

A SURVEY OF PROBLEMS AND CONDITIONS WITHIN THE ORGANIZATIONAL  
CONTEXT OF LAW ENFORCEMENT AGENCIES PERCEIVED TO BLOCK  
OR IMPEDE THE USE OF ACCIDENT INVESTIGATION TRAINING

by

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(ABSTRACT)

Reported is an exploratory study of problems and conditions within the organizational work context that influence posttraining use of training outcomes. Training is widely perceived and supported as an effective means for facilitating planned change in organizational performance. Little empirical evidence is available to support such supposition. Of the several studies of training impact, few have focused on why training does or does not produce behavioral change back on-the-job. Accordingly, training management is often incomplete and ineffective. This study employed a questionnaire methodology, directed to a national sample of 391 local, county, and state law enforcement personnel who graduated from a two-week accident investigation training program. Questions elicited ratings on 29 problem/conditions hypothesized within the literature as influential to organizational work behavior. A Likert type scale was used to rate the perceived influence of each problem/condition on the application of specific training outcomes

during investigation of a recent most serious accident. An index was used to measure level of training use.

Analysis of Variance (ANOVA), Scheffe's comparisons test, and multiple regression analysis were used to answer study questions. Problem/conditions identified by more than 30% of the respondents as a Moderate or Major impediment to their use of training outcomes were: lack of rewards or incentives to conduct thorough investigations or to use knowledge and skill acquired through training; lack of time to apply investigative techniques by training; lack of resources and equipment necessary to apply training; lack of follow through by agency decision makers to see that training was put into use; and, lack of communication from top administrators indicating how the training was to be used. Isolated as predictors of training use were: the relative seriousness of the situational context within which training was applied; the trainee's opinion of the course; level of specialized training received; relative frequency of investigative assignment; and, level of conflict perceived to exist between behaviors specified by training and agency standard operating procedures.

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## Chapter 1

### BACKGROUND OF THE PROBLEM

Training is widely perceived and supported as an effective means of facilitating change in performance and behavior within organizations. Each year millions of private and public sector employees participate in training and education programs (Anderson and Kasl, 1982; Smith, 1979; Lusterman, 1977). Annual nationwide training and education costs have been estimated as high as \$100 billion dollars (Gilbert, 1976).

Within this context, concern continues to grow over the basic effectiveness of such programs (Beaumont, 1979; Ettlíe, 1979; Deterline, 1976). It has been estimated that the U.S. government alone spends an estimated one billion dollars each year just to evaluate the programs it funds (Rossi, 1979), many of which employ training as a primary intervention.

Likewise, accountability in private sector training is becoming of greater concern, as witnessed by recent focus within the literature on such topics as "results oriented training designs" (This, 1980), "bottom line pay-off for training" (Nickols, 1979), and "training evaluations; evidence vs proof" (Kirkpatrick, 1977).

In spite of such attention, many who conduct and evaluate training, as well as those who provide fiscal or administrative support for training, do so as a matter of faith. As noted by Nickols (1979), little evidence is yet available to document the overall accountability

of training. Although numerous studies have been conducted which substantiate the claim that training can and often does produce change in trainee behavior, such studies typically limit their focus to the documentation of behavioral change -- measured within the controlled training environment. Empirical evidence is limited, however, to support the contention that change measured within the training context routinely carries over into the context of the day-to-day organizational work environment from which trainees are extracted.

The net effect is that, although widespread, trust in the training process remains largely unfounded. Recognition of the need for better understanding of the individual context vs group context determinants of behavior can be traced back to reference group research, popular during the 1950's, which sought to determine why individuals joined particular groups (Firebaugh, 1980). In 1966, Katz and Kahn expressed major concern over psychological fallacy. Writing in their landmark text, "The Psychology of Organizations", Katz and Kahn noted that such error in logic was widespread throughout social science research during the early 1960's. Of particular concern was the overgeneralization of change at the micro (individual) level to the intermediate (work group) level. They defined psychological fallacy as "the error one makes, when dealing with organizational change by disregarding the systemic properties of the organization and confusing individual change with modification of the organization" (p. 391).

More recently, Firebaugh (1980) has argued that this flawed logic remains widespread in social science research in the form of contextual fallacy or inattention to contextual effects. A classic example of contextual effect, noted by Firebaugh, can be found in the 1949 study by Stouffer. Stouffer, and others, found that inexperienced army officers, when assigned to an experienced unit, were less likely to state that they were combat ready than were inexperienced officers assigned to less experienced units. The difference in public testimony of readiness was accredited to the influence of the experienced, more critical, veterans on the inexperienced personnel.

In summary, Firebaugh suggests that although "most social scientists assume that groups affect individuals ..., the vast majority of empirical studies in the social sciences fail to test for group effects" (p.43).

As suggested previously, the result for training has been both unfortunate and expensive. Current training management practices, as well as those employed to evaluate training, commonly address only those tasks deemed necessary to facilitate change or support change at the individual (micro) level (Broad, 1980; Tracey, 1971). Ignored have been the many equally important factors and conditions within the organizational (macro) and work group (intermediate) contexts which may heavily influence the degree to which new knowledge and skill are actually put into use (Scheirer, 1981, 1979; Broad, 1980; Johnson, 1976).

Helpful examples do exist, however, in the diverse literature on organizational behavior and effectiveness, which illustrate the several factors and conditions (implementation problems) which may exist within the work environment to influence implementation success. At the macro level Berman and McLaughlin (1975) have focused on decision making as an important factor in program implementation success, Cohen and Collins (1976) on availability of necessary resources, and Greiner (1971) on the effects of anxiety induced by pressures in the external environment.

Although similarly reductionist in approach, research is also available to suggest a variety of contextual influences on behavior at the intermediate and individual levels. Examples at the work group level include Sussman (1978), Carpenter-Huffman (1979) and Doig's (1977) contentions that supervisory attitude toward an innovation may influence subordinate behavior, Allen and Silverzweig's (1976) association of group norms with individual behavior, and Manley's (1975) work on communication and change.

Effects at the micro, or individual, level have been associated with the individual's attitude (Sheirer, 1981; Ettlief, 1979), incentives (Fensterbush and Motz, 1980; Herzburg, Broad, 1980, Herzburg, 1968), and level of education (Heydebrand and Noell, 1973), among other factors.

Because research to integrate these diverse findings has not been forthcoming, the management of training remains cut off, or isolated,

from a significant portion of the organizational arena in which its effectiveness is both determined and ultimately evaluated.

An emerging evaluation methodology that may aid those concerned with the formulation of a more complete understanding of training impact, and the processes that affect it, is implementation research. Implementation has been defined, by Berman and Pauly (1975), as the process that occurs when an innovative policy or program impinges on an organization; with the primary purpose of implementation research being the explanation of an innovation's success or failure (Leithwood and Montgomery, 1980).

In recent years implementation research has emerged as a viable method for the identification and study of such factors and conditions. Research on implementation has been conducted in such areas as political decision making, program implementation and policy analysis (Hargrove, 1977), implementation of operations research strategies (Doktor, Schultz, and Slevin, 1979; Schultz and Slevin, 1975), and strategy implementation (Alexander, 1983; 1980).

According to Alexander, however, "little of the available literature goes beyond generalization or is of an empirical nature." (1983, p.1). According to Firebaugh (1980) empirical research, designed to overlap, so as to, over time, support the development of more highly integrated theory bases, is desperately needed in the social sciences.

### Statement of the Problem

This study represents a logical and necessary step forward for the training and adult education professions. Reported is a descriptive study of problems and conditions existing within the work environment of law enforcement agencies that are perceived to block or impede the use of knowledge and skill acquired through training. The results of this research may prove helpful to organization decision makers, training managers, and others, concerned with the use of training as an effective and efficient vehicle for maintaining and advancing individual, group, and organization competencies.

For this initial study a particular "job skill" training program (motor vehicle accident investigation), commonly endorsed by law enforcement agencies, and largely standardized among law enforcement training institutes throughout the United States, was targeted. Following Nadler's (1970, p.40) definition of job skill training, as that training which is "designed to improve performance on the job the employee is presently doing ... .", accident investigation training, with it's emphasis on development of precise technical skills for immediate job application, seemed particularly well suited to implementation research techniques.

Accordingly, this research focused on the following problem: What implementation problems, occurring within the organizational work

environments of accident investigation trainees, are perceived to block or impede training impact.

The following research questions served as guides during the investigation.

- RQ1 What are the demographic characteristics of personnel trained in the Institute of Police Traffic Management's (IPTM) At-Scene Accident Investigation course?
- RQ2 What implementation problem/conditions are most commonly perceived by law enforcement trainees to influence the posttraining use of knowledge and skill acquired from accident investigation training?
- RQ3 What association exists between the reason individuals are selected to attend training and level of training use?
- RQ4 What association exists between trainee opinion of course appropriateness for training law enforcement personnel and level of training use?
- RQ5 What association exists between trainee rating of specific implementation problem/conditions existing within the organizational context and level of training use?
- RQ6 What association exists between trainee opinion of accident investigation as an enforcement function and job responsibility and level of training use?
- RQ7 What association exists between accident severity and level of training use?
- RQ8 What association exists between trainee posttraining accident investigation rate and level of training use?

### Objectives of the Study

The major objective of this study was to develop a more complete understanding of how various problems and conditions within the organizational work environment of law enforcement agencies influence the use of training. This level of understanding is necessary if training management and design is to advance beyond the overly simplistic theory base that currently supports many contemporary training activities. To meet this central objective this study identified problems and conditions existing within the organizational environment of law enforcement agencies that were perceived by organization members to block or impede the use of knowledge and skill acquired during accident investigation training.

It should be noted that a wide variety of interesting and potentially fruitful questions could have been posed relating to individual, group, and organizational characteristics, and how they may influence training impact. For example, the relationships between level of education, years of work experience, and agency size and type and use of training are particularly attractive. However, due to the overall constraints of time, effort and finance, among other considerations, this study was restricted to the questions outlined above.

### Limitations

The research outlined within this dissertation was subject to the following limitations. A proportionate response from the study sample

was needed so that findings could be generalized to the larger population of sworn enforcement personnel, throughout the United States, who have successfully completed the two-week At-Scene Accident Investigation program offered by IPIM.

Findings may not be generalized to other training interventions or topics, or to training or education programs aimed at impacting more complex learning outcomes (see Gagne', 1974; Gagne' and Briggs, 1974).

#### Definition of Terms

Detailed discussion of the various problems or conditions which may be hypothesized to influence posttraining use of training outcomes are included within the various sections of Chapter 2. Definitions are provided below for "level of training use" (independent variable), "implementation problem/condition", and several several constructs which require more precise measurement.

#### Accident Seriousness.

A rating on a Likert type scale comparing the seriousness of the most serious accident investigated since attending accident investigation training with most accidents investigated by the respondent's agency. Reponse options ranged from zero (Much Less Serious) to ninety-nine (Much More Serious) (see Q-1.2).

#### Implementation Problem/Condition.

A behavior, condition, characteristic, or other attribute of the organization environment, rated by the respondent on a four point

Likert type scale as having exerted some level of negative influence on his/her posttraining use of knowledge and skill emphasized during training. Scale ratings are 1) "Not a Problem/Influence", 2) "A Minor Problem/Influence", 3) "A Moderate Problem/Influence", 4) "A Major Problem/Influence" (see Q-5).

#### Law Enforcement Trainee.

A sworn law enforcement officer, representing either a local or county police department, a sheriff's department, or a state police/patrol agency, within the United States, who has successfully completed the two-week At-Scene Accident Investigation course provided nationally by the University of North Florida's Institute of Police Traffic Management (IPTM).

#### Level of Training Use.

An index score calculated for each respondent by summing their affirmative responses to 17 statements which elicited feedback on use, or non-use, of a specific job skill or technique emphasized during AI course training (Q-2).

#### Opinion of Course Content and Appropriateness For Law Enforcement Personnel.

An index score calculated for each respondent by summing their individual responses to 10 course associated opinion statements. The statements were selected from among 78 statements based on their ability to distinguish AI trainees holding a "positive" opinion toward

the training program, and its appropriateness for law enforcement personnel, from those holding a "negative" opinion. (Q-8; Items 4,5,6,8,10,11,12,13, 14,18).

Opinion of Accident Investigation as an Enforcement Job Responsibility.

An index score calculated and derived in a manner identical to the "course content/appropriateness" index, but which differentiates on the basis of opinion toward accident investigation as a law enforcement job responsibility. (Q-8; Items 1,2,3,7,9,11,15,16,17,19)

Posttraining Accident Investigation Rate.

A rate calculated for each respondent by dividing the total reported number of accidents investigated since completion of At-Scene training (Q-3) by the number of weeks elapsed since training.

Reason Selected to Attend Training.

An affirmative response to one of three statements indicating the reason the respondent was selected to attend At-Scene Accident Investigation training. Response options are; 1) "My job assignment required that I investigate accidents", 2) "I was sent in preparation for a future job assignment which would involve accident investigation", 3) I was assigned to attend for reasons other than present or future job need; that is, while recovering from injury, as a reward, or other department reason" (see Q-6.2).

### Assumptions

In conducting this mail questionnaire study several assumptions were made. One key assumption was that study findings would be generalizable to the larger population of At-Scene Accident Investigation trainees. To support this assumption it was necessary to achieve an adequate response level, or rate of return. Henkel (1976) points out that when the nonresponse rate is high a nonprobability sample results. As noted by Dillman (1978), however, a relatively high response rate for questionnaires mailed to homogeneous groups can be expected, if the mail survey process is carefully designed and implemented. Using Dillman's Total Design Method (TDM), it was anticipated that a 70% rate of return would be achieved with the specific population of enforcement personnel targeted by the survey. In support of that assumption, it was noted that a 59.6% return (adjusted for non-locatables) had been achieved on a 78 item AI attitude scale development questionnaire mailed to 184 accident investigation course graduates during the summer of 1984. This reasonably high rate of return was without a second reminder. With follow up, Dillman notes (p. 185); "the reminder postcard is followed by a burst [of returns] that almost equals and occasionally surpasses that achieved by the first mailing."

A second major assumption was that respondent data would be reliable and valid. At least one optimistic indicator of potential study reliability was available from the attitude scale development experience described above. Using a Likert type scale to solicit

ratings on 78 opinion statements and develop two opinion sub-scales, Cronbach's alphas of .858 and .864 were observed (Carmines and Zeller, 1979). These measures of internal consistency of response, on a scale with many reverse coded items and which differentiated positive from negative opinion holders, lended support to the assumption of response reliability from the enforcement population studied. Safeguards taken against major sources of response error and other forms of invalidity are discussed in Chapter 3.

#### Significance

Those who endorse training as a means for facilitating change in organizational behavior and performance, as well as those who design and manage training interventions, currently do so on the largely unfounded assumption that training results are actually put into use. Although some training evaluations do attempt to measure training impact, few research efforts have attempted to explain why training outcomes are, or are not, implemented "back-on-the-job".

The purpose of this research study was to help fill that void in knowledge. Accordingly, it represents a logical and necessary step forward for the training and adult education professions, toward the development of a more complete understanding of training impact and how it may be more effectively planned and facilitated. Findings from this study may also aid law enforcement administrators and training managers to more effectively manage and achieve increased training impact.

In addition, findings from this research may lead to further empirical study of the factors and conditions underlying training impact and effectiveness, and provide, over time, a more responsive vehicle through which training management theory and practice may evolve. To paraphrase Leithwood and Montgomery (1980), several important questions which implementation research may, in time, answer are: 1) Under what conditions are training outcomes more likely to be implemented?; 2) Do the actual outcomes of a particular training intervention match the contextual attributes and conditions of the organizational setting into which they are to be introduced?; and, 3) Was a particular training program's failure due to faulty design, lack of adequate resources, financial support, or lack of a fair opportunity to succeed?.

#### Organization of the Study

This dissertation is divided into five chapters. Chapter 1 provides a brief introduction to the problem and its setting. Study objectives, research questions, definitions, and other preliminaries are included.

Chapter 2 provides a review of the literature relevant to the overall research objective, and presents pertinent conceptual and theoretical foundations for the research questions outlined within Chapter 1.

Chapter 3 focuses on the analytical methods and procedures used. Included are discussions of: the population studied, the research design, instrumentation, and data gathering and analysis procedures.

Chapter 4 presents the research findings. Tables, figures and charts related to the several research questions are presented as a basis for analysis and discussion.

Finally, Chapter 5 includes a summary of the entire research effort, conclusions drawn from the evidence at hand, and recommendations for further research.

#### Summary

This dissertation details exploratory research conducted to identify problems and conditions perceived to exist within the work environment of law enforcement organizations that influence the posttraining use of training outcomes. Training is widely perceived and supported as an effective means for facilitating change in organizational behavior and performance. Little empirical evidence is available to support such supposition. Of the several studies of training impact few have focused on "why" training does or does not produce behavioral change back-on-the-job. Accordingly, training management is often incomplete and ineffective.

This study employed a mail questionnaire methodology directed to a sample of enforcement agency personnel who attended a two-week job skill training program (At-Scene Accident Investigation). This course and, more specifically, its training outcomes, are commonly regarded by

enforcement agencies throughout the United States and Canada as the "right way" to conduct a professional accident investigation or reconstruction. Questions elicited ratings from successful course graduates on approximately 29 problems hypothesized from the literature as influential to individual behavior within the organizational setting. Using an index to classify respondents according to level of training use, problems and conditions existing within the organizational context that were perceived to block or inhibit training use are discussed.

## Chapter 2

### REVIEW OF RELEVANT LITERATURE

This chapter is divided into two sections; 1) Background of the Training Management/Evaluation Problem, and 2) Problem/ Conditions Affecting Training Use Within the Organizational Context. Section one is further divided into two parts; The Role of Training in Organizational Systems, and Approaches to Training Evaluation. Section two, Problem/Conditions Affecting Training Use Within Organizational Systems, provides a review of literature relevant to the overall training effectiveness issue. Findings from the diverse literatures of organization behavior, education, and psychology, among others, are discussed, to identify implementation problem/conditions existing at the organization (macro), intermediate (work group), and micro (individual) levels.

#### Background of the Training Management/Evaluation Problem

Commonly cited throughout the literature are statements that billions of dollars are spent each year by private and public organizations to support the training of millions of individuals (Anderson and Kasl, 1982; Lusterman, 1977). Gilbert (1976) has estimated the total annual training cost, for all U.S. public and private sector organizations, to be as high as \$100 billion dollars. The prevalence of sponsored training activities may be more easily grasped by reviewing Lusterman's 1977 survey of 600 major U.S.

corporations, with 500 or more employees. He found that over 74% of the respondents supported the annual involvement of their employees in some form of in-house or external training activity. Direct expenditures for this sample alone were estimated to be \$2 billion dollars.

In spite of considerable evidence that support for training and the installation of new training programs in U.S. corporations (Lusterman, 1977), as well as the public sector (Smith, 1979), is increasing at a rapid rate, there also exists widespread concern over the effectiveness and accountability of such activities (Meyers, 1981; Nickols, 1979; Kirkpatrick, 1977).

Katz and Kahn presented a useful perspective on this somewhat paradoxical situation in their landmark text, "The Social Psychology of Organizations" (1966). In their model of organizations as open systems, whose behavior and output result from the dynamic interaction of both internal and external forces, Katz and Kahn presented training as a function whose purpose is the facilitation of change, or movement, within the organization, toward some purpose or goal. Accordingly, the tendency to misinterpret this vital relationship was noted as "psychological fallacy". Viewed as a common problem in social science research during the early 1960's, psychological fallacy was defined as the error committed in dealing with problems of organizational change, both at the practical and theoretical levels, by disregarding the systemic properties of the organization and confusing individual change with modification of organizational variables (p. 391). As applied to

training, it is accordingly erroneous to interpret change in knowledge and skill observed at the individual level as evidence of behavioral change which has occurred, or will occur, back on the job.

Unfortunately, the tendency toward oversimplification, with the frequently associated misinterpretation of change, continues to be widespread throughout social science research and practice (Firebaugh, 1980). Presenting Katz and Kahn's earlier argument in slightly different form, Firebaugh suggests that many of today's studies are overly reliant on the single-level approach to research. He notes, "though most social scientists assume that groups can affect individuals . . . , the vast majority of empirical studies in the social sciences fail to test for group effects" (p. 43).

The importance of this recurring observation in helping gain insight into the training credibility problem is considerable. In spite of arguments by Dunn (1982) and Patton (1980) that theory, along with its close relative generalization, should be "practice driven" (Dunn, p. 293), much of what we do in training and training management continues to model after historically accepted theory and practice from psychology and education. Both of these disciplines focus extensively on the individual as the primary unit of analysis and tend to ignore the effects on behavior of broader, adjoining contexts such as conditions within the individual's (trainee's) work environment.

The result has been both unfortunate and expensive. Current training management practices focus largely on only those issues deemed relevant to facilitation of change at the individual, or micro level

(Broad, 1980; Tracey, 1971). The change or outcome at this level can generally be categorized as increased or enhanced knowledge or behavioral skill. Commonly ignored are the many equally important determinants of behavioral change that exist at the intermediate and macro levels of human/organizational interaction (Broad, 1980; Scheirer, 1979; Johnson, 1976). As a result the management of training has been largely cut off, or isolated, from a significant portion of the organizational arena in which its effectiveness must ultimately be evaluated.

#### The Role of Training in Organizational Systems

Figure 1, a systems model depicting the role of the training function within organizational systems, graphically illustrates the current training management dilemma (McDonald, 1981). At level OB (organizational behavior), the various units that make up an organization perform tasks and activities necessary to ensure the organization's survival. As needs are identified from internal as well as external sources they are transported along with other inputs such as energy, communications, and resources into appropriate sub-units for processing. These inputs form the basis for the organization's work behavior -- as depicted by boxes A2, A3, and A4. This routine processing of inputs into outputs is commonly referred to as throughput (French and Bell, 1973).

