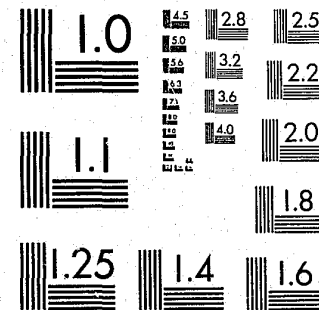National Criminal Justice Reference Service

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METREK DIVISION

# An Assessment of Crime and Policing Responses in Urban Mass Transit Systems

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APRIL 1977

42630 OVR.

MITRE

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AUG 3 1979

ACQUISITIONS

The MITRE Corporation
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MITRE Department
and Project Approval: _Wannnf L Vng_____

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ABSTRACT

This report presents an assessment of what is currently known about crime and policing responses in urban mass transit systems. The assessment consists of:

- analyzing the interactions among the transit environment, crime and policing operations;

- examining the effectiveness of various transit policing strategies and supportive anti-crime measures; and

- suggesting new evaluative and experimental programs to either fill in knowledge gaps or improve policing effectiveness.

Report findings are based on a literature survey, site visits and the knowledge of transit police/security officials.

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## PREFACE

The "Policing Urban Mass Transit Systems" study is one in a series of National Evaluation Program (NEP) Phase I studies initiated by the National Institute of Law Enforcement and Criminal Justice. The NEP program involves the selection of major areas of criminal justice activities that are of national importance and the funding of research studies to provide a timely and an objective assessment of the effectiveness of alternative strategies or programs in each selected topic area. Some of the specific topic areas examined under the NEP program thus far have included: pre-trial release, treatment of drug addicts coming into contact with the criminal justice system (TASC), Project Ident (marking of personal properties), juvenile diversion, court information systems, and anti-robbery projects.

This report presents an assessment of what is currently known about policing urban mass transit systems and what additional evaluation effort is warranted. It is organized into seven sections. Section I provides a summary of the study. Section II examines the scope and importance of urban mass transit in the United States. It also surveys the problems presently besetting these systems, focusing on the impact of crime on passengers and system viability as well as responses by transit and government of officials. Section III identifies information sources and data constraints.

Section IV traces the development of transit policing and highlights current policing arrangements for a number of rapid rail and bus systems. Appendix A presents additional details, reviewing information gathered during site visits. Section V develops an analytical framework designed to provide a coherent context for investigating transit crime problems, the police responses and the impact of these responses. The framework depicts the interactions between the transit environment, policing and crime. This section also outlines the basic assumptions underlying policing urban mass transit systems.

The key questions related to planning and evaluation are addressed in Section VI. Current knowledge is assessed and information gaps identified within the context of each question. (Appendix B expands on findings concerning environment, offender and victim profiles.) Finally, recommendations for future research and evaluation efforts designed to respond to current problems and fill present gaps in knowledge are offered in Chapter VII.

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SECTION I.

SUMMARY OF FINDINGS

A.  Introduction to Urban Mass Transit Policing

Mass transportation plays a vital role in the functioning of
urban areas.  In recent years, urban transit systems have been engulfed
by a number of interrelated problems:  dwindling ridership, deterio-
rating facilities, crime and large operating deficits.  While factors
such as speed, convenience, reliability, comfort and cost affect
ridership levels, there also is evidence to suggest that crime,
vandalism and other expressions of anti-social behavior discourage
the public's use of urban mass transportation.

For the purposes of this study, the mass transit system of an
urban area can include any of the following four systems:

- buses (self-propelled, rubber-tired vehicle with on-board
  fuel supply);

- trolley coaches (electrically-propelled, rubber-tired
  vehicle joined normally via overhead wires to a central
  power source);

- streetcars/trolleys (bus-type vehicle traversing city
  streets on tracks on semi-private or exclusive right-
  of-way, also referred to as light rail); and

- subway/elevated lines (railway-type transit vehicle with
  underground and/or at-grade and/or elevated stations
  using a private right-of-way, also referred to as heavy
  rail).

The first three of these systems share a number of common character-
istics such as few terminals, numerous designated street corner stops,
surface-oriented vehicles, and shared right-of-ways with the general
public use of the streets that clearly differentiate them from subways.
Dominated, in terms of sheer numbers, by buses, these three systems
will hereafter be referred to as "bus systems."  Subway/elevated lines,
on the other hand, operate on grade-separated right-of-ways and pas-
sengers board and exit from well-defined station facilities.

This study specifically examines crime and other expressions of
anti-social behavior evident in urban mass transit systems and policing
responses.  There is a range of strategies being utilized to police
transit systems.  Strategies currently employed include:

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- police operations (uniformed and plainclothes patrol, stakeout);

- electronic and mechanical communication and security devices (2-way radio, telephones, closed-circuit television);

- support activities (driver education, liaison with schools, courts and neighborhoods);

- Target hardening via environmental and vehicular design (increase lighting, improve visibility, exact fare, scrip); and

- selective operating actions (skipping stops, closing stations, eliminating runs, reducing the number of cars in a train).

While transit systems may rely, for the most part, on one or another of these strategies, many have implemented several types of strategies in the belief that a combination of approaches will be more effective in reducing transit crime than one or another strategy independently.

The problems generated by crime and other forms of anti-social behavior are not new to mass transit systems. By the early 1900's several transit authorities had formed their own in-house police departments to protect passengers and safeguard company property. Today, the policing of rapid rail transit (subway or elevated lines) is performed by either a special transit police unit in the local police department or a transit authority police force, whereas the major responsibility for providing police services to surface transportation (buses and trolleys) usually rests with the general local police force. There are a variety of transit police units operating in the country today. Their differences can be characterized by organizational factors and resource allocation:

- whether the force consists of sworn or non-sworn personnel;

- size of the force in terms of the number of officers; and

- scope of responsibility: the security of passengers and transit employees; the protection of transit property and revenues; emergency services (e.g., fire fighting, first aid and rescue); non-law enforcement duties (lost and found, public information).

Equally as important as their differences, there are fundamental assumptions that guide transit police anti-crime activities. Specific police activities such as uniformed patrol, plainclothes units and decoy operations are all directed toward controlling crime through the processes of deterrence, prevention and apprehension. It is assumed that crime control activities will benefit both the public and the transit system, leading to:

- increased ridership perception of security;

- increased ridership volume; and

- increased revenues.

B. Findings

Based on a review of relevant literature, a series of 12 site visits and continuing discussions with transit police officials, certain findings emerge concerning the policing of urban mass transit systems, the selection of anti-crime strategies and the factors that influence decisions to implement these strategies.

Nature and extent of transit crime. The crime problem in mass transit is essentially concentrated in the nation's large cities. In many respects the problem is similar to that on the street. Transit crime generally reflects changes in the surrounding environment and increases in transit crime have paralleled increases in street crime. Both victims and offenders closely resemble their street counterparts. On the other hand, the transit environment presents less opportunity for certain types of crime such as burglary but aggravates the conditions, especially during rush-hours, conducive to committing offenses such as pocket-picking and purse-snatching. There also are significant variations in the crime pattern across rapid rail transit systems. Several subway/elevated lines are akin to commuter railroads, while several others form the nucleus of inner-city public transportation systems. The major types of crime problems associated with the suburban commuter lines (vandalism, pocket-picking, etc.) are generally not as serious as those crime problems usually associated with inner-city rapid rail systems.

Finally, certain types of transit crime are more amenable to control than others. For example, robbery of bus drivers has been virtually eliminated in systems using exact fare collection. Several transit properties reported that the assault of transit employees (particularly bus drivers) can be reduced through training programs designed to improve their inter-personal relations skills.

Influence of system characteristics on the selection of policing strategies. The operating characteristics of a mode of transportation such as mobility, headway and method of fare collection frequently impact on the selection of policing strategies. For instance, the complex network of bus routes (the mobility dimension) along with the large number of buses in-service at any given time within major metropolitan areas presents formidable obstacles to extensive police coverage. Hence, police resort to isolating problem routes, employing riding posts and other surveillance activities on a small number of buses at a time. Environmental characteristics of a system such as age, lighting and visibility also impact on the selection of strategies. General characteristics of older stations such as poor lighting, low visibility and recessed areas hinder surveillance. An officer in one area of the station may be unaware of events occurring around a corner or down a passageway. By contrast, newer stations, designed to heighten visibility and improve access control, permit the use of closed-circuit television (CCTV) to increase overall surveillance capabilities.

Relationship between various policing strategies and transit crime. The few studies in this area concentrate on saturation patrol by uniformed officers. Findings indicate that substantial increases in patrol generally reduce crime; however, the magnitude of the impact often is unclear and effects appear to diminish over time. Data also suggest that saturation patrol produces some displacement. The comparative impact of specific types of uniformed patrol such as riding posts, fixed posts, and random patrol remains the subject of further research efforts.

While covert operations have not been formally evaluated, transit police consider stakeout and decoy operations effective, especially against certain types of crimes such as robbery, assault, pocket-picking, and fare evasion. Additionally, transit police are involved in a variety of support activities that include community relations, liaisons with schools, courts, and local police transit authority, and courses on inter-personal relations for drivers. Little has been documented about the impact of these activities. Nevertheless, many transit police believe support activities contribute to controlling transit crime.

Impact of mechanical and electronic security and communication devices on the effectiveness of transit policing. In recent years, transit companies have sought to increase security by implementing a variety of mechanical and electronic devices. While most of these devices have not been evaluated in terms of their crime reduction effects, there is some evidence that devices such as CCTV, silent alarms and 2-way radios have some deterrent value and bolster police surveillance and apprehension capabilities. Experience with these

devices, however, suggest a number of current and potential problems. The high rate of false alarms, about 90 to 95 percent, on buses often discourages police cooperation. Telephones in rapid rail stations are ripped from the walls or purposely taken off the hook. CCTV is not suitable for installation in older stations with poor visibility, multiple passage ways, and numerous hidden areas. Further, the continuous monitoring of images picked up by CCTV cameras presents human engineering problems. Transit systems are developing practical solutions to these difficulties. In Atlanta, radio dispatchers use a nonverbal call back signal to determine whether a radio alarm is true or false. Some public emergency telephones have anti-vandalism features and automatic locator and hangup capabilities.

Effectiveness of different types of policing units. The nature of police strategies employed is generally related to the type of police unit, i.e., whether the unit is comprised of sworn or non-sworn personnel. Units made up of sworn personnel emphasize traditional police patrol anti-crime measures. Units consisting of non-sworn personnel tend to rely on non-patrol activities such as working with bus drivers to improve inter-personal relations skills and maintaining liaisons with the community, schools, courts and local police.

While effectiveness has not been addressed through formal evaluation, evidence indicates a need for a dedicated unit consisting of sworn personnel in certain situations: large, multi-jurisdictional systems experiencing serious crime problems. Dedicated transit police units can provide uninterrupted patrol coverage, whereas a general police force may assign lower priority to transit crime and, therefore, not allocate adequate resources to patrol the transit system. Further, the special characteristics of rapid rail systems such as rush-hour crowding, hazards related to high-speed vehicles, tunnels and electrified third rails complicate policing operations and appear to call for some degree of specialization via training and continuous on-the-job learning. These requirements are better satisfied by dedicated units.

Organizational affiliation of the unit--police department or transit authority--depends on the area served by the transit system, the attitude of the local police chief, and historical precedents. The need for a transit authority police force becomes greatest when the transit system traverses a large number of jurisdictions. Usually local police prefer to provide passenger protection when the system operates within a single jurisdiction.

