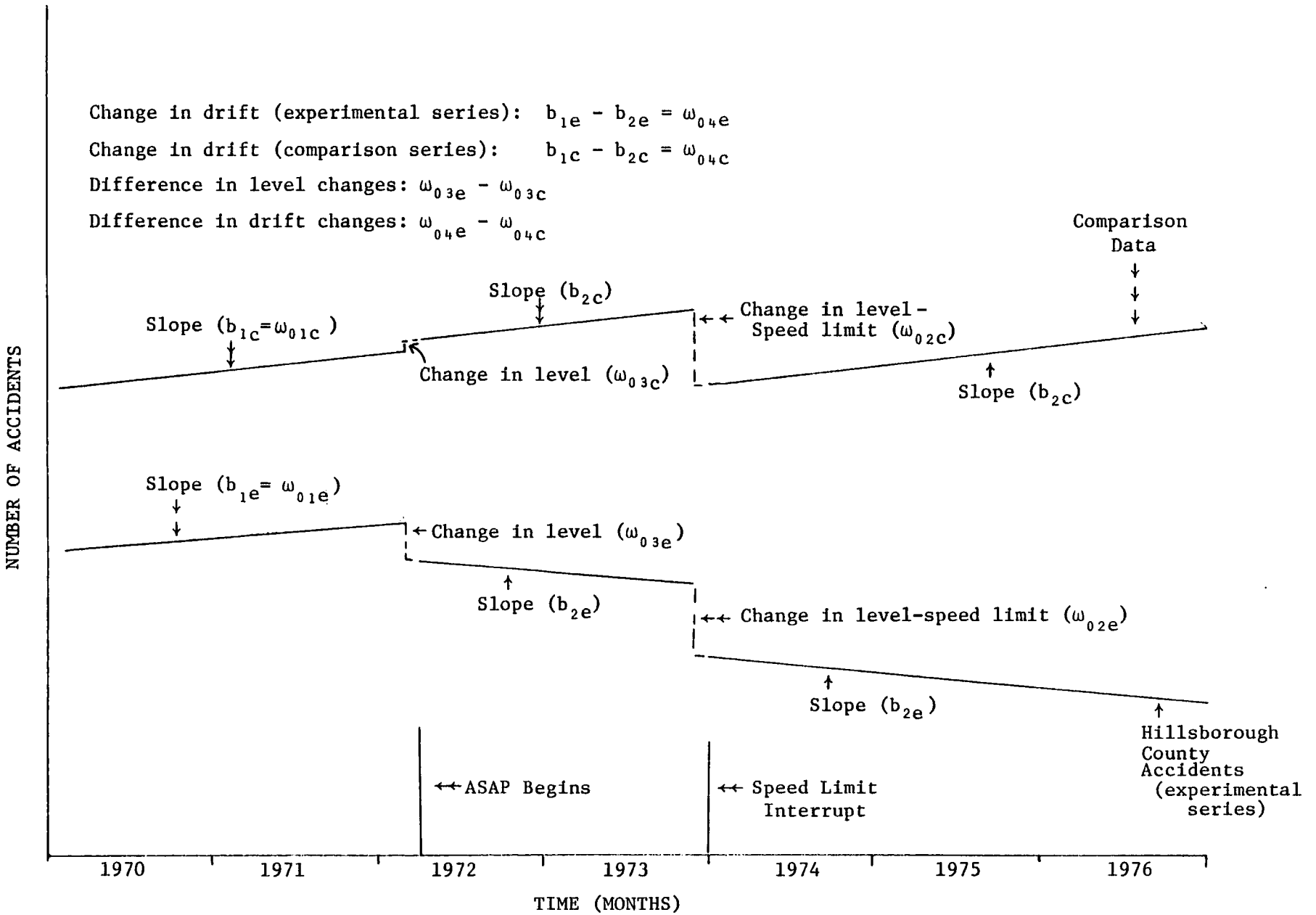


FIGURE 2

Illustration of Change Parameters Tested by Time Series Analyses

$$\dot{y}_t = \sum_{j=1}^{k} \left(\frac{\omega_j(B)}{\delta_j(B)}\right) \dot{\xi}_{tj} + N_t$$

where: t represents time points 1, 2, ... N ;

$\dot{y}_t$ represents a suitably differenced set of data y_t, y_t itself, $y_t - \bar{y}$, or some appropriate transformation thereof;

$\dot{\xi}_{tj}$ represent the effect of interrupts and are a suitably differenced set of indicator variables ξ_{tj}, ξ_{tj} itself, $\xi_{tj} - \bar{\xi}_j$, or some appropriate transformation thereof;

the δ and ω are transfer function parameters such that

$$\delta_j(B) = 1 - \delta_{1j}B - \ldots - \delta_{rj}B^r \text{ and}$$

$$\omega_j(B) = \omega_{0j} - \omega_{1j}B - \ldots - \omega_{sj}B^s ;$$

B is a backshift operator such that $By_t = y_{t-1}$;

N_t is Autoregressive Integrated Moving Average (ARIMA) modeled background noise.

Note that if the $\left(\frac{\omega_j(B)}{\delta_j(B)}\right)$ are restricted to ω_{0j} , we have $\dot{y}_t = \sum_{j=1}^{k} \omega_{0j} \dot{\xi}_{tj} + N_t$ which is simply the familiar multiple regression model for k indicator variables except that the error term is represented by ARIMA modeled noise. Accordingly a specific model was constructed for testing the effect of the ASAP interruption on accident frequencies following general linear model coding principles. This model took the following form:

$$\dot{y}_t = \sum_{j=1}^{4} \omega_{0j} \dot{\xi}_{tj} + N_t \qquad (1)$$

where y_t = monthly accident frequencies ;

ξ_{t1} = 1,2, ... 84 for observations 1,2, ... 84 ;

ξ_{t2} = 0 for observation 1,2, ... 47; else $\xi_{t2}=1$;

ξ_{t3} = 0 for observation 1,2, ... 26; else $\xi_{t3}=1$;

ξ_{t4} = 0 for observation 1,2, ... 26; 1,2, ... 58 for observations 27,28 .... 84 respectively.

Parameter estimates from this model have the following interpretation:

ω_{01} = the drift of the baseline data

ω_{02} = change in level between Regions II and III at month 47 (speed limit interrupt). Note that since no term is included for change in drift following the speed limit change, the model assumes that the slopes of regions II and III are equal.

ω_{03} = change in level between region I and II + III (with the speed-change accounted for) at the ASAP interrupt (month 26).

ω_{04} = change in drift between region I and II + III (with the speed change accounted for).

The background noise N_t was modeled according to the Box and Jenkins (1972) general ARIMA process:

$$N_t = \frac{\theta(B)}{\phi(B)(1-B)^d} a_t$$

where $N_t = \dot{y}_t - \sum_{j=1}^{4} \omega_{0j} \dot{\xi}_{tj}$ at time t ;

θ and ϕ are moving average and autogressive parameters respectively such that

$\theta(B) = 1 - \theta B - \ldots - \theta_q B^q$ and

$\phi(B) = 1 - \phi B - \ldots - \phi_p B^p$ are of order q and p respectively;

d represents the order of differencing ;

(θ, ϕ and differencing may also be seasonal in nature but this is not represented here)

a_t is random normal uncorrelated error at time t (NID($0,\sigma_a^2$)).

In order to further describe the relationship between the Box-Tiao transfer function model and the multiple regression model we now note that if $N_t = a_t$ (that is, θ, ϕ, $d = 0$) together with our prior restriction of the $\frac{\omega_j(B)}{\delta_j(B)}$ to ω_{0j}, the transfer function model reduces to:

$$\dot{y}_t = \sum_{j=1}^{k} \omega_{0j} \dot{\xi}_{tj} + a_t \qquad (2)$$

which is precisely the multiple regression model. In this case the parameters ω_{01}, ω_{02}, ω_{03}, and ω_{04} from the basic change model (1) represent exactly the changes depicted in the hypothetical experimental series shown in Figure 2. If $N_t \neq a_t$, the ω_{0j} still have the same meaning as described above but they are estimated differently to a greater or lesser degree dependent on the specific form of the ARIMA noise than they would under the simple regression model (2). For example, if the N_t are ARIMA ($p = 0$, $d=1$, $q=1$) in form (commonly known as IMA(1,1), the change in level is estimated by comparing an exponentially weighted average of the pre and post observations such that observations close to the interrupt receive relatively high weight while observations some distance removed from the interrupt may receive practically no weight at all. On the other hand, if no differencing is required and there is only moderate autocorrelation of the N_t to account for with ARIMA parameters, the estimation of the ω_{0j} may differ only slightly from estimation under the regression model (2).

The following procedure was used to estimate the unknown ω_{0j} and identify the form of the noise model for each data series: First, the ω_{0j} from the basic model (1) were estimated under the

assumption $N_t = a_t$ via an ordinary least squares multiple regression solution. Second, the autocorrelation function (ACF) and partial autocorrelation function (PACF) of the residuals from this model were examined. If the ACF ≈ 0 for all lags >0, the assumption $N_t = a_t$ was considered met and the ordinary least squares solution was considered adequate. If the ACF of residuals did not approximate 0, a tentative ARIMA noise model was postulated following Box and Jenkins (1972) procedures for identifying ARIMA models from patterns in the ACF and PACF. The model (1) was then solved for estimates of unknown parameters using the tentatively identified $N_t = \frac{\theta(B)}{\phi(B)(1-B)^d} a_t$. This estimation was done via a general non linear estimation solution and procedures described in Westra (1976). The ACF and PACF of residuals from this model were then inspected and a judgment as to whether or not the model was adequate was made. If the inspection process revealed inadequacies of the tentative model, a new ARIMA noise model was framed and the process repeated until the model was considered adequate.

At this point it might be instructive to point out the relationship between the method of estimation chosen by the authors and the more popular data transformation method of estimation favored most notably by Glass, Willson, and Gottman (1975). This relationship is described in Box and Tiao (1975) and is simply expanded here. For illustration purposes let us assume $N_t = \frac{\theta(B)}{\phi(B)} a_t$. Then, using the non-linear estimation procedure all the unknown parameters from $\dot{y}_t = \sum_{j=1}^{k} \omega_{0j} \dot{\xi}_{tj} + \frac{\theta(B)}{\phi(B)} a_t$ are estimated simultaneously via a general non-linear estimation routine. Using the data transformation technique the data are transformed such that remaining N_t (after transformation) are uncorrelated and the data are in the form of the general linear model. The model may then be solved for ω_{0j} via an ordinary least squares solution. A number of these solutions are then carried out "trying out" different values of the ARIMA parameters each time until a

minimum sums of squares is found. The transformation is carried out for our example as follows:

$$\dot{y}_t \left(\frac{\phi(B)}{\theta(B)} \right) = \left(\frac{\phi(B)}{\theta(B)} \right) \sum_{j=1}^{k} \omega_{0j} \dot{\xi}_{tj} + a_t$$

Now if we let $z_t = \dot{y}_t \left(\frac{\phi(B)}{\theta(B)} \right)$ and let $x_{tj} = \left(\frac{\phi(B)}{\theta(B)} \right) \dot{\xi}_{tj}$,

then $z_t = \sum_{j=1}^{k} \omega_{0j} x_{tj} + a_t$ is in the form of the general linear model with uncorrelated error terms and may be solved using ordinary least squares techniques. A generalized method for carrying out these transformations has been described by Kepka (1972). Obviously, the two approaches to estimation are algebraically equivalent and differences can only be due to the estimation procedure itself. Since both procedures seek a least squares solution, any differences are almost certainly trivial.

In summary, each experimental accident series was tested for change in level and change in drift following the ASAP inerrupt, taking into account a possible speed limit change effect and taking into account any ARIMA noise. The basic change model $\dot{y}_t = \sum_{j=1}^{4} \omega_{0j} \dot{\xi}_{tj} + N_t$ described previously was used for testing the hypothesis of interest. The alpha level was set at .05 (two tailed) for all inferential tests of significance.

The method of planned comparisons was used for comparing changes at the ASAP interrupt with changes at the same point for appropriate comparison accident series. These comparisons are also illustrated and described in Figure 2. In the case where the comparison data are accidents occurring outside the ASAP area the questions of interest are: 1) Is change in level at the ASAP interrupt for accidents in the ASAP area different from the change in level at the same point for accidents outside the ASAP area?, and 2) is the change in drift following the ASAP interrupt for accidents in the ASAP area different from the change in drift at the same point for accidents occurring outside of the ASAP area?

In the case where the comparison data are subsets of accident data occurring within the ASAP area the hypothesis of interest may be stated as follows: 1) Is the change in level for accidents known to have a high rate of alcohol involvement different from the change in level for similar accidents known to have a lesser rate of alcohol involvement?; and 2) is the change in drift following the ASAP interrupt for accidents known to have a high rate of alcohol involvement different from the change in drift for similar accidents known to have a lesser rate of alcohol involvement?

Methods of planned comparisons are well known (see Hays (1973) for example) and the procedure used will be only briefly described. Basically we wish to test the hypothesis $H_0: \omega_{03e} - \omega_{03c} = 0$ and the hypothesis $H_0: \omega_{04e} - \omega_{04c} = 0$ where the parameters have the same meaning as described previously. The subscript e indicates experimental series and the subscript c indicates comparison series (see Figure 2). The test for the first hypothesis is given by

$$t = \frac{\hat{\omega}_{03e} - \hat{\omega}_{03c}}{\sqrt{(\sum_{i=1}^{2} s^2_{\omega_{03i}}/2)(1^2 + -1^2)}}$$

which is referred to tables of the t distribution with (N-# parameters estimated) degrees of freedom. The second hypothesis is tested in the same way except that the $\hat{\omega}_{04}$ are used. It should be pointed out that if the two series being compared have different ARIMA noise structures, these comparison tests will only be an approximation.

B. Results

1. Fatal Accident Data

Total Fatal Accidents: The monthly frequencies of total fatal accidents for Hillsborough County are presented in Figure 3. The mark extending above time point 27 indicates the onset of ASAP and

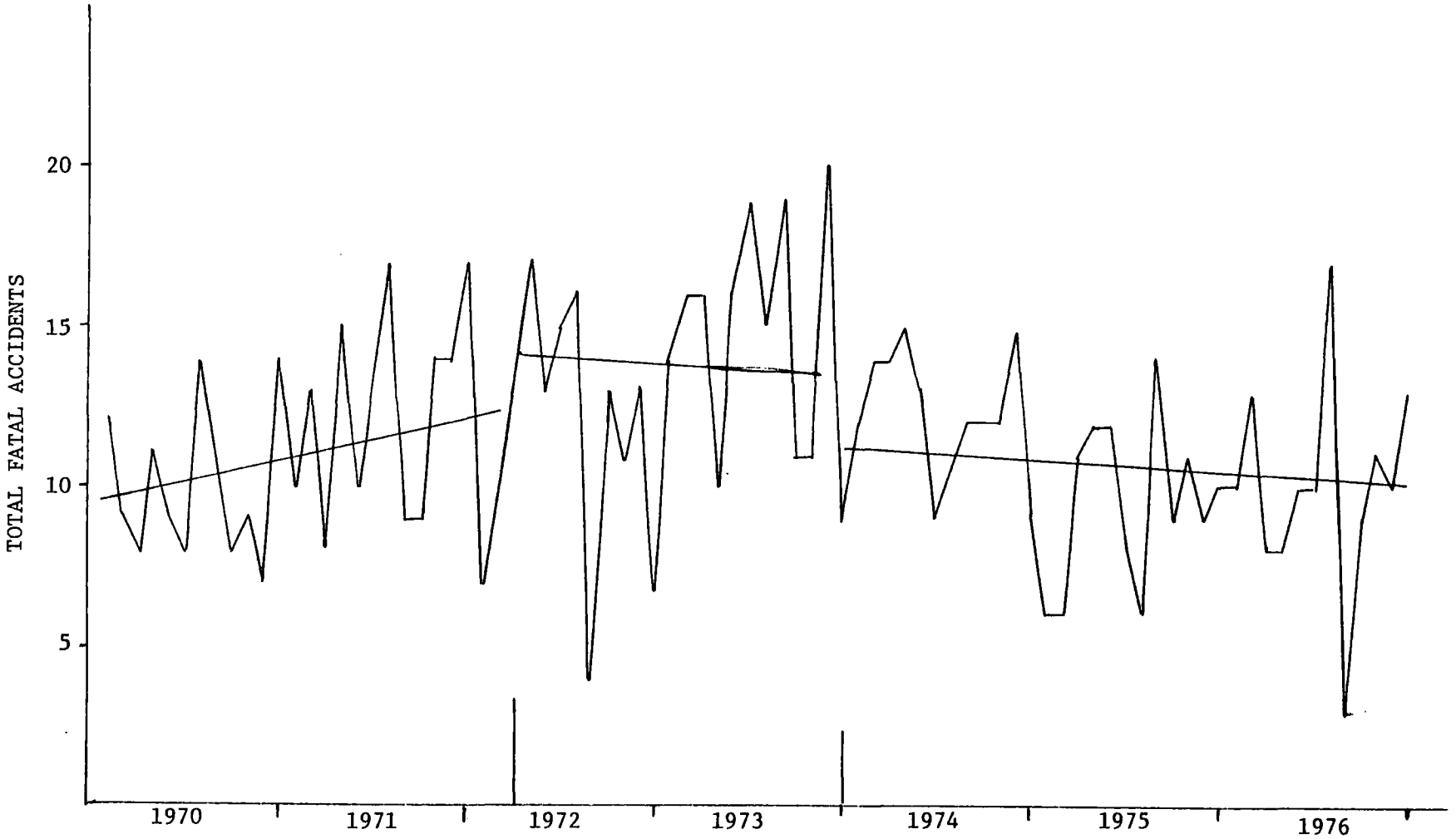


FIGURE 3

Total Fatal Accidents for Hillsborough County:
1/70 - 12/76

the mark extending above point 48 indicates the point at which speed limits were reduced to 55 mph. Inspection of the ACF and PACF of residuals from the basic regression model applied to these data indicated no significant autocorrelation. Thus the basic regression model with no ARIMA noise (i.e. $N_t = a_t$) was considered adequate. Since this model is a form of the usual regression model the regression lines from the model (actually the predicted values) were superimposed on the raw data shown in Figure 3 as an aid in visualizing the estimated changes. These regression lines indicate an increase in level following the ASAP interrupt and a decrease in level following the speed limit interrupt as well as a decrease in the slope or drift of total accidents following the ASAP interrupt. The actual estimates of these changes are shown in Table 1 and indicate an increasing pre-ASAP slope of .112 accidents per month, an increase in level of 1.759 accidents at the ASAP interrupt, a decrease in level of 2.264 accidents at the speed limit interrupt, and a decrease in slope of .144 accidents per month following the ASAP interrupt (as compared to the pre-ASAP slope) - the post ASAP slope itself = (.112 - .144) = -.032 accidents per month. As shown in Table 1, none of these change estimates are significant. Thus based on this information alone it would be concluded that ASAP had no (significant) effect on total fatal accidents in Hillsborough County. The obtained values were referred to tabled values of the t distribution with 79 degrees of freedom. The degrees of freedom were found by:

degrees of freedom = N minus the number of parameters estimated

where: N = the effective number of observations available for estimation; and

the number of parameters estimated includes an estimate of the mean if d (the order of differencing in the ARIMA portion of the model) equal 0. If $d \neq 0$, the estimation of the mean is not included.

TABLE 1

Summary of Time Series Analyses: Hillsborough County Total Fatal Accidents; Florida Less Hillsborough County Total Fatal Accidents; Hillsborough County Total Fatal Accidents vs. Florida Less Hillsborough County Total Fatal Accidents

Hillsborough County Total Fatal Accidents ($N_t = \overset{a}{Q}_t$)

Parameter	Estimate	S.E.	t
ω_{01e}	0.112	0.084	1.339
ω_{02e}	- 2.264	1.580	1.433
ω_{03e}	1.754	1.493	1.178
ω_{04e}	- 0.144	0.095	1.512

Florida Less Hillsborough County Fatal Accidents ($N_t = \frac{(1-\theta_{12}B^{12})}{1-B^{12}}a_t$)

Parameter	Estimate	S.E.	t
ω_{01c}	0.829	0.287	2.889*
ω_{02c}	- 26.860	6.715	4.000*
ω_{03c}	17.920	6.130	2.923*
ω_{04c}	- 1.009	0.344	2.933*
θ_{12}	0.7344	0.105	7.021*

Planned Comparisons

Comparison	Estimate	S.E.	t +
$\omega_{03e} - \omega_{03c}$	- 16.161	6.309	2.561*
$\omega_{04e} - \omega_{04c}$	0.864	0.357	2.424*

+approximate - for descriptive purposes only

*$p \leq .05$

Figure 4 presents monthly fatal accidents for the balance of the State of Florida in graphic form. The ACF of residuals from the basic regression model fitted to these data indicated seasonal non-stationarity and led ultimately to a noise model of the form

$$N_t = \frac{(1-\theta_{12}B^{12})}{1-B^{12}} a_t \quad .$$

Results of estimation using the basic regression model and the above noise model are also shown in Table 1. Since the predicted values from this model are not simple regression lines, the predicted values have not been superimposed on the raw data shown in Figure 4. The remainder of this section follows the practice of superimposing predicted values only if $N_t = a_t$. The results shown in Table 1 for the balance of the state indicate the same general pattern of change as in Hillsborough County. However, the estimates of the change parameters are significant at the .05 level (degrees of freedom = 67 for these values). There was a strong speed limit effect (decrease in level of 26.86 accidents) and a significant decrease in slope following month 27. The estimation also indicates an increase in level at the (hypothetical) ASAP interrupt.

The planned comparison results shown in Table 1 indicate that the increase in level at the ASAP interrupt was significantly less in Hillsborough County than it was in the balance of the state (degrees of freedom = 146 for the planned comparison t values). However, this particular comparison is almost worthless for several reasons: 1) the two parameters are estimated somewhat differently due to the different noise models for the individual data sets; 2) the <u>increase</u> in level for Hillsborough County can hardly be said to be a favorable ASAP effect; 3) the two comparison series have highly non-homogeneous variance. Virtually all of the variance in the two data sets combined is in the balance of the state data. This results in the balance of the state data dominating the comparison - i.e. any significance for a balance of the state parameter estimate is likely to result in significance

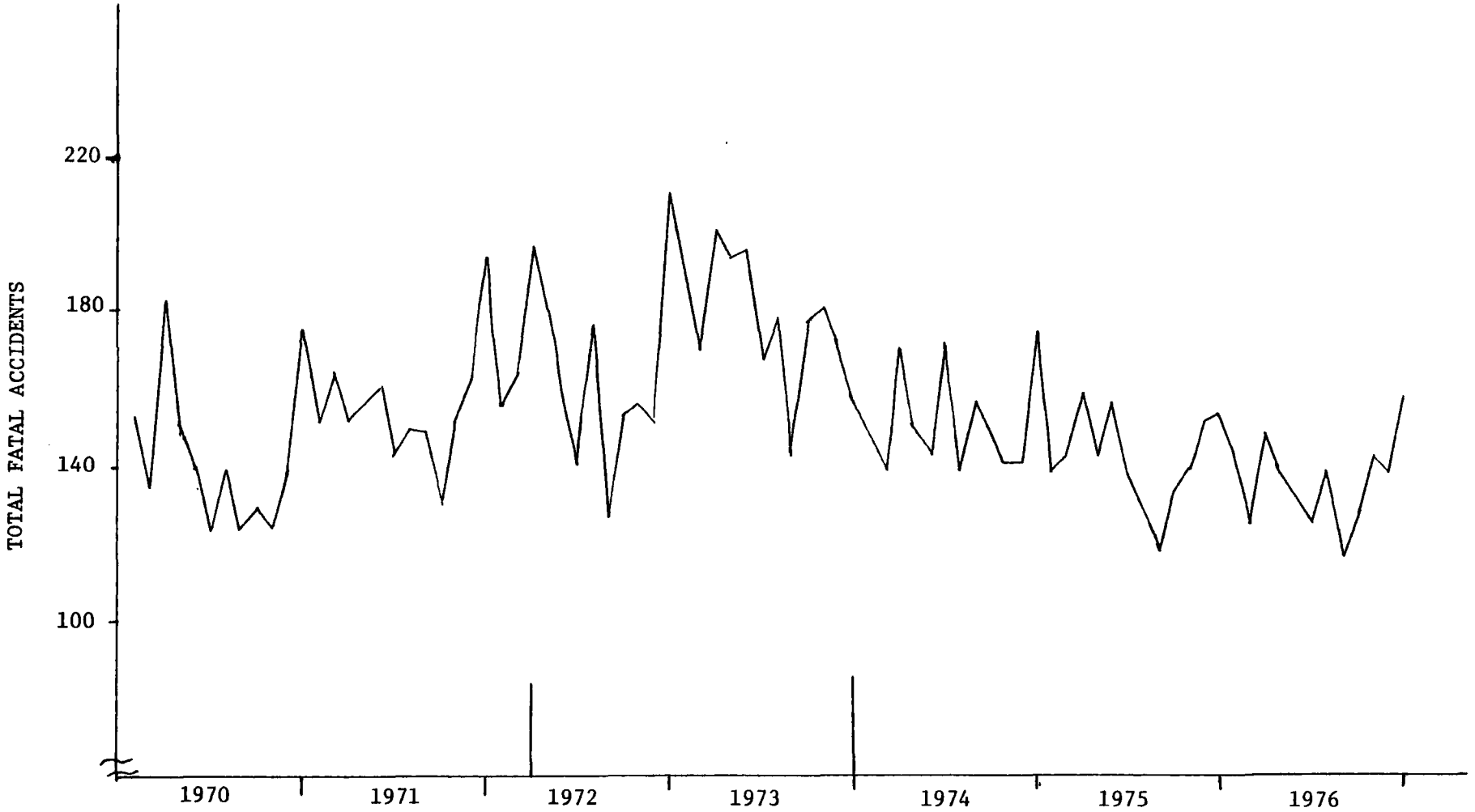


FIGURE 4

Total Fatal Accidents for Florida Less Hillsborough County
1/70 - 12/76

of the comparison; and finally 4) the authors are of an opinion that an hypothesis of an immediate ASAP impact on accidents is not very plausable to begin with.

