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# An Evidence Based Evaluation Of The Effectiveness Of Continuous In-Service Police Pursuit Training In Minnesota

David Seyfried

# AN EVIDENCE BASED EVALUATION OF THE EFFECTIVENESS OF CONTINUOUS IN-SERVICE POLICE PURSUIT TRAINING IN MINNESOTA

by

David F. Seyfried
Bachelor of Arts, University of Minnesota, Morris, 1992
Master of Arts, University of Minnesota, Minneapolis, 1995
Master of Public Health, University of Minnesota, Minneapolis, 1995

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This dissertation, submitted by David F. Seyfried in partial fulfillment of the requirements for the Degree of Doctor of Philosophy from the University of North Dakota, has been read by the Faculty Advisory Committee under whom the work has been done, and is hereby approved.

_____
Dr. Michael Meyer, Chairperson

_____
Dr. Wendelin Hume, Committee Member

_____
Dr. Bruce DiCristina, Committee Member

_____
Dr. Martin Gottschalk, Committee Member

_____
Dr. Kathy Smart, Committee Member

This dissertation is being submitted by the appointed advisory committee as having met all of the requirements of the Graduate School at the University of North Dakota and is hereby approved.

_____
Dr. Wayne Swisher
Dean of the Graduate School

_____
Date

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David Seyfried
June 20, 2012

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

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ABSTRACT

Minnesota passed a law in 1999 requiring continuous in-service training in police pursuits for all licensed peace officers in the state. The purpose of this study is to conduct an evidence based program evaluation of the effectiveness of this law. This study examines the literature and presents the findings of previous research on police pursuits, including a discussion of the implementation of police pursuit policies and the usual approach taken by most police agencies to address police pursuits. The history of events that led Minnesota to take a unique approach to the problem by adopting this specific law is described. The effectiveness of continuous in-service training in pursuits for police officers is evaluated by answering thirteen research questions. First, the research questions examine if there are significant differences on the number of pursuits in Minnesota between licensed officers who are required to attend continuous in-service police pursuit training and licensed officers who are not required to attend continuous in-service police pursuit training. Second, the research questions examine if there are significant differences on the number of pursuits ending in a collision between licensed officers involved in a pursuit who are required to attend continuous in-service police pursuit training and licensed officers involved in a pursuit who are not required to attend continuous in-service police pursuit training. This analysis examines all pursuits and then breaks the pursuits down for further analysis by reason for initiation. Third the

research questions examine if there are significant differences on the number of pursuits terminated by officer discretion between licensed officers involved in a pursuit who are required to attend continuous in-service police pursuit training and licensed officers involved in a pursuit who are not required to attend continuous in-service police pursuit training. This analysis also examines all pursuits and then breaks the pursuits down for further analysis by reason for initiation. Fourth, the research questions examine if there are significant differences on the number of pursuits resulting in property damage between licensed officers involved in a pursuit who are required to attend continuous in-service police pursuit training and licensed officers involved in a pursuit who are not required to attend continuous in-service police pursuit training. Fifth, research questions examine if there are significant differences on the number of pursuits resulting in personal injury between licensed officers involved in a pursuit who are required to attend continuous in-service police pursuit training and licensed officers involved in a pursuit who are not required to attend continuous in-service police pursuit training. Effectiveness of training is evaluated by statistical analysis using t-tests and multivariate analysis of variance. Data from six years of police pursuits in Minnesota obtained from the Minnesota Department of Public Safety, Bureau of Criminal Apprehension is analyzed. A discussion of the results of the evaluation of the program's effectiveness is then presented.

To my wife, Candi, and my children, Benjamin, Sarah, David and Katie
May the roads you travel be a little bit safer.

# CHAPTER I

# INTRODUCTION

## Overview of the Evidenced Based Evaluation of Pursuit Training in Minnesota

According to the Minnesota Department of Public Safety's Bureau of Criminal Apprehension, 921 police pursuits occurred in the State of Minnesota in 1998 resulting in 6 deaths and 113 injuries. Another two people were killed in a police action that involved Minneapolis police officers following what the officers believed to be a suspect vehicle. The officers were not operating emergency equipment and the suspect was not aware he or she was being pursued. The specifics will be discussed later but this incident was a key precipitator to the legislation that made this research possible and is thus worth noting immediately. Of the eight fatalities, fifty percent were innocent third parties with no involvement in the crime or pursuit.

Minnesota is not an anomaly. Nationally, police pursuits were responsible for 3,429 deaths in the ten years between 1992 and 2001, an average of 343 deaths per year. Of these, 37 deaths were pursuing officers, 2,320 were suspects, and 1,072 were uninvolved third-parties (National Highway Traffic Safety Administration Fatality Analysis Reporting Systems, 1992 – 2001). Though the percentage of pursuits that end in a fatality is low, the raw numbers are disconcerting.

The use of a police pursuit to apprehend a violator who fails to stop is a controversial topic as pursuits pit two key values of the police against one another: the protection of life and the apprehension of violators. Policies regarding the use of high speed pursuit by police have historically been developed after a tragedy. Developing policies in this manner, without the benefit of research and empirical evidence, is short-sighted. Often pursuit policies, and even state laws, have been developed hastily under the fear of a lawsuit from an injured party. Minnesota is no exception.

In 1999 Minnesota passed a law requiring continuous in-service training in police pursuits for all licensed peace officers in the state. The purpose of this study is to conduct an evidence based program evaluation of the effectiveness of this law. First, the history of events that led Minnesota to taking a unique approach to the problem by adopting this specific law will be explained. Second, this study will examine the literature and present the findings of previous research on police pursuits. This will include a discussion of the implementation of police pursuit policies and the usual approach taken by most police agencies to address police pursuits. Third, the effectiveness of continuous in-service training in pursuits for police officers will be evaluated by conducting multiple statistical analyses of a variety of outcomes of police pursuits occurring in Minnesota both before and after the implementation of the continuous in-service training to answer thirteen research questions. The specific research questions are:

1) Is there a decline in the number of vehicle pursuits in Minnesota among licensed officers after attending continuous in-service police pursuit training compared with the period preceding such training?
2) Is there a decline in the number of vehicle pursuits ending in a collision among licensed officers after attending continuous in-service police pursuit training compared with the period preceding such training?
3) Is there an increase in the number of vehicle pursuits terminated by officer discretion among licensed officers after attending continuous in-service police pursuit training compared with the period preceding such training?
4) Are there significant differences in the outcomes of police vehicle pursuits based on the reason for initiating a pursuit?
5) Is there a change in the number of pursuits ending in a collision after training compared with the period preceding training based on selected reasons for initiating a pursuit?
6) Is there a change in the number of pursuits terminated by officer discretion after training compared with the period preceding training based on selected reasons for initiating a pursuit?
7) Is there a decline in the number of pursuits resulting in property damage among licensed officers involved in a pursuit after attending continuous in-service police pursuit training compared to the period preceding training?

8) Is there a decline in the number of pursuits resulting in personal injury among licensed officers involved in a pursuit after attending continuous in-service police pursuit training compared to the period preceding training?

These analyses will be conducted using t-tests and multivariate analysis of variance on data from six years of police pursuits in Minnesota, three years prior to the training and three after it. Fourth, a discussion of the results of the evaluation of the program's effectiveness will be presented.

Minnesota's training program is unique. Police pursuits have been a controversial issue for many years. States, municipalities, and law enforcement agencies have traditionally responded to this issue by developing and enforcing policies on pursuit. Some individual departments across the country have incorporated in-service pursuit training but Minnesota requires it for every licensed officer in the state.

## Minnesota and Police Pursuits

### *Statewide Collection of Data on Peace Officer Pursuits*

In what Alpert and Dunham refer to as the "first statewide study ever conducted" (1990, p.31) Minnesota began collecting data from all officers involved in police pursuits pursuant to legislation passed by the 1988 Minnesota Legislature. The law follows:

**626.5532 Pursuit of fleeing suspects by peace officers.**

Subdivision 1. **Reports.** If a peace officer pursues a fleeing suspect, the officer's department head must file a notice of the incident with the commissioner of public safety within 30 days following the pursuit. A pursuit must be reported under this section if it is a pursuit by a peace officer of a motor vehicle being operated in violation

of section 609.487. The notice must contain information concerning the reason for and circumstances surrounding the pursuit, including the alleged offense, the length of the pursuit in distance and time, the outcome of the pursuit, any charges filed against the suspect as a result of the pursuit, injuries and property damage resulting from the pursuit, and other information deemed relevant by the commissioner.

Subd. 2. **Local governments to adopt procedures and training requirements.** Each political subdivision and state law enforcement agency that employs persons licensed by the peace officer standards and training board under section 626.845 must establish written procedures to govern the conduct of peace officers who are in pursuit of a vehicle being operated in violation of section 609.487, and requirements for the training of peace officers in conducting pursuits. The procedures must state how peace officers will provide assistance to a person injured during the course of a pursuit. A political subdivision or agency that does not establish procedures and requirements by October 1, 1989, is subject to licensing sanctions of the peace officer standards and training board.

**609.487 Fleeing Peace Officer; Motor Vehicle; other.**

**Subdivision 1. Flee; definition.** For purposes of this section, the term "flee" means to increase speed, extinguish motor vehicle headlights or taillights, refuse to stop the vehicle, or use other means with intent to attempt to elude a peace officer following a signal given by any peace officer to the driver of a motor vehicle.

(Minnesota State Statutes, 1989)

Data is collected using a form created by the Minnesota Bureau of Criminal Apprehension. Information on, and an example of, the form is included in the methods chapter of this paper.

Minnesota routinely collects and stores information on every police pursuit that occurs in the State but has not consistently analyzed the information obtained from the forms. Research by Crew and Hart (1999) as well as research by Crew, Fridell and Pursell (1995) has examined the Minnesota data but did not specifically address training requirements. The present study will use the data to specifically address the impact of training on pursuits and pursuit outcomes.

*Continuous In-Service Training Requirements for Licensed Minnesota Peace Officers*

In 1998 the Minnesota Legislature considered a new law requiring all licensed peace officers in the state who operate a vehicle equipped with emergency lights or siren to attend continuous in-service training on pursuits once every three years. Three years is also the licensure period for officers in Minnesota so the training is required before a license will be renewed by the Minnesota Board of Peace Officer Standards and Training (POST). The law passed in 1999; it follows:

**626.8458 Vehicle pursuits; policies and instruction required.**

Subdivision 1. **Purpose.** The legislature finds that emergency vehicle operations are an integral part of law enforcement's commitment to public safety. Law enforcement agencies shall make reasonable efforts to guide their officers in the safe and responsible performance of their emergency response duties. Although laws and rules provide the foundation for the conduct of law enforcement officers, continuous and

effective training is essential to ensure proper law enforcement action during emergency vehicle operations, including police pursuits. This training must be designed to give officers both skills and decision-making ability so that emergency vehicle operations can be resolved safely and successfully.

Subd. 4. **Preservice training in police pursuits required.**

(a) By January 1, 2000, the board shall prepare learning objectives for instructing peace officers in emergency vehicle operations and in the conduct of police pursuits. The course shall consist of at least seven hours of classroom and skills-based training.

(b) An individual is not eligible to take the peace officer licensing examination or the part-time peace officer licensing examination on or after January 1, 2000, unless the individual has received the training described in paragraph (a).

Subd. 5. **In-service training in police pursuits required.** The chief law enforcement officer of every state and local law enforcement agency shall provide in-service training in emergency vehicle operations and in the conduct of police pursuits to every peace officer and part-time peace officer employed by the agency who the chief law enforcement officer determines may be involved in a police pursuit given the officer's responsibilities. The training shall comply with learning objectives developed and approved by the board and shall consist of at least eight hours of classroom and skills-based training every three years.

Subd. 6. **Licensing sanctions; injunctive relief.** The board may impose licensing sanctions and seek injunctive relief under section 214.11 for failure to comply with the requirements of this section.

(Minnesota State Statutes, 1999)

Beginning in 1999 all licensed Minnesota peace officers were required to attend an eight-hour course on pursuit every three years. The Minnesota POST Board further clarified the statute in its learning objectives adopted on August 26, 1999. The learning objectives outlined multiple performance objectives. But perhaps most importantly it defined the eight-hour training requirement as no less than four hours behind the wheel of the same type of vehicle used by the officer during his or her normal shift.

This left up to four hours to be spent on required classroom training that included multiple topics related to pursuits. Those classroom requirements include the following.

A. Emergency vehicle operations

B. Vehicle seizures and intentional stopping techniques

1. Title 42, US Code, Section 1983

"Federal Civil Rights Act"

2. Use of force

3. Use of deadly force

4. Pursuit intervention options

C. Pursuit decision making

1. Physiological and psychological effects of pursuits

D. Case law and relevant Minnesota traffic law

(Minnesota POST Board Learning Objectives, 1999)

Including classroom time is important because it insures the training consists of more than simply how to operate the vehicle in pursuit situations. Discussion of pursuit

laws, the danger of pursuits, liability of officers engaging in pursuit, and the effect of pursuits on the officer are all included in the classroom portion of the training. This addresses the concern raised by some researchers that training, when it existed at all, was too focused on the technical aspects of the pursuit while disregarding the decision making components of a pursuit.

It would be an outstanding triumph of empirical research influencing public policy if the new requirement of continuous in-service training on pursuit was a result of a decade of data analysis by the Minnesota Department of Public Safety. However, that is not the case. Like so many policies and laws, the continuous in-service training requirement was a result of one particular incident. And that incident wasn't considered a pursuit by the Minneapolis Police (the agency involved) or by the Minnesota Bureau of Criminal Apprehension.

*History of MN Statue 626.8458, Subd. 5: In-Service Training in Police Pursuits Required*

Historically police pursuit policies have been examined, and often changed, when a serious incident occurs. According to Neil Melton, Executive Director of the Minnesota POST Board, such is the case with the continuous in-service training requirement in Minnesota. In an interview (N. Melton, personal communication, March 28, 2011) Mr. Melton related that on Thanksgiving night, 1998, a Minneapolis Police squad car was tracking a suspect vehicle after responding to a burglary call. The Minneapolis police officers spotted what they believed was the suspect vehicle and accelerated to catch up. They did not activate their lights or siren and had their headlights off to avoid detection. The police officers were so focused on trailing the

vehicle the squad drove through a stop sign without stopping and "t-boned a pick-up truck" (Melton, 2011). The crash killed the driver of the pick-up and the "media went crazy" (Melton, 2011). Minneapolis Police Commander Rich Stanek, who was a legislator in the Minnesota House of Representatives, co-sponsored the legislation requiring continuous in-service training on police pursuits.

The statute does not seem to be an appropriate response to address the incident as described. During our conversation I confirmed with Mr. Melton that the incident was not a pursuit under the law and that the law didn't seem to fit the incident. He chuckled and responded "there's no reason to let facts get in the way of legislation" (Melton, 2011). He went on to say the legislature made a one-time appropriation toward the training and that three years was identified because pursuit driving is a psycho-motor skill and it fit well with the licensing renewal period.

Due to the high profile nature of the case the Minneapolis Star Tribune covered it for over a year. The facts are reported as Mr. Melton stated they occurred. On November 28, 1998, the following was reported in the Star Tribune about the incident:

> Police weren't after the pickup truck. They were responding to a call of a burglary in progress in the 3900 block of E. Lake St. Witnesses reported a car speeding away. So when police saw taillights leaving the area, they accelerated to catch up. Officials said the pickup failed to yield to the squad car at the intersection of 32nd St. and 36th Av. S. about 12:30 a.m.
>
> (Walsh & Powell, 1998, p. 1B)

The story continues to unfold in reports over the next month and is covered throughout the year as new information became available. Additional information is published in December 1, 1998 by the Star Tribune. The article states the Minneapolis Police have determined the incident was not a chase.

> About 12:30 a.m. Friday, officers were responding to a burglary in progress at an apartment building in the 4100 block of E. Lake St. in Minneapolis. A woman told police that her boyfriend was trying to enter her apartment through a second-floor balcony. When someone yelled at him, he drove away in his truck. Officers Kenneth Awalt and Doug Leiter heard the radio call. They spotted taillights about eight blocks away on E. 32nd St. from a vehicle moving at high speed, Parrish said. The officers tried to catch up with the vehicle but hit Winkel's truck at the intersection of 32nd St. and 36th Av. S. It was not clear whether the officers had turned on their strobe lights for pursuit. Parrish said the department had determined that the officers were not involved in a chase, since the people in the vehicle they were moving toward didn't know they were being pursued and didn't attempt to elude police. Awalt and Leiter were treated for minor injuries that night.
>
> (Baca, 1998, p. 3B)

The determination by the Minneapolis Police Department that the officers were not involved in a chase drew condemnation from Doug Grow, staff writer for the Star Tribune. In an article titled “A pursuit by any other name is just as tragic” published on

December 2nd, Grow rails against the Minneapolis Police and states "Pursuits, chases and high-speed follows must become the rare exception" (Grow, 1998, p. 2B).

On December 7, 1998 the driver of the pick-up truck, Steven Winkel, 27, died raising the death toll in the incident to two. The passenger, Jeffrey Carlson, 23, had been killed the night of the crash (Collins, 1998). Two innocent people were dead and the public outcry was getting louder.

On December 10, 1998 the Star Tribune reported "The Minneapolis police officers whose cruiser smashed into a pickup truck were driving without their flashing lights or siren on, Police Chief Robert Olson has disclosed in letters to the families of the two men who died" (Powell & Collins, 1998, p. 1B). This revelation was met with condemnation by one of the victim's family members, "Winkel's father, Jim Winkel, said the police should be held accountable for running a stop sign without using emergency equipment. "Any time a police officer has to break those laws, it's his responsibility to turn on those lights and turn on the sirens," Winkel said. "These officers clearly didn't do that. They made a conscious decision to pursue something or somebody without their lights on, without their sirens on, through a quiet city street at midnight, in the dark"" (Powell & Collins, 1998, p. 1B).

Early on the morning of December 13th, 1998, another tragedy occurs. An innocent third party and a suspected drunk driver are killed after the drunk driver collides with the victim during a police pursuit that lasted five miles. "The driver, Jason J. McMurray, lost control, swerved into the northbound lane of 316, clipping one car before slamming head-on into a car driven by Peeravat Wongchote, 35, of Hastings. The impact

of that crash probably killed McMurray, 26, of Hastings whose car then hit a utility pole" (Graves, 1998, p. 1A). McMurray was being pursued after refusing to stop for a Dakota County sheriff's deputy who suspected him of driving under the influence of alcohol. Four fatal crashes involving the police had occurred in three weeks.

On December 15, 1998 the Star Tribune reported the Minnesota POST Board would be requiring behind-the-wheel and classroom pursuit training for currently licensed peace officers. "The Peace Officer Standards and Training Board (POST) probably will mandate the extra training as part of its license renewal requirements, said executive director Neil Melton. Every officer in the state must be licensed. Every three years, they must complete a series of training sessions to maintain that license" (Graves, 1998, p. 1A).

The official report of the Minneapolis Police Department's investigation into the crash on Thanksgiving night involving two Minneapolis police officers was released in early February of 1999 and the subject of a February 3rd article in the Star Tribune. "The report obtained Tuesday includes the accident reconstruction. It concludes there were two main contributing factors: Leiter went through a stop sign without activating his emergency equipment and both vehicles exceeded the speed limit…The accident reconstruction portion of the final report calculated that Leiter was traveling 34 to 37 miles per hour and Winkel was traveling 33 to 35 mph. the posted speed limit is 30 mph" (Chanen, 1999, p. 1B).

Findings from the investigation into the crash by the Minnesota State Patrol were published in the Star Tribune on April 10, 1999.

> According to the State Patrol, Leiter was going 37 to 38 mph at impact, and the pickup was going 35 to 36 mph. These results are virtually identical to the results in the Police Department's report, which also said that Leiter hadn't activated his flashing lights or siren before entering the intersection where the crash happened. He had put on the lights at each intersection until the one where the men were killed.
>
> (Chanen, 1999, p. 1A)

The Minneapolis Police had endured a great deal of scrutiny over the incident and the resulting deaths of Carlson and Winkel. Minneapolis Police Commander Rich Stanek, who was also a member of the Minnesota House of Representatives, commented about the case and the legislation in the Star Tribune on July 26, 1999.

> Cops and several police officials, including investigations Cmdr. Rich Stanek, say officers often speed after suspects without flashing lights and siren because it's safer. They say suspects are less likely to flee and further endanger the public if emergency lights and siren aren't activated until the squad car is right behind them. "If I went with red lights and siren every time I had an emergency run, there'd be more accidents. People don't know how to react, they get scared and panic or freeze," said Stanek, also a Republican state House member from Maple Grove. "There's no way to avoid {driving without emergency lights} if you are going to catch people." Stanek thinks police need fewer rules and more training for chases. He cosponsored a bill last session that provides $600,000 for police agencies to give patrol officers eight hours of pursuit training every three years.

> He also sponsored legislation in 1998 that allows officers to speed to emergency calls if they use flashing lights or their siren. Previously, the law required both, as Minneapolis policy still does.
>
> (Adams, 1999, p. 1B)

Representative Stanek's comment that officers need more training and fewer rules provides insight into the thought process behind the continuous in-service training requirement in the legislation. The additional sponsors of the legislation were Representative Broecker, Representative P. Larsen, Representative Holberg and Representative Murphy. Sponsors in the Senate included Senator R.C. Kelly, Senator Spear, Senator Neuville, Senator Knutson and Senator Ranum.

Thus the legislation responsible for this pioneering continuous in-service pursuit training requirement came into being primarily as a result of an incident that was not defined by the Minneapolis Police Department or the Minnesota Bureau of Criminal Apprehension as a pursuit. Nevertheless, whether involved in a pursuit or not, the decisions made by the Minneapolis police officers early on the morning of November 27, 1998, may have been affected by this training. Through their sponsorship of this legislation, Minnesota legislators demonstrated their belief that it would have.

# CHAPTER II

# LITERATURE REVIEW

## Research on Police Pursuits

What constitutes a police pursuit? For the sake of clarity a standardized definition is recognized. "A police pursuit is an active attempt by a law enforcement officer operating a motor vehicle with emergency equipment to apprehend a suspected law violator in a motor vehicle, when the driver of the vehicle attempts to avoid apprehension" (Alpert, 1987, p. 299).

Policing is a profession that often turns to customs and practices when developing strategies to respond to problems without the benefit of empirical research (Alpert and Dunham, 1990). There is a sense of tradition among police officers that leads to problems being addressed by looking to past practice. Basing strategies on solid research is far from being a universally accepted approach to law enforcement problems. The custom of pursuing any violator of the law, no matter how minor the offense, at high speed was a customary police response that went unquestioned for decades.

The topic of police pursuits came to light in the 1960s. According to Alpert and Dunham, "It was not until the 1960s that police pursuits were viewed as a concern to either the police or the public. During that decade, several influential civic groups began to notice and comment publicly that pursuit driving resulted in expensive and disastrous

outcomes" (1990, p. 25). While the 1960s saw an increase in the number of persons concerned and commenting on police pursuits those comments were based on nothing more than anecdotal evidence. A police pursuit would occur; those pursuits which ended in a crash were observed and publicized by the media. The story would focus on the crash and question the value of police pursuits given the dangers. The police, who spent most of the 1960s in defensive mode, argued pursuits were necessary to maintain law and order (1990).

Neither side relied on evidence to support opinions which were often stated as fact. Commenting about the differences in opinion, Fennessy and Joscelyn wrote "One of the basic reasons for this divergence of opinion is the almost total lack of reliable information on the nature of the hot pursuit situation" (1972, p. 389). In studying the problem Fennessy and Joscelyn found only one national estimate of pursuit crash data: the 1968 report written by the Physicians for Automotive Safety.

*The Physicians for Automotive Safety Report*

The first national estimate of crashes caused by pursuits was presented by an organization called the Physicians for Automotive Safety. The report stated:

- One out of five pursuits end in death
- Five out of ten pursuits end in injury
- Seven out of ten pursuits end in accidents
- One out of 25 killed is a policeman
- More than 500 Americans die each year as a result of rapid pursuit by the police

> There are grave doubts on the payoff in rapid pursuit. The costs in deaths and injuries hardly sustain the risks involved, especially for the police and injured bystanders. The whole paramount concern is public health, we have no conflict in judging the value of human live before all other considerations. (Physicians for Automotive Safety, 1968, as cited in Fennessy & Joscelyn, 1972, p. 394)

Statistics cited by the Physicians for Automotive Safety focused on the negative outcomes of police chases. Media sources pounced on these statistics and came to the conclusion that police pursuits were not worth the risks.

The seriousness of the findings prompted a closer examination of the data by researchers in the law enforcement community. This secondary look at the study found that it was fraught with problems. Criticism focused on the statistical ratios presented in the study which were calculated by the Physicians for Automotive Safety (PAS) by using a three month sample of newspaper clippings. "The number of pursuit accidents, the number of fatalities, and the number of injuries – serious and minor – were tabulated and extrapolated by PAS to obtain an annual estimate of the size of the problem" (p. 394). Ironically the PAS statistics ubiquitous in the media, that caused the excitement, came originally from none other than media reports.