Impact of various policing strategies on passenger perceptions of security. Findings from a number of studies generally suggest:

- passenger ridership patterns are influenced by perceptions of crime and security, with perceptions of crime more likely to influence rapid rail than bus riders;

- passengers accurately perceive that more transit crime occurs on the rapid rail than on bus systems and within the rapid rail system itself more crime occurs at the stations than on the trains; and

- more police patrol of stations and on trains and implementation of communication capabilities to ensure rapid response by police when assistance is needed would achieve greatest positive impact on passenger perceptions of security.

Appropriate measures of "success" for the various policing strategies. Five types of measures are suggested: changes in crime; perceived passenger security; ridership volume; revenue; and police productivity/performance measures. As is true with crime measurement in general, measures of transit crime are subject to many data reliability and validity limitations. A host of unknowns involving the relationships between security activities and crime reduction, passenger perceptions, ridership volume and transit revenues currently limit the use of cost-effectiveness trade-off analysis to a guessing process.

C. Suggestions for Future Research

An examination of key issues in policing urban mass transit systems reveals a concentration of research in certain areas and an absence of knowledge in others. The seven following suggestions for future research efforts are oriented toward responding to current problems and acquiring knowledge. Crime control-oriented recommendations include:

- develop projects directed toward controlling juvenile crime;

- improve mechanical and electronic security-related equipment; and

- improve fire prevention and detection capabilities.

Knowledge-oriented recommendations include:

- evaluate the effects and effectiveness of specific security strategies;

- develop and implement uniform crime reporting for transit systems;

- develop a handbook for passenger perception measurement; and

- initiate a case study of policing the Washington Metropolitan Area Transit Authority.

Findings from these activities and studies will be useful for government administrators, transit authority officials, transit police and, in the long run, the riding public.

SECTION II

THE PROBLEM SETTING

Urban mass transit systems serve many important national objectives today--the preservation of our cities as vital commercial and cultural centers, control of air pollution, conservation of energy, mobility for all citizens and particularly the disadvantaged.[1] The capability of mass transit to move a large number of people efficiently is an essential component of overall national efforts to improve the quality of life in American cities. Millions of passengers are carried daily by mass transit systems to and from their places of work, and to educational, recreational, and cultural facilities within the urban areas. The use of mass transit is almost a basic necessity to the young and aged and to those who cannot afford or do not desire to use the private auto.

There are 947 operating transit systems nationally (excluding intercity and interstate carriers such as Greyhound and Continental Trailways); an overwhelming majority of these systems are comprised solely of motor buses, while a small number of systems in large and older metropolitan areas offer multiple modes of public transportation (subway/elevated lines, trolleys, and buses).[2] In 1975, these systems together moved over 5.6 billion revenue passengers annually, following three decades of steady decline in ridership. After reaching a peak of almost 19 billion annual revenue passengers in 1945, transit usage of all types (excluding commuter rail) declined to a low of 5.3 billion in 1973. Since that time there are indications that a reversal of this long-term downtrend may be occurring as ridership has shown an approximate 3 percent increase each year.

Urban mass transit systems in this country have been beset by a multitude of problems: dwindling ridership, deteriorating facilities, crime, and large operating deficits. Transit systems in many places do not offer a sufficiently attractive alternative to the automobile to compete successfully for passengers. Many transit systems answered ridership decreases and the loss of revenue by raising fares and reducing transit services during low usage hours or along unprofitable routes.

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[1] Secretary of Transportation, A Statement of National Transportation Policy, September 1975, Washington, D. C.

[2] Transit Fact Book, American Public Transit Association, 1975-1976 Edition, March 1976, p. 23.

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But these measures in turn led to additional ridership decreases and revenue losses, and the cycle has undermined the viability of urban mass transit systems.

Massive highway construction, widespread auto ownership, the lack of capital funds to improve transit services, the movement of city populations, industries and retail businesses to the suburbs--these are some of the well known factors contributing to the decline in transit ridership. There also is evidence to indicate that crime, disruptive behaviors and acts of vandalism on mass transit systems exert some influence on passenger decisions concerning the use of mass transit. The fear of victimization, whether real or perceived, may adversely affect usage patterns. Consequently, public perceptions of security may be as important as the other factors of speed, convenience, reliability, comfort and cost in attracting people to use urban mass transit systems. However, it is extremely difficult to establish that a given change in ridership is caused by a single factor such as crime or vandalism. In any situation there may be a combination of factors that influence ridership, making it difficult to determine the degree of influence of any one factor.[3]

Until the 1950's transit crime was directed primarily against property and provided little reason for public concern over personal security. This situation changed, however, during the 1950's and 1960's: As crime rates surged in the cities, transit systems, similarly, experienced more crime. Further, "this crime was increasingly directed against persons...and was violent rather than non-violent."[4]

Local authorities, during the mid and late 1960's, responded to the growing transit crime problem. In 1965 New York City's Mayor Wagner "ordered nearly a tripling of the Transit Police force, from 1,219 to over 3,100 men."[5] In 1966-1967 the Mass Transit Unit of the

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[3] Thrasher, Edward J., and John B. Schnell, "Studies of Public Attitudes Toward Transit Crime and Vandalism," Crime and Vandalism in Public Transportation, Transportation Research Board, No. 487, 1974, pages 32-33.

[4] Transportation Research Institute, Security of Patrons on Urban Public Transportation Systems, Carnegie-Mellon University, 1975, p. 2.

[5] Chaiken, Jan M., Michael W. Lawless, and Keith A. Stevenson, The Impact of Police Activity on Crime: Robberies on the New York City Subway System, The Rand Corporation, R-1424-NYC, January 1974, p. v.

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Chicago Police Department was organized in that city.[6] In 1968 the Massachusetts legislature authorized the Massachusetts Bay Transportation Authority to establish an in-house police department.[7] Additionally, mechanical and electronic devices such as alarms, 2-way radios, emergency phones, and closed-circuit television were introduced to complement manned patrol. By the late 1960's a concerted effort was underway in many major metropolitan areas to control crime on mass transit systems.

The implications of transit crime and of the public perception of that crime for mass transit systems are numerous. At the very least and without reference to social costs, crime means an increased financial burden to transit systems through vandalism, lost patronage, and the need for increased security. As has been the case in the past two decades, this increased burden can be detrimental to the survival of mass transit networks.

Three basic crime control strategies for transit systems have been suggested:

> "The first is the traditional reliance on an increase
> in police manpower, including flexible deployment
> strategies directed towards specific crime problems.
> The second lies in an experimentation with electronic
> or other devices to complement police patrol, enhancing
> the effectiveness of police response. The third is
> an operational matter, that of eliminating stops in
> those portions of the city where street crime is high."[8]

The third strategy may well be counter-productive by denying transit service to precisely those areas where service is most needed. Moreover, such service cutbacks are likely to carry the implication that the system is unable to successfully combat transit crime throughout its entire network.

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[6]Shellow, Robert, et al., Improvement of Mass Transit Security in Chicago, Transportation Research Institute and the Urban Systems Institute, Carnegie-Mellon University, June 30, 1973, pp. 107-162.

[7]Comparative Evaluation of Public Safety Services in Selected Metropolitan Areas with Rapid Transit Systems, Department of Public Safety, Metropolitan Washington Council of Governments, February 1973, p. 7.

[8]Security of Patrons on Urban Public Transportation Systems, p. 8, (Based on a report by Robert Shellow appearing in the proceedings of the Transportation Research Forum, October 1974).

Policing is the strategy most often relied upon by mass transit systems to fight transit crime. The cost of police manpower constitutes the largest portion of most transit security budgets. Given the financial pressures on public transit operators and a strong national interest in promoting greater use of mass transit, it becomes important to examine the effectiveness of various transit policing methods in controlling crime and alleviating the public's fear of insecurity. The values of electronic and mechanical devices as means of enhancing police effectiveness or minimizing the cost of providing security must also be examined.

SECTION III

INFORMATION SOURCES AND CONSTRAINTS

Information for this study has been gathered from a number of
sources including:

- background literature,

  - project descriptions and evaluation reports,

  - research studies covering topic areas such as public
    perceptions of security and victim, offender and
    environmental profiles,

  - papers presented at various meetings and conferences,

  - newspaper and magazine articles;

- site visits to transit properties; and

- an advisory board consisting of transit police chiefs
  and persons belonging to organizations with strong
  interests in the day-to-day operations and security
  of urban mass transit systems.

Currently available data suffer from a number of constraints.
Inaccurate measurement, poor sampling techniques and weak evaluation
designs frequently undermine the reliability and validity of study
findings. Further, absence of uniformity in the definition and
classification of transit crimes limits across system comparisons.

A. Background Literature

While much research has been performed in the general field of
crime and police operations, comparatively little has been conducted
in the specialized area of transit crime and policing. Formal studies
of transit crime and policing are few in number and narrow in scope.
The research community involved with the subject of transit policing/
security is relatively small (a few authors wrote most of the existing
literature). Most of the studies were done in the late 1960's and
early 1970's. Generally, literature dealing with transit crime and
policing may be grouped into the four following categories:

- planning;

- evaluation;

- citizen perceptions; and

- summary reports.

Planning studies basically focus on the Chicago, Oakland, and
Washington, D. C. rapid rail transit systems. The Chicago study
investigates the transit crime situation (detailing environmental-,
offender-, and victim-related characteristics), describes existing
policing responsibilities and recommends installation and evaluation
of closed-circuit television on an experimental basis. The Oakland
and Washington studies address important issues facing a new, multi-
jurisdictional system. Both reports deal with concerns such as
organizing an in-house police department and developing a working
relationship with local police.

Current evaluative literature consists of three basic studies
(and a number of derivative articles). These studies concentrate
on a few systems (either Philadelphia's or New York City's rapid
rail system or half-a-dozen or so bus systems) and examine particular
police activities and types of crimes: large increases in manpower,
robbery and assault of bus drivers, robbery of passengers and token
booth attendants. The studies are specific in nature, addressing few
of the many topic areas key to a broad understanding of transit crime
and policing. The potential impact of environmental characteristics,
transit operations and transit police characteristics on a particular
crime problem have not been taken into account in most of these
studies. For these reasons, it is difficult to make meaningful across-
system comparisons.

There are several studies which explore citizen perceptions
of transit security. Some of the studies examine rider response to
a well publicized transit-related criminal incident. Other studies
either investigate public perceptions of the relative hazardness of
various areas of the transit environment, or survey citizens to
determine which policing measures are most likely to bolster passenger
confidence in transit security.

An overview of transit crime and security is provided by two
major reports. One focuses on vandalism and suggests countermeasures,
while the other summarizes most of the transit crime and policing
research conducted during the late 1960's and early 1970's. Addi-
tionally, there are a number of newspaper and magazine articles as
well as papers presented at conferences and meetings. Some of these
reports focus on specific problems and activities such as fare evasion
or decisions to have policemen ride buses. Other articles and papers
are somewhat broader, discussing transit crime and policing in very
general terms.

B. Selection of Sites

In the early stage of this study, it was learned that:

- subway/elevated rapid rail lines generally have a more extensive and serious crime problem than bus systems;

- most transit-related crime takes place on systems serving major metropolitan areas; and

- formal policing efforts usually target subway/elevated lines.

A search of the LEAA Grant Management Information System data base and responses to MITRE inquires by mail and telephone revealed that relatively little federal or state action funds have been spent for projects specifically designed to police urban mass transit systems. A small number of metropolitan areas have been the prime recipients of the limited funds thus far allocated. Transit management companies reported that crime was generally not a serious problem on bus systems except in large urban areas and, in these instances, was generally associated with teenagers riding public buses to and from school.

Accordingly, transit properties were stratified into two groups for the purpose of selecting candidates for site visits:

- subway/elevated lines (or rapid rail); and

- bus systems.