The comparison of changes in drift shown in Table 1 indicates that the balance of the State of Florida experienced a greater decrease in drift following the ASAP interrupt for total fatal accidents than Hillsborough County did. This comparison suffers from points (1) and (3) above but nevertheless, the trend is quite clear: there has been a significant decrease in drift for total fatal accidents in the State of Florida following the point at which ASAP was introduced in Hillsborough County despite the absence of an ASAP program in the rest of the state and despite the fact that a significant decrease in the level of accidents following the ASAP interrupt has been taken into account. Thus, even if there had been a significant decrease in drift for fatal accidents in Hillsborough County following the ASAP interrupt, it would not be possible to say the effect was due to ASAP since the "comparison" area also experienced a significant decrease in drift, but without the benefit of an ASAP program.

Alcohol-Related Fatal Accidents: Known alcohol-related fatal accidents are presented in Figure 5. Residuals from the basic time series regression model were uncorrelated and thus ordinary least squares estimation was used in obtaining the results shown in Table 2. These results indicate that none of the change parameters of interest are significant. Although the statistical tests themselves are valid, the problems associated with "reported" alcohol-related fatal accidents have been previously discussed, and the results shown should be considered descriptive of "reported" A/R fatal accidents only, not an inference of ASAP effect.

Non alcohol-related fatal accidents for Hillsborough County are presented graphically in Figure 6. Residuals from the basic regression model for this data could also be considered white noise

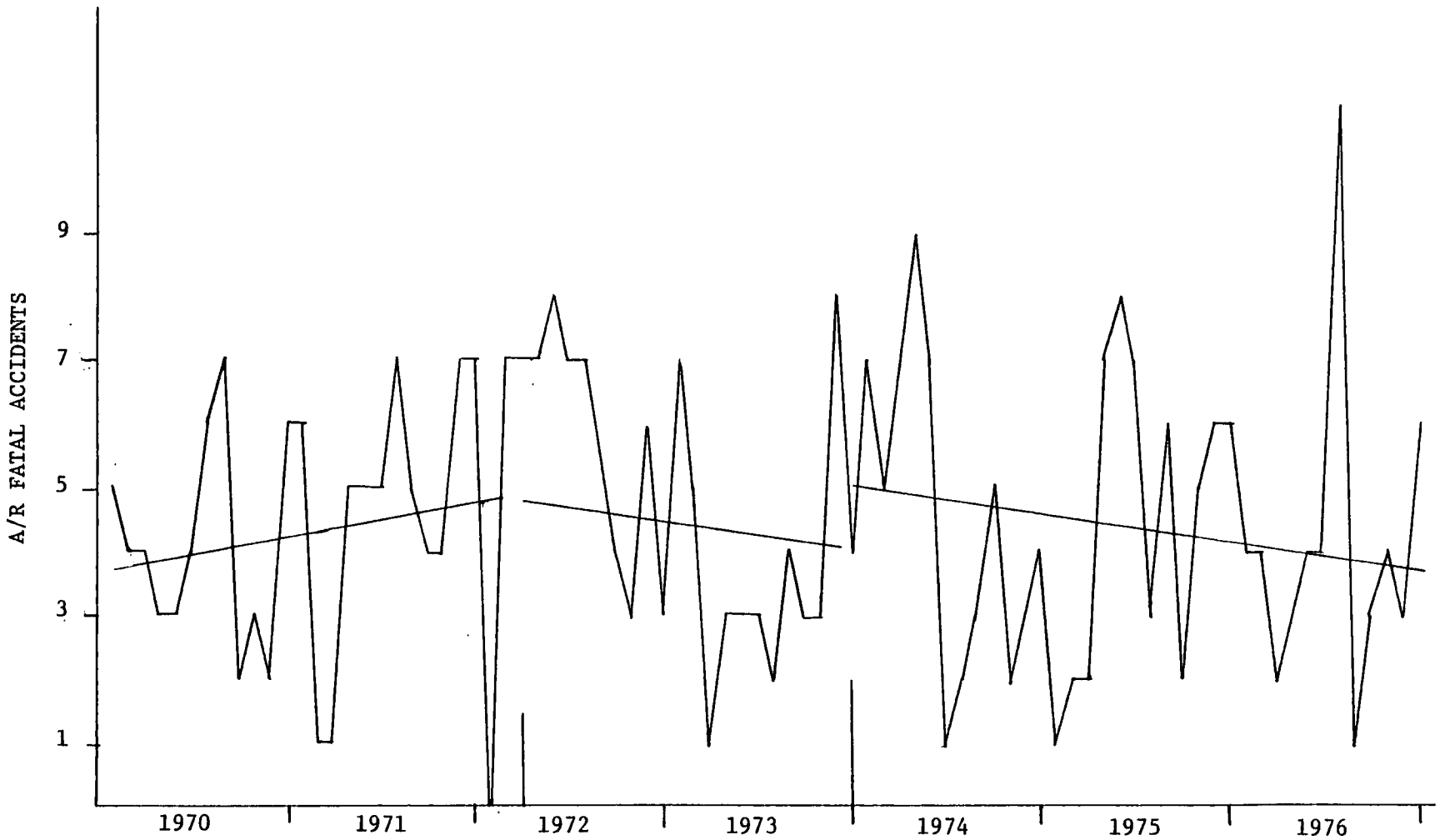


FIGURE 5

Total Alcohol-Related Fatal Accidents for Hillsborough County:
1/70 - 12/76

TABLE 2

Summary of Time Series Analysis: Hillsborough County Alcohol-Related Fatal Accidents; Hillsborough County Non Alcohol-Related Fatal Accidents; Hillsborough County Alcohol-Related Fatal Accidents vs Hillsborough County Non Alcohol-Related Fatal Accidents

Hillsborough County Alcohol-Related Fatal Accidents ($N_t = a_t$)

Parameter	Estimate	S.E.	t
ω_{01e}	0.047	0.060	0.784
ω_{02e}	1.011	1.126	0.897
ω_{03e}	- 0.045	1.064	0.043
ω_{04e}	- 0.084	0.068	1.239

Hillsborough County Non Alcohol-Related Fatal Accidents ($N_t = a_t$)

Parameter	Estimate	S.E.	t
ω_{01c}	0.065	0.070	0.928
ω_{02c}	- 3.274	1.328	2.466*
ω_{03c}	1.804	1.254	1.438
ω_{04c}	- 0.060	0.080	0.748

Planned Comparisons

Comparison	Estimate	S.E.	t
$\omega_{03e} - \omega_{03c}$	- 1.849	1.645	1.124
$\omega_{04e} - \omega_{04e}$	- 0.024	0.105	0.229

* $p \leq .05$

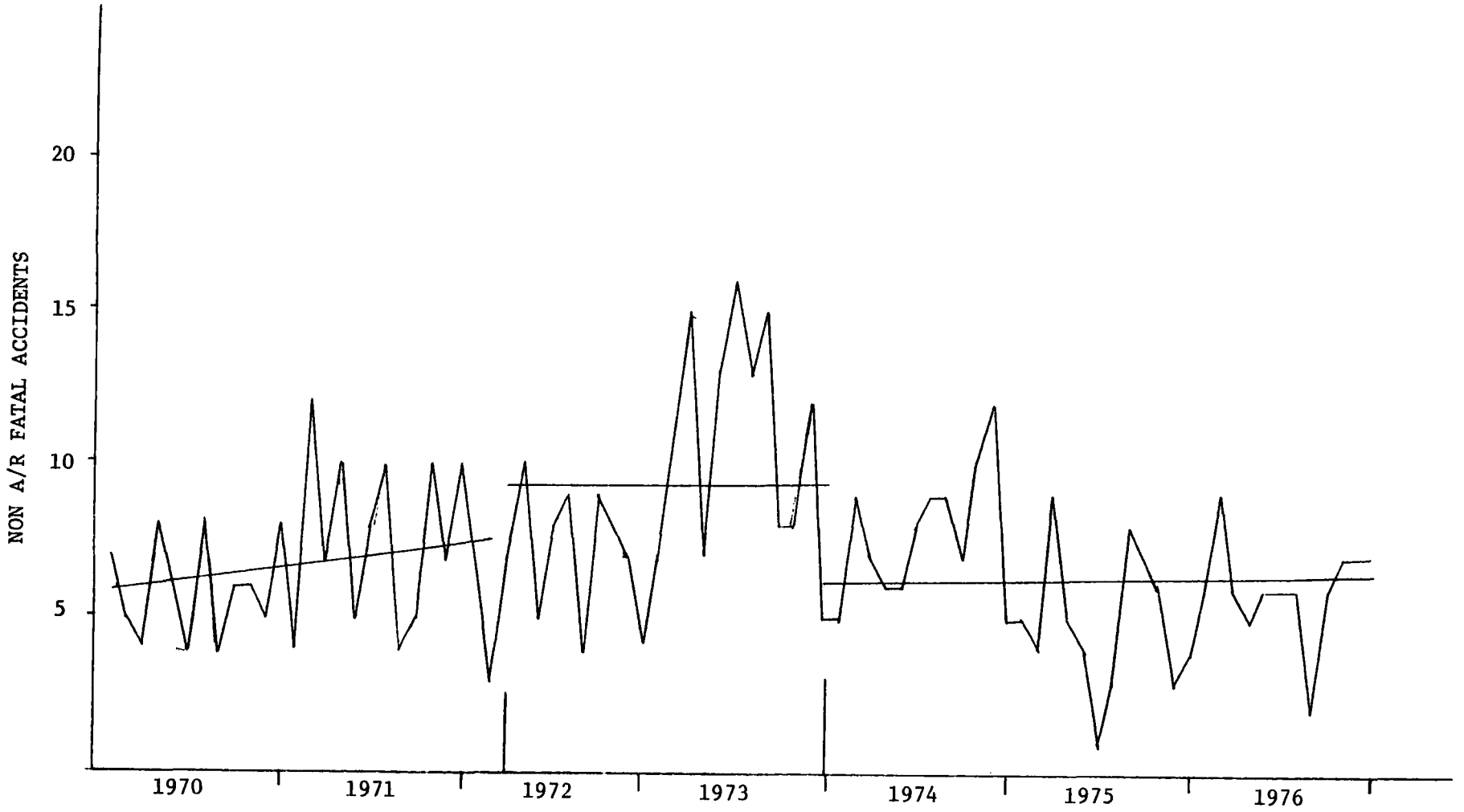


FIGURE 6

Non Alcohol-Related Fatal Accidents For Hillsborough County:
1/70 - 12/76

and Table 2 shows the results of ordinary least squares estimation. Results indicate no changes following the ASAP interrupt but the decrease in level at the speed limit interrupt was significant. Results of the planned comparisons indicate no significant differences between the two accident series in the changes at the ASAP interrupt.

Nighttime Fatal Accidents: Monthly frequencies of nighttime (between 8 p.m. and 4 a.m.) fatal accidents for Hillsborough County are presented graphically in Figure 7. The ACF of residuals from the basic regression model for these data indicated that residuals about the regression lines were not correlated. Thus the superimposed regression lines shown in Figure 7 depict the estimated changes presented in Table 3. Notice that both the change in level at the ASAP interrupt (significant) and the change in drift following the ASAP interrupt (non-significant) show an increase from baseline. This could be due to changing driving factors (i.e. increase in population of licensed drivers or increased number of miles driven), but fortunately both daytime fatal accidents in Hillsborough County and nighttime fatal accidents in the balance of the State of Florida are available as comparison series. If driving patterns are assumed to be similar between the experimental and comparison series, the planned comparison tests should effectively block out driving patterns as a "nuisance" factor.

Figure 8 presents the monthly frequencies of daytime (4:01 a.m. to 7:59 p.m.) fatal accidents in Hillsborough County. The ACF of residuals from the regression change model for these data indicated a noise model of the form $N_t = (1-\theta B)\, a_t$. Table 3 shows the results of non linear estimation for the regression model with the noise model indicated above. These results indicate a significant decrease in drift following the ASAP interrupt and the planned comparison for differences in change in drift is also significant, indicating that the decrease in drift occurring for daytime fatal accidents is significantly different from the

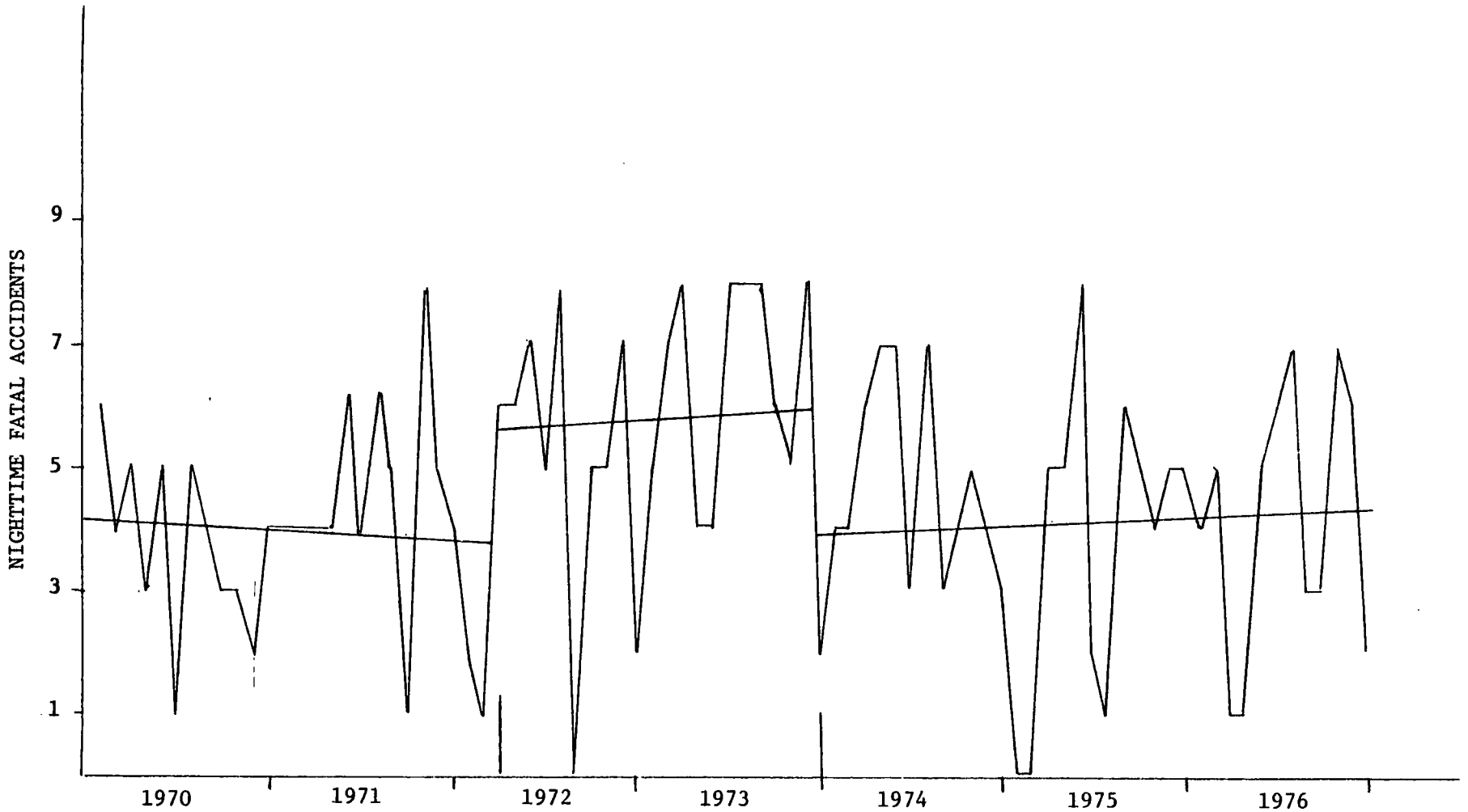


FIGURE 7

Nighttime Fatal Accidents for Hillsborough County:
1/70 - 12/76

TABLE 3

Summary of Time Series Analysis: Hillsborough County Nighttime Fatal Accidents; Hillsborough County Daytime Fatal Accidents; Florida Less Hillsborough County Nighttime Fatal Accidents; Hillsborough County Nighttime vs. Hillsborough County Daytime Fatal Accidents; and Hillsborough County Nighttime Accidents vs. Florida Less Hillsborough County Nighttime Fatal Accidents

Hillsborough County Nighttime Fatal Accidents ($N_t = a_t$)

Parameter	Estimate	S.E.	t
ω_{01e}	- 0.014	0.053	0.266
ω_{02e}	- 1.969	0.994	1.981
ω_{03e}	1.891	0.939	2.013*
ω_{04e}	0.026	0.060	0.435

Hillsborough County Daytime Fatal Accidents ($N_t = (1-\theta B)\, a_t$)

Parameter	Estimate	S.E.	t
ω_{01c}	0.127	0.044	2.925*
ω_{02c}	0.043	0.837	0.051
ω_{03c}	- 0.075	0.780	0.096
ω_{04c}	- 0.181	0.050	3.665*
θ	0.290	0.112	2.601*

Planned Comparisons (Hillsborough County Nighttime vs. Daytime Fatal Accidents)

Comparison	Estimate	S.E.	t+
$\omega_{03e} - \omega_{03c}$	1.966	1.221	1.610
$\omega_{04e} - \omega_{04c}$	0.208	0.078	2.658*

Florida Less Hillsborough County Nighttime Fatal Accidents ($N_t = a_t$)

Parameter	Estimate	S.E.	t
ω_{01c}	0.329	0.206	1.598
ω_{02c}	0.875	3.887	0.225
ω_{03c}	8.157	3.673	2.221*
ω_{04c}	- 0.544	0.234	2.322*

Planned Comparisons (Hillsborough County Nighttime Fatal Accidents vs. Florida Less Hillsborough County Nighttime Fatal Accidents)

Comparison	Estimate	S.E.	t
$\omega_{03e} - \omega_{03c}$	- 6.266	3.791	1.653
$\omega_{04e} - \omega_{04c}$	0.570	0.242	2.361*

+approximate - for descriptive purposes only

*$p \leq .05$

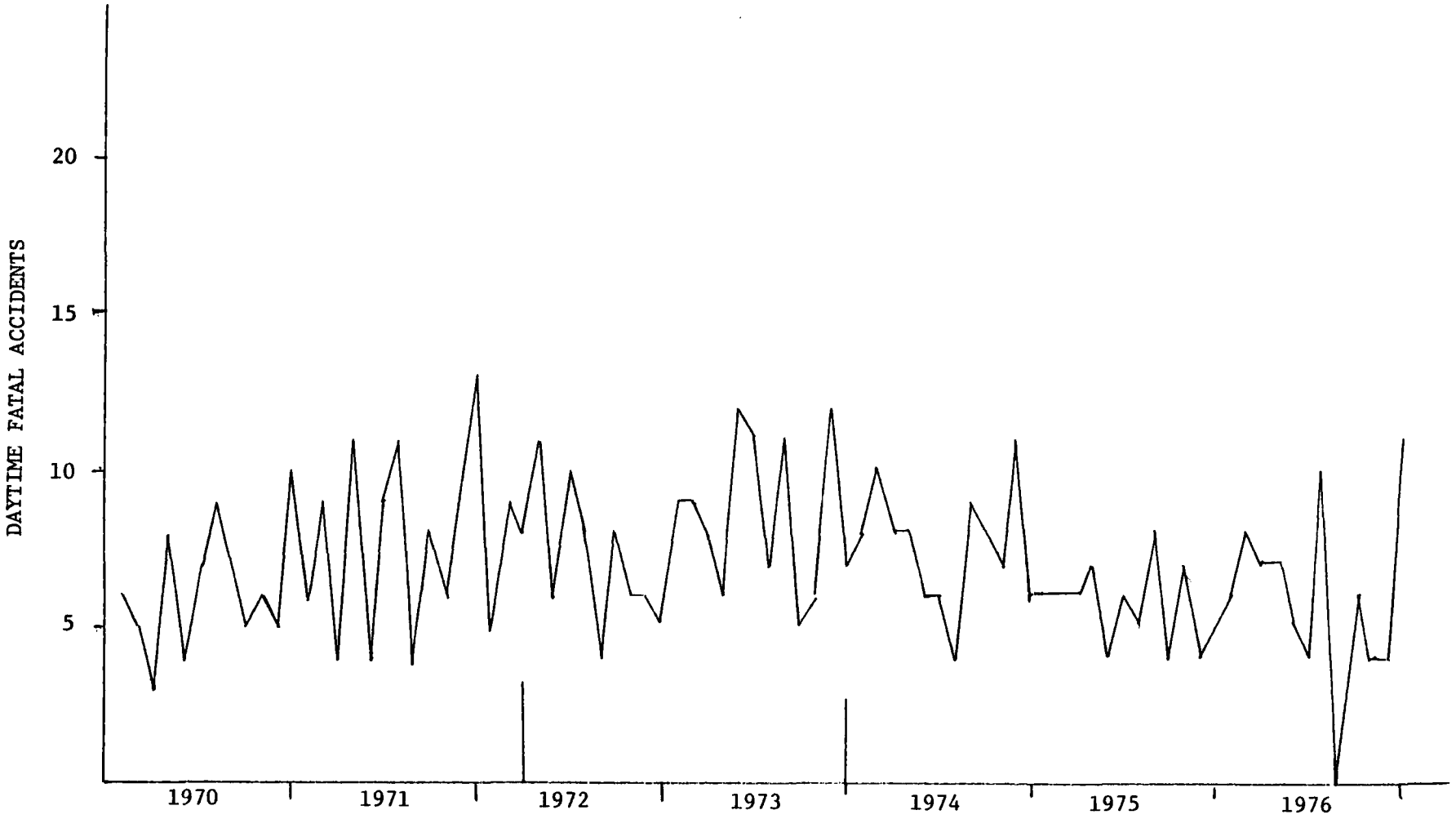


FIGURE 8

Daytime Fatal Accidents for Hillsborough County:
1/70 - 12/76

increase in drift for nighttime fatal accidents. (The planned comparisons shown for these data are not completely valid because of the different noise structures; however, with the moderate value seen for θ and no differencing requirements, the comparison may be considered reasonably good).

Nighttime fatal accidents for the State of Florida minus Hillsborough County are presented graphically in Figure 9. Since the basic regression model with $N_t = a_t$ fit these data adequately, the predicted values (regression lines) from the model were superimposed on the raw data. The regression lines make it possible to visualize the fairly strong decrease (significant) in drift following March, 1972. The results of estimation are also presented in Table 3 and indicate a decrease in drift of .544 accidents per month as compared to the baseline and a decrease of .215 accidents per month since the ASAP interrupt (.329 - .544). Results of the planned comparisons shown in Table 3 comparing the balance of the state with Hillsborough County nighttime accidents indicates that this decrease in drift is significantly different from the increase in drift following the ASAP interrupt in Hillsborough County.

These results are, of course, exactly opposite of an hypothesized favorable ASAP effect, and since these particular sets of comparisons represent the best tests of ASAP impact on alcohol-related accidents the authors were able to make, it must be concluded that no evidence of a favorable ASAP impact on alcohol-related fatal accidents has been found.