Such a sampling method was ripe with bias; the most obvious problem being the fact that police pursuits which ended without incident would not be reported because few agencies required reporting of pursuits and media organizations could not be aware they even occurred. Nevertheless, while the statistical ratios were improperly calculated due

to the lack of essential information, the total number of accidents, injuries, and fatalities attributable to police pursuits was likely valid. Addressing this issue the authors write "the fatality and injury totals, however, are reasonably reliable" (Fennessy & Joscelyn, 1972, p. 48). Searching for better facts and scientific results, Fennessy and Joscelyn commenced a study of the issue in 1970 with their own National Study of Hot Pursuit.

### *A National Study of Hot Pursuit*

Due to the concerns with the validity of the Physicians for Automotive Safety study it became clear additional research was necessary. To this effort a national study of hot pursuit by Fennessy and Joscelyn (1972) was undertaken to review pursuit policies and outcomes. Police pursuit policies were requested from 130 cities with populations over 100,000 and the 48 state-level police agencies in the continental United States. A response rate of 40 percent was obtained from cities and a rate of 46 percent from state agencies.

The results identified three basic approaches to the development of pursuit policies among municipal and state-level police agencies.

- *Officer Judgment Model*: All basic decisions to initiate, conduct, or terminate hot pursuit are made by the street officer. His decisions are subject to internal review and possible legal action, depending on "due care" provisions
- *Restrictive Policy Model*: There are certain restrictions on the officer's decision to initiate, conduct, or terminate a pursuit. Examples are: only pursue for felonies; no speed above 20 m.p.h. over posted limits; stop at intersections

- *Pursuit Discouraged*: Officers are cautioned or discouraged from engaging in hot pursuit. None of the agencies, however, expressly forbids pursuit if there is no other choice and if it is an extreme emergency.

> The officer judgment policy was by far (80 percent of the responses) the most predominant type. A much smaller number of agencies (about 15 percent) subscribe to the restrictive model. Less than 5 percent of the police agencies…have a formal written policy discouraging rapid pursuit. (Fennessy & Joscelyn, 1972, p. 395)

It is worth noting again that this describes only the 40 percent of city police and 46 percent of state-level police responding agencies. It is not unreasonable to assume that, with over 50 percent of the agencies not responding, there are likely many police agencies with no pursuit policy at all. This very issue showed up as late as 1996 in research completed by Alpert, Kenney, Dunham, Smith and Cosgrove.

Information on police pursuit training was also requested in Fennessy & Joscelyn's survey. Additionally, research staff attended training programs provided by the California Highway Patrol and the North Carolina Highway Patrol because they were "generally considered to conduct the most advanced training in this area" (p. 395). Considering the information from survey respondents, as well as interviews with training experts in California and North Carolina, the researchers concluded that less than 25 percent of police officers had attended a formal pursuit driving or emergency vehicle operations course.

In summary, fewer than half of the police agencies surveyed responded. 80 percent of responding agencies were found to have used a judgmental policy (the least restrictive). And fewer than 25 percent of officers were estimated by researchers to have adequate training in police pursuit.

The training statistic, while not exact, is of particular interest to this study. Most of the research in police pursuits focuses on the actual pursuit data. Studies routinely examine the number of pursuits, the number of crashes resulting from pursuits, the number of persons injured, the number of fatalities, and who those persons were (police officer, suspect, passenger in suspect vehicle, or unrelated party). Few research studies have investigated the training police officers received before the pursuit and whether that training had any measurable effect.

The second part of the Fennessy and Joscelyn study consisted of a small field study that examined pursuits at four agencies, the North Carolina Highway Patrol; the Fairfax County, Virginia Police Department; the South Bend Indiana Police Department; and the Bloomington, Indiana Police Department. One form was developed for use at all sites and officers were trained by research team staff. Over 1,400 officers participated in the study.

The combined data from the four sites produced the following results:

- Forty-six pursuits were recorded by the 1,400 officers.
- One out of nine pursuits ended in a crash.
- One out of fifteen pursuits ended in a minor injury.

- Eight out often pursuits ended in the successful (no crash, no escape) apprehension of the offender.
- No fatal pursuit crashes were reported.
- Alcohol played a role in more than half of the pursuits.
- One out of ten chases resulted in the offender escaping.
- Most pursuits occurred at night, and particularly during weekends.
- The apprehended drivers, as a group, had a significantly higher than "average" number of prior accidents, violation convictions, and suspensions.
- One out of seven chases involved vehicles that were "modified" to attain high speeds.
- Over 95 percent of the apprehended drivers were males and were predominantly (75 percent) youthful (age 24 and under).
- One out of seven apprehended drivers, for whom records were available, was driving without a valid license (suspended, revoked, or no license at all).
- The longest chase distance reported was 15 miles, the shortest less than 1 mile.
- Twenty-eight percent of the chases took place in predominantly residential areas; the remainder occurred under primarily rural conditions.
- The average pursuit speed was 85 m.p.h. The average of the highest speeds attained during the 46 pursuits was 98 m.p.h. The maximum chase speed reported was 135 m.p.h. The lowest was 30 m.p.h. (during heavy traffic)

> It is evident that these results are almost totally contradictory to those obtained during the PAS study. We do not make any claims that these results provide us with anything more than some initial quantitative suggestions, with respect to national conditions.
>
> (Fennessy & Joscelyn, 1972, p. 398)

While this study cannot be extrapolated to describe the state of pursuits nationally it does confirm the problems with the Physicians for Automotive Safety study. In these conclusions Fennessy and Joscelyn estimate 400 hot pursuit-related deaths annually. This is less than one percent of all motor-vehicle fatalities.

The problem of police pursuits is not as extreme as the Physicians for Automotive Safety suggest but is still a serious problem. Fennessy and Joscelyn recommend additional study and the implementation of policies related to hot pursuits. A decade will pass before additional study into the issue takes place.

### *The California Highway Patrol Study*

In the early 1980's the California Highway Patrol (CHP) conducted a study of police pursuits by officers in its department. Due to the nature of highway patrol work the substantial majority of pursuits studied occurred on freeways. Nevertheless, the study, done over six months and comprising almost 700 pursuits, provides an "excellent base of information" (Alpert & Dunham, 1990, p. 28).

The profile of the typical pursuit based upon results from this study includes:

1. Initiated by a traffic violation
2. Takes place at night

3. Continues for one mile
4. Lasts one to two minutes
5. Involves two police cars
6. Is terminated voluntarily by the offender
7. Involves a male driver twenty years old

Two of the most important findings reported by the California Highway Patrol are that

1. 77% of the suspects were apprehended
2. 70% of the pursuits ended without an accident

The data reported by the Highway Patrol adds empirical support to the conclusions suggested by Fennessy & Joscelyn. The CHP concluded that pursuits do not typically end in injury or death as the various media and information presented in police textbooks often imply.

(California Highway Patrol, 1983, as cited in Alpert & Dunham, 1990, p. 28)

The results of the CHP study resemble those discovered by Fennessy and Joscelyn (1972) and provide additional evidence that the statistical ratios reported by the Physicians for Automotive Safety were inaccurate. Both the 1972 Fennessy & Joscelyn study and the 1983 California Highway Patrol study were limited in scope but neither concluded the issue of police pursuits was unimportant. Additional study of the matter was warranted to identify national trends in police pursuit.

By the late 1980's multiple agencies began collecting data. Of particular importance to this research is that the Minnesota Board of Peace Officer Standards and

Training began collecting data in 1988 after the Minnesota Legislature required all police agencies in the state to report pursuits by peace officers to the Minnesota Department of Public Safety. An in-depth description of Minnesota's landmark legislation is provided in a later section of this paper.

At the very end of the 1980's Alpert and Dunham gave a glimpse into a large study the results of which they published the following year. Introducing their 1989 article Alpert and Dunham wrote of the scarcity of empirical evidence available to police administrators and politicians charged with developing public policy.

> Recent concern and publicity have forced the law enforcement community to respond with appropriate guidelines for officers to follow. As with any police technique about which little is known, solutions are often suggested without proper analysis or information. Armchair philosophy and conventional wisdom can aid in deciding which of several responses to a problem is the best one, but solving the problem of police pursuit requires decision-making rather than problem-solving skills. Thus, appropriate knowledge must be obtained and processed before proper decisions can be made.
>
> (Alpert & Dunham, 1989, p. 521)

The importance of developing data upon which to base policies and practices was emphasized throughout the article.

Alpert and Dunham referenced studies on police responses to domestic violence as well as the use of firearms to show how empirical evidence has been used effectively to shape police policies. Regarding police shootings they quoted Mark Blumberg, "the

research suggests not only that a tightened policy which is rigorously enforced will reduce the number of shootings, but that it will change their nature as well" (Blumberg, 1989, as cited in Alpert & Dunham, 1989, p. 523). The impetus of the discussion was that police discretion, at both the officer and departmental levels, can be controlled by policies based on research and enforced by administration before negative outcomes occur. Discussion of police discretion and the affect of policy on discretion is included later in this paper.

### *The Dade Association of Chiefs of Police Two-Phase Study on Police Pursuits aka The Alpert and Dunham Study of Police Pursuits by the Metro-Dade Police Department*

In 1990 an important study on police pursuits was published based on research that began in 1984. Research was conducted on behalf of the Dade Association of Chiefs of Police by Geoffrey Alpert and Roger Dunham using data from Dade County, Florida. The study had two phases, a policy review and development phase and a data analysis phase.

The first phase of the study consisted of a review of department policies on police pursuits from law enforcement agencies throughout Florida and the country. As a result of this review, a model policy was developed with the assistance of Professor Geoffrey Alpert from the University of South Carolina. By 1985 this model policy was adopted by all police departments in Dade County. The policy included a specific report form to be used after every police pursuit. This standardization of policies, which included a reporting requirement on a specific form based on that used during the California Highway Patrol Study, made analysis of data feasible.

The second phase of the study involved an empirical analysis of the data collected about police pursuits conducted by the Metro-Dade Police Department. Administrative orders required all Metro-Dade Police Officers to complete a pursuit report form for every pursuit in which they engaged. Additional data was also collected from the Miami Police Department. Data was collected from August 1985 through 1987 from the Metro-Dade Police Department and in 1986 from the Miami Police Department.

The study is of particular importance because in addition to reporting the outcome of the pursuits the authors, through discriminant analysis and cross-tabulation, were able to identify relationships between outcomes and specific independent variables. Data on the outcome of 952 pursuits by reason for pursuit are reported in Table 1.

Table 1

*Outcome of Pursuit by Reason for Pursuit*

| Reason<br><br>Outcome | Traffic | Bolo | Felony Stop/ Suspected Felon | Reckless/DUI | Total Ave. % |
|---|---|---|---|---|---|
| Defendant Arrested | 332 (65%) | 81 (76%) | 218 (70%) | 13 (68%) | 644 |
| Defendant Escaped | 144 (28%) | 25 (23%) | 85 (27%) | 4 (21%) | 258 |
| Defendant Killed | 4 (1%) | ---- | 3 (1%) | ---- | 7 |
| Accident | 150 (29%) | 41 (38%) | 112 (36%) | 5 (26%) | 308 |
| Voluntary Termination | 31 (6%) | 1 (2%) | 6 (2%) | 2 (11%) | 40 |

This table is based on 1257 outcomes rather than 952 pursuits. It is for this reason that column percentages may total to more than 100%...

(Alpert & Dunham, 1990, p. 39)

The Alpert and Dunham/Dade Association of Chiefs of Police study provides the first substantial data set capable of being used for multiple types of statistical analyses. Alpert and Dunham availed themselves of this opportunity and made comparisons to identify relationships between pursuit variables and outcomes on several dependent variables. First, they made comparisons between the outcome of accident with the independent variables of officer's age, reason for pursuit, road conditions, officer's gender, officer's race, day or night, and whether the chase occurred on an expressway. Second, they made comparisons to identify relationships between the outcome of escape with the independent variables of number of units, suspect vehicle type, chase at night, and top speed. Third, they made comparisons to identify relationships between the outcome of injury with the independent variables of officer's age, other police agencies involved, elapsed time of pursuit, number of police cars, officer's gender and pursuit in a rural area.

Finally, the authors aggregated outcomes to create a variable they designated as negative outcome. To accomplish this goal each chase was identified as having either a negative outcome or no negative outcome. Negative outcomes were defined as one of these three results: accident, escape, or injury (Alpert & Dunham, 1990).

Alpert & Dunham used two statistical tests to analyze the data, discriminant analysis for its predictive capabilities and analysis of variance for its explanatory strengths. They determined which officer and pursuit characteristics predict each type of negative outcome using discriminant analysis first. Then, they explained how the characteristics relate to the outcome, using analysis of variance (1990, p. 40). This

process was used for each of the three separate outcomes, accident, escape, and injury, as well as for the combined negative outcome variable that was inclusive of all three previous variables.

*Pursuit Variables and Accidents*

Discriminant analysis on the accident/no accident outcome identified seven variables that significantly contributed to the prediction of accidents. Accidents include all suspect and police vehicles involved in the pursuit that become involved in an accident. The officer's age, reason for pursuit, road conditions, officer's gender, officer's race, day or night, and whether the chase occurred on an expressway were found to be significant at the .08 level with a canonical correlation of .21 resulting in the correct classification of 59% of the cases (Alpert & Dunham, 1990). Analysis of variance was conducted on each of these seven variables.

*Accidents and Officer Age.* Analysis found that officers over forty were least likely to have a pursuit end in an accident. 23% of officers over forty were involved in a pursuit-related accident. Pursuits by officers in their twenties and thirties ended in accidents 36% and 35% of the time, respectively. "Officers forty years of age and over seem to approach pursuits in a way that significantly reduces the likelihood of accidents" (Alpert & Dunham, 1990, p. 42).

*Accidents and Reason for Pursuit.* Alpert & Dunham noted a slightly greater chance of the pursuit resulting in an accident when a pursuit was initiated for a traffic violation. 36% of pursuits started for a traffic violation resulted in an accident compared

with 32% of pursuits that began for other reasons. The authors note the difference is small and should be interpreted cautiously (1990).

*Accidents and Road Conditions.* As one might expect, wet roads contribute to accidents. 43% of pursuits conducted on wet roadways resulted in accidents compared with 33% of pursuits that resulted in accidents when the roadway was dry (Alpert & Dunham, 1990).

*Accidents and Officer Gender.* Pursuits by female officers have a lower incidence of accident than pursuits by males, 28% and 34%, respectively. Alpert & Dunham caution the relationship is based on only 25 pursuits by female officers. "However, this same relationship emerges in the analyses of other negative outcomes of pursuits, and should be investigated further" (1990, p. 43).

*Accidents and Officer Race.* The data do not identify significant differences between pursuits started by Anglo and Non-Anglo officers in which accidents occurred. Unlike the gender data, the number of pursuits was roughly equivalent and did not suffer from a much smaller number of pursuits initiated by one group than the other. No further study was recommended (Alpert & Dunham, 1990).

*Accidents and Daytime Chase.* Daytime chases result in more accidents, 38%, than chases that occur at night, 33%. Alpert and Dunham noted their belief that common sense would predict the opposite due to the reduction in lighting. But they found instead "the greater concentrations of traffic during the day than during the night is the reason for this difference, offsetting the danger of poor lighting" (1990, p. 44).

*Accidents and Expressway Chases.* 29% of chases occurring on freeways ended in an accident compared with 35% of chases on other roadways which confirmed the authors' suspicions concerning the comparison of this data with the California Highway Patrol data. "Although freeway chases have higher speeds, this danger seems to be offset by the more even and orderly flow of traffic on expressways" (Alpert & Dunham, 1990, p. 44).

*Pursuit Variables and Escape*

Discriminant analysis on the escape/apprehended outcome identified four variables that significantly contributed to the prediction of escape. The number of police cars involved in the chase, the type of vehicle (motorcycle or other), whether the chase occurred at night, and the top speed of the chase were found to be significant at the .05 level with a canonical correlation of .18 resulting in the correct classification of 63% of the cases (Alpert & Dunham, 1990). Analysis of variance was conducted on each of these four variables.

*Escape and Number of Police Units.* Alpert & Dunham found more than one police unit involved in a pursuit significantly reduces the likelihood of escape. Pursuits involving only on police car resulted in the suspect escaping nearly one-third of the time (31%). However, when more than one police unit was involved that chance of escape dropped to fewer than one in five (18%) (1990). Data was gathered only on whether or not there was more than one police unit involved; the number of additional police units and its impact was not examined.

*Escape and Type of Vehicle Chased.* Motorcycles were far better vehicles to use when successfully fleeing the police was the goal. Suspects on motorcycles had a 44% chance of escaping compared with only a 24% chance when in an automobile (Alpert & Dunham, 1990). Clearly the maneuverability of a motorcycle provides a distinct advantage to a fleeing suspect. The data did not separate out types of police vehicles; it would be interesting to examine whether a police officer on a motorcycle would have a greater chance of apprehending a suspect on the same type of vehicle.

*Escape and Chase at Night.* Alpert and Dunham make note of a belief held by many: that it is easier to escape from the police at night than during the day. The data, however, do not support this widely-held assumption. 24% of chases occurring during the day result in escape. Night doesn't provide a much greater chance to suspects as only 28% of chases occurring at night result in the suspect escaping (1990).

*Escape and Top Speed.* Yet another common belief, faster speeds equate to a greater likelihood of escape, was debunked by Alpert and Dunham's study. Interestingly, the slowest speed category resulted in the highest number of escapes. 33% of pursuits that did not reach a top speed above 40 m.p.h. resulted in escape. Pursuits with top speeds between 41 – 69 m.p.h. and those with top speeds of 70 m.p.h. or greater resulted in escape only 25% of the time. The authors posit chases taking place in business and residential areas provide suspects with more hiding places. Those chases, constricted by traffic and congestion, do not reach high speeds. However, the traffic and congestion that interferes with escape by means of high speeds provides opportunity for escape via concealment (1990).

*Pursuit Variables and Personal Injury*

Discriminant analysis on the injury/no injury outcome identified six variables that significantly contributed to the prediction of personal injury. The officer's age, other police agencies involved, elapsed time of pursuit, number of police cars, officer's gender and pursuit in a rural area were found to be significant at the .03 level with a canonical correlation of .22 resulting in the correct classification of 59% of the cases (Alpert & Dunham, 1990). Analysis of variance was conducted on each of these six variables.

*Personal Injury and Officer Age.* According to the data officer age is correlated with personal injury. Officers in their twenties had 26% of their pursuits result in personal injury. Personal injuries resulted in 20% of pursuits by officers in their thirties and in 18% of pursuits by officers in their forties. Alpert & Dunham advance two theories to explain this phenomenon. One reason is officers in their twenties may not be able to make the split-second decisions necessary to reduce the danger in a pursuit. "Another relevant factor may be the ability of older and more experienced officers to control their emotions during and after the chase, and avoid injuring the offender" (p. 49, 1990).

*Personal Injury and Involvement of Other Police Agencies.* When more than one police agency was involved in a pursuit the rate of personal injuries increased. Fully one-third (33%) of pursuits in which other police agencies were involved resulted in personal injuries occurring. This is contrasted with about one-fifth (21%) of pursuits that did not have assistance from another police agency resulting in personal injury.

Alpert and Dunham state "It is difficult to determine the reason for this difference. It may be due to the greater level of emotion generated by the combined chase, or simply that these chases are more serious than others where other departments are not called in. In either case, the finding calls for further research on multijurisdictional pursuits" (1990, p. 49).

*Personal Injury and Elapsed Time of Pursuit.* While significant group differences exist when comparing personal injury to the length of time elapsed in a pursuit there is not a linear relationship. The chance of injury during a pursuit that lasted between one and three minutes was 23%, between 4 and 5 minutes was 21%, between six and nine minutes was 37%, and ten or more minutes was 11%. The authors proffer "many of the suspects involved in such long chases are likely to escape completely and therefore escape injury" (Alpert & Dunham, 1990, p. 49).

*Personal Injury and Number of Police Cars Involved.* It was noted previously that additional police cars, beyond one car, decrease the likelihood of escape. Unfortunately more than one police car has a negative outcome as well: the number of pursuits resulting in personal injury increases. 20% of pursuits involving one police car resulted in personal injury. But when the number of police cars was over one 28% of pursuits resulted in personal injury to the suspect, the officer or a third party uninvolved in the pursuit (Alpert & Dunham, 1990).

The authors suggest the increased emotion generated by a more involved chase may account for this difference. While they do not suggest it in this particular data analysis it seems to follow that, as suggested in the data analysis on personal injury and

elapsed time of pursuit, since fewer escape, more are injured. And it was previously shown that fewer suspects escape when more police cars were involved (Alpert & Dunham, 1990).

*Personal Injury and Officer Gender.* Pursuits initiated by female officers resulted in personal injury 12% of the time. In comparison, pursuits initiated by male officers resulted in personal injury 24% of the time. As with the data on accidents, the small number (25) of pursuits conducted by females should be noted. But the percentages are nonetheless interesting (Alpert & Dunham, 1990).

*Personal Injury and Rural Chase.* Pursuits occurring in rural areas are significantly less likely to result in personal injury than those occurring in urban and suburban areas. Rural chases resulted in personal injury in 11% of the cases while urban/suburban chases resulted in personal injury 24% of the time (Alpert & Dunham, 1990). As was suggested by the data comparing time of day with accidents, it would seem traffic is the key factor. Even though rural pursuits result in higher rates of speed than urban/suburban pursuits the decrease in traffic seems to offset the increase in speed.

*Negative Outcome and Pursuit Variables*

The last analysis completed by Alpert and Dunham involved a combination of individual variables to create a new variable. The variable of whether or not there was a negative outcome comprises the variables of whether or not there was an accident, whether or not the suspect escaped and whether or not anyone sustained personal injury (Alpert & Dunham, 1990). This variable is a good measure of the overall outcome of a police pursuit. The individual data is useful because some of the outcomes are arguably

worse than others, yet all three are negative. For example, escape is a negative outcome but it probably exposes the department to less liability and long-term consequences than personal injury. So both an analysis of total negative outcomes as well as an analysis of each negative outcome individually is useful.

Discriminant analysis on the negative outcome versus no negative outcome variable found that "five variables contributed significantly to the prediction of negative outcome: the chasing officer's Hispanic origin, the officer's age, the top speed of the chase, whether other police were involved in the chase, and the gender of the officer (Alpert & Dunham, 1990, p. 51). The analysis was found to be significant at the .04 level with a canonical correlation of .20 resulting in the correct classification of 57% of the cases (1990). Analysis of variance was conducted on each of these five variables.

*Negative Outcome and Hispanic Officer.* Hispanic officers have a negative outcome in over half of the pursuits they are involved in. "54% of the chases conducted by Hispanic officers had negative outcomes, compared with 44% of the chases initiated by non-Hispanic officers (Anglo or black)" (Alpert & Dunham, 1990, p. 52). The authors offer no explanation for this variance.

*Negative Outcome and Officer Age.* As noted previously in the analysis of individual variables, age plays a significant role. As officer age increases the percent of pursuits ending with a negative outcome decreases. Officers in their twenties who initiated a pursuit had that pursuit end in a negative outcome 53% of the time. Officers in their thirties and forties had pursuits they initiated end negatively 49% and 44% respectively (Alpert & Dunham, 1990).

When interviewed about involvement in a pursuit the difference in perspective between older and younger officers was offered. Officers involved in a pursuit were interviewed the day of the pursuit. One patrol officer stated the following. "When I was younger I would have been more concerned about busting my ass to catch some creep who was trying to escape. Now, I figure this creep will get himself in enough trouble and someone will bust his head. I wasn't going to put my ass on-the-line for that creep. He was smart he just quit" (48 year-old male patrol officer as quoted in Alpert & Dunham, 1989, p. 537).

Another officer, half the age of the first, had a different perspective on the situation. "It was a game, man he was trying to get away and I wasn't going to let him. Thinking about it now, I probably shouldn't have been so concerned with getting the guy, who cares, you know? But at the time it was all that mattered. And I got the son-of-a-bitch" (24 year-old male patrol officer as quoted in Alpert & Dunham, 1989, p. 537).

*Negative Outcome and Top Speed.* High speed does not automatically equate to an increased probability of a negative outcome. Pursuits with top speeds of 70 and above were the least likely to end negatively, coming in at 46%. Slow pursuits were second; pursuits with top speeds of 40 and below ended with a negative outcome 49% of the time. The most likely top speed to result in a negative outcome was between 41 and 49 miles per hour. These pursuits resulted in a negative outcome 55% of the time. The drop in negative outcome of pursuits categorized in the highest speed group is attributed by Alpert and Dunham to the likelihood that those pursuits occurred on freeways (1990).

*Negative Outcome and Other Police Agencies Involved.* Pursuits involving other police agencies were more likely to end with a negative outcome. When other police agencies were involved the pursuits ended with a negative outcome 57% of the time. 50% of pursuits involving only one police agency ended negatively.

*Negative Outcome and Officer Gender.* The effect of gender is to be considered with caution because of the small number of pursuits initiated by female officers (25 total). Nevertheless, the analysis shows pursuits initiated by female officers end with a negative outcome 44% of the time compared with 51% of pursuits initiated by male officers ending with a negative outcome. The numbers are too small to draw any conclusive deductions.