Of the nine subway/elevated lines in the country, eight are policed on a regular basis. MITRE selected these eight,[9] listed below, for field visits:

- Chicago Transit Authority (CTA);

- Massachusetts Bay Transportation Authority (MBTA);

- New York City Transit Authority (NYCTA);

- Port Authority Trans-Hudson Corporation (PATH);

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[9] The ninth subway/elevated line, Greater Cleveland Regional Transit Authority, was not policed on a regular basis at the time of site selection.

- Port Authority Transit Corporation of Pennsylvania and New Jersey (PATCO);

- San Francisco Bay Area Rapid Transit District (BART);

- Southeastern Pennsylvania Transportation Authority (SEPTA); and

- Washington Metropolitan Area Transit Authority (WMATA).

The selection of bus systems for on-site visits was based on the existence of a formal transit policing program and the advice of experts. The following five sites were chosen and visited:

- Mass Transit Administration of Maryland (MTA) (Baltimore);

- Metropolitan Atlanta Rapid Transit Authority (MARTA);

- San Francisco Municipal Railway (MUNI);

- Southern California Rapid Transit District (SCRTD); and

- Southeastern Pennsylvania Transportation Authority (SEPTA) [also included in rapid rail transit group].

C. Advisory Board

At the outset of this project, an advisory board consisting of transit police chiefs and other persons belonging to organizations with broad interests in urban mass transit systems was formed. (See acknowledgements for a complete list of advisory board members.) Members of the advisory board were involved in the day-to-day operation and security of urban mass transit systems. Their experience and insights in identifying and solving security problems contributed to the information gathering process and filled many gaps where knowledge/ data has not yet been documented. Also, the advisory board served as a review panel, critiquing the analysis, methodology and findings of this study.

D. Data Constraints

A number of data problems complicate the evaluation of transit policing operations. Most important, transit crime measurement faces the same problems as with street crime such as police reporting discretion and the failure of some crimes to come to police attention. Further, there is a lack of uniformity in the definition and classification of transit crimes among jurisdictions. Transit crime has not been included routinely as a separate category in local police crime

statistics; nor has it been a specific subject of inquiry in victimization surveys. Currently there is no authoritative national data source on the magnitude and distribution of transit crimes.

Beyond the measurement problems cited above, transit crime trends may reflect more the changes in transit police organization than the success or failure of anti-crime strategies. For instance, changes in the numbers of reported crime or other indices of police effectiveness (e.g., arrest and clearance rates) could result from a turnover in transit police leadership accompanied by the adoption of new or modified reporting and classification procedures or shifts in policing priorities (e.g., aggressive campaigns against fare evaders and disorderly person). In an extreme case, crime incident data may be purposely manipulated, "ignored or reclassified as to time, location or crime type,"[10] in order to justify a particular management action or create a favorable public image for the organization.

In many instances, confidence in study findings is weakened by reliability and validity problems engendered by poor sampling procedures, absence of control groups and so on. More specific comments concerning data reliability and validity, methodological and statistical shortcomings, and confidence in the data are presented with specific findings throughout this document.

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[10] Chaiken, Jan M., What's Known About Deterrent Effects of Police Activities, P-5735, The Rand Corporation, November 1976, p. 5.

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SECTION IV

TRANSIT POLICING: PAST AND PRESENT

Transit companies have long recognized that prompt, efficient and safe service is a key to success. When public transit was introduced, they realized that anti-social behavior would disrupt service and turn away potential riders. For that reason, they instituted rules and regulations that "forbade children from playing on or around the cars," "prohibited drinking and smoking," and "permitted conductors to keep possible disrupters of the peace from the cars."[11] These regulations may have inhibited, but did not eliminate, undesired or criminal activities on transit systems. While the actual dimensions of crime on public transit systems during the late 1800's and early 1900's remain unknown, the problem did exist. Rowdiness and minor offenses such as pocket-picking and vandalism against transit property were evident in most systems. So also were armed robberies against the drivers.

By the early 1900's several states had passed legislation authorizing transit companies to develop and maintain their own police forces. On the other hand, many transit systems relied on local police departments instead of a company-operated transit police or security force to enforce the laws and maintain order. Still other systems employed a limited private security force to work in concert with the local police to protect the transit system and passengers.

Currently, primary responsibility for providing police services to surface transportation (buses and trolleys) usually rests with the general local police force, whereas the policing of rapid rail transit (subways or elevated lines) is performed by either a special transit police unit in a local police department or a transit authority police force. The need for a transit authority police force becomes greater when a rapid transit system serves multiple jurisdictions.

Transit authority police forces rely to varying degrees on the support services and back-up capabilities provided by the local police. When a transit crime occurs, functions such as report-taking, transporting prisoners, booking, and follow-up investigation are frequently performed by the local police. The nature and type of law enforcement activities performed by transit authority police are similar, if not identical, to those of the general police force. However, there also are some differences:

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[11] Security of Patrons on Public Transportation Systems, p. 1.

- A transit police force has the dual responsibility of
  protecting the riding public and the transit system.
  Less serious offenses such as vandalism, fare evasion,
  and disorderly conduct are given more attention by the
  transit authority police then by the general police
  because these offenses threaten the transit system.

- Transit police are specially trained to handle crowd
  control problems and large scale evacuation.

- Transit police officers must be familiar with the
  physical layout and operations of a transit system,
  the location of power control equipment, hazards
  posed by the energized third-rail and by high-speed
  moving trains.

- In systems that serve multiple political jurisdictions,
  transit officers with police power are required to
  meet the training and certification requirements
  imposed by all the local police departments and be
  familiar with variations in legislation.

On balance, there are more similarities than differences between mass
transit policing and general police work in respect to organization
and basic functions.

Table I shows the transit policing arrangements for the nation's
9 rapid rail, urban mass transit systems. More detailed information
on each system is presented in Appendix A.

In two of the 9 systems listed in Table I, Chicago (CTA) and
Philadelphia (SETPA), a special transit unit is established within
the city police department to protect the public using rapid rail
services. An internal transit security force is responsible for pro-
tecting transit property. (The job of protecting bus riders is assigned
to the individual city police District Commands.) In Chicago, the
city police Mass Transit Unit (MTU) has 250 officers. Of this force,
32 are plainclothes members of four tactical teams whose assignments
are made at the discretion of the commanding officer. The MTU operates
around the clock, 7 days a week, in 3 daily shifts of 8-1/2 hours
each: a midnight watch, a day watch, and an evening watch. The MTU
annual budget, at $2.7 million, represents less than one percent of
the annual police department budget.

In Philadelphia, the city police department has, since the
beginning of subway operations in the early 1900's, allocated men to
patrol the underground portion of the system. In 1957 the department

TABLE I

ALLOCATION OF RESPONSIBILITY FOR POLICING TRANSIT SYSTEMS IN SEVERAL MAJOR METROPOLITAN
AREAS AND RELEVANT INFORMATION ABOUT THE POLICE FORCES AND TRANSIT SYSTEMS

| SYSTEM | DATE OF PRESENT POLICING CONCEPT | TYPE OF POLICE FORCE | SIZE OF POLICE FORCE | JURISDICTIONAL AREA OF POLICING | YEARLY BUDGET | POPULATION SERVED | TOTAL STATIONS | HOURS OF OPERATION | ESTIMATED DAILY NUMBER OF TRIPS |
|---|---|---|---|---|---|---|---|---|---|
| CHICAGO ILLINOIS CTA | 1949 | CHICAGO CITY POLICE FORCE AND SECURITY FORCE (PEACE OFFICER STATUS) | 250 <br> 85 | CITY LIMITS <br><br> INTRA-STATE, ALL PROPERTIES RAPID TRANSIT BY SUBWAY SYSTEM | $ 2,500,000 | 6,000,000 | 142 | 24 HOURS 7 DAYS | MON-FRI 600,000 |
| CLEVELAND OHIO CTS | 1963 | REGULAR SWORN POLICE FORCE | 7 | INTRA-STATE TRAINS, STATIONS AND PARKING LOTS | $ 80,392 | 1,750,000 | 18 | 24 HOURS 7 DAYS | MON-FRI 38,000 |
| MASSACHUSETTS BAY AREA MBTA | 1964 | TRANSIT POLICE FORCE WITH REGULAR POLICE POWER | 65 | INTRA-STATE TRAINS, STATIONS AND SURFACE LINES | $ 1,000,000 | 2,760,000 | 51 | 24 HOURS 7 DAYS | 475,000 |
| NEW YORK CITY NEW YORK MTA | 1936 | TRANSIT POLICE FORCE WITH REGULAR POLICE POWER | 3,000 | INTRA-STATE NYC SUBWAY SYSTEM | $ 97,000,000 | GREATER NEW YORK AREA | 461 | 24 HOURS 7 DAYS | MON-FRI 4,000,000 |
| NEW YORK CITY/ NEW JERSEY PATH | 1962 | TRANSIT POLICE FORCE WITH REGULAR POLICE POWER | 72 | (BI-STATE) INTER-STATE FULL POLICE SERVICE ON ENTIRE SYSTEM | $ 1,850,000 | 6,500,000 | 13 | 24 HOURS 7 DAYS | MON-FRI 140,000 |
| PHILADELPHIA/ NEW JERSEY PATCO | 1969 | TRANSIT POLICE FORCE WITH REGULAR POLICE POWER | 21 | (BI-STATE) INTER-STATE ENTIRE SYSTEM | $ 450,000 | 500,000 IN CAMDEN AND PHILADELPHIA | 12 | 24 HOURS 7 DAYS | 43,000 |
| PHILADELPHIA PENNSYLVANIA SEPTA | -- | CITY POLICE FORCE AND SECURITY FORCE | 160 <br> 22 | CITY LIMITS | NOT AVAILABLE | 4,000,000 | 197 | 24 HOURS 7 DAYS | 975,000 |
| OAKLAND CALIFORNIA BART | 1972 | TRANSIT POLICE FORCE WITH REGULAR POLICE POWER | 81 | INTRA-STATE | $ 2,400,000 | 2,000,000 | 34 | 6 AM-8 PM 5 DAYS | 136,000 |
| WASHINGTON D.C. WMATA | 1975 | TRANSIT POLICE FORCE WITH REGULAR POLICE POWER | 201 | (TRI-STATE) TWO STATES AND D. C. | $ 3,049,800 | 3,500,000 | 86[e] | 24 HOURS[e] 7 DAYS | 959,000[e] |

[e]ESTIMATE BASED ON PROJECTIONS FOR FULL SYSTEM OPERATIONS.

SOURCE: SITE VISITS TO TRANSIT PROPERTIES (SEPTEMBER – NOVEMBER 1976) AND A SURVEY CONDUCTED BY THE WASHINGTON METROPOLITAN AREA
TRANSIT AUTHORITY POLICE FORCE (1975).

decided to create a special Transit Police Unit comprised of 47 officers to patrol the subway system. Since that time, the size of the Unit has grown to 160 officers (50 of whom are accompanied by dogs). The Unit is funded in part by the City and in part by a three-year $1,000,000 grant from the Law Enforcement Assistance Administration (LEAA.)[12] Public security on buses is routinely handled by patrolmen attached to various police districts throughout the city; however, the Transit Unit occasionally targets specific bus-related crime problems.

An internal security force in SEPTA is responsible for protecting revenue collection and transit properties. This SEPTA security force maintains close contact with the Police Department's Transit Unit, trading information and occasionally joining forces to stakeout depots and repair shops.

Policing responsibility in the other 7 systems is assumed by a transit authority police force which is recruited, financed and managed by each transit system. (In New York City, the city government reimburses the New York City Transit Authority for transit police services.) These transit authority police forces have full police power, either granted by state legislatures or commissioned by local police departments. The recruitment standards, pay scale and training requirements of a transit authority police force are comparable to those of local police departments in areas served by the transit system. The size of these transit police units range from a 7-officer force in Cleveland to the 3000-officer force in New York City.