Weekend Fatal Accidents: Figure 10 presents the monthly frequencies of weekend fatal accidents (8 p.m. Friday to 4 a.m. Monday) for Hillsborough County. The basic regression model with $N_t = a_t$ was applied to these data and found to be adequate. The results of ordinary least squares estimation are shown in Table 4 and indicate that none of the change parameters of interest are significant. It should be noted though that the decrease in drift

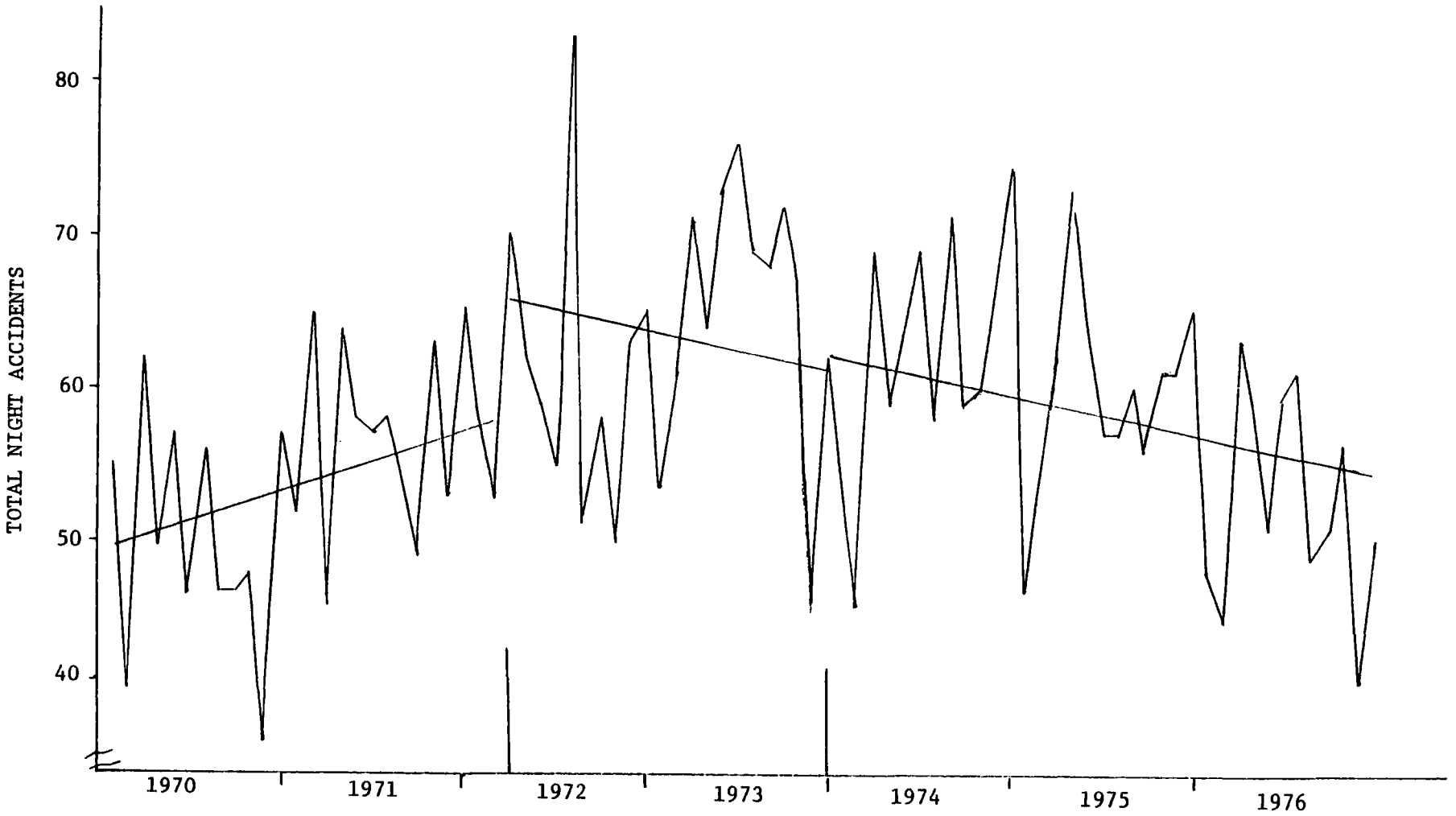


FIGURE 9

Fatal Night Accidents For Florida Less Hillsborough County
1/70 - 12/76

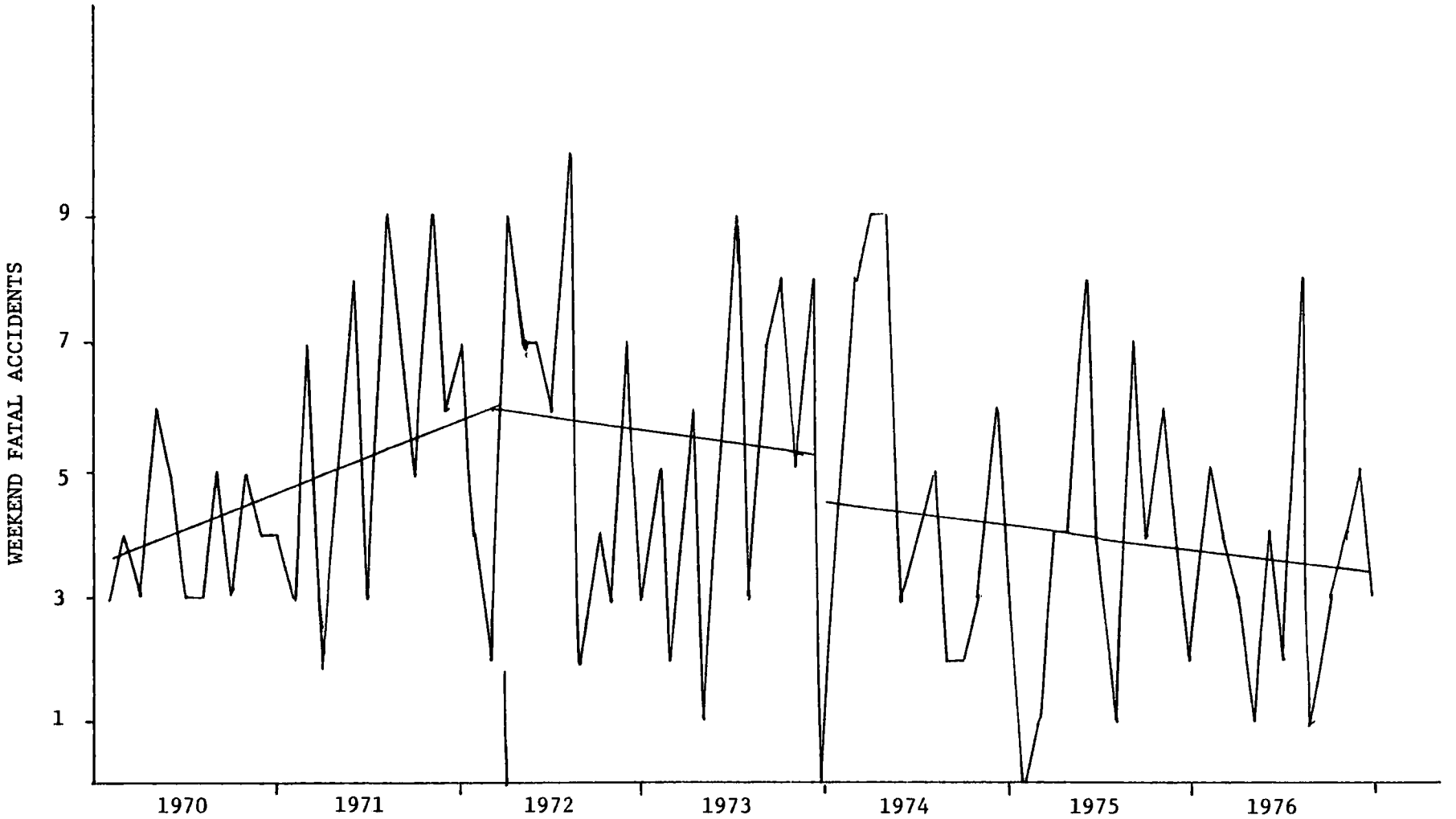


FIGURE 10

Weekend Fatal Accidents For Hillsborough County:
1/70 - 12/76

TABLE 4

Summary of Time Series Analysis: Hillsborough County Weekend Fatal Accidents; Hillsborough County Weekday Fatal Accidents; Hillsborough County Weekend vs. Weekday Fatal Accidents

Hillsborough County Weekend Fatal Accidents ($N_t = a_t$)

Parameter	Estimate	S.E.	t
ω_{01e}	0.095	0.061	1.558
ω_{02e}	- 0.713	1.147	0.622
ω_{03e}	- 0.074	1.083	0.068
ω_{04e}	- 0.126	0.069	1.825

Hillsborough County Weekday Fatal Accidents ($N_t = a_t$)

Parameter	Estimate	S.E.	t
ω_{01c}	0.017	0.068	0.257
ω_{02c}	- 1.551	1.282	1.210
ω_{03c}	1.832	1.211	1.513
ω_{04c}	- 0.018	0.077	0.231

Planned Comparisons

Comparison	Estimate	S.E.	t
$\omega_{03e} - \omega_{03c}$	- 1.906	1.625	1.173
$\omega_{04e} - \omega_{04c}$	- 0.108	0.103	1.045

of .126 accidents per month is in the expected direction (favorable to ASAP) and is significant at the .10 level.

Weekday fatal accidents (4:01 a.m. Monday to 7:59 p.m. Friday) are shown in Figure 11. The basic regression change model with $N_t = a_t$ was also adequate for these data and results of estimation are shown in Table 4. None of the change parameters are significant and the results of the planned comparisons also shown in Table 4 indicate there are no differences between the changes at the ASAP interrupt between Hillsborough County weekend and weekday fatal accidents. In contrast to the nighttime comparisons however, at least the direction of the results, particularly the negative value for the estimate of $\omega_{04e} - \omega_{04c}$, is not inconsistent with the expected favorable ASAP impact on alcohol-related accidents.

2. Injury Accident Data

Total Injury Accidents: Total injury accidents for Hillsborough County are shown in Figure 12. The basic regression model applied to these with $N_t = a_t$ was clearly not adequate as evidenced by the ACF of residuals from this model. With the ACF and PACF of residuals serving as guides to model building, a noise model of the form $N_t = \frac{(1-\theta B)}{1-B} a_t$ was eventually considered adequate. Results of non linear estimation for the basic regression model with the above noise model are shown in Table 5. There have been no significant changes at the ASAP interrup although a large non-random decrease in level at the speed limit interrupt has taken place.

Since a noise model of the form indicated above, commonly known as IMA(1,1), occurs quite frequently in time series analysis in general as well as in several subsets of Hillsborough County injury accidents which follow, it was considered instructive to present the predicted values from the change model for Hillsborough County in graphic form. Accordingly, these predicted values are depicted in Figure 13. The predicted values show a

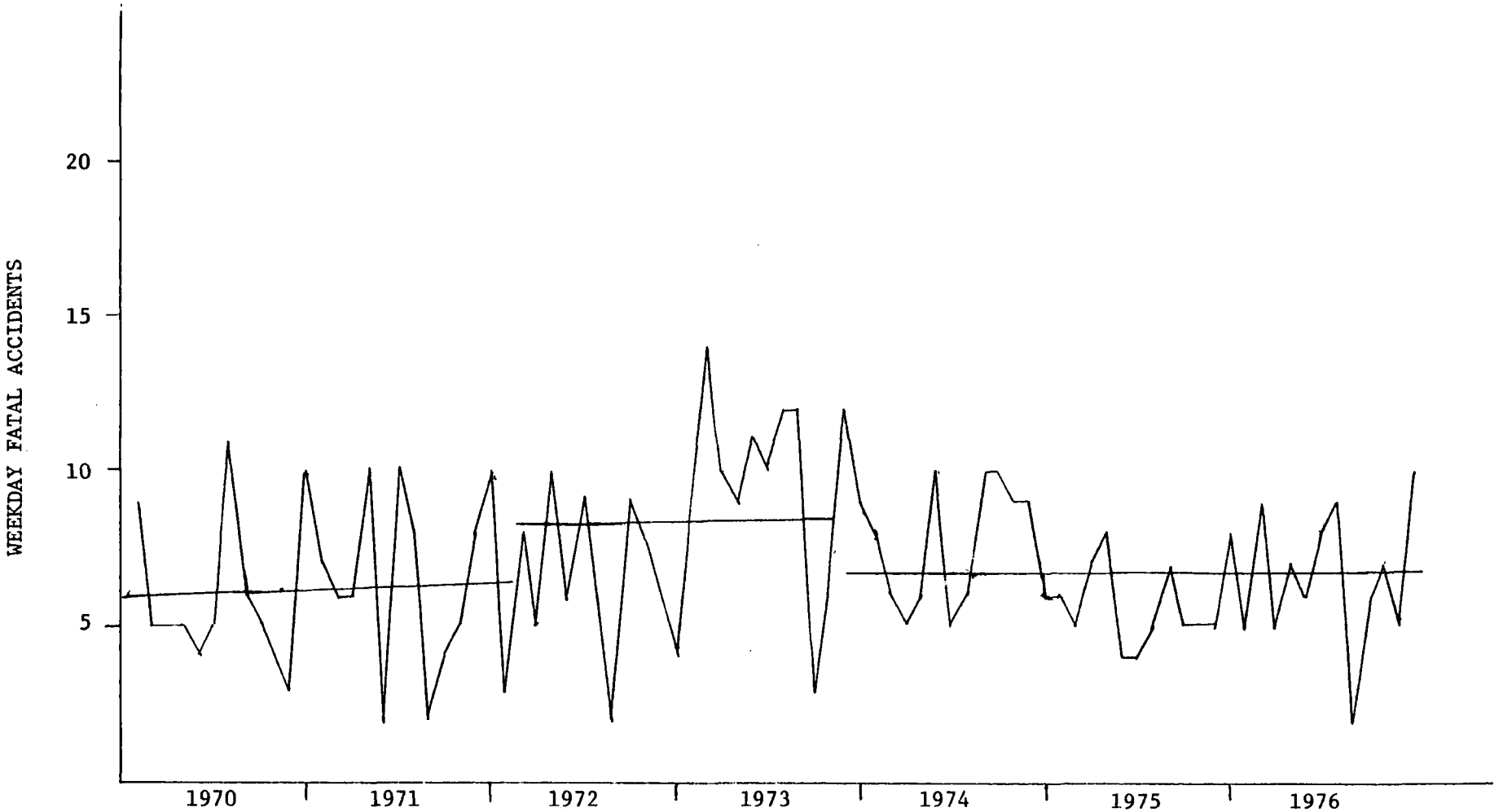


FIGURE 11

Weekday Fatal Accidents For Hillsborough County:
1/70 - 12/76

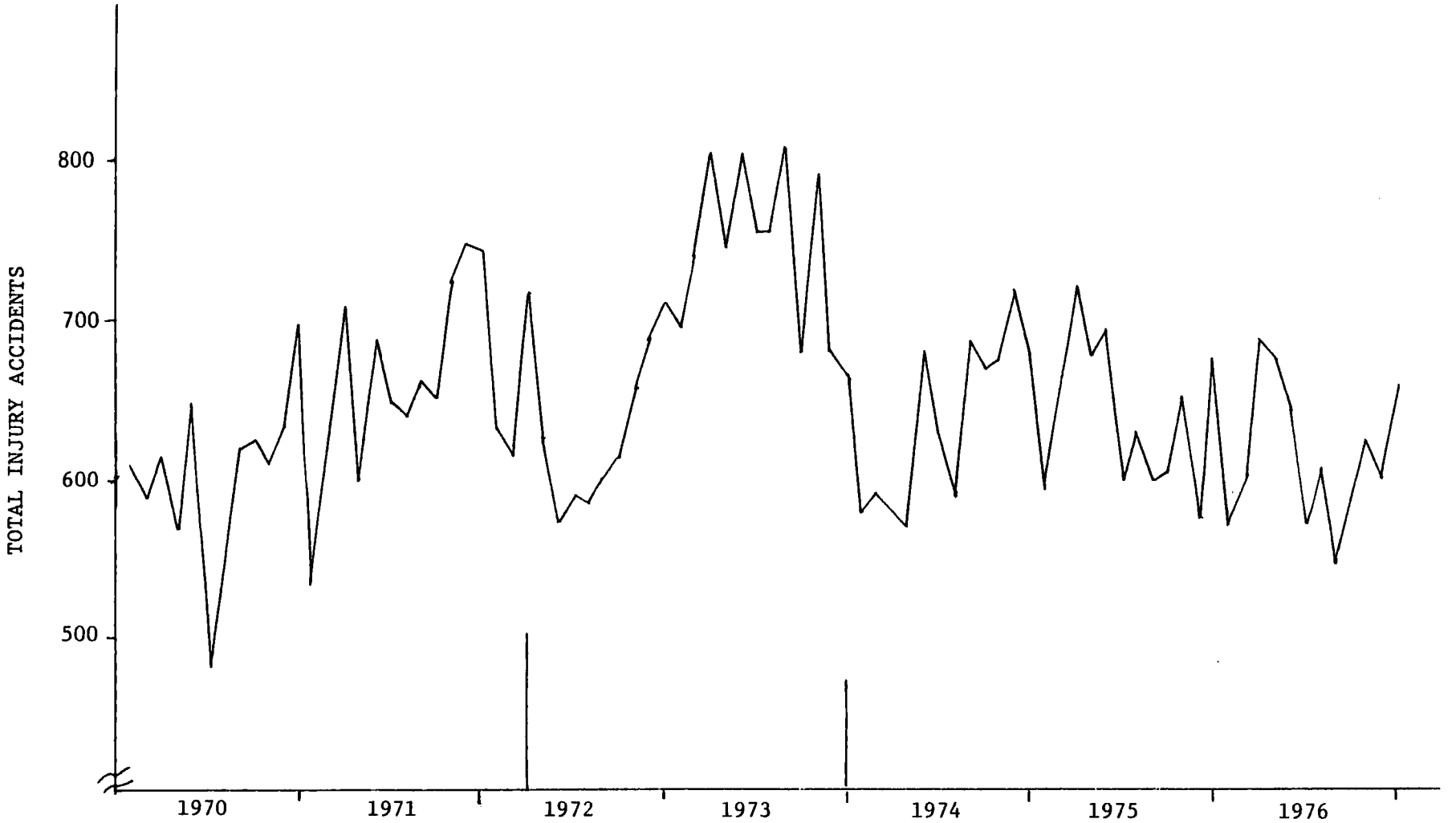


FIGURE 12

Total Injury Accidents For Hillsborough County:
1/70 - 12/76

TABLE 5

Summary of Time Series Analysis: Hillsborough County Total Injury Accidents

Hillsborough County Total Injury Accidents ($N_t = \frac{(1-\theta B)}{(1-B)} a_t$)

Parameter	Estimate	S.E.	t
ω_{01}	2.807	3.602	0.780
ω_{02}	- 124.500	40.850	3.048 *
ω_{03}	- 31.730	40.690	0.780
ω_{04}	- 0.890	4.332	0.205
θ	0.682	0.085	8.037 *

* $p \leq .05$

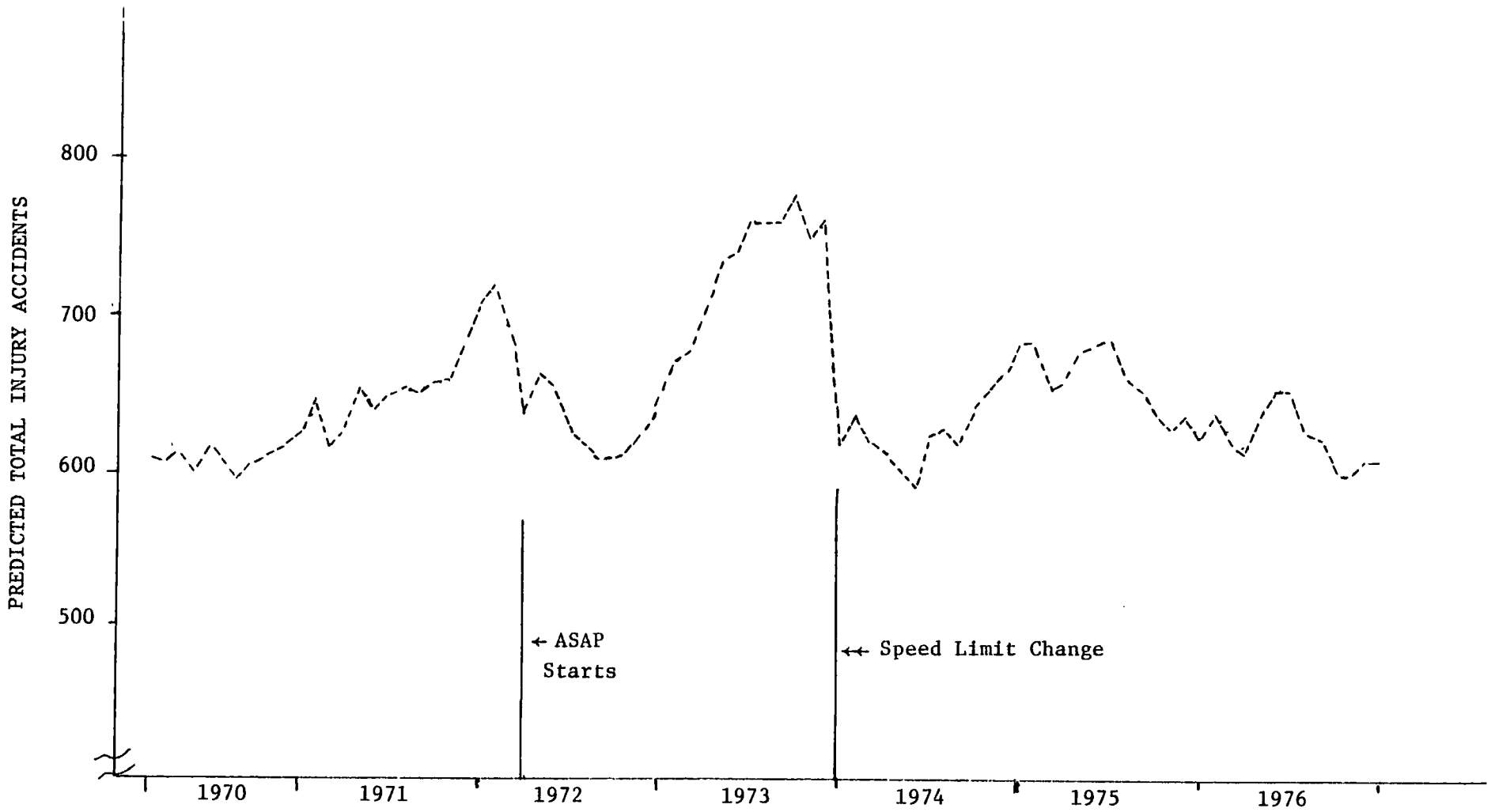


FIGURE 13

Predicted Total Injury Accidents For Hillsborough County

From the Model $y_t = \omega_{01}\xi_{t1} + \omega_{02}\xi_{t2} + \omega_{03}\xi_{t3} + \omega_{04}\xi_{t4} + \frac{(1-.682B)}{(1-B)} a_t$:

2/70 - 12/76

close correspondence with the raw data shown in Figure 12 and the estimated change at the speed limit interrupt is clearly visible. On the other hand, the estimated change in level and change in drift (which were not significant) at the ASAP interrupt cannot be distinguished from the background variation.

Alcohol-Related Injury Accidents: Reported or 'measured' A/R injury accidents for the period 1/70 to 12/76 taking place in Hillsborough County are shown in Figure 14. Residuals from the basic regression model with $N_t = a_t$ for these data were correlated and the ACF of residuals suggested a noise model of the form $N_t = (1-\theta B)a_t$. Results of estimation for the regression model with this noise structure are shown in Table 6. The negative estimate of θ makes the noise model seem somewhat implausable (elements in a transformed design matrix under this circumstance will have alternate negative and postive exponential weighting increments) but in the absence of further information the model has been retained. In any case, since the estimate of θ is not excessively large and there were no differencing requirements, the estimation process (from a practical viewpoint) was not considerably different from ordinary least squares estimation. The results shown in Table 6 indicate no significant changes for any of the parameters of interest.

Figure 15 presents Hillsborough County non alcohol-related inquiry accidents for the period January, 1970 to December, 1976. This subset of injury accidents contains most of the total injury accidents shown in Figure 12 and therefore resembles it closely in nature. The noise model for these data was identified as IMA(1,1): $(N_t = \frac{(1-\theta B)}{1-B} a_t)$ and results of estimation for the basic regression model with this noise model are shown in Table 6. Significance tests indicate the decrease in level at the speed the limit interrupt is significant but the changes associated with ASAP interrupt are not. Results of the planned comparisons also shown in Table 6 indicate no significant differences of ASAP interrupt changes between A/R and non-A/R injury accidents.