Training is depicted at level IC (individual change) as a functional subsystem of the routine organizational throughput process.

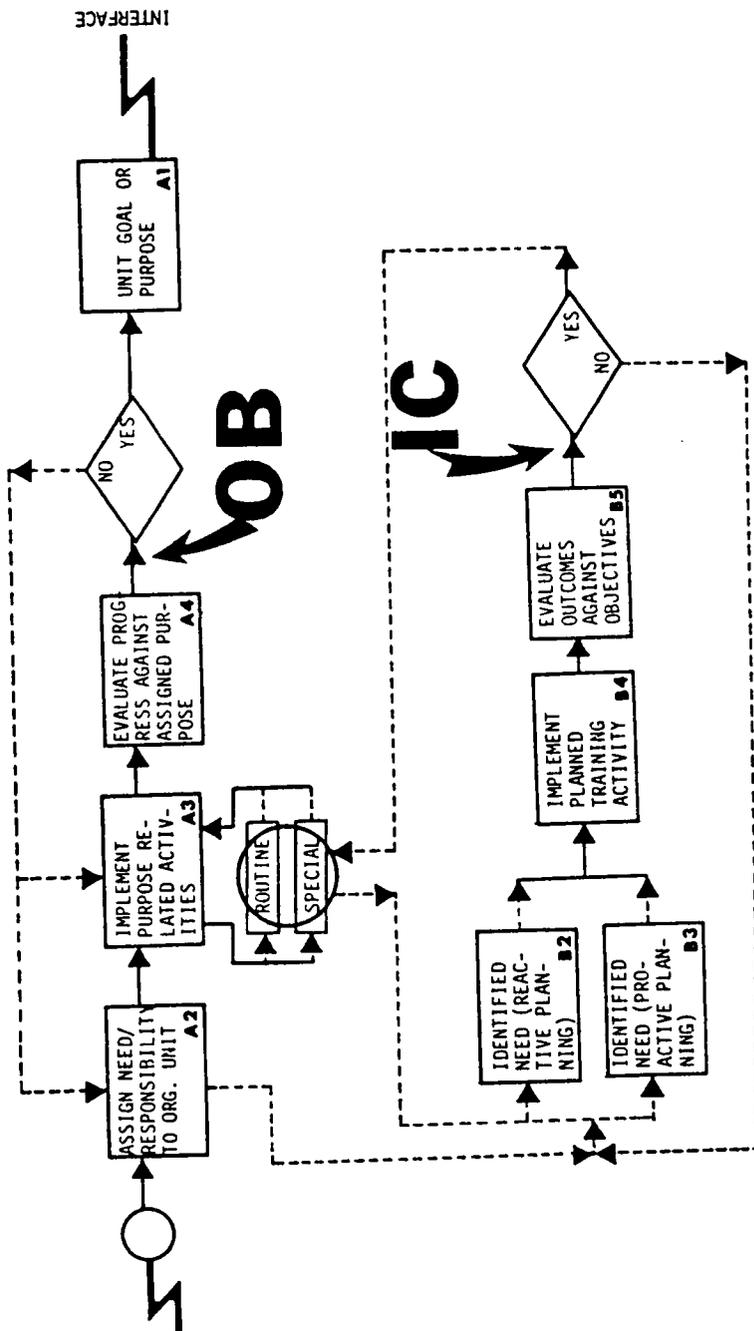


Figure 1. Basic Relationship of Planned Training Interventions to Behavior in Organizational Units.

As problems or needs are identified, perceived, or anticipated at level OB they are transmitted into the training subsystem for processing. Conceptually, the role of the training subsystem becomes quite clear. It is to facilitate those changes in organizational behavior required to maintain viability and goal attainment at level OB.

Within the literature, however, the term training has come to hold a wide variety of interpretations. It has been widely used to "mean anything from an obsession with increased productivity to something closely resembling a fringe benefit for the employee" (Brown and Wedel, 1974; p. 13). For purposes of this dissertation research the term will be follow Nadler's definition of training as any planned activity "designed to improve performance on the job that the employee is presently doing or is being hired to do" (1970, p.40).

The significance of Nadler's definition is not in its emphasis on behavioral change, but in its underlying assumption that change produced by training is directly linked to some purpose within the larger organizational context (A1 ; A2). It is attention to this sense of interconnectedness that seems to be missing in much of the literature upon which contemporary training practices are based. Broad (1980) notes, for example, that in spite of increased attention by those who manage organizations to "training support systems" (p.3) there has been little, if any, effort undertaken to systematically identify and compile information on management actions that support on-the-job use of results from training.

The need for a more expansive and responsive philosophy of training and training management has been recognized for some time. In their 1967 report on line-staff relationships within employee training, Heisel, Padgett, and Harrell observed that while "much has been written on the techniques of line supervision, the use of conferences, the value of audio-visual aids, and the functions of programmed instruction . . . , training policies and organization have received little attention" (p. 2).

More recently Nigro and Nigro (1974) have suggested that training managers concern themselves with three strategic functions. They are: (1) the isolation and analysis of socio-psychological and technological conditions within the organization that inhibit or block goal attainment, (2) the development and maintenance of an organizational climate in which rational decisions can be made about training goals, methods, and procedures, and (3) program design, development, implementation, and evaluation (p. 146).

In spite of such well rounded and conceptually well integrated training management strategies, those who manage and conduct training continue to draw heavily on theory and practice from education and psychology (Ingalls, 1973) and engineering (Smith, 1971). As noted previously, both education and psychology view the level of individual behavior as the primary unit of analysis. In a similarly restrictive fashion, the training theory base drawn from engineering is heavily influenced by assumptions from closed systems theory about how complex organisms can be subdivided into a finite set of component parts --

with each discrete part susceptible to assessment and efficient re-design. Both Smith (1971) and Cicero (1976), for example, have presented systems models outlining how training may be evaluated. Their concern is directed more to the processes of instructional design and delivery (B2-B5) than to the ultimate utilization of training outcomes (A3) -- or facilitation of training impact on organizational behavior (A4).

Ball (1981) suggests such models, which rely on oversimplistic assessments of complex events, incorrectly assume "if certain processes occur, then certain outcomes are bound to occur" (1981;p. 71). As a result, it is not surprising that commission of the individualistic fallacy -- or error of oversimplification -- is so widespread throughout the training enterprise.

If one accepts the view that training's purpose is to facilitate planned change in organizational behavior (OB), then one must also reject the notion that training impact may be assessed with any degree of organizational validity at the individual level (IC) (Schultz and Slevin, 1975). The significance of agreeing with this observation is that in so doing one must also reject the fallacious reasoning inherent in interpreting learning outcomes, such as verbal information, intellectual skills, cognitive strategies, attitudes, and motoric skills (Gagne', 1974) as commensurate with training effectiveness. Clearly, while training does often result in learning -- or changes in individual behavior (IC) -- those changes are not automatically generalizable to the organizational level (A3). The valid assessment

of training effectiveness requires a more holistic analysis of the extent to which learning produced by training takes root within the complex organizational environment. In addition, the further advancement of training management theory and practice will require a more complete understanding of how specific contextual factors influence the use of training. Presently the literature on evaluation, relevant to the study of training, is silent as to how this may be accomplished.

#### Approaches To Training Evaluation

A review of the training and evaluation literature indicates that basically four major categories of evaluation exist. They are: (1) assessments concerned with program planning and improvement, (2) assessments focusing on administrative concerns, which rely on monitoring techniques to compare program activities with program objectives, (3) assessments concerned with program impact, and (4) assessments focusing on economic efficiency (Rossi, Freeman, and Wright, 1979).

With regard to the first category, assessments aimed at program planning and improvement, one of the most frequently used types is the participant reaction assessment (Reeves and Jensen, 1972; Suessman, 1978; Margolis, 1970). Such assessments measure participant satisfaction with various aspects of the training activity. While Reeves and Jensen (1972), in their verification study of participant evaluations, argue that such assessments can be used an effective tool

for the development and refinement of future training programs, they are generally recognized to be lacking in validity and reliability (Seussman, 1978). Blumenfield and Crane (1973), for example, found little evidence of any systematic relationship between perceived positive effectiveness of training and quality evidence of effectiveness.

Other evaluation strategies commonly used in program improvement include pre/post assessments (Morris and Fitz-Gibbons, 1978) and posttraining examination (Micheels and Karnes, 1950). If properly conducted and interpreted these assessments do provide useful information about specific changes in trainee knowledge, attitude, or skill. Accordingly, they may be particularly helpful in the formative management of human resource development programs. Of concern to this proposed research, however, is the fact that, as typically implemented, these assessments only focus on change at the individual level (IC) and ignore the equally important context of organizational behavior (OB). In general, while program planning and management assessments provide information useful in efforts to sequence, instruct, and support training activities, their outputs remain seriously incomplete.

The second category, program monitoring, differs in that the assessment is concerned with quantitative monitoring and measurement of task completion status (Rossi, 1979). Though monitoring assessments often produce useful information about training accomplishments, both at the training and organization levels, it is commonly in the form of count data which may or may not address the important questions

targeted by this proposed research (Rossi, Freeman, and Wright, 1979). Deterline (1976) suggests that although numbers trained, classroom hours engaged, and subjects covered are the "kinds of meat and potato questions and answers" that might make sense in almost any other area of endeavor they are misplaced when asked in the context of training (p.9).

The third category, impact or outcome assessment, is most closely aligned with the assessment of training effects at level OB. Davis (1974) describes impact assessment as the attempt to measure training effects on "participant behavior back on the job, and consequently the impact on the organization itself" (p. 278). These evaluations typically involve the application of experimental design techniques, and because of the difficulties and complexities involved, are often limited to the documentation of change at the classroom level (Beaumont, 1979). Even when impact assessments do direct their focus to training induced change at level OB, they do not provide understanding or insight into how and why observed changes occurred. In addition, as Wolfe (1973) points out in his review of experimental evaluation studies in training, virtually no one has succeeded in meeting the requirements of the experimental ideal.

The fourth category of evaluative approaches commonly used to assess training is the economic efficiency model. The purpose of such assessments is to answer specific management question such as, "Is it better to implement or not implement a specific training program?", "Which among alternative approaches to meeting the training need is the

best?", and, "What collection of programs or activities represents the best expenditure of available resources?" (Thompson, 1980; p.3). Economic efficiency assessments generally take the form of either benefit/cost or cost effectiveness evaluations. The output of both types is a ratio, with the computation of the ratio relying on the use of monetary valuation to make all aspects of an activity comparable (Smith, 1971; Meyers, 1981). In the case of benefit/cost analysis, once both positive and negative costs and effects are valued, the total benefit value is divided by total cost. While the result, a measure representing the proportion of dollars invested to dollars returned, does have important implications for training management, it offers little information about "how" training might be better managed or improved.

The procedures involved in cost effectiveness assessments are basically the same. No attempt is made, however, to place a dollar value on effects (Meyers, 1981). The objective is to determine how much alternative solutions cost, in comparison with one another, to meet or achieve the same end result (Thompson, 1979). Although models such as Gilbert's (1976) exist which attempt to use economic efficiency assessments to help legitimize the training function, Steele's (1977) comprehensive overview of over fifty approaches to program evaluation currently in use by adult educators failed to acknowledge even a single example.

Based on this review it can be noted that few commonly used training assessment techniques attempt to document training's

effectiveness in fulfilling its conceptual purpose and intent. As Beaumont (1979) points out, "this situation is unfortunate because it allows training investment to move cyclically with change in funding levels" and when decision-makers, lacking hard evidence to the contrary, assume that training produces few results then "less than rational choices about participation in development efforts are acceptable" (p. 491).

A notable exception to the lack of comprehensive training effectiveness assessment strategies is Kirkpatrick's four level assessment model (Beaumont, 1979). According to Kirkpatrick, the proper evaluation of training can be conducted only after the meaning of effectiveness is defined. He argues that, at a minimum, effectiveness should be defined in terms of: (1) participant reactions, (2) the amount of cognitive, affective, or psycho-motor change which results, (3) posttraining behavior back on the job, and (4) actual changes produced in organizational performance (Kirkpatrick, 1977). In contrasting this model with the four discussed previously, it should be noted that Kirkpatrick does not place a great deal of emphasis on monitoring and administrative record keeping. His primary concern is with documentation and improvement of training impact on organizational performance. According to Wolfe (1973) this comprehensive form of assessment should provide accurate before and after measures of change produced by training, and serve to isolate the cause and effect relationships involved.

Unfortunately, use of Kirkpatrick's evaluation model is not widespread. Catalanello and Kirkpatrick (1968) reported, for example, that 77 percent of training directors surveyed used participant reaction as a primary evaluative criterion, while only 46 percent used results. More recently Wolfe (1973) has reported, in his review of 21 of the best known and presumably most rigorous studies of training effectiveness, that most failed to produce valid, reliable results regarding any of the four levels outlined by Kirkpatrick. Of the 21 studies reviewed, 24 percent measured participant reactions, 52 percent focused on learning outcomes, 66 percent included some attempt to measure behavior change back on the job, and only 9 percent attempted to document training's impact on organizational performance. Considering the notoriety and presumed exemplary nature of these assessments, it is disappointing that so few attempted to deal with the bottom line issue of training's effect beyond the restrictive training environment. As noted by Newstrom (1982), the overattention in training evaluation to reaction and learning, in conjunction with the underattention to behavior and results, "provides an unfortunate model for members of the profession" (p. 22).

There is now a growing and widespread concern within the evaluation community that multi-variable approaches are more responsive in the assessment of complex, real world problems such as those involved in training. Gross, Giacuinta, and Bernstein (1971), for example, have discredited the tendency to blame program failure on resistance by individuals and have suggested such failures are more

likely due to a combination of factors. In reviewing current evaluation practices in education, Ball (1981) has argued for greater attention to the interrelationship of all key factors, psychological, social, environmental, as well as educational. Ginzberg (1979) has called for more widespread use of process oriented research models to focus on the multiplicity of interacting factors which exist in most settings and, Scheuch (1969) has argued for cross-level theory construction and testing. Gellerman (1977) has focused this issue on training with his observation that although change occurs in the classroom, it does not occur back on the job due to contextual factors. He further suggests that adult training needs support to survive -- and if such support is not to be provided, then its conduct is futile.

It would then seem apparent that if training effectiveness assessments are to advance, the direction of that advancement must be toward examination of variables within the posttraining environment -- the organizational context. Context has been defined by Radnor (1979) as "the totality of all factors and dynamics and their interactions which affect ... implementation (p.18)." Examination of the effects of problems and conditions on training would then represent a form of contextual analysis, which Cox (1969) defines as "attempts to explain an individual behavior pattern in terms of social context or milieu in which the individual lives, when certain of his own social or other personnel attributes are held constant (p. 158-159)."

Recently, Baugher (1981) has recognized the need for greater replication of training effectiveness studies. The replication problem

directly addresses Cameron's (1981) argument that most studies on organizational effectiveness do not overlap, and that study variables are selected more out of accessibility than sound conceptual analysis.

In summary, in spite of the fact that most trainers, managers, and other decision makers, continue to believe in training as a means to facilitate planned change in both individual and organizational behavior, little documented evidence exists to support that belief. Accordingly, the situation now exists where those who manage training fail to acknowledge their responsibility for the reasoned direction and influence over the broader set of variables that may affect training impact (i.e., the use of training outcomes). At the root of this dilemma are several specific problems. They are: 1) the historical and present trend toward overly simplistic, non-overlapping research and 2) widespread misinterpretation and overgeneralization of behavioral change observed at the classroom level as evidence of behavioral change also occurring within the organizational context.

In order to overcome these deficiencies, in both current training assessment and management practices, several specific advancements are necessary. First, to break the simplistic and fallacious mindset involved when assessments at level IC are construed as evidence of positive change at level OB it will be necessary to re-direct evaluative focus to the organizational context. Second, research addressing that level must be designed to overlap and provide, over time, cumulative insight into the true dynamics of training effectiveness.

### Implementation Problems Within The Organizational Context

Unfortunately, little research has been conducted to identify factors beyond the protective training environment which may affect the subsequent use of training back on-the-job. One of the few recent exceptions is Broad's (1980) survey of top U.S. Human Resource Development (HRD) leaders. In responding to the need to identify "management actions currently practiced in organizations, designed to support the utilization on the job of learning gained in training (p. 4)", Broad documented and validated seventy one specific management actions and activities as important to training effectiveness. These support actions covered the full management spectrum, from upper management involvement, to pretraining preparation, support during training, job linkage, and posttraining follow-up. She noted in her recommendations, however, that "any implementation of the study's results should take into consideration several important factors: a) the organization's environment, culture and practices; (b) the nature of the specific training program ...; and, (c) differences in the management styles of managers and supervisors of trainees (p. 86)." In other words, research must focus on the organizational context.

Recently an increasing number of researchers have turned their attention to implementation research as a promising means for gaining better understanding of how complex settings influence the success or failure of policy decisions, program changes, and other forms of innovative change (Hargrove, 1977). As defined earlier, implementation

is the process that occurs when an innovative policy or program impinges on an organization (Berman and Pauly, 1975); with the primary purpose of implementation research being the explanation of an innovation's success or failure (Leithwood and Montgomery, 1980). Berman and Pauly suggest that benefits to be accrued from such research might include the identification of key factors which influence the use of an innovation, and the development of management strategies which could more effectively support positive integration of program changes into day-to-day organizational behavior.

Although no identifiable implementation research has been conducted to date that focuses on training, studies from other areas illustrate the potential. One of the most widely recognized is Pressman and Wildavsky's (1973) study of the Federal Economic Development Administration's 1966 grant of \$23 million dollars to the city of Oakland, California. The grant was one of many such expenditures made during the 1960's, under President Johnson's Great Society program. Among its intents were the creation of 3,000 jobs and the construction of a new industrial park, marine terminal, and several other community projects. After three years, however, following much publicity and attention to the program's success, Pressman and Wildavsky noted that only \$3 million dollars had been spent, and only a few new jobs had been created. Problems identified were those of implementation. Although plenty of money was available, the intended programs never got off the ground due to administrative and bureaucratic delays. In short, what appeared to be a relatively

straightforward jobs/urban development program failed due to the unanticipated and unattended conditions within the environment within which it was implemented.

More closely aligned with the concerns of this dissertation, Berman and Pauly's (1975) report on 293 federally funded, innovative, educational projects identified specific factors that either supported or inhibited positive implementation. Factors supporting implementation included training, frequency and regularity of meetings, the combination of training with meetings, and the quality and amount of change required by the innovation. Greenwood, Mann, and McLaughlin's (1975) assessment of those same innovations concluded that programs were more often put in place when the decision to implement was based on real local need -- as opposed to the more opportunistic alternative of implementing only because program resources or incentives were available.

According to Berman (1978), in his follow-up article to the Rand studies, discussed above, the same technologies were implemented in different settings with very different results. More importantly, factors associated with how the programs were implemented explained a relatively high proportion of the variance in outcome. It is important to note that his observations refute the overly simplistic philosophy, permeating the training enterprise, which assumes that if training (T) is conducted then the desired outcome (O) will result. Adapted to Figure 1, presented earlier, this commonly held assumption may be written as equation 1:

$$OB = f(IC)$$

where OB represents actual change in organizational behavior and performance (successful implementation of training outcomes), and IC for change in the individual resulting from interaction with the training intervention. Berman's findings, along with those provided in the other Rand Corporation commissioned reports (Berman and McLaughlin, 1974; Berman and Pauly, 1975; Greenwood, Mann, and McLaughlin, 1975; Berman, Greenwood, McLaughlin, Pincus, 1975), as well as findings from the literature on organizational theory (French and Bell, 1973; Hellriegel and Slocum, 1980; Hersey and Blanchard, 1977; Hackman and Morris, 1979) support the more holistic model presented by equation 2:

$$OB = f(IC, IA, HS, TS)$$

where IC represents individual change, IA stands for individual attributes such as attitude/opinion and motivation, HS for human social systems characteristics and interactions, and TS for similar attributes and interactions with the technical subsystem.

This holistic model responds directly to Elmore's (1978) argument that a more unified model of organization behavior be used. As such, it provides a useful framework for guiding the design and conduct of research aimed at identifying problem/conditions within the organizational context that may affect the use of training. By following the macro, intermediate, and micro level distinctions (Katz and Kahn, 1966; Scheirer, 1981), individual attributes, and human/social and technological sub-system characteristics may be identified and evaluated.

Unfortunately, few additional implementation research studies, relevant to this proposed dissertation, have been conducted. Alexander's (1980) compilation of references related to strategy implementation does not include a single major entry related to training. Research findings which do exist have focused primarily on topics such as the implementation of social policy (Johnson, 1978; Sabatier and Mazmanian, 1979), or offer methodologies for assessing the actual degree to which implementation has occurred. Examples include Hall and Loucks' (1977) level of use (LoU) index and Leithwood and Montgomery's (1980) innovation profile. Relevant findings from these and other implementation studies will be discussed in more detail later in this chapter.

In addition to being affected by processes, characteristics and conditions at the macro, intermediate, and micro organizational levels, implementation may also be envisioned as occurring in five distinct stages. Expanding on Lewin's Field perspective of change as a process of unfreezing, moving, and refreezing organizational culture (Benne, 1976), Scheirer (1981) noted that five phases of implementation actually exist: 1) the decision to adopt phase, where factors, forces, and conditions affect both the decision to implement and the type and level of control over implementation processes; 2) the assembling of resources phase, where human, material, fiscal, and temporal resources are allocated; 3) the role change phase, which encompasses the interaction and effects of various conditions within the work group and their relative influence on the quantity and quality of change; 4) the

problem solving phase, where identified difficulties are diagnosed and treated; and, 5) the institutionalization phase, where processes described above actually become the new organizational routine.