The transit police in New York City have police powers to enforce all city and state laws anywhere in New York City; their powers are not limited to Transit Authority property and "hot pursuit" situations. In the late 1960's, there were approximately 200 transit patrolmen on duty round the clock, with an additional 700 men on duty between 8 p.m. and 4 a.m. to patrol the stations and ride every one of the more than 300 trains operating in that time period. A motor patrol unit supplemented foot patrol of stations. A special Public Safety Squad in the detective force was deployed in subway stations between 2 p.m. and 5 p.m. to handle juvenile problems when after-school traffic and juvenile-perpetrated crimes were highest.

Some significant changes in deployment strategies have been instituted in recent years by a new transit police administration.

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[12]The LEAA grant provides monies for 60 patrolmen (30 K-9 units and 30 officers to work as patrol and undercover units).

The manpower committed to on-train patrol during nighttime hours has been reduced drastically. Resources are now concentrated on the high incident, daylight hours.

The New York City police and the transit police cooperate closely. If an incident occurs where the Transit Police cannot reach the scene rapidly, the City Police are called to respond. Similarly, Transit Police will take action when they witness a crime occurring off Transit Authority property.

In contrast, the PATCO system (rapid rail serving New Jersey communities and Philadelphia) has one of the smaller transit authority police units, with only 21 officers.

The system itself is relatively small--14.5 miles with 13 stations, carrying 40,000 passengers per day. A squad of four men consisting of a sergeant, a K-9 team, and two officers covers the system at all times. These officers patrol by car, on foot, and on trains working both in uniform and plainclothes. Closed-circuit TV provides continuous coverage of the fare collection area in each station. Centrally monitored via a bank of TV screens located in a control tower, the system is complimented by "call-for-aid" phones and a public address system. Only one around-the-clock, fixed patrol post is established for the whole system and it is manned during weekends. That post is for the station located in the City of Camden, a city with one of the highest crime rates in the country.

The organizational and security measures employed by other rapid rail transit police departments vary among systems. For example, the MBTA (Boston) police department currently numbers 61 officers; some are assigned to uniformed patrol and others to a plainclothes tactical squad. The department also provides security for the bus system with four patrol cars assigned to cruise the bus routes.

The responsibility for policing PATH (Port Authority Trans-Hudson System) is assumed by the PATH police unit of the 1200-man Port Authority's Police Division. Commanded by a captain, the unit consists of about 63 uniformed patrol officers and 11 supervisors with full police power in both New York and New Jersey. Emphasizing visibility, PATH police maintain around-the-clock coverage of the 13.9 mile system. Officers are assigned to fixed posts, riding posts and roving patrol. The PATH police unit is supported by the communication, logistic, and training capabilities of the parent organization.

The BART (Oakland/San Francisco) police department consists of 77 officers and 18 civilian employees and operates on a budget of $2,400,000 per year. Directed by the Chief of Police Services, the department is divided into two sections: Field Operations Bureau and Support Services Bureau. The Field Operations Bureau provides patrol, undercover, and communication services. Utilizing both plainclothed and uniformed officers, the Bureau's three platoons patrol all BART facilities by foot, on trains and in cars on a 24-hour-a-day, 7-day-a-week basis. The Support Services Bureau provides protection for revenue collection crews and administrative support including follow-up investigations, in-service training, and maintenance of records, equipment and evidence.

Security for WMATA (Washington, D. C.) also is provided by an in-house, police department consisting of sworn officers. The department, with over 100 officers and support personnel, is organized into three major divisions: Bureau of Field Operations, Bureau of Support Services, and Bureau of Security Operations. The Bureau of Field Operations is responsible for day-to-day passenger protection and safeguarding trains and stations. The Bureau of Support Operations handles administration, training, protection and transportation of rail revenue, security of the Metro Building and services for the handicapped. Finally, the Bureau of Security Operations is responsible for protecting bus yards and transportation of bus revenues. Currently, WMATA police used fixed and mobile patrols of trains, stations, parking areas, facilities and stations under construction. The system was designed to incorporate security features; and patrol operations are integrated with CCTV which provides continuous coverage of station areas.

Bus systems also employ several types of policing arrangements. The MTA (Baltimore) maintains an in-house security force consisting of about 35 sworn officers. Some officers ride buses in uniform, while others ride in plainclothes. The MTA force concentrates on the more serious problems with heavy reliance on local police for response to spontaneous incidents. By contrast, SCRTD (Los Angeles), MUNI (San Francisco), and MARTA (Atlanta) operate security departments with non-sworn personnel ranging in size from five to 46 men. These departments focus their resources on developing and maintaining liaisons with local police, schools, courts and communities and also developing and presenting courses on inter-personal relations for bus drivers. Actual patrol of buses is handled by local police, often on an as-need-be basis. Most buses, further, are equipped with 2-way radios, silent alarms, and other security-related devices that are integrated with both transit operations and policing activities.

Because of the diversity of characteristics among systems, a general analytical framework is needed to understand the interactions between the transit environment and crime, between the transit environment and policing, and between crime and policing. Such a framework, essential to planning and evaluating anti-crime activities on mass transit systems, is presented in Section V.

SECTION V

ANALYTICAL FRAMEWORK

A simple analytical framework for analyzing transit crime and policing response is depicted diagramatically in Figure 1. The framework consists of three major elements that are assumed to be related to each other causally as well as through feedback loops. The first element consists of what may be termed as "inputs" into transit policing and consists of the general transit environment and the current transit crime situation. The transit environment factors are shown to impact on the current crime situation. Both the transit environment and the current crime situation are expected to influence policing operations which is the second major element (i.e., the process element). The third element in the framework comprises outcomes assumed to be the result of policing operations: crime reduction and other benefits such as increases in rider perceptions of security, in rider volume and in transit revenues. One outcome, crime reduction, is shown as influencing the other outcomes. These outcomes, in turn, modify future transit crime characteristics, rider characteristics, and rider volume in a continual cycle. Crime reduction as an outcome will likely cause changes in the crime situation confronting a mass transit system, although there will be a time lag. Similarly, rider perceptions of security, rider volume and transit revenues will introduce changes into the transit environment. The basic assumptions are that each of the major elements and the various factors are interrelated, in terms of influence, in a manner depicted by the direction of the arrows in Figure 1. More detailed explanations of these assumptions are presented next.

A. General Transit Environment

For the purpose of this study, the transit system environment is defined by: system characteristics, ridership characteristics and crime in the areas surrounding the system. There is evidence that the transit environment influences where, when, and under what circumstances transit-related crimes are committed, the preponderance of crime types and the kinds of opportunities crime perpetrators act upon, as well as the types of individuals most likely to be victims and offenders, although the precise relationships are not known. It is believed that the mass transit environment operates in a limiting as well as enhancing manner with regard to crime and policing activities. Among other things, this means that a number of crimes, e.g., burglary and assault within a family, which are commonplace outside the boundaries of the transit system, are much less likely to be committed within the system. Conversely, certain crimes such as pocket-picking and purse-snatching might be more prevalent on a mass

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TRANSIT ENVIRONMENT

● SYSTEM CHARACTERISTICS

- MODE OF TRANSPORTATION
- NUMBER AND TYPE OF
  ROLLING STOCK
- NUMBER OF STATIONS
- ARCHITECTURE OF STATIONS
- PARKING LOTS
- JURISDICTIONS SERVED
- METHODS OF FARE
  COLLECTION

● RIDER CHARACTERISTICS

- INDIVIDUAL AND
  DEMOGRAPHIC
- AGGREGATE (VOLUME, DEN-
  SITY, ROUTES TRAVELLED)

● SURROUNDING NEIGHBORHOOD
  CRIME

- CRIME TREND
- TYPES OF CRIME

CURRENT TRANSIT CRIME
SITUATION

● TYPE OF CRIME
● LEVEL OF CRIME
● TIME/PLACE
  DISTRIBUTION
● MODUS OPERANDI
● OFFENDER CHARAC-
  TERISTICS
● VICTIM CHARAC-
  TERISTICS

POLICE CHARACTERISTICS
AND OPERATIONS

● ORGANIZATIONAL
  AFFILIATION
● AUTHORITY AND
  RESPONSIBILITIES
● MANPOWER RESOURCES
● EQUIPMENT RESOURCES
● ANTI-CRIME STRATEGIES
● RELATIONS WITH PUBLIC
● RELATIONS WITH
  SURROUNDING
  JURISDICTIONS

CRIME
REDUCTION

OTHERS

● RIDER PERCEPTION
  OF SECURITY
● RIDER VOLUME
● TRANSIT REVENUE
● BROADER SOCIETAL
  BENEFITS

INPUT ELEMENT          ROCESS ELEMENT          OUTCOME ELEMENT

FIGURE 1
ELEMENTS OF THE ANALYTICAL FRAMEWORK

transit system than on the streets because of a greater opportunity created by large crowds during rush hours. The relatively closed nature of a rapid rail system can also be a significant environmental factor with regard to policing and other security operations.

### 1. System Characteristics

System characteristics refer to structural and operational features of the transit system. Among the major characteristics which have been shown or are assumed to influence both crime and policing operations are:

- mode of transportation (bus, subway, elevated rail line, etc.);

- station characteristics;

- parking facilities;

- design of rolling stock;

- method of fare collection;

- hours of operation;

- headway;

- route layout;

- size of train; and

- attended or unattended stations.

The architectural features of rapid rail stations have been considered as important in providing opportunities for crime and in shaping various types of security activities. The age of a station is believed to be a significant factor. Older stations, constructed between the 1890's and 1930's, are characterized by multiple entrances/exits, a maze of connecting tunnels, numerous hidden areas, many structural columns and poor lighting. These features are believed to be conducive to criminal activities, although no formal evaluation has been done to substantiate it. By contrast, newer stations, built in the 1960's and '70's, tend to be purposely designed to heighten visibility, have good access control and eliminate areas of concealment. Such improvements are believed to have crime deterrent effects, enhance passengers' sense of security and facilitate policing operations.

Previous study findings as well as data collected from site visits of rapid rail systems indicate that the majority of crimes occur on specific parts of a rapid transit station: primarily station platforms, stairs, and lobby areas where ticket agents are located. (A much smaller percentage of the crimes occur on moving trains.) The levels of risk associated with different areas of stations are shown in Table II.[13] There are differences in ranking between actual and perceived security. Actual security is based on a comparison of crime frequency; perceived security is based on an attitude survey.

Other system characteristics such as method of fare collection, hours of operation, and parking lots can have a bearing on the nature and extent of the crime problem. For example, automatic fare collection in concert with unattended stations provides an atmosphere highly conducive to fare evasion but, on the other hand, prevents robbery and assault of booth attendants. Similarly, auto theft and larceny from cars are problems limited to those transit systems with park 'n' ride facilities. The ease with which auto-related crimes are often committed in wide-open, unattended parking lots with cars left for 10 to 12 hours may influence police decisions to institute various forms of surveillance such as stakeout or undercover activity.

Bus systems, on the other hand, do not have exclusive station facilities except for a small number of terminal buildings. While relevant data are not available, it is expected that characteristics of bus terminals may influence both crime and policing as is the case for rapid rail stations. It is difficult to distinguish bus stop crime from street crime in general. Accordingly, it is reasonable to assume that policing strategies directed toward controlling street crime are equally applicable to crimes committed at designated bus stops.

### 2. Characteristics of the Riders

A significant part of the transit environment is the characteristics of those who ride the system. There are two classes of rider characteristics:

- Demographic and socio-economic characteristics of individuals which may be related to crime (as offenders and/or victims); these include:

  - Age;

  - Sex;

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[13] *Security of Patrons on Urban Public Transportation Systems*, pp. 36-37.