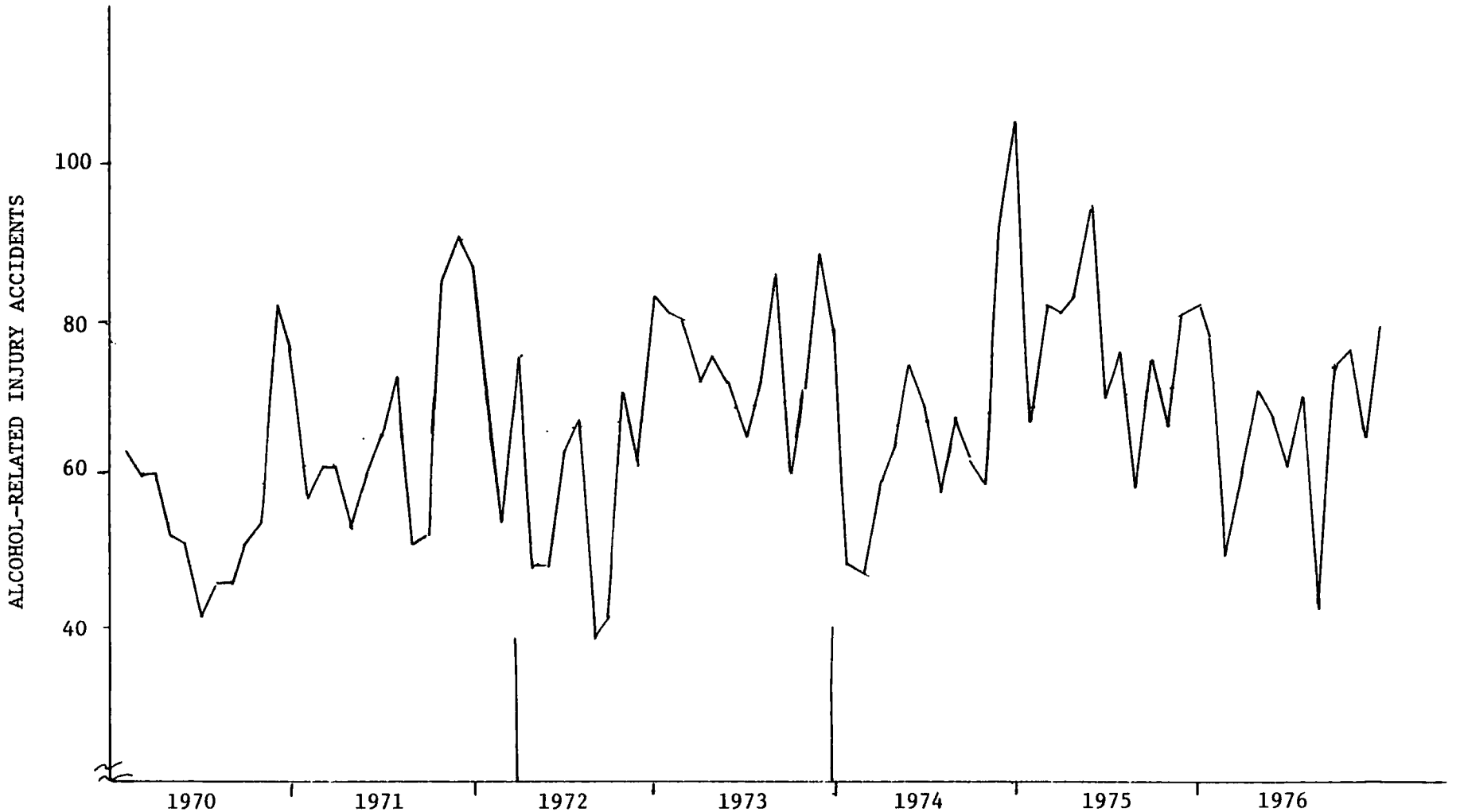


FIGURE 14

Alcohol-Related Injury Accidents For Hillsborough County:
1/70 - 12/76

TABLE 6

Summary of Time Series Analyses: Hillsborough County A/R Injury Accidents; Hillsborough County Non-A/R Injury Accidents; and Hillsborough County A/R vs. Non A/R Injury Accidents

Hillsborough County A/R Injury Accidents ($N_t = (1-\theta B)\, a_t$)

Parameter	Estimate	S.E.	t
ω_{01e}	0.638	0.420	1.518
ω_{02e}	- 4.334	7.873	0.550
ω_{03e}	- 3.325	7.468	0.445
ω_{04e}	- 0.425	0.482	0.881
θ	- 0.384	0.104	3.679 *

Hillsborough County Non A/R Injury Accidents ($N_t = \frac{(1-\theta B)}{(1-B)} a_t$)

Parameter	Estimate	S.E.	t
ω_{01c}	2.413	3.002	0.804
ω_{02c}	- 111.000	35.700	3.109 *
ω_{03c}	- 23.860	35.305	0.676
ω_{04c}	- 0.917	3.611	0.254
θ	0.707	0.082	8.617 *

Planned Comparison

Comparison	Estimate	S.E.	t +
$\omega_{03e} - \omega_{03c}$	20.535	36.086	0.569
$\omega_{04e} - \omega_{04c}$	0.492	3.643	0.135

+ approximate - for descriptive purposes only

* $p \leq .05$

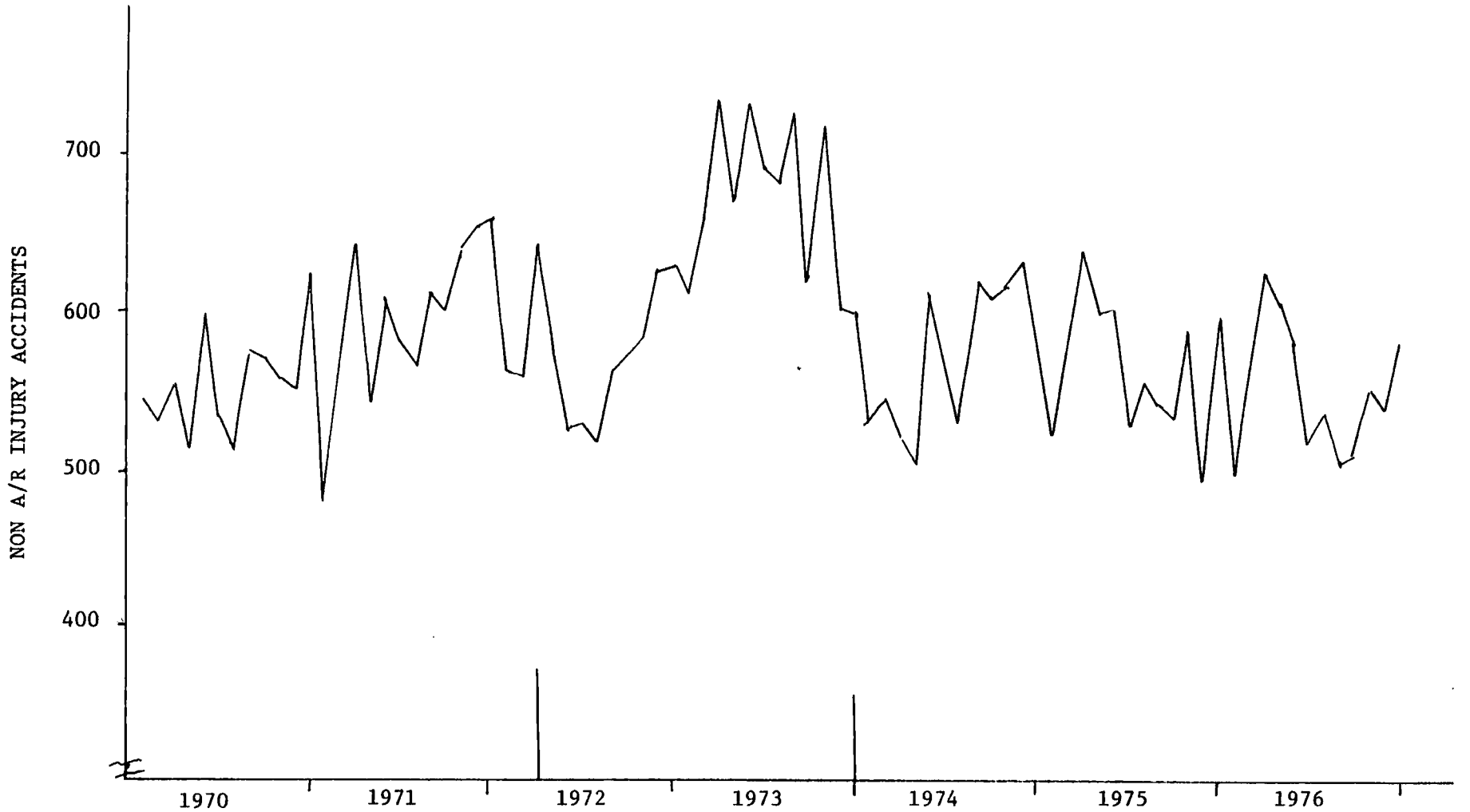


FIGURE 15

Non Alcohol-Related Injury Accidents For Hillsborough County:
1/70 - 12/76

Nighttime Injury Accidents: Injury accidents occurring between 8 p.m. and 4 a.m. are shown in Figure 16. A noise model of the form $N_t = \frac{(1-\theta B)}{(1-B)} a_t$ was determined to be appropriate for these data and the results of non linear estimation for the basic regression model with this noise model are shown in Table 7. Neither of the ASAP change parameters of interest are seen to be significant.

Daytime (4:01 a.m. to 7:59 p.m.) injury accidents are presented graphically in Figure 17. The appropriate noise model for these data was also $N_t = \frac{(1-\theta B)}{(1-B)} a_t$ and results of non linear estimation for the basic regression model with this noise model are shown in Table 7. Again, the ASAP change parameters are not significant and results of the planned comparisons also shown in Table 7 indicate no differences between nighttime and daytime injury accidents for change in level or change in drift at the ASAP interrupt.

Weekend Injury Accidents: Monthly frequencies of weekend (8 p.m. Friday to 4 a.m. Monday) injury accidents for Hillsborough County are presented graphically in Figure 18. The ACF of residuals from the basic regression model with $N_t = a_t$ indicated a strong lag 3 autocorrelation which eventually led to the selection of a noise model of the form $N_t = \frac{a_t}{(1-\phi_3 B^3)}$. Results of estimation for the regression model with this noise model are shown in Table 8 and indicate that the ASAP change parameter estimates are not significant. There has been a significant decrease in level of 38.8 accidents at the speed limit interrupt.

Hillsborough County weekday (4:01 a.m. Monday to 7:59 p.m. Friday) injury accidents are depicted in Figure 19 for the years 1970 to 1976. The ACF of residuals from the basic regression model with $N_t = a_t$ applied to these data indicated an IMA(1,1) noise model with added seasonal noise would be appropriate. This model took the eventual form $N_t = \frac{(1-\theta B)(1-\theta_{12} B^{12})}{(1-B)} a_t$ and results of non linear estimation for the basic regression model with this

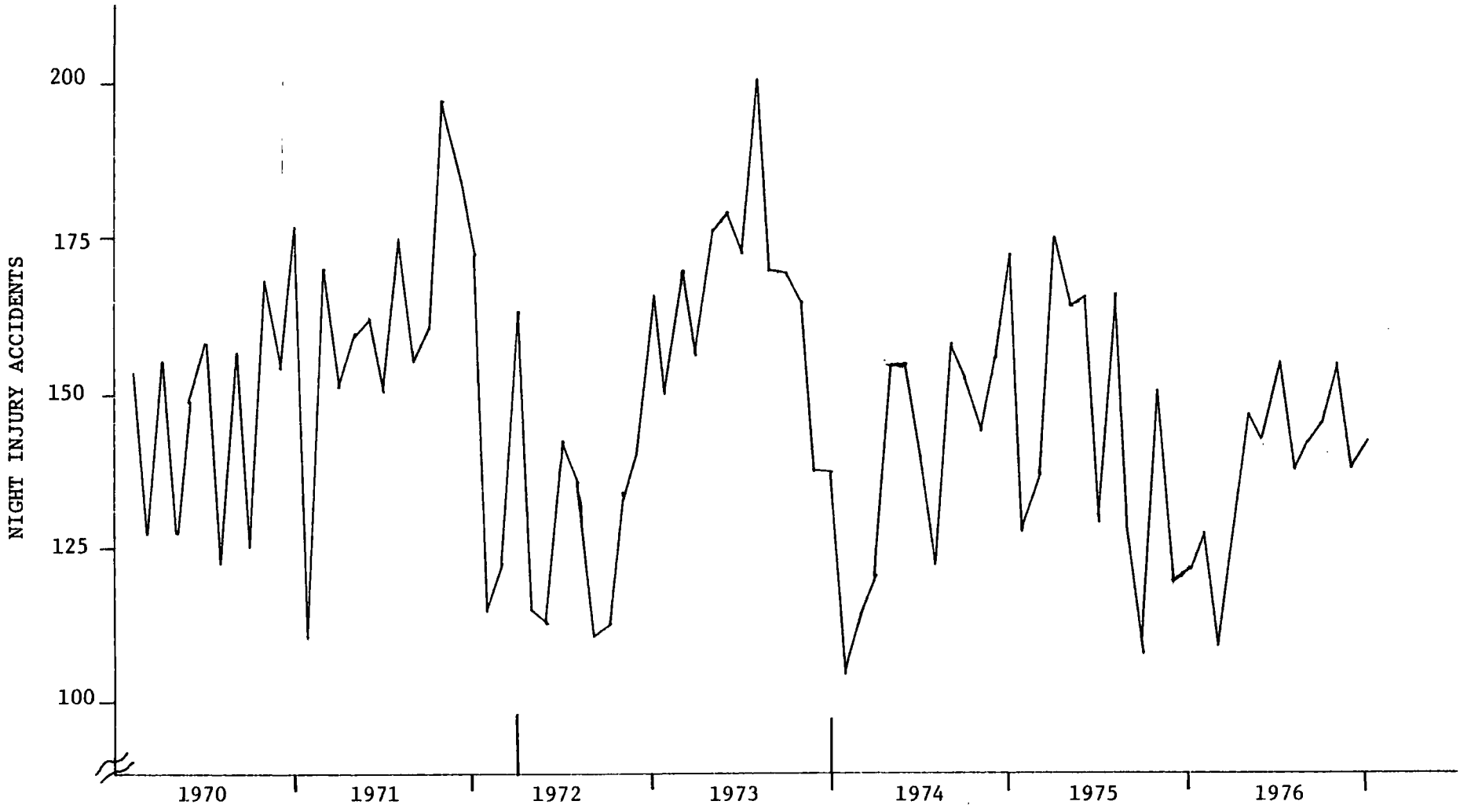


FIGURE 16

Night Injury Accidents For Hillsborough County:
1/70 - 12/76

TABLE 7

Summary of Time Series Analyses: Hillsborough County Nighttime Injury Accidents; Hillsborough County Daytime Injury Accidents; and Hillsborough County Nighttime vs. Daytime Injury Accidents

Hillsborough County Nighttime Injury Accidents ($N_t = \frac{(1-\theta B)}{(1-B)} a_t$)

Parameter	Estimate	S.E.	t
ω_{01e}	- 0.009	1.246	0.007
ω_{02e}	- 38.680	15.840	2.442 *
ω_{03e}	- 15.630	16.280	0.960
ω_{04e}	0.902	1.508	0.598
θ	0.7254	0.084	8.590 *

Hillsborough County Daytime Injury Accidents ($N_t = \frac{(1-\theta B)}{(1-B)} a_t$)

Parameter	Estimate	S.E.	t
ω_{01c}	3.012	2.316	1.301
ω_{02c}	- 91.530	30.335	3.017 *
ω_{03c}	- 23.400	29.760	0.786
ω_{04c}	- 1.844	2.797	0.659
θ	0.761	0.073	10.461 *

Planned Comparisons

Comparison	Estimate	S.E.	t
$\omega_{03e} - \omega_{03c}$	7.770	33.922	0.229
$\omega_{04e} - \omega_{04c}$	2.746	3.178	0.864

* $p \leq .05$

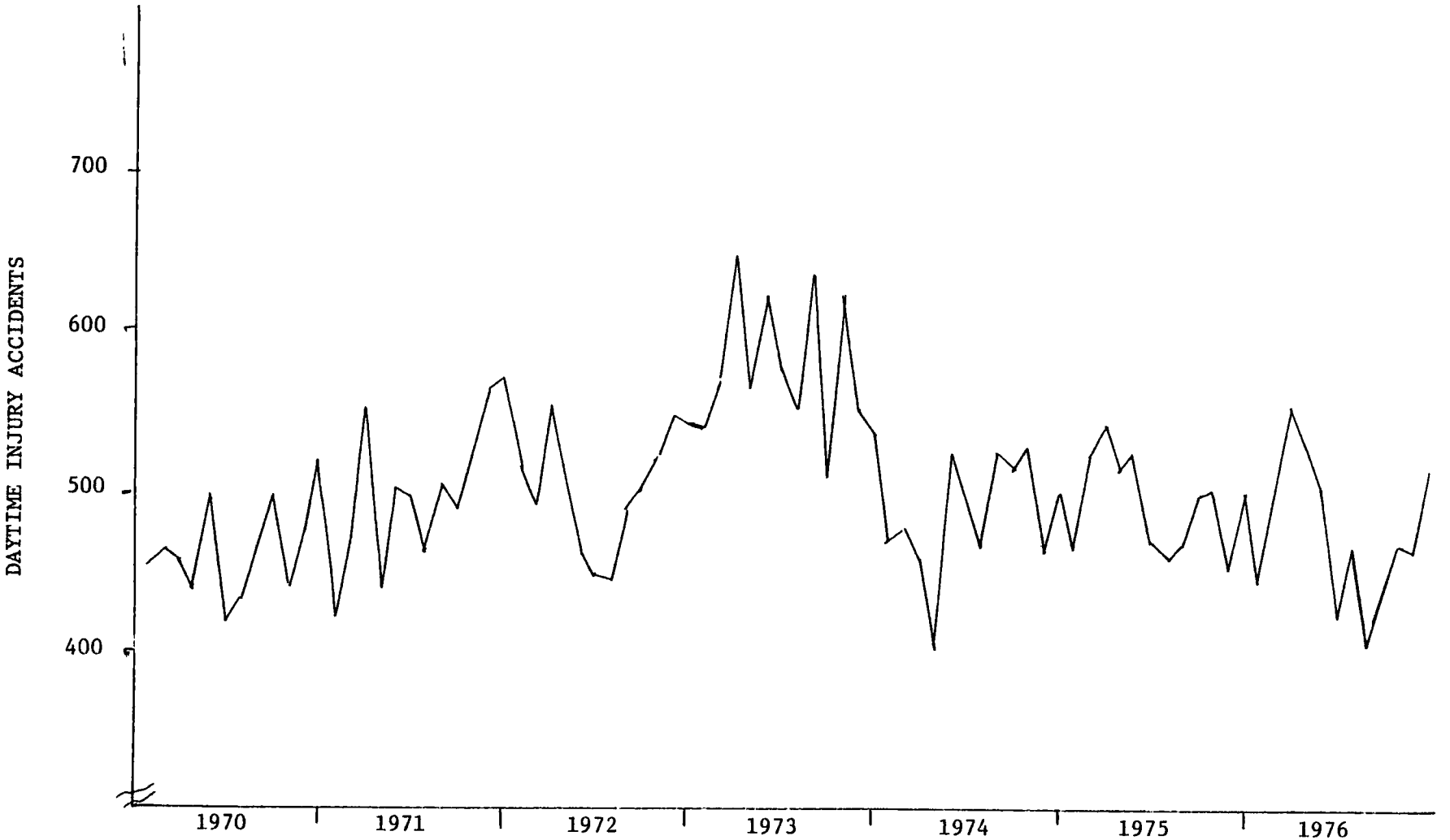


FIGURE 17

Daytime Injury Accidents For Hillsborough County:
1/70 - 12/76

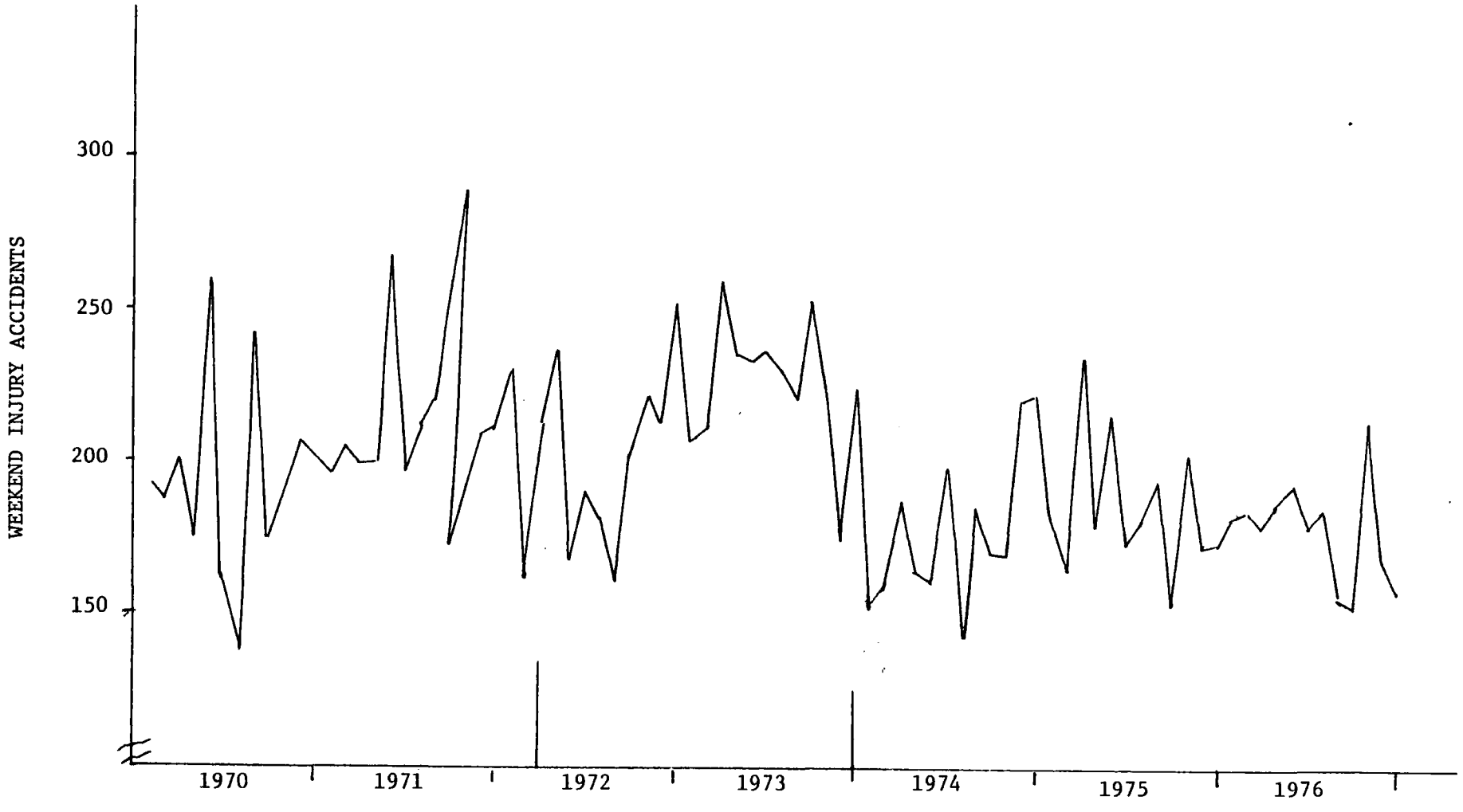


FIGURE 18

Weekend Injury Accidents For Hillsborough County:
1/70 - 12/76

TABLE 8

Summary of Time Series Analyses: Hillsborough County Weekend Injury Accidents; Hillsborough County Weekday Injury Accidents; and Hillsborough County Weekend vs. Weekday Injury Accidents

Hillsborough County Weekend Injury Accidents ($N_t = \frac{a_t}{(1-\phi_3 B^3)}$)

Parameter	Estimate	S.E.	t
ω_{01e}	0.970	1.256	0.772
ω_{02e}	- 38.800	15.735	2.466 *
ω_{03e}	- 0.597	15.932	0.037
ω_{04e}	- 0.832	1.378	0.604
ϕ_3	0.372	0.110	3.395 *

Hillsborough County Weekday Injury Accidents ($N_t = \frac{(1-\theta B)(1-\theta_{12} B^{12})}{(1-B)} a_t$)

Parameter	Estimate	S.E.	t
ω_{01c}	1.837	2.894	0.635
ω_{02c}	- 104.900	27.850	3.767 *
ω_{03c}	- 64.920	27.190	2.388 *
ω_{04c}	0.961	3.423	0.281
θ	0.756	0.076	10.008 *
θ_{12}	- 0.424	0.113	3.735 *

Planned Comparisons

Comparison	Estimate	S.E.	t
$\omega_{03e} - \omega_{03c}$	64.323	31.514	2.041 *
$\omega_{04e} - \omega_{04c}$	- 1.793	3.690	0.486

+Approximate - for descriptive purposes only

*$p \leq .05$

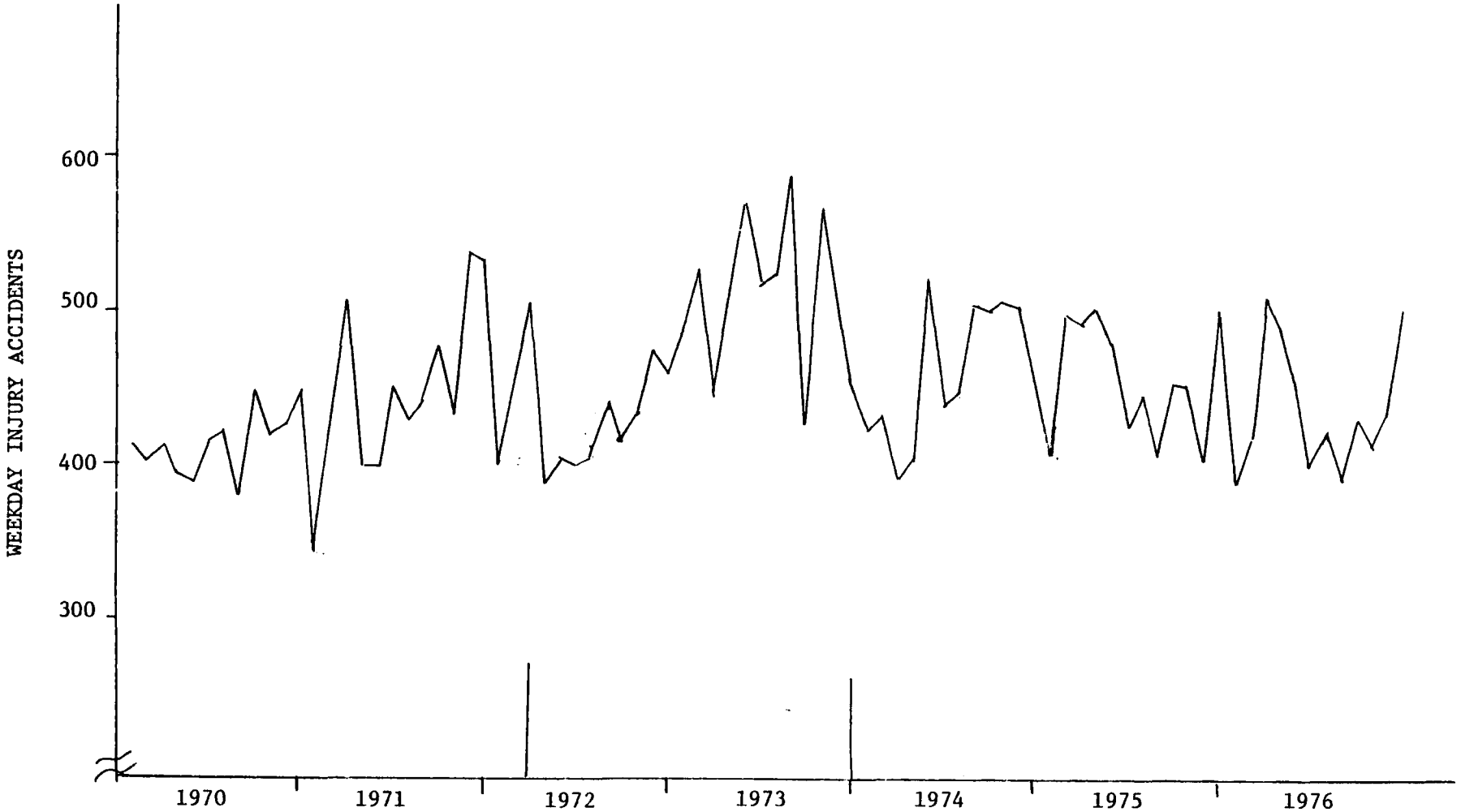


FIGURE 19

Weekday Injury Accidents For Hillsborough County:
1/70 - 12/76

noise model are shown in Table 8. These results indicate a significant decrease in level at the ASAP interrupt and a significant decrease in level at the speed limit interrupt. However, it must be kept in mind that with the IMA(1,1) noise model, the estimate of change in level compares an exponentially weighted average of values immediatly preceding and following the interrupt such that observations 6 or 7 time periods removed from the interrupt may receive practically no weight at all in making the comparison (depending on the estimated value of θ). Thus a visual inspection of Figure 19 reveals that the estimated change in level at the ASAP interrupt is quite short lived as compared to the change in level at the speed limit interrupt which seems to be more permanent in nature.