Following this useful frame of reference, key variables at the macro, intermediate, and micro organizational levels, will be identified and discussed.

#### Macro Level Problem/Conditions

What problems and conditions at the macro organizational level can be hypothesized as influential to the posttraining use of training outcomes? As defined previously, the term macro level will be used to describe those interactions, characteristics, and conditions that affect the organization as a whole. Characteristics and conditions at this level, which may be relevant to the discussion at hand, include: 1) the decision process surrounding the training intervention and the selection of individuals to be trained; 2) the control process whereby newly acquired knowledge and skill are acknowledged by the organization and interfaced with organizational expectations and activities; 3) the procedures used to acquire and allocate resources necessary for implementing training outcomes; and, 4) the quality of critical relationships with the external environment that relate to the training topic and the use of training outcomes.

Decision making. Insight into how dynamics within the decision making process can affect program outcomes, in general, can be best gained through a review of two landmark works. They are Allison's

(1971) analysis of the factors and conditions surrounding the Cuban missile crisis in 1962, and Berman and McLaughlin's (1974) study of a federally funded educational innovations. Allison, in contrast to the traditional strategic model which viewed both American and Russian decisions as outcomes of rational processes, offered two alternative perspectives. Allison's Model II focused on organizational processes such as information networks, standard operating procedures, and other determinants of everyday organizational behavior. Model III moved even further away from rational Model I and suggested that intergovernmental and interpersonal politics, conflict resolution practices, and routine bureaucratic behavior be used as the analytical framework. In short, Allison found that decision making was not as straightforward as it first appeared, and that a variety of motivations and environmental factors could seriously affect decision direction and outcome.

Berman and McLaughlin's (1974) Rand study, Federal Programs Supporting Educational Change, Volume 1 : A Model of Educational Change, also offered an early insight into how decisions can affect program implementation. They reported that decisions to implement educational programs often result, not due to rational planning but, from political and social pressures outside the school setting. In other words, decisions to implement are frequently made for reasons that have little to do with the program itself. In general, this view appears widely supported within the literature on organizational change.

Another aspect of the decision making process relates to the reason a particular individual is sent to training. Diversities exist at several levels. Houle, for example, in his pioneering adult education text, The Inquiring Mind (1963), focused on variations in why adults attended training and education programs. Houle found three separate types of adult learners; those who were goal oriented, or had a specific problem/need to resolve, those who were learning oriented and who participated widely in learning activities just for personal satisfaction, and those who were "other" oriented. It is this last group, who attend for reasons other than to benefit directly from course content or activity, who may represent a significant source of misplaced job training resources. In the organizational setting, persons selected into training for reasons "other" than job need are not uncommon. This selection framework can be observed whenever supervisors and training managers select individuals so they can have "someone" to fill an "opportunity" slot in a socially or politically important program, use training as a reward or vacation for a favored employee, or use training to temporarily remove a discipline or personality problem.

Following Pressman and Wildavsky's example (1973), Berman and McLaughlin categorized such key turning points in program installation as decision points, and suggested that by following their path of occurrence --- called the path of implementation --- valuable insights could be gained. Following this path in relation to any organization's overall training decision framework could prove extremely fruitful.

Berman and McLaughlin suggested that questions should be asked relating to the substance of the decision, why one alternative was chosen above others, who made the decision, and why the decision points arose as they did.

In a follow up to their earlier study of 293 educational change projects, Berman and McLaughlin (1975) reported further evidence that decision making processes significantly affect levels of implementation. They dichotomized decisions into two types, opportunistic and problem solving. Opportunistic decisions to adopt were defined as those where the motivation to implement stemmed from factors unrelated to the program, or the possible benefits to be accrued from adoption. Their findings were not surprising. In settings where the desire to obtain political advantage, or financial or other resources precipitated the decision to implement, little evidence of program interest or commitment could be found. In settings, however, where implementation occurred in response to identified local need, much stronger commitment resulted. Narasimhan and Schroeder (1979), in their summary of findings from two in-depth case studies of program implementation in public school settings, also reported that creation of a felt-need for change by decision makers introduced a positive influence on implementation.

Possible explanation of these effects may be found in the Berman, Greenwood, McLaughlin, and Pincus (1975) study of innovations in education. They reported that substantial ongoing program implementation did not occur in settings where the original decision to

implement was opportunistic. Two reasons were advanced. First, adaptation does not occur under such conditions, and as reported in both their analysis, as well as the later analysis by Berman (1978), mutual adaptation between innovation and the setting into which it is to take root must occur if lasting implementation is to result. A second factor involved what they called centrality. Centrality has to do with the degree to which the goals of the innovation parallel, or are congruent with, the agencies needs. The greater the congruence the greater the likelihood of successful adaptation. Similarly, Greene (1982) reported varied results in his study of the effects of goal consensus (i.e., the extent to which police administrators and commanders actively supported project goals) on successful program implementation in certain types of enforcement agency settings.

Scheirer (1979;1981) has also noted heirarchical position of the decision maker who endorses program implementation to be an important factor. In her study of implementation of goal planning within two mental health organizations, the decision to implement was initiated by individuals outside the primary lines of authority. Her qualitative analysis suggested this condition prevented the involvement of ultimate users of the system in the decision process. As a result, their overall level of commitment was reduced.

In summary, there appear to be several important research questions relevant to the decision making process which may affect training effectiveness. First, who is involved in making the decision to implement, and what are their motivations in doing so? Second, to

what extent do anticipated training outcomes, or goals, coincide with other organizational problems and needs which are competing for resources, as well as decision maker attention and interest? Unfortunately, due to restrictions placed on the collection of valid macro level data by use of trainee self-report techniques, only limited data on the decision process will be collected for this study, leaving several very interesting and major questions for future investigation. Data to be collected will focus on: the perceived adequacy of the training decision maker's authority to "make sure the training is put to use" and the perceived adequacy of "trainee involvement in the department decision making process". Data on perceived centrality of the training intervention to perceived department priorities will be collected, along with feedback on why the trainee was selected to attend.

Control processes. A second macro level component that may be pertinent to the training use/non-use issue is that of organizational control processes. Control processes represent the overall system of internal mechanisms which affect organizational direction and task performance related to a given decision (Scheirer, 1979;1981). In spite of the positive relationship which can be easily hypothesized, apriori, between control processes and successful implementation, the literature is largely silent.

Some empirical evidence, however, is beginning to emerge. Schmuck and Runkel (1972), Berman and Pauly (1975), Cohen and Collins (1976), and Agranoff (1977), for example, have reported that participation in

decision making influences both the degree of program implementation and level of overall organizational effectiveness.

Alexander's study (1983; p.8) of 220 private and government agencies reported significant mean response differences for several control process oriented problem statements. Significant t-test values were reported between high and low success management strategy implementation groups for the following statements: "leadership and direction provided by departmental managers were not adequate enough"; "support and backing by top management were not adequate"; and, "coordination of implementation activities was not effective enough". Further support for the importance of organizational control processes can be found in Alexander's earlier survey (1982) of 92 corporate executives. Using factor analysis to identify groupings of implementation problems affecting decision/program success, Alexander reported an Eigenvalue of 6.15 for the factor labeled "key people lack of involvement and ineffectiveness". This initial factor explained 28% of the total variance.

When combined with Scheirer's (1979;1981) observation that program implementation in two mental health agencies was inhibited by lack of follow through and involvement by those who made the initial decision to implement, it seems reasonable to hypothesize that all relevant control levels within an organization must be committed, visible, and active, if changes such as those brought about by training are to be successfully implemented.

Useful insight into how organizational control processes, critical to training success, might be organized can be found in Broad's (1980) survey of top U.S. Human Resource Development (HRD) leaders. After extracting a lengthy list of possible pretraining, training, and posttraining management support actions from the literature, she analyzed survey feedback from 84 respondents to validate a set of 71 actions deemed important to training effectiveness. Support actions ranged from top management's designation of appropriate personnel to serve on a training design committee, to holding supervisor/trainee pretraining conferences, to the increasing of expectations related to posttraining job performance. Of the 71 support actions validated, however, only 36 were identified as having been commonly observed in practice. Aside from these intuitively appealing, but largely untested support actions, little additional evidence exists linking control with training effectiveness.

From this discussion, it would also appear warranted to explore the perceived effects of several organizational control processes on training use, such as: the priority level assigned by top and mid-level management to the specific job function targeted by training, the level of expectancy communicated by top and mid-level management's regarding the posttraining use of training outcomes, and, the adequacy of follow-up by those who made the initial training decision.

Resource acquisition and allocation. A third macro level component found to be related to implementation is that of resource acquisition and allocation. According to Scheirer (1979;1981), such

considerations can generally be limited to the adequacy of personnel, time, and financial support. Data from her study indicated that in both mental health agencies resources were perceived, by those responsible for implementation on a day to day basis, as inadequate. While she did not elaborate on this finding she did note that the perception may have been a rationalization by staff of their relative inaction. Alexander's study of private and public organizations (1983) reported a significant mean difference in response by high and low strategy implementation groups to the statement, "implementation took more time than was originally allocated". Cohen and Collins (1976), also, reported a rank order correlation of .32 between utilization of resources and office effectiveness in their survey of 330 Social and Rehabilitation Services field offices.

More closely related to education and training, Gross, Giacquinta, and Bernstein's (1971) study of the implementation of a catalytic role model program in an elementary school noted the lack of instructional materials as a serious inhibitor of that programs success. Gross' (1979) review of recent case studies in educational change also indicated widespread agreement that failure to provide staff members with the assistance and materials required represents a major determinant in program success or failure. In several of these studies, lack of resource materials was due, not to lack of funds, but to delays in acquisition and distribution, and in some cases even to the distribution of the wrong materials altogether. In contrast to these findings, Berman and Pauly (1975) reported, in their study of 293

federally funded educational programs, that inadequate financial resources did not significantly effect implementation. This could suggest that implementation occurs more out of commitment and resourcefulness, rather than raw resources alone.

In summary, the timely acquisition, allocation and availability of temporal, fiscal, and materiel resources represent obvious determinants of training outcome implementation success.

Relations with the environment. A fourth macro level component addresses the organization's relations with its environment. Related to training, it is not difficult to speculate on how external influences, whether they stem from corporate stockholders, consumers, government agencies, or other key system components, could and most likely do influence training effectiveness, along with the overall climate within which it takes place. Greiner (in Gross, Giacquinta, and Bernstein, 1971) suggests that outside pressures may raise a systems level of anxiety and, as a result, cause it to be susceptible to influence. Greiner noted that he had observed direct evidence of this in four of eight situations reviewed where organizational change efforts had been successful.

Baldrige and Burnham's (1975) multiple regression analysis of selected variables related to adoption of innovation in public schools in San Francisco and Illinois indicated that a heterogeneous internal environment supports innovation. In addition, input from the community and other organizations also represents a major determinant of innovative behavior.

Finally, Cohen and Collin's (1976) reported a rank order correlation of .49 between environmental support for agency action and overall effectiveness in state Social and Rehabilitation Services offices. For specialized job related training, such as accident investigation, a key extra-agency determinant of training use may be the court system within which a trainee's knowledge, skill, and performance are critically evaluated. Over the researcher's thirteen years of experience in training enforcement personnel in accident reconstruction techniques, acceptance, or non-acceptance, of accident reconstruction competencies by local criminal and civil courts, has continued to be a major trainee concern. In short, input from the organization's surrounding environment may be hypothesized to have significant impact on internal interest, motivation, and support related to program implementation.

In summary, at least four categories of organizational characteristics and processes, at the macro or overall organization level, can be hypothesized as influential to training effectiveness. These are: decision making, control processes, acquisition and allocation of resources, and relations within the environment. Although enforcement organizations tend to more similar than dissimilar, there are also several other lines of macro level distinction along which further investigation may be warranted. Among those distinctions most frequently noted are agency type, size, and urban/rural placement.

Agency type is straightforward distinction which can be drawn between constitutionally empowered sheriff's and legislatively empowered local, county, and state enforcement agencies. While no major differences are suggested, analysis of problem/conditions affecting the use of training among the several agency types is intuitively appealing and may produce information helpful in guiding future research efforts.

Some support does exist for the contention that personnel from larger, more sophisticated, urban agencies located in high population density areas are more innovative, in general, than their small, rural counterparts. Research focusing on the effects of size, typically structuralist in perspective, indicates the larger more structurally diverse the organization the greater its receptiveness to innovation and change (Heydebrand and Noell, 1973). Heisell, Padgett and Harrell's study (1967) of line-staff relationships in employee training, for example, reported that larger governmental jurisdictions and agencies typically conduct more training activities than do their smaller counterparts. Although resource availability and economies of scale certainly play some role, the greater opportunity for creativity and variance from formal and informal norms provided within the larger environments may also partially explain this discrepancy. Baldrige and Burnham (1975) suggest that size and organizational complexity are important to program implementation because they permit specialization, and actually induce a critical mass of organizational problems to which the organization must respond.

### Intermediate Level Problem/Conditions

According to Katz and Kahn (1966), studies of organizational behavior that focus on only macro level variables, to the exclusion of others, fail to account for the important effects of psychological dynamics within the work setting. On the other hand, those which focus on only the micro level deal with too few of the variables involved in the total situation. To avoid these reductionist approaches, Katz and Kahn argued for the combination of macro and micro level studies. Scheirer (1979, 1981) operationalized and further expanded on this recommendation by including the intermediate level. She has defined the intermediate level as that which addresses the sub-divisions within an organization, which may differ from one another in type of work performed, clients served, physical setting, and supervisory structure.

Within the literature on organizational theory and behavior, studies focusing on intermediate level variables are among the most common. Hughes (1975), for example, recently studied leader behavior, organizational climate, subclimate, and job satisfaction. He hypothesized that behavior and attitudes are influenced by organizational climate, which in turn results from the interaction of such variables as leadership style, technology, work groups, communications, and motivational strategies, among others. Hackman and Morris (1978), in noting the prevalence of intermediate level studies, observed there is substantial agreement among researchers and observers

that something important happens at the group level which affects performance outcomes; unfortunately, "there is little agreement about just what that 'something' is -- whether it is more likely to enhance or depress group effectiveness, and how it can be monitored, analyzed, and altered (p. 5)."

Four major categories of intermediate level variables can be hypothesized as potentially significant determinants of posttraining use of training outcomes. They are: 1) supervisory attitudes; 2) work group norms; 3) formal and informal communications; and 4) level of congruence between training outcomes and standard operating procedures. In addition, job assignment may also be hypothesized to exert some influence.

Supervisory attitude. In spite of frequent commentary within the literature (Seussman, 1978; Carpenter-Huffman, 1979; Doig, 1977) that supervisory attitudes, and other leadership attributes, affect performance, typically little is done to train or better equip supervisors for their vital role in the implementation of change. Broad's (1980) survey of leading U.S. trainers reported only marginal use by managers and supervisors of training support strategies believed important to training effectiveness. She noted, while managers in many organizations are increasingly more aware of the need to increase productivity, and are conscious of the high costs of training, only half of the actions validated by her study were being implemented. Such actions were found to be widely perceived as influential to the full utilization of results from training back on the job.

Research linking supervisory attributes and actions with various performance outcomes is common. Hackman and Morris (1978) suggest that leader attitudes in particular are important in setting group interaction patterns, which in turn represent the key to understanding group effectiveness. Scheirer's (1979) multiple regression analysis of factors related to observed use of goal planning in a mental health agency reported a regression coefficient of .16 for actual supervisory attitude. While not significant, she found that subordinates' perceptions of their supervisor's attitude toward the innovation did significantly predict implementation.

Smuck, et.al. (1975) discussed similar findings in their research on innovative change in public school settings. They reported positive effects for both supervisory expectations and communications. These relationships were explained as a function of social psychological readiness of group members toward change.

Further evidence of the importance of supervisory expectations in the innovation process has been reported by Baldrige and Burnham (1975) and Berman and Pauly (1975). Baldrige and Burnham's study of educational innovations in California and Illinois found that department chairmen represent a critical link between top administrators who support innovative change, and subordinate workers responsible for its implementation. Berman and Pauly reported similar findings in their Rand Corporation study of federally sponsored educational innovations. They observed that school principals are actually the "gatekeepers" of educational change -- by either

facilitating or inhibiting its implementation. Likewise, Len Nadler (1970), in his pioneering work on contemporary HRD, has stressed the need for practical, intuitive application of expectancy building interventions to facilitate planned growth and development. Operationally, Nadler defines the output of such actions as mutual expectations related to training outcomes, directions for growth, and organizational goals.

In summary, although evidence is relatively common indicating a direct relationship between supervisory and managerial attitude and the subsequent success of innovative efforts, the relationship of supervisory attitude to posttraining use of training remains largely unexplored. Accordingly, further exploration to determine if significant differences exist between perceived supervisory and management attitude/support for the accident investigation job function, as well as use of accident investigation training, appears justified.

Group norms. Allen and Silverzweig (1976) state that "norms of group behavior, or the expected behaviors of the individuals within an established group setting, are major factors in determining how that group performs (p. 17-1)." As the case for attitudes, a great deal of research exists linking norms with a variety of group outputs and characteristics. Likert (1967), for example, has suggested that social support within the work group is significant to productivity. Kaufman (1971) also perceives custom and norm to be key determinants in the organizational change process, and Hackman and Morris (1978) contend

that norms exert a powerful influence on interpersonal behavior. They suggest that norms may be supportive of either positive or negative results, depending on the quality of the group members individual experience with the task or innovation. In other words, if group members find an innovation frustrating and unpleasant to deal with, they will most likely develop a negative attitude toward it. Eventually, if others share the same experience, normal communications will lead to an implicit or explicit agreement about how to deal with and perceive the task or object. Allen and Silverzweig further suggest that when new norms, proposed by training, meet head on with existing norms, the old norms will invariably win.

In a somewhat similar vein, Berman, Greenwood, McLaughlin and Pincus (1975) have suggested, based on their Rand Corporation study of educational innovations, that if an innovation's values and goals are too dissimilar from those existing within the organizational setting where implementation is to occur that the innovation is likely to fail. They described the degree of congruence between organizational and innovation norms as the level of consonance.

While these are but a few of the findings which link group norms to both individual and group behavior, it is quite clear that norms may be hypothesized to have a direct and significant effect on training effectiveness. The direction of that influence will be a function of several factors, including the degree of conflict with formalized rules, adequacy of resources, supervisory expectations, communication patterns, and the type and nature of the training outcomes.

Communications. Preceding discussions of macro and intermediate level factors have suggested that nature, content, and quality of communications within the organizational context can and do exert powerful effects on virtually all organizational processes. Lanzetta and Roby (1960), for example, note that the way a group employs communication in problem solving and performance activities is more important than level or amount of knowledge held. Manley (1975) reported similar findings in his study of factors associated with group sociological resistance to change. In testing his mathematical model of group resistance factors in a large suburban school district, Manley found evidence indicating that urgency of need, relative importance to users, degree of top level support, simplicity, and level of user participation, in that order, explained observed level of support for a new teacher's supplementary pay calculation model. In conclusion, Manley noted that the most important contribution of his research was the demonstration that very small changes in written communications concerning an innovation caused significant variation in observed attitude toward it.

Baldrige and Burnham (1975) have similarly observed that supervisors in educational settings, in this case department chairmen, played an important role as communications links between top administrators who supported educational innovations and those responsible for carrying them out. Scheirer (1979; 1981) hypothesized that both communications flow and frequency of communications between workers would affect observed levels of goal planning in a mental

health agency. She reported a negative standardized regression coefficient of  $-.31$  for frequency of discussion, indicating that more frequent interaction actually inhibited implementation. She found little evidence of a predictive relationship for the variable related to communication flow, but attributed the lack of substantive findings to an already high level of interaction between unit workers and professional staff. Hackman and Morris (1978), in reviewing several years research on organizational effectiveness, reported statistically reliable correlations, ranging from  $.59$  to  $.68$ , between group performance and the group interaction process in general.

Unfortunately, the relationship of communications within the organization to posttraining use of results from training is not clear. Few empirical investigations can be found and literature that does address this issue stems largely from the speculative training literature which advocates the use of open, direct, unambiguous communication between those who originate training and those who must implement training outcomes (Broad, 1980; Ingalls, 1973; Margolis, 1970).

In addition, literature on communications in organizations is often contradictory. While Goldhaber (1979) suggests that increases in message flow, or openness of communications, may have a negative effect, in some cases, due to overload or increased expectations, Greenwood, Mann, and McLaughlin (1975) and Berman and Pauly (1975), have reported the opposite. They found that frequent communication, particularly through regular meetings of project personnel, facilitated

implementation of educational innovations. In general, Berman and Pauly found implementation to be largely dependent on support from supervisors and administrators. One explanation of such inconsistencies, offered by Goldhaber, is that levels of reinforcement carried by the communication may vary from context to context; in other words, other variables and other contexts, such as discussions with family and friends may interact with quantity and quality of communications to determine final outcome.

Based on this brief review, it seems that both quantity and content of communication related to both the training related job function and the use of training outcomes can be hypothesized to exert influence over training use back on the job.

Standard operating procedures. Another organizational factor which affects and controls behavior at the work group level is standard operating procedure, or SOP. Morrison (1966) provides insight into the strength of their potential influence in his discussion of an innovation, in this case a new aiming device for guns on navy ships, which could not be used without modification to fit Navy SOP's and operational norms. Results from training are often confronted by this same dilemma. On one hand the organization must prescribe certain protocols and procedures to insure output, while, on the other, those same rules and regulations may directly inhibit the positive changes intended from sponsored training activities.