TABLE II

LEVELS OF RISK ASSOCIATED WITH
DIFFERENT AREAS OF STATION

| ACTION | SECURITY RANK | | HAZARD AREA/ FACTOR |
|---|---|---|---|
| | PERCEIVED | ACTUAL | |
| 1. ARRIVAL AT STATION | – | 6 | PARKING LOT |
| 2. ENTERING STATION | 1 (MOST DANGEROUS) | 4 | STAIRWAYS, ESCALATORS, ELEVATORS, ETC. |
| 3. FARE COLLECTION | – | 3 | HANDLING CURRENCY |
| 4. WAITING FOR VEHICLE | 3 | 1 | ISOLATION |
| 5. ENTERING VEHICLE | – | 5 | CROWDING |
| 6. RIDING | 3 | 2 | ISOLATION, UNKNOWN ARRIVAL ENVIRONMENT |
| 7. EXITING VEHICLE | – | 7 | UNFAMILIARITY |
| 8. EXITING STATION | 1 | 8 | STAIRS, ESCALATORS, RAMPS, ETC. |

SOURCE: Security of Patrons in Urban Public Transportation
Systems, pp. 36-37.

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- Race;

- Income;

- Employment; and

- Place of residence.

● Variables dealing with individuals as groups of riders
which may be related to the level and type of crimes
found in a system as well as the risk of victimization
and the perception of security; these include:

- frequency of use of the system;

- length of trips;

- purpose of trips;

- captive vs. non-captive riders; and

- riding alone or together with others.

Individual and group characteristics of riders interact with
many of the system characteristics to increase or limit the level
and types of crime. In turn, characteristics of the riders are depen-
dent on the route structure of the system as well as the ease and
availability of alternate forms of transportation (private car,
privately-operated bus, school bus). Some systems serve the inner
city residential, business and shopping areas primarily, while others
mainly serve as suburban commuter links to the center city. Riders
reflect the neighborhoods where they board the vehicles as well as
the reasons for riding (e.g., going to work, school, shopping, to
places of entertainment, etc.).

It has been shown that on certain systems specific crime prob-
lems are related to large numbers of juveniles going to and from
school and to and from entertainment events such as football games.
Additionally, both victims and perpetrators of crime seem to be over
represented by certain age, sex and race groups. This may be
explained by the fact that for some transit systems or specific
routes the older, younger, poorer and minorities tend to use the
system more than other segments of the general population.

Studies have also shown that for several transit systems certain
crimes are related to passenger density and volume. For example,
pocket-picking and purse-snatching tend to occur when rider density

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is high, while robbery often occurs when the victim is alone and the density of riders is much lower than at peak periods.

Thus it can be seen that the characteristics of the ridership (along with those of the transit system) have some influence both on the level and type of crime in the system and police responses. To illustrate, knowledge about individuals with higher than average risks of being victimized can be the basis of a public information program directed toward these people, teaching them ways of reducing their probabilities of being victimized. Police responses in general should, therefore, take into account the characteristics of passengers and their distribution in space and time.

Another important input influencing police response is knowledge about specific groups of individuals likely to commit transit crimes such as rebellious students using mass transit for trips to and from school and attending special events, or youth gangs operating in a particular area. Special buses to transport school children, community relations programs with schools, and extra patrol during times and on routes which are heavily used by large groups of juveniles have been the typical responses to juvenile crime.

### 3. Surrounding Neighborhood Crime

Urban mass transit facilities such as stations, street-corner stops, and segments of bus and subway/elevated line routes are part of their surrounding neighborhood. As such, transit system components are expected to mirror the crime problems evident in the immediate community.

Two studies--one focusing on the Chicago subway and bus systems[14] and the other on the New York subway system[15]--examine the correspondence between transit and street crime. Both studies conclude that there is a positive association between the two and that high crime subway/elevated stations and routes are likely to be located in high crime neighborhoods. However, the Chicago study concludes that this correlation is conditional on mode of transportation. It applies only to rapid rail routes and stations and does not seem to hold for  ·

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[14] *Improvement of Mass Transit Security in Chicago.*

[15] *The Impact of Police Activity on Crime: Robberies on the New York City Subway System.*

bus-related crimes. The validity of this observation may be challenged because all bus crimes were compared against only street robberies. The authors of the Chicago study explained:

> Robbery was the only crime for which district-wide data comparable to the crimes being studied was available. Unfortunately, too few bus robberies occurred during the period studied to allow a valid comparison with district robbery in general. As a substitute, total bus crimes in each district was compared to that district's number of robberies.[16]

In the case of the New York study, there was some evidence that the transit systems might provide mobility for crimes to be committed outside high-crime areas, but on the whole transit stations and routes experience crime problems that reflect the magnitude of crime prevalent in the local community.

### B. Urban Mass Transit Policing Operations

Urban mass transit police units have a diverse set of characteristics. Some units are comprised of sworn personnel, while others consist of non-sworn personnel. In some cases the units are funded and/or managed by the transit authority and, in others, they are part of the local police departments. The policing responsibilities in some systems are assumed by one unit; in others, shared by several organizations. These differences in organization and authority may well affect what types of policing activities are performed and their effectiveness. On the other hand, all transit police units operate on a common principle: controlling crime via deterrence, prevention and apprehension. While the selection of strategies and allocation of resources are, in part, determined by organizational factors, the transit environment also plays a key role. Being a relatively closed system, the transit environment enhances the effectiveness of some activities and limits others.

### 1. Organizational Factors and Resource Allocation

A number of factors such as organizational affiliation (transit company or local police department), type of department (sworn or non-sworn personnel), size of force (number of men, rank, organizational

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[16] *Improvement of Mass Transit Security in Chicago.*

structure), position in the parent organization (hierarchy and lines of communication) and areas of responsibility (company property, passengers, revenue) may influence the operations and effectiveness of transit police units.

Among these factors, the most important is the law enforcement authority of the transit police unit; whether it is sworn personnel or non-sworn personnel. Both types of units are involved in policing bus systems, but there are distinctive differences in their operations. Units with sworn personnel tend to rely on traditional police operations such as targeting problem routes, posting uniformed and plainclothes patrols on buses, and following buses in cars or on motorcycles. On the other hand, units comprised of non-sworn personnel (operating as security departments within the transit company) emphasize non-patrol oriented activities; for example, liaison with the police, community and courts, and designing and presenting on-the-job training courses for drivers dealing with inter-personal relations. Patrolling buses is performed either by local police on an as-needed basis or by off-duty police hired intermittently by the transit company when serious problems arise.

Difference in organizational affiliation (i.e., whether the transit police are part of the city police department or under the management control of the transit authority) can have an impact on effectiveness via personnel selection and assignments, management support and attention given to controlling transit crime, and jurisdictional limitations. However, organizational affiliation seems to have less influence on strategy selection than other factors such as size of the transit police force relative to the number of stations, number of trains, and passenger route miles.

It is important to note that police/security units, especially those operating under the jurisdiction of transit companies, have, in addition to passenger and transit employee security, other major responsibilities differentiating transit units from local police. Transit police often provide emergency services usually covered by rescue squads and fire departments; patrol transit properties such as garage facilities/repair yards, storage depots, and terminal buildings; and monitor various phases of revenue collection. These extra responsibilities could affect the selection of policing strategies, allocation of manpower and other resources.

## 2. Definition of Basic Assumptions

There are certain fundamental assumptions underlying transit police attempts to counter criminal activity. Specific police activities such as uniformed patrol, specialized plainclothes units, and decoys are all directed toward controlling crime through the processes

of deterrence, prevention and apprehension (Figure 2). It is also assumed that crime control will lead to several outcomes affecting the well being of the public and urban mass transit system:

- increased ridership perceptions of security;

- increased ridership volume; and

- increased revenue.

One of the objectives of police activities is "to influence the perceptions of potential criminals as to the likelihood of apprehension, and the certainty of punishment when apprehended."[17] It is believed that individuals are deterred from committing a crime if the risk of being apprehended is too high and/or the likelihood of achieving the goal of the intended act is too low. Activities aimed at heightening police visibility such as fixed posts, saturation patrol, or reducing response time are assumed to have deterrent effects discouraging criminal activity.

Prevention is the process whereby criminal activity is made more difficult or the opportunity for crime is reduced quite apart from perceived probability of apprehension. Prevention measures such as security checks of facilities, physical barriers, improved lighting and exact fare are intended to decrease the opportunity for crime. By making the environment less conducive to criminal activities, some preventive activities have a deterrent effect by making crime more difficult to carry out successfully.[18] Other preventive activities include community relations and school programs aimed at limiting transit crime by influencing social and psychological factors that may have a restraining effect on crime.

Apprehension refers to the arrest of suspects by police when a crime is in progress or while a suspect is fleeing from the crime scene, victimizing a decoy officer, or subsequently caught through investigations. Police activities leading to apprehension are assumed to limit crime in three ways. First, the unpleasant experience of being arrested, booked and detained temporarily may be a sufficient

[17] Schell, T. H., D. H. Overly, S. Schack, and L. L. Stabile, National Evaluation Program Phase I Summary Report, Traditional Preventive Patrol, National Institute of Law Enforcement and Criminal Justice, Law Enforcement Assistance Administration, June 1976, p. 6.

[18] Evaluation Program Phase I Summary Report, Traditional Preventive Patrol, p. 6.

**FIGURE 2**
**TRANSIT POLICE ANTI-CRIME ACTIVITIES AND BASIC UNDERLYING**
**ASSUMPTIONS AND OUTCOMES**

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deterrent to committing future crimes. Second, court sanctions resulting from an arrest have special and general deterrent effects. Third, incarceration upon conviction curtails criminal careers. It is also conceivable that potential criminals, when aware of intensified apprehension-oriented police activities such as stakeouts, decoys, and plainclothes patrols, will be deterred from committing crimes.

The three process assumptions discussed above may act independently or in combination with one another.

3. **Effects of the Transit System on Policing**

Although transit system policing is based on the same basic assumptions as almost any type of policing (deterrence, prevention and apprehension) and employs similar activities to produce visibility, surveillance, fast response time and investigation, the transit system does have features which differ from the environment in which general policing occurs. For example, entrances and exits to and from the system are limited (especially in rapid rail systems) as are those into and out of the rolling stock. Transit vehicles are closed off during movement, and most crimes, whether on moving vehicles or in station areas, take place within possible public view. On the other hand, the rapid flow of many people into and out of the system and the limited jurisdiction of some transit police may be detrimental to deterrence and apprehension.

Some of the possible assumptions concerning the differential effectiveness of police and other security activities in a transit system vs. in the general "street" environment are:

- Criminal acts in transit systems generally take place in areas open to public view making them more easily detectable and immediate apprehension more likely. Surveillance and preventive patrol, therefore, may have greater deterrent effects in the transit system than above ground.

- A large proportion of criminal acts against people in transit systems are stranger-to-stranger crimes. This should lead to higher reporting rate and willingness of victims to assist police in investigation and court processing.

- A relatively enclosed system enhances police visibility. Proper deployment of even a limited number of visible patrols may produce both deterrent effects and enhanced passenger feelings of security.

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- There is limited access (especially in rapid rail systems) and there are limited areas (trains, buses, platforms, other parts of stations) in which crime can occur. Surveillance and detection equipment can be used productively in a closed system to facilitate apprehension and achieve some deterrence.

- The transit system lends itself to construction of physical barriers and/or changes in operations to prevent some types of criminal activity. The system allows for such preventive activities as exact or automatic fare collection, closing off parts of stations during certain periods, decreasing headway, limiting access to stations and/or vehicles, etc. These factors enhance crime control through prevention.