The planned comparisons shown in Table 8 must be considered descriptive only since the noise models for the two data sets are considerably different. The comparison of changes in drift indicates that weekend injury accidents decreased by 1.793 accidents per month relative to weekday injury accidents following the ASAP interrupt. This value is nowhere near significance however, and it must be kept in mind that the individual change estimates were estimated differently.

C. Summary

Total fatal and injury accidents, as well as A/R, nighttime, and weekend subsets of fatal and injury crashes for Hillsborough County were examined for evidence of ASAP impact in the present report. The basic hypothesis of interest was that ASAP would have a gradually increasing effect on A/R accidents, bringing about a gradual decrease in A/R accidents over time. Formally stated, the null hypothesis was that there was no change in slope or drift of A/R accidents following the onset of ASAP operations. The null hypothesis of no change in level of A/R accidents at the point ASAP began was also tested but the authors considered this hypothesis less plausible. In all accident analyses, a possible change in level due to the speed limit change

was accounted for. The ASAP changes were also compared to relevant comparison data in as much as was possible.

1. Fatal Accidents

The following is a summary of the significance tests of interest for fatal accidents and subsets described above: (tests significant in a direction opposite that of a favorable ASAP impact are summarized here as not significant).

Total Fatal Accidents

Test	Parameter Estimate	Significant?
Change in Level	1.759	No
Change in drift	- 0.144	No

Total Fatal Accidents (State-Wide Comparisons)

Test	Parameter Estimate	Significant?
Difference in level change	- 16.161	Not Comparable
Difference in drift change	0.864	Not Comparable

A/R Fatal Accidents

Test	Parameter Estimate	Significant?
Change in Level	- 0.045	No
Change in Drift	- 0.084	No

A/R Fatal Accidents (Non A/R Comparisons)

Test	Parameter Estimate	Significant?
Difference in level change	- 1.849	No
Difference in drift change	- 0.024	No

Nighttime Fatal Accidents

Test	Parameter Estimate	Significant?
Change in Level	1.891	No
Change in Drift	0.026	No

Nighttime Fatal Accidents (Daytime Comparisons)

Test	Parameter Estimate	Significant?
Difference in level change	1.966	Not Comparable
Difference in drift change	0.208	Not Comparable

Nighttime Fatal Accidents (State-Wide Comparisons)

Test	Parameter Estimate	Significant?
Difference in level change	- 6.266	No
Difference in drift change	0.570	No

Weekend Fatal Accidents

Test	Parameter Estimate	Significant?
Change in Level	- 0.074	No
Change in Slope	- 0.126	No

Weekend Fatal Accidents (Weekday Comparisons)

Test	Parameter Estimate	Significant?
Difference in level change	- 1.906	No
Difference in slope change	- 0.108	No

None of the tests of interest which were possible were significant in a direction favorable to ASAP. Furthermore, it can be seen that 7 of the 18 parameter estimates are positive in

sign, indicating that often even the direction of the change was opposite to an expected favorable ASAP effect. Therefore, it must be concluded that there is no evidence of a favorable ASAP impact on fatal accidents in Hillsborough County.

2. Injury Accidents

The following is a summary of the significance tests of interest for injury accidents and subsets described previously:

Total Injury Accidents

Test	Parameter Estimate	Significant?
Change in Level	- 31.730	No
Change in Drift	- 0.890	No

A/R Injury Accidents

Test	Parameter Estimate	Significant?
Change in Level	- 3.325	No
Change in Drift	- 0.425	No

A/R Injury Accidents (Non A/R Comparisons)

Test	Parameter Estimate	Significant?
Difference in level change	20.535	Not Comparable
Difference in drift change	0.492	Not Comparable

Nighttime Injury Accidents

Test	Parameter Estimate	Significant?
Change in Level	- 15.630	No
Change in Slope	0.902	No

Nighttime Injury Accidents (Daytime Comparisons)

Test	Parameter Estimate	Significant?
Difference in level change	7.770	No
Difference in slope change	2.746	No

Weekend Injury Accidents

Test	Parameter Estimate	Significant?
Change in Level	- 0.597	No
Change in Slope	- 0.832	No

Weekend Injury Accidents (Weekday Comparisons)

Test	Parameter Estimate	Significant?
Difference in level change	64.323	Not Comparable
Difference in slope change	- 1.793	Not Comparable

There were no significant differences for any of the tests of interest and again it can be seen that 6 of the 14 parameter estimates are positive in sign. It must be concluded that there is no evidence of a favorable ASAP impact on injury accidents in Hillsborough County.

3. Discussion

At this point the authors would like to offer some comments on the difficulties involved in making inferences about ASAP impact on A/R accidents in Hillsborough County. These are not meant as complaints in any way since evaluation in the "real world" is normally beset by difficulties not encountered in the experimental laboratory and any evaluator soon recognizes this and regards it as a challenge to his ingenuity and creativity to come up with the best evaluation possible under the circumstances. Rather, they should be thought of as constructive criticisms whose goal is to attempt to provide evaluators of future projects of this nature

with an adequate experimental design and fixed data collection procedures before the project goes into effect.

The first and foremost problem encountered in the assessment of ASAP impact on A/R accidents was the fact that "measurement" of A/R accidents fluctuated over time as discussed previously. This change in measurement was primarily a tendency to test more drivers involved in accidents for BAC during later stages of the project operational period, which in turn almost certainly brought about a relative increase in the number of "reported" A/R accidents. This problem rendered tests of significance based directly on A/R accidents virtually useless, a most unfortunate occurrence since ASAP cannot reasonably be expected to influence other than A/R accidents.

Because of the difficulty with "reported" A/R accidents, evaluation was forced to examine a number of proxy measures of A/R accidents, namely total, nighttime and weekend fatal and injury accidents. The rationale is of course that these subsets of accidents are known to have a higher than average rate of alcohol involvement and that an ASAP impact will be most visible in these data (relative to other proxy measure possibilities). This brings us to the question of reasonable expectations in terms of ASAP impact on these proxy measures. If ASAP were to effect a 10% reduction in A/R accidents (a not unreasonable expectation and one that would probably be considered good by all but the most optimistic), there would be only a 5% reduction in total fatal accidents (which are known to contain about 50% A/R cases). There is a good probability this 5% reduction could not be statistically distinguished from the background variation. The situation becomes much worse when injury accidents are considered since only about 12% of all injury accidents are reported to be alcohol related. The ASAP effect would have to be remarkable indeed in order to detect any effect in injury accident proxy measures.

The second major difficulty stems from the fact that there was no reasonably comparable experimental control area available for comparison purposes. This is particularly important in view of the fact that simple population changes (and corresponding changes in miles driven) in an area can confound estimated ASAP effects, and evaluation could not correct for this in Hillsborough County since these data were not available on a monthly basis throughout the time period examined. An adequate comparison area, assumed to have similar population and driving trends as well as similar improvements in roads, cars, and effects of other highway safety programs, would have made possible tests ruling out all these competing and confounding factors as explanations of change following the introduction of an ASAP program.

Because of the lack of an experimental control area similar in nature to Hillsborough County, evaluation used available statewide data for comparison purposes as well as compliments of the target subsets occurring in Hillsborough County (e.g., daytime vs. nighttime fatal accidents). The authors feel that the statewide comparisons, except for the problem of non-homogeneous variance, are reasonably useful and meaningful. The complimentary comparisons however, while certainly better than none, present a detection problem similar to detecting ASAP impact in the proxy measures themselves. By way of illustrating this, let us again assume that ASAP has effected a 10% reduction in A/R accidents. Further, let us assume that nighttime fatal accidents are 60% alcohol related and daytime fatal accidents are 40% alcohol related. Then there will be a 6% reduction in nighttime fatal accidents, but there will also be a 4% reduction in daytime fatal accidents, a difference of only 2% which would almost certainly be indistinguishable from background variance. The situation gets considerably worse (if possible) when considering injury accident subsets. In short, there is no reasonable possibility of detecting an ASAP effect via these comparisons unless ASAP has been very, very effective.

There are several other difficulties involved in the assessment of ASAP impact on accidents. One has to do with the analysis of many proxy measures of A/R accidents. It is desirable, of course, to answer the question of whether or not ASAP had an impact on A/R accidents by simultaneously considering all the proxy measure analyses and making one ultimate judgment as to ASAP effect. But in order to make this judgment an evaluator has to consider the results of 30 or more t (or F) tests. If all these t tests were independent (which they are not), the probability of obtaining one or more significant results by chance alone = $1 - (1-.05)^{30} = .785$ for 30 t tests. Since some dependencies between the t tests almost certainly exist, the probability will not be quite this high, but nevertheless this points out the difficulty involved when attempting to interpret multiple t tests. To look at this another way, if 30 independent t tests are carried out with alpha set at .05, we can expect 5% or 1.5 (1 or 2) significant results by chance alone.

Finally, a matter of practical consideration is pointed out. This last point is concerned with potential or possibility for change after an ASAP goes into effect and surfaces when accident frequencies are very low to begin with. For example, a particular target data series such as Tampa city A/R fatal accidents may have only 1 or 2 cases per data point (month) prior to the onset of ASAP. Then, given the usual amount of error variance, past ASAP accidents may have to be something less than 0 in order for a statistically significant change to be detectable - a most impossible expectation. Clearly, such a situation offers no real possibility for change to occur even though ASAP may be capable of effecting a reduction.

All of this is not to suggest that ASAP may have had a desirable impact on A/R accidents in Hillsborough County. Based on the evidence that is available, it must be concluded that ASAP had no effect on A/R accidents in Hillsborough County. However, all of this is to suggest that had an ASAP effect occurred, it may have been very difficult to detect unless the impact was very

strong - probably stronger than it was reasonable to expect. This is also to suggest that it may be more reasonable to look at roadside survey BAC data as a direct indication of ASAP effect rather than as a proxy measure for the "bottom line" of A/R accidents. On the other hand, it could be argued that if ASAP cannot be demonstrated to have effected a reduction in A/R accidents, it (ASAP) did not do very well in terms of cost-effectiveness and as such has limited usefulness to society in return for the tax money society pays to fund it. The authors do not take issue with this point but rather wish to emphasize the difficulties involved in demonstrating an ASAP effect on A/R accidents in the absence of a sound experimental design. Further, the difficulties described above may be taken as a petition for thorough planning and design before projects of a similar nature are undertaken. All of the problems mentioned above are avoidable if taken into consideration prior to the launching of a project.

III. ANALYSIS OF BAC DATA

A. Methodology

1. Performance Measures

Roadside Survey BAC Data: Direct measurement of drinking-driving behavior was accomplished through voluntary roadside surveys conducted in January (1/72, 1/73, 1/74, 1/75, 1/76 and 1/77) and in July (7/72, 7/73 and 7/74). The January surveys were conducted on two consecutive weekends (Friday, Saturday and Sunday) at 24 randomly selected eligible locations throughout Hillsborough County with the constraint that half the locations fell within the Tampa city limits. Locations were considered eligible if they had a high incidence of alcohol-related accidents and arrests during 1970 and 1971. Four stops of approximately 90 minutes each were made each night within the following two-hour time frames: 8 p.m. to 10 p.m., 10 p.m. to midnight, midnight to 2 a.m., and 2 a.m. to 4 a.m. (These hours were selected because they produced the majority of A/R accident and arrest events. It should be noted further that drinking establishments with "beer and wine only" licenses closed at 1 a.m. while those with liquor licenses closed at 3 a.m.) BAC's were obtained from 32 drivers at each site. Passengers (16 years of age or older) were also requested to take BAC tests. However, only BAC data from drivers who were residents of Hillsborough County were analyzed in the present study. The procedure for the July survey was identical except that only half the sites used the previous January were visited and it was completed in one weekend.

Fatally Injured Driver BAC Data: The extent of alcohol involvement in fatal accidents was assessed by the examination of BAC's among fatally injured drivers. However, these data were beset by the difficulties discussed earlier in relation to A/R crashes in that the percent of BAC's obtained from fatally injured drivers has fluctuated considerably from year to year. The specific problems associated with the collection of these data are discussed below.

ASAP evaluation's procedure for obtaining BAC data on any individuals involved in fatal crashes within the County has been to routinely search the local Medical Examiner's records. However, quite often key data elements were omitted or missing. For example, accident reports were infrequently available to the Medical Examiner. Consequently, the Medical Examiner could not determine whether he had BAC data on all individuals killed in fatal accidents, or even whether an individual's death was associated with an automobile accident. To help compensate, Tampa ASAP evaluation cross-checked accident reports made available by all law enforcement agencies in the County with the Medical Examiner's records.

There remained, however, several problems associated with obtaining blood alcohol data on individuals fatally injured in traffic accidents in Hillsborough County:

1) There were eight fully functioning hospitals in the County and the Medical Examiner's staff was fairly limited. Consequently, the Medical Examiner relied on reports of attending physicians and these reports were not always as comprehensive as Tampa ASAP would like. The Medical Examiner has attempted to improve this situation by providing monies for staff at various hospitals to improve reporting.

2) Automobile accident casualties who died six hours or longer after being admitted to a hospital were not typically given blood alcohol tests since after this time the data were of poor quality.

3) In some cases, the bodies of accident victims were too badly damaged to obtain reliable BAC data.

4) There were situations where a BAC test was simply not done for no apparent reason.

5) BAC tests were not done on juveniles (under age 18) unless an autopsy was requested. Such requests had to be made within six hours and had to include a specific request for a BAC test.

6) The Medical Examiner changed twice during the time period addressed by the present study: once in 1971 and one in 1973. Each change resulted in the loss of some data for the respective years.

7) The final problem was a function of standard operating procedure of law enforcement agencies in the County. Casualties of automobile accidents which occurred in Hillsborough County were transported to the nearest medical facility which could have been located in a neighboring county. In such cases, the accident reports were filed in Hillsborough County but the associated medical records (including BAC data) were filed outside the County. Since Tampa ASAP was not authorized to collect data outside of Hillsborough County, evaluation had to rely on communication between these out-of-county sources and individual law enforcement agencies. This communication could not be considered optimum.

Although the quality of BAC data on fatally injured drivers was compromised by the above mentioned problems, an analysis of these data could provide supportive evidence of project impact, and thus was included in this study.

Arrested Driver BAC Data: The final set of BAC analyses addressed the drinking-driving behavior of drivers arrested for A/R traffic offenses. A traffic offense was defined by ASAP evaluation as alcohol-related if: 1) the driver was cited for an A/R offense (i.e., Driving While Intoxicated, Unlawful Blood Alcohol Level, Careless Driving While Drinking, Reckless Driving While Drinking, or Driving While Drunk); 2) the driver was cited for a non-A/R offense (i.e., Careless Driving; Reckless Driving, or Speeding) but had a BAC greater than or equal to .05. This definition was applied consistently to baseline and operational period data. During the baseline years, however, lesser A/R offense citations could not be distinguished from DWI, thus most of the A/R offense determinations were based on the BAC criterion of .05. While this inadequacy in the baseline data did not substantially effect the comparability of baseline and operational

period arrest BAC data, it did prohibit the analysis of DWI arrests alone.

2. Research Design and Statistical Analysis

Proxy Measures of Impact: As previously discussed, the most direct measure of total project impact was the reduction of A/R accidents. The use of roadside survey BAC data as a proxy measure of project impact was based on the straight forward assumption that if the number or proportion of drivers who operated motor vehicles while impaired by alcohol decreased the number of A/R accidents would decrease.

Arrest BAC data had a more tenuous relationship with total project impact. One could assume that a change from baseline to operational periods in the BAC Levels of drivers arrested for A/R offenses reflected a change in the drinking-driving behavior of the beneral driving population. It was on the basis of this assumption that an analysis of arrest BAC data was included in the present study. However, it is the authors' opinion that changes in arrest BAC's primarily reflected changes in law enforcement characteristics resulting from ASAP selective enforcement and breath testing countermeasures. There has been a substantial increase in the number of A/R arrests and the number of offenders who received BAC tests during operational years. The combined effect of an increased number of tests and increased police attention to the apprehension of drunk drivers would be expected to reduce the mean BAC and increase the proportion of arrests at lower BAC levels. Although this was, of course, the anticipated effect of ASAP on the general driving population, lower arrest BAC's were not considered necessarily indicative of total project impact.

The BAC's of fatally injured drivers reflected the drinking-driving behavior of a very important subset of the general driving population. Lower BAC levels of deceased drivers during the operational period would provide indirect evidence of ASAP impact.

Group Comparisons: Two general evaluative strategies were used in the analysis of roadside survey BAC data. It should be recalled that roadside survey data were obtained in nine discrete samples (6 January samples and 3 July samples). The first approach was to compare baseline and operational period data. The 1/72 sample was compared with the composite of 1/73, 1/74, 1/75, 1/76 and 1/77 samples, and the composite of 1/72 and 1/73 samples was compared with the composite of 1/74, 1/75, 1/76 and 1/77 samples. The former comparison constituted the stronger analysis of ASAP impact on drinking-driving behavior in the sense that it assessed change in driver BAC's between the only true baseline sample (i.e., January, 1972) and operational period samples from the same month. However, in the authors' opinion the use of a composite 1/72 - 1/73 baseline was preferable in that it increased the baseline period sample size and thus the reliability of the findings while still providing an analysis reasonably sensitive to project impact.

Because January and July samples could differ as a result of seasonal changes in the characteristics of the driving population or in driving patterns, a comparison of the 1/72 sample with all available operational period data might yield misleading results. In order to utilize the July samples in an analysis of project impact, the composite of January and July, 1972 "baseline" samples was compared with the composite of January and July 1973, and 1974 samples. These analyses were presented in the 1974 Analytic Study #1 (Reis, 1975) and were not repeated in the present study.

The second approach to the analysis of roadside survey BAC data was to examine the trend in the proportion of drivers at selected BAC levels across individual January survey samples. Trends in the proportion of drivers who had been drinking (BAC $\geq$ .01) and who were legally intoxicated (BAC $\geq$ .10) were analyzed. Trends in the proportion of drivers in the .05 - .09 BAC range were analyzed in last years Analytic Study #1 (Reis, 1976) and were not repeated in the present study. A steady decrease

over time in the proportion of intoxicated drivers on the road would provide strong evidence of ASAP impact.

For both baseline vs. operational period comparisons and trend analyses, roadside survey data were analyzed for the entire survey sample (8 p.m. to 4 a.m.) and the subsample of drivers participating from Midnight to 4 a.m. This particular subsample was chosen in an attempt to "increase the volume of the signal" (drinking drivers) since the incidence of drinking-driving behavior is known to be highest during these hours and the greatest potential ASAP impact could reasonably be expected to have occurred during these hours.

The analyses of BAC data from fatally injured drivers and drivers arrested for A/R traffic offenses consisted of baseline vs. operational comparisons similar to those conducted for roadside survey data. However, the baseline period was defined as 1/70 through 2/72 and the operational period was defined as 3/72 through 12/76, as was the case with accident analyses.

Statistical Analysis: Analyses of BAC data are presented in the following order:

Roadside Survey BAC Data

Baseline vs. Operational Period Comparisons:

8 p.m. to 4 a.m. Data - 1/72 Baseline
8 p.m. to 4 a.m. Data - 1/72 + 1/73 Baseline
Midnight to 4 a.m. Data - 1/72 Baseline
Midnight to 4 a.m. Data - 1/72 + 1/73 Baseline

Trend Analyses:

Proportion $\geq$ .01/8 p.m. to 4 a.m., Midnight to 4 a.m.
Proportion $\geq$ .10/8 p.m. to 4 a.m., Midnight to 4 a.m.

Fatally Injured Driver BAC Data

Trend Analysis:

Proportion of BAC's Obtained by Year

Baseline vs. Operational Period

Arrested Driver BAC Data

Baseline vs. Operational Period

All baseline and operational BAC distributions were compared with a Kolmogorov-Smirnov two sample test. A two tailed significance test was used with alpha set at .05. The Kolmogorov-Smirnov was chosen over the t test for these data because of their extremely skewed nature. While the authors recognize that this departure from normality would not in general invalidate t test results for large samples, it was felt that the Kolmogorov-Smirnov procedure would call attention to the skewed nature of the data and still provide a statistical test nearly as powerful as the t test. All baseline vs. operational period comparisons were further analyzed for the specific BAC level categories of 1) had been drinking (BAC $\geq$ .01), and 2) driving while intoxicated (BAC $\geq$ .10). The differences between baseline and operational periods for these specific BAC categories were tested with 2x2 contingency table χ^2 tests (corrected for continuity). For example, the BAC $\geq$ .01 category 2x2 table was #BAC's $\geq$ .01 vs. #BAC's = .00 by baseline vs. operational periods.

Trends across January roadside survey samples and across years (for percent of BAC's obtained on fatally injured drivers) were assessed with the gradient in proportions test (Fleiss, 1973, pp 96-99). The gradient in proportions test is a non-parametric analogue of simple linear regression analysis. It provides an estimate of the slope of the gradient (linear relationship) among sample proportions (e.g., the proportion of drivers with BAC's $\geq$ .01) and a test of the hypothesis that the slope = 0. The entire gradient in proportions analysis involved three tests of significance. The first was a standard goodness if fit χ^2 to determine if there was any difference between the sample proportions (analagous to a one way analysis of variance). The second test was of the hypothesis that the slope = 0, as previously discussed. The third test was for departures from linearity (analogous to

a test for all higher order relationships (quadratic, cubic, etc.) in regression analysis). It is instructive to note that $\chi^2_{linearity}$ is equal to the overall χ^2 minus χ^2_{slope}. Thus it can be seen that if the overall χ^2 is not significant, there is probably no need to look further for a linear relationship. Further, if the χ^2_{slope} is not significant, $\chi^2_{linearity}$ becomes redundant with the overall χ^2 and has no meaning in and of itself. If χ^2_{slope} is significant, then the value of $\chi^2_{linearity}$ gives an indication of the strength of the linear relationship. A low value of $\chi^2_{linearity}$ (and a high probability level) relative to χ^2_{slope} is indicative of a strong linear relationship. A significant $\chi^2_{linearity}$ indicates that there is reason to suspect that a non-linear function may be better in describing the trend.

B. Results

1. BAC's of Roadside Survey Participants

For descriptive purposes, the BAC distributions for every survey conducted by Tampa ASAP are summarized in Table 9. The average BAC's for each survey are shown along with the average BAC's of those who had been drinking. It should be noted that all of the information given in this table and all information used in subsequent analyses of roadside survey data is based on resident drivers only (residents of Hillsborough County). Since the July surveys terminated in 1974 and analyses utilizing the July data were reported in an earlier study as previously discussed, the present report concerns itself only with the January roadside survey samples.

Baseline vs. Operational Period Comparisons: The BAC distributions for the baseline period of 1/72 and the operational period of all subsequent surveys through 1/77 for the entire survey sample period (8 p.m. to 4 a.m.) are shown in Table 10. The maximum difference in cumulative proportions of .0367 is seen to occur at the BAC level of .03, meaning that 3.67% more survey respondents

TABLE 9

BAC Distributions By Surveys

BAC	Jan. '72		July '72		Jan. '73		July '73		Jan. '74		July '74		Jan. '75		Jan. '76		Jan. '77	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
.00	518	65.2	292	68.4	589	71.7	272	68.2	564	68.9	286	70.3	562	73.1	518	65.8	509	63.3
.01 - .04	164	20.6	75	17.6	122	14.8	69	17.3	157	19.2	67	16.5	132	17.2	177	22.5	190	23.6
.05 - .09	65	8.2	22	5.2	46	5.6	36	9.0	61	7.4	29	7.1	45	5.9	70	8.9	69	8.6
.10 - .14	27	3.4	25	5.9	36	4.4	9	2.3	26	3.2	17	4.2	20	2.6	14	1.8	25	3.1
.15 +	21	2.6	13	3.0	29	3.5	13	3.3	11	1.3	8	2.0	10	1.3	8	1.0	10	1.2
Total	795		427		822		399		819		407		769		787		803	
$\overline{X}$	.019		.019		.018		.019		.015		.017		.013		.014		.016	
HBD* $\overline{X}$	.054		.060		.064		.059		.049		.057		.048		.041		.044	

* Had Been Drinking (mean BAC of all drivers with non-zero BAC's)

TABLE 10

Cumulative BAC Distributions for Roadside Survey Participant Drivers
1/72 Baseline vs. 1/73, 1/74, 1/75, 1/76 + 1/77 Operational Periods:
8 P.M. to 4 A.M.