In assessing the possible effects of SOP's on implementation, Scheirer (1979,1981) suggested that new programs actually require one

of three kinds of change in daily work routine -- or formalized SOP -- before progress can be achieved. Procedures required by the innovation can either totally replace existing SOP's, invoke their gradual change, or add new dimensions to them. Unfortunately, Scheirer's method of operationally defining SOP's and entering them into multiple regression analysis was rather circumstantial and her findings offer little insight into how training/SOP conflict affects subsequent implementation levels.

Several specific training use/S.O.P. conflicts come readily to mind. For example, a behavioral objective of "fuel efficient driving", a training program popular among enforcement agencies in recent years, requires the trainee to shut his vehicle's engine off whenever a two minute or longer stop is required. In spite of the fact that many agencies have adopted this training for their personnel, many also have maintained operating procedures requiring that vehicle engines be left running, to ensure communications and rapid response availability. Whether right or wrong, the very existence of this conflict could easily destroy a significant percentage of the positive benefits to be derived from the training. In the case of accident investigation training, trainees are instructed to use their patrol vehicle to conduct a tire-skid experiment at the accident scene to measure road surface friction. Many departments, however, maintain policies and procedures prohibiting the use of enforcement vehicles in such activities which could "harm the department's public image". Accordingly, investigation into the relationship between training use

and perceived conflict with accepted organization operating procedures is of interest.

In summary, four major categories of problem/conditions at the intermediate level may be hypothesized to effect training effectiveness. They include: trainee perceptions of attitudes held by organization managers and supervisors toward the training intervention and the job function targeted by the training; perceived conflict with work group norms; the perceived adequacy and content support of formal and informal communications regarding the training and its use; and, conflict which may be perceived to exist between training outcomes and formal organization operating procedures.

#### Micro Level Problem/Conditions

Factors originating at the third, or micro, level of organization processes have also been the focus of many organizational behavior and effectiveness studies. As noted by Katz and Kahn (1966), study of micro level variables is of particular importance because of their relationship to individual human motivation. For benefit of clarity, three categories of micro level variables will be used. They are behavioral skills, incentives, and cognitive supports.

Behavioral skills. Behavioral skills, or the technical competence of the individual, level of education, and degree of specialized training related to the innovation being implemented were hypothesized by Scheirer (1979;1981) as significant determinants of goal planning. She used the number of hours trained as a measure of

mastery, assuming that the more training, the greater the individual's knowledge and skill. She justified this measurement approach in that training was not standardized, and different persons attended courses of varying lengths. Although length of training did not add significantly to the predictive equation for goal plan implementation, it would seem reasonable to conjecture that a relationship may exist between total hours of specific job skill training completed and the level of training use or non-use.

In their review of factors affecting group effectiveness, Hackman and Morris (1978) noted that "for tasks on which knowledge and skill are important in determining performance, it often is possible to predict how well the group will do solely on the basis of the talents of its members (p. 25)." A case in point, illustrated by Gross, Giacquinta and Bernstein's (1971) in-depth case study of implementation of a catalytic role model program in an urban laboratory school, was the finding that implementation was seriously blocked by teachers' lack of clarity about the innovation, as well as their lack of the knowledge and skill necessary to make it work.

With regard to level of education, Heydebrand and Noell (1973) reported, in their study of task structure and innovation in 122 private welfare agencies, that the greater the level of professionalism, defined as proportion of management employees with a master's degree, the more likely the organization to support innovative change efforts. Baldrige and Burnham (1975) reported contradictory findings in their study of innovative practices in 264 schools public

schools. In finding no significant difference in mean level of education between opinion leaders in charge and all school faculty at large, they observed that micro level variables are not as important when the organization is the innovation adapter -- as opposed to situations where the individual is the adapter. This would tend to suggest that the relative influence of knowledge and skill competencies, as well as educational level, depends in part on the level within the organization at which the innovation is aimed.

Looking at training from a different perspective, Greenwood, Mann and McLaughlin (1975) reported that type of training may also significantly effect program implementation. They found, based on implementation of innovations in public schools, that the most effective training, in support of implementation, is the very concrete, how-to-do-it type. Berman and McLaughlin (1975) concurred with this finding, stating that "training was significantly related to project outcomes only when it was tied to the specifics of project operation and the practical day-to-day problems of project participants (p. 19)."

In summary, individual knowledge and skill competency may be hypothesized to directly effect training effectiveness. Likewise, level of education, representing a crude measure of professionalism, may be tentatively presumed to interact with individual behavior patterns in some situations. As observed by Baldrige and Burnham (1975), level of professionalism may be hypothesized to be of greatest significance when the focus of the innovative process rests directly on

the individual, as opposed to more distant organizational levels and processes.

Finally, since effects from training must be presumed to resemble other types of learning, it would seem reasonable to hypothesize that elapsed time since training would also exert some influence on observed level of implementation. Moreover, while considerable research has been conducted on retention of learning and learning curves (Gagne', 1974; Gagne' and Briggs, 1974), little research has been done to estimate the half-life of training effects within the dynamic day-to-day work environment. This is an area which should receive considerable future attention.

Incentives. The second category of micro level variable is that of incentive. Observing that motivation stems from both internal as well as external sources, Scheirer (1979;1981) offered several very tentative hypotheses as to the effects of various perceived intrinsic and extrinsic motivation problems on implementation. Unfortunately, the public bureaucracies she studied did not afford the opportunity to assess the effects of external motivators, such as pay incentives or extra days off. According to Finsterbush and Motz (1980), many organizations do depend on such monetary, or other symbolic rewards to motivate program participants. They noted that such rewards work best when people within the organization are in common agreement about the innovation's merit and worth. From this perspective further analysis by Scheirer for possible interactions between individual's perceptions of problems with goal planning, their attitude, and group norms, would

have been most interesting. Results from her actual regression analysis, however, were accordingly both informative as well as disappointing. She did report a standardized regression coefficient of .24 for level of job satisfaction, and .28 for frequency of outside professional reading, an indirect measure of professionalism. Similar findings, interpreting mean educational level as a measure of intrinsic professional motivation were also reported in Heydebrand and Noell's study, discussed earlier, of public welfare agencies.

Ettlie (1979), however, reported no significant results when motivation scores, as measured by a two part expectancy/valence instrument, were entered into a step-wise regression analysis of factors predicting success in training. As with the several macro, intermediate, and micro level variables already mentioned, the possible effects of individual motivation on level of program implementation are many and varied. In addition, incentives may interact with other variables and conditions unique to each environment and setting. As Etzioni (1961) has pointed out, various types of rewards and sanctions work differently in different settings, as well as for different people. In general, however, they all fall under one of the following three categories: money; symbols, such as praise, recognition, and esteem; and, coercion.

Whether or not external incentives exist to support trainee use or non-use of training, a considerable source of internal motivation and incentive may result from the individual's job assignment. A work assignment, for example, which involves the almost daily performance of

training related behaviors, or which identifies the trainee as an agency "specialist" in that area, may generate considerable internal dissonance and desire to "look good" in that area.

In a similar vein, knowledge of whether training participation resulted from trainee or agency initiative may also provide insight into how motivation relates to training use.

In summary, although a considerable amount of literature exists attempting to link various motivators to such outcomes as job satisfaction, productivity, and effectiveness (Katz and Kahn, 1966; Herzberg, 1968), as well as to sound training management (Broad, 1980), little empirical evidence exists documenting the effects of various motivators on training impact. Based on the brief review provided here, it can be hypothesized that the perceived level of incentive within the work environment represents a problem/condition which differs significantly between high success and low success training users.

Cognitive supports. The final micro level category encompasses cognitive supports, such as beliefs and attitudes, and their influence to the implementation process. Unfortunately, hypothesized relationships between attitude and behavior have often not proven significant. Henerson, Morris, and Fitz-Gibbon (1978) point out that in spite of widespread empirical testing, attitude/opinion instruments typically score low in predictive validity. In other words, the relationship between attitude/opinion and behavior, in general, is very weak.

Ettlie's (1979) study, however, designed to evaluate and predict success in training did report significant findings. In order to identify factors contributing to trainee success, Ettlie generated hypotheses for eight, independently related variables. They included task-specific self esteem, motivation, stress, task complexity, feedback, and job-specific attitude toward change. Using a multiple step-wise regression technique to isolate predictor variables for two learning outcomes, Ettlie found job-specific attitude toward change to be most significant. Manley's (1975) chapter, *Implementation Attitudes: A Model and Measurement Methodology*, however, suggests that attitude may also introduce negative effects on implementation. Manley argues that program success is largely determined by the attitudes of those directly affected. When their attitudes are positive the program will be supported, but, when the program evokes a strong negative image it will be resisted, and most likely not implemented.

Although Scheirer (1979;1981) did not report individual worker attitude as a significant predictor of goal planning, she did state that significant results would most likely have resulted if it had not been for incomplete data collection on this variable. Her positive speculation was based on a standardized regression coefficient of .30 for belief in goal planning, and an overall correlation of .59 between attitude and level of implementation, for the sample data that was available for analysis.

Based on these findings, it can be easily conjectured that an individual's attitude or opinion toward the use of training outcomes

back on the job, as well as toward the job function targeted by training, will to some degree influence his subsequent behavior.

In summary, several determinants of training use may be hypothesized to exist at the micro level. They include: each involved member's level of knowledge and skill in relation to the level needed for full implementation; educational level, an indirect measure of professionalism; time elapsed since training; perceptions of existing incentives and motivators; opinion of training content and appropriateness; and, opinion of the training related job function.

#### Conclusions

The number and diversity of variables discussed in the preceding sections confirm the extremely complex nature of human/social and technical interaction within the context of organizational work environment. In spite of these complexities, evaluators, researchers, and program managers and administrators are focusing increased attention to the need for more complete understanding of how such variables interact to affect individual behavior, group performance, and effectiveness. Whereas previous research attempting to unravel these complexities has been largely disciplinary, and conceptually fragmented in nature, multi-variable research methods, such as implementation research, are now gaining in popularity and use. While no one study can hope to account for all the variables that may influence training use within the dynamic organizational context, the ongoing conduct of well designed implementation research efforts may,

in time, provide cumulative insight into more effective ways to plan, schedule, conduct, and manage training activities. Of even greater importance, more effective means may be developed through which results from training can be successfully integrated and applied within the posttraining organization work environment.

## Chapter 3

### METHODS AND PROCEDURES

This chapter outlines the mail questionnaire research methodology used in this study of organizational context problems and conditions perceived to negatively influence training impact. The following sections discuss: 1) the training program studied, 2) the study population and sample, 3) the study design, 4) instrumentation, 5) data gathering, 6) data analysis. A summary section is also included.

#### The Training Program: At-Scene Accident Investigation

The University of North Florida's Institute of Police Traffic Management (IPIM) offers approximately 12 sessions of the two-week, 70 hour, At-Scene Accident Investigation course each year. The courses are offered both on campus and at various host agency locations throughout the United States. This training, and more specifically, it's behavioral outcomes, have been largely standardized over the past forty years among the several national, regional, and state training institutes that specialize in "police traffic instruction", and among the various disciplines concerned with traffic accident investigation, adjudication, and loss control/management. Accordingly, enforcement agencies, state traffic safety funding agencies, traffic engineers, and lawyers concerned with criminal and civil prosecution and defense, among others, consider such training as critically important to their respective efforts and objectives.

Following the framework recommended by Gagne' (1974) and Gagne' and Briggs (1974), course learning outcomes can be classified as predominantly "intellectual skill", "cognitive strategy" and "motor skill" in nature. According to Gagne' (1974), an intellectual skill constitutes knowing "how" to do something as contrasted with the "knowing that" of information (p.55). Because At-Scene Accident Investigation training focuses on the development of skills necessary to reconstruct behaviors and events occurring before and during a motor vehicle crash, as well as those data collection and preservation skills necessary to support such reconstruction, it relies heavily on concepts and procedures from law, math and physics. Appropriately, much of what is done in the classroom and laboratory involves learning how to identify, collect, preserve, measure, draw, analyze, and interpret relevant information.

To a lesser extent, At-Scene training also targets the development of cognitive strategies -- or the development of those learning outcomes generally described as problem solving. The analysis of evidence collected during an investigation and its synthesis into an "it most likely happened this way" scenario represents one example. Pursuit of this more complex and difficult outcome, however, is generally left to more advanced reconstructionist training.

Several aspects of At-Scene training, such as using a roll-o-tape to measure distance or a template to draw an accident scene to scale are best described as motor skill in nature. They generally correspond

with the "how to" intellectual skills discussed above and support actual behavioral performance.

In summary, over 85 percent of At-Scene course content and exercise is aimed at preparing the student to demonstrate and perform practical job related behaviors. Course objectives, targeting these levels of learning outcome (IPTM At-Scene Course Notebook, 1984 ed.), specify that: "the student will gain the knowledge to properly:"

1. Measure, diagram, photograph, and document physical evidence and other data from the accident scene;
2. Interview drivers and witnesses and record their statements for later use;
3. Make reliable speed estimates of accident vehicles by use of skidmark and scuffmark evidence;
4. Measure and record the positions of vehicles and other other objects at the scene and account for their movements during the accident sequence;
5. Recognize the importance of using evidence and facts to develop intelligent opinions of how the accident happened.

#### Population and Sample

The population studied consisted of law enforcement personnel (i.e., local police, state police and highway patrol, and sheriffs) who had successfully completed the two-week IPTM At-Scene Accident Investigation course. Since its inception in 1978 as an independent outgrowth of Northwestern University's much older Traffic Institute, IPTM has presented over 100 offerings of the two-week At-Scene Accident Investigation course. Over 2,500 local, county, state and Federal law enforcement personnel have completed this training, as well as a

sizeable number of traffic engineers, government planners, and others, who desired specialized training in accident investigation and reconstruction techniques.

Law enforcement agencies across the United States vary in their legal and stated professional responsibilities related to accident investigation. Approximately half of the states support a state police agency. These organizations are typically authorized with full police powers. The remainder of the states support highway patrol organizations which are typically limited to traffic enforcement and control. This distinction between agency missions is more theoretical than real, however, when quantity and quality of traffic related agency activities are compared (IACP, 1972). These "state" agencies often specialize in traffic work and are noted for their innovation and aggressiveness in traffic accident reduction activities. State level enforcement agencies typically investigate accidents on Interstate and express highway systems, those that occur in rural areas and smaller communities, and those that falling outside the jurisdictional boundaries of local and county enforcement agencies.

Sheriffs' departments vary more considerably in their relative importance to local traffic management and control. As a political office, many sheriffs' agencies limit their efforts to those authorized under their State's Constitution, such as operating the jail and serving the local court. Sheriffs in the Western and Southern United States, however, typically hold greater power, and engage in more diverse "enforcement" activities, than do their counterparts in the

East. In recent years visible signs of difference between Sheriffs' departments and local and county police departments have begun to disappear. Many sheriffs' departments, throughout the United States, are now aggressively enforcing traffic as well as criminal laws and ordinances.

For most jurisdictions traffic management and control is maintained by a local or county police department. Like state police and patrol organizations, local and county police are required by law to "investigate" or "report" any accidents occurring within their jurisdiction which meets certain minimum severity criteria. Investigations are normally conducted by officers assigned to routine patrol or by teams of officers specially trained in accident investigation and reconstruction. While the "AI team" concept appears to be growing in popularity, specialized teams investigate only a small percentage of those accidents which occur annually.

This mail questionnaire study targeted a sample of 391 trainees who had successfully completed one of twelve At-Scene courses offered by IPTM during the time period beginning October, 1983, and ending October, 1984. Those time parameters, defining the study sample, were necessary for two reasons. First, as noted by Sudman and Bradburn (1982), the time period between the occurrence or behavior under question and the point at which questions about that situation are asked is a critical factor in controlling for memory error. They suggest periods of a year or longer should only be allowed when the behavior or occurrence is highly salient.

Because the investigation and reporting of a serious personal injury or fatality crash typically requires the enforcement officer to complete and submit detailed reports, and testify in court up to two or three years later, saliency in this study was believed to be exceptionally high, with memory error low. By using a behavior inventory to "aid" respondent recall, along with each respondent's course completion date to "bound" their recall, a date fifteen and one-half months from the initial questionnaire mailing was established as a reasonable upper sample boundary.

Since the major objective of the study was to identify organizational context problems and conditions that are perceived to block or impede training use, a reasonable amount of time had to be allowed following the most recent course to give all trainees an opportunity to apply what they had learned. Because serious motor vehicle accidents are relatively infrequent (the circumstance where this training is most likely to be applied), a time span of 3 months from the date of the last course to the date of the initial questionnaire mailing was maintained.

### Design

This mail questionnaire study employed an ex post facto research design to collect self-report data on the posttraining use of training outcomes by individual trainees, as well as the rating of problems and conditions within the organizational context according to their

perceived significance in blocking or inhibiting training outcome implementation.

Feedback was elicited from trainees who had completed the two-week job skill training program, within a specified time interval. The time interval was calculated to provide trainees' the opportunity for on-the-job application of training outcomes, while remaining compact enough to counter errors due to memory loss and salience.

#### Instrumentation

A questionnaire entitled "A Survey of At-Scene Graduates" was used to collect data from the study sample. The instrument (Appendix A) consists of four major sections. They are: 1) a training use index; 2) a rating list of organizational context problems and conditions which may affect training impact; 3) two opinion scales ;and, 4) screening and demographic data.

#### Level of Training Use Index.

The first questionnaire component is an index designed to measure each respondent's use, or non-use, of 17 specific training outcomes during the investigation of a recent serious motor vehicle crash. This index score representing the study's dependent variable was used in the several analyses aimed at identifying those organizational context conditions which affected training use.

Although limiting the index to one specific event may have reduced its generalizability to routine job performance, this delimitation was purposely introduced so as to maintain salience and reliability and

maximize the number of respondents eligible for study analysis (Sudman and Bradburn, 1982). A dichotomous "yes/no" response set was used for each of the seventeen training use index statements (see questionnaire item Q-2).

#### Problems and Conditions Affecting Training Impact.

This section (questionnaire item Q-5) collected data relevant to Research Question 2. A total of twenty-nine statements, each describing a problem or condition hypothesized to influence training use within the organizational work environment, were developed by the investigator for this second questionnaire component. The problem/condition statements were identified through several sources: from the literature on training, program evaluation, and organizational effectiveness; from discussions with trainers and training administrators at three law enforcement training institutes and one state criminal justice training standards agency; from discussions with selected police administrators and line personnel; and, from discussion with members of the researcher's doctoral committee.

This questionnaire section is introduced by a statement requesting respondents to think about their personal experience over the past several months in using the knowledge and skills acquired in training. They are then requested to rate each statement according to the extent it describes a problem or situation which blocked or reduced their use of At-Scene training during the investigation evaluated under question one.

Response to each statement was collected on a four point Likert type scale (Was Not a Problem; Was a Minor Problem; Was a Moderate Problem; Was a Major Problem).

#### Opinion of Accident Investigation Training and Job Responsibility.

Data collected by questionnaire item Q-8 was used to respond to Research Questions 4 and 6 which focused on the link between trainee opinion of training and work and training use. While the link between opinion and attitude and behavior remains tentative (Henerson, Morris, and Fitz-Gibbons, 1978), belief in and support for the rational relationship between attitude and behavior remains widespread (Ettlie, 1979; Manley, 1975; Scheirer, 1981). Accordingly, two "opinion" sub-scales were included in the study questionnaire to evaluate the strength and direction of each respondent's opinion toward: 1) training content and it's appropriateness for use by law enforcement personnel; and, 2) accident investigation as an enforcement function and work responsibility.

Initial concept development for the two opinion scales benefited heavily from work done by Sudman and Bradburn (1982). Actual scale construction and field testing followed procedures outlined by Henerson, Morris, and Fitz-Gibbons (1978). An inventory of seventy-eight favorable and unfavorable statements about the two-week accident investigation training program and about accident investigation as an enforcement agency responsibility was mailed to 184 sworn Virginia enforcement officers, who had completed a two-week AI

course during 1983 and 1984. This available sample was drawn from training records at the Transportation Safety Training Center, Virginia Commonwealth University. One hundred and five (105) useable and 8 non-deliverable questionnaires were returned; the adjusted response rate was 59.65 percent.

Item analysis was used to identify the best discriminating items for inclusion on the two scales. Items selected were those which demonstrated a large mean difference between positive and negative opinion holders, while demonstrating low response variability for those groups. The SPSSX Procedure RELIABILITY (Alpha Model, SPSSX, Release 1.1) was then used to calculate Cronbach's Alpha, a measure of internal response consistency or reliability (see Camines and Zeller, 1979). The computed Alpha for each scale follows. For Sub-Scale A, "Opinion of Course Content and Course Appropriateness for Law Enforcement Personnel", which included 10 items, Alpha was found to be .858. For Sub-Scale B, "Opinion of AI as an Enforcement Function and Responsibility", which also included 10 items, Alpha the resulting Alpha was .864.

#### Screening and Demographic Information.

A basic assumption underlying this study was that sample members would have had the opportunity following training to actually put their newly acquired skills to use. To support this assumption and to screen out respondents who did not meet it, a three response option question asking the respondent to rate the severity of the single, most serious

accident investigated since attending training was included as questionnaire item Q-1.

Since several research questions address differences among the predictor variables which may exist for various sub-groups existing within the population sampled, a variety of demographic and attribute questions are asked. Those demographic variables (Research Question 1) included were: age, sex, total hours of AI training, agency affiliation, agency environment (i.e., urban/ rural), and agency size, among others. Question 5 (Q-5), which asked why the respondent was selected to attend training is included to support response to Research Question 3. Data on the number of accidents investigated since attending training, collected by Q-3, will be analyzed for the response to Research Question 8.

As noted in Chapter 1, not all data collected by the survey instrument is discussed in this dissertation. Several additional data items were included for use in anticipated follow up analyses and in future publication.