- Large numbers of people rapidly moving into and out of the transit system (into other police jurisdictions) may diminish the ability of policing operations to deter and apprehend. This may be a problem at certain time periods in some systems.

These assumptions have implications for the optimum use of limited men and equipment to control crime in transit systems. Some of the assumptions are more relevant to rapid rail than bus systems. The physical and operational features of a particular rapid transit system will further determine the relevance of these assumptions to that system.

C. Outcomes of Transit Policing Activities

Increased prevention, apprehension, and deterrence of crimes are expected to produce certain outcomes within the context of the urban mass transit environment. As displayed in Figures 1 and 2, the major outcome objectives are:

- to control and/or reduce crime;

- to increase the ridership's perception of security;

- to increase ridership volume; and

- to increase transit revenue.

These objectives are interrelated. Changes in crime levels impact on ridership perception of security within the transit system. Changes in perception of security, in turn, should lead to changes

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in ridership volume and transit revenues. Additionally, changes in crime levels (e.g., vandalism, fare evasion, and employee theft) may impact directly on revenues without affecting either public perception or ridership volume.

D. Planning and Evaluation Issues

There is a range of strategies available for providing security on transit systems. Some of these strategies may be more effective in deterring and preventing crime in certain systems and situations than in others. Some strategies may have greater impact on ridership perceptions of security, transit revenues, and ridership volume than others. The selection of a particular strategy (or an optimal mix of strategies) is the product of both planning and evaluation.

Several types of issues, or questions, can arise in examining transit crime and planning and evaluating counter-measures. The criminal justice decision-makers need to know the magnitude of the mass transit crime problem in the light of other problems competing for attention in order to determine an equitable allocation of increasingly scarce public resources. This perspective is concerned with long-term questions affecting community-wide trends in crime and their resolution. The issues of major concern to this group are those associated with initial decisions to fund and subsequent decisions to continue or change the levels of funding.

The managers and police/security officials concerned with the day-to-day provision of transit services are interested in the near-term as well as longer range effects of crime on operations, cost of service, and revenue. They need information on changes in transit crime patterns and on the comparative effectiveness of different policing/security options either in response to a particular crime situation or to achieve some general objectives of improving the security of passengers and the transit system.

Analysis of these concerns in light of mass transit system operations and mass transit crime gives rise to a series of issue-oriented questions whose answers can provide the basis for determining which strategies are most effective and under what conditions they should be employed:

- What is the nature and extent of transit crime?

- What is the influence of system characteristics on the selection of a policing strategy?

- What are the relationships between various policing strategies and transit crime?

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- What is the impact of mechanical and electronic security and communication devices on the effectiveness of transit policing?

- How effective are the different types of policing units?

- What is the impact of various policing strategies on passenger perceptions of security?

- What are the appropriate measures of "success" for the various policing strategies?

Additional questions subsumed by the above generic questions are presented in Exhibit I.

Each of the issue-oriented questions corresponds to a specific element of the analytical framework (see Section V, Figure 1). For example, questions concerning the nature and extent of transit crime and the influence of system characteristics on the selection of a policing strategy are associated with the input element. Likewise, questions concerning the relationships between policing activities and transit crime, the bearing of mechanical and electronic devices on policing effectiveness, and the impact of different types of policing units relate to the process element. Questions dealing with the influence of policing activities on passenger perceptions of security and appropriate measures of "success" correspond with the outcome element of the analytical framework.

These questions address the central issues and primary assumptions underlying policing urban mass transit systems. Section VI assesses existing information, culled from the literature and gathered during site visits, bearing on each of the issue areas. Transit policing activities are examined in terms of their effectiveness in achieving primary objectives. The assessment also identifies data- and methodological-related problems and delineates important gaps in current knowledge.

NATURE AND EXTENT OF TRANSIT CRIME

- Where is transit crime of sufficient magnitude to be considered a serious criminal justice system problem?

- Are transit crime levels increasing, decreasing, or remaining fairly constant?

- Over time, how do changes in transit crime compare to changes in crime in general?

- What is the risk that a passenger will be victimized?

- What are the profiles of typical transit-related victims, offenders and crimes?

  - Who are the typical victims?

  - Who are the typical offenders?

  - Where and when are most transit crimes committed?

INFLUENCE OF SYSTEM CHARACTERISTICS ON THE SELECTION OF POLICING STRATEGIES

- Do the operating characteristics of a mode of transportation such as mobility, headway and method of fare collection impact on the selection of a strategy?

- Do the environmental characteristics of a system such as age, lighting and visibility impact on the selection of a strategy?

RELATIONSHIP BETWEEN VARIOUS POLICING STRATEGIES AND TRANSIT CRIME

- How effective are the various strategies?

- Are proactive strategies more or less effective than reactive strategies?

EXHIBIT I

KEY QUESTIONS RELATED TO PLANNING AND EVALUATION ISSUES

- Does a combination of strategies produce an optimal
  mix for deterring and preventing transit crime?

- Do the strategies actually reduce crime or do they
  reduce the rate of increase?

- Do the strategies produce displacement, and if so,
  how much?

IMPACT OF MECHANICAL AND ELECTRONIC SECURITY AND COMMUNICATION DEVICES
ON THE EFFECTIVENESS OF TRANSIT POLICING

- How effective are the various mechanical and electronic
  security and communication devices?

- Do security devices reduce response time sufficiently
  to impact on police effectiveness?

EFFECTIVENESS OF DIFFERENT TYPES OF POLICING UNITS

- Is there a need for a dedicated transit police
  unit?

- Should policing of the system be the responsibility
  of the transit company or the local police?

IMPACT OF VARIOUS POLICING STRATEGIES ON PASSENGER PERCEPTIONS
OF SECURITY

- Which police strategies/security measures increase
  passenger perceptions of security?

- Do passenger perceptions influence ridership behavior?

- Are passenger perceptions accurate in terms of the
  magnitude of transit crime?

- Which policing strategies increase ridership?

EXHIBIT I    (CONTINUED)

KEY QUESTIONS RELATED TO PLANNING AND EVALUATION ISSUES

APPROPRIATE MEASURES OF "SUCCESS" FOR THE VARIOUS POLICING
STRATEGIES

- What measures are used to determine transit crime
  trends and levels, and passenger risk?

- What are the appropriate measures of achievement of
  policing and other security strategies?

- What are the relative levels of cost-effectiveness
  of the various strategies?

EXHIBIT I   (CONCLUDED)

KEY QUESTIONS RELATED TO PLANNING AND EVALUATION ISSUES

SECTION VI

AN ASSESSMENT OF URBAN MASS TRANSIT SYSTEMS POLICING


Present knowledge about transit crime and policing responses
are brought into focus in this section in a question-and-answer form.

Two general types of questions are included.  The first type is
of a descriptive nature concerning "What is happening?," "Who is
involved?," and "What is being done?," in respect to transit crime.
The second type consists of evaluative questions such as "Is transit
crime considered a serious problem?," "What factors appear to influ-
ence transit crime and policing responses?," and "How effective are
the various strategies?"

As each question is discussed, the reliability of information used
in developing the answers and important gaps in knowledge are noted.
The recommendation for future research presented in Section VII can
be traced back to these deficiencies.  The questions examined in
this section are listed in Exhibit I, Section V.

A.  Nature and Extent of Transit Crime

    1.  Where is Transit Crime of Sufficient Magnitude to be
        Considered a Serious Criminal Justice System Problem?

Information gathered from several sources indicate that transit
crime is concentrated in the nation's large cities.  Crime data for
1969-1971 (see Table III) collected from 37 United States transit
systems by Thrasher and Schnell[19]  show that cities with populations
exceeding one million account for approximately 86 percent of the
reported transit-related crime against revenue passengers, while less
than one percent is associated with cities having populations under
250,000.

Representatives of two major transit companies that manage about
30 bus transit systems (National City Management Company and ATE
Management and Services Company, Inc.) stated via telephone interviews
that transit crime was indeed a problem confined to major metropolitan
areas (loosely defined as cities with populations greater than
250,000).  Members of the American Public Transit Association Committee
on Transit Security generally concurred in this assessment.

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[19] Thrasher, Edward J. and John B. Schnell, "Scope of Crime and
     Vandalism on Urban Transit Systems," Crime and Vandalism in Public
     Transportation, Transportation Research Board, No. 487, 1974.

TABLE III

INCIDENTS OF TRANSIT VIOLENT CRIME AND TOTAL CRIME
TO REVENUE-PASSENGERS, 1969, 1970 AND 1971

| SYSTEM | VIOLENT CRIME [26] | | | OTHER CRIME | | | TOTAL CRIME | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1969 | 1970 | 1971 | 1969 | 1970 | 1971 | 1969 | 1970 | 1971 |
| >1,000,000 | | | | | | | | | |
| BOSTON (MBTA) | 56 | 234 | 168 | 1,120 | 1,879 | 1,966 | 1,176 | 2,113 | 2,134 |
| CHICAGO (CTA) | 1,090 | 405 | 714 | 1,480 | 1,841 | 2,410 | 2,570 | 2,246 | 3,124 |
| CLEVELAND (CTS) | -- | 36 | 11 | -- | 79 | 26 | -- | 115 | 37 |
| LOS ANGELES (SCRTD) | 217 | 45 | 87 | 192 | 765 | 1,108 | 409 | 810 | 1,195 |
| NEW YORK (NYCTA) | 381 | 204 | 305 | 8,399 | 9,921 | 10,619 | 8,780 | 10,125 | 10,924 |
| NEW YORK (PATH) | 14 | 21 | 22 | 70 | 94 | 68 | 84 | 115 | 90 |
| PHILADELPHIA (PATCO) | 0 | 0 | 1 | -- | -- | 35 | -- | -- | 36 |
| PHILADELPHIA (SEPTA) | 95 | 132 | 102 | 689 | 625 | 325 | 784 | 757 | 427 |
| 250,000-1,000,000 | | | | | | | | | |
| ALBANY | -- | -- | 3 | -- | -- | 19 | -- | -- | 22 |
| ATLANTA | -- | -- | 6 | -- | -- | 41 | -- | -- | 47 |
| BALTIMORE | -- | 25 | 23 | -- | 1,490 | 860 | -- | 1,515 | 883 |
| COLUMBUS | 0 | 1 | 3 | 18 | 28 | 16 | 18 | 29 | 19 |
| DENVER | -- | -- | 0 | -- | -- | 54 | -- | -- | 54 |
| FORT WORTH | 11 | 16 | 5 | 39 | 41 | 38 | 50 | 57 | 43 |
| INDIANAPOLIS | 4 | 42 | 21 | 248 | 372 | 249 | 252 | 414 | 270 |
| MILWAUKEE | 46 | 60 | 73 | 190 | 158 | 269 | 236 | 218 | 342 |
| NEW ORLEANS | 154 | 514 | 28 | 120 | 179 | 249 | 274 | 693 | 277 |
| OAKLAND (AC TRANSIT) | -- | -- | 6 | -- | -- | 266 | -- | -- | 272 |
| PORTLAND | 7 | 4 | 2 | -- | -- | 171 | 7 | 4 | 173 |
| ST. LOUIS | 19 | 16 | 10 | 123 | 140 | 153 | 142 | 156 | 163 |
| SAN ANTONIO | 0 | 0 | 0 | 60 | 71 | 43 | 60 | 71 | 43 |
| SAN DIEGO | 0 | 0 | 2 | 50 | 59 | 54 | 50[27] | 59 | 56 |
| SEATTLE (STS) | -- | 24 | 22 | -- | 130 | 110 | -- | 154 | 132 |
| SEATTLE (MTC) | 0 | 0 | 0 | 6 | 6 | 11 | 6 | 6 | 11 |
| <250,000 | | | | | | | | | |
| 12 SELECTED CITIES[28] | 2 | 1 | 9 | 37 | 74 | 116 | 39 | 75 | 125 |
| TOTAL | 2,096 | 1,780 | 1,623 | 12,841 | 17,952 | 19,276 | 14,937 | 19,732 | 20,899 |

[26] VIOLENT CRIMES CONSIST OF: (1) CRIMINAL HOMICIDE; (2) FORCIBLE RAPE; (3) ROBBERY; AND, (4) AGGRAVATED ASSAULT.