BAC	Operational Period			Baseline Period			Difference of Cumulative Proportion
	Frequency	Cumulative Frequency	Cumulative Proportion	Frequency	Cumulative Frequency	Cumulative Proportion	
.00	2742	2742	.6855	518	518	.6516	.0339
.01	305	3047	.7618	60	578	.7270	.0348
.02	220	3267	.8170	46	624	.7849	.0321
.03	140	3407	.8518	24	648	.8151	.0367*
.04	113	3520	.8800	34	682	.8579	.0221
.05	69	3589	.8973	22	704	.8855	.0118
.06	70	3659	.9148	14	718	.9031	.0117
.07	80	3739	.9348	8	726	.9132	.0216
.08	45	3784	.9460	12	738	.9283	.0177
.09	27	3811	.9528	9	747	.9396	.0132
.10	39	3850	.9625	5	752	.9459	.0166
.11	29	3879	.9698	4	756	.9509	.0189
.12	22	3901	.9753	6	762	.9585	.0168
.13	18	3919	.9798	4	766	.9635	.0163
.14	13	3932	.9830	8	774	.9736	.0094
.15	19	3951	.9878	6	780	.9811	.0067
.16	12	3963	.9908	5	785	.9874	.0034
.17	15	3978	.9945	3	788	.9912	.0033
.18+	22	4000	1.0000	7	795	1.0000	.0000

*Maximum Difference of Cumulative Proportions

Kolmogorov-Smirnov two tailed test:

Critical $D_{.05}$ = .0528, critical $D_{.10}$ = .0474

Maximum D = .0367 (not significant)

Mean BAC's

Baseline: .0188
Operational: .0153

had BAC's of .03 or less during the operational period than had BAC's of .03 or less during the baseline period. Table 10 also points out the general tendency towards more drivers at lower BAC levels in the operational period relative to the baseline period. However, the results of the Kolmogorov-Smirnov test indicate that the difference is not significant either at the .05 or .10 levels of significance. The cumulative distributions are seen to converge rapidly at BAC levels above .03. For example, inspection of Table 10 indicates that 89.73% of resident drivers participating in the surveys during the operational period had BAC's of .05 or less while 88.55% of participating drivers had BAC's of .05 or less during the baseline period, a difference of only 1.18%.

Table 11 presents the percentages of participating drivers who were drinking and who were legally drunk for the baseline and operational periods. Inspection of Table 11 indicates that 34.84% of the baseline sample and 31.45% of the operational sample had been drinking, a difference of 3.39%. The χ^2 value of 3.353 (df = 1) indicates that this difference is not significant. (The difference of 3.39% is of course identical to the difference for drivers who had not been drinking seen in Row 1 of Table 10 except that the sign is switched; therefore, this test may also be viewed as a test of the difference in proportions of survey respondents who had not been drinking as displayed in Row 1 of the cumulative proportion tables). Table 11 also indicates that 6.04% of the baseline sample were legally drunk and 4.73% of the operational sample were legally drunk. The difference of 1.31% is not significant.

A second set of analyses was performed on the January survey participants responding between 8 p.m. and 4 a.m. However, the "baseline" was defined as the 1/72 + 1/73 samples and the operational period was defined as the 1/74, 1/75, 1/76 + 1/77 samples. Although this does not constitute a true baseline vs. operational comparison, the authors feel such a comparison is reasonable as discussed earlier.

TABLE 11

Percentage of Roadside Survey Participant Drivers at Selected BAC Levels

1/72 Baseline vs. 1/73, 1/74, 1/75, 1/76+ 1/77 Operational Periods
8 P.M. to 4 A.M.

BAC Level	Baseline Period #	Baseline Period %	Operational Period #	Operational Period %	Difference of Operational and Baseline Percentages	χ^2 Value
Had Been Drinking BAC $\geq$ .01	277	34.84	1258	31.45	- 3.39	3.353
Driving While Intoxicated BAC $\geq$ .10	48	6.04	189	4.73	- 1.31	2.161
Total Participants	795		4000			

Table 12 presents the BAC distributions for the "baseline" and operational periods as defined above for resident roadside survey participants responding betwen 8 p.m. and 4 a.m. The maximum difference in cumulative proportions between these periods of .0324 occurs at the BAC level of .07. This difference is not significant as shown by the results of the Kolmogorov-Smirnov two tailed test. The negative value for difference in cumulative proportions seen for the BAC = .00 category simply means that more drivers had BAC's = .00 during the baseline period than during the operational period (.71% more).

The percentage of roadside survey participants responding between 8 p.m. and 4 a.m. who had been drinking and who were drunk for the previously defined operational and baseline periods are shown in Table 13. There has been an increase of .71% in the proportion of drivers with BAC's of .01 or more during the operational period; however, this difference is far from significant. The percentage of drivers who were legally intoxicated during the baseline period was 6.99% compared to 3.90%, during the baseline period. The difference of 3.09% is significant indicating that the percentage of drivers who were drunk during the operational period was significantly less than the percentage of drivers who were drunk during the baseline period.

The next set of analyses in this section is essentially a repeat of all analyses performed up to this point except that only those roadside survey participants responding between Midnight and 4 a.m. were considered. This is simply an attempt to make the target population of drunk drivers more visible and thus make the analyses more sensitive to a possible ASAP effect.

Table 14 presents the cumulative BAC distributions for roadside survey participants responding between Midnight and 4 a.m. The baseline period is defined as the survey taking place on 1/72 and the operational period consists of all the subsequent

TABLE 12

Cumulative BAC Distributions for Roadside Survey Participant Drivers
1/72 + 1/73 Baseline vs. 1/74, 1/75, 1/76 + 1/77 Operational Periods:
8 P.M. to 4 A.M.

BAC	Operational Period			Baseline Period			Difference of Cumulative Proportion
	Frequency	Cumulative Frequency	Cumulative Proportion	Frequency	Cumulative Frequency	Cumulative Proportion	
.00	2153	2153	.6775	1107	1107	.6846	- .0071
.01	266	2419	.7612	99	1206	.7458	.0154
.02	182	2601	.8184	84	1290	.7978	.0206
.03	115	2716	.8546	49	1339	.8281	.0265
.04	93	2809	.8839	54	1393	.8615	.0224
.05	55	2864	.9012	36	1429	.8837	.0183
.06	60	2924	.9201	24	1453	.8986	.0215
.07	70	2994	.9421	18	1471	.9097	.0324*
.08	36	3030	.9534	21	1492	.9227	.0307
.09	24	3054	.9610	12	1504	.9301	.0309
.10	28	3082	.9698	16	1520	.9400	.0298
.11	20	3102	.9761	13	1533	.9481	.0280
.12	15	3117	.9808	13	1546	.9561	.0247
.13	13	3130	.9848	9	1555	.9617	.0178
.14	9	3139	.9874	12	1567	.9690	.0184
.15	10	3149	.9909	15	1582	.9784	.0125
.16	6	3155	.9928	11	1593	.9852	.0076
.17	8	3163	.9953	10	1603	.9913	.0040
.18+	15	3178	1.0000	14	1617	1.0000	.0000

*Maximum Difference of Cumulative Proportions

Kolmogorov-Smirnov two tailed test:

Critical $D_{.05}$ = .0415, critical $D_{.10}$ = .0373

Maximum D = .0324 (not significant)

Mean BAC's

Baseline: .0184

Operational: .0146

TABLE 13

Percentage of Roadside Survey Participant Drivers at Selected BAC Levels

1/72+ 1/73 Baseline vs. 1/74, 1/75, 1/76+ 1/77 Operational Periods
8 P.M. to 4 A.M.

BAC Level	Baseline Period #	Baseline Period %	Operational Period #	Operational Period %	Difference of Operational and Baseline Percentages	χ^2 Value
Had Been Drinking BAC $\geq$ .01	510	31.54	1025	32.25	+ 0.71	0.219
Driving While Intoxicated BAC $\geq$ .10	113	6.99	124	3.90	- 3.09	21.077*
Total Participants	1617		3178			

*$p \leq .05$

TABLE 14

Cumulative BAC Distributions for Roadside Survey Participant Drivers
1/72 Baseline vs. 1/73, 1/74, 1/75, 1/76 + 1/77 Operational Periods:
12 P.M. to 4 A.M.

BAC	Operational Period			Baseline Period			
	Frequency	Cumulative Frequency	Cumulative Proportion	Frequency	Cumulative Frequency	Cumulative Proportion	Cumulative Proportion
.00	1195	1195	.5972	220	220	.5556	.0416
.01	167	1362	.6807	30	250	.6313	.0494
.02	131	1493	.7461	29	279	.7045	.0416
.03	90	1583	.7911	14	293	.7399	.0512*
.04	77	1660	.8296	17	310	.7828	.0468
.05	45	1705	.8521	17	327	.8258	.0263
.06	46	1751	.8751	11	338	.8535	.0216
.07	56	1807	.9031	6	344	.8687	.0344
.08	29	1836	.9175	9	353	.8914	.0261
.09	21	1857	.9280	6	359	.9066	.0214
.10	33	1890	.9445	4	363	.9167	.0278
.11	21	1911	.9550	3	366	.9242	.0308
.12	16	1927	.9630	5	371	.9367	.0263
.13	13	1940	.9695	3	374	.9444	.0251
.14	11	1951	.9750	7	381	.9621	.0129
.15	15	1966	.9825	5	386	.9747	.0078
.16	9	1975	.9870	4	390	.9848	.0022
.17	12	1987	.9930	2	392	.9890	.0040
.18 +	14	2001	1.0000	4	396	1.0000	.0000

*Maximum Difference of Cumulative Proportions

Kolmogorov-Smirnov two tailed test:

Critical $D_{.05}$ = .0748, critical $D_{.10}$ = .0671

Maximum D = .0512 (not significant)

Mean BAC's

Baseline: .0265

Operational: .0213

January surveys to date. The maximum difference in cumulative proportions is seen to occur at the BAC level of .03. Table 14 is seen to be similar to Table 10 except that the tendency toward lower BAC's in the operational period seems to be stronger. However, despite the fact that the maximum difference in cumulative proportions is now .0512 during the Midnight to 4 a.m. period, the difference is still not significant.

Table 15 indicates that 44.44% of the baseline period survey participants responding between Midnight and 4 a.m. had been drinking compared to 40.28% during the operational period and that 9.34% of the baseline survey respondents were legally intoxicated compared to 7.20% in the operational period. The differences of 4.16% and 2.14% for drivers who had been drinking and drivers who were legally drunk respectively were not significant.

These last comparisons were reexamined with the "baseline" period re-defined as the 1/72 + 1/73 surveys and the operational period defined as the 1/74, 1/75, 1/76 + 1/77 surveys. The cumulative BAC distributions for these periods for survey participants responding between Midnight and 4 a.m. are shown in Table 16. This table is similar to Table 12 except that again the tendency toward lower BAC's in the operational period seems stronger. The maximum difference in cumulative proportions of .0501 which occurred at the BAC level of .07 compares with the difference of .0324 at the BAC level of .07 seen in Table 12 for the 8 p.m. to 4 a.m. samples. However, results of the Kolmogorov-Smirnov two-tailed test indicate that this difference is not significant. Thus it must be concluded that the overall BAC distributions of the baseline and operational periods for both a "baseline" of 1/72 and 1/72 + 1/73 roadside survey participants are not significantly different.

Table 17 presents the percentages of roadside survey participants responding between Midnight and 4 a.m. who had been drinking and who were legally intoxicated for the "baseline" (1/72 + 1/73)

TABLE 15

Percentage of Roadside Survey Participant Drivers at Selected BAC Levels

1/72 Baseline vs. 1/73, 1/74, 1/75, 1/76+ 1/77 Operational Periods
Midnight to 4 A.M.

BAC Level	Baseline Period #	Baseline Period %	Operational Period #	Operational Period %	Difference of Operational and Baseline Percentages	χ^2 Value
Had Been Drinking BAC $\geq$ .01	176	44.44	806	40.28	- 4.16	2.202
Driving While Intoxicated BAC $\geq$ .10	37	9.34	144	7.20	- 2.14	1.886
Total Participants	396		2001			

TABLE 16

Cumulative BAC Distributions for Roadside Survey Participant Drivers
1/72 + 1/73 Baseline vs. 1/74, 1/75, 1/76 + 1/77 Operational Periods:
12 P.M. to 4 A.M.

BAC	Operational Period			Baseline Period			Difference of Cumulative Proportions
	Frequency	Cumulative Frequency	Cumulative Proportion	Frequency	Cumulative Frequency	Cumulative Proportion	
.00	934	934	.5885	481	481	.5938	- .0053
.01	144	1078	.6793	53	534	.6593	.0200
.02	107	1185	.7467	53	587	.7247	.0220
.03	74	1259	.7933	30	617	.7617	.0316
.04	67	1326	.8355	27	644	.7951	.0404
.05	37	1363	.8589	25	669	.8259	.0330
.06	38	1401	.8828	19	688	.8494	.0334
.07	50	1451	.9143	12	700	.8642	.0501*
.08	22	1473	.9282	16	716	.8840	.0442
.09	19	1492	.9401	8	724	.8938	.0463
.10	25	1517	.9559	12	736	.9086	.0473
.11	15	1532	.9653	9	745	.9196	.0363
.12	11	1543	.9723	10	755	.9321	.0402
.13	10	1553	.9786	6	761	.9395	.0391
.14	7	1561	.9836	11	772	.9531	.0305
.15	8	1568	.9880	12	784	.9679	.0201
.16	4	1572	.9905	9	793	.9790	.0115
.17	6	1578	.9943	8	801	.9889	.0054
.18 +	9	1587	1.0000	9	810	1.0000	.0000

*Maximum Difference of Cumulative Proportions

Kolmogorov-Smirnov two-tailed test:

Critical $D_{.05}$ = .0587, critical $D_{.10}$ = .0527

Maximum D = .0501 (not significant)

Mean BAC's

Baseline: .0261

Operational: .0202

TABLE 17

Percentage of Roadside Survey Participant Drivers at Selected BAC Levels

1/72+ 1/73 Baseline vs. 1/74, 1/75, 1/76,+ 1/77 Operational Periods
Midnight to 4 A.M.

BAC Level	Baseline Period #	Baseline Period %	Operational Period #	Operational Period %	Difference of Operational and Baseline Percentages	χ^2 Value
Had Been Drinking BAC $\geq$ .01	329	40.62	653	41.15	+ 0.53	0.042
Driving While Intoxicated BAC $\geq$ .10	86	10.62	95	5.99	- 4.63	15.820 *
Total Participants	810		1587			

* $p \leq .05$

and operational periods. Inspection of this table which focuses on two populations of interest indicates that 40.62% of the survey respondents had been drinking during the baseline period compared to 41.15% who had been drinking during the operational period. This increase (the negative of the difference seen in Row 1, Table 16) is not significant. Table 17 also indicates that 10.62% of the survey respondents had BAC's $\geq$ .10 during the baseline period and 5.99% had BAC's $\geq$ .10 during the operational period. This decrease of 4.63% (the negative of the difference seen in Row 10 (BAC = .09), Table 16) is significant. Thus it is concluded that there has been a significant decrease in the percentage of drunk drivers participating in roadside surveys during the operational period when the "baseline" period is defined as the 1/72 + 1/73 surveys.

Trend Analyses: The preceding analyses have provided evidence that there has been a decrease in the percentage of legally drunk drivers participating in roadside surveys during the ASAP operational period. It was of interest then, to pursue this further and examine the trends over time for the six January survey samples. Trend analyses were conducted for the 8 p.m. to 4 a.m. total samples and the midnight to 4 a.m. subsamples for the proportions of drivers who had been drinking and the proportions of drivers who were legally intoxicated. The proportions of survey respondents who had been drinking for each of the January survey samples are shown in Table 18. As Table 18 indicates, the "dummy" X values of 1 to 6 (X is the predictor variable) represent surveys 1/72 to 1/77 respectively. Table 18 also gives information on the sample size (total resident participants) for each survey sample. Results of the gradient in proportions analysis for each of the time periods indicated are given on the right hand side of Table 18. The equation giving predicted proportions is of the form: $\hat{p} = \bar{p} + b(X - \bar{X})$, where $\bar{p}$ is the average proportion for the 6 surveys; b is the slope of the predicted values (average increment from survey to survey); X is the

TABLE 18

Proportion of Roadside Survey Participant Drivers
Who Had Been Drinking Across January Survey Samples:
8 P.M. to 4 A.M., Midnight to 4 A.M.

BAC $\geq$ .01: 8 P.M. to 4 A.M.

Survey	X	Sample Size	Proportion	Gradient in Proportions
1/72	1	795	.348	$\hat{p} = .320 + .00660\ (X - 3.49)$
1/73	2	822	.283	$\chi^2 = 27.092^{*}$, df = 5
1/74	3	819	.311	$\chi^2_{slope} = 2.799$, df = 1
1/75	4	769	.269	$\chi^2_{linearity} = 24.293^{*}$, df = 4
1/76	5	787	.342	
1/77	6	803	.366	

BAC $\geq$ .01: Midnight to 4 A.M.

Survey	X	Sample Size	Proportion	Gradient in Proportions
1/72	1	396	.444	$\hat{p} = .410 + .00974\ (X - 3.48)$
1/73	2	414	.370	$\chi^2 = 24.882^{*}$, df = 5
1/74	3	413	.387	$\chi^2_{slope} = 2.732$, df = 1
1/75	4	389	.332	$\chi^2_{linearity} = 22.150^{*}$, df = 4
1/76	5	388	.459	
1/77	6	397	.469	

* $p \leq .05$

previously defined predictor variable; and $\bar{X}$ is the average of the predictor variable. The χ^2 values shown provide tests as previously described. It should be noted that χ^2_{slope} is actually testing the null hypothesis that b = 0.

Results of the gradient in proportions analysis for survey participants responding between 8 p.m. and 4 a.m. who had been drinking indicate an increasing proportion of .00660 per survey over the 6 surveys. This is consistent with earlier findings that the proportion of survey respondents who had been drinking increased slightly during the operational period. The χ^2_{slope} value of 2.799 indicates that this increase in slope is not significant. The overall χ^2 is significant; however, indicating that the proportions of drivers who had been drinking has not been constant over the six surveys. The $\chi^2_{linearity}$ has no meaning here since there is no significant slope. The proportions for the six surveys are presented graphically in Figure 20. A visual inspection of Figure 20 indicates that the proportions of drinking drivers seems to have been down somewhat in 1/73, 1/74 and 1/75 as compared to 1/72 but then went up to and past the 1/72 level in 1/76 and 1/77.

Table 18 also presents the results of the gradient in proportions test for survey participants responding between midnight and 4 a.m. who had been drinking. These results are similar to the results for the 8 p.m. to 4 a.m. samples. The increase in slope of .00974 is not significant although there has been significant changes between surveys as indicated by the overall χ^2 value of 24.882. The graphical presentation of these proportions in Figure 20 indicates a pattern similar to the one for the 8 p.m. to 4 a.m. samples.

Table 19 presents the proportions of roadside survey respondents with BAC's of .10 or more. Results of the gradient in proportions test for the 8 p.m. to 4 a.m. sample indicate a decreasing slope of .00685. The χ^2_{slope} indicates that this

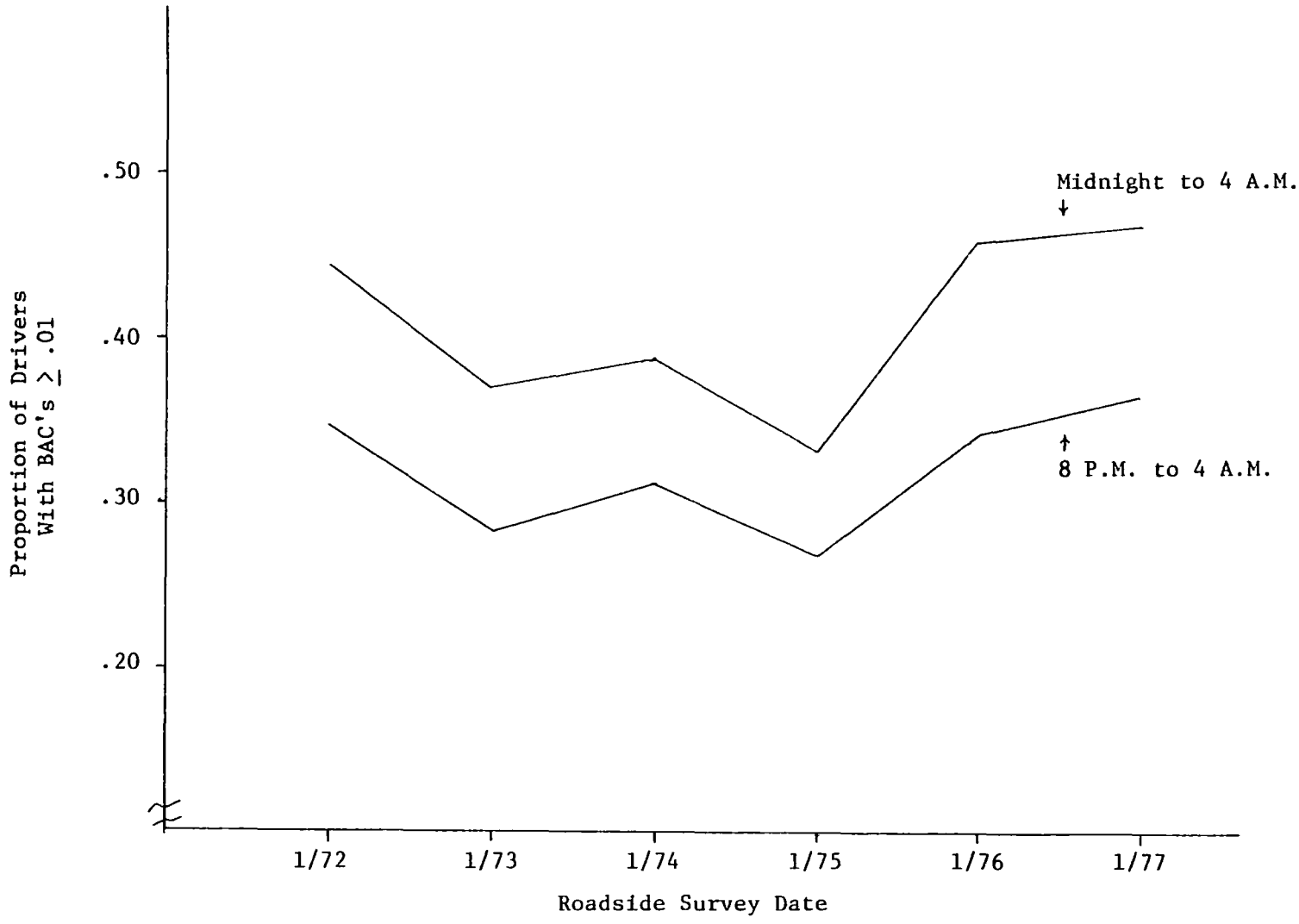


FIGURE 20

Proportion of Roadside Survey Participant Drivers Who Had Been Drinking (BAC's ≥ .01) Across January Survey Samples: 8 P.M. to 4 A.M. and Midnight to 4 A.M.

TABLE 19

Proportion of Roadside Survey Participant Drivers Who Were Driving While Intoxicated (BAC $\geq$ .10) Across January Survey Samples: 8 P.M. to 4 A.M., Midnight to 4 A.M.

BAC $\geq$ .10: 8 P.M. to 4 A.M.

Survey	X	Sample Size	Proportion	Gradient in Proportions
1/72	1	795	.060	$\hat{p} = .049 - .00685\ (X - 3.49)$
1/73	2	822	.079	$\chi^2 = 27.750^{*},\ df = 5$
1/74	3	819	.045	$\chi^2_{slope} = 14.083^{*},\ df = 1$
1/75	4	769	.039	$\chi^2_{linearity} = 13.668^{*},\ df = 4$
1/76	5	787	.028	
1/77	6	803	.044	

BAC $\geq$ .10: Midnight to 4 A.M.

Survey	X	Sample Size	Proportion	Gradient in Proportions
1/72	1	396	.093	$\hat{p} = .075 - .01096\ (X - 3.48)$
1/73	2	414	.118	$\chi^2 = 22.642^{*},\ df = 5$
1/74	3	413	.073	$\chi^2_{slope} = 12.044^{*},\ df = 1$
1/75	4	389	.062	$\chi^2_{linearity} = 10.598^{*},\ df = 4$
1/76	5	388	.036	
1/77	6	397	.068	

$^{*}p \leq .05$

decrease in slope is significant. The overall χ^2 is also significant indicating the proportion of drivers who were drunk has not been constant between sample surveys. The $\chi^2_{linearity}$ is significant also indicating significant departures from the predicted linear relationship. However, since the linear relationship accounts for the greater amount of variance between samples, it is concluded that there has been a decrease averaging .685% per survey in the proportion of drunk drivers responding to the roadside surveys over the period of the six surveys. These proportions are graphically presented in Figure 21 and indicate an initial increase in proportion in 1/73 as compared to 1/72 but steady decreases thereafter until 1/77. The proportion of drunk drivers is seen to have gone up in 1/77, but not up to the 1/72 or 1/73 level. The authors feel that the 1/77 increase may have been due at least in part to a slowdown of law enforcement countermeasure activity in 1976. It should also be pointed out that the proportion of roadside survey participants who were legally intoxicated in 1976 was so low (2.8%) that it would be reasonable to expect some leveling off to have occurred.