#### Data Gathering, Procedures and Results

Data necessary for this study were collected either from training records maintained by IPTM, at the University of North Florida, or through return of the completed mail questionnaire. IPTM training records data were collected personally by the researcher, in collaboration with the IPTM registrar, during two pre-mailout site visits to the University of North Florida campus. Questionnaire

response data were collected via a modified version of the mailing procedure outlined by Dillman (1978;p. 163).

Responses from IPTM At-Scene Course Graduates.

On January 14, 1985, the cover letter and questionnaire (Appendix A) were mailed to 391 local, county, and state law enforcement personnel. Those officers were identified by the Institute of Police Traffic Management (IPTM) registrar as having successfully completed one of twelve two-week At-Scene Accident Investigation courses conducted by the Institute between October 1983 and October 1984. One hundred and thirty-three responses (34%) were received by January 23, the date on which 256 thank you/reminder postcards were mailed (Appendix B) to remaining non-respondents.

During the following two-week period an additional 90 responses were received, bringing the response rate to 57%. On February 6, 182 questionnaires were mailed with revised cover letter urging the prompt completion and return of the questionnaire (Appendix C). The follow-up questionnaire was identical to the first except for an "X" which was added to the four digit identification number stamped on the front of each questionnaire. By February 20 a total of 295 responses were logged. The returns continued at a much slower rate until March 27, the latest postmark date on any returned questionnaire. The final response rate, which included returned questionnaires, and personal letters and phone calls explaining non-response totalled 322 (82.3%).

Table 1 indicates the response frequencies (by agency type) for the twelve At-Scene classes comprising the study sample. Of the 322 responses logged 25 were rejected for data entry and analysis for the following reasons; 1 was returned as non-deliverable, 2 were returned not completed, 1 was noted by his department as having left police employment, 10 stated that they had not been assigned to any form of traffic duty since training, 9 reported that they had not investigated a single accident since training, and, 2 identified themselves as supervisors who did not personally investigate accidents. According to these voluntary explanations for non and non-useable response to the questionnaire, it can be conjectured that similar kinds of reasons also motivated the 69 (17.6%) sample members who did not respond in any form. Of the 25 known, non-useable responses, 21 (84%) justified their incomplete response as due to the lack of opportunity to apply their training.

#### Analysis of Response Adequacy.

With those responses deleted from the total, 297 questionnaires were coded for analysis, providing an adjusted rate of 75.9% useable responses. The overall response rate of 82.3% can be reviewed as quite satisfactory, indicating that only a 17.7% bias in the data is possible due to non-response.

Table 2 presents the results of the Chi-Square Goodness of Fit test to which the response distribution data were submitted. This test was conducted to evaluate the proportion of respondents, classified by

Table 1

Response Frequencies and Percentages for the Twelve  
IPTM At-Scene Accident Investigation Courses Comprising the Study Sample

Course Location	Total N Mailed	Total N Returned	Overall % Response	Local/County Police		Sheriffs' Departments		State Police/Patrol	
				N Mailed	N Returned <sup>a/</sup>	N Mailed	N Returned <sup>a/</sup>	N Mailed	N Returned <sup>a/</sup>
1. Columbia, SC	31	21	64.5%	22	14 (63.6%)	2	2 (100%)	7	5 (71.4%)
2. Richmond, VA	37	32	86.4%	-	-	-	-	37	32 (86.4%)
3. Baltimore, MD	32	28	87.5%	28	26 (92.8%)	2	2 (100%)	2	0 ( 0.0%)
4. Essex County, NJ	38	33	86.8%	38	33 (86.8%)	-	-	-	-
5. Jacksonville, FL	18	14	77.7%	13	11 (84.6%)	5	3 ( 60%)	-	-
6. Bergen County, NJ	49	39	79.5%	47	37 (78.7%)	2	2 (100%)	-	-
7. Pennsauken, NJ	30	23	73.3%	30	23 (73.3%)	-	-	-	-
8. Columbia, SC	31	27	87.0%	23	20 (86.9%)	2	2 (100%)	6	5 (83.5%)
9. Tampa, FL	37	31	83.7%	31	25 (80.6%)	6	6 (100%)	-	-
10. Miami-Dade, FL	30	26	86.6%	30	26 (86.6%)	-	-	-	-
11. Pittsford, VT	35	30	85.7%	21	18 (85.7%)	-	-	14	12 (85.7%)
12. Salisbury, MD	23	18	78.2%	23	18 (78.2%)	-	-	-	-
<b>Total N</b>	<b>391</b>	<b>322</b>	<b>82.3%</b>	<b>306</b>	<b>251</b>	<b>19</b>	<b>17</b>	<b>66</b>	<b>54</b>
<b>Avg. Response Rate</b>			<b>82.3%</b>		<b>81.6%</b>		<b>89.4%</b>		<b>81.8%</b>

<sup>a/</sup> The percentage return for each agency type is shown beside the number of questionnaires returned

Table 2. Goodness of Fit of Respondent Agency Affiliation To Agency  
Affiliation in the Study Sample

Agency Affiliations	Agency Affiliation in the Study Sample	Observed Agency Affiliation Of Respond's	Expected Returns Based On Agency Affiliation in Sample	$\frac{(O-E)^2}{E}$
State Police/Patrol Personnel (% of study sample)	66 16.88%	54	54.35	.002
Sheriffs' Depart- ment Personnel (% of study sample)	19 4.86%	17	15.65	.116
Local/County Police Department Personnel (% of study sample)	306 78.26%	251	252	.004
Total	391	322		.122

Chi-Square = .122, DF = 2, p > .94

type of agency where employed, with agency affiliation in the overall study sample. A brief comparison of the expected and observed numbers of returns, grouped by agency type, suggests that the returns were balanced and in proportion to the overall study sample. The very low observed Chi-Square of .122, with two degrees of freedom, further supports the assumption of a proportionate response.

As noted previously, 21 of the 25 trainees whose responses were not sufficiently complete for data entry and analysis stated the reason for their incomplete response as lack of opportunity to apply their training. For this study, it may be that those who did not respond in any form were similarly motivated.

To determine whether the 69 (17.6%) non-respondents were similar to this known group, or whether they shared some common characteristic or bias that, if known, would significantly alter the study findings, phone contacts were made with a randomly selected 16% (n=11).

Reasons given by these individuals for their non-response included, one trainee who considered the questionnaire to be "junk mail", one trainee who worked a steady midnight shift and who "just did not get around to dropping it in the mail", one trainee who had left police employment, one whose response was apparently "lost in the mail", and two trainees who had no accident to report, along with five supervisors who also did not have an accident report due to their indirect contact with accident investigation activities. The fact that 7 trainees from this group (64%) also confirmed that their non-response

was due to a lack of opportunity to apply their training, strongly suggests that non-response bias was not a problem in this study.

Accordingly, it is believed, that the 82.3% return adequately reflects the study sample and that the results of analyses performed on data collected are generalizable to that group, as well as to the larger population of At-Scene Accident Investigation graduates.

In reference to other forms of data contamination, Dillman has noted social desirability bias, interviewer distortion and subversion, contamination through joint deliberation, and failure to consult additional, accurate sources, as potential problems. He suggests, however, that response bias due to social desirability is less of a problem in mail surveys than in other types of research. To further reduce over or under statement in response to threatening or socially desirable behavior questions, Sudman and Bradburn's (1982) technique of isolating on a single event, from among many common events, was used.

According to Dillman, in addition to recovering a more honest response, the questionnaire procedure also removes the threat of interviewer distortion and subversion since it does not rely on humans to collect data. While some response contamination may be introduced by respondents conferring with peers or family, the overall likelihood that this was a major source of error appears encouragingly small.

Two final sources of error, noted by Dillman, are the failure by respondents to consult additional sources to ensure accuracy of response, and negative response effects due to ambiguity and

misunderstanding of questionnaire items. These threats also appear acceptable, particularly the latter, which was controlled by careful item construction and instrument pretesting. As noted previously, the salience of investigating a serious motor vehicle accident is high, even for the most experienced investigator. In addition, enforcement personnel routinely access and consult not only official agency records, but their own "field notes" which are required for report preparation and court testimony. The use of "bounded" and "aided" recall techniques (Sudman and Bradburn, 1982) were also used to control over-reporting of behavior due to "telescoping" and to further ensure the accuracy of response by reducing memory error.

As completed questionnaires were received, they were closely screened for serious response defects. This was in keeping with Dillman's advice (1978) that errors, such as incomplete response due to pages sticking together, can be corrected if caught early with appropriate follow-up mailing undertaken. Response data were then keypunched by a hired assistant. A verification check was made on 20% of the data with a reliability coefficient of .996% observed. Data were then entered into the WYLBUR text/data management system for storage and subsequent analysis. The WYLBUR system is maintained by Virginia Commonwealth University's Division of Academic Computing, on the University's mainframe.

### Data Analysis

The data analysis procedures outlined within this section were selected as appropriate for answering the study's several research questions. Descriptive analysis procedures were performed using Release 82.4 of the Statistical Analysis System (SAS), and, Release 1.1 of the Statistical Package for the Social Sciences (SPSS-X); both resident at the VCU Computing Center.

Analyses related to the several research questions will be discussed in the following order: Chi Square analysis to test the "goodness of fit" between respondent and initial population sample characteristics, and substantiate several preliminary study assumptions; descriptive analysis of the study population and respondent sample; descriptive analysis of the most commonly occurring training implementation problems and conditions; regression analysis to examine relationships existing between implementation problem/conditions, trainee opinion(s), reason selected to attend training, posttraining accident investigation rate, accident severity and level of training use.

#### Validation of Sampling Assumptions.

Since the intent of this study was to generalize to the wider population of enforcement personnel who undertake training in At-Scene Accident Investigation, the preliminary Chi Square analysis (see Table 2) was conducted to ensure that key respondent characteristics were proportionate to those in the larger study sample. The findings from

that analysis suggest that a proportionate response was obtained and support the wider generalization of study findings to the population of At-Scene Accident Investigation course graduates.

#### The Demographic Characteristics of At-Scene Graduates.

Prior to discussion of the analytical methods to be used in responding to the central research questions, an examination of several basic questions relating to demographic characteristics of the population sample will be helpful. Research Question 1 asked: "What are the demographic characteristics of personnel trained in IPTM's At-Scene Accident Investigation course?". Sub categories under this question focused on the sex, age, agency affiliation, prior training, and other related work characteristics of At-Scene trainees.

Data necessary to respond to these questions were collected by questionnaire items Q-3, Q-4, and Q-9 through Q-16. Bi-variable tables were constructed to display the findings and to allow comparisons across important agency and trainee descriptors. For these analyses, simple frequencies and percentages are displayed.

#### Identification of Commonly Perceived Implementation Problems.

The second central research question asks, "What implementation problems are most commonly perceived by law enforcement trainees to influence the posttraining use of knowledge and skill acquired from Accident Investigation training?". A table was prepared in response to this question displaying the 11 most frequently identified implementation problem/conditions. Response frequencies and

percentages are included for each of the 4 points on the Likert type rating scale employed by the questionnaire. The problem ratings included; "Was Not A Problem", "Was A Minor Problem", "Was A Moderate Problem", "Was A Major Problem".

#### Relationships Between Contextual and Demographic Variables and Training Use.

Because Research Questions 3 through 8 lend themselves to a common form of analysis, these several questions are grouped here for discussion. The dependent variable for these questions was respondent level of training use. As noted within the definitions section, level of training use was measured as the sum of affirmative responses entered by each trainee to a seventeen item inventory of job behaviors emphasized by training.

The relative association between "reason for selection to attend training" (see RQ3) and training use were evaluated by the use of ANOVA, with the conservative Scheffe comparisons test performed to assess observed differences between mean training use rates among the several groups.

"Trainee opinion of the training (see RQ4)" and "opinion of accident investigation as an enforcement agency responsibility (see RQ6)", as well as, "selected implementation problem/ conditions (RQ5)", "accident severity (RQ7)", and "posttraining accident investigation rate (RQ8)" were submitted to a Stepwise multiple regression analysis. This procedure produced a "most efficient" model for predicting training impact. A second, full multiple regression analysis was

conducted so that the stability of the various predictor variables could be observed and intercorrelations better explained.

### Summary

. A questionnaire, developed largely around Dillman's Total Design Method (TDM) (1978), was mailed to a sample of 391 law enforcement trainees. The study sample consisted of officers who had completed one of several two-week At-Scene Accident Investigation courses offered by the Institute of Police Traffic Management (IPTM), University of North Florida, during a recent twelve month period. IPTM routinely offers this course, on-campus as well as on a regional basis, to enforcement agencies throughout the United States.

Items on the questionnaire elicited ratings of 29 specific organizational context problems and conditions hypothesized to affect the use of knowledge and skill acquired during training. Trainee opinions of the training and of accident investigation as a job assignment were measured, and responses were collected to several questions about demographic and work environment characteristics.

Descriptive statistics, multiple regression analyses, and ANOVA were used to answer the research questions.

## Chapter 4

### RESULTS

#### Introduction

Three hundred and ninety-one questionnaires were mailed in January, 1985, to law enforcement personnel who had successfully completed a two-week accident investigation job skill training program. The questionnaire was designed to elicit information from the trainees on their posttraining use of knowledge and skill acquired during the training, and about problems and conditions within their work environments that negatively influenced training use. A total of 322 responses were received (82.3%) and analyzed.

The results of those analyses are presented in this chapter. In overview, the major questions to be answered were: 1) What are the demographic and work environment characteristics of At-Scene Accident Investigation trainees?, 2) What problem/conditions existing in the organizational work environment are most commonly perceived to block or impede training use?, 3) What relationship exists between training use and the reason an individual was selected to attend training?, and, 4) What relationships exist between training use and such variables as course opinion, work opinion, accident severity, frequency of investigative assignment, and various other problems in the work environment?.

Demographic And Work Environment Characteristics  
of Trainees and Their Agencies

Several items were included on the questionnaire to collect demographic and work characteristics of the respondents and their employing agencies. In general, graduates of IPIM's At-Scene Accident Investigation Course are roughly proportionate by age and sex (U.S. Dept. of Justice, 1982) to the larger national population of sworn law enforcement personnel. The graduates are predominantly males (96%) between the ages of 26 and 40 (81%) (see Table 3).

As indicated in Table 1 (see Chapter 3), the majority of enforcement personnel attending At-Scene training represent Local or County Police agencies (78%). State Police and Patrol agencies rank a distant second in attendance (17%), with representation by County Sheriffs' personnel third (5%). Table 4 presents data on the relative size of the several agencies which employ survey respondents. To simplify this presentation, five agency size class intervals were used. They are: 1) 1-25 personnel; 2) 26-50 personnel; 3) 51-100 personnel; 4) 101-250 personnel; 5) above 250 personnel. As might be expected, the "state" agencies are among the largest in terms of overall agency size with 90% of their trainees indicating that their agency employs more than 250 persons. Data submitted by representatives of Sheriffs' Departments suggest that over 70% of them are also in the above 250 total personnel category. Participation by Local and County Police Departments, however, appears to run the gamut, with relatively balanced proportions in each of the five agency size categories.

Table 3. Age and Sex of At-Scene Accident Investigation Trainees

Sex	Age					Total
	21-25 Years	26-30 Years	31-35 Years	36-40 Years	40+ Years	
Male						
(frequency)	20	90	81	59	34	284
(percent)	6.78%	30.51%	27.46%	20.00%	11.53%	96.27%
Female						
(frequency)	1	2	7	-	1	11
(percent)	.34%	.68%	2.37%	-	.34%	3.73%
Total						
(frequency)	21	92	88	59	35	295
(percent)	7.12%	31.19%	29.83%	20.00%	11.86%	100.00%

Non-reponses to age and/or sex survey item(s) = 2.

Table 4. Number of Personnel Employed by Type of Enforcement Agency

Agency Type	Number of Persons Employed By Agency					Total
	Employ- ing 1-25 Persons	Employ- ing 26-50 Persons	Employ- ing 51-100 Persons	Employ- ing 101-250 Persons	Employ- ing More Than 251 Persons	
State Police/ Patrol Agency (frequency)	-	-	3	2	47	52
(row percent)	-	-	5.77%	3.85%	90.38%	100.%
Sheriff's Department (frequency)	2	-	2	1	12	17
(row percent)	11.76%	-	11.76%	5.88%	70.59%	100.%
Local/County Police Dept. (frequency)	56	52	42	32	40	222
(row percent)	25.53%	23.42%	18.92%	14.41%	18.02%	100.%
Total (row percent)	58 19.93%	52 17.87%	47 16.15%	35 12.03%	99 34.02%	291 100.%

Non-responses to table data collection items = 6

Table 5 illustrates the urban/rural characteristic of participating agencies. Because state agencies, by definition, have jurisdiction over much larger geo-population tracts than do Sheriff's or Local/County Police organizations, a secondary measurement of the population density of each trainees work environment had to be used. This was accomplished by asking each respondent to identify the population of the specific jurisdiction within which he most frequently testified in traffic accident cases. Population categories used were 1) below 10,000, 2) 10,000 to 50,000, 3) 51,000 to 150,000, and above 150,000 population.

Based on these data, most trainees representing State and Local Police agencies work in areas ranging in population from 51,000 to 150,000 persons; whereas, County Sheriffs' trainees tend to work in more highly urbanized areas (above 150,000 population).

Table 6 provides summary data on the relative frequency (rate) of accident investigations conducted by personnel from the three types of enforcement agency represented in the study. It was possible to calculate a weekly investigation rate for only 204 (69%) of the respondents (see Table 6) due to incomplete response. Of those for whom rates were calculated, 141 (47%) reported an average of one to two investigations per week. It may be noted that over 23 percent of both Local/County Police and Sheriff's respondents reported investigating 3 or more accidents per week. While the number of Sheriff's personnel in the study sample was too small to generalize to that agency type, these

Table 5. Population of Jurisdiction Where Traffic Court Resides  
by Type of Enforcement Agency

Agency Type	Population of Traffic Court Jurisdiction				Total
	Below 10,000 Pop.	10,000 to 50,000	51,000 to 150,000	Above 150,000 Pop.	
State Police/ Patrol Agency (frequency) (row percent)	8 14.81%	28 51.85%	15 27.78%	3 5.56%	54 100.%
Sheriff's Department (frequency) (row percent)	1 6.25%	2 12.50%	1 6.25%	12 75.00%	16 100.%
Local/County Police Dept. (frequency) (row percent)	38 17.04%	101 45.29%	48 21.52%	36 16.14%	223 100.%
Total (row percent)	47 16.04%	131 44.71%	64 21.84%	51 17.41%	293 100.%

Non-responses to population data collection item = 3.

Table 6. Number of Accidents Investigated Per Week Since Attending Training  
By Agency Affiliation

Affiliation	<sup>a</sup> Number of Investigations Per Week				Total	<u>Mean</u> Wkly Inv. By Agency Affil.
	<sup>b</sup> Not Able To Cal- culate	1-2 per week	3-4 per week	5 or more per wk		
State Police/ Patrol Agency (frequency) (row percent)	14 23.45%	36 65.45%	4 7.27%	1 1.82%	55 100.%	1.1
Sheriff's Department (frequency) (row percent)	4 23.53%	9 52.94%	2 11.76%	2 11.76%	17 100.%	3.4
Local/County Police Dept. (frequency) (row percent)	75 33.33%	96 42.67%	31 31.78%	23 10.22%	225 100.%	1.9
Total (row percent)	93 31.31%	141 47.47%	37 12.46%	26 8.75%	297 100.00	

<sup>a</sup>Number of Accidents Investigated was computed for each trainee by dividing the total number of accidents investigated since training by the number of weeks since training.

<sup>b</sup>Non-responses to "number of accident investigated since training" data collection item = 93.

findings suggest accident investigation to be a routine job activity of some local enforcement personnel.

Table 7 addresses the relative use of training by personnel according to their agency affiliation. For this table, responses to the seventeen item training use index were collapsed into the following categories: 1) 1-3; 2) 4-6; 3) 7-9; 4) 10-12; and 13-15 outcomes used. Sheriffs' personnel and Local/County Police personnel both reported median training use rates of 8 for their investigations of the "single most serious accident investigated since training". As noted in Chapter 1, the training use index measured the number of specific investigative techniques, emphasized during At-Scene training, that the officer used during that specific investigation. State Police/Patrol personnel reported a somewhat lower median training use rate of 6. The higher use rates for Sheriffs' and Local/County personnel may be explained by the fact that relatively large numbers from those agencies reported assignment to a "specialized" accident investigation team (47% and 41%, respectively); whereas, less than 6 percent of State Police Personnel reported such an assignment (see Table 8).

#### Implementation Problem/Conditions Most Commonly Perceived to Influence Training Use

Respondents were asked to rate twenty-nine specific problems and conditions suggested within the literature as potential determinants in the implementation process. Ratings were collected on a four point Likert type scale according to the extent each item was perceived to

Table 7. Training Use By Agency Affiliation

Affiliation	Number of Training Outcomes Applied During Most Serious Recent Accident Investigated					Total	<sup>a</sup> Median Application By Agency Type
	Used 1-3 Outcomes	Used 4-6 Outcomes	Used 7-9 Outcomes	Used 10-12 Outcomes	Used 13-15 Outcomes		
State Police/ Patrol Agency (frequency) (row percent)	7 12.73%	23 41.82%	17 30.91%	6 10.91%	2 3.64%	55 100%	6
Sheriff's Department (frequency) (row percent)	3 17.65%	1 5.88%	6 35.29%	3 17.65%	4 23.53%	17 100%	8
Local/County Police Dept. (frequency) (row percent)	35 15.56%	40 17.78%	72 32.00%	61 27.11%	17 7.56%	225 100%	8
Total (row percent)	45 15.15%	64 21.55%	95 31.99%	70 23.57%	23 7.74%	297 100%	

<sup>a</sup>Median scores have been rounded to the nearest whole number.  
Non-response = 0.