[27] ESTIMATE.

[28] CITIES IN THIS CATEGORY ARE ANN ARBOR, MICHIGAN; BILLINGS, MONTANA; CHATTANOOGA, TENNESSEE; CONCORD, NEW HAMPSHIRE; DAYTON, OHIO; EVERETT, WASHINGTON; LAFAYETTE, INDIANA; ORLANDO, FLORIDA; PUEBLO, COLORADO; SCHENECTADY, NEW YORK; SYRACUSE, NEW YORK; AND TACOMA, WASHINGTON.

SOURCE: TABLE ADAPTED FROM THRASHER, EDWARD AND JOHN B. SCHNELL, "SCOPE OF CRIME AND VANDALISM ON URBAN TRANSIT SYSTEMS," CRIME AND VANDALISM IN PUBLIC TRANSPORTATION, TRANSPORTATION RESEARCH BOARD, #87, 1974, p. 37.

In answer to MITRE inquiries, criminal justice state planning agencies, regional offices of the LEAA, and regional offices of the Urban Mass Transportation Administration further confirm this observation. According to the responses, transit crime is a serious problem thus far limited to major metropolitan areas. Areas without major population centers (cities with less than 250,000 persons) report that transit-related crime is a minor problem and relatively non-existent in many sparsely populated regions. This is partly reflected by the choice of recent recipients for government-funded anti-crime transit projects. LEAA has funded transit security projects in Los Angeles, California; Oakland/San Francisco, California; the State of New Jersey (strictly research); New York City, New York; and Philadelphia Pennsylvania. Additionally, the Urban Mass Transportation Administration has provided Chicago, Boston and Philadelphia among other cities with funds to purchase security-related equipment.

FBI Uniform Crime Report data show a fairly strong, positive association between frequency of reported crime and city size; this same association appears to apply to transit crime as well.

## 2. Are Transit Crime Levels Increasing, Decreasing, or Remaining Fairly Constant?

The most recent data available are crime statistics gathered during visits to transit properties. The data, for several reasons, are not conducive to aggregation and/or generalization across systems. First, in over half of the 12 cases the data cover a time frame of two years or less, not long enough to detect trends. Second, the time frames vary from one system to the next. Third, comparisons are hindered by differences in crime classifications among systems as well as differences in definitions as to what actions constitute these crimes and methods of data collection. Therefore, assessments of crime levels and associated trends must be system specific. Comparisons between systems must be made cautiously taking into account these methodological problems.

For two rapid rail systems BART (Oakland) and SEPTA (Philadelphia) and three bus systems MTA (Baltimore), MARTA (Atlanta), and SCRTD (Los Angeles), crime data are available for 1973 through 1974. There are distinct differences among systems. For example, SEPTA exhibits a steady increase totalling 34 percent over the three years, mostly due to a substantial rise in reported larcenies. MARTA, on the other hand, shows a continual, across-the-board decrease in transit crime of approximately 30 percent. The three remaining systems exhibit overall increases in crime ranging from 14.3 percent for SCRTD to 48.5 percent for BART. However, there were year-to-year fluctuations with crime levels rising one year and dropping the next (BART and MTA) or vice versa (SCRTD).

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Crime data for 1969-1971 gathered by Thrasher and Schnell via interviews and mail questionnaires for 37 transit properties in the United States suggest several overall trends (see Table III).[20] For transit systems included in their survey, violent crime against revenue passengers decreased by about 23 percent, but non-violent crime rose sharply--by approximately 50 percent, resulting in a net increase of total crime against passengers by about 40 percent.

In at least two cities, San Francisco and Detroit, the transit crime problem recently reached sufficiently alarming levels, forcing city officials to implement forceful countermeasures. The mayor in San Francisco "promised action to protect riders of city buses and trolleys who have been subjected in broad daylight to random attacks and robberies by youths." The Mayor's plan involved assigning 55 patrol teams to ride buses and trolleys during the high crime hours of 11 p.m. to 7 a.m.[21] In Detroit, the Police Chief "ordered the return to duty of 48 laid-off policemen to ride shotgun on city buses" in response to rising incidents of purse-snatching, fighting, and general harassment of citizens using public transportation.[22]

Overall, currently available data are not amenable for determining crime trends across systems. Without uniform collection of transit crime data, assessments will continue to be limited to system specific analyses; any comparison across systems runs into serious methodological problems.

## 3. Over Time, How Do Changes in Transit Crime Compare to Changes in Crime in General?

There appear to be significant differences between transit crime and surface crime in terms of the relative frequency of various types of crimes. The transit environment, with the exception of several rapid rail systems, precludes the opportunity for burglary. The environment also affects the distribution of types of crimes as indicated by the following comparison of percentage distributions of assault, larceny and robbery reported for the City of New York as a

[20] "Scope of Crime and Vandalism on Urban Transit System," Crime and Vandalism in Public Transportation.

[21] "San Francisco Cracks Down on Street Crime," Washington Post, November 25, 1976.

[22] "Reinstated Detroit Police Put on Buses," Washington Post, October 15, 1976.

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whole and for a period (selected at random) reported for the City's
subway system (taken from newspaper statistics):[23]

| TYPE OF CRIME | CITY AS A WHOLE | SUBWAY |
|---|---|---|
| ASSAULT | 15% | 11% |
| LARCENY | 75% | 61% |
| ROBBERY | 10% | 28% |

Although the crime patterns differ, changes in transit crime
levels generally reflect changes in the crime problems of the sur-
rounding environment both locally and nationally. During the 1950's
and 1960's when shifts in the demographic composition of cities were
accompanied by rising crime rates, transit systems likewise experienced
increases in crime.[24]

This relationship is exemplified by the crimes of robbery and
assault between 1963 and 1968. In that time period, robbery and
assault of bus drivers in the United States increased by a factor of
five.[25] The rate of increase was greatest from 1966 to 1968 when
the number of incidents almost tripled.[26] During the 1960's for the
United States as a whole, the number of robbery offenses rose by
177 percent (with the greatest increase from 1966 through 1969) and
the number of aggravated assaults climbed by 102 percent.[27]

[23] Williams, E. M., et al., Control of Mass Transit Vandalism and Other
Crime, Prepared for the Fifth International Conference on Urban
Transportation, Pittsburgh, September 8-10, 1971, pp. 95-96.

[24] Security of Patrons on Urban Public Transportation Systems, p. 2.

[25] Gray, Paul, "Robbery and Assault of Bus Drivers," Operations Research,
March-April 1971, pp. 257-269.

[26] Stanford Research Institute and the University of California,
Reduction of Robberies and Assaults of Bus Drivers--Volume I:
Summary and Conclusions, April 1970, pp. 1-2.

[27] Hoover, John Edgar, Crime in the United States - 1969 Uniform Crime
Reports, U.S. Department of Justice, 1970, pp. 9-11, 13-16.

In one particular city (Chicago), total transit crime "decreased
by 20 percent the first six months of 1972 as compared to the same
period in 1971," while surface crime in the surrounding police districts
also decreased by about 20 percent.[28]

### 4. What Is the Risk That a Passenger Will Be Victimized?

The number of serious crimes on a transit system is far less
than the number found in the neighborhoods served by the system, but
there are conflicting findings on the comparative risk of victimiza-
tion between transit systems and the streets. There is no commonly
accepted method for calculating victimization risk on rapid transit
systems.

A survey by the American Public Transit Association of 37
transit properties in the United States led to the conclusion that the
risk of victimization on transit systems, based on exposure time where
the average trip is assumed to be 15 minutes, was approximately twice
that on the streets.[29] A study of the Chicago system, using rider
population as a basis for measuring risk, came to a diametrically
opposed conclusion, stating that the relative risk of victimization
on the transit system was about one-half that on the streets.[30] How-
ever, in a later publication the authors of the Chicago study conceded
that they may have made a conceptual error in trying to "compare the
index used in the Chicago study (robberies/ridership) with the FBI
crime index," since ridership alone does not provide a valid basis for
estimating risk on a transit system. They further concluded that a
better measure is 'robberies per year' (or crimes per passenger-year).
This measure is defined in such a way as to capture the number of
trips and how long the average passenger stays in the transit system
during a trip. Calculations utilizing this revised index produce a

[28] Improvement of Mass Transit Security in Chicago, pp. 56-58. Also
Security of Patrons on Public Transportation Systems, p. 6.

[29] Schnell, John B., Arthur J. Smith, Karen R. Dimsdale, and Edward J.
Thrasher, Vandalism and Passenger Security: A Study of Crime and
Vandalism on Urban Mass Transit Systems in the United States and
Canada, American Transit Association, September 1973, pp. III-1
to III-36.

[30] Improvement of Mass Transit Security in Chicago, pp. 195-200.

victimization risk in close agreement with that estimated by the American Public Transit Association and indicate subways, at least, are much less safe than the streets.[31]

The debate over the proper denominator for calculating risk of victimization obscures the larger issue dealing with whether it is meaningful to compare victimization risk between transit systems and the streets. It would be more meaningful, especially from the operational perspective of transit officials and police, to be able to calculate and compare risk of victimization for different times and parts of the transit systems. (For a more detailed discussion of these issues, see Section VI, G, 1.)

A report based on the Chicago study compares victimization risk on subways vs. buses. The data show that about 84 percent of the mass transit robberies are subway-related. By contrast, the number of assault and batteries are about the same for the two modes. However, when ridership is taken into account "risk on (subway) system is ten times greater than on the bus system."[32] (It is important to note that bus-related crimes tend to be underreported because crimes at bus stops are usually included in street crime statistics and not separately compiled as transit crime.)

The risk of being a victim of serious crimes also differs across rapid rail transit systems. Several subway/elevated lines are akin to commuter railroads, while several others form the nucleus of inner-city public transportation systems. The major types of crime associated with the suburban commuter lines (vandalism, pocket-picking, etc.) are generally not as serious as those crime problems usually associated with inner-city rapid rail systems.

Within a given transit system, the risk is not uniform throughout the system but dependent on location. A study of the New York subway system indicated that "subway robbery tends to be highest in areas having a high surface crime rate."[33] As far as crime on the rapid

[31]Security of Patrons on Urban Public Transportation Systems, pp. 6, 9-12, Appendix I, pp. 51-53.

[32]Johnson, Ronald C., "Mass Transit Security in Chicago," Transportation Research Forum, 15th Annual Meeting, 1974, pp. 227-228.

[33]The Impact of Police Activities on Crime: Robberies on the New York City Subway System, pp. 44-48.

transit system is concerned, the Chicago study agrees with the one done in New York; however, it further suggests that the correlation is conditional on mode of transportation.[34] Bus crime does not seem to be correlated with robbery levels in surrounding neighborhoods.[35] Since robbery represents a small percentage of total street crime, it may not be indicative of the magnitude of street crimes in a given neighborhood.[36] Therefore, the validity of this comparison based on all bus crimes against non-transit robberies may be questionable.

Transit police officials interviewed during site visits generally agreed that there is a correspondence between transit and street crime, with routes and stations located in high crime neighborhoods experiencing a higher percentage of transit crime than those situated in low crime areas. In short, the risk of victimization is not uniform throughout systems. It is possible to identify high risk routes, stations or segments of the various transit systems.

It is expected that factors such as passenger density and level of security have an effect on the risk of victimization. However, these factors have not been addressed by current research.