Also shown in Table 19 are the results of the gradient in proportions test for roadside survey participants responding between midnight and 4 a.m. who were legally intoxicated. Results parallel those for the 8 p.m. to 4 a.m. samples except that the hoped for effects seem even stronger. The estimated slope of -.01096 is highly significant, indicating an average decrease of 1.096% per survey in the percentage of survey participants who were drunk across the six surveys. The $\chi^2_{linearity}$ is also significant indicating some departures from linearity, but this value is small enough to retain the assumption that there is a fairly strong linear relationship. Figure 21 depicts the proportions of drunk drivers across the midnight to 4 a.m. survey subsamples in graphic form with the predicted values superimposed. The pattern is similar to the 8 p.m. to

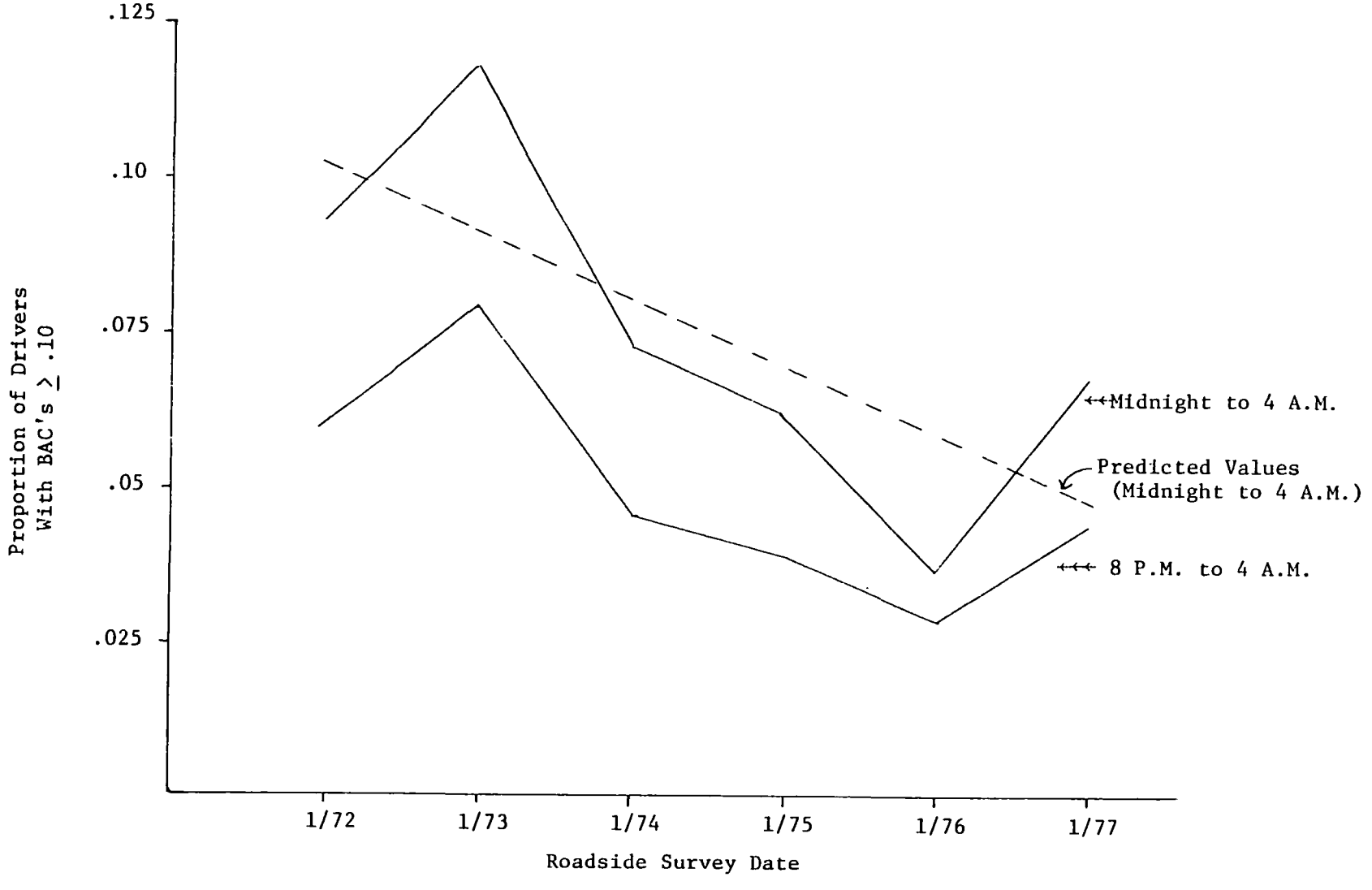


FIGURE 21

Proportion of Roadside Survey Participant Drivers With BAC's ≥ .10 Across January Survey Samples: 8 P.M. to 4 A.M. and Midnight to 4 A.M.

4 a.m. survey samples, showing consistent decreases in 1/74, 1/75 and 1/76 and a rather sharp increase in 1/77 which was still well below 1/72 and 1/73 proportions.

2. BAC's of Fatally Injured Drivers

Several problems associated with the collection of BAC data on fatally injured drivers were previously discussed. Table 20 reflects the problem of fluctuating percentages of BAC's obtained from fatally injured drivers. There was some tendency towards higher percentages of BAC's obtained during the operational period (63.59% compared to 51.09% during the baseline period), but large year to year differences seem to be more characteristic of the data. A gradient in proportions analysis performed on the percentages of BAC's obtained in 1970, 1971, 1972, 1973, 1974, 1975, and 1976 confirms these observations. There is a significantly increasing slope of 4.715% per year, but the $\chi^2_{\text{linearity}}$ indicates that most of the variance across years is accounted for by departures from linearity which in this case are year to year fluctuations. It is encouraging to note, however, the high percentages of 85% and 82% obtained in 1975 and 1976 respectively.

Difficulties in data collection notwithstanding, the BAC distributions of fatally injured drivers for the baseline and ASAP operational periods are presented in Table 21. There appears to be some tendency toward lower BAC's in the operational period, but the pattern is mixed from a positive ASAP effect viewpoint as the maximum difference in cumulative proportions does not occur until the BAC level of .14, indicating that the operational period had a greater proportion of fatally injured drivers in the .10 to .14 BAC range as well as the .00 to .09 range, which is questionable as a positive ASAP effect. In any case, the difference between the operational and baseline periods is not significant as can be seen by inspection of the results of the Kolmogorov-Smirnov test. Table 22 presents the percentages of fatally injured drivers who had been drinking and who were legally drunk during

TABLE 20

Percentages of BAC's Obtained on Fatally Injured Drivers By Years

	1970	1971	Approx.+ Baseline	1972	1973	1974	1975	1976	Approx.+ Operational
# Drivers Killed	61	76	137	79	99	62	60	68	368
# BAC's Obtained	47	23	70	53	34	40	51	56	234
Percent BAC's Obtained	77.05	30.26	51.09	67.09	34.34	64.52	85.00	82.35	63.59

Gradient in Proportions

$$\hat{p} = .602 + .04715\ (x - 3.94)$$

$$\chi^2 = 94.699^{*} \quad df = 6$$

$$\chi^2_{slope} = 17.114^{*} \quad df = 1$$

$$\chi^2_{linearity} = 77.585^{*} \quad df = 5$$

* $p \leq .05$

\+ For statistical analysis of project impact the baseline period was defined as 1/70 to 2/72 and the operational period was defined as 3/72 to 12/76.

TABLE 21

Cumulative BAC Distributions For Fatally Injured Drivers
Baseline vs. Operational Periods

BAC	Operational Period 3/72 - 12/76			Baseline Period 1/70 - 2/72			Difference of Cumulative Proportions
	Frequency	Cumulative Frequency	Cumulative Proportion	Frequency	Cumulative Frequency	Cumulative Proportion	
.00	106	106	.4670	30	30	.3896	.0774
.01	0	106	.4670	1	31	.4026	.0644
.02	2	108	.4758	1	32	.4156	.0602
.03	3	111	.4890	0	32	.4156	.0734
.04	5	116	.5110	2	34	.4416	.0694
.05	3	119	.5242	1	35	.4545	.0800
.06	4	123	.5419	2	37	.4805	.0614
.07	4	127	.5595	2	39	.5065	.0530
.08	2	129	.5683	0	39	.5065	.0648
.09	2	131	.5771	1	40	.5195	.0576
.10	2	133	.5859	1	41	.5325	.0534
.11	3	136	.5991	0	41	.5325	.0666
.12	6	142	.6256	1	42	.5455	.0801
.13	10	152	.6696	2	44	5714	.0982
.14	3	155	.6828	0	44	.5714	.1114*
.15	4	159	.7004	2	46	.5974	.1030
.16	5	164	.7225	2	48	.6234	.0991
.17	2	166	.7313	0	48	.6234	.1079
.18	5	171	.7533	3	51	.6623	.0910
.19	2	173	.7621	1	52	.6753	.0868
.20	7	180	.7930	5	57	.7403	.0527
.21	3	183	.8062	8	65	.8442	- .0380
.22	6	189	.8326	3	68	.8831	- .0505
.23	6	195	.8590	0	68	.8831	- .0241
.24	1	196	.8634	1	69	.8921	- .0287
.25	5	201	.8855	2	71	.9221	- .0366
.26	4	205	.9031	0	71	.9221	- .0190
.27	1	206	.9075	1	72	.9351	- .0276
.28	5	211	.9295	2	74	.9610	- .0315
.29	2	213	.9383	0	74	.9610	- .0227
.30	1	214	.9427	1	75	.9740	- .0181
.31	3	217	.9559	0	75	.9740	- .0362
.32	3	220	.9692	0	75	.9740	- .0048
.33	4	224	.9868	0	75	.9740	.0128
.34	0	224	.9868	1	76	.9870	- .0002
.35+	3	227	1.0000	1	77	1.0000	.0000

*Maximum Difference in Cumulative Proportions

Kolmogorov-Smirnov two-tailed test:

Critical $D_{.05} = .1794$, critical $D_{.10} = .1609$

Maximum $D = .1114$ (not significant)

Mean BAC's

Baseline: .108

Operational: .095

TABLE 22

Percentage of Fatally Injured Drivers
at Selected BAC Levels
Baseline vs. Operational Periods

BAC Level	Baseline Period 1/70 - 2/72 #	%	Operational Period 3/72 - 12/76 #	%	Difference of Operational and Baseline Percentages	χ^2 Value
Had Been Drinking BAC $\geq$ .01	47	61.04	121	53.30	- 7.74	1.096
Driving While Intoxicated BAC $\geq$ .10	37	48.05	96	42.29	- 5.76	0.559
Total BAC's Obtained	77		227			

the baseline and operational periods. During the baseline period 61.04% had been drinking compared to 53.30% during the operational period while 48.05% were drunk during the baseline period compared to 42.29% during the operational period. Neither of these differences (7.74% and 5.76% respectively) were significant.

3. BAC's of Drivers Arrested for A/R Offenses

The BAC distributions of drivers arrested for A/R offenses during the baseline and operational periods are presented in Table 23. The maximum difference in cumulative proportions of .1552 occurred at the BAC level of .16 which indicated a tendency to arrest a larger percentage of drivers at and below this level during the operational period. Results of the Kolmozorov-Smirnov two tailed test also presented in Table 23 indicates that this difference was highly significant. (It should be kept in mind though, that the overall N for these data is so large that even relatively minor differences would have turned up significant.) In terms of percentages, it can be seen that 48.63% of all drivers arrested for A/R offenses had BAC's of .16 or below during the operational period compared to only 33.11% during the baseline period. This difference does appear to be substantial from a practical as well as statistical point of view.

Table 24 gives the percentages of drivers arrested for A/R offenses during the baseline and operational periods for selected BAC levels. Inspection of this table reveals that 98.46% of arrested drivers had been drinking during the baseline period compared to 98.32% during the operational period. The difference of .14% was not significant. Table 24 further indicates that 94.0% of arrested drivers were above the legal limit of .09 during the baseline period while 88.29% were above the legal limit during the operational period. This difference of 5.77% was significant. The BAC category of at or above .20 was added to this table since the at or above .01 category is not very meaningful for these data

TABLE 23

Cumulative BAC Distributions For Drivers Arrested For A/R Offenses
Baseline vs. Operational Periods

BAC	Operational Period 3/72 - 12/76			Baseline Period 1/70 - 2/72			Difference of Cumulative Proportions
	Frequency	Cumulative Frequency	Cumulative Proportion	Frequency	Cumulative Frequency	Cumulative Proportion	
.00	553	553	.0168	39	39	.0154	.0014
.01	174	727	.0221	7	46	.0181	.0040
.02	159	886	.0269	6	52	.0205	.0064
.03	122	1008	.0306	6	58	.0228	.0078
.04	162	1170	.0356	3	61	.0240	.0116
.05	314	1484	.0451	8	69	.0272	.0179
.06	407	1891	.0575	11	80	.0315	.0260
.07	550	2441	.0742	19	99	.0390	.0352
.08	632	3073	.0934	21	120	.0472	.0462
.09	779	3852	.1171	31	151	.0594	.0577
.10	1250	5102	.1551	43	194	.0764	.0787
.11	1412	6514	.1980	48	242	.0953	.1027
.12	1572	8086	.2457	67	309	.1217	.1240
.13	1708	9794	.2976	108	417	.1642	.1334
.14	1854	11648	.3540	103	520	.2047	.1493
.15	2124	13772	.4185	157	677	.2665	.1520
.16	2231	16003	.4863	164	841	.3311	.1552*
.17	2240	18243	.5544	174	1015	.3996	.1548
.18	2026	20269	.6160	175	1190	.4685	.1475
.19	1848	22117	.6721	167	1357	.5343	.1378
.20	1932	24049	.7309	188	1545	.6083	.1226
.21	1620	25669	.7801	158	1703	.6705	.1096
.22	1419	27088	.8232	147	1850	.7283	.0949
.23	1183	28271	.8592	137	1987	.7823	.0769
.24	928	29199	.8874	125	2112	.8315	.0559
.25	837	30036	.9128	89	2201	.8665	.0463
.26	638	30674	.9322	90	2291	.9020	.0302
.27	554	31228	.9490	69	2360	.9291	.0199
.28	389	31617	.9609	45	2405	.9469	.0140
.29	287	31904	.9696	40	2445	.9626	.0070
.30	263	32167	.9776	23	2468	.9717	.0059
.31	204	32371	.9838	23	2491	.9807	.0031
.32	156	32527	.9885	11	2502	.9850	.0035
.33	110	32637	.9919	12	2514	.9898	.0021
.34	78	32715	.9942	8	2522	.9929	.0013
.35	58	32773	.9960	6	2528	.9953	.0007
.36	43	32816	.9973	4	2532	.9969	.0004
.37+	89	32905	1.0000	8	2540	1.0000	.0000

*Maximum Difference of Cumulative Proportions

Kolmogorov-Smirnov two-tailed test:

Critical $D_{.05}$ = .0280

Maximum D = .1552 ($p \leq .05$)

Mean BAC's

Baseline: .189

Operational: .168

TABLE 24

Percentage of Drivers Arrested For A/R Offenses at Selected BAC Levels Baseline vs. Operational Periods

BAC Level	Baseline Period 1/70 - 2/72 #	Baseline Period 1/70 - 2/72 %	Operational Period 3/72 - 12/76 #	Operational Period 3/72 - 12/76 %	Difference of Operational and Baseline Percentages	χ^2 Value
Had Been Drinking BAC $\geq$ .01	2501	98.46	32352	98.32	- 0.14	0.221
Driving While Intoxicated BAC $\geq$ .10	2389	94.06	29053	88.29	- 5.77	77.559 *
BAC $\geq$ .20	1183	46.57	10788	32.79	- 13.78	199.845 *
Total Arrested	2540		32905			

* $p \leq .05$

(the relative numbers of those arrested for A/R offenses with negative BAC's is quite minor; further, some of these cases involve other drugs). During the baseline period 46.57% of drivers arrested for A/R offenses had BAC's of .20 or more compared to 32.79% during the operational period. This difference of 13.78% was highly significant. It is concluded that there was a definite tendency to arrest drivers at lower BAC levels during the operational period.

C. Summary and Discussion

In the present section driver BAC data was examined for evidence of Tampa ASAP impact. The basic assumption underlying the use of these data as a proxy measure of ASAP effect was that lowered incidences of alcohol-related driving would ultimately be manifested in lowered A/R crash rates. Summaries of the results of analyses of driver BAC data are presented and discussed below. General conclusions concerning the analyses of BAC data are addressed in Section IV of this report.

1. BAC's of Roadside Survey Participants

The most direct measure of the drinking-driving behavior of the general driving population in Hillsborough County was obtained through the use of a series of voluntary roadside surveys. A total of nine surveys were conducted over the years 1972 through 1977. A survey was conducted in January of each year from 1972 - 1977 and in July of 1972, 1973 and 1974. Only the data on resident Hillsborough County drivers from the January surveys were utilized for analysis in this report. Two approaches to analysis were taken. The first was to compare the baseline and operational period BAC distributions of roadside survey participants. These comparisons were made for the entire BAC distributions both for the true baseline survey of 1/72 and for the "baseline" composed of the 1/72 and 1/73 survey samples. Further, comparisons of the entire distributions were made for the complete survey data (less non-Hillsborough County residents of course) taken

between 8 p.m. and 4 a.m. as well as for the subsamples of data obtained between midnight and 4 a.m. Results of these comparisons indicated a tendency toward lower BAC's in the operational periods for all comparisons. However, Kolmogorov-Smirnov tests of the differences in BAC distributions between the baseline and operational periods revealed no significant differences.

For each of the comparisons described above, further analyses focusing on survey respondents who had been drinking (BAC $\geq$ .01) and who were legally intoxicated (BAC $\geq$ .10) were conducted via χ^2 tests. These tests indicated no significant differences between baseline and operational periods in the proportions of drivers who had been drinking for all comparisons. There were also no significant differences in the proportions of survey respondents who were drunk when the baseline consisted of data from only the 1/72 survey. When the "baseline" consisted of data from both the 1/72 and 1/73 surveys the proportions of drunk drivers during the operational period were significantly less than during the "baseline" period. The percentages of drunk drivers participating in the survey between 8 p.m. and 4 a.m. decreased by 3.09% and decreased by 4.63% for drivers participating between midnight and 4 a.m.

The second basic approach to analysis of roadside survey BAC data was to examine the trends over time in the proportions of participants who had been drinking and who were legally intoxicated. These trends were analyzed with gradient in proportions tests for the complete survey data (8 p.m. to 4 a.m.) and for the subsamples obtained between midnight and 4 a.m. These tests revealed no significant trends over time for the six January surveys in the proportions of drivers who had been drinking (consistent with prior analyses) although there was evidence of significant year to year fluctuation. The tests of the trends in proportions for drivers who were legally intoxicated indicated a significant decline in proportions over the six surveys (consistent with prior analyses) although there was also evidence of signifi-

cant departures in proportions from the estimated trend lines. The estimated decline in the percentage of drivers who were drunk participating in the surveys between 8 p.m. and 4 a.m. was .685% per year and the estimated decline for drivers participating between midnight and 4 a.m. was 1.096% per year.

2. BAC's of Fatally Injured Drivers

A reduction in the BAC's of fatally injured drivers would provide evidence supportive of a Tampa ASAP effect. Unfortunately, difficulties in the collection of these data compromise their use as a proxy measure. It was shown that there were significantly large year to year fluctuations in the percentages of BAC's obtained from dead drivers as well as tendencies to obtain higher percentages of BAC's during the operational period.

The analysis of the data that was available via the Kolmogorov-Smirnov two sample test indicated no difference between baseline and operational periods in the BAC distributions of fatally injured drivers. Further analysis of the proportions who had been drinking and of the proportions who were legally intoxicated via χ^2 tests showed no differences between the baseline (1/70 - 2/72) and ASAP operational (3/72 - 12/76) periods.

3. BAC's of Drivers Arrested for A/R Offenses

If A/R offense arrest rates had remained constant, a decrease in BAC levels of arrestees would provide evidence of a change in the drinking driving characteristics of Hillsborough County drivers. However, since A/R offense arrests went up sharply, and law enforcement officers increased their skills in detecting incidents of drunken driving as a result of the ASAP law enforcement countermeasure, one would expect BAC levels of persons arrested for A/R offenses to have declined following the implementation of Tampa ASAP for these reasons alone.

The comparison of BAC distributions between baseline (1/70 to 2/72) and ASAP operational (3/72 to 12/76) periods for drivers arrested for A/R offenses confirmed expectations. During the operational period 48.63% of A/R arrestees had BAC's of .16 or below, compared to only 33.11% during the baseline period. In addition, 94.06% of baseline period arrestees had BAC's of .10 or above and 46.57% had BAC's of .20 or above compared to 88.29% and 32.79% respectively during the operational period. All of these differences were highly significant and the average BAC decreased from .189 to .168 during the operational period. As previously discussed, the authors feel these changes reflect a change in the characteristics of arrested drivers, and not necessarily a change in the drinking-driving behavior of Hillsborough County residents.

IV. CONCLUSIONS

The present study was concerned with the assessment of the impact of Tampa ASAP on alcohol-related motor vehicle accidents and drinking-driving behavior in Hillsborough County. The report was divided into two major sections, each addressing a specific evaluative question. Conclusions for each question based on the results of statistical analyses are presented below.

Has the entire ASAP system affected a reduction in alcohol-related accidents?

Because the availability of accident BAC data fluctuated considerably over the years for which analyses were conducted, results based on direct measures of A/R accidents were considered unreliable. Consequently a number of analyses on proxy measures of A/R accidents were conducted. These measures were total, nighttime, and weekend fatal crashes and total, nighttime, and weekend injury crashes. Population changes were controlled for by comparisons with complementary data within Hillsborough County, i.e. nighttime vs. daytime and weekend vs. weekday comparisons. Nighttime and total fatal accidents were compared with similar data from the balance of the state which was considered a control area not receiving ASAP influence.

None of the analyses described provided any evidence that ASAP had reduced alcohol related fatal or injury accidents.

Has the entire Tampa ASAP system effected a reduction in the incidence of drinking-driving activity in Hillsborough County?

BAC data obtained from January roadside surveys were used as measures of drinking-driving behavior. Comparisons of pre-ASAP and post-ASAP BAC data gave no evidence of changes in the overall BAC distributions. Analyses of the proportions of drivers who had been drinking (BAC $\geq$ .01) also showed no evidence of an ASAP effect. However, analyses of the proportions of drivers who were legally intoxicated (BAC $\geq$ .10) indicated a significant reduction in

proportions during the ASAP operational period when the "pre-ASAP" period was defined as data from the 1/72 and 1/73 surveys. Analyses of trends over time in the proportions of drivers who were drunk also indicated a significant decline in proportions. This effect was strongest for survey participants responding between midnight and 4 a.m. when the incidence of drinking and driving was highest.

It is concluded then, that after five years of ASAP counter-measure activity there has been a decline in the percentages of drunken drivers on the road although there has been no change in the overall incidence of drinking and driving (primarily meaning no change in the proportions of drivers with BAC's between .01 and .09). This decline, averaging less than 1% per year, has not had a noticeable effect on alcohol-related accidents in Hillsborough County.

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VI. APPENDICES

APPENDIX A

ASAP REPORT TO COURT

Defendant_____Age_____Race_____Sex_____

Citation #_____Current DWI Arrest Date_____BAC_____

Court Date_____Court Room_____Time_____

DWI ARREST HISTORY	BAC
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

HISTORY OF COURT REFERRALS

☐ ASAP has no record of prior DWI Arrests.

☐ Prior arrest(s) exist. Referral to ASAP was not ordered.

☐ Prior arrest(s) exist. Referral to ASAP was ordered as follows:

Diagnostic Interview

☐ Ordered in 197____: Completed_____(diagnosis)
Not Completed

DWI School

☐ Ordered in 197____: Completed
Not Completed

Additional Treatment at_____

☐ Started in 197____: Completed
Not Completed

Phase I Phase II Phase III No Recommendation

ASAP
TAMPA

APPENDIX B

JURY TRIAL AND APPEAL PROCEDURES

ITEM I

Procedures for Obtaining Jury Trials

The procedure for obtaining a jury trial for an alcohol-related traffic offense is fairly simple in the State of Florida. Since all alcohol-related cases first go to the Traffic Division of County Court, all the defendant (or his attorney) need do is to file a petition for a jury trial. If possible, the petition is preferred in writing, but may be accepted orally by any judge currently serving in the Traffic Division. If the petition has not been filed prior to the court date, the defendant or his attorney may move for a jury trial when the defendant appears in court for the first time.

Under Florida Law (322.262(4) F.S.), an individual's right to trial by jury is considered to be waived if his petition for jury is: 1) not made in good faith, 2) made to obtain a delay, or 3) if real harm would be done to the public by granting the petition. Thus, the judge has the prerogative of denying the motion for a jury trial under the above criteria. Both the defendant and the State have the right to appeal the judge's decision, and also have the right to petition for jury trial at the appellate level.

When a motion for jury trial is received and accepted, the case is transferred to the Criminal Misdemeanor Division of County Court and a trial data is set in that division.

County Court has three sections: Traffic, Criminal Misdemeanor, and Civil. Thus, requests for jury trials after March 15, 1976 do not leave County Court (as do appeals) but rather simply transfer from the Traffic Division to the Criminal Misdemeanor Division of County Court. Between January 1, 1975 and March 15, 1976, jury trials were held in the Traffic Division itself by the same judges who heard non-jury proceedings.

Should the decision reached at the jury trial be unacceptable to the defendant or to the prosecution, an appeal may be made following the procedure outlined in Appendix A, Item 2 of this report.