An interview conducted with a female officer the day she was involved in a pursuit provides some insight into her thinking and shows her concern about the risks involved in pursuit driving. "I have to concentrate enough while stopping someone who is cooperating. I'm not going to take crazy chances driving crazy in a crowded area with the radio blasting, driving to beat all hell after some character who doesn't want to stop for whatever reason. I'll do my job, but there is a limit" (35 year-old female patrol officer as quoted in Alpert & Dunham, 1989, p. 537).

*Lessons from the Metro-Dade Pursuit Study*

The Alpert and Dunham study of police pursuits by the Metro-Dade Police Department was one of the first comprehensive empirical analyses undertaken to address the issue of police pursuits from a scientific perspective. Describing this feat, Alpert and Dunham write:

> In the absence of adequate research data, any analyses of solutions to problems involving police strategies and tactics often result in erroneous conclusions. This has certainly been the case with previous attempts to formulate police strategies when confronted with the problems of domestic violence, as well as problems related to police pursuit driving. In each case, more appropriate operational decisions have been made after empirical research findings have been utilized than when decision making has relied upon philosophical beliefs and "expertise". (Alpert & Dunham, 1990, p. 57)

The analysis provided the Metro-Dade Association of Chiefs of Police with data to base management decisions upon. The study also provided information for chiefs from around the country to consider as well as a model for future researchers to fashion additional studies on pursuits. I will use this model in my study of police pursuits in the State of Minnesota.

Key conclusions of the study were related to total number of pursuits, length and speed of pursuits and outcomes of pursuits. Alpert and Dunham noted surprise at the total number of pursuits. Given the total number of police cars on the road, the number of miles driven by police and the relatively high crime rate of the area the expected number of pursuits was greater. Figures indicate an average of fewer than one pursuit per day occurred. "Relative to the expectations derived from the social concern over police pursuits and the media attention given the subject, a greater frequency of pursuits was expected" (1990, p. 59).

Continuing the pattern of refuting widely-held beliefs, pursuits turned out to be shorter, and they occurred at slower speeds, than conventional wisdom held. "More than two-thirds of the pursuits lasted five minutes or less and 27% ran shorter than three minutes. Top speed for nearly half of the pursuits never reached fifty-five miles per hour" (Alpert & Dunham, 1990, p. 59). However, the statistics also revealed that pursuits occurring at the highest speeds were not the most dangerous. Because the high-speed pursuits tended to occur on expressways they resulted in fewer negative outcomes. Indeed, the slower pursuits occurring in residential areas are to blame for more negative outcomes than high-speed pursuits.

Finally the third, and what the authors call the most important, conclusion is that the majority of pursuits had no negative outcomes. Over half the time pursuits ended without personal injury to the officer, suspect, passengers, or unrelated parties, without property damage, and without the suspect escaping. Pursuits accounted for less than 1% of traffic accidents in the county and less than 5% of all accidents involving squad cars. "More important, 83% of the chases resulted in no personal injury. Personal injuries occurred in 160 (17%) of the chases; in 30 (3%) of the chases a police officer was injured, and in 13 (1.4%) of the chases a bystander was injured. The remaining injuries were to the law violators or passengers" (Alpert & Dunham, 1990, p. 59).

Even though the previous conclusions put the risk of police pursuits into perspective, the mere absence of negative data should not be enough to warrant a pursuit. Pursuits must be justified with the positive outcomes of conducting a pursuit rather than

the lack of negative ones. Thus, the benefit side of the cost-benefit analysis needs to be addressed.

There are benefits to police pursuits. The Metro-Dade Study found that, although a majority of police pursuits were initiated for traffic violations, almost 50% of those apprehended after a pursuit were arrested for a felony offense unrelated to that pursuit. This finding gives weight to the belief most police officers hold that someone who chooses to run from the police is usually fleeing from something far more serious than a traffic infraction. While research and media attention focuses on costs, and those costs certainly cannot be discounted, benefits to pursuits exist.

After considering the costs and benefits of pursuits through the analysis of data obtained in the Metro-Dade Study Alpert and Dunham do not believe the costs associated with police pursuits outweigh the benefits. "Our analysis fails to support the view that police pursuits in Dade County, Florida, during the years under study resulted in an unfavorable cost-benefit ratio. We realize this interpretation of the findings is favorable to the policy of pursuing offenders, by pointing out the exaggerated perception of danger inherent in many chases." (1990, p. 60).

The conclusion reached by Alpert & Dunham in 1990 was contrary to conclusions reached by other researchers even though each conclusion was based on similar data findings. Five years before the publication of this research Stone and Deluca summarized the conventional wisdom concerning police pursuits in their book *Police Administration: An Introduction*.

> One of the major areas of controversy in traffic law enforcement, and in patrol administration generally, is the practice of pursuing fugitives at high speed…High-speed pursuit is an exceedingly dangerous kind of police operation. It is dangerous not only for the police officer and the fugitive, but equally so for innocent citizens who happen to be in their path…More often than not, a high-speed pursuit ends only when either the fugitive or the officer is involved in a collision, often a fatal one."
>
> (Stone & Deluca, 1985, Pp. 414-415)

Such a description of pursuits accents the danger of the pursuit. It even specifically mentions fatalities which, according to the data in the Metro-Dade study as well as others, are actually quite a rare occurrence.

But even given empirical data, Alpert and Dunham acknowledge the analysis of the Metro-Dade Study is subject to different conclusions. The authors provide quotes from anonymous reviewers of the research who deduce a dissimilar finding from the same data. "Indeed, a couple of crippling injuries or deaths of young people or innocent third parties can outweigh in the public mind the capture of an entire warren of drug dealing Mafiosi. Chiefs are not unmindful of this sort of public moral calculus, and I am not sure that they should be…The data do refute Stone and DeLuca's hyperbole, but that hardly matters" (anonymous reviewer of Alpert & Dunham's data, as cited in Alpert & Dunham, 1990, p. 61).

The framework in which the dangers of a police pursuit are analyzed helps to explain the different conclusions drawn from the same data. Discussing this issue Alpert and Dunham state:

> Clearly, these differences of opinion emanate from subjective views concerning acceptable risk, which in turn reflect different frames of reference. Compared with normal police driving, pursuits are much more dangerous. However, compared with making other arrests (which is what a pursuit attempts to do), the risk may seem acceptable. A comparison involving police shootings, another use of force, stretches credibility. It would read: "The act of police officers drawing their weapons to use force increases the level of risk of injury xxxx times over what it is when their weapons are holstered. Does this mean that police officers should not draw their weapons?" The point being made is that interpreting these findings is subjective and should be left up to the reader."
>
> (Alpert & Dunham, 1990, p. 61)

The authors take the position that the empirical findings of this research comprise the important contribution to the field. They understand a subjective analysis of the data based on the beliefs, values and interests of the person drawing the conclusion will occur. But that conclusion will be based on the interpretation of empirical research rather than anecdotal evidence and personal experience.

Disagreement will continue to exist on whether the costs of police pursuits outweigh the benefits. Regardless there is one point that everyone can agree on, lowering the costs. There is risk associated with police pursuits and these risks translate into costs.

If those risks can be diminished the costs are reduced. Minnesota's continuous in-service pursuit training requirement is designed to reduce risks and lower costs. The relationship between this requirement and the costs of pursuit will be examined later in this paper.

*Cost/Benefit Analysis of Pursuit Outcomes and Reason for Pursuit*

One of the most controversial aspects of police pursuit involves the caveat of the reason for the pursuit. When a person is killed or seriously injured in a police pursuit the reason for the pursuit does not change the outcome. Nevertheless, such injuries and fatalities are portrayed in the media as somehow more tragic when the reason for the pursuit was minor. Media coverage often focuses on the high cost of a pursuit that ends with someone seriously injured or killed compared with the small benefit of capturing someone guilty of a minor crime or infraction.

As cited earlier, Alpert & Dunham showed in their research that nearly half of pursuits initiated for a traffic infraction ended in an arrest for an unrelated felony. It is reasonable, then, for officers to assume in at least 50% of the cases the pursuit is not related to avoiding a citation for a traffic violation but to something more serious. Critics complain that officers always make this argument but the data prove the argument is often a valid one.

In an interesting variation on the traditional research into pursuits Robert Crew, Lorie Fridell and Karen Pursell in 1995 examined if there was a relationship between the costs of a pursuits and the reason a pursuit was initiated. By calculating the probability and odds of arrest, injury, damages and deaths by pursuit type they developed a "pursuit trade-off ratio" and used it to determine the cost effectiveness of each type of pursuit.

Their aim was to show that pursuits initiated for different reasons have different costs and those costs could be used by police administrators to establish departmental pursuit policies.

Using rationale similar to that used in earlier research by Fennessy & Joscelyn (1972) and Alpert & Dunham (1990), Crew, Fridell and Pursell argue police pursuit policies that limit pursuits based on reasons for that pursuit are not based in empirical data but, rather, are the result of assumptions and beliefs that may or may not be true. Additional information could be useful and that is what the authors aim to achieve.

> In the absence of empirical data on this debate, law enforcement officials have made choices in the context of their own value systems and have based operational decisions on assumptions about the probable consequences of alternative courses of action. One widely accepted assumption is that some crimes are more important than others and that pursuits of persons involved in these are more warranted than pursuits involving less serious crimes. The operational strategy that follows is to limit chases to those circumstances in which there are offenders who are thought to pose significant threats to public safety and to forego the pursuit of other offenders, for example, traffic violators who are assumed not to pose as much danger to society.
>
> (Crew, Fridell & Purcell, 1995, Pp. 417-418)

However, based on the conclusions drawn by Alpert & Dunham (1990) after their study of police pursuits on behalf of the Metro-Dade Association of Chiefs of Police, one can

observe that these assumptions and beliefs regarding traffic infractions are not true nearly 50% of the time.

The authors used five reasons for chase initiation and five reasons for pursuit termination. Initiation reasons were Traffic, DWI, Warrant, Felony Vehicle, and Other. Termination reasons were Officer Decision, Lost, Violator Stopped, Collision and Other. The framework used was limited to apprehension, accident and injury rates. The authors did not consider the deterrent effect of pursuits nor did they factor in the value of the capture. Whether the suspect apprehended was a speeder or a murderer did not affect the calculus.

The data used to compute the cost-benefit ratio came from the State of Minnesota. Crew, Fridell & Purcell (1995) used data from the Minnesota Department of Public Safety, Bureau of Criminal Apprehension. The data used for the Crew et al. study was from earlier years than the data used in this dissertation but it was derived from the same law and reporting forms.

Data was collected for five complete years, 1989-1993. A total of 4,349 pursuits were reported during this time period. General conclusions about pursuits reached in other studies are supported by this data: "most are initiated for traffic offenses, most do not involve accidents, and most end in arrests" (Crew et al., 1995, p. 419). Though this outcome was useful in showing consistency of results between studies, the authors went beyond those general findings to answer their primary research question "What are the relative costs and benefits involved in pursuing different kinds of offenders?" (Crew et al., 1995, p. 418)

Crew, Fridell & Purcell report their findings in terms of a "pursuit trade-off ratio. This ratio is calculated by dividing the odds of being caught by the odds of incurring damages, injury, or death. The lower the ratio, the poorer the trade-off or the least cost efficient the chase" (1995, p. 421). The authors found that for all chases the chance of catching the offender were 44.1% greater than the chance a chase will end in an accident. "Put another way, the odds are 4.5 times greater that the offender will be caught than that there will be an accident. Thus, the trade-off ratio for all types of chases is 4.5" (Crew et al., 1995, p. 421).

Given this calculation methodology, the higher the trade-off ratio the better the chance the offender will be caught and the pursuit will end without an accident. The best trade-off ratio was for DWI which was 7.4. The worst trade-off ratio was for pursuits begun for reasons the officer marked as other, this ratio was 3.0. There is no description or examples provided for the category other. The second worst trade-off ratio was for felonies at 3.2. Traffic and Warrant round out the reasons for pursuit and have a ration of 5.8 and 6.8 respectively (Crew et al., 1995).

If administrators were to use these ratios alone to make decisions on pursuit policies the policies would certainly be controversial. DWI and warrants were the most cost-effective pursuits in terms of chance of capture vs. chance of accident. Even traffic fairs better than pursuing for felonies. Thus policies using this data alone would encourage pursuit of traffic violators over felons.

This outcome is interesting for an academic discussion but fails to be useful for policy making because it neglects to weight the ratio for seriousness of the offense, i.e.

capturing a motorist who ran a stop sign is equal to capturing a serial rapist who just committed murder. However, the authors don't argue their findings should be used exclusively and admit other factors need to be taken into account. "Because of the greater need to capture felons, presumable a policymaker, in his or her cost-benefit analysis, would be willing to take more risks (that is, accept a lower trade-off ratio) to effectuate those captures. Further, this analysis does not incorporate into the cost-benefit equation the deterrent value of pursuits" (Crew et al., 1995, p. 423).

The primary reason conducting a cost-benefit analysis of pursuits is incredibly challenging is the assignment of costs and benefits to weigh against each other is a monumental task. Indeed, most researchers report statistical outcomes of police pursuits but do not put a particular value on any specific outcome. The studies posit the multitude of costs consist of the rate of escape, the rate of accidents, the rate of injuries, and the fatality rate. The benefits are singular, the rate of suspect capture. Police administrators are encouraged to take the data and assign their own value to each possible outcome. But this raises the question, is the value of a life more in Miami than in Minnesota or Illinois? It would seem some additional calculus could be completed to further guide administrators in this analysis.

In a 1999 study, Robert Crew and Robert Hart attempt to provide that missing component of the pursuit equation. By assigning values to every possible outcome of a police pursuit, the authors are able to complete a cost-benefit analysis by using what they term as a "pursuit tradeoff ratio". While the results sound intriguing, their solution to the

problem is far from gaining universal acceptance. Nonetheless, the process was unique and worth reviewing.

In describing the crux of their research, Crew and Hart write "A major problem for the scholars and practitioners concerned with the question posed above (measuring the costs and benefits of pursuit) is the difficulty associated with the measurement, estimation and comparison of the costs and, in particular, the benefits of police pursuit. In the typical debate, benefits are framed as reduction and deterrence of crime and costs are usually couched in terms of the numbers of accidents, injuries and deaths that occur as a product of chases" (1999, Pp. 58 - 59). The costs are fairly clear to define. Insurance companies, as a common practice, assign values to life, compute the average cost of property damage accidents and know the average cost of a personal injury accident.

"The costs of pursuit are measured in two ways. First, by the average paid claim cost for bodily injury and property damage reported by the American insurance industry for each year (Insurance Information Institute, 1997). These costs cover the direct costs of accidents and injuries: property losses, productivity losses and medical bills. We also use the average monetary value of a fatality estimated in the relevant literature and synthesized by Miller (1990)" (Crew & Hart, 1999, p. 60). Costs can be defined in a manner generally accepted as valid by the insurance industry. Defining the benefit value is more difficult.

There are no data available that relate reduction in crime or deterrence directly with police pursuit. For this reason, Crew and Hart choose to assign a benefit value using

punishment theory. "Punishment theorists see benefit in capturing lawbreakers and think of arrests, in and of themselves, as a highly valued product of law enforcement activity" (1999, p. 59). By defining arrests as the sole beneficial outcome of a pursuit the authors assign a monetary value to each arrest.

It is the assignment of the monetary value of this benefit that makes Crew & Hart's (1999) research unique. In what they admit is "accomplished in a rudimentary fashion" (Crew & Hart, 1999, p. 59) the authors assert that getting arrested is the price a suspect pays for committing a crime. Therefore each arrest can be assigned a price, paid by the criminal, to the benefit of the police agency making the arrest.

The calculation of the monetary value of the benefit of an arrest is not very complex, but the explanation of the data source is. Describing the data source for the benefit value the authors write:

> Using data from the National Victimization Surveys and a variety of medical, mental health and government sources, this study estimated the annual number of crime attempts during the years 1987-1990 and their associated costs. We divide the first of these numbers into the second, deriving an average cost for each crime. We then assume that the average arrest is punishment for this average crime and that each capture is worth the amount derived. Let us be forthright concerning this technique for estimating the benefit of police pursuit: it is, to say the least, crude.
>
> (Crew & Hart, 1999, p. 59)

As the authors make clear in the quote above, estimating benefits is challenging.

The costs are measured first. The average cost for accidents in the USA over the time period involved was $12,221 (Insurance Information Institute, 1997, as cited in Crew & Hart, 1999). The cost of each death is estimated at $800,000 (Miller, 1990, as cited in Crew & Hart, 1999). There were 2,770 chases during the study which resulted in an accident or personal injury for a total cost of $33,852,170. There were also 13 fatalities during the study for a total cost of $10,400,000. Using these computations the total monetary cost of pursuits in Minnesota from 1989 – 1996 was $44,252,170 (Crew & Hart, 1999). The authors then add in an estimation of pain and suffering to arrive at a grand total of $185 million. Dividing that number by the number of pursuits in Minnesota between 1989 and 1996 a pursuit in Minnesota cost the State about $35,000.

But the costs, for the reasons discussed earlier, are the easy part. Insurance data is not only reliable but is relatively accepted as a proper valuation. While debate on the value of a life may be far from over in many people's eyes, the insurance companies assigned a dollar value to it long ago. Whether that value is appropriate may be questioned but it is a regularly used number. Pain and suffering is less clear but can be estimated based on average court awards.

In order for pursuits in Minnesota to make sense from a cost-benefit standpoint the benefit must be greater than 185 million dollars. Using the formula quoted above, the benefits to the State of Minnesota, according to Crew and Hart, were worth 11.1 billion. In their conclusion they write "these benefits outweigh the costs by about 60 to one" (1999, p 70). In the last paragraph of the study the authors, writing about the benefit

value calculation, state "While our attempt to do so is crude, we suggest that it is valid" (Crew & Hart, 1999, p. 71).

The estimate of the benefit value used by Crew & Hart (1999) is not universally accepted. However, the estimates of the cost of a pursuit are valid and used by the insurance industry. If every pursuit costs the State of Minnesota $35,000 then law enforcement officials have at least some number they can consider when developing a policy. Capturing a felon may be worth the price; arresting a traffic violator probably is not. Of course, Alpert and Dunham (1990) revealed half of those traffic violators are running from something else. Unfortunately, it is impossible for officers to determine which half until the pursuit is complete.

*Rates of Injury and Fatality in Pursuits versus Other Vehicle Operations*

Most of the research discussed thus far examined the rates of accidents, injuries and deaths related to police pursuits. The goal is obvious, to get that rate as low as humanly possible. Arguing that accidents occur every day during normal police operations, as well as in the general public, Dennis Payne and John Fenske (1996) initiate a comparison of the rates of accidents, injuries and fatalities among the general population as well as those rates among police in non-pursuit related circumstances, with the rates of accident, injuries and fatalities resulting from pursuit.

Payne and Fenske (1996) note that driving results in a certain percentage of accidents that cause damage to property, injury to persons, and even death. Given this perspective, the rate of accidents resulting in these negative outcomes because of a

pursuit is somewhere above zero. Payne and Fenske (1996) used data from the Michigan State Police to elucidate this issue.

Describing their study, Payne and Fenske write: "This analysis examines the accident injuries and fatalities which occurred during a one year study of pursuits in Michigan, and it compares those outcome rates to Michigan's three and five-year general population accident mean injury and fatality rates. It also provides comparisons to a three-year mean rate of the same outcomes resulting from accident experience of the same agency in non-pursuit related accidents" (1996, p. 95). Because pursuit data was gathered from a one year study and then compared with statistics gathered over a three-year timeframe and a five-year timeframe the mean of each data set was used.

First, accident rates of the Michigan State Police during pursuits were gathered through the Michigan Emergency Response Study (MERS). The MERS consisted of anonymous questionnaires completed by licensed Michigan State Police Officers. The MERS was completed in three phases and comprised questions relating to pursuit policies, high speed driving incidents (unrelated to pursuit), specific police pursuits and questions exploring the level of participation and reasons why officers did not participate (Payne & Fenske, 1996).

The phase used to discover accident rates during pursuit was phase II which was specifically designed to gather information regarding specific police pursuits from the officer involved. "Phase II, conducted from June 23, 1991, through May 21, 1992, involved three sections administered to all road patrol and motor carrier officers of MSP…Section three involved a self-administered 58 question survey instrument to be

completed each time an officer on patrol (n = 1,293) was engaged in a pursuit throughout the year" (Payne & Fenske, 1996, p. 104). This survey was completed by an officer after he or she was involved in a pursuit and then turned into the district office.

The anonymous, completed surveys were forwarded by the district office to the State and then to the researchers who aggregated the data and compared it with accidents not involving the police as well as accidents in which the police were involved but not in a pursuit. "The focus of analysis was to determine differences in accident frequency and severity between reported MERS pursuit accidents, general population accidents and MSP non-pursuit related accidents" (Payne & Fenske, 1996, p. 105). Data from the surveys was compared with data on accidents among the general population from 1987 through 1991 and non-pursuit related accidents among the Michigan State Police from 1988 through 1990 obtained from the Michigan Office of Highway Safety Planning (OHSP). Additionally, the authors separated out a three year period for the general population data to provide the opportunity to use the same three years.

Of the three comparison groups, the rate of injury and death caused by accidents was similar between the general population and Michigan State Police not involved in pursuits. The three-year mean percentage of accidents resulting in injury was 25.25% for the general population and 24.33% for the Michigan State Police involved in non-pursuit operations. The three-year mean percentage of accidents resulting in a fatality was 0.36% for the general population and 0% for the Michigan State Police. It should be noted that the total number of accidents between the general population and the MSP over three years were drastically different. During the three year period there were

1,214,869 accidents on Michigan highways involving the general population compared with 1,007 involving the Michigan State Police during non-pursuit activities (Payne & Fenske, 1996).

The similarities quickly dissipate when comparisons are made between accidents among the general population and accidents related to pursuit. And given the parallel between the general population statistics and the non-pursuit related accidents among the Michigan State Police it follows there is a significant difference between pursuit and non-pursuit accidents in which MSP officers are involved. This data proves that police pursuits result in significantly worse outcomes than non-pursuit police driving. The percentage of accidents resulting in injury during a pursuit was 46.15%, compared with a non-pursuit operations percentage of 24.33% and a general population accident percentage of 25.25% (Payne & Fenske, 1996).

The data on fatalities is no better. The percentage of pursuit related accidents resulting in a fatality was 1.54%, compared with a non-pursuit operations percentage of 0% and a general population accident percentage of 0.36% (Payne & Fenske, 1996). It should be noted the percentages are based on a small number of pursuits (n = 65). But the rates are nonetheless higher.

> It is not surprising to find pursuit accident injuries occur at significantly higher rates than the general population's experience, or for that matter, than police non-pursuit accident experience. Police administrators interested in reducing injuries resulting from pursuits should seriously consider restrictive policies, closer

supervision of pursuits and enhance pursuit driving training with an emphasis on accident avoidance.

(Payne & Fenske, 1996, p. 111)

The data are clear, when accidents happen as a result of a police pursuit they are more serious. Injury rates were significantly higher. And fatality rates, while not statistically significant, were also higher.

Payne and Fenske also examined accident data from the Michigan Emergency Response Study and its relationship to day and night pursuits. Alpert & Dunham (1990) had observed in their study a greater likelihood of pursuit-related accidents during daytime hours and attributed it to the greater amount of traffic present during the day. Pursuits by the Michigan State Police actually had the opposite outcome. The MSP study found that "pursuit accidents were significantly more likely to occur during darkness and less likely during daylight hours" (Payne & Fenske, 1997, p. 370).

The authors offer no reason for this finding. A possible explanation is the Michigan State Police pursuits occurred statewide resulting in a greater number of pursuits in unincorporated areas. When the traffic variable is removed the belief that nighttime driving is more dangerous due to the decreased amount of light, refuted by Alpert & Dunham (1990) in the Metro-Dade study, is supported by Payne & Fenske (1997) in the Michigan Emergency Response Study. The importance of study results and their applicability beyond the research area is accented by this result. Like so many other aspects of policing, pursuits in urban and rural areas are different.

*Comparison of Pursuit Outcome Results across Multiple Data Collection Strategies*

The data used for this dissertation comes from one of the largest and most complete repositories of information on police pursuits in the country. It has been used in prior studies that have addressed pursuits in general, though not the specific research questions of this study. The Minnesota dataset is unique and not replicated nationally. When data such as that found in Minnesota is unavailable it can be difficult to examine police pursuit outcomes. Discussing this paucity of information, Wells and Falcone write "Collecting valid and reliable data on policing activities is a perennial problem for police scholars…this is particularly true when studying activities such as police shootings, use-of-force, and vehicle pursuits, which are organizationally sensitive and often controversial events" (1997, p. 729). Due to this challenge alternative methods of data collection have been explored.

In a novel approach to collecting this data, Wells and Falcone examined radio transmissions occurring during police pursuits in Illinois. They then compared their findings to results obtained from more regularly used approaches such as official police administrative accounting of pursuits, pursuit reporting forms completed by officers involved in pursuits, and surveys completed by officers involved in pursuits. This approach is unique and addresses two common problems with researching police pursuits.