Table 8. Frequency of Assignment to a Specialized Accident Investigation/Reconstruction Team By Agency Affiliation

Affiliation	Assigned to A Specialized Accident Investigation Team		Total
	YES	NO	
State Police/ Patrol Agency (frequency) (row percent)	3 5.45%	52 94.55%	55 100%
Sheriff's Department (frequency) (row percent)	8 47.06%	9 52.94%	17 100%
Local/County Police Dept. (frequency) (row percent)	92 40.89%	133 59.11%	225 100%
Total (row percent)	103 34.68%	194 65.32%	297 100%

Non-response = 0.

have influenced the respondent's use of At-Scene training during the investigation of the single, most serious accident investigated since training. Scale ratings included; 1) Was Not A Problem, 2) Was A Minor Problem, 3) Was A Moderate Problem, 4) Was A Major Problem. Table 9 provides a summary of those problem/conditions which were rated as Any Degree of Problem (i.e., either a Minor, Moderate, or Major Problem) by at least 40% of all survey respondents. This percentage was selected as a reasonable criterion for selecting out the most common problem/conditions following the first descriptive run of the survey data. The eleven problem/conditions meeting this criterion are listed in descending order of frequency.

While none of the problem/conditions were seen as a Major impediment to training use by more than 22 percent of the respondents, six problem conditions, when combined as Moderate or Major Problem, were identified by over 30 percent of the respondents. A review of these frequently cited Moderate/Major problems provides insight into the perceived dynamics of training use within operational law enforcement agencies. The ranked problems, with combined Moderate/Major percentages of 30% or more are: 1) There were no rewards or incentives for those who conducted thorough accident investigations (41%); 2) There were no rewards or incentives for those who applied or used their training (40%); 3) Officers were not allowed enough time to conduct a thorough investigation (39%); 4) Resources and equipment necessary to apply the training were not made available (38%); 5) Those who made the decision for personnel to attend training did not follow

Table 9. Problem/Conditions Most Frequently Reported  
As Impeding or Preventing the Use of Training

a Problem or Condition	Rated As Not A Problem	Rated As A Minor Problem	Rated As A Moderate Problem	Rated As A Major Problem	b Rated As Any Degree Of Problem	c Mean Response To This Problem
	Resources and equipment necessary to apply the training were not made available	114 (39%)	70 (24%)	70 (24%)	42 (14%)	182 (62%)
There were no rewards or incentives for those who conducted thorough accident investigations	113 (39%)	58 (20%)	58 (20%)	62 (21%)	178 (61%)	2.24
There were no rewards or incentives for those who applied or used their training	117 (40%)	59 (20%)	52 (18%)	63 (22%)	174 (60%)	2.21
Officers were not allowed enough time to conduct a thorough investigation	125 (42%)	53 (18%)	57 (19%)	60 (20%)	170 (58%)	2.18
Those who made the decision for personnel to attend training did not follow through to make sure that it was used	134 (46%)	59 (20%)	47 (16%)	54 (18%)	160 (54%)	2.07
Too few communications were received from top administrators indicating how training was to be applied	160 (54%)	45 (15%)	51 (17%)	39 (13%)	135 (46%)	1.89

a Listed in decreasing order of rating as "Any Degree of Problem" (see percentages in column b).

b This column presents combined frequencies from the "Minor", "Moderate" and "Major" problem columns -- only those problem/conditions identified as same degree of problem by at least 40% of the respondents were listed in this table.

c Means were calculated by dividing the sum of the problem ratings (1 = Not A Problem, 2 = Minor Problem, 3 = Moderate Problem, 4 = Major Problem) by the number of respondents to that item.

Table 9 (Continued)

Problem or Condition	Rated	Rated	Rated	Rated	Rated	Rated	Mean
	AS Not A Problem	AS A Minor Problem	AS A Moderate Problem	AS A Major Problem	AS A Degree Of Problem	AS Any Degree Of Problem	Response To This Problem
Department personnel, in general, did not view accident investigation as an important job priority	160 (54%)	64 (22%)	44 (15%)	27 (9%)	135 (46%)	1.79	
Those who received training had too little input into how the training was to be put to use	164 (56%)	56 (19%)	34 (12%)	40 (14%)	130 (44%)	1.83	
Top agency administrators did not make it clear that accident investigation was a department priority	168 (57%)	55 (19%)	37 (13%)	35 (12%)	127 (43%)	1.79	
Traffic volume was too heavy to allow this training to be used	169 (57%)	74 (25%)	29 (10%)	24 (8%)	127 (43%)	1.69	
My supervisor did not know enough about the content of this course to be able to help support me in its use	177 (60%)	49 (17%)	27 (9%)	40 (14%)	116 (40%)	1.76	

through to make sure it was used (34%); and, 6) Too few communications were received from top administrators indicating how training was to be applied (30%).

These commonly perceived implementation problems may be grouped into logical categories. The first two, for example, focus on the perceived adequacy of the incentive/reward feedback system which operates within the trainees immediate work environment. Since monetary rewards for exemplary or meritorious job performance are rare in public service agencies, it must be assumed that respondents viewed incentive/reward more in terms of verbal feedback, quality of job assignment, and general sense of importance placed on quality accident investigation within their work environment. The fact that over 40 percent of of all respondents rated each problem as either Moderate or Major in magnitude speaks directly to their significance to the training use issue.

The next two problem/conditions were perceived to be almost as significant by the survey respondents. Rated to be either a Moderate or Major Problem by over 38 percent of the respondents, these problem/conditions address the issue of resource adequacy. Some implementation researchers (see Scheirer, 1979) have suggested that individuals often raise the complaint of resource inadequacy out of guilt to explain their individual failure to implement an innovative practice. While that explanation may have some relevance here, it should be noted that in-depth accident investigation, of the type

commonly perceived as desirable for serious motor vehicle accidents, is both time and other resource intensive.

The last two problems, rated by at least 30 percent of the survey respondents to be either a Moderate or Major Problem affecting their use of training, suggest lack of management follow through, as well as lack of management communication to clarify agency expectations regarding training use, to be of significant importance. Similar to the first two problems which dealt with adequacy of the job performance motivation/feedback system within the trainee's work environment, these problems focus directly on the issue of organizational expectancy related to the training investment and the ongoing monitoring of that investment to ensure an adequate return. In fact, further examination of Table 9 suggests, if Moderate and Major Problem categories are combined, that general lack of organizational clarity about training's purpose, inadequate communication and expectancy setting regarding its use, along with management concern, in general, regarding training impact, are perceived to be the most significant problems.

#### The Relationship Between Reason Selected to Attend Training and Training Use

Because At-Scene Accident Investigation training is a highly technical form of job skill training, with obvious but limited application, a key area of interest in this research was the reason individuals were selected to attend, and how that selection decision related to subsequent training use. It is known that individuals are sometimes sent to training for reasons other than to enhance their job

related knowledge and skill. To assess the overall significance of the "reason for selection" issue, respondents were grouped according to their response to the following question, "Why were you selected to attend this training?". Accordingly, four groupings were generated based on replies to the following response options: 1) Attended Because My Present Job Assignment Requires That I Investigate Accidents; 2) I Was Sent In Preparation For A Future Job Which Would Involve Accident Investigation; 3) I Was Selected To Attend For Reasons Other Than Present Or Future Job Need; and, 4) I Don't Know Why I Was Selected To Attend. Overall, 213 respondents (74%) were assigned to training for reasons related to "present" or "future" job need.

When examined by agency affiliation (see Table 10), State enforcement personnel were most often sent in response to a "present" job need (70%) with those identifying their training as preparation for a "future" job assignment a low 2 percent. Personnel from Local and County Police agencies and Sheriffs' Departments were also heavily associated with the "present" job need category. In contrast with State agency personnel, however, 16% and 13%, respectively, identified with the "future" application category.

Since one of the principal questions posed by this study queried the relationship between training use and reason selected to attend, closer examination of responses to the "selected for other reasons" and "don't know why selected" categories seems important. As noted by Table 10, a relatively high percentage (19%) of the County Sheriffs' personnel indicated that they were selected to attend for "other"

Table 10. Reason Personnel Were Selected To Attend Training By Agency

## Affiliation

Affiliation	Reason Selected To Attend Training.				Total
	Present Job Requirement	Future Job Requirement	Selected For Other Reason	Do Not Know Why Selected	
State Police/ Patrol Agency (frequency) (row percent)	38 70.37%	1 1.85%	4 7.41%	11 20.37%	54 100.0%
Sheriff's Department (frequency) (row percent)	10 62.50%	2 12.50%	3 18.75%	1 6.25%	16 100.0%
Local/County Police Dept. (frequency) (row percent)	127 58.26%	35 16.06%	20 9.17%	36 16.51%	218 100.0%
Total (row percent)	175 60.76%	38 13.19%	27 9.38%	48 16.66%	288 100.0%

Non-responses to one or both data collection items = 9.

reasons (i.e., while recovering from injury, as a reward, or other department reason). Relatively high percentages of both Local/County (17%) and State (20%) personnel that indicated they "did not know why they were selected". The presence of over 16.5 percent of all respondents in the "don't know" category may suggest a serious lack of internal clarity and communication within some agencies concerning the purpose of course attendance and lack of expectancy regarding trainees use of training once it has been received. The low median use rate of 5 for the "don't know" category (Table 11) compares poorly with the median use rates of 8, 9, and 7, reported for the "training required for present job", "training required for future job", and "selected into training for other reasons" groups.

Respondents' scores on the training use index (Dependent Variable), grouped according to the four response categories, were submitted to a one-way ANOVA to contrast training use among the four groups. The SAS GLM Procedure was used to allow for inequalities in group size. The results of the ANOVA are reported in Table 12.

Examination of the F ratio ( $F(3,284)=10.06, p<.01$ ) indicates that significant differences in reported training use do exist among trainees when differentiated by reason selected to attend training. Since significant differences among the groups were suggested by the ANOVA, further analysis involving comparisons among the four groups was undertaken. Because this follow-up evaluation for significant differences between the "reason selected into training" groups involved six individual comparisons, the potential for commission of a Type I

Table 11. Median Use of Training Outcomes For Trainees Grouped According To Reason Selected to Attend Training

Reason Selected	Number of Times Training Outcomes Were Applied					Total	Median Applica- tion for Group
	Used 1-3 Out- comes	Used 4-6 Out- comes	Used 7-9 Out- comes	Used 10-12 Out- comes	Used 13-15 Out- comes		
Present Job Requirement (frequency) (row percent)	16 9.14%	36 20.57%	63 36.00%	45 27.51%	15 8.57%	175	8
Future Job Requirement (frequency) (row percent)	4 10.53%	7 18.42%	9 23.68%	13 34.21%	5 13.16%	38	9
Selected for Other Reason (frequency) (row percent)	7 25.93%	3 11.11%	8 29.63%	7 25.93%	2 7.41%	27	7
Did Not Know Why Selected (frequency) (row percent)	15 31.25%	17 35.42%	12 25.00%	3 6.25%	1 2.08%	48	5
Total (row percent)	42 14.58%	63 21.88%	92 31.94%	68 23.61%	23 7.99%	288 100%	

Non-responses to this data collection item = 7.

Table 12. Analysis of Variance of Training Use By Reason  
Selected to Attend Training

Source	DF	SS	Mean S	F	p
Between Groups Change	3	340.347	113.449	10.06	**
Within Groups Change	284	3203.816	11.281		

\*\* p < .01  
R<sup>2</sup> = .096

error (at the .05 level) was calculated and found to be an unacceptably high 32 percent. To guard against the reporting of a significant difference where none exists, the conservative Scheffe test was used for the post hoc comparisons.

The results, displayed in Table 13, indicate that the "I Do Not Know Why I Was Selected" group mean (5.3) was significantly different from the "Present Job Requirement" (8.1) and "Future Job Requirement" (8.7) group means. The differences in average number of training outcomes used (i.e., 2.8 and 3.4, respectively) also seems meaningful from a pragmatic perspective, as well. In total, the  $R^2$  of .096 reported by the GLM ANOVA procedure (a ratio of SS between and SS total) suggests that as much as 10 percent of the variance in training use may be associated with factors and conditions surrounding the selection process.

The aim of the remaining five research questions was to gain better understanding of those problems, conditions, and factors within the organizational work environment that significantly block or impede training use. They are discussed here collectively to avoid unnecessary redundancy.

Because of the large number of independent variables for which data were collected, a preliminary analysis was undertaken to reduce the independent variable pool. Correlations were derived for each independent variable with the dependent variable, with those exhibiting the most sizeable correlations selected out for further analysis. A correlation matrix of the intercorrelations among the remaining

Table 13. Results of Scheffe's Test for Differences in Training Use  
Between Trainees Grouped By Reason Selected to Attend Training

Reason Selected to Attend Training	Mean Difference
Future Job Requirement (8.7) vs Present Job Require.(8.1)	.61
Future Job Requirement (8.7) vs Other Reason (7.2)	1.45
Future Job Requirement (8.7) vs Do Not Know Why (5.3)	3.38 *
Present Job Requirement(8.1) vs Other Reason (7.2)	.84
Present Job Requirement (8.1) vs Do Not Know Why (5.3)	2.77 *
Other Reason (7.2) vs Do Not Know (5.3)	1.93

Group Means shown in parentheses; table differences due to rounding  
DF = 284, MSE = 11.281

\*  $p < .05$

independent variables was then developed (see Table 14). Further examination was undertaken to eliminate those variables which had a significant correlation with other predictor variables. A final regression model was then developed which included fourteen predictor variables. These variables are identified in Table 14.

Due to the exploratory nature of this research, and the absence of a strong theoretical model to order the analysis of the potential predictor variables, a stepwise multiple regression solution was utilized. The major strength of the stepwise procedure is the ability to develop a "most efficient" predictive model (based on the data at hand), with the unique contribution made by each of the predictor variables isolated for further examination. This is accomplished by allowing only one variable to enter the regression equation at a time, with the order of entry determined by the strength of each variables correlation with variance remaining "unexplained" in the dependent variable. The SPSSX REGRESSION procedure (Stepwise), with default criteria, was used for this analysis.

The results of the stepwise procedure are presented in Table 15. Only seven of the fourteen predictor variables met the criteria for inclusion in the final Stepwise equation. The multiple correlation (R) for these seven variables, with training use, was .58 (DFreg=7, DFres=289,  $p < .01$ ). The model was found to explain 34 percent of the observed variance in training use.

Further interpretation of the model, specifically with regard to the relative influence of the several predictor variables, is

Table 14. Zero Order and Partial Correlations for 18 Explanatory Variables and Training Use.

	Partial Correlation	Work Opinion	Training Opinion	Spec Trng	Prob 27	Prob 4	Accid Invest Rate 3	Prob 17	Prob 29	Prob 10	Prob 2	Prob 13	Prob 19	Prob 8	Prob 26	Prob 20	Prob 14
Training Use	1.00	.42**	.33**	.19**	.16*	-.18**	.18**	-.15*	.10*	.09*	-.11*	-.07	-.07	-.07*	-.06	-.06	-.08
Seriousness	.35**	1.00	.24**	.09	.10*	.06	.16*	-.03	.05	.07	-.01	-.07	-.02	-.05	-.01	.00	-.08*
Work Opinion	.08	1.00	.54**	.21**	.02	-.17*	.16*	-.05	.00	.08	.02	.05	.04	-.14*	.00	.05	.03
Training Opinion	.19**	1.00	.12*	-.09	-.20**	.00	-.18*	-.07	-.14*	.14*	-.08	.03	.01	-.20**	-.02	.00	-.01
Special Training	.11*	1.00	.06	.06	.00	.11*	.04	.05	.00	.04	.00	-.01	.03	-.12*	-.07	.00	.05
Problem 27	.17**	1.00	.07	.05	.07	.19**	.68**	.05	.11*	.06	.09*	.15*	.12*	.14*	.15*	.15*	.15*
Problem 4	-.08	1.00	-.08	.39**	.23**	.06	.03	.09*	.08	.05*	.10*	.06	.20**	.09*	.09*	.09*	.09*
Invest. Rate	.13*	1.00	-.05	.06	.03	.00	.07	-.01	.02	.00	.05	.06	.11*	.09*	.01	.02	.02
Problem 3	-.05	1.00	.15*	.05	.01	.19**	.04	.05	.06	.11*	.09*	.15*	.12*	.14*	.15*	.15*	.15*
Problem 17	-.11*	1.00	.17**	.37**	.26**	.36**	.44**	.27**	.41**	.45**	.45**	.45**	.45**	.45**	.45**	.45**	.45**
Problem 29	.01	1.00	.14*	.14*	.14*	.12*	.08*	.18**	.16*	.16*	.14*	.14*	.14*	.14*	.14*	.14*	.14*
Problem 10	.14*	1.00	.35**	.55**	.42**	.20**	.46**	.42**	.46**	.46**	.46**	.46**	.46**	.46**	.46**	.46**	.46**
Problem 2	-.10*	1.00	.32**	.31**	.22**	.37**	.41**	.34**	.34**	.34**	.34**	.34**	.34**	.34**	.34**	.34**	.34**
Problem 13	-.04	1.00	.54**	.14*	.38**	.45**	.55**	.72**	.72**	.72**	.72**	.72**	.72**	.72**	.72**	.72**	.72**
Problem 19	-.02	1.00	.21**	.47**	.69**	.69**	.69**	.69**	.69**	.69**	.69**	.69**	.69**	.69**	.69**	.69**	.69**
Problem 8	-.01	1.00	.41**	.23**	.16**	.16**	.16**	.16**	.16**	.16**	.16**	.16**	.16**	.16**	.16**	.16**	.16**
Problem 26	-.04	1.00	.53**	.45**	.45**	.45**	.45**	.45**	.45**	.45**	.45**	.45**	.45**	.45**	.45**	.45**	.45**
Problem 20	.03	1.00	.60**	.60**	.60**	.60**	.60**	.60**	.60**	.60**	.60**	.60**	.60**	.60**	.60**	.60**	.60**
Problem 14	-.03	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

a Partial correlations are for each explanatory variable and "training use" with all other variables partialled out.  
 b Denotes a variable selected for multiple regression analysis. Selection criteria: 1) strength of partial correlation with dependent variable, 2) number and significance of intercorrelations with other independent variables.  
 N = 297  
 \* p < .05  
 \*\*p < .01

Table 14. (Continued) Zero Order and Partial Correlations for 18 Explanatory Variables and Training Use.

Label	Variable
Training Use .....	Dependent Variable: Number of training outcomes used during investigation of most serious crash since training.
Seriousness .....	Rating of the seriousness of the most serious crash investigated since training.
Work Opinion .....	Trainee's opinion of accident investigation as a job assignment.
Training Opinion ....	Trainee's opinion of accident investigation training.
Special Training ....	Number of hours of specialized training - not this course.
Problem 27 .....	Civil Courts did not allow reconstruction findings to be entered into evidence.
Problem 4 .....	Trainee had forgotten much of what had been taught.
Investigation Rate ..	Average number of investigations per week since training.
Problem 3 .....	Trainee had not developed investigative skills adequately during training.
Problem 17 .....	Training conflicted with agency's S.O.P.'s.
Problem 29 .....	Courts viewed reconstruction with low credibility.
Problem 10 .....	Supervisor did not know enough about training to support its use.
Problem 2 .....	Necessary resources and equipment were not available.
Problem 13 .....	My supervisor did not expect me to use my training.
Problem 19 .....	Those trained had too little input into how the training was to be used.
Problem 8 .....	Traffic volume was too heavy to allow training to be used.
Problem 26 .....	Not enough time was allowed to conduct a thorough investigation.
Problem 20 .....	Training decision makers did not follow through to see that it was put into use.
Problem 14 .....	Too few communications were received from top administrators regarding how training was to be applied.

Table 15. Results of Stepwise Multiple Regression of Level of Training Use on 14 Predictor Variables

Predictor Variable	<sup>a</sup> Regression Results				
	Multiple R at Each Step	Change in Mult. R <sup>2</sup>	Beta Weight in Final Equation	F	p
Seriousness of Accident Investigated	.42	.18	.42	53.0	**
Opinion of Training	.51	.08	.28	27.9	**
Local Civil Courts did not accept reconstruction findings as evidence	.53	.03	.17	14.0	**
Trainee forgot how to apply important skills from training	.55	.02	-.14	4.1	*
Hours of Specialized AI Training	.56	.01	.11	4.7	*
Job behaviors emphasized by training conflicted with Agency S.O.P.'s	.57	.01	-.11	5.5	*
Frequency of Investigations (Investigation Rate)	.58	.01	.10	4.2	*

\*  $p < .05$                       Final  $R^2 = .58$  \*\*

\*\*  $p < .01$                        $R^2 = .34$

DF Reg = 7, DF Res = 289

<sup>a</sup>See text for explanation.

difficult, if not impossible, due to the presence of multicollinearity among the predictor variables. This problem is particularly noticeable in the changes which occur in the standardized regression coefficients (Beta weights) as variables are either added or deleted from the equation.

Nevertheless, in order to gain some insight into the relative contribution and stability of the predictive model produced by the stepwise procedure, a second multiple regression analysis was performed using Table 15 data (see Table 16). In the second analysis, however, all fourteen predictor variables were entered into the regression equation at one time. The results of this analysis differ from those reported in Table 13 in one major respect. The Beta's reported by the full regression model are based on the partial correlation of each predictor variable with the dependent variable, as opposed to the Beta's reported by the Stepwise procedure which were based on semi-partial correlations. The results of the full fourteen variable multiple regression analysis are reported in Table 16. It is important to note, that the standardized regression coefficients reported for the variables in the full regression equation were adjusted for the explanatory contributions made by all the other variables in the equation, and not for just those effects made by a few stronger variables already entered on some previous step.