In 1975, an average of 27.5 cases were docketed for jury trial each month, with an average of one (1) actually reaching trial. Of the 318 cases where petitions for jury trials were granted but the trial in fact did not occur, all defendants were convicted of DWI or UBAC through the plea process. Of the 12 cases which were actually tried by jury, acquittals were recorded for six, the remaining six being found guilty. Thus, while petition for trial by jury occurred almost daily (4.5% of all disposed cases in 1975), an actual trial was quite rare (0.2% of all disposed cases).

Given the change in jurisdiction within County Court for jury trials (and the availability of other judges) the rate of petition and trial may increase.

ITEM II

Aspects of Appeal

Appeal to Circuit Court: All alcohol-related cases are first processed through the Traffic Division of County Court. These trials are typically of a non-jury nature. If a defendant is convicted of an alcohol-related charge, but feels that a reversible decision occurred during the trial itself, he may appeal the decision by filing a Notice of Appeal with the Criminal Appellate Division of the Circuit Court. Reversible decisions may include such items as, 1) the test was inappropriately administered, 2) the equipment was not in proper working order, 3) evidence admitted was prejudicial, etc.

The Circuit Court has three divisions: The Civil Division, the Criminal Division (and the Criminal Appellate Division within it), and the Juvenile Division. Typically, all felonies appear before the Criminal Division of Circuit Court. There are two exceptions. The first exception is the Appellate Division which honors appeals from the Criminal Misdemeanor Division of County Court, such as that described above, and is the first line of appeal from County Court.

The second exception deals with juveniles. All alcohol-related offenses where juveniles are involved are handled directly by the Juvenile Division of Circuit Court, and do not therefore, ever appear in County Court.

Appropriate grounds for appeal to the Appellate Division of the Circuit Court are many and varied. If however, an individual wishes to appeal a decision of the Appellate Division of the Circuit Court, such grounds are more limited.

To appeal beyond the Appellate Division of the Circuit Court, the individual must appeal to the Circuit District Court of Appeals located in Lakeland. In this case, grounds for appeal are scrutinized a good deal more carefully, and the Circuit District Court has every right to refuse to accept cases if in their judgment the grounds are insufficient.

In the above discussion, reference was made to the defendant who was convicted of an alcohol-related offense. Appeals are by no means limited to defendants. Prosecutors representing the State can also appeal any judicial decision from County Court using the same avenues.

In 1975 fewer than five appeals were made from County Court, including both those made by defendants as well as those made by the State. No data on the outcome of those appeals are available. This low frequency is largely due to the fact that County Courts are not courts of record. Anytime a record of the proceedings is unavailable, successfully negotiating for an appeal is much more difficult than when a record of the proceedings is available.

In order to obtain a record of the proceedings in County Court, court reporters must be brought in at the expense of either the defendant or the prosecution. Such measures are taken only when the defense or the prosecution feels that a record is necessary because the possibility of appeal is great. So far, those occasions have been few.

Direct Appeal to the Florida State Supreme Court: If the issue raised by either the defendant or the prosecution in the original case was one of a constitutional nature, the case goes directly to the Florida Supreme Court on appeal. In 1975 there were two such cases. In both cases the appeal was made by the defendant but the State was successful.

The first case (State v. Wooten) was a Tampa case where the constitutionality of the driving with an unlawful blood alcohol level [F.S. 316.028(3)] was attacked on the grounds that the prohibition of withholding adjudication in such cases denies equal protection. The Florida Supreme Court affirmed the conviction of the lower court and rejected the challenge by defense counsel. The Supreme Court held that rather than denying equal protection, the inability of a judge to withhold adjudication in fact guaranteed equal protection.

The second case (State v. Roberts) came from Sarasota and challenged the constitutional validity of the DWI statute itself [F.S. 316.028(3)] on the grounds that (1) it was not reasonably related to the police power of the State of Florida, and (2) that it was vague and indefinite. The second point concerns the inability of the consumer of alcohol to determine when their blood alcohol level would make it illegal for them to drive. The Florida Supreme Court again affirmed the conviction and rejected the challenge citing a Utah Supreme Court decision indicating the ability of individuals to make appropriate decisions about alcohol consumption and driving.

Appendix C

ASAP COURT ORDERS

Phase I

Phase II

Phase III

PHASE I
Court Order
Hillsborough County Court, Traffic Division

NAME_____ SUBJECT #_____

DL#_____ SS #_____

RACE_____ SEX_____ AGE_____ DOB_____

ADDRESS (HOME)_____ PHONE (HOME)_____

ADDRESS (BUSINESS)_____ PHONE (BUSINESS)_____

DATE OF ARREST_____ CITATION #_____

INTERVIEW DATE_____ DIAGNOSIS_____ M/F:K-1___ K-2___ K-3___ OT___ FS___

COUNSELOR_____ REFERRALS_____

You are hereby placed on six (6) months probation. It is further ordered that you comply with the following conditions of Probation:

(a) Not change your residence or employment or leave the county without first procuring the consent of the Court.
(b) Use no narcotic drugs. Do not use intoxicants of any kind in excess
(c) Avoid injuries or vicious habits; avoid association with persons of harmful character or bad reputation.
(d) In all respects live honorably, work diligently at a lawful occupation, and support dependents, if any, to the best of your ability, and live within what income is available.
(e) Not carry any weapons without first securing the consent of the Court.
(f) Visit no gambling places.
(g) Live and remain at liberty without violating any law.
(h) Promptly and truthfully answer all inquiries directed by the Court.

You are hereby ordered to attend one (1) diagnostic interview at Hillsborough Community Mental Health Center Alcoholism Services at____o'clock on _____the_____of_____, 197___. (Fee: $25.00)
You are hereby ordered to attend the DWI Counterattack School at the Hillsborough Community College_____Campus, at _____o'clock on_____the_____of_____, 197___. (Fee: $40.00)

REPORT IMMEDIATELY AT THE ASAP CENTRAL BREATH TESTING LABORATORY at the south end of the Tampa Police Station, 1710 North Tampa Street, Tampa, Florida 33602 for scheduling. Additional fees will be assessed for missed appointments.

_____ _____
ASAP Scheduling Officer Client Signature

By further written Order of this Court you may be required to attend and participate in additional therapeutic programs. In this event, you are also ordered to participate in any follow-up interviews which may be required (at no charge) at six month intervals during the next year.

The Court may at any time rescind or modify any of the conditions of this probation, or may extend the period of probation as authorized by law, or may discharge you. If you violate any of the conditions of this probation, you may be arrested and the Court may revoke this probation and impose any sentence which it may have imposed before placing you on probation.

DONE AND ORDERED in open Court this_____day of_____197___.

_____
COUNTY COURT JUDGE

You are hereby further ordered to attend additional treatment described as follows:

_____
_____at____o'clock on____the___of_____197___.

_____
COUNTY COURT JUDGE

DISTRIBUTION:
White: Court of Record
Green: ASAP Phone: 223-8001/Scheduling Office 23-8005
Yellow: HCMHC Alc. Svcs. Phone: 223-7411
Pink: DWI Counterattack, Inc. Phone 872-6663
Goldenrod: Defendant

ASAP
TAMPA

PHASE II

COURT ORDER
HILLSBOROUGH COUNTY COURT, TRAFFIC DIVISION

NAME _____ SUBJECT # _____

DL# _____ SS# _____

RACE _____ SEX _____ AGE _____ DOB _____

ADDRESS (HOME) _____ PHONE (HOME) _____

ADDRESS (BUSINESS) _____ PHONE (BUSINESS) _____

DATE OF ARREST _____ CITATION # _____

INTERVIEW DATE _____ DIAGNOSIS _____ M/F:K-1 _____ K-2 _____ K-3 _____ QT _____ FS _____

Counselor _____ Referrals _____ _____ _____

You are hereby placed on six (6) months probation. It is further ordered that you shall comply with the following conditions of Probation:

(a) Not change your residence or employment or leave the county without first procuring the consent of the Court.
(b) Use no narcotic drugs. Do not use intoxicants of any kind to excess.
(c) Avoid injurious or vicious habits; avoid association with persons of harmful character or bad reputation.
(d) In all respects live honorably, work diligently at a lawful occupation, and support dependents, if any, to the best of your ability, and live within what income is available.
(e) Not carry any weapons without first securing the consent of the Court.
(f) Visit no gambling places.
(g) Live and remain at liberty without violating any law.
(h) Promptly and truthfully answer all inquiries directed by the Court.

You are hereby ordered to attend one (1) diagnostic interview at Hillsborough Community Mental Health Center Alcoholism Services at _____ o'clock on _____ the _____ of _____, 197_____. (Fee: $25.00)

You are hereby ordered to attend the DWI Counterattack School at the Hillsborough Community College, _____ Campus, at _____ o'clock on _____ the _____ of _____, 197_____. (Fee: ~~$30.00~~ $40.00)

REPORT IMMEDIATELY TO THE ASAP CENTRAL BREATH TESTING LABORATORY at the south end of the Tampa Police Station, 1710 North Tampa Street, Tampa, Florida 33602 for scheduling. Additional fees will be assessed for missed appointments.

_____ _____
ASAP SCHEDULING OFFICER CLIENT SIGNATURE

During your diagnostic interview, you may be assigned to treatment at the Hillsborough Community Mental Health Center, or at other treatment programs. You are hereby ordered to enter into and complete any program that you are referred to and to pay any fees that are charged for your treatment. You are also ordered to participate in any follow-up interviews which may be required (at no charge) at six month intervals during the next year.

You are hereby further ordered to attend additional treatment described as follows:

_____ at _____ o'clock on _____ the _____ of _____ 197 _____.

The Court may at any time rescind or modify any of the conditions of this probation, or may extend the period of probation as authorized by law, or may discharge you. If you violate any of the conditions of this probation, you may be arrested and the Court may revoke this probation and impose any sentence which it may have imposed before placing you on probation.

DONE AND ORDERED in open Court this _____ day of _____ 197_____.

_____
COUNTY COURT JUDGE

DISTRIBUTION:

White: Court of Record
Green: ASAP Phone: 223-8001
Yellow: HCMHC Alc. Svcs. Phone: 238-7411
Pink: DWI Counterattack, Inc. Phone 872-6683
Goldenrod: Defendant

asap
ALCOHOL SAFETY ACTION PROJECT TAMPA

PHASE III

COURT ORDER
HILLSBOROUGH COUNTY COURT, TRAFFIC DIVISION

NAME _____ SUBJECT # _____

DL# _____ SS# _____

RACE _____ SEX _____ AGE _____ DOB _____

ADDRESS (HOME) _____ PHONE (HOME) _____

ADDRESS (BUSINESS) _____ PHONE (BUSINESS) _____

DATE OF ARREST _____ CITATION # _____

INTERVIEW DATE _____ DIAGNOSIS _____ M/F:K-1 _____ K-2 _____ K-3 _____ QT _____ FS _____

Counselor _____ Referrals _____ _____ _____

You are hereby placed on two (2) years probation. It is further ordered that you shall comply with the following conditions of Probation:

(a) Not change your residence or employment or leave the county without first procuring the consent of the Court.
(b) Use no narcotic drugs. Do not use intoxicants of any kind to excess.
(c) Avoid injurious or vicious habits; avoid association with persons of harmful character or bad reputation.
(d) In all respects live honorably, work diligently at a lawful occupation, and support dependents, if any, to the best of your ability, and live within what income is available.
(e) Not carry any weapons without first securing the consent of the Court.
(f) Visit no gambling places.
(g) Live and remain at liberty without violating any law.
(h) Promptly and truthfully answer all inquiries directed by the Court.

You are hereby ordered to attend one (1) diagnostic interview at Hillsborough Community Mental Health Center Alcoholism Services at _____ o'clock on _____ the _____ of _____, 197_____. (Fee: $25.00)

You are hereby ordered to attend the DWI Counterattack School at the Hillsborough Community College, _____ Campus, at _____ o'clock on _____ the _____ of _____, 197_____. (Fee: $30.00)

REPORT IMMEDIATELY TO THE ASAP CENTRAL BREATH TESTING LABORATORY at the south end of the Tampa Police Station, 1710 North Tampa Street, Tampa, Florida 33602 for scheduling. Additional fees will be assessed for missed appointments.

_____ _____
ASAP SCHEDULING OFFICER CLIENT SIGNATURE

During your diagnostic interview, you may be assigned to treatment at the Hillsborough Community Mental Health Center in Group or Chemotherapy or at other treatment programs. You are hereby ordered to enter into and complete any program that you are referred to and to pay any fees that are charged for your treatment. You are also ordered to participate in any follow-up interviews which may be required (at no charge) at six month intervals during the next year.

You are hereby further ordered to attend additional treatment described as follows:

_____ at _____ o'clock on _____ the _____ of _____ 197 _____.

The Court may at any time rescind or modify any of the conditions of this probation, or may extend the period of this probation as authorized by law, or may discharge you. If you violate any of the conditions of this probation, you may be arrested and the Court may revoke this probation and impose any sentence which it may have imposed before placing you on probation.

DONE AND ORDERED in open Court this _____ day of _____ 197_____.

_____
COUNTY COURT JUDGE

DISTRIBUTION:

White: Court of Record
Green: ASAP Phone: 229-6001
Yellow: HCMHC Alc. Svcs. Phone: 238-7411
Pink: DWI Counterattack, Inc. Phone: 872-6603
Goldenrod: Defendant

asap
ALCOHOL SAFETY ACTION PROJECT TAMPA

APPENDIX D

A S A P C O U R T O R D E R S

PHASE I

PHASE II

PHASE I

COURT ORDER
IN THE COUNTY COURT IN AND FOR
HILLSBOROUGH COUNTY, STATE OF FLORIDA

TRAFFIC DIVISION

CITATION # _____ DATE OF ARREST _____

NAME _____ AGE _____ RACE _____ SEX _____

DL# _____ SS# _____ DOB _____

ADDRESS (HOME) _____ PHONE (HOME) _____

ADDRESS (BUSINESS) _____ PHONE (BUSINESS) _____

INTERVIEW DATE _____ DIAGNOSIS _____ M/F:K-1 _____ K-2 _____ K-3 _____ OT _____ FS _____

Counselor _____ Referrals _____ _____ _____

You are hereby placed on six (6) months probation. It is further ordered that you shall comply with the following conditions of Probation:

(a) Not change your residence or employment or leave the county without first procuring the consent of the Court.
(b) Use no narcotic drugs. Do not use intoxicants of any kind to excess.
(c) Avoid injurious or vicious habits; avoid association with persons of harmful character or bad reputation.
(d) In all respects live honorably, work diligently at a lawful occupation, and support dependents, if any, to the best of your ability, and live within what income is available.
(e) Not carry any weapons without first securing the consent of the Court.
(f) Visit no gambling places.
(g) Live and remain at liberty without violating any law.
(h) Promptly and truthfully answer all inquiries directed by the Court.

You are hereby ordered to complete one diagnostic interview at _____ _____ , at _____ o'clock on _____ the _____ of _____ , 197 _____ . (Fee $ _____ .)

You are hereby ordered to complete an approved alcohol education course at _____ _____ , at _____ o'clock on _____ the _____ of _____ , 197 _____ . (Fee $ _____ .)

REPORT IMMEDIATELY TO THE SCHEDULING OFFICE at the south end of the Tampa Police Station, 1710 North Tampa Street, Tampa, Florida 33602 for scheduling. Additional fees will be assessed for missed appointments.

_____ SCHEDULING OFFICER

_____ CLIENT

After your diagnostic interview, you may be assigned to treatment. You are hereby ordered to enter into and complete any program that you are referred to and to pay any fees that are charged for your treatment.

The Court may at any time rescind or modify any of the conditions of this probation, or may extend the period of probation as authorized by law, or may discharge you. If you violate any of the conditions of this probation, you may be arrested and the Court may revoke this probation and impose any sentence which it may have imposed before placing you on probation.

DONE AND ORDERED in open Court this _____ day of _____ 197_____ .

_____ COUNTY COURT JUDGE

_____ Judge's Initials	Judicial Concurrence Requested	_____ Judge's Initials	Interview and School Only	_____ Judge's Initials	Interview Only

Your treatment is described as follows:

_____ at _____ o'clock on _____ the _____ of _____ 197 _____ .

DISTRIBUTION:

White: Court of Record
Green: Alcohol Traffic Safety Project
Yellow: Alcohol Rehabilitation/Counseling Agency
Pink: Alcohol Education Agency
Goldenrod: Defendant

PHASE II

COURT ORDER
IN THE COUNTY COURT IN AND FOR
HILLSBOROUGH COUNTY, STATE OF FLORIDA

TRAFFIC DIVISION

CITATION # _____ DATE OF ARREST _____

NAME _____ AGE _____ RACE _____ SEX _____

DL# _____ SS# _____ DOB _____

ADDRESS (HOME) _____ PHONE (HOME) _____

ADDRESS (BUSINESS) _____ PHONE (BUSINESS) _____

INTERVIEW DATE _____ DIAGNOSIS _____ M/F:K-1 _____ K-2 _____ K-3 _____ QT _____ FS _____

Counselor _____ Referrals _____ _____ _____

You are hereby placed on two (2) years probation. It is further ordered that you shall comply with the following conditions of Probation:

(a) Not change your residence or employment or leave the county without first procuring the consent of the Court.
(b) Use no narcotic drugs. Do not use intoxicants of any kind to excess.
(c) Avoid injurious or vicious habits; avoid association with persons of harmful character or bad reputation.
(d) In all respects live honorably, work diligently at a lawful occupation, and support dependents, if any, to the best of your ability, and live within what income is available.
(e) Not carry any weapons without first securing the consent of the Court.
(f) Visit no gambling places.
(g) Live and remain at liberty without violating any law.
(h) Promptly and truthfully answer all inquiries directed by the Court.

You are hereby ordered to complete one diagnostic interview at _____ _____ . at _____ o'clock on _____ the _____ of _____ , 197 _____ . (Fee $ _____ .)

REPORT IMMEDIATELY TO THE SCHEDULING OFFICE at the south end of the Tampa Police Station, 1710 North Tampa Street, Tampa, Florida 33602 for scheduling. Additional fees will be assessed for missed appointments.

_____ SCHEDULING OFFICER

_____ CLIENT

After your diagnostic interview, you may be assigned to treatment. You are hereby ordered to enter into and complete any program that you are referred to and to pay any fees that are charged for your treatment.

The Court may at any time rescind or modify any of the conditions of this probation, or may extend the period of probation as authorized by law, or may discharge you. If you violate any of the conditions of this probation, you may be arrested and the Court may revoke this probation and impose any sentence which it may have imposed before placing you on probation.

DONE AND ORDERED in open Court this _____ day of _____ 197_____ .

_____ COUNTY COURT JUDGE

Your treatment is described as follows:

_____ at _____ o'clock on _____ the _____ of _____ 197 _____ .

DISTRIBUTION:

White: Court of Record
Green: Alcohol Traffic Safety Project
Yellow: Alcohol Rehabilitation/Counseling Agency
Pink: Alcohol Education Agency
Goldenrod: Defendant

APPENDIX E

Treatment Modalities

APPENDIX E ITEM I

Treatment Modality: DWI Counterattack

1.	Drinker Type	Social and Problem Drinkers
2.	Treatment Length	4 Weeks
3.	Frequency of Meetings	1 per Week
4.	Length of Each Meeting	2 1/2 Hours
5.	Average # Present at Each Meeting	20, with one instructor

6. Content Description (Sessions must be taken in numerical order)

Session 1 (Week 1) is an introduction to the program, explaining its purpose of modifying, or otherwise changing, DWI behavior. Scope, seriousness, and gravity of the drinking-driver problem is emphasized.

Session 2 (Week 2) explains how drinking affects individual functioning and how it impairs driving skills. Blood alcohol concentration and the breathalyzer are explained. The importance of maintaining a BAC of under .05%, if the individual is going to then drive, is stressed.

Session 3 (Week 3) defines problem drinking and alcoholism, and these subjects are discussed. The students are then assisted in determining the extent of their individual involvement with alcohol.

Session 4 (Week 4) focuses on the student's plan to prevent future DWI's by reviewing the main factors of the influence of alcohol on driving, the drinking driver problem, and problem drinking. It is stressed that some students will need long term help, as they have lost the ability to control their drinking once they start. Resources available to help these individuals are discussed.

7. Cost — $40 per participant (paid by participant)

APPENDIX E ITEM II

Treatment Modality: TACOA Intermediate Step (Information and Education: I&E)

1.	Drinker Type	"grey area", beginning problem drinkers
2.	Treatment Length	2 Weeks
3.	Frequency of Meetings	1 per Week
4.	Length of each Meeting	2 Hours
5.	Average # at each Meeting	30
6.	Content Description	

The first hour of each meeting was devoted to films concerning alcoholism, Al-Anon, and the results of alcohol abuse. The second hour was consumed with discussion of the topics raised in the films, where treatment resources were located, and how one might contact those resources. The majority of the meetings were held in an AA Clubhouse.

7.	Cost	TACOA absorbed the entire cost

APPENDIX E ITEM III

Treatment Modality: TACOA Group Therapy and TACOA Youth Group Therapy

1.	Drinker Type	Problem
2.	Treatment Length	10 Weeks
3.	Frequency of Meetings	1 per Week
4.	Length of Each Meeting	2 Hours
5.	Average # Present at Each Meeting	15
6.	Content Description	

Groups are conducted by Ph.D. Clinical Psychologists in conjunction with an alcoholism specialist. "Drink-a-logs" are kept for the first five weeks and are used in therapy discussions. Therapy is reality-oriented, and covers the physical aspects, emotional aspects, conversant aspects, and cultural aspects of problem drinking. Unity of the vital life areas is stressed. Summaries of drinking patterns are noted during the problem analysis.

The effort is made to invite spouses and/or friends to come with the individual in order to build the beginnings of a social group not dependent upon alcohol for interaction. Further discussions center on family/interpersonal interactions, community resources, determining alternatives, and developing and testing action plans.

During the last four weeks, individuals are actively pointed toward other community resources which are available for continued support.

7.	Cost	$10.00 per Week per Client (Paid by client)

APPENDIX E ITEM IV

Treatment Modality: ASAP Supported Group Therapy

1.	Drinker Type	Problem
2.	Treatment Length	4 Months
3.	Frequency of Meetings	Once per Week
4.	Length of Each Meeting	3 Hours
5.	Average # Present at Each Meeting	15
6.	Content Description	

This treatment modality used the "typical" group therapy approach, utilizing reality-oriented therapy as well as non-directive techniques. The individual in charge has an MSW, is a Vocational Education counselor, and has some 10 years experience dealing with alcoholics. Since more time is available in this treatment modality than in those presented in Appendix E Item III, a good deal more interaction occurs, specifically related to problem identification and problem to the results of group participant's efforts at changing their drinking and driving behavior according to certain guidelines which they have helped establish.

7.	Cost	Total cost is borne by Tampa ASAP

APPENDIX E ITEM V

Treatment Modality: HCMHC Short Term Didactic and Group Therapy

1.	Drinker Type	Beginning and mid-range problem drinkers
2.	Treatment Length	6 Months, Approx. 24 Sessions
3.	Frequency of Meetings	1 per Week
4.	Length of Each Meeting	1 Hour
5.	Average # Present at Each Meeting	8 - 11 with 1 Therapist

6. Content Description

The objectives of this modality are:

a) To facilitate in helping the clients gain a better understanding of the effect drinking can and is having on their lives.

b) Emphasis is placed upon the individual responsibility and accepting consequences resulting from his behavior.

c) To allow for some consideration on client's part of how his use and/or abuse of alcohol is affecting his life style.

d) To use the group process to give support in helping those who wish to change their behavior to do so.

The procedures used to achieve the objectives of this modality are:

a) To educate the client about alcohol and its effects on the client.

b) The use of the eclectic group modality approach incorporating the different therapies such as rational, gestalt, analytical, etc., to most effectively meet the needs of each client.

The typical client receives 6 weekly didactic sessions followed by 5 months of group therapy. However, some of the clients who are experienced with alcohol may skip the didactic sessions and enter directly into 5 - 6 months of group therapy. Both didactic and therapy sessions are of the same size (i.e., 8 - 11 clients).

All therapists are psychiatric social workers with Master's degrees and specializing in the field of alcoholism.

7. Cost — Sliding scale client fees

APPENDIX E ITEM VI

Treatment Modality: HCMHC Extended Group Therapy and Chemotherapy

1.	Drinker Type	Mid-range problem drinker to alcoholic
2.	Treatment Length	1 - 2 Years, 50 - 100 Sessions
3.	Frequency of Meetings	1 per Week
4.	Length of Each Meeting	1 Hour
5.	Average # Present at Each Meeting	8 - 10, with 1 Therapist
6.	Content Description	

The objectives of this modality are:

a) Emphasis placed upon individual responsibility and accepting consequences of his behavior.

b) To help the client become aware of how he is abusing the use of alcohol.

c) Use of group process to give support in helping those who wish to become more responsible and in control of their drinking.

d) To enable the clients to gain some insight concerning the reasons why they drink. This requires a good deal of understanding of the dynamics of alcoholism and in-depth study of individual history, current situation and level of functioning by the group.

e) To make use of the group process to elicit such information and understanding to give support to foster change in one's behavior.

The procedures used to achieve the objectives of this modality are:

a) The first is the use of didactic sessions to help educate the clients about drinking and driving. In addition to educate the client about alcohol and its effect on each client.

b) The use of the eclectic group modality approach incorporating the different therapies such as rational, gestalt, analytical, etc., to most effectively meet the needs of each client.

All therapists are psychiatric social workers with Master's degrees and specializing in the field of alcoholism.

The chemotherapy modality combines extended group therapy with antabuse maintenance. Antabuse is administered (in liquid form) twice weekly under supervision.

7.	Cost	Sliding scale client fees