First, many times there simply is no data available. While Minnesota is an exception to the rule, most departments nationwide don't collect data on pursuits. "In a content analysis of police agency pursuit policies collected by Police Executive Research

Forum, it was found that only 54 of the 303 sampled agencies policies required some form of reporting on vehicle pursuits by their officers, and only 17 percent required that specific data be recorded" (Wells & Falcone, 1997, p. 729). This lack of a requirement for regular reporting results in many police pursuits going under the radar. Indeed, it is a reason why the problem of police pursuits is often over emphasized. If reports aren't regularly filed after a pursuit the only pursuits reported are those that end badly.

Even when data is collected its validity may be questioned by opponents of police pursuits who are concerned the data is no longer raw. This illuminates the second challenge with relying on the customary sources of police pursuit data. Reports are filed in the comfort of the office after there has been time to come down from the adrenaline rush of the chase. For that reason, there may be a temptation to sterilize the pursuit report to insure the officer and his or her fellow officers are shown in the best light possible (Wells & Falcone, 1997).

Wells and Falcone argue that radio transmissions, conversely, provide real-time information about a pursuit as it is occurring. They purport this eliminates the sterilization process that may occur when the officer is completing paperwork long after the pursuit has ended. Their argument is that officers don't have time to think about how the information looks or sounds when in the midst of a pursuit.

> Police emergency band radio transmissions seem appealing as an alternative or supplemental data source for police vehicle pursuits, because they seem to avoid (or substantially minimize) these conventional biases… radio transmission data involve substantial "unwitting leakage" of information about pursuits that calmer

> officers filling out retrospective questionnaires or official forms might edit, censor, misinterpret, or forget.
>
> (Wells & Falcone, 1997, p. 744)

Thus it is asserted police emergency radio transmissions during a pursuit should provide a glimpse behind the blue wall of secrecy that may skew the image presented by other sources of pursuit data.

There are considerable challenges to using police emergency radio transmissions as a data source. The primary issue is the sheer magnitude of raw data that needs to be filtered to obtain a recording of a police pursuit. While pursuits are not unheard of they are far from common occurrences. The human capital required to listen to hours of taped radio transmissions is beyond the scope of almost any researcher's time or budget.

Compounding this issue is the extensive emergency radio network used by police departments, sheriff's offices and state policing agencies. In Illinois, the state the research study was conducted, there are "1008 separate and distinct police and law enforcement agencies (Illinois State Police 1993) – using dozens of frequencies" (Wells & Falcone, 1997, p. 733). Monitoring or obtaining tapes from that number of agencies across that number of frequencies approaches impossibility.

These logistical challenges required Wells and Falcone (1997) to pare down the scope of the study. They chose to focus on radio transmissions broadcast over the Illinois State Police Emergency Radio Network (ISPERN). This network is a common frequency used by most, if not all, law enforcement agencies statewide to communicate with one

another to request mutual aid and during emergency operations. This was deemed an appropriate frequency to monitor for three primary reasons.

One, pursuits commonly cross jurisdictional lines. In these cases other police agencies become involved. Different police agencies operate on different radio frequencies and would be unable to communicate with one another if they did not switch to ISPERN. By using the statewide radio network all officers would be on the same frequency. Two, the radio systems of many municipal police and county sheriff agencies are limited. A pursuit that covers just a few miles can quickly go beyond the range of a municipal agency's radio tower. If the pursuit lasts for many miles officers will lose the county tower as well. ISPERN is built to pass-off radio transmissions from tower to tower. When a pursuit leaves the range of one tower, the next tower automatically picks it up. Three, agencies do not casually switch to ISPERN. Officers know the importance of keeping that frequency open for true emergencies. "Thus, the incidents appearing on ISPERN transmissions invariably represent "fully-developed pursuits," in which the driver is clearly attempting to evade police requests to stop and where characterization of the incident as a pursuit is unambiguous (in the pursuing officer's judgment)" (Wells & Falcone, 1997, p. 734).

For the above reasons, cursory research into the use of ISPERN revealed to Wells and Falcone (1997) that many police agencies require officers to switch to that frequency every time they engage in a vehicle pursuit. Once the authors chose to focus only on pursuit transmissions over the ISPERN emergency frequency the project became feasible. An agreement was made with the Illinois State Police to provide for a brief summary

report to be completed by Illinois State Police dispatchers any time a pursuit was broadcast over ISPERN.

Data was collected for calendar year 1993 and for four months of 1994. A total of 197 police pursuits were recorded and analyzed. The outcomes of these pursuits were compared with data from previous studies to identify differences between data sources. The comparison studies included a 1992 AAA Foundation for Traffic Safety study of 51 police agencies in Illinois, the California Highway Patrol Study, the Alpert and Dunham study of Miami/Dade County and the Crew et al. study using data from Minnesota.

The authors discovered considerable similarities between the studies even though they used different data sources. "There is a fairly high degree of convergence among the various studies and data sources concerning the typical characteristics of police vehicle pursuits, despite some substantial variations in when, where, how, and from whom the data were collected" (Wells & Falcone, 1997, p. 737). The data show only slight, non-significant differences between the data collected on pursuits using ISPERN radio transmission and other data sources regarding the percentage of pursuits ending in accidents, the percentage of arrests, and the percentage of fatalities.

The percentage of pursuits ending in injuries was significantly less, 4 percent of pursuits analyzed using ISPERN recordings compared with a 9 – 17 percent range from other studies. Wells and Falcone offer the fact that the pursuits recorded by ISPERN are predominantly rural, since urban pursuits are unlikely to switch from a local frequency to ISPERN because urban departments have a radio network extensive enough to cover the entire area. They also write that full assessment of injuries may not be possible by

evaluation of radio transmissions (1997). The other notable finding was that 34% of ISPERN pursuits ended with the escape of the subject compared with a 12% - 22% range from other pursuit studies. Pointing again to the higher number of rural pursuits the authors state "In such rural settings, where terrain and natural features frequently make it easy for officers to lose sight of their subject, a single pursuing officer often may be unable to maintain contact with the subject being pursued" (Wells & Falcone, 1997, p. 739).

The use of recordings from police emergency radio frequencies to analyze police pursuits makes Wells' & Falcone's research unique. Determining whether a difference would exist between the different data methods provided a great contribution to the research. The finding supports using paper based reporting forms as a valid methodology for researching police pursuits. The suspicions that these reports might be sterilized by officers filing them with the benefit of hindsight were not confirmed.

### *Policies on Police Pursuits*

The costs and benefits of high-speed pursuit have been analyzed empirically in the studies discussed previously. A recurring theme is the need for policies to guide officer decisions during a pursuit. In their National Study of Hot Pursuit, reviewed earlier, Fennessy and Joscelyn (1972) described three different types of policies. Alpert, Dunham & Stroshine (2006) describe these three types of pursuit policies as well.

> Judgmental: Allows officer discretion in making decisions regarding the initiation of the pursuit, tactics used during the pursuit, and if and when to terminate the pursuit.

Restrictive: Places certain restrictions on officer's judgment and decisions.

Discouragement: Severely cautions against or discourages pursuit except in the most extreme cases.

(Alpert, Dunham & Stroshine, 2006, p. 198)

Policies are established based on state and local laws as well as the beliefs and values of the department's administration.

Judgmental policies rely on each individual officer to use his or her best professional judgment to make critical decisions to initiate, continue, and call-off a chase. The officer also makes decisions throughout the chase based on his or her training and experience. Judgmental policies are the least onerous and reflect the traditional policing culture's emphasis on officer discretion. Judgmental policies will result in the greatest variation between officers because at its foundation the policy gives decision making authority to the officer.

Restrictive policies still provide for officer judgment to be an important component of the process but they limit the choices an officer can make. A restrictive policy may prohibit officers from chasing for minor violations, may disallow chases through residential neighborhoods, may require chases to be terminated if weather conditions are poor, etc. Restrictive policies don't prohibit pursuits, but because the pursuits are only allowed under an established set of circumstances fewer occur. Restrictive policies will result in greater consistency among officers due to the amount of guidance provided by the policy.

Discouragement policies are the most restraining. While discouragement policies do not prohibit all pursuits they do prohibit the substantial majority of them. A discouragement policy allows a pursuit only in extreme situations and, even then, only after the officer wishing to initiate the pursuit has received approval from a supervisor. Discouragement policies will provide the best consistency between officers because so few pursuits are permitted.

In 1986, Geoffrey Alpert and Patrick Anderson listed components that should be contained in a pursuit policy:

A. Officers' background and preparation.
    1. tactical preparation (training, experience, familiarity with the area including possible escape routes);
    2. type of vehicle (condition, equipment, etc.); and
    3. likelihood of successful apprehension (identification of offender, probability of apprehending offender at a later time, extent to which offender will go to avoid capture).

B. Knowledge of incident, area and conditions.
    1. knowledge of the offense (nature and seriousness);
    2. traffic conditions (density, speed etc.);
    3. road conditions (width, lanes, fitness, surface);
    4. geographic area (hills, sidewalks, curb-breaks);
    5. weather (dry, rain, snow);
    6. location of pursuit (school, residential, commercial);

7. time of day (light, dark, close to rush hour);
8. pedestrian traffic (light, heavy); and
9. visibility (fog, no lighting).

This list of variables is in no way complete. Moreover, each variable may be significant by itself, yet two or more may be taken together for a different effect. (Alpert & Anderson, 1986, Pp. 7 – 8)

These suggestions for the key components of a pursuit policy were important to express as the discussion of pursuits and the need for policies grew in jurisdictions all over the United States.

Department pursuit policies vary across the country but, if they have one, it can be placed into one of the three above-mentioned categories. Because of the high costs of pursuits numerous police agencies have been moving toward more restrictive policies in recent years. "Many departments throughout the United States began restricting their pursuits to situations in which only those suspected of committing violent felonies were chased. In other words, these chiefs, sheriffs, and directors decided that the risk of pursuit driving could only be balanced by the need to apprehend a violent felon" (Alpert et al., 2006, p. 199).

An example of a pursuit policy that restricts pursuits can be found in Tennessee. In 1995 the Tennessee Municipal League published a model pursuit policy that restricted pursuits to violent felonies only and included a checklist of questions for officers to consider when deciding whether or not to initiate a pursuit. The questions follow.

1. Are there alternative measures of apprehending the suspect other than pursuit?

If yes, discontinue pursuit.

If no, go to question 2.

2. Do I have probable cause to believe an occupant of the vehicle has committed or will commit a felony involving violence to a person?

   If no, discontinue pursuit.

   If yes, pursuit may be undertaken as long as risk factors (e.g., speed, area, weather and road conditions, pedestrians and other traffic, etc.) do not cause risk to the public that outweighs the benefit of catching suspect. Immediately notify supervisor.

(Tennessee Municipal League, 1995, as cited by Alpert et al., 2006, p. 199)

A restrictive policy that contains a checklist such as this one provides officers with clear direction. That clarity is a component often absent from many policies resulting in misinterpretation by officers.

Policies are important because "A litigious case involving pursuit can cost the department, the city, and inadvertently, the public, millions of dollars in damages. Thus, the question arises: Is pursuing a fleeing offender worth the economic risks?" (Britz & Payne, 1994, p. 113). An even more important motivation than the possible economic repercussions, policies provide needed direction to officers involved in high-speed pursuits. Research on officer attitudes and opinions of police pursuit policies is presented in the next section. But empirical analysis shows the policies absolutely have an effect on the number of pursuits. This was observed when two large departments changed the type of policy applicable to their officers and the number of pursuits was affected.

The Metro-Dade Police Department in Miami Florida implemented a restrictive pursuit policy and saw the number of pursuits drop from 479 annually to 51. "Pursuits decreased 82% in the year following the implementation of a pursuit policy" (Alpert et al., 2006, p. 197). The Omaha, Nebraska Police Department did the opposite and went from a restrictive policy to one better described as judgmental and saw the number of pursuits increase from 17 annually to 122. "In Omaha, where a more permissive pursuit policy was implemented, pursuits increased by more than 600%" (Alpert et al., 2006, p. 197).

The argument against restrictive pursuit policies is often that if the police do not pursue violators, the number of suspects who choose to run form the police will increase. David Falcone addressed this issue in a study conducted in 1992. He interviewed 36 police officers, 21 from patrol, 4 sergeants and 1 lieutenant, from six purposefully selected police departments with differing types of pursuit policies. One department had a discretionary policy, two had discouraging policies, and three had restrictive policies (Falcone, 1994).

Officers were asked whether a no-pursuit policy would increase pursuits or attempts to elude. "Officers overwhelmingly responded that they believed a no-pursuit policy would result in increased numbers of pursuits and attempts to elude…a 94 percent yes response to the question" (Falcone, 1994, Pp. 148 – 149). The survey then asked respondents to anonymously report the number of chases the officer had been involved in during a 12-month period. The numbers were closely related to the type of policy used by each officer's department with one exception. "The only small rural department with

a clearly discretionary pursuit policy has the greatest number of chases…Departments with restrictive policies have the next lowest numbers of pursuits, while Oatville with its discouraging/highly restrictive policy, has no pursuits over the 12-month period" (Falcone, 1994, p. 151).

One department's statistics did not line up well with its discouragement policy, incurring a high number of pursuits related to the other departments. But the exceptional department was a branch of the Military Police Core on an open base. Falcone attributes the divergence between policy and practice to the fact the officers in that department turnover more frequently than other departments and officers may be coming from other military police assignments with discretionary policies (Falcone, 1994).

Upon removing the Military Police Core from the findings and analyzing the figures from the other five departments, "The data suggest that civilian departments with discouraging pursuit policies experience no increase in attempts to elude and show that actual pursuits were lower than in departments with more permissive policies…Both pursuits and attempts to elude appear to increase as the restrictiveness of the policy decreases" (Falcone, 1994, p. 154). He concludes that even though the study has limitations, it appears specific pursuit policies impact officer behavior and manifest the outcomes desired.

*Officer Discretion and Opinions on Police Pursuits and Pursuit Policies*

> In 1980, I lost my first wife and 2-year-old daughter…as a result of an Oklahoma Highway Patrol trooper's pursuit of three motorcycles for minor traffic violations in an area just west of Choctaw. Even though two of the riders soon pulled over

> to give up, the trooper continued pursuing the third motorcycle into a residential area and through a section-line intersection obscured by tall weeds, proceeding through a stop sign at 100 mph. The trooper's vehicle struck and demolished my private vehicle - driven by my wife - which had just entered the intersection. I was dispatched to the accident scene to assist and was not aware until 15 minutes after my arrival that my family lay crushed in this carnage. There are no words to describe the trauma I went through.
>
> (Chief John Whetsel, Choctaw Police Department, as cited in Jensen, 1997 – 1998, Pp. 1277 – 1278)

Attitudes of police officers regarding the value, necessity and risks of high-speed pursuit differ. The above quote, from a police chief who personally experienced an extremely tragic event, is in sharp contrast to the attitude expressed by this officer: "It was a game, man he was trying to get away and I wasn't going to let him… at the time it was all that mattered. And I got the son-of-a-bitch" (24 year-old male patrol officer as quoted in Alpert & Dunham, 1989, p. 537). Understanding these different attitudes their affect on officer discretion is an important first step in determining the need for policies and training.

Officer discretion to handle incidents in a manner they deem appropriate, given their training and experience, is a fundamental component of the policing profession. The most widely recognized definition of police discretion is that of Kenneth Culp Davis: "A public officer has discretion whenever the effective limits on his power leave him free to make a choice among possible courses of action or inaction" (1969, p. 3). In his later

book on police discretion Davis wrote "The police make policy about what law to enforce, how much to enforce it, against whom, and on what occasions. Some law is always or almost always enforced, some is never or almost never enforced, and some is sometimes enforced and sometimes not. Police policy about selective enforcement is elaborate and complex" (1975, p. 1).

The nature of police work provides individual officers with considerable discretion to determine how to handle a situation. The different characteristics of every call make discretion a requisite component of the profession. "Since police work is so complex, it would be impossible to detail acceptable official procedure for every situation. Rather, responses must follow some reasonable pattern for predictability and social order. Police officers are not robots; they must have some degree of authority to vary their behavior according to the particular incident" (Alpert, Dunham & Stroshine, 2006, p. 134). In addition to the unpredictable nature of police work, further reasons for police discretion are provided in the literature. "At least some discretion is exercised in every aspect of the police task…Police discretion has been justified on many grounds including: the existence of vague laws, limited resources, community alienation, the need to individualize the law, and the fact that many violations are minor in nature" (Brooks, 2005, p. 91). One of the most common of police actions is the traffic stop. The initiation of a traffic stop is the precursor for most police pursuits.

> Police officers make at least three significant decisions in the course of a traffic stop encounter. First, an officer must decide to initiate a traffic stop. Second, an officer might decide (or by policy, be compelled) to conduct a search of a driver,

a vehicle, and/or passengers. An issue of importance that is related to this decision is the outcome of the search (e.g., whether some form of contraband discovered). Third, an officer must decide how to sanction a vehicle's driver (warning, citation, arrest, etc.).

(Schafer, Carter, Katz-Bannister and Wells, 2006, p. 189)

The factors that determine whether a traffic stop is initiated may become the factors that determine whether a pursuit is initiated if the driver does not stop when signaled.

Police discretion is not perfect. Discretion is affected by many factors including environmental factors, such as demographic and the socio-economic makeup of neighborhoods, individual factors, including age, gender, physical size and citizen attitude, and, though research has obtained mixed results, the race of the citizen and of the officer (Alpert et al., 2006). "The exercise of police discretion poses some difficulties, such as: unequal treatment of citizens, interference with due process, a reduction in deterrent effects, and the hidden or unreviewable nature of many discretionary decisions" (Brooks, 2005, p. 91). In a recent qualitative study designed to identify the working rules individual police officers develop to guide their discretionary decision making researchers found individual officers take different approaches to handling situations "The reality of policing is that different officers look for different things and respond to suspects and situations differently" (Stroshine, Alpert & Dunham, 2008, p. 335).

Discretion is an accepted component of police work. However, limits to that discretion can and should be imposed in high-risk situations. "Clearly, some officer

decisions, such as the decision to arrest, how to patrol, and to stop and frisk should be made with a significant amount of individual discretion, while others, such as the use of deadly force and continuing a police pursuit, are certain candidates for a reduced amount of discretion" (Brooks, 2005, p. 91). Discussing the use of deadly force to apprehend a fleeing suspect, John Hall writes "The Constitution does not impose an affirmative duty on the police to use deadly force to prevent escape of dangerous suspects. Accordingly, officers, as a matter of discretion and departments, as a matter of policy, are free to be more restrictive than the Federal constitutional standard" (1994, p. 32).

Discretion has been limited in certain circumstances, most commonly deadly force situations and, more recently, high speed pursuit. Departmental policies on police pursuits are extremely important. But officers don't always take the time to memorize policies or necessarily respect them. Pursuit policies also vary greatly not only in permissibility but in completeness. In a study of 100 pursuit policies from campus police departments, researchers found "three policies were a single page long while some others were 10 to 15 pages in length" (Bromley, 2000, p. 497).

A branch of research into police pursuits examines the attitudes and opinions of the officers who make the decision whether or not to initiate a chase. Those attitudes and opinions can have a serious impact on the implementation of pursuit policies. This is especially true when polices are classified as judgmental in nature, leaving the majority of decisions to officer discretion. "Discretion, whether controlled by the command staff through policies and procedures or left up to the line officer, must be reasonably

exercised within the rule of law and expectations of the community" (Alpert & Fridell, 1992, p. 119).

In a 1992 study, Michael Charles and David Falcone examined the opinions of police officers in Illinois on police pursuit issues. The authors were interested in the understanding, interpretation and implementation of police pursuit policies on the street by officers. "Understanding the organizational response by viewing pursuits from the operational level of the police officer's world could be very helpful in understanding the practical aspects of this phenomenon" (Charles & Falcone, 1992, p. 74).

Personal interviews conducted by researchers with sworn police officers comprise the data for the research project. 29 police and sheriffs' departments of varying size and geography across the state of Illinois were selected. Officers and command personnel were chosen by the administrator of each department and interviewed by research staff. This selection process precluded having a random sample. The researchers note this selection process leaves open the possibility that administrators could intentionally select officers they believed would show the department in the best light possible and limits the generalizability of the research (Charles & Falcone, 1992).

Interviews were conducted face-to-face in different locations including squad cars while the officer was on patrol, lunchrooms, offices, and anywhere it was convenient for the officer. Most interviews were conducted in private locations but some were not. The sample of officers included "64 patrol officers, sheriff's deputies, and state troopers, as well as 43 supervisory and administrative officers. Twelve chiefs of police, two sheriffs,

and one public safety director were also interviewed" (Charles & Falcone, 1992, p. 77). Years of police experience varied from one to 34 years.

Surveys consisted of eleven questions that covered topics including the officer's understanding of pursuit policy, pursuit training, and supervision. One issue discerned quickly by the researchers was that the level of understanding of the pursuit policy was low.

> It was discovered during the interviews that there was considerable confusion among officers regarding the department's pursuit policy. Interestingly, confusion was pervasive among not only line personnel, but command staff as well. For example, while an interviewer was asking a chief of police specific questions regarding the departments pursuit policy, the chief paused for a moment and stated, "To be honest with you, I read the policy five times before you got here and I'm still not sure what it means. There must be four or five basic points here that the officers can follow." Needless to say when officers in that department were queried, similar confusion was discovered. As one officer pointed out: "When I heard that you were coming to interview me I went to the squad room to look at the policies manual and I couldn't find a copy of the pursuit policy. I didn't have one in my copy of the policy manual either. You would think that if they want you to follow the rules that they would have a copy for you to read." It was discovered that in this department the pursuit policy was essentially the model International Association of Chiefs of Police (IACP) pursuit

policy. The obvious problem was that no one seemed to understand exactly what the policy was, or how it was to be implemented.

(Charles & Falcone, 1992, Pp. 77 – 78)

It is worth reiterating that this department administrator and officer were both aware researchers were coming to interview them about pursuit policies and tried to prepare. One can reasonable make the assumption that, given the responses elicited from this administrator and officer, line officers in this organization had no idea what the department pursuit policy was, or if it even existed.

While the example Charles and Falcone relay above is extreme, misunderstanding of pursuit policies was common. As researchers conducted interviews across the state of Illinois it became evident most officers were not familiar with their department's pursuit policy. "Given the self-selected sample of officers the researchers were interviewing it seemed, at first blush, to be highly unusual that these officers would not be able to answer basic questions regarding their policy" (Charles & Falcone, 1992, p. 78). Nevertheless, though researchers experienced an almost universal lack of understanding of pursuit policy, they did exhibit an understanding of what behavior was acceptable in the field in relation to pursuits.

One of the challenges the researchers noted was that the policies were simply too complex for officers to remember, much less understand. "It became clear from the interviews that the policies were generally too long and complicated for officers to commit to memory. Many officers indicated that they had become involved in few actual pursuits during their career, hence, there was little incentive for the officer to remain

current" (Charles & Falcone, 1992, p. 79). And this occurred, researchers observed once again, among interviewees that had the opportunity to review the policy before the interview.

In another study, Marjie Britz and Dennis Payne surveyed all sworn members of the Michigan State Police "to determine the degree of agreement or disagreement with pursuit policy content and related pursuit operational issues" (1994, p. 119). They received 1,212 surveys back. Similar to the finding of Charles & Falcone (1992), Britz and Payne noted that over 20 percent of personnel reported not knowing the department pursuit policy. Other concerns identified through the survey were that 38 percent of officers said the language of the policy was ambiguous and difficult to understand. And 27 percent of the officers surveyed did not believe the policy provided guidance for sound decision making (1994).

The relatively high percentage of officers who did not know the departmental pursuit policy or found it to be ambiguous or difficult to put into practice points to the need for more training, but not just for officers on the street. "Though more extensive training for line officers appears to be warranted, supervisors are also deficient in training. For example, it was found that supervisors were the least likely to follow the written policy, yet they were responsible for supervising subordinates' pursuit behaviors" (Britz & Payne, 1994, p. 133).

*Attitudes toward Pursuit Training*

Of particular interest to the present research are themes related to training that were identified in the interviews. Charles' and Falcone's researchers found limited initial

training on pursuit policies and even less frequent refresher training. Officers interviewed mentioned this as an area of concern. While most felt they did not personally need further direction many could single out fellow officers that needed direction.

Officers also felt it was the administration's responsibility to develop clear policies, provide them to officers, and reinforce them through decent training and supervision (1992). This attitude is echoed by Wendy Hicks (2003) who, upon reviewing legal cases and research, concludes "It is the responsibility of police administrators to synthesize the findings of academics with the decisions of judges and justices to arrive at the ideal pursuit policy. This would serve the officer, the public, and the department well, as pursuit litigation is destructive to all involved" (Hicks, 2003, p. 92).

Pursuit training was mentioned by officers as second only to supervision as an item that influences their behavior. Charles and Falcone (1992) found considerable variation in what was deemed an acceptable risk by officers within the same department. Attitudes about risk to violators, for instance, varied widely. While the prevailing view held that violators choose to put themselves and others at risk and therefore get what they deserve if they are injured in a crash, many other officers articulated a responsibility for the safety and well-being of violators. These differences can be attributed to multiple factors but a lack of training is one of the primary concerns.