By comparing the Betas reported by the full fourteen variable

Table 16. The "Full" Model: Regression of Training Use on 14 Predictor Variables.

Predictor Variable	<sup>a</sup> Regression Results			
	Beta at Step One	<u>t</u>	<u>p</u>	<sup>b</sup> <u>p</u> in Stepwise Model
Opinion of Training	.20	3.21	**	**
Frequency of Investigations (Investigation Rate)	.10	2.06	*	*
Those trained had too little input into how training was to be used	-.03	-.39		
Local Civil Courts did not accept reconstruction findings as evidence	.19	2.86	**	**
Hours of Specialized AI Training	.10	2.05	*	*
Seriousness of Accident Investigated	.33	6.44	**	**
Trainee did not adequately develop important skills during training	-.05	-.90		
Necessary resources and equipment were not available	-.10	-1.77		
Trainee forgot how to apply important skills from training	-.07	-1.35		*
Supervisor did not know enough about training to support its use	.13	2.24	*	
Job behaviors emphasized by training conflicted with Agency S.O.P.'s	-.12	-2.04	*	*
Opinion of Accident Investigation as a work assignment/responsibility	.08	1.26		
Local Courts viewed reconstruction testimony with low credibility	.00	-.00		
Too few communications received from top admin. about use of training	-.04	-.57		

\*  $p < .05$                        $R_2 = .60$  \*\*  
 \*\*  $p < .01$                        $R_2 = .36$   
 DFreg = 14, DFres = 282

<sup>a</sup>See text for explanation.

<sup>b</sup>Significance of predictor variable reported by Stepwise procedure (see Table 15)

regression model with those from the more efficient stepwise model, it is possible to gain a better insight into the stability and relative importance of each variable as a predictor of training use.

#### The Relationship Between Accident Seriousness and Training Use

Because many of the investigative techniques emphasized by the At-Scene Accident Investigation curriculum require large commitments of time, as well as other resources, it would seem reasonable to assume that those valuable resources would be applied more liberally as the seriousness or severity of the accident being investigated increases. Comparison of the two regression results seems to support this contention, with this variable representing the single most important predictor of training use in both models. The Betas compare favorably, with a Beta of .42 ( $p < .01$ ) reported by the Stepwise procedure, and a not too dissimilar Beta of .33 ( $p < .01$ ) reported by the full regression model.

It should be noted here that since it was not possible to anchor the measurement of this variable to a common or universal standard of accident seriousness, additional caution must be exercised in evaluating these results. Nevertheless, the selection of this variable as the best predictor of training use by the efficient stepwise procedure does suggest that training use may be strongly influenced by the severity or seriousness of the situational context within which it is applied.

### The Relationship Between Trainee Opinion and Training Use

The second most significant predictor of training use, based on the stepwise procedure, was trainee opinion of the At-Scene Accident Investigation training program and its applicability to their job performance. As noted in Chapter 2, much is reported in the literature about the relationship between attitude or opinion and implementation success. In general, this relationship has proven quite weak. In this study, two opinion index scores entered into the pool of potential regression variables. These data were calculated for each respondent by summing their responses to two, 10 question Likert scaled opinion inventories. One inventory measured the respondent's opinion of the training and its usefulness to law enforcement personnel, while the second rated the individual's opinion of accident investigation as an enforcement agency job responsibility.

While the "work opinion" variable did not emerge as a significant predictor of training use in either model, the "training opinion" variable was found to be significant by both. Selected as the second best predictor of training use, at step-two by the stepwise procedure (see Table 15), this variable produced a Beta of .28 ( $p < .01$ ). As with accident seriousness, the training opinion variable also maintained its relative importance in the full fourteen variable regression model (see Table 16). The consistency of these findings suggests that a positive opinion of the accident investigation training

intervention is related, at least somewhat, to the subsequent use of that training.

#### The Relationship Between Training Use and Work Environment Problem/Conditions

As discussed in Chapter 2, a wide variety of actions, inactions, and other circumstances existing within the day-to-day work environment can be hypothesized to influence innovation implementation and use. Respondents were presented a list of twenty-nine such problem/conditions and were asked to rate each on a four point Likert type scale. The scale questioned whether the condition was Not A Problem, A Minor Problem, A Moderate Problem, or, A Major Problem which affected their recent use of At-Scene Accident Investigation training.

Preliminary correlations among the twenty-nine original problem/conditions, however, indicated that many were so intercorrelated that multicollinearity would be a serious problem. To counter this problem, the list of problem/conditions was reduced from twenty-nine to nine. The nine variables were selected for the apparent strength of their relationship to the dependent variable.

Of the nine, the most significant predictor of training use, reported by both the stepwise and full multiple regression models, was Problem 27 ("The Civil Court(s) in which I testify did not allow accident investigation findings to be entered into evidence."). The stability of this predictor across the two models is quite striking. Entered on step-three of the stepwise solution, Problem 27 had a Beta of .17 ( $p < .01$ ). This standardized regression coefficient compares

closely with the .19 Beta ( $p < .01$ ) reported by the full regression equation.

Of greatest interest, however, is the absence of a negative sign on these regression coefficients. Because the problem of "court acceptance" of training results was voiced more frequently than any other problem by trainees during the several pre-study discussion sessions held by the researcher with law enforcement personnel, it was anticipated that the problem statement would assume a negative relationship with training use. In other words, training use would be lower for those who perceived court acceptance to be a major problem. The opposite case was found to be true. Examination of Table 14 suggests one possible explanation for this unanticipated finding. That is, that Problem 27 held a negative correlation ( $r = -.09$ ) with another important predictor variable, "opinion of training". It should be noted that opinion of training also demonstrated a positive relationship with training use. Taken at face value, a contradiction seems to exist. One might logically assume that those who perceive "lack of acceptance by the courts" to be a major impediment to training use would also be those who hold a positive opinion and regard for the training intervention and its usefulness to law enforcement personnel. This, however, does not appear to be the case. The answer may be that those who voice lack of court acceptance as a problem are using that problem as a scapegoat or external excuse to avoid placing blame on themselves for their lack of implementation success.

A second problem/condition was selected in step-four of the stepwise solution. The problem (Problem 4) represented the situation where the trainee had "forgotten much of what had been taught" during At-Scene Accident Investigation training. Although a Beta of  $-.14$  ( $p < .05$ ) was reported by the stepwise solution, this problem did not demonstrate a significant Beta in the full regression model (Beta =  $-.07$ ). Explanation of this discrepancy can be found in the intercorrelation between Problem 4 and Problem 3 ("I had not developed the skills adequately during training to be able to apply them."). The significant correlation coefficient for the two variables ( $r = .39, p < .01$ ), reported in Table 14, was obviously instrumental in masking Problem Four's significance. These findings suggest that, if combined, the two variables may represent a more general attribute which could be labeled "individual competency". It is also important to note the negative signs of the Betas which indicate that lower training use rates were reported by those who indicated that forgetting or never learning were major problems.

The third problem/condition selected by the stepwise procedure was Problem 17, where trainees indicated that "job behaviors emphasized by At-Scene Accident Investigation training conflicted with their department's standard operating procedures." Once again, a reasonable case can be made that this variable offers a significant contribution to the prediction of training use. The two very similar Betas reported by the regression models were a  $-.11$  ( $p < .05$ ) for the Stepwise solution, and  $-.12$  ( $p < .05$ ) for the full regression model.

As with Problem 4, where trainees reported that they had forgotten much of what had been taught during training, the problem of training conflict with formalized organizational norms exhibits a negative sign. This suggests that for those using their training to a lesser degree, apparent inconsistencies existing between behaviors emphasized by training and those officially endorsed by their employing agency, may be a real problem.

At this point, a second disagreement between the two regression solutions should be addressed. Whereas, Problem 10 ("My supervisor did not know enough about the content of this course to be able to support me in its use.") did produce a significant Beta in the full regression analysis (Table 18) of  $-.13$  ( $p < .05$ ), it was not selected by the more efficient stepwise procedure. Once again, examination of Table 14 suggests that the significant correlations between this variable and "training opinion" ( $r = .14$ ,  $p < .05$ ) and Problem 17, where "training behaviors conflicted with department standard operating procedures", ( $r = .37$ ,  $p < .01$ ), may have reduced its unique explanatory capability in the Stepwise solution for this sample.

#### The Relationship Between Training Use and Hours of Specialized Training

Information on the number of hours of "basic" and "specialized" training in accident investigation (not including the 70 hours of At-Scene Accident Investigation training) is presented in Tables 17 and 18. State Police personnel reported the greatest amounts of "basic" training, with over 70 percent indicating that they had received from

Table 17. Number of Hours of Accident Investigation Basic Training Received By Agency Affiliation

Affiliation	Number of Hours of Basic Training in Accident Investigation Received						Total
	None	1-20 Hours	21-40 Hours	41-60 Hours	61-80 Hours	More Than 80 Hrs.	
State Police/ Patrol Agency (frequency)	4	4	18	11	11	6	54
(row percent)	7.41%	7.41%	33.33%	20.37%	20.37%	11.11%	100%
Sheriff's Department (frequency)	2	9	2	1	1	2	17
(row percent)	11.76%	52.94%	11.76%	5.88%	5.88%	11.76%	100%
Local/County Police Dept. (frequency)	14	122	64	6	8	5	219
(row percent)	6.39%	55.71%	29.22%	2.74%	3.65%	2.28%	100%
Total (row percent)	20	135	84	18	20	13	290
	6.90%	46.55%	28.97%	6.21%	6.90%	4.48%	100%

Non-responses to this data collection item = 7.

Table 18. Number of <sup>a</sup>Hours of Accident Investigation Specialized Training Received By Agency Affiliation

Affiliation	Number of Hours of Specialized Training in Accident Investigation						Total
	None	1-20 Hours	21-40 Hours	41-60 Hours	61-80 Hours	More Than 80 Hrs.	
State Police/ Patrol Agency (frequency)	23	15	3	1	9	3	54
(row percent)	42.59%	27.78%	5.56%	1.85%	16.67%	5.56%	100%
Sheriff's Department (frequency)	9	1	2	1	1	3	17
(row percent)	52.94%	5.88%	11.76%	5.88%	5.88%	17.65%	100%
Local/County Police Dept. (frequency)	82	39	34	6	14	46	221
(row percent)	37.10%	17.65%	15.38%	2.71%	6.33%	20.81%	100%
Total (row percent)	114	55	39	8	24	52	292
	39.04%	18.84%	13.36%	2.74%	8.22%	17.81%	100%

<sup>a</sup>Other than this course

Non-responses to this data collection item = 5.

21 to 80 hours of training. This contrasts with the 24 percent of Sheriff's personnel and the 36 percent of Local/County Police personnel who reported that same level of training. While not a primary interest of this study, number of hours of "specialized" training in accident investigation/reconstruction techniques was investigated and found to be a significant predictor of training use (see Tables 15 and 16). This variable was selected by the Stepwise procedure on step five (Beta = .11,  $p < .05$ ). This finding was consistent with the .10 Beta ( $p < .05$ ) reported by the full regression model.

This finding makes sense in that individuals receiving this often expensive training would most likely be expected by their agencies to apply it. It may be noted that the two agency types reporting the highest median training use rates (Sheriff's and Local/County Police personnel, each with a median of 8 training outcomes used) also had the highest percentages of personnel reporting more than 80 hours of "specialized" training (i.e., 18% and 21%, respectively).

#### The Relationship Between Training Use and Posttraining Accident Investigation Rate

Just as accident seriousness could be considered a fundamental determinant of training use, so might be the frequency that the individual officer is assigned to investigate accidents. To assess the influence of this predictor variable on training use, an investigation index score was computed for each respondent by dividing the total number of accidents they had investigated since training by the number

of weeks elapsed since training. The result was an average number of accidents investigated each week for each of the survey respondents.

This variable was selected at step-seven into the Stepwise regression equation (Beta = .10,  $p < .05$ ; see Table 15), a finding identical to that reported by the full regression model (Table 16). Since the relative size of a regression coefficient, calculated at this relatively late point in the stepwise solution, may be diminished by intercorrelations between the variable and those already entered into the model, the apparent stability of this variable as a predictor should be noted.

#### Summary

Fourteen predictor variables, selected on the significance of their correlation with training use, were submitted to two multiple regression procedures. The first, a stepwise solution, selected seven variables (see Table 15) as the most efficient model for predicting training use. The second regression model produced a full multiple regression analysis of the fourteen predictor variables (see Table 16). Comparisons were made between the standardized regression coefficients produced by the two models to evaluate the significance and consistency of the predictor variables.

For the sample included in this study, the results suggest the general importance of several factors and conditions to the determination of posttraining training use. Isolated as predictors of training implementation success were: the relative

seriousness of the situational context within which the training was applied; trainees' opinion of the training and its appropriateness for use by members of their profession; the degree of blame placed by trainees' on local courts for not accepting training associated evidence -- an excuse which may be voiced by a small percentage of trainees to avoid personal responsibility for their non-use of training; problems related to the retention of knowledge and skill acquired during training; the level of specialized training completed, as well as the relative frequency of assignment to the investigation of accident cases; and, the level of conflict perceived to exist between training use and formalized agency standard operating procedures.

## Chapter 5

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This final chapter provides a summary review of the research conducted and presents conclusions drawn from the study findings. Recommendations are offered for implementing the study conclusions and to aid the conduct of future research in this important area.

#### Summary

This study was concerned with the identification of problems and conditions existing within the day-to-day work environment of law enforcement agencies that are perceived to block or inhibit the use of knowledge and skill acquired through accident investigation training. Law enforcement agencies, like many other types of organizations, frequently rely on training to facilitate planned changes in policy and to support the implementation of innovative practices and procedures. Unfortunately, those who sponsor training, and make training decisions, as well as those who design, conduct, and evaluate training, often do so on the largely unfounded assumption that trainees' newly acquired behavioral capabilities will be put to use back on the job.

This tendency toward overgeneralization was noted by Katz and Kahn, as long ago as 1966, to be a common and serious problem among those involved with training management. They labeled it psychological fallacy and defined it as "the error one makes, when dealing with organizational change, by disregarding the systemic properties of the

organization and confusing individual change with modification of the organization" (p. 391). Today the problem continues to be widespread. Even those who evaluate training have been criticized for their inadequate attention to the question of whether training actually produces positive behavioral change outside the protected training environment (Deterline, 1976; Newstrom, 1978; Beaumont, 1979; Nickols, 1979).

The results of this tendency to overgeneralize training's effects have been considerable, both in molding the management and decision making practices of training's sponsors, as well as in shaping the content and delivery of job-skill oriented training interventions. One of the most noticeable results is the fact that contemporary training theory and practice places primary emphasis on the facilitation of behavioral competencies at the individual level (Tracey, 1971; Broad, 1980). Largely ignored are the many powerful forces existing at the work group and organizational levels of the work environment that may also influence the individual's behavior (Johnson, 1976; Broad, 1980; Scheirer, 1981). As a result, training management efforts are often isolated, or disassociated, from the day-to-day work environment where training's impact may be heavily influenced and where its effectiveness must ultimately be evaluated.

The research reported in this dissertation represents a step forward in the attempt to gain better understanding of the larger set of factors and conditions that influence training impact. The central

question asked in this study was: What implementation problems and conditions, existing within the organizational work environment, are perceived to block or inhibit the use of job skills acquired through accident investigation training?. Of course, this question has an obvious corollary -- that some contextual factors and conditions may also facilitate and support training's use.

It has been noted that a major obstacle to the conduct of this type of research has been the lack of an adequate conceptual model to explain behavior within organizational settings (Elmore, 1978). In the absence of such a model, two helpful paradigms were used to guide this research. The first model was Lewin's Field perspective of change as a process of unfreezing, moving, and re-freezing organizational culture (see Benne, 1976). Building on this premise, Scheirer (1979;1981) suggested that the process of organizational change actually consists of five stages. They are: 1) the decision to adopt phase, where commitment, direction, and control issues are decided in relation to the innovation; 2) the assembling of resources phase, where human, fiscal, and material resources are allocated; 3) the role change phase, where factors and conditions within the work group setting interact with, and influence the quantity and quality of change; 4) the problem solving phase, where difficulties are diagnosed and treated; and, 5) the institutionalization phase, where the results of this process become the organization's new way of doing things.

While helpful in conceptualizing the implementation process, Lewin's model is not clear as to who the principal actors are at each stage. For this reason, Katz and Kahn's (1966) notion of viewing behavior within organizations as the product of factors and conditions existing at the macro (organization wide) and micro (individual) levels, was also used to guide the theoretical development of this research. That conceptualization was strengthened by Scheirer's addition (1979) of an intermediate (work group) level. By combining these distinct frames of reference, it is possible to view innovative behavioral change within organizational settings as a process that occurs in distinct chronological stages and that is influenced by factors and conditions existing at the macro, intermediate, and micro levels.

Guided by this theoretical framework, At-Scene Accident Investigation, a specific job-skill training program commonly implemented by local, county, and state law enforcement agencies, was selected for study. This training intervention was selected particularly for its focus on the development of specific job skills, or competencies, that are commonly endorsed by law enforcement agencies across the United States. An ex-post-facto mail questionnaire methodology was used to collect self-report data from course graduates on 1) level of training use, 2) the relevant influence of specified macro/intermediate/micro level problem conditions on training use, and, 3) respondent and agency demographic characteristics.

Questionnaires, designed to be consistent with Dillman's Total Design Method (1978), were mailed to a sample of 391 local, county, and state law enforcement personnel who had completed one of twelve two-week At-Scene Accident Investigation courses offered by the University of North Florida between October 1983 and October 1984. A total of 322 responses were received, for an overall response rate of 82.3%. Two hundred and ninety-seven useable questionnaires were coded for analysis (75.9%). Descriptive statistics, ANOVA, and multiple regression analysis were used to answer the study questions.

### Conclusions

Based on the findings presented in Chapter 4, the following conclusions are drawn. Katz and Kahn's (1966) useful distinction of macro and micro level variables is used to order and integrate the conclusions.

#### Macro Level Variables Influencing Training Impact

At the organizational, or macro level, inadequate communications regarding the purpose of agency participation in At-Scene Accident Investigation training, inadequate support and follow-through to ensure that important training outcomes are used, and inadequate resources, are perceived as relatively frequent impediments to training use.

Communications inadequacy. Support for the contention that communications from managers to trainees are often inadequate, outlining "how" and "to what extent" training outcomes are to be used,

is evidenced by fact that almost half (46%) of all respondents rated lack of communication as having been a Minor, Moderate, or Major problem affecting their use of accident investigation training. Thirty percent rated lack of communications as a Moderate to Major inhibitor of their use of training.

In addition, 43% of the respondents rated the situation where top agency administrators did not make it clear that accident investigation was a department priority to have been some level of problem. Forty-six percent rated the low priority assigned to accident investigation by fellow officers as a condition which negatively influenced their use of this training.

While it is possible that poor or non-existent communication regarding training use, in some agencies, may be the result of real disaffection by agency administrators with accident investigation as an agency priority, this seems unlikely in that over 73% of the trainees associated their selection to attend with "present" or "future" job need. It seems unlikely that the considerable human, temporal, and fiscal resources involved in sending an individual to this training would be expended if the training was not viewed as being of some benefit to the trainee's agency. This further supports the conclusion that administrators' objectives in assigning personnel to attend training are often poorly communicated.

Perhaps the most significant indictment of the communications process in some law enforcement agencies is the finding that 16.6% of

the trainee respondents did not know why they were selected to attend. It should be noted that this group also reported significantly lower training use rates than did those who indicated they were selected for reasons associated with present or future job need. Several explanations for their lack of awareness are possible: 1) agency decision makers may not have told these individuals "why" they were being assigned -- i.e., a lack of communication; 2) the trainees may have known, but forgot; or, 3) the organization, as a whole, may have been unclear about the specific purpose of its participation -- again, symptomatic of a lack of communication. Although further analysis to determine why individuals did not know the reason for their assignment was not undertaken, it can easily be speculated that communication inadequacy was a primary factor.

Inadequate management support and follow-through. The conclusion that management support and follow-through to see that important training outcomes are put into use, in some agencies, are inadequate is supported by the fact that over half (54%) of the trainees rated lack of follow-through as having been some degree of problem. Thirty-four percent rated lack of follow through to have been a Moderate or Major impediment to their use of the accident investigation training.

Additional evidence of inadequate follow-through is found in the ratings of other macro and intermediate "organizational context" (Ingalls, 1972; Broad, 1980) variables. Of particular note is the

multiple regression analysis finding of "training outcome/S.O.P. conflict" as a significant predictor of training use ( $p < .05$ , see Table 16). The negative Betas reported by the Stepwise (-.11) and Full regression solutions (-.12) suggest that incongruities between behaviors emphasized by training and agency norms and procedures are significant problems in many of the respondents' agencies.

A final indicator of inadequate management support is suggested by the identification of 40% of the respondents with the problem of having a supervisor who did not know enough about the content of the training to be able to support them in its use.

Inadequate resources. The conclusion that lack of resources necessary to implement newly learned behaviors represents a serious impediment to the use of accident investigation training is based on the rating of that situation as a Minor, Moderate, or Major problem by 62% of the trainee respondents. Almost four out of ten (38%) rated resource inadequacy as a having been a Moderate or Major impediment to their recent use of accident investigation training.

Lack of time, another resource, was also cited by 58% of the respondents to have been a Minor, Moderate, or Major problem, with 39% rating it as a Moderate or Major problem. Although the complaint of resource inadequacy has been suggested to be nothing more than rationalization by some individuals to avoid personal blame for their lack of implementation success (Scheirer, 1979), the relatively widespread identification with this problem further supports its

importance as an issue that agency decision makers and training managers should address.

#### Micro Level Variables Influencing Training Impact

At the individual, or micro, level, the individual's overall competency (i.e., their learning and retention of course content) and their overall opinion of the training are important determinants of training use. In addition, training use is also highly affected by an important background variable, the relative seriousness of the task or situation to which the training is to be applied.