Further, the vulnerability of rapid transit systems to acts of terrorism (e.g., bombing and hostage taking) and arson has not received any attention in the literature, although such acts pose enormous threats to the safety of large numbers of passengers and to transit properties. One rapid rail system reported an average of two bomb threats a month; fortunately they turned out to be false alarms. In 1976, a fire set on board a subway train caused two to three million dollars damage in the Toronto system; a similar incident occurred in BART, resulting in $200,000 to $300,000 worth of damage to subway cars. Preventive and early detection capabilities need to be developed for subway trains to fight against arson.

[34]Security of Patrons on Urban Public Transportation Systems, pp. 12, 35.

[35]Improvement of Mass Transit Security in Chicago, pp. 50-56, 83-85.

[36]Ibid., p. 83.

5.  What Are the Profiles of Typical Transit-Related Victims, Offenders and Crimes

Most of the currently available information detailing victim, offender and environmental characteristics come from three studies of urban mass transit systems. The New York[37] and Chicago[38] studies look at subway/elevated systems. The former study focuses on robbery and its attendant characteristic, while the latter examines a cross-section of criminal activities. The SRI-University of California[39] study provides most of the information on bus robberies and assaults.

The three following sections provide summaries of victim, offender and crime characteristics. Detailed profiles are presented in Appendix B.

a.  Who Are the Typical Victims?

Most serious rapid transit crimes are perpetrated against single passengers. Rarely are persons in groups of three or more victimized together. Over one-half of the robberies of bus drivers occur when no passengers are on board. On buses, the driver is usually the sole target of the offenders. (Most of the information concerning bus systems was collected before exact fare was introduced nation-wide and, therefore, may no longer be accurate).

On rail rapid transit, most robberies are directed against male passengers. Race varies with sex: approximately 67 percent of the male victims are Caucasian, while only 33 percent of the female victims are white. Information detailing age is somewhat less precise, indicating that over 60 percent of the victims are between the ages of 21 to 50. A further breakdown shows that black females tend to be somewhat younger than their white counterparts.

As with robbery, white males comprise the majority of battery victims. On the average, however, they are somewhat younger than robbery victims.

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[37] The Impact of Police Activity on Crime: Robberies on the New York City Subway System.

[38] Improvement of Mass Transit Security in Chicago.

[39] Reduction of Robberies and Assaults of Bus Drivers - Volume I: Summary and Conclusions.

Women are the victims of about 75 percent of a broad class of crimes categorized as "crimes against persons," a miscellaney of offenses including homicide, rape, indecent exposure, purse-snatching, etc.

The transit system and its employees form a distinctive group of targets of criminal activity. Employees handling money, especially fare collectors, are frequent targets of robbery. The system is the direct victim of various forms of vandalism and theft of service.

b.  Who Are the Typical Offenders?

The data indicate that the large majority of transit crimes are perpetrated by young, black males. Other offender characteristics such as modus operandi and number of associates tend to vary by type of crime.

For example, the overwhelming majority of bus robbers are male (about 95 percent) and black (90 percent). About half of the offenders are between 16 and 20 years old and very few are over 30. Typically bus robbers are armed--usually with a gun--and work singly or in pairs. In most instances, the offender(s) enters the bus, commits the robbery and immediately exits on foot.

Robbers who work the rapid rail systems prey on passengers and token booth attendants. Passenger robbers are generally male (95 percent), black (90 percent), comparatively young (averaging 17 years of age with few older than 30), operating in groups of two or three, and usually not armed. Token booth robbers also tend to be male and black, although a greater proportion of token booth robbers are white compared to passenger robbers. Additionally, token booth robbers are usually armed, average 22 years in age and operate singly or in pairs.

Approximately half of the transit-related batteries are committed by single individuals, but a substantial minority are perpetrated by groups of four or more offenders. As is the case with other types of transit-related crime, most offenders are male, black and young--over 50 percent are less than 21 years old and 90 percent under 31. In most instances weapons are not used; victims are either threatened, hit, kicked or struck by a weapon. Upon completion of the crime, offenders usually escape from the system on foot as rapidly as possible.

Finally, almost all "crimes against persons" (indecent exposure, homicide, rape, etc.) are committed by single individuals. While a significant majority of these offenders are black, a sizeable

minority (about 20 percent) are white. Although weapons are rarely used, those situations involving a gun or knife usually result in serious injury to the victim.

During site interviews, representatives of transit police units and security departments indicated that their profiles of offenders generally matched the descriptions presented in the literature. In cities such as Baltimore, Philadelphia and San Francisco, where public transportation is used by junior and senior high school students for school trips, a sizeable proportion of transit-related crime is committed by juveniles. Transit police chiefs in Boston and New York emphasized that a small number of people are responsible for most of the crime in the subways. According to the Chief of New York City transit police, "three hundred to four hundred people are responsible for up to half of the crimes committed in the subway."[40]

c. **Where and When are Most Transit Crimes Committed?**

The data show a positive correlation between the location of surface crime and transit crime. This is especially the case with subway lines. In discussing the New York rapid transit system, the Carnegie-Mellon University Workshop summarized the Rand study (The Impact of Police Activity on Crime: Robberies on the New York City Subway System) and concluded:[41]

> The geographical locations of subway crimes are not evenly spread throughout the system but are focused on a small number of stations and the portions of train routes that run between those stations. The high-crime locations can be easily identified from historical data and tend to be where surface crime rates are also high.

Further analyses reveals notable interactions among other environmental variables and specific types of crimes. Several examples, taken from studies of rapid rail systems, are presented below.

Robberies occur primarily at night between 6 p.m. and midnight when passenger levels drop after the evening rush hour. About 70 percent of the passenger robberies take place on the platforms and

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[40] Bird, David, "One-Man Subway Crime Wave," New York Times, January 21, 1977, p. A14.

[41] Security of Patrons on Urban Public Transportation Systems, p. 35.

30 percent inside trains either between stations or as the trains pull into stations. Passenger robbery is much more frequent during weekdays. Token booth robbery takes place in the lobby area of stations and the frequency increases toward the end of the week and peaks on Sundays.

Incidents of battery are fairly evenly distributed throughout the week. About half are committed between 4 p.m. and 10 p.m.: the highest frequency occurs during the evening rush hour. As with transit robberies, most batteries take place on station platforms.

"Crimes against persons" exhibit a bimodal frequency distribution, peaking during morning rush hour and again between 5 p.m. and 10 p.m. Approximately half of the CAP's occur on subway vehicles, usually between stations with the offender exiting at the first stop. The remaining 50 percent take place in the station—a majority in the platform area, though a significant minority occur in the station lobby.

Currently available data detailing victim, offender and environmental characteristics are, at best somewhat fragmentary and imprecise. Nevertheless, some profiles and patterns do emerge. In some cases the profiles are system specific and, in others, the patterns exhibit similarities from one transit system to the next. The data suggest that transit crime victims and offenders closely resemble their counterparts in the surrounding community.

B. **Influence of System Characteristics on the Selection of Policing Strategies**

1. **Do the Operating Characteristics of a Mode of Transportation Such as Mobility, Headway and Method of Fare Collection Impact On the Selection of a Strategy?**

The operational characteristics of a transit system often have a bearing on the selection of policing strategies. In some instances, the impact is relatively direct and, in other instances, comparatively indirect. Usually the operational characteristics interact with the environment, ridership, and the nature and extent of transit crime to influence decisions concerning strategy selection.

For example, automatic fare collection effectively reduces robbery and assault of rapid rail transit token/change booth attendants because the need for these attendants has been eliminated. However, automatic fare collection systems have produced several unintended effects: fare evasion (especially in unmanned stations) and counterfeit tickets, tokens or coins. In response, transit police have instituted various forms of covert surveillance such as

stakeouts to catch violators. New York City Transit Authority police currently maintain a 200-man Fare Evasion Unit to deter and apprehend fare evaders. Turnstiles in target areas are temporarily modified to detect slugs and sound an alarm to alert stakeout teams positioned in nearby hiding places.[42]

Similarly, many bus systems employ exact fare to counter robbery. Exact fare for buses was implemented first during the summer of 1968. By mid-1969, 34 cities had instituted similar systems. Exact fare (as well as other security-oriented equipment) was assessed by the Stanford Research Institute and the University of California as part of a study focusing on robberies and assaults of bus drivers. Study findings show that exact fare has achieved its primary intended purpose. A "survey of fifteen properties employing the exact fare plan showed a 98 percent reduction in the number of robberies experienced by the respondents during the initial months of operation."[43] Additional study findings show:[44]

- exact fare does not diminish the problem of assaults on drivers;

- exact fare does not appear to result in displacement in terms of passenger robberies; and

- exact fare is generally accepted by management, drivers and passengers.

The mobility dimension of buses combined with the large number of buses normally in-service at any given time in major metropolitan areas makes continuous police coverage extremely difficult. Consequently, transit police target specific routes for patrolling activities. Crimes occurring on other routes are responded to by district patrols as they are reported.

Decisions concerning system operations such as changes in headway, number of vehicles per train, skipping stops, and closing stations or the entire system for certain hours often impact on police activity.

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[42]Berendt, John, "Turnstile Justice: Nabbing the Slug-Users," New York, February 7, 1977, pp. 39-42.

[43]Reduction of Robberies and Assaults of Bus Drivers, p. 14.

[44]Ibid., p. 7.

To illustrate, BART closes and locks stations on weekends and midnight to 6:00 a.m. during weekdays. When the system is operating, BART police concentrate on both safeguarding passengers and property. However, during down time responsibilities are limited to property protection. The allocation of manpower clearly reflects these shifts in responsibilities. Manpower levels are greatest during weekday business and early evening hours but significantly reduced late at night and on weekends.

As evident, operating characteristics are one of several groups of factors influencing decisions dealing with the deployment of manpower and the selection of specific transit police activities. Findings suggest that operating characteristics can be manipulated to enhance transit police effectiveness in countering crime.

2. Do the Environmental Characteristics of a System Such as Age, Lighting and Visibility Impact on the Selection of a Strategy?

Many researchers and transit police officials feel that the environmental characteristics of a transit system have an influence on opportunities for crime as well as on police response. Further, crime prevention features can be built into the architectural design of transit stations.

Transit police have been able to use many of the architectural features of newer stations to their advantage. In some instances, station design increases the surveillance capabilities of manned patrol and, in other instances, provides an opportunity to install and utilize security and communication devices to supplement manned patrol. For example, heightened visibility permits use of CCTV, which may deter potential offenders and increase surveillance capabilities, thereby reducing the need for frequent preventive patrol.

A recent study of transit security and crime prevention through physical planning makes a number of suggestions on how environmental characteristics can be used to improve crime prevention:[45]

> The physical strategies of prevention are achieved
> by: providing physical barriers which preclude
> the commission of a crime; prolonging the time

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[45]Southern Califronia Association of Governments, Transit Safety and Security A Design Framework, April 1976, p. 85.

required for the criminal act, thereby increasing
the probability of detection and apprehension by
law enforcement agencies; increasing the visibility
and pedestrian traffic and therefore, observation
by police and citizens. Crime prevention through
physical planning also helps to deter crimes and
improve the effectiveness of police operations by
maximizing patrol observation and reducing response
times. Similarly, site planning and architectural
design can increase or maintain a flow of traffic
and/or visual observation, thereby deterring or
minimizing the commission of crimes.

Some systems provide large parking lots for the use of passengers.
The design, location and method of operation of these lots may also
impact on the nature and extent of the crime problem and police
responses. Parking lots that are wide-open and unattended, with cars
left for 10 to 12 hours, may require periodic police surveillance
such as stakeout or undercover activity to control auto-related
crimes.

The environmental characteristics of bus systems generally are