When first asked, many officers responded they had received training in pursuits. In their 1992 survey, however, Charles and Falcone had looked at training in Illinois and were aware that only Illinois State Patrol Officers received pursuit training. Other officers in Illinois received emergency vehicle operation training but it did not contain

pursuit training. As interviews progressed and the researcher pressed the officer or administrator for further details about pursuit training specifics, the officers and administrators realized they really had not been taught pursuit policies or techniques (Charles & Falcone, 1992).

Although officers interviewed were confident in their driving ability and their decision making skills they generally did not believe there wasn't more to learn. Officers were quite open to more training, and viewed the main barrier to such training as financial. "Officers and administrators reported that they would like more training in a number of areas, but insufficient funds were provided by government authorities for such activity" (Charles & Falcone, 1992, p. 82).

Expanding research into officer attitudes from Illinois to South Carolina, Florida, Arizona and Nebraska, officer attitudes toward pursuit were examined in 1994 and again in 1998 in research led by Geoffrey Alpert. Through written pursuit scenarios that required officers to choose whether to pursue or not pursue based on several situational variables, Alpert determined which factors were most influential on an officer's decision to chase. These decision making skills are at least as, and perhaps more, important than driving skills. "Perhaps the most critical change in the 1990s , has been the development and implementation of decision–making training skills to augment defensive driving skills" (Alpert & Madden, 1994, p. 23).

Alpert and Madden identified four critical factors which are important to police officers when determining whether or not to pursue a violator who refuses to stop.

1. the know violation;

2. the area in which the chase occurred;

3. the traffic conditions; and

4. the weather conditions

(Alpert & Madden, 1994, p. 24)

The 1994 research examined differences in attitudes between sworn police officers, new police recruits in their second day of training, and criminal justice students at the University of South Carolina. In 1998, Alpert examined attitudes of sworn officers only but did so among a variety of departments responsible for policing different jurisdictions.

The officers selected in 1998 came from three metropolitan areas, Miami, Florida, (Metro-Dade Police), Omaha, Nebraska, and Mesa, Arizona. Officers were also selected from one non-metro area department, Aiken County South Carolina. Pursuit policies varied greatly between the agencies. Metro-Dade operated under a policy authorizing pursuit for violent felonies only, Omaha had a judgmental policy, Mesa had a restrictive policy that allowed pursuit only in case of a serious felony and Aiken County had "a vague pursuit policy" (Alpert, 1998, p. 351).

Police officer and administrator, recruit, and student attitudes were measured using a survey that required 15 – 20 minutes to complete. The four critical factors were used and properties were assigned to each factor. The first factor was the need to apprehend or reason for pursuit. This factor was assigned one of eight possibilities:

- Traffic offense;
- Property misdemeanor;
- DUI;

- Stolen Vehicle;
- Nonviolent felony other than stolen vehicle;
- Violent felony, no reported death;
- Violent felony, with reported death;
- Officer shot

The second, third and fourth factors were all risk factors. The second one was chase area and the choices were:

- Freeway
- Commercial
- Inner City
- Residential

The third factor was the weather conditions, there were only two choices, wet or dry. The fourth factor was the traffic conditions, also limited to two choices, congested or non-congested (Alpert & Madden, 1994) (Alpert, 1998).

Since the full factorial design for the four critical factors would have provided for 128 possible chase scenarios the researchers used a main-effects fractional factorial design to reduce the number of scenarios to 32. This was deemed necessary because of a belief that "asking subjects to rate or rank 128 scenarios was considered to be overwhelming and likely to create bias in the decisions due to fatigue" (Alpert & Madden, 1994, p. 33). The respondent was required to decide whether or not he or she would pursue if he or she was the officer or authorize a pursuit if he or she was the

supervisor. Respondents were not allowed to explain or to choose anything but yes or no. An example of a scenario follows:

AREA: FREEWAY

VIOLATION: FELONY PROPERTY OTHER THAN STOLEN CAR

TRAFFIC CONDITIONS: CONGESTED

WEATHER CONDITIONS: DRY

PURSUE: Yes [ ] No [ ]

(Alpert & Madden, 1994, p. 34)

Analysis of the 1994 responses from students, officers and recruits indicated the most important factor of the four was the reason to pursue or need to apprehend. The order of importance was identical for the top three reasons among groups. Those reasons were (1) officer shot (2) violent felony - with death and (3) violent felony – no death. Analysis of the 1998 responses from Metro-Dade, Omaha, Aiken County, and Mesa police officers and deputies also identified the need to apprehend as the most important factor. The order of importance was identical for the top two reasons among all four agencies, and they were the same two identified by the different groups in 1994, (1) officer shot and (2) violent felony – with death. Three of the agencies, Omaha, Aiken County and Mesa listed violent felony – no death as third while Metro-Dade officers placed stolen car in the number three spot (Alpert & Madden, 1994) (Alpert, 1998).

Traffic conditions were identified as the most important risk factor for all groups in both 1994 and 1998. Officers, recruits and students in 1994 as well as officers from all departments in 1998 stated that they were more likely to pursue in a commercial area or

on a freeway than in the inner city or a residential area. Among 1994 respondents, weather was more of a concern to students than to recruits or officers (Alpert & Madden, 1994). While in the 1998 study weather was a concern to officers in Omaha but not to Metro-Dade or Mesa Officers or Aiken County Deputies. "This difference makes sense because the weather is more severe in Omaha" (Alpert, 1998, p. 355).

Despite different life experiences between officers and supervisors, recruits, and students and widely different departmental pursuit policies, groups ranked the factors very close to the same. While minor differences were observed, generally the groups came to the same conclusions. "Findings show that street officers and supervisors from agencies of different sizes and locations, and directed by different policies, report similar opinions about continuing a pursuit. In some cases, officers' opinions conflicted with their own departmental policies, but our study assessed their attitudes, not their actions" (Alpert, 1998, p. 357). Knowing these opinions are similar among police officers in four different departments spread across the country can assist police administrators in choosing the best approach to training officers on pursuit policies by providing them with a point at which to start discussion.

*Attitudes toward Calling-Off a Pursuit*

As discovered in the research presented above, officers from departments with completely different department policies on pursuits have similar attitudes. One of the most important aspects of training is decision making, and the crucial decision is whether or not to terminate the chase. Studies have shown there are two primary factors officers use to determine if it is wise to discontinue the pursuit. These factors are whether they

believe the suspect can be located later (Alpert, 1998) and whether they believe the suspect will stop fleeing (Hill, 2002).

In terms of whether the suspect can be identified and apprehended later if a pursuit is discontinued, Alpert writes "Police have learned over the years that there is no shortcut to good investigative work. Because most offenders are apprehended through hardhearted police investigations, many suspects who flee the police can be caught later without the risks of a high-speed pursuit" (Alpert, 1998, p. 358). Officers have confidence in their own, and in their fellow officers', investigators', and detectives' ability to solve crimes.

That confidence needs to be bolstered during pursuit training so that officers don't look at discontinuing a pursuit as giving up. Rather, officers need to understand ending a high-speed chase is simply smart strategy. Ending a pursuit that could lead to a crash, injury or fatality and postponing capture of the suspect until later, significantly reducing the risk to officers and third-parties, is good police work. The reduction in risk pertains to the suspect, too, but as we have seen in earlier research, that carries much less weight with officers. It's far too easy to think short-term during a pursuit. Officers need to stay focused on the big picture. Enforcing the law and protecting public safety do not have to be a trade-off. A smart officer can do both by delaying, not giving up on, capturing the suspect.

Another criterion officers use when making a determination to call-off a pursuit is whether the officer discontinuing the pursuit will have any effect on the suspect's behavior (Alpert, Kenney, Dunham, Smith & Cosgrove, 1996). If an offender does not

discontinue the reckless and erratic driving after the officer stops pursuing him or her, then public safety is not improved by the officer disengaging. Some officers may even argue public safety deteriorates after an officer ends a pursuit because there will be no lights or siren to warn other motorists of the reckless driver.

In 1996 the National Institute of Justice supported a grant to research this issue. Two experts on police pursuits, Geoffrey Alpert and Roger Dunham, were joined by Dennis Kenney, William Smith and Michael Cosgrove to examine this phenomenon. The researchers examined attitudes of offenders as well as officers to determine, among other things, how long after a police officer ends a pursuit by turning off his or her lights and siren, pulling over, and turning around, a suspect will continue to drive evasively.

To gain an understanding of when high-risk driving behaviors would end following the discontinuation of a pursuit due to officer discretion, suspects and officers were interviewed. The suspects interviewed were in adult jails, therefore the research excluded juveniles. This is worth noting because prior research has found that a number of pursuits involve juveniles. However, the majority of pursuits involve adult suspects.

The interviews were conducted with 146 suspect-respondents accused of fleeing from the police. Suspect-respondent ages ranged from 18 – 40 with a mean of 26.2 years old and were 93.8% male and 6.2% female. Ethnicity was recorded as 56.8% white, 36.3% black and 6.8% Hispanic. Suspect-respondents were asked to estimate the distance they would drive after police signaled they were ending the pursuit by turning off emergency notification equipment in three different locations, on a freeway, on a highway and in town (Alpert et al., 1996).

Suspect-respondents were asked "If the police had turned off their lights and siren, how many miles would the fleeing suspects have to drive to feel safe if they were on a freeway?" (Alpert et al., 1996, p. 136). The choices provided fleeing suspects were 1 mile, 2 miles, 3 miles, 4 miles, and don't know. The highest percentage of suspects (41.8%) responded they would feel safe in 2 miles. This was followed by 4 miles (17.1%), 3 miles (13.0%) and 1 mile (9.6%). 16.4% of suspects responded they didn't know and 2.1% provided no answer (Alpert et al., 1996).

Next, suspect-respondents were asked "If the police had turned off their lights and siren, how many miles would the fleeing suspects have to drive to feel safe if they were on a highway?" (Alpert et al., 1996, p. 137). The choices provided suspect-respondents were 1 mile, 2 miles, 3 miles, 4 miles, and don't know. The highest percentage of suspects (46.6%) responded they would feel safe in 2 miles. This was followed by 4 miles (11.6%), 1 mile (11.0%) and 3 miles (8.9%). 18.5% of suspects responded they didn't know and 3.4% provided no answer (Alpert et al., 1996).

Finally, suspect-respondents were asked "If the police had turned off their lights and siren, how many blocks would the fleeing suspects have to drive to feel safe if they were in town?" (Alpert et al., 1996, p. 138). The choices provided were 1 block, 2 blocks, 3 blocks, 4 blocks, and don't know. The highest percentage (33.6%) responded they would feel safe in 2 blocks. This was followed by 1 block (21.2%), 4 blocks (13.0%) and 3 blocks (10.3%). 18.5% of suspects responded they didn't know and 3.4% provided no answer (Alpert et al., 1996).

Summarizing this data, suspects "explained that on average, they would have to be free from the police show of authority by emergency lights or siren for approximately two blocks in town…and 2.5 miles on a freeway. In other words, suspects who have fled from the police report that once the officer terminates the pursuit, they will slow down within a reasonable period" (Schultz, Hudak & Alpert, 2010, p. 3).

Understanding suspect behavior after a pursuit has been terminated by officer discretion is important because it provides insight into how long the public will continue to be endangered by his or her behavior. Of course, it is the officer or a supervisor, depending on the agency's pursuit policy, who makes the determination to discontinue a chase. Understanding officers' beliefs about suspect behavior is just as important, or perhaps even more so. With the goal of identifying these beliefs, Dave Schultz, Ed Hudak and Geoffrey Alpert surveyed officers in 2010 to determine their beliefs.

Subjects surveyed were Minnesota peace officers meeting the continuous in-service pursuit training requirements and recruits meeting the pre-service pursuit training requirement at the Minnesota Highway Safety and Research Center in Saint Cloud from July of 2007 through June of 2008. Data was collected from 1,015 officers with a combined 10,968 years of experience (Shultz, Hudak & Alpert, 2010).

Discussing the survey, the authors write "Perhaps the most important aspect of this research involved the officers' and recruits' opinions concerning when a fleeing suspect would slow down after a chase had been terminated" (Shultz et al., 2010, p.6). The researchers asked officers and recruits, "If a pursuit was terminated, how far do you believe the suspect would run if in town and if out of town?" (Schultz et al., 2010, p. 6).

On average, the officers reported that suspects would quit running after 1.7 blocks in town. Overall 98% advised that suspects would stop within five or fewer blocks (Schultz et al., 2010).

Out of town pursuits were discussed in terms of miles. Officers reported a mean of 7 miles as their belief of the number of miles it would take suspects to quit fleeing. For out of town driving that mean was somewhat skewed by outliers - officers and recruits who believed the pursuit would last for a very high number of miles. For this reason researchers reported the median, which was 5 miles. In addition, Schultz, Hudak and Alpert (2010) further divided the groups into those who believed the suspect would continue fleeing for over 10 miles and those who believed the suspect would quit within 10 miles after the officer stopped pursuing. 70% of officers identified the suspect would quit fleeing after the officer stopped chasing him or her within 10 miles. Of those officers, the average number of miles they believed the suspect would continue fleeing was 3.9 (Schultz et al., 2010).

"It is noteworthy that fleeing suspects and officers have provided similar answers to the questions of suspect behavior" (Schultz et al., 2010). On average suspects reported they would slow down after 2 blocks in town. Officers estimated it would take an average of one and three-quarter blocks before the suspect would slow. On highways the averages were also similar. The average distance identified by suspects before they would feel safe and slow down was 2½ miles. 70% of officers believed it would take, on average, just under four miles for the suspect to slow.

Research by Alpert, Kenney, Dunham, Smith & Cosgrove (1996) confirmed that ending the pursuit by shutting off lights and siren and discontinuing the chase will result in offenders stopping erratic driving behavior in a reasonable distance. Research by Schultz, Hudak and Alpert (2010) showed that officers understand this suspect behavior and identified distances similar to those identified by suspects. These findings recognize calling-off a pursuit as a proven method to reduce the risk to public safety (2010).

# CHAPTER III

# METHODS

The purpose of this research is to describe selected characteristics of police vehicular pursuits and to evaluate the effects of continuous in-service training on pursuit for licensed police officers in Minnesota on the total number of pursuits undertaken by officers and the outcomes of these pursuits. The specific research questions are:

1) Is there a decline in the number of vehicle pursuits in Minnesota among licensed officers after attending continuous in-service police pursuit training compared with the period preceding such training?

   The independent variable (IV) is categorical with two categories:

   1) Attended in-service police pursuit training
   2) Did not attend in-service police pursuit training

   The dependent variable (DV) is interval:

   1) Number of pursuits occurring during each period

   The appropriate statistical test is a t-test.

2) Is there a decline in the number of vehicle pursuits ending in a collision among licensed officers after attending continuous in-service police pursuit training compared with the period preceding such training?

   The independent variable (IV) is categorical with two categories:

1) Attended in-service police pursuit training

2) Did not attend in-service police pursuit training

The dependent variable (DV) is interval:

1) Number of pursuits occurring during each period ending in a collision

The appropriate statistical test is a one-way multivariate analysis of variance.

3) Is there an increase in the number of vehicle pursuits terminated by officer discretion among licensed officers after attending continuous in-service police pursuit training compared with the period preceding such training?

The independent variable (IV) is categorical with two categories:

1) Attended in-service police pursuit training

2) Did not attend in-service police pursuit training

The dependent variable (DV) is interval:

1) Number of pursuits occurring during each period terminated by officer discretion

The appropriate statistical test is a one-way multivariate analysis of variance.

4) Are there significant differences in the outcomes of police vehicle pursuits based on the reason for initiating a pursuit?

5) Is there a change in the number of pursuits ending in a collision after training compared with the period preceding training based on selected reasons for initiating a pursuit?

6) Is there a change in the number of pursuits terminated by officer discretion after training compared with the period preceding training based on selected reasons for initiating a pursuit?

7) Is there a decline in the number of pursuits resulting in property damage among licensed officers involved in a pursuit after attending continuous in-service police pursuit training compared to the period preceding training?

   The independent variable (IV) is categorical with two categories:

   1) Attended in-service police pursuit training
   2) Did not attend in-service police pursuit training

   The dependent variable (DV) is interval:

   1) Number of pursuits resulting in property damage

   The appropriate statistical test is a t-test.

8) Is there a decline in the number of pursuits resulting in personal injury among licensed officers involved in a pursuit after attending continuous in-service police pursuit training compared to the period preceding training?

   The independent variable (IV) is categorical with two categories:

   1) Attended in-service police pursuit training
   2) Did not attend in-service police pursuit training

   The dependent variable (DV) is interval:

   1) Number of pursuits resulting in personal injury

   The appropriate statistical test is a t-test.

The purpose of the research questions is to identify group differences. The research design is quasi-experimental and examines data collected by the Minnesota Department of Public Safety, Bureau of Criminal Apprehension. The years 1996, 1997, 1998 and the years 2003, 2004, 2005 are analyzed providing for three years of data from pursuits that occurred before officers received in-service training and three years of data from pursuits that occurred after officers received in-service pursuit training.

Data from the years 1999, 2000, 2001 and 2002 will not be used. These years are dropped because during this time there were officers in Minnesota who had received the treatment and officers who had not depending on when the officer renewed his or her license. The law required the in-service training in pursuit be completed every three years. Minnesota peace officer licenses are valid for three years. Upon renewal officers are required to have completed continuous education and must certify that it has been done. Officers are randomly selected for audit to insure compliance with the continuous education requirement. Officers had three years from the time the law passed in 1999 to complete the pursuit training. The latest an officer could have complied was in the year 2002. After 2002 all officers would have received the in-service pursuit training treatment.

The dataset was obtained from the Minnesota Department of Public Safety, Bureau of Criminal Apprehension. Beginning in 1988 all police pursuits occurring in the State of Minnesota were required to be reported to the Bureau of Criminal Apprehension on a designated pursuit report form developed by the Bureau to be used by law enforcement agencies statewide. The form tracks the following components:

1. Originating Agency
2. Case Number
3. Assisting Agencies
4. Date of Offense
5. Time Chase Started
6. Time Chase Ended
7. Initial Reason for Pursuit
8. Reason for Termination
9. Miles Covered in Chase
10. Property Damage
11. Subject Information and Type of Injury

(Minnesota Bureau of Criminal Apprehension Pursuit Reporting Form)

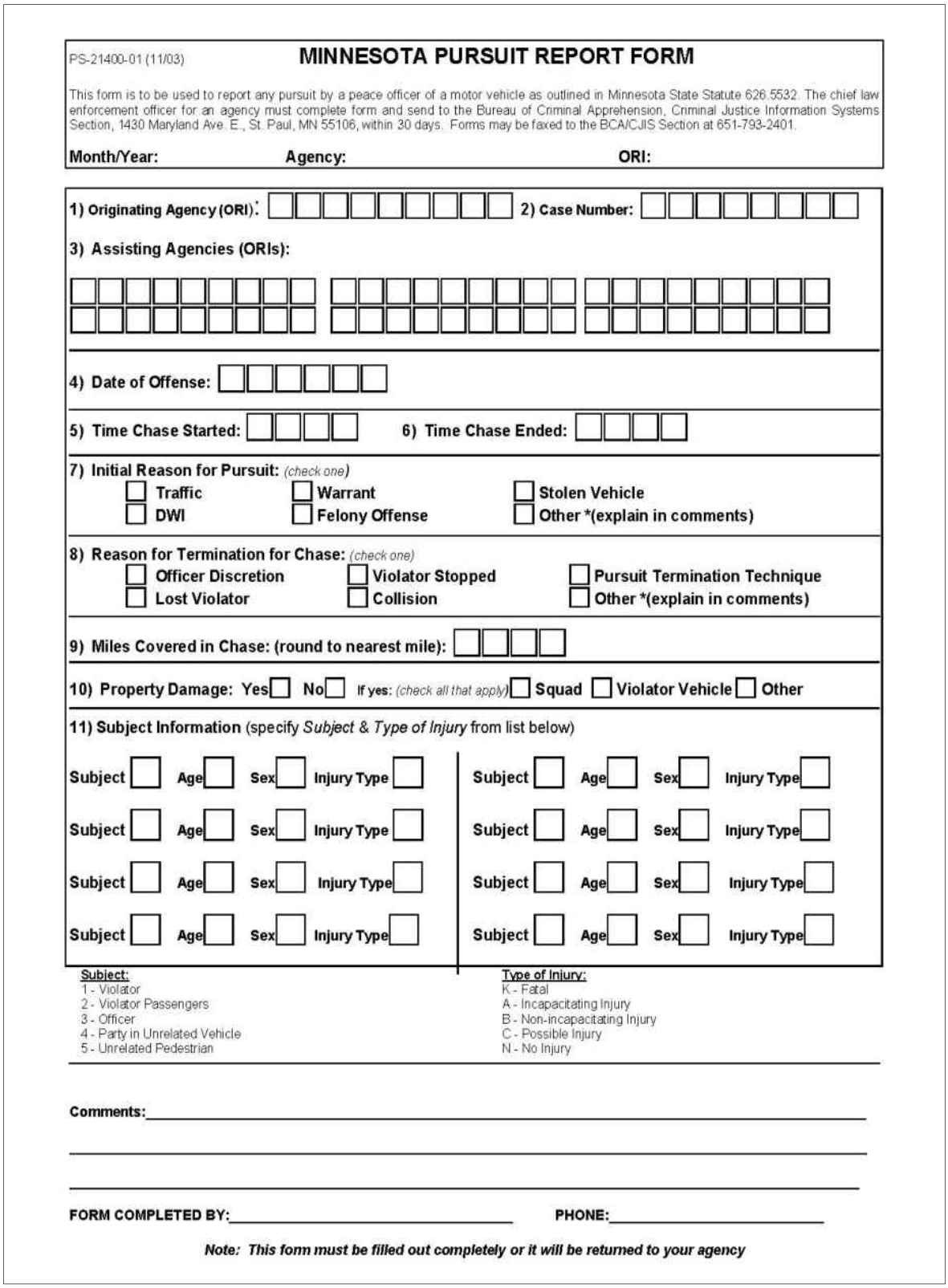
Certain components of the form are broken down into check boxes to allow for data analysis. Component seven, initial reason for pursuit, includes six choices: traffic, DWI, warrant, felony offense, stolen vehicle and other (which requires an explanation). Component eight, reason for termination of chase, also includes six choices: officer discretion, lost violator, violator stopped, collision, pursuit termination technique, and other (which requires an explanation). Component ten, property damage, includes three choices, squad, violator vehicle, and other. Component eleven, subject information, provides for both the identification of the subject and the type of injury. There are five choices for subject: violator, violator passengers, officer, party in unrelated vehicle, unrelated pedestrian. There are six types of injury: fatal, incapacitating injury, non-

incapacitating injury, possible injury, no injury, unknown. A copy of the form is shown in Figure 1.

When the Bureau of Criminal Apprehension (BCA) receives a pursuit report form from a law enforcement agency it is scanned into an Adobe file. A member of the BCA staff then enters the information into a Microsoft Excel spreadsheet. The original paper forms are filed and retained for seven years. The electronic versions have been retained either in an Excel format or in an Adobe format since collection began in 1988.

Data from 1996 includes information from 901 police pursuits, data from 1997 includes information from 956 pursuits, data from 1998 includes 921 pursuits, data from 2003 includes 1,315 pursuits, data from 2004 includes 1,325 pursuits and data from 2005 includes 1,180 pursuits. In total, data from 6,598 pursuits over two three year periods will be examined.

Data was provided by the Bureau of Criminal Apprehension in electronic form. Data for the years 1996, 1997, 1998, 2004, and 2005 were supplied in Microsoft Excel spreadsheets. Data from 2003 was unavailable in an Excel format due to a computer problem at the BCA that had ruined the spreadsheet file. As an alternative, the BCA provided an Adobe file that contained the scanned copy of every pursuit report form from



PS-21400-01 (11/03)

# MINNESOTA PURSUIT REPORT FORM

This form is to be used to report any pursuit by a peace officer of a motor vehicle as outlined in Minnesota State Statute 626.5532. The chief law enforcement officer for an agency must complete form and send to the Bureau of Criminal Apprehension, Criminal Justice Information Systems Section, 1430 Maryland Ave. E., St. Paul, MN 55106, within 30 days. Forms may be faxed to the BCA/CJIS Section at 651-793-2401.