Individual trainee competency. The conclusion that the individual trainee's competency is an important factor in determining their use of training is supported by findings associated with two closely related problems. They are: 1) the problem of forgetting, or loss, by those trained of major investigative knowledge and skill, and, 2) the problem of not having developed the skills during the initial training session. Although neither of these problems was rated by the 40% required for inclusion in Table 9, both conditions did emerge as predictor variables in the multiple regression analyses. The problem of forgetting was selected on step-four of the Stepwise procedure as a significant predictor of training use (Beta =  $-.14$ ,  $p < .05$ ). The intercorrelation between this problem and the problem of "not having developed the skills during training" ( $r = .39$ ,  $p < .01$ ) reduced its predictive strength, however, in the full fourteen variable regression equation. It may be, that given another sample, the

observed importance of these variables would be reversed. Together, the two commonly perceived problems suggest a more general attribute, (e.g., individual competency) which should be considered by those concerned with training impact.

Opinion of training. The second macro level conclusion, that the individual's opinion of the training program is an important predictor of training use, is strongly supported by the Stepwise Beta of .28 ( $p < .01$ ). Selected as the second most important predictor of training use, this finding is consistent with Manley's observation (1975) that an innovation will be supported when workers' opinions toward it are positive and that it will not be supported when it evokes a strong negative image.

A very tentative micro level conclusion may also be raised regarding the positive effects of professionalism on training use. It will be noted that Problem 27, "local courts did not accept accident reconstruction evidence into evidence", was selected in the multiple regression analysis as the third most efficient predictor of training use (Stepwise Beta = .17,  $p < .01$ ). This finding was somewhat surprising, in that "lack of court acceptance" was voiced more often than any other problem during the several pre-study discussion sessions held by the researcher with law enforcement personnel. Accordingly, it was anticipated that this problem would assume a negative relationship with training use -- that is, that training use would diminish as perceptions of non-acceptance by the courts increased. For this

sample, the opposite was observed. The more the courts were viewed to reject accident reconstruction findings the greater the number of training outcomes applied by course graduates.

One likely explanation for this paradox is that it results from high professional standards and ideals held by the law enforcement trainees. It should be noted, however, that a negative correlation was also found ( $r = -.09$ ,  $p < .01$ ) between opinion of training and Problem 27 (court non-acceptance of evidence produced through training). This negative relationship, between two variables that both held a strong a positive correlation with training use, may suggest that there does exist a small group of trainees who use the court acceptance issue as an excuse for their non-use of training.

Finally, support for the finding that the seriousness of the situation to which the training is applied is an important predictor of training use is evidenced by the selection of this variable at step-one of the Stepwise regression solution ( $Beta = .42$ ,  $p < .01$ ).

#### Recommendations

Several recommendations can be made with regard to ways the conclusions of this study can be implemented by law enforcement administrators, training managers, and others concerned with training impact. It must be emphasized, however, that this study focused on only one specific job skill training intervention (At-Scene Accident Investigation training) currently in common use by local, county, and state law enforcement agencies. Other types of training, such as

management, supervisory, or human relations, among others, and other types of organizations, were not studied. With these factors in mind, the following recommendations are made.

1. Agency administrators and training managers should evaluate the training curriculum and the specified learning outcomes, in advance of assignment of personnel to training, to ensure compatibility and congruence with existing agency norms and standard operating procedures. As a result, desired behavioral outcomes should be identified and conflicts with existing procedures should be resolved. In addition, subsequent decisions, and/or changes in policy and procedure should be clearly communicated to all work group members and supervisors who may be affected.

2. Law enforcement agency administrators and training managers should be more aware that the return on their training investment may be affected by many factors and conditions operating within their agency's day-to-day work environment. Those responsible for training management should be charged with the identification of problem/conditions that may inhibit implementation of positive new behaviors acquired through training and undertake efforts to reduce or eliminate their inhibitory effects.

3. Administrators and training managers should clearly communicate to individuals assigned to accident investigation training the reason(s) they were selected to attend, and specify the agency's expectations regarding their subsequent use of that training.

4. Refresher training focusing on key investigative concepts and skills should be offered on a periodic basis to accident investigation graduates, particularly those with continuing investigative responsibilities, but who have little opportunity to use or reinforce their accident investigation knowledge and skill.

#### Concluding Statement

In the course of this study, several areas emerged which are recommended for further study.

1. Further research should be conducted which focuses on the factors and conditions surrounding the "decision to train" and the effects of various decision frameworks on overall training impact. The finding reported here, that the 16% of trainee respondents who did not know why they had been selected to attend accident investigation training reported significantly and meaningfully lower training use scores than those who knew why they had been assigned, along with Berman and McLaughlin's (1975) conclusion that implementation is higher for those who participate to "solve a problem" than for those who attend out of mere "opportunity", supports this as an important area for further study. In addition, greater attention should be directed in future studies to the level of receptiveness shared by agency administrators, supervisors, and subordinates, to the training intervention and their view of the desirability of "adopting" or "adapting" new training induced behaviors into their agency's work routine.

2. Implementation research should be continued in law enforcement agencies, as well as in other types of organizational settings, focusing on the various types of learning outcomes, and targeting the identification of factors and conditions affecting training use at the macro, intermediate, and micro organizational levels. Through the conduct of such research, we may be able to better understand, predict, and manage the key determinants of training use.

The investment of time and other scarce resources in training, both by the organizations who sponsor such interventions and the individuals who attend, is much too great to allow the use of positive benefits gained from training to be left to chance. It is hoped that the findings of this study will aid law enforcement administrators, training managers, and adult education practitioners, in their efforts to better control and manage the impact of training within organizations.

In summary, the major objective of this study was to develop a more complete understanding of how problems and conditions existing within the day-to-day work context of law enforcement agencies affect the use of training outcomes. The study was exploratory in that few empirical studies have shared this objective, or have attempted to explain "why" sponsored training interventions do, or do not, result in behavioral change back-on-the-job. Although the results from this study are modest, they are, nevertheless, useful. The results, combined with the macro, intermediate, micro level perspective of

organizational behavior, may immediately aid the efforts of agency administrators and training managers who are concerned with achieving greater impact from their investment of training resources.

Of greater significance, however, is the suggestion offered by this study's findings that future research of this type may significantly advance our understanding of the training/organizational change process, and, thereby, add to our ability to manage and control that important process.

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APPENDIX A

Cover Letter and Questionnaire  
to At-Scene Accident Investigation Graduates



January 14, 1985

Dear :

We are asking you to participate in this important study which examines problems faced by law enforcement personnel in using the knowledge and skills acquired through participation in IPTM's "At-Scene Accident Investigation Course".

The questionnaire is being completed by enforcement personnel throughout the U.S. who have completed an IPTM two-week At-Scene training program within the past 18 months. We believe that the study findings will help everyone involved with this type of training to ensure that the knowledge and skills acquired from training are used in the most effective manner possible.

When the questionnaire is completed, return it in the stamped, self-addressed envelope. Should you have any questions, please call Mike McDonald, at 804-257-6237. Your individual response will remain confidential. Only generalized findings about common problems which block or inhibit training will be used by Mr. McDonald in his doctoral research and will be published in several criminal justice publications.

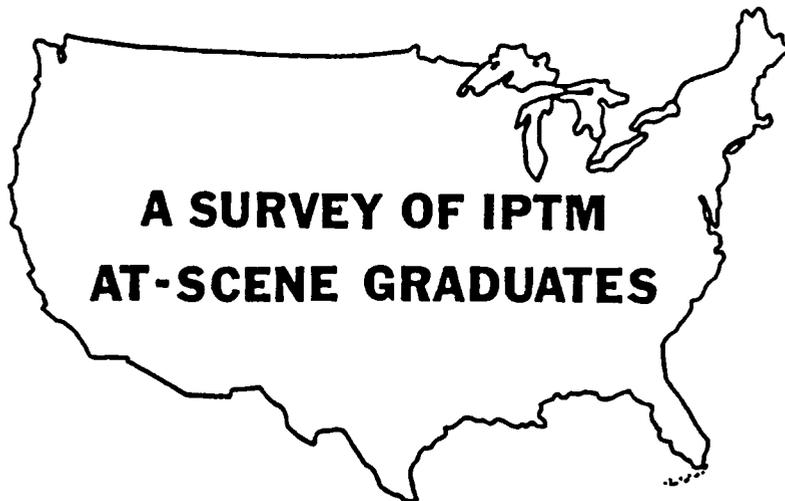
Thanks for your participation in this important study.

R. Michael McDonald, Director  
 Transportation Safety Training  
 Center  
 Virginia Commonwealth University

Russell J. Arend, Jr., Director  
 Institute of Police Traffic  
 Management  
 University of North Florida



**PUTTING TRAINING TO USE: A COMPREHENSIVE SURVEY  
OF IPTM AT-SCENE ACCIDENT INVESTIGATION GRADUATES  
ABOUT CONDITIONS AFFECTING THE USE OF TRAINING**



This survey is being conducted to better understand the level to which knowledge and skill acquired through participation in IPIM's At-Scene Accident Investigation course is being used by graduates, and the kinds of problems and conditions within the law enforcement work environment that impede or prevent the use of training.

Please answer all the questions. If you wish to comment on any questions or qualify your answers, please feel free to use the space in the margins. Your comments will be read and taken into account.

You may be assured of complete confidentiality.

Thank you for your help.

**R. Michael McDonald**  
At-Scene Accident Investigation Study  
Department of Administration of Justice & Public Safety  
Virginia Commonwealth University  
816 W. Franklin Street  
Richmond, Virginia 23284



- 9. Draw a scale diagram or map of the post-accident scene to include characteristics of the trafficway, as well as vehicle positions and evidence? ..... 1 NO  
2 YES
- 10. Consult a Traffic Engineer to obtain the accident scene Coefficient of Friction? ..... 1 NO  
2 YES
- 11. Conduct a skid test with either patrol or accident vehicle, or use a drag sled to measure Coefficient of Friction? ..... 1 NO  
2 YES
- 12. Measure and record tiremark evidence (skidmarks and/or scuffmarks)? ..... 1 NO  
2 YES
- 13. Use a template or nomograph to estimate a minimum pre-collision speed? ..... 1 NO  
2 YES
- 14. Compute a mathematical formula to calculate a minimum pre-collision speed? ..... 1 NO  
2 YES
- 15. Use a carpenter's level, or template, to measure the grade at the accident scene? ..... 1 NO  
2 YES
- 16. Use a carpenter's level, or template, to measure the superelevation at the accident scene? ..... 1 NO  
2 YES
- 17. Complete a supplemental vehicle damage, lamp examination, tire examination, or mechanical condition form? ..... 1 NO  
2 YES

These questions ask for information about your experience investigating accidents and the nature of your job assignment since completing At-Scene Accident Investigation training.

Q-3 Please indicate the number of accidents, by type, for which you have been the primary investigating officer, since attending At-Scene AI training?

Number of Accidents

- \_\_\_\_\_ PROPERTY DAMAGE ONLY
- \_\_\_\_\_ PERSONAL INJURY
- \_\_\_\_\_ FATALITY

Q-4 Were you, for at least half of the time since completing At-Scene AI training, a member of an official Accident Investigation squad or unit? (Circle number)

- 1 NO
- 2 YES

→ (IF NO)

Were you in a position where Accident Investigation represented a major part of your job duties? (Circle number)

- 1 NO
- 2 YES

Another important part of understanding how training is used within organizations has to do with conditions within the work environment. Therefore, we would like to ask some questions about conditions on-the-job which affected your use of At-Scene Accident Investigation training.

Q-5 Please think of your personal experience prior to and during the investigation of the serious accident just discussed (Q-1). Read the following statements carefully. Circle the number of the response that best describes the extent the item was a problem that reduced, impeded, or prevented your use of knowledge and skills taught during At-Scene training.

		WAS NOT A PROBLEM	WAS A MINOR PROBLEM	WAS A MODERATE PROBLEM	WAS A MAJOR PROBLEM
1. Key agency administrators considered other competing job responsibilities to be more important .....	1	2	3	4	
2. Resources and equipment necessary to apply techniques learned during At-Scene AI training were not available .....	1	2	3	4	
3. I had not developed the skills adequately during training to be able to apply them during that investigation .....	1	2	3	4	
4. I found that I had forgotten much of what had been taught.....	1	2	3	4	
5. My supervisor had not commended or rewarded me when I had previously attempted to use my At-Scene training .....	1	2	3	4	
6. My supervisor had not communicated the extent to which he/she expected me to use my new skills .....	1	2	3	4	
7. My supervisor did not view Accident Investigation as an important job priority .....	1	2	3	4	
8. Traffic volume was too heavy to allow training to be used .....	1	2	3	4	
9. Mid-level management (Captains and Lieutenants) did not view Accident Investigation as an important job priority .....	1	2	3	4	
10. My supervisor did not know enough about the content of the course to be able to help support me in its use .....	1	2	3	4	
11. Members of my work unit did not view Accident Investigation as an important job responsibility .....	1	2	3	4	
12. Department personnel, in general, did not view Accident Investigation as an important job priority .....	1	2	3	4	

		WAS NOT A PROBLEM	WAS A MINOR PROBLEM	WAS A MODERATE PROBLEM	WAS A MAJOR PROBLEM
	1 WAS NOT A PROBLEM (Did not occur or had no influence)				
	2 WAS A MINOR PROBLEM (Had only a small influence)				
	3 WAS A MODERATE PROBLEM (Had a medium influence)				
	4 WAS A MAJOR PROBLEM (Had a large influence)				
13.	My supervisor did not expect me to apply my training .....	1	2	3	4
14.	Too few communications were received from top agency <u>administrators</u> indicating how this training was to be applied .....	1	2	3	4
15.	<u>Formal</u> verbal and written communications from supervisors (such as at roll call, during patrol assignments, etc.) were vague and non-supportive with regard to the use of At-Scene training .....	1	2	3	4
16.	<u>Informal</u> communications from supervisors (such as off-hand comments, over coffee, etc.) regarding the use of this training were vague and non-supportive toward its use .....	1	2	3	4
17.	Job behaviors emphasized by At-Scene training conflicted with department Standard Operating Procedures (S.O.P.) .....	1	2	3	4
18.	Top agency administrators did not make it clear that accident investigation was a department priority .....	1	2	3	4
19.	Those who received At-Scene training had too little input into how their training was to be put to use .....	1	2	3	4
20.	Those who made the decision for department personnel to attend At-Scene AI training did not follow through and make sure that the training was actually put to use .....	1	2	3	4
21.	Those who made the decision for personnel to attend this training did not have the command authority to make sure the training was put to use .....	1	2	3	4
22.	There were no rewards or incentives for those who conducted thorough accident investigations .....	1	2	3	4
23.	There were no rewards or incentives for those who applied or used their At-Scene training .....	1	2	3	4
24.	The investigative procedures learned in At-Scene training conflicted with those generally accepted by my work group .....	1	2	3	4
25.	I was not given the authority necessary to put my training to use .....	1	2	3	4
26.	Officers were not allowed enough time to conduct a thorough accident investigation .....	1	2	3	4



Next we would like to ask your opinion on several items.

Q-8 Please read each statement and CIRCLE the response to the right which best expresses your agreement with that opinion statement.

	DISAGREE	TEND TO DISAGREE	UNDECIDED	TEND TO AGREE	AGREE
1. I feel that I am making an important contribution to my department when I investigate an accident .....	1	2	3	4	5
2. For me accident investigation is an important job responsibility .....	1	2	3	4	5
3. I would like an assignment where accident investigation was my major job responsibility .....	1	2	3	4	5
4. Using what we were taught in At-Scene AI training takes too much time .....	1	2	3	4	5
5. I enjoy using the knowledge and skill I acquired during At-Scene AI training .....	1	2	3	4	5
6. The content of the At-Scene AI course was not appropriate for training enforcement officers .....	1	2	3	4	5
7. I would prefer that someone else had the responsibility for investigating accidents .....	1	2	3	4	5
8. Investigations are just as effective if you don't have to do all the things we were taught in At-Scene training .....	1	2	3	4	5
9. For me, performing a thorough accident investigation is a very satisfying experience .....	1	2	3	4	5
10. Much of what we were taught in At-Scene AI training is unnecessary .....	1	2	3	4	5
11. First line supervisors should require their subordinates to use the skills acquired in At-Scene training .....	1	2	3	4	5
12. All personnel who report traffic accidents should attend the two-week At-Scene course .....	1	2	3	4	5
13. I would recommend the At-Scene course to others .....	1	2	3	4	5
14. The At-Scene course contained too much theory .....	1	2	3	4	5

		DISAGREE	TEND TO DISAGREE	UNDECIDED	TEND TO AGREE	AGREE
1	DISAGREE					
2	TEND TO DISAGREE					
3	UNDECIDED					
4	TEND TO AGREE					
5	AGREE					
15.	Investigating traffic accidents should be a job for someone else, not enforcement personnel .....	1	2	3	4	5
16.	Law enforcement administrators should make Accident Investigation an important agency priority .....	1	2	3	4	5
17.	I wish my fellow officers would view Accident Investigation as a more important job responsibility .....	1	2	3	4	5
18.	I would buy my own equipment (such as tape measure, crayons, etc.) if necessary, so that I could apply what I learned in the At-Scene course .....	1	2	3	4	5
19.	Investigating accidents is simply not important .....	1	2	3	4	5

Finally, we would like to ask a few questions for statistical purposes.

Q-9 Please estimate the total number of hours of training you have completed dealing specifically with accident investigation. Do not count the 70 hours in this two-week At-Scene course in your estimate. (Estimate hours)

\_\_\_\_\_ HOURS DURING BASIC/RECRUIT TRAINING  
 \_\_\_\_\_ HOURS DURING IN-SERVICE & SPECIALIZED TRAINING

Q-10 Your sex. (Circle number)

- 1 MALE
- 2 FEMALE

Q-11 Your present age: \_\_\_\_\_ YEARS

Q-12 Your years of experience as a sworn police officer: \_\_\_\_\_ YEARS

Q-13 Which is the highest educational level you have completed? (Circle number)

- 11 LESS THAN 12 YEARS
- 12 HIGH SCHOOL
- 13 1 YEAR COLLEGE
- 14 2 YEARS COLLEGE
- 15 3 YEARS COLLEGE
- 16 4 YEARS COLLEGE
- 17 SOME GRADUATE SCHOOL
- 18 EARNED A GRADUATE DEGREE

Q-14 Your department or agency is: (Circle number)

- 1 STATE POLICE/PATROL AGENCY
- 2 COUNTY SHERIFF'S DEPARTMENT
- 3 MUNICIPAL OR COUNTY POLICE DEPARTMENT
- 4 OTHER (Specify): \_\_\_\_\_

Q-15 What is the population of the jurisdiction in which you most often go to court to testify in traffic accident related cases? (Circle number)

- 1 BELOW 10,000 POPULATION
- 2 10,000 TO 49,999 POPULATION
- 3 50,000 TO 149,999 POPULATION
- 4 ABOVE 150,000 POPULATION

Q-16 How many personnel does your department or agency have? (Specify number by each category)

\_\_\_\_\_ TOTAL SWORN PERSONNEL  
\_\_\_\_\_ PATROL OFFICERS IN YOUR DISTRICT/BEAT/AREA

Are there any additional comments you wish to offer regarding the serious crash discussed under Q-1?

Is there anything else you would like to tell us about problems or conditions which impeded or influenced the extent to which you were able to put your At-Scene Accident Investigation training to use? If so, please use this space for that purpose.

Also, any comments you wish to make that you think may help us in future efforts to understand how training services can be best provided to enforcement agencies will be appreciated, either here or in a separate letter.

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*Your contribution to this effort is very greatly appreciated. If you would like a summary of results, please print your name and address on the back of the return envelope (NOT on this questionnaire). We will see that you get it.*

APPENDIX B

Follow-up Thank You/Reminder Postcard

January 21, 1985

Last week a questionnaire was mailed to you seeking your opinion about conditions within the law enforcement work environment which block or inhibit the use of training. You were selected to participate in this study, along with other recent graduates of IPTM's (Institute of Police Traffic Management) At-Scene Accident Investigation course.

If you have already completed and returned it to us, please accept our sincere thanks. If not, please do so today. It is extremely important that your input be included in this study, so that results will accurately reflect the opinions of all At-Scene Accident Investigation course graduates.

If by some chance you did not receive the questionnaire, or it got misplaced, please call me right now (804-257-6237). I, or my secretary, will get another one in the mail to you today.

Sincerely,

R. Michael McDonald, Director  
Transportation Safety Training  
Center

APPENDIX C  
Follow-up Cover Letter



February 4, 1985

Dear :

About three weeks ago we wrote to you seeking your opinion on the kinds of problems and conditions, existing within the law enforcement work environment, which block or impede the use of training. As of today we have not yet received your completed questionnaire.

We have undertaken this study knowing that training resources are limited -- and, therefore, their expenditure should be expected to produce positive results. As a recent graduate of IPFM's At-Scene Accident Investigation course, your experience, ideas, and opinions are extremely valuable.

We are writing to you again because of the significance each questionnaire has to the usefulness of this study. Your response is needed for this study to be representative of At-Scene Accident Investigation participants.

If you have already returned the questionnaire, please accept our sincere thanks. However, if you have not, a replacement questionnaire is enclosed. May we urge you to complete and return it as quickly as possible.

Sincerely,

\_\_\_\_\_  
 R. Michael McDonald  
 Director  
 Transportation Safety Training  
 Center  
 Virginia Commonwealth University

\_\_\_\_\_  
 Russell J. Arend, Jr.  
 Director  
 Institute of Police Traffic  
 Management  
 University of North Florida



VITA

R. Michael McDonald

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