**Month/Year:** **Agency:** **ORI:**

**1) Originating Agency (ORI):** ☐☐☐☐☐☐☐☐☐ **2) Case Number:** ☐☐☐☐☐☐☐☐

**3) Assisting Agencies (ORIs):**

☐☐☐☐☐☐☐☐☐ ☐☐☐☐☐☐☐☐☐ ☐☐☐☐☐☐☐☐☐
☐☐☐☐☐☐☐☐☐ ☐☐☐☐☐☐☐☐☐ ☐☐☐☐☐☐☐☐☐

**4) Date of Offense:** ☐☐☐☐☐☐

**5) Time Chase Started:** ☐☐☐☐ **6) Time Chase Ended:** ☐☐☐☐

**7) Initial Reason for Pursuit:** *(check one)*

☐ Traffic ☐ Warrant ☐ Stolen Vehicle
☐ DWI ☐ Felony Offense ☐ Other *(explain in comments)

**8) Reason for Termination for Chase:** *(check one)*

☐ Officer Discretion ☐ Violator Stopped ☐ Pursuit Termination Technique
☐ Lost Violator ☐ Collision ☐ Other *(explain in comments)

**9) Miles Covered in Chase: (round to nearest mile):** ☐☐☐☐

**10) Property Damage:** Yes☐ No☐ **If yes:** *(check all that apply)* ☐ Squad ☐ Violator Vehicle ☐ Other

**11) Subject Information** (specify *Subject* & *Type of Injury* from list below)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Subject ☐ | Age ☐ | Sex ☐ | Injury Type ☐ | Subject ☐ | Age ☐ | Sex ☐ | Injury Type ☐ |
| Subject ☐ | Age ☐ | Sex ☐ | Injury Type ☐ | Subject ☐ | Age ☐ | Sex ☐ | Injury Type ☐ |
| Subject ☐ | Age ☐ | Sex ☐ | Injury Type ☐ | Subject ☐ | Age ☐ | Sex ☐ | Injury Type ☐ |
| Subject ☐ | Age ☐ | Sex ☐ | Injury Type ☐ | Subject ☐ | Age ☐ | Sex ☐ | Injury Type ☐ |

**Subject:**
1 - Violator
2 - Violator Passengers
3 - Officer
4 - Party in Unrelated Vehicle
5 - Unrelated Pedestrian

**Type of Injury:**
K - Fatal
A - Incapacitating Injury
B - Non-incapacitating Injury
C - Possible Injury
N - No Injury

**Comments:** _____

_____

_____

**FORM COMPLETED BY:** _____ **PHONE:** _____

***Note: This form must be filled out completely or it will be returned to your agency***

Figure 1. Minnesota Pursuit Report Form.

2003. The Adobe file was printed and each form was then entered into Excel. The Excel spreadsheet from 2004 was used as a template to insure data was entered in the identical format as other years. Data was entered exactly as the officer had recorded it.

In addition to the research questions examining the effectiveness of the continuous in-service pursuit training, two questions investigating the effect of the involvement of other agencies on pursuits ending in collision and pursuits terminated by officer discretion are answered using data from before the in-service training (1996 – 1998). While the degree of analysis could have been improved by studying the data from after the in-service training (2003 – 2005) that data is unavailable because the BCA did not record whether or not other agencies joined a pursuit in those years. The specific research questions used in this analysis follow:

9) Are there differences in the number of pursuits ending in a collision between pursuits where other agencies are involved and pursuits where other agencies are not involved?

   The independent variable (IV) is categorical with two categories:

   1) Other agencies are involved
   2) Other agencies are not involved

   The dependent variable (DV) is interval:

   1) Number of pursuits ending in a collision

   The appropriate statistical test is a one-way multivariate analysis of variance.

10) Are there differences in the number of pursuits terminated by officer discretion between pursuits where other agencies are involved and pursuits where other agencies are not involved?

The independent variable (IV) is categorical with two categories:

1) Other agencies are involved
2) Other agencies are not involved

The dependent variable (DV) is interval:

1) Number of pursuits terminated by officer discretion

The appropriate statistical test is a one-way multivariate analysis of variance.

This dataset is unique and was described by multiple researchers as the best and only dataset available using data collected routinely and consistently from an entire state. Geoffrey Alpert and Lorie Fridell refer to the Minnesota data as "the only state-wide reporting effort available" (1992, p. 108). Robert Crew, Lorie Fridell and Karen Purcell illustrate the quality and exceptionality of the Minnesota dataset, which they used to perform a cost-benefit analysis of hot pursuit covered earlier in this paper, in the following manner.

> These data are unrivaled for the purposes of this study: The systematic way in which the data were collected, the large number of incidents involved, and the variety of circumstances under which the chases occurred allow the authors to speak with great confidence about the outcomes of these pursuits and to generalize to many, if not all, other jurisdictions.
>
> (Crew, Fridell & Purcell, 1995, p. 418)

Robert Crew returned to the dataset again four years later and, along with Robert Hart, describes the Minnesota dataset in this way.

> This is arguably the largest and most systematic database in existence on the topic of hot pursuit. The large numbers and the variety of circumstances involved in these chases make them an unusually good platform from which to generalize about the costs and benefits associated with police pursuits.
>
> (Crew & Hart, 1999, p. 60)

Access to information on pursuits is not always easy to obtain. "Collecting valid and reliable data on policing activities is a perennial problem for police scholars…This is particularly true when studying activities such as police shootings, use-of-force, and vehicle pursuits" (Wells & Falcone, 1997, p. 729). The Minnesota dataset is unrivaled in its value for the research questions of this study.

Police officer license information was obtained from the Minnesota Board of Peace Officer Standards and Training (POST). The number of licensed police officers in the state changes constantly throughout the year due to hiring, termination, retirements, etc. The best estimate of the number of licensed police officers comes from the POST Board which tracks active police officer licenses by taking a snapshot at the end of each biennium on June 30th. This data was provided by Mr. Daniel Glass, Licensing and Testing Coordinator for the Minnesota POST Board. The data show there were 8,711 active, licensed peace officers at the end of the biennium in 1996, 8,420 officers in 1998, 8,949 officers in 2000, 9,272 officers in 2002, 9,406 officers in 2004, and 9,833 officers in 2006 (D. Glass, personal communication, May 22, 2012). Minnesota peace officers

who are licensed but not currently working for an agency are considered inactive licensees and are not counted in these totals. The number of active, licensed officers used in the statistical analysis for odd years was the mean of the number of officers in the year immediately prior and immediately subsequent to the odd year.

Given the infrequency of police pursuits, a daily average of approximately three occur statewide in Minnesota, as well as many other challenges to designing such a trial to test this particular issue, a true experimental design is not possible. For that reason a quasi-experimental design will be used: the nonequivalent-groups design. Described by William Trochim of Cornell University as "one of the most intuitively sensible designs around" (Trochim, 2001, p. 216) the nonequivalent-groups design provides researchers a methodology to analyze group differences before and after a treatment program.

The challenge in terms of the Minnesota data is there is not a control group. Due to the change in the law, all officers in the State received the treatment. Comparisons between groups will consist of an analysis of all pursuits conducted by officers before the treatment compared with all pursuits conducted by officers after the treatment. Because every record is used the random sampling concerns usually associated with nonequivalent-groups design will be eliminated.

Multivariate analysis of variance is the proper test to identify group differences. In their pioneering research on police pursuits, Alpert and Dunham, in the Metro-Dade Pursuit Study, chose multivariate analysis of variance as their preferred statistical tool to separately measure different outcomes between various officer and situational characteristics (1992). The current study also aims to measure different outcomes based

on officer characteristics – whether the officer has received continuous in-service pursuit training or has not.

Multivariate analysis of variance provides a method to measure different affects of the treatment, the continuous in-service pursuit training, on officers who participated in the treatment. Multiple dependent variables will be used to obtain the best representation of the treatment effect. "The use of several criterion measures permits the researcher to obtain a more "holistic" picture, and therefore a more detailed description, of the phenomenon under investigation" (Mertler & Vannatta, 2005, p. 119).

The first dependent variable is the total number of pursuits. By measuring the total number of pursuits it is possible to analyze whether the treatment affected the decision to pursue. The Minnesota pursuit training program contains both instruction on decision making as well as practical driving skills development; either of those components could have an effect on the total number of pursuits.

The second dependent variable is the number of pursuits ending in a collision. Measuring the number of pursuits that ended in a collision provides the opportunity to analyze whether the treatment affected the number of pursuits ending in a manner clearly defined as negative: a crash. This statistic is likely affected by both the decision-making component of the course, officers may choose to discontinue a chase that is becoming risky and thus avoid a collision, as well as the skills development component, officers who have honed pursuit driving skills are more accomplished drivers and as a result are more likely to avoid collisions.

The third dependent variable is the number of pursuits terminated by officer discretion. This statistic is expected to be most affected by the decision-making component of the pursuit training program. Officers are taught to consider the alternatives to continuing a pursuit based on the risks the pursuit poses to the officer, the public, and the suspect.

"MANOVA tests whether mean differences among *k* groups on a *combination of DVs* are likely to have occurred by chance" (Mertler & Vannatta, 2005, p. 120). Measuring these three dependent variables will provide insight into the effectiveness of the training as a whole and may provide a glimpse into the efficacy of each component of the training program as well. It will provide the best overall representation of the continuous in-service pursuit training program's impact.

Data analysis was conducted using the Statistical Package for the Social Sciences (SPSS) software package. SPSS is a powerful software package capable of handling the large dataset used in this research. The SPSS output and interpretation are included in the results chapter.

# CHAPTER IV

# ANALYSIS

Police pursuits in Minnesota were examined before the implementation of continuous in-service pursuit training for all licensed officers, from 1996 – 1998, and after the training, from 2003 – 2005. Pursuits occurred across the State of Minnesota in rural and metropolitan areas, in the middle of the night and in broad daylight, for reasons as minor as traffic violations and as serious as felonies. Violators' ages ranged from an 8-year-old girl in Minneapolis out for a Christmas Eve. drive to an 88-year-old man, likely suffering from Alzheimer's disease, driving southbound in the northbound lane of Interstate 35. Violators are predominantly male (92%), and young. There are five or six reasons on the form, depending on the period, for initiating a pursuit. The most prevalent reason for initiating a pursuit, comprising over half of all pursuits in the study periods, was for a traffic violation. The next most common reason was for a felony offense or a stolen vehicle; the two are not separated in data from the earlier period.

When pursuits terminated officers were required to choose between five or six reasons, depending on the reporting period, the chase ended. The most prevalent reason for terminating a pursuit was the violator stopped. Half of all pursuits in the first study period and over forty percent of them in the second period ended because the violator decided to stop fleeing. The second most common reason for termination was a collision.

Pursuits are dangerous and expensive. Pursuits resulted in property damage between 38% and 44% of the time during the study period. Personal injury occurred in 15% - 22% of all pursuits. And between two and ten persons were killed as a result of a police pursuit. An analysis of property damage and personal injury rates is included in this chapter. Because the fatality numbers are so low an analysis was not possible due to the great variability of the numbers. Fatalities are especially impacted by factors such as non-use of seatbelts and rollover accidents. For example, the year 2004 had the lowest rate of pursuits resulting in personal injury (15%) but ten fatalities, the highest number in the study period, were recorded that year.

Due to limitations in the data officer characteristics are not available. Officers did not include themselves on the form a substantial proportion of the time. At the time of these pursuits the form requested subject data. Clearly this was interpreted as suspect data by many officers and, in fact, whole departments. The Minneapolis Police Department almost never included information on officers involved on the form. Realizing this limitation, the Bureau of Criminal Apprehension has since changed the forms to specifically request data on officers. But that change occurred after the study period.

The data provides good information on violator demographics. Violators were younger than thirty 61% of the time and were juveniles, violators younger than eighteen, 11% of the time. The age breakdown of known violators is shown in Figure 2. The reason for pursuit initiation differs between juvenile and adult violators. Juveniles are more likely to flee because they are driving a stolen vehicle. Pursuit initiation due to a

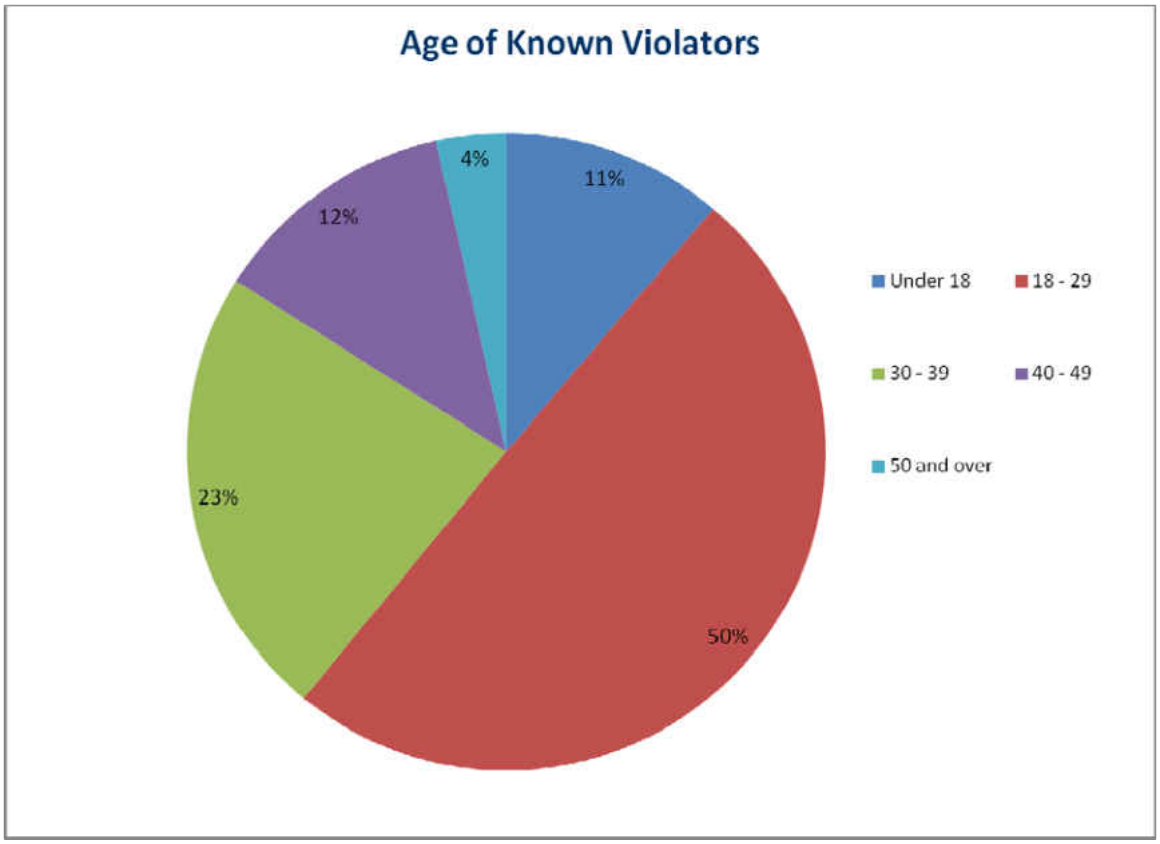



Figure 2. Age of Known Violators.

stolen vehicle is 29% for juveniles and 8% for adults. Adults are more likely to flee because of driving while intoxicated (DWI) than juveniles. Pursuit initiation due to DWI is 9% for adults and 2% for juveniles. The reason for pursuit initiation for juveniles is shown in Figure 3; the reason for pursuit initiation for adults is shown in Figure 4.

The number of police pursuits in Minnesota increased by 31% from the start of the first period to the end of the second period of study (Minnesota Department of Public Safety, Bureau of Criminal Apprehension, Pursuit Data, 1996 – 2003). That time period also experienced an increase of 9% in the number of licensed drivers in Minnesota (Office of Highway Policy Information, Federal Highway Administration, Highway Statistics, 1996 – 2003) and an increase of 13% in the number of police officers with

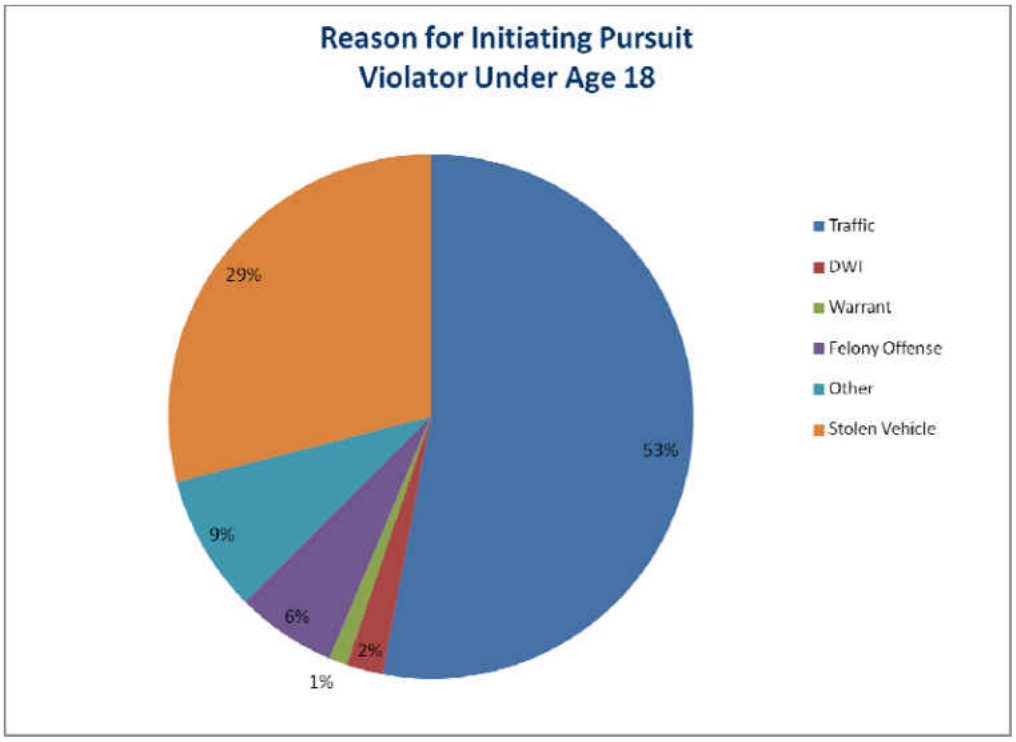



Figure 3. Reason for Initiating Pursuit: Violator Under Age 18

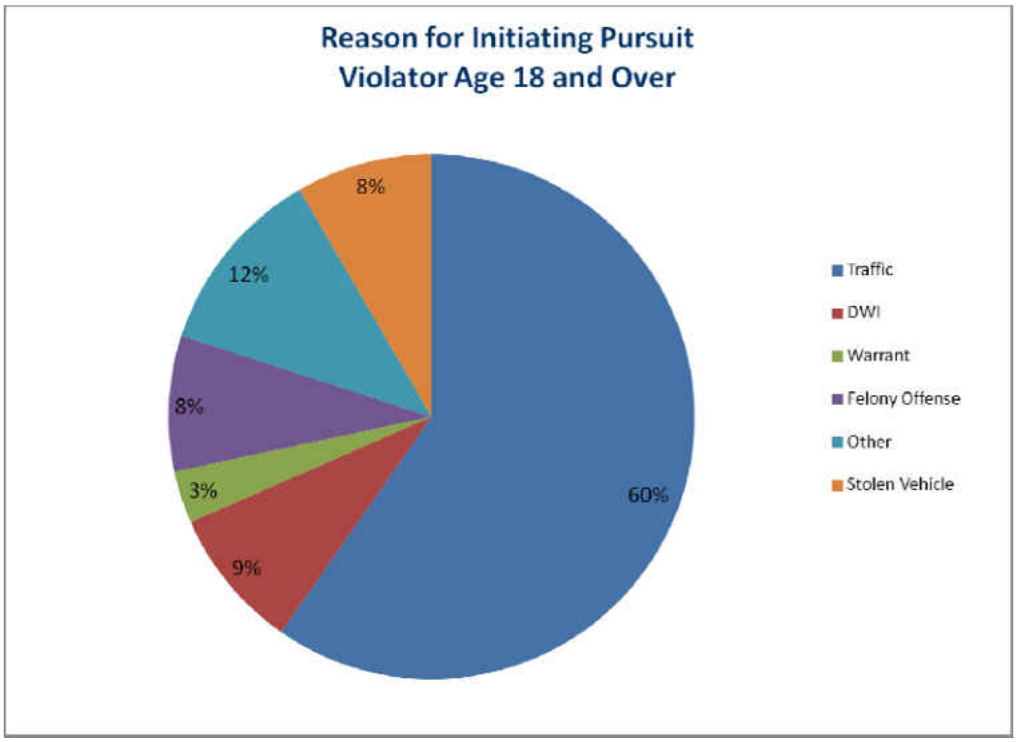



Figure 4. Reason for Initiation Pursuit: Violator Age 18 and Over

active licenses (Minnesota POST Board, 2012). These numbers are shown in Table 2.

Officers can report one of five or six reasons, depending on the period, for initiating a pursuit. The majority of pursuits are initiated for traffic violations in both time periods. 53% of pursuits are initiated as the result of a traffic violation before the training. That percentage grows to 60% in the years following the training. A felony offense is the second highest percentage for a pursuit in the years prior to training. After training the second highest percentage of pursuits are initiated for a stolen vehicle. The reason for initiating a pursuit in the period before the training is shown in Figure 5; the reason for initiation of a pursuit after the training is shown in Figure 6.

Table 2.

*Number of Pursuits, Licensed Drivers, and Licensed Minnesota Peace Officers by Year*

| | 1996 | 1997 | 1998 | 2003 | 2004 | 2005 |
|---|---|---|---|---|---|---|
| Pursuits | 901 | 956 | 921 | 1,315 | 1,325 | 1,180 |
| Licensed Drivers | 2,830,232 | 2,839,291 | 2,868,002 | 3,035,553 | 3,083,007 | 3,083,757 |
| Licensed Officers | 8,711 | 8,566* | 8,420 | 9,339* | 9,406 | 9,620* |

* Odd years estimated using the mean of the years directly prior and after

The first research question in this study: is there a decline in the number of vehicle pursuits in Minnesota among licensed officers after attending continuous in-service police pursuit training compared with the period preceding such training?

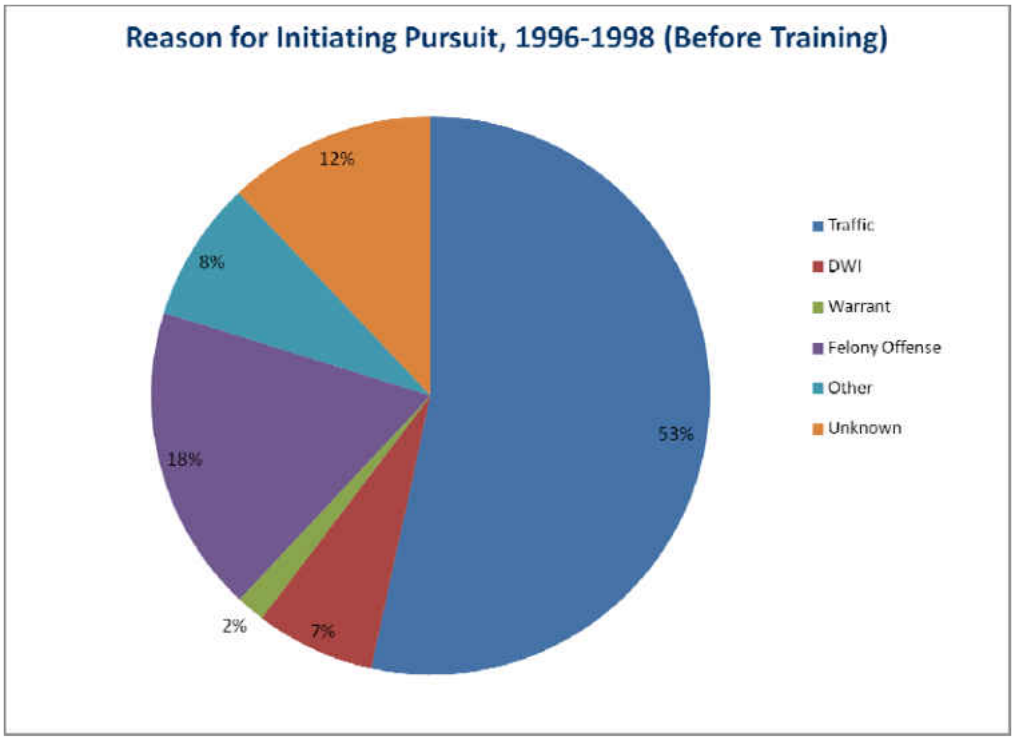



Figure 5. Reason for Initiating Pursuit, 1996-1998 (Before Training).

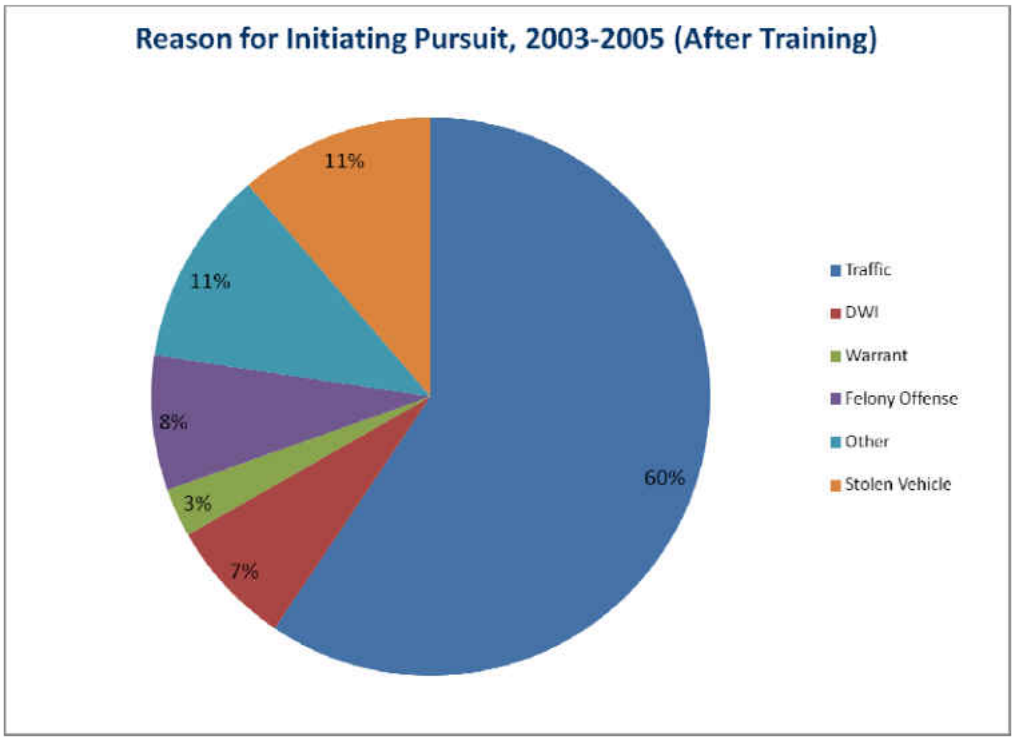



Figure 6. Reason for Initiating Pursuit, 2003-2005 (After Training).

The independent variable (IV) is categorical with two categories:

1) Attended in-service police pursuit training

2) Did not attend in-service police pursuit training

The dependent variable (DV) is interval:

1) Number of pursuits

An independent-samples t-test was conducted to compare the number of pursuits conducted by licensed police officers who have not completed continuous in-service training on police pursuit and licensed police officers who have completed continuous in-service training on police pursuit. There was a significant difference in the number of pursuits for licensed police officers who had not received training ($M$=.11, $SD$=.311) and those who had received training ($M$=.13, $SD$=.341); t(54,059)=-9.476, p=.000.

The total number of police pursuits increased after the officers received in-service training in police pursuit. The next question is, given the rise in the number of pursuits, what impact will that have on the outcome of the pursuits? The specific research question is more detailed. Before addressing it, additional statistics are supplied to provide a more in-depth understanding of the issue. Figure 7 provides data on the number of pursuits and certain outcomes, specifically property damage, personal injury, and fatality. Figure 7 covers a decade but the analysis excludes years 1999, 2000, 2001, and 2002 due to the fact that some officers had received training and others had not during those years. After 2002 all officers had received in-service pursuit training.

Officers are required to identify one of six reasons for termination of a pursuit. The reasons provided on the form are: collision, lost violator, officer discretion, other,

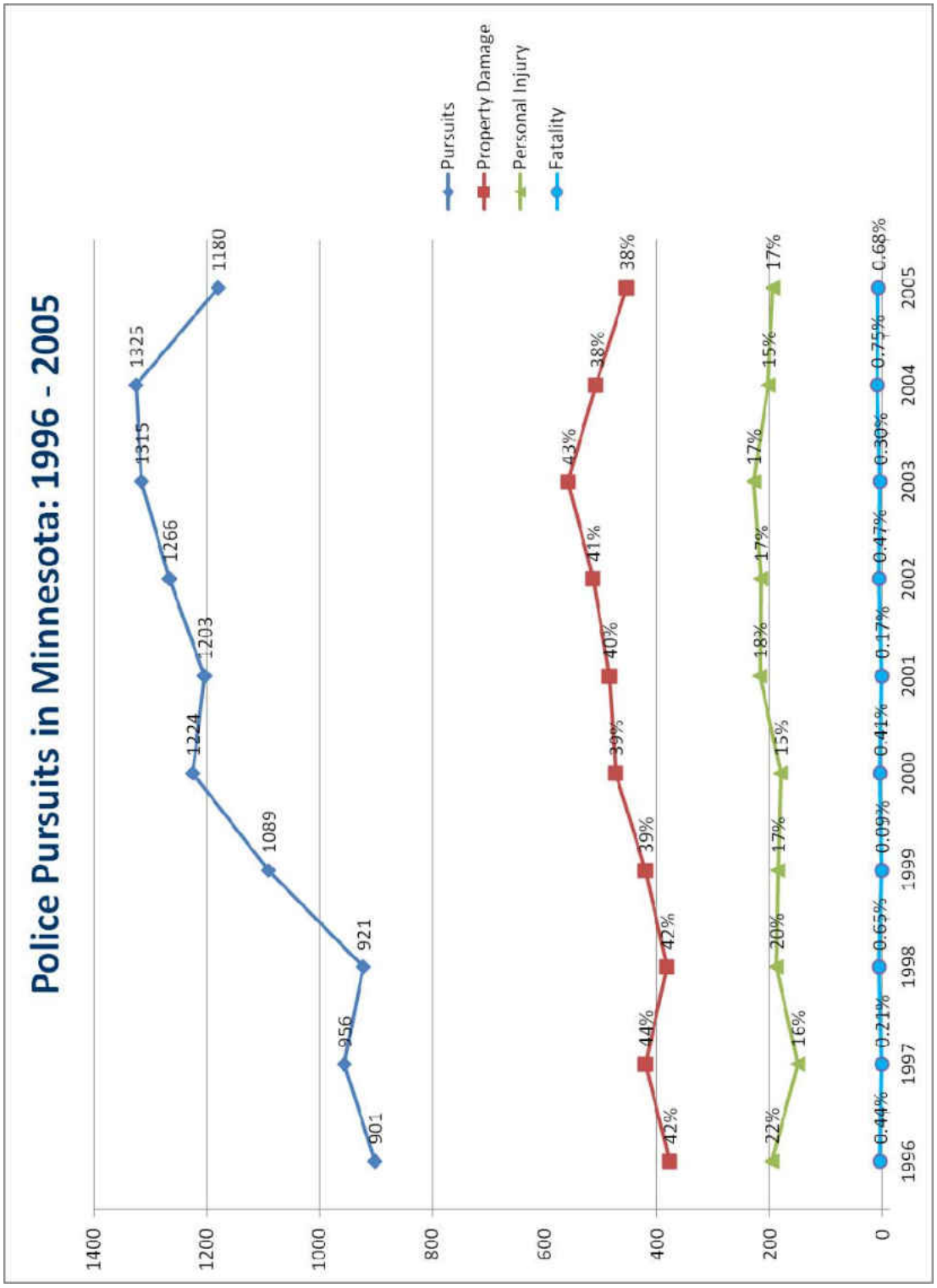



Figure 7. Police Pursuits in Minnesota: 1996 – 2005.

pursuit termination technique or violator stopped. Officers were not trained in the pursuit termination technique prior to the implementation of the in-service training therefore no pursuits were terminated in that manner in 1996 – 1998. The most prevalent reason a pursuit ended was the violator stopped: this occurred 50% of the time before the training and 44% of the time after the training. The next highest reason a pursuit ended was a collision. 25% of pursuits ended in collision prior to the training; 19% ended in collision after. The reason for terminating a pursuit in the period before the training is shown in Figure 8; the reason for termination of a pursuit after the training is shown in Figure 9.

The pursuit training mandated by Minnesota Statute 626.8458, Subd. 5: In-Service Training in Police Pursuits Required, includes two primary components: behind-the-wheel training in pursuit vehicle operations and classroom training on multiple topics including decision making. A goal of this training is to inform officers of the risks inherent in high speed pursuits and to encourage them to constantly weigh the dangers of continuing a pursuit. When the dangers become too great officers are taught to discontinue the pursuit. Data on the number of pursuits ending in a collision before and after training are provided in Figure 10. Data on the number of pursuits ended by officer discretion before and after training are provided in Figure 11.

The second research question in this study: is there a decline in the number of vehicle pursuits ending in a collision among licensed officers after attending continuous in-service police pursuit training compared with the period preceding such training? The independent variable (IV) is categorical with two categories:

1) Attended in-service police pursuit training

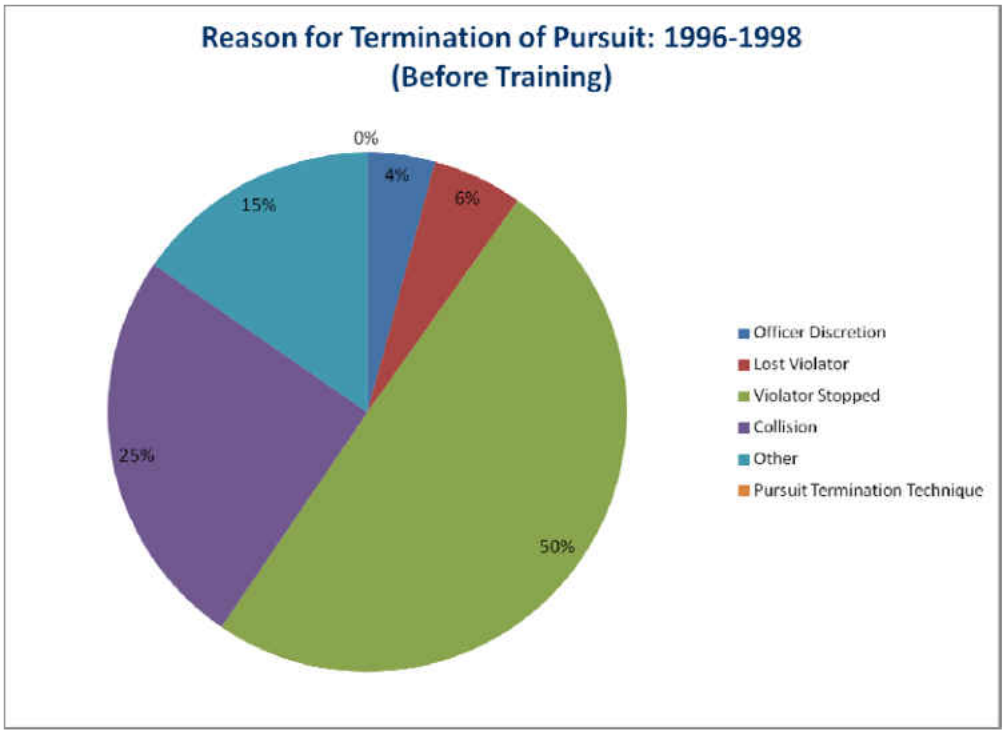



Figure 8. Reason for Termination of Pursuit: 1996-1998 (Before Training).

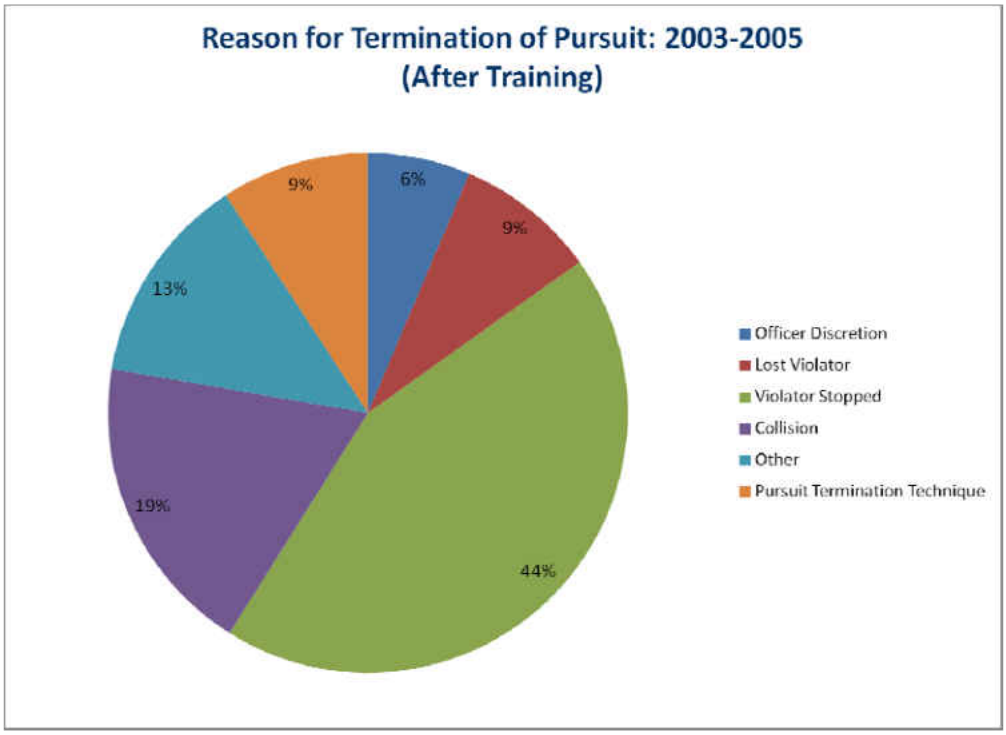



Figure 9. Reason for Termination of Pursuit: 2003-2005 (After Training).

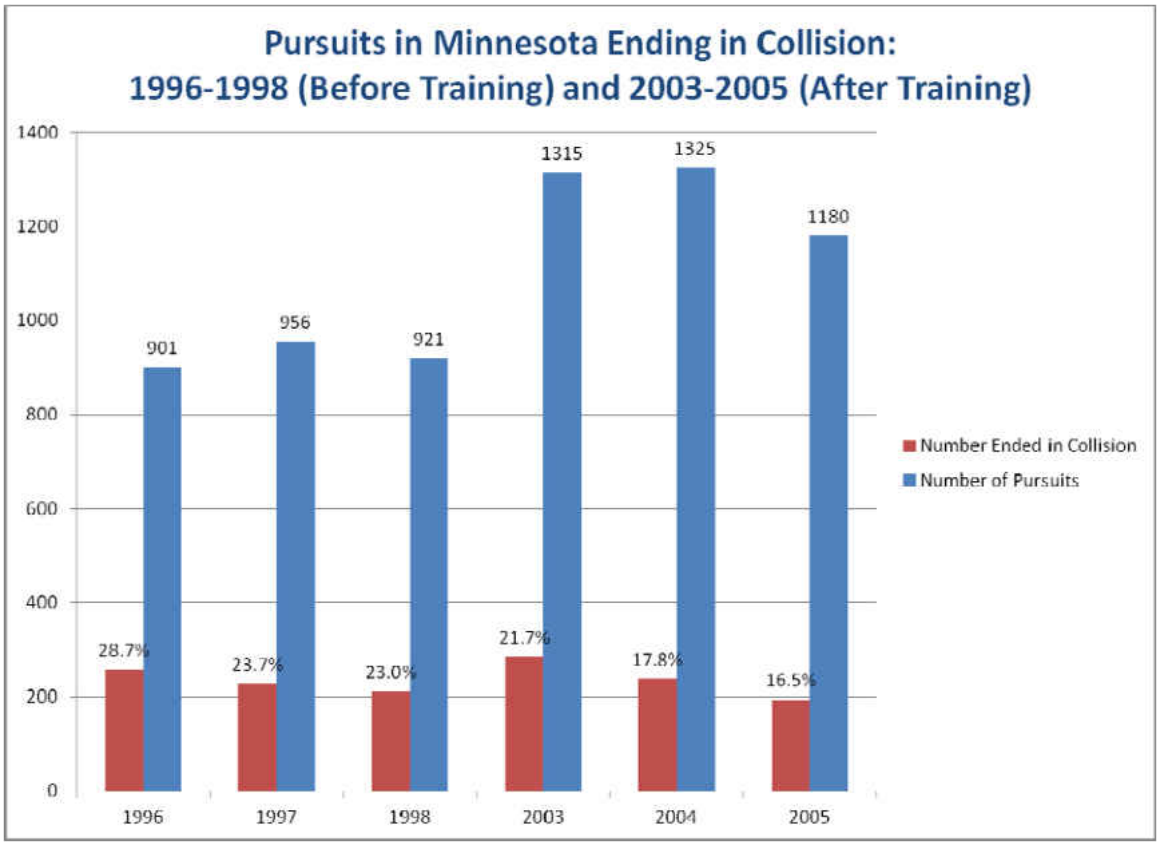



Figure 10. Pursuits in Minnesota Ending in a Collision.

2) Did not attend in-service police pursuit training

The dependent variable (DV) is interval:

1) Number of pursuits ending in a collision

The third research question in this study: is there an increase in the number of vehicle pursuits terminated by officer discretion among licensed officers after attending continuous in-service police pursuit training compared with the period preceding such training?

The independent variable (IV) is categorical with two categories:

1) Attended in-service police pursuit training

2) Did not attend in-service police pursuit training

The dependent variable (DV) is interval:

1) Number of pursuits terminated by officer discretion

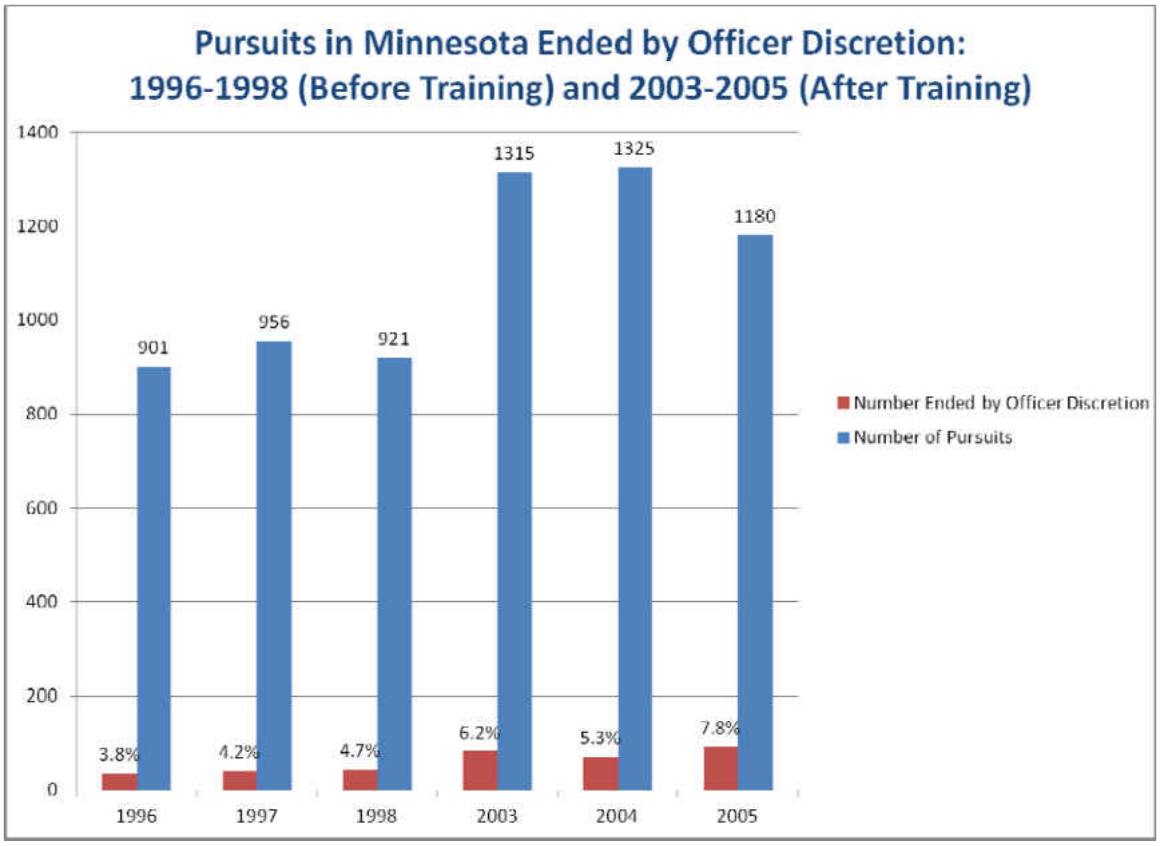



Figure 11. Pursuits in Minnesota Ended by Officer Discretion.

A one-way between-groups multivariate analysis of variance was performed to investigate differences in pursuits ending in collision and pursuits ended by officer discretion between licensed police officers involved in a pursuit who have completed continuous in-service police pursuit training and licensed police officers involved in a pursuit who have not completed continuous in-service police pursuit training. Two dependent variables were used: pursuits ending in collision and pursuits ending by officer discretion. The independent variable was training. There was a statistically significant difference between officers who had completed pursuit training and officers who had not

on the combined dependent variables: $F(2, 6595)=26.56$, p=.000; Wilks' Lambda=.992. When the results for the variables are considered separately, using a Bonferroni adjusted alpha level of .025, both pursuits ending in collision, $F(1, 6596)=38.79$, p=.000, and pursuits ended by officer discretion, $F(1, 6596)=14.75$, p=.000, reached statistical significance. An inspection of the mean scores indicated that officers involved in a pursuit who had received pursuit training were less likely to be involved in a collision ($M$=.19, $SD$=.391) than officers involved in a pursuit who had not received pursuit training ($M$=.25, $SD$=.434). An inspection of the mean scores indicated that officers involved in a pursuit who had received pursuit training were more likely to end the pursuit with officer discretion ($M$=.06, $SD$=.245) than officers involved in a pursuit who had not received pursuit training ($M$=.04, $SD$=.201).

To determine if pursuits initiated for different reasons are terminated differently the data was analyzed by reason for termination based on reason for initiation. The fourth research question is: are there significant differences in the outcomes of police vehicle pursuits based on the reason for initiating a pursuit? Table 3 provides the reason for pursuit termination based on the reason for pursuit initiation before the training. Table 4 provides the reason for pursuit termination based on the reason for pursuit initiation after the training. A chi-square test for independence was performed on both tables. The reason for pursuit termination based on the reason for pursuit initiation before the training was found to be statistically significant, $X^2=123.534$, p=.000. The reason for pursuit termination based on the reason for pursuit initiation after the training was also found to be statistically significant, $X^2=202.193$, p=.000.

Table 3.

*Reason for Termination of Pursuit Based on Reason for Initiation of Pursuit: Before Training*

| 1996-1998 | Collision | Officer Discretion | Lost Violator | Violator Stopped | Other |
|---|---|---|---|---|---|
| Traffic | 21% | 5% | 8% | 55% | 11% |
| DWI | 24% | 3% | 1% | 63% | 9% |
| Warrant | 26% | 2% | 4% | 57% | 11% |
| Felony Offense | 39% | 2% | 3% | 44% | 11% |
| Other | 18% | 6% | 2% | 55% | 19% |

Table 4.

*Reason for Termination of Pursuit Based on Reason for Initiation of Pursuit: After Training*

| 2003-2005 | Collision | Officer Discretion | Lost Violator | Pursuit Termination Technique | Violator Stopped | Other |
|---|---|---|---|---|---|---|
| Traffic | 16% | 6% | 10% | 8% | 48% | 13% |
| DWI | 18% | 2% | 1% | 16% | 51% | 11% |
| Warrant | 17% | 9% | 9% | 13% | 38% | 13% |
| Felony Offense | 19% | 4% | 6% | 15% | 41% | 15% |
| Stolen Vehicle | 36% | 5% | 3% | 12% | 32% | 12% |
| Other | 15% | 7% | 7% | 8% | 43% | 20% |

Given the discovery of a statistically significant relationship between training and pursuits resulting in a collision and training and pursuits terminated by officer discretion and a discovery of a statistically significant relationship between reason for pursuit

initiation and reason for pursuit termination, additional analysis was performed to investigate each reason for pursuit. The next research questions are designed to examine each reason for pursuit separately. Table 5 presents the percentage of pursuits, initiated for selected reasons, ending in collision and the percentage of pursuits terminated by officer discretion.

Table 5.

*Percentage of Pursuits Ending in Collision and Terminated by Officer Discretion by Reason for Pursuit Initiation*

| | Percent Ending in Collision | | Percent Terminated by Officer Discretion | |
|---|---|---|---|---|
| | 1996 – 1998 | 2003 – 2005 | 1996 – 1998 | 2003 - 2005 |
| Traffic | 21%* | 16%* | 5% | 6% |
| DWI | 24% | 18% | 3% | 2% |
| Warrant | 26% | 17% | 2% | 9% |
| Total | 25%* | 19%* | 4%* | 6%* |

* Indicates statistically significant difference at the .05 level

The fifth research question in this study: is there a change in the number of pursuits ending in a collision after training compared with the period preceding training based on initiating a pursuit for a traffic violation?

The independent variable (IV) is categorical with two categories:

1) Attended in-service police pursuit training

2) Did not attend in-service police pursuit training

The dependent variable (DV) is interval:

1) Number of pursuits initiated for a traffic violation that end in a collision

The sixth research question in this study: is there a change in the number of pursuits terminated by officer discretion after training compared with the period preceding training based on initiating a pursuit for a traffic violation?

The independent variable (IV) is categorical with two categories:

1) Attended in-service police pursuit training
2) Did not attend in-service police pursuit training

The dependent variable (DV) is interval:

1) Number of pursuits initiated for a traffic violation that are terminated by officer discretion

A one-way between-groups multivariate analysis of variance was performed to investigate differences in pursuits initiated for a traffic violation ending in collision and ended by officer discretion between licensed police officers involved in a pursuit who have completed continuous in-service police pursuit training and licensed police officers involved in a pursuit who have not completed continuous in-service police pursuit training. Two dependent variables were used: pursuits initiated for a traffic violation ending in collision and pursuits initiated for a traffic violation ended by officer discretion. The independent variable was training. There was a statistically significant difference between officers who had completed pursuit training and officers who had not on the combined dependent variables: $F(2, 3661)=5.36$, p=.005; Wilks' Lambda=.997. When the results for the dependent variables are considered separately, the only difference to

reach statistical significance, using a Bonferroni adjusted alpha level of .025, was pursuits initiated for a traffic violation ending in collision $F(1, 3662)=10.16$, $p=.001$. An inspection of the mean scores indicated that officers involved in a pursuit initiated for a traffic violation who had received pursuit training were less likely to be involved in a collision ($M=.16$, $SD=.371$) than officers involved in a pursuit who had not received pursuit training ($M=.21$, $SD=.404$).

The seventh research question in this study: is there a change in the number of pursuits ending in a collision after training compared with the period preceding training based on initiating a pursuit for DWI?

The independent variable (IV) is categorical with two categories:

1) Attended in-service police pursuit training

2) Did not attend in-service police pursuit training

The dependent variable (DV) is interval:

1) Number of pursuits initiated for DWI that end in a collision

The eighth research question in this study: is there a change in the number of pursuits terminated by officer discretion after training compared with the period preceding training based on initiating a pursuit for DWI?

The independent variable (IV) is categorical with two categories:

1) Attended in-service police pursuit training

2) Did not attend in-service police pursuit training

The dependent variable (DV) is interval:

1) Number of pursuits initiated for DWI that are terminated by officer discretion

A one-way between-groups multivariate analysis of variance was performed to investigate differences in pursuits initiated for DWI ending in collision and ended by officer discretion between licensed police officers involved in a pursuit who have completed continuous in-service police pursuit training and licensed police officers involved in a pursuit who have not completed continuous in-service police pursuit training. Two dependent variables were used: pursuits initiated for DWI ending in collision and pursuits initiated for DWI ended by officer discretion. The independent variable was training. There was no statistically significant difference between officers who had completed pursuit training and officers who had not completed training.

The ninth research question in this study: is there a change in the number of pursuits ending in a collision after training compared with the period preceding training based on initiating a pursuit for a warrant?

The independent variable (IV) is categorical with two categories:

1) Attended in-service police pursuit training
2) Did not attend in-service police pursuit training

The dependent variable (DV) is interval:

1) Number of pursuits initiated for a warrant that end in a collision

The tenth research question in this study: is there a change in the number of pursuits terminated by officer discretion after training compared with the period preceding training based on initiating a pursuit for a warrant?

The independent variable (IV) is categorical with two categories:

1) Attended in-service police pursuit training

2) Did not attend in-service police pursuit training

The dependent variable (DV) is interval:

1) Number of pursuits initiated for a warrant that are terminated by officer discretion

A one-way between-groups multivariate analysis of variance was performed to investigate differences in pursuits initiated for a warrant ending in collision and ended by officer discretion between licensed police officers involved in a pursuit who have completed continuous in-service police pursuit training and licensed police officers involved in a pursuit who have not completed continuous in-service police pursuit training. Two dependent variables were used: pursuits initiated for a warrant ending in collision and pursuits initiated for a warrant ended by officer discretion. The independent variable was training. There was no statistically significant difference between officers who had completed pursuit training and officers who had not completed training. It should be noted that the number of pursuits initiated for a warrant is small; 148 pursuits were initiated for a warrant in the entire study period.

Analysis on reason for pursuit termination based on pursuits initiated for a felony offense or for a stolen vehicle was unable to be performed because of a change in the reporting form that occurred between the study periods. In the first period, before the training, stolen vehicle was not an option. Pursuits initiated because of a stolen vehicle were presumably listed as felony offenses but may also have been tallied as unknown. In

the second period of study, after the training, stolen vehicle was an option. Due to these differences a comparison of the data is not appropriate.

The preceding research questions have focused on the effect of training on the termination of a pursuit by collision or by officer discretion. However, examination of termination by collision does not completely comprise all negative outcomes of a pursuit. Pursuits that end for other reasons, such as the violator stopping, can still result in property damage during the pursuit which does not result in the termination of the pursuit. For example, a violator may side-swipe a parked car but be able to continue fleeing or one squad car may be wrecked but other responding units are able to continue pursuing. Research questions twelve and thirteen are designed to examine this phenomenon.

The eleventh research question in this study: is there a decline in the number of pursuits resulting in property damage among licensed officers involved in a pursuit after attending continuous in-service police pursuit training compared to the period preceding training?

The independent variable (IV) is categorical with two categories:

1) Attended in-service police pursuit training

2) Did not attend in-service police pursuit training

The dependent variable (DV) is interval:

1) Number of pursuits resulting in property damage

An independent-samples t-test was conducted to compare the number of pursuits resulting in property damage conducted by licensed police officers who have not

completed continuous in-service training on police pursuit and licensed police officers who have completed continuous in-service training on police pursuit. There was a significant difference in the number of pursuits resulting in property damage for officers who had not received training (*M*=.42, *SD*=.494) and those who had received training (*M*=.40, *SD*=.490); t(6,596)=2.17, p=.000.

The twelfth research question in this study: is there a decline in the number of pursuits resulting in personal injury among licensed officers involved in a pursuit after attending continuous in-service police pursuit training compared to the period preceding training?

The independent variable (IV) is categorical with two categories:

1) Attended in-service police pursuit training

2) Did not attend in-service police pursuit training

The dependent variable (DV) is interval:

1) Number of pursuits resulting in personal injury

An independent-samples t-test was conducted to compare the number of pursuits resulting in personal injury conducted by licensed police officers who have not completed continuous in-service training on police pursuit and licensed police officers who have completed continuous in-service training on police pursuit. There was a significant difference in the number of pursuits resulting in personal injury for officers who had not received training (*M*=.19, *SD*=.394) and those who had received training (*M*=.16, *SD*=.370); t(6,596)=3.00, p=.000.

The preceding research questions have all examined the effectiveness of the continuous in-service pursuit training. Many of the questions have produced results that show statistical significance. In an effort to examine another factor unrelated to the continuous in-service pursuit training treatment two questions investigating the effect of the involvement of other agencies on pursuits ending in collision and pursuits terminated by officer discretion are answered using data from before the in-service training. While the degree of analysis could have been improved by studying the data from after the in-service training, that data is unavailable because the BCA did not record whether or not other agencies joined a pursuit in those years. The specific research questions used in this analysis follow:

The thirteenth research question in this study is: are there significant differences on the number of pursuits ending in a collision between pursuits where other agencies are involved and pursuits where other agencies are not involved?

The independent variable (IV) is categorical with two categories:

1) Other agencies are involved

2) Other agencies are not involved

The dependent variable (DV) is interval:

1) Number of pursuits ending in a collision

The fourteenth research question is: are there significant differences on the number of pursuits terminated by officer discretion between pursuits where other agencies are involved and pursuits where other agencies are not involved?

The independent variable (IV) is categorical with two categories:

1) Other agencies are involved

2) Other agencies are not involved

The dependent variable (DV) is interval:

1) Number of pursuits terminated by officer discretion

A one-way between-groups multivariate analysis of variance was performed to investigate differences in pursuits ending in collision and ended by officer discretion between pursuits in which other agencies assisted and pursuits in which no other agencies assisted. Two dependent variables were used: pursuits ending in collision and pursuits ended by officer discretion. The independent variable was other agency assisted. There was no statistically significant difference between pursuits in which other agencies assisted and pursuits in which no other agency assisted.

Alpert and Dunham (1990) found other units involved had a significant effect on pursuit outcomes. This finding was not replicated, however this data only examines whether other agencies were involved, not other units, so the results are not directly comparable. The analyses examining the effect of the continuous in-service training on pursuit identified significant effects on the total number of pursuits and on pursuits terminated by collision and officer discretion. The discussion of these results continues in the next chapter.

# CHAPTER V

# DISCUSSION AND CONCLUSION

The data from Minnesota on police pursuits is robust and provides insight into the phenomenon. As previously discussed, this dataset has been described as "unrivaled" (Crew et al., 1995, p. 418), "the only statewide reporting effort available" (Alpert & Fridell, 1992, p. 108) and "arguably the largest and most systematic database in existence on the topic" (Crew & Hart, 1999, p. 60). Minnesota is a leader in the nation when it comes to collecting data on police pursuits.

The validity of the methodology of using pursuit report forms to analyze police pursuits was supported by research from Wells and Falcone (1997). Upon completion of their study of police pursuits in Illinois using monitoring of state-wide emergency band radio frequencies they concluded the data show only slight, non-significant differences between the data collected using the emergency band radio network and other data sources such as report forms. The percentage of pursuits that ended in an accident, the percentage of arrests, and the percentage of fatalities were all similar between research methodologies.

The descriptive statistics alone provide officers and the public an opportunity to comprehend who is involved in a police chase. An overwhelming 61% of suspects fleeing the police are younger than 30-years-old and 11% are juveniles (Minnesota

Bureau of Criminal Apprehension, 1996 – 2003). Clearly a youthful violator is a probability given these numbers.

One component of quality pursuit training includes a discussion of the high prevalence of youthful offenders who choose to flee the police. Minnesota includes this discussion in its continuous in-service, as well as pre-service, training. If officers realize there is a good chance the traffic violator they are pursuing at high speed is a juvenile they may reconsider whether or not a serious injury resulting from a crash due to the poor choice of a teenager is truly just desserts.

The reason for pursuit initiation differs between juvenile and adult violators. Juveniles are more likely to flee because they are driving a stolen vehicle. Pursuit initiation due to a stolen vehicle is 29% for juveniles and 8% for adults. Adults are more likely to flee because of driving while intoxicated (DWI) than juveniles. Pursuit initiation due to DWI is 9% for adults and 2% for juveniles.

Knowing the high percentage of juveniles who are driving a stolen vehicle may provide an officer with some insight into the reason for fleeing if the officer can identify the approximate age of the violator. That information, combined with the fact that pursuits for stolen vehicles result in a collision at a higher rate than any other reason, may be a reason to end these pursuits through officer discretion. In addition, juveniles driving stolen vehicles are most often joyriding. While an officer can never be completely sure of the juvenile's intent, it is probable the offender will abandon the car with little or no damage when he or she is done with it. This especially brings the prudence of pursuing the violator at high speed into question. The fact that a high percentage of stolen vehicle

pursuits result in collision, combined with the fact most juveniles are joyriding and intend to abandon the car, makes the benefits of apprehending the suspect immediately secondary to the possible costs.

The descriptive statistics from Minnesota also made it clear the vast majority, 92%, of violators are male. Whether that information can be used in any meaningful manner is unclear. Nevertheless it is worth noting.

Results of the independent samples t-test on the number of pursuits found statistically significant differences between the two groups. Continuous in-service training on police pursuits is correlated with an increase in the reported number of pursuits. Given the history of the events precipitating this legislation it is certainly clear the goal of legislators could not have been to increase the number of pursuits occurring in Minnesota.

The research time period spans a decade. A lot can change in ten years and, as is exhibited in Table 2, the increase in the number of pursuits was joined by an increase in the number of licensed drivers on Minnesota roads and an increase in the number of licensed officers working for Minnesota departments. The number of officers with active licenses was used in the statistical calculations and is accounted for in the analysis. The increase in the number of licensed drivers was not part of the equation. The percentage growth of licensed drivers was smaller than the percentage growth in the number of pursuits and the number of officers with active licenses. However, the total number increase in the number of licensed drivers is much larger.

The question then becomes, is the treatment actually increasing the number of pursuits? If it is, serious questions arise as to the value of the training. Are officers somehow suddenly more comfortable with engaging in a pursuit after training? Did officers routinely choose not to pursue prior to the training due to a lack of confidence in their driving ability? While this is a possible explanation, there are other possibilities to consider.

One explanation for the increase in the number of pursuits between the study periods is that the increase in the number of drivers combined with the increase in the number of licensed officers may be working together to drive up the number of pursuits. Additional drivers are on the road committing more infractions. Additional police officers are on the road observing these infractions. This probably is contributing to the increased number of pursuits. In fact, the percentage of pursuits initiated for a traffic infraction, the reason most likely affected by the growth of these two groups, went from 53% in the period of 1996 – 1998 to 60% in the period of 2003 – 2005. Population growth in Minnesota during that time period was primarily in the Minneapolis – Saint Paul metropolitan area. If it were possible to separate that area out it is likely an even larger percentage increase in licensed drivers and licensed officers would be identified.

Another explanation for the increase in pursuits could be better reporting practices. Since 1988 all police pursuits in Minnesota had to be reported to the Minnesota Bureau of Criminal Apprehension using the appropriate form. While this law went into effect in 1988, training in pursuits, and consequently training in reporting pursuits, did not occur until a decade later. It is plausible that the increase observed after

the training is simply an increase in the number of pursuits reported, not the number of pursuits. As was found true in the literature review, pursuits without negative outcomes were seldom reported in jurisdictions studied. Officers who engaged in a pursuit but were unaware of the law may not have reported pursuits that did not end with a negative consequence. Reporting requirements can be changed often. It is certainly not impossible that individual officers, and even entire departments, missed the 1988 change in the law.

Unfortunately it is impossible to test this hypothesis with a quantitative analysis since one cannot analyze data that does not exist. As anecdotal evidence to support my hypothesis I relay the following event. During my time as a deputy sheriff with the Otter Tail County, Minnesota, Sheriff's Department I was assigned to lake patrol. This was a full-time, seasonal position. One winter a snowmobile went through the ice on a lake and the operator drowned. The deputy who responded knew a drowning needed to be reported to the State Department of Natural Resources (DNR). He completed the standard Otter Tail County Sheriff's Office accident report and diligently sent a copy to the Minnesota DNR. He received the report back with a letter that he had not used the proper report form. Seeing that a trip to the file cabinet full of State forms was in order, the deputy found a Watercraft Accident Report form from the DNR to be used to report all watercraft accidents. He completed the form and mailed it to the DNR, confident in the fact he had done his duty.

Approximately a week later he received a letter back from the DNR that he had not completed the proper form. Having tried twice to comply with the law, and having

responsibilities other than paperwork, he called me frustrated. I knew what the problem was immediately. I had been trained in water rescue and recovery operations; that training included the State's requirement of reporting all drownings to the DNR. I sent him back the file cabinet full of State forms and told him to complete a DNR Water Accident Report form, not a DNR Watercraft Accident Report form (the blue form, not the green one). A snowmobile is not a watercraft and the DNR was not going to have a water accident involving a drowning off a snowmobile reported as a watercraft accident. He completed the Water Accident Report form and the DNR accepted it.

I relay this anecdote simply to elucidate the impact training can have on compliance rates with laws and rules. As part of my training in water rescue and recovery operations I was given information on the State reporting requirements and the proper manner in which to comply with those requirements. Minnesota peace officers were not provided training after the reporting requirements changed in 1988. The training required after the 1998 legislation includes a discussion on the need to use the BCA form to report all pursuits. It is plausible to conclude the increase in the number of pursuits observed between the study periods may be attributable to better reporting rather than to additional police pursuits.

The challenge to the conclusion that the increase in the number of recorded pursuits is primarily due to underreporting is that pursuits, even when they end successfully, are public events. When a pursuit is initiated, the local dispatcher is notified. The pursuit occurs over radio frequencies monitored by other agencies, media organizations, and the public. Even if an officer and his or her department were unaware

of the reporting requirement, officers from other agencies will be aware of the pursuit. As additional persons become aware of the pursuit the likelihood someone would be aware of the reporting requirement increases. Though the increase shows up as statistically significant based on the number of active peace officer licenses the combination of an increase in the number of actively licensed peace officers, up 13%, and an increase in the number of licensed drivers, up 9%, may interact to account for the increase in the number of pursuits experienced by Minnesota between the study periods.

Results of a multivariate analysis of variance on the number of pursuits ending in a collision and the number of pursuits discontinued due to officer discretion found statistically significant differences between the two groups. There is a correlation between continuous in-service training on police pursuits, a decrease in the number of pursuits ending in a collision, and an increase in the number of pursuits ended by officer discretion. Certainly these are the outcomes sponsors of the groundbreaking 1998 legislation were hoping for. This discovery is exciting and its possible impact on public policy is considerable.

The statistically significant reduction in the number of pursuits ending in a collision that is correlated with continuous in-service pursuit training will be discussed first. Pursuits that end in a collision are costly, both in financial and personal terms. An estimate of the financial impact to the State of Minnesota by Crew and Hart (1999) using data from police pursuits and data from the Insurance Information Institute identified the total cost of pursuits that resulted in an accident, personal injury or fatality during the period of study at $185 million. This study period included 2,783 chases that resulted in

an accident, personal injury or fatality. By dividing the number of chases that ended in those outcomes with the total cost, a result of a cost per collision of approximately $66,475 is obtained.

Providing continuous in-service training on pursuits to every actively licensed officer in the State of Minnesota is not inexpensive. In 2008, the training cost $366 per officer. That price includes the use of a car owned by the training facility so vehicle wear and tear is included. In the years 2003 – 2006 approximately 28,365 officers attended the training, an average of 9,455 officers annually. This cost police agencies in the State of Minnesota $3,460,530 annually. Some of this cost is reimbursed to those agencies through the State via surcharges attached to traffic violations.

The analysis also identified a reduction in the percentage of pursuits ending in collisions from 25% in the years prior to training to 19% in the years after training. There were 3,820 pursuits during the years 2003 – 2006, an average of 1,273 pursuits annually. Prior to the training, an average of 318 pursuits would have ended in a collision annually. After the training, an average of 242 pursuits ended in a collision annually. Therefore, on average, 76 fewer pursuits ended in a collision after the training than before the training. This change provided a public good to the citizens of the State of Minnesota valued at $5,052,100 annually. The calculation of this public good follows.

Continuing education in any aspect of policing is not free. Officers in Minnesota are required to complete 48 hours of continuing education every three years. Money is going to be spent on continuing education whether or not that includes pursuit training. This is worth mentioning because the cost estimate does not account for this fact. Simply

put, even if the in-service pursuit training requirement was eliminated the State would not realize the full annual savings of $3,460,530. But even when that fact is set aside, continuous in-service pursuit training seems to make financial sense. By subtracting the cost of training from the savings realized by the reduced number of pursuits ending in collision, the citizens of the State of Minnesota are provided with an annual return on its investment of $1,591,570.

Additional analysis identified that pursuits initiated for certain reasons are more likely to end in a collision than others. This information may assist agencies in training officers on which pursuits are traditionally the most dangerous. Pursuits initiated for a stolen vehicle ended in a collision 36% of the time. Information that pursuits for stolen vehicles are dangerous is important to disseminate during training. Unfortunately the reason of stolen vehicle could not be separated out between study periods because the State of Minnesota did not provide it as a reason for initiation of a pursuit until 2000. This precluded analysis of the impact of training by separating out pursuits initiated for this reason.

Pursuits initiated for traffic violations, DWI and warrant all end in a collision at approximately the same rate, 16%, 18%, and 17%, respectively. The decrease in collisions after the training was significant for traffic violations, which had been ending in collision 21% of the time. It was not statistically significant for pursuits initiated for DWI or a warrant. The number of pursuits for warrants is small; there were only 148 pursuits for warrants over the six year study period. There was no statistically significant

difference in the rate of pursuits terminated by officer discretion when the pursuit was initiated for a traffic violation, a DWI, or a warrant.

Pursuit training also had an effect on the number of pursuits ending in property damage. This is different than reason for termination by collision because pursuits that end for other reasons, such as the violator stopping, can still result in property damage during the pursuit which does not result in the termination of the pursuit. Examples mentioned earlier included the fact that a violator may side-swipe a parked car but be able to continue fleeing or one squad car may be wrecked but other responding units are able to continue pursuing. The percentage of pursuits resulting in property damage before the training was 42%. The percentage of pursuits resulting in property damage after the training was 40%. This decrease was found to be significant.

Personal injuries resulting from police pursuits are especially concerning given the enormous financial, physical, and emotional costs associated with them. Pursuit training significantly decreased the number of pursuits resulting in personal injury. Before the training 19% of pursuits resulted in personal injury; after the training 16% of pursuits resulted in personal injury. This decrease was significant. This is a great outcome given the severe consequences of personal injuries.

In an effort to look at other factors that may be affecting the reasons police pursuits are terminated, data on pursuits ending in collision and pursuits terminated by officer discretion based on other agencies assisting was examined. In 1990, Alpert and Dunham found that when other units were involved in a pursuit the chance of a negative outcome increased. Minnesota does not record how many units are involved in a pursuit

but did record when multiple agencies were involved. This is not the same so the statistics are not comparable but it is interesting to study nonetheless. Minnesota stopped recording whether other agencies were involved in 2000 so the data is only available for the first study period. One might expect to find fewer pursuits terminated by officer discretion due to the desire of some officers to avoid appearing weak in front of officers from other agencies. In turn, this could result in an increase in the number of pursuits ending in collision because high risk pursuits that may have been terminated by officer discretion were not. But during the study period in which data on other agency involvement was recorded there appears to be no significant effect of other agencies being involved on the outcome of pursuit.

Better trained officers, a smaller percentage of pursuits ending in a collision, a decline in the percentage of pursuits resulting in property damage, a decrease in the percentage of personal injuries, and a savings of $1.6 million annually indicate the continuous in-service training on pursuits program is having a significant impact. However, there is another interpretation that can be made from this correlation between the reduced percentages of pursuits ending in collision and training: that the training did not reduce the percentage of collisions but rather increased the number of reported pursuits. Previous research has shown the most likely pursuits to be unreported are those with no negative outcome since they do not result in property damage, injuries, or fatalities that require explanation. Minnesota experienced an increase in the number of pursuits recorded by the BCA during the study period. Perhaps the reduction in the percentage of collisions is simply a function of this phenomenon and thus training cannot

be credited for the financial savings identified above. While that explanation cannot be discounted, I proffer the initial explanation to be more plausible due to the data on pursuits discontinued by officer discretion.

The increase in the percentage of pursuits discontinued by officer discretion is also found to be correlated with continuous in-service pursuit training. This increase is unlikely to be the result of better reporting because the evidence that lends support to the hypothesis that pursuits ending in a negative outcome are reported at a higher rate does not extend to pursuits discontinued by officer discretion being underreported. Prior to the training, police officers, or their supervisors, discontinued 4% of pursuits due to officer discretion. After the training, they discontinued 6% of pursuits due to officer discretion. As discussed previously, the training focuses on decision making skills and behind-the-wheel driving skills. An officer who keeps a cool head and is constantly weighing the costs of continuing a pursuit with the benefits of capturing a violator is more likely to arrive at a conclusion that supports discontinuing a pursuit than an officer whose emotions and adrenaline have taken over his or her better judgment. The violator has shown that he or she is not exercising sound judgment; the officer is the safety valve capable of ending danger to him or herself, the violator, and the public. The analysis indicates that Minnesota officers who have completed the training are more likely to act as that safety valve.

The dataset from Minnesota is broad and robust. It contains a great deal of information on pursuits that occurred in the state over the last two dozen years. Nevertheless there are limitations to the dataset, especially in the years that were

examined in this research. One of the limitations is the deficiency of data on officers involved in a pursuit. While the form requests this information, it does so in a manner that was easily misinterpreted. For that reason, a large percentage of pursuit report forms did not include any information on the officer involved. The Minneapolis Police almost never report officer information and the problem presents itself consistently across departments in the state. Previous research found significant differences in pursuit outcomes based on the demographics of the officer. Without that information, comparisons between those studies and Minnesota cannot be made; this is disappointing. Fortunately, staff at the Bureau of Criminal Apprehension noticed this problem and made a change to the report form. There is now a specific line titled officer in the subject information section. This should allow analysis of data from later years to be conducted on officer characteristics and is an area for future research.

This research revealed a large number of police pursuits involve youthful violators. Well over half of all violators were under age 30. Over one in ten violators was under the age of 18; this is disconcerting when paired with the fact this age group represents a very small percentage of the total number of licensed drivers and anyone under 16 in Minnesota is not licensed at all. These drivers have the least experience of anyone on the road. This fact combined with decision-making skills that have not had time to fully develop is a recipe for disaster. Between one-quarter and one-third of all pursuits involving juveniles are initiated because of a stolen vehicle. And, as previously mentioned, pursuits initiated for a stolen vehicle are most likely to end in a collision; over one-third of them do.

Better information on why juveniles flee would be useful. It would be especially beneficial to incorporate that information into officer training. This would provide pursuing officers with some insight into what the violator may be thinking and how the violator may respond to different actions an officer may take. Since many juveniles in stolen vehicles are joyriding, and do not intend to keep the car, ending these chases by officer discretion seems to have obvious benefits. Further research on this phenomenon is justified.

Police pursuits are a controversial topic that will continue to be the subject of considerable debate in law enforcement agencies, in state legislatures, in Congress and among the public. The police community has come a long way since the 1968 Physicians for Automotive Safety study. Pursuit policies have been developed; pursuits are reported more regularly; and officers are receiving training on pursuits. All of these changes have moved the police in the right direction. Much has been learned about police pursuits, but there is still much to discover.

Minnesota was a pioneer when it began requiring that all police pursuits statewide be centrally reported to enable tracking of pursuit outcomes. The required continuous in-service training on pursuits is also groundbreaking. This research study has shown the program has had an impact on police pursuits and the outcomes of those pursuits. Data analyzed came from the entire State of Minnesota and comprises rural regions, small and mid-sized communities, and large metropolitan areas. The breadth of the data makes it especially generalizable beyond Minnesota. It is probable these results could be replicated outside the State of Minnesota. Continuous in-service training of police

officers in pursuit is valuable, should be continued in Minnesota, and should be expanded across the country.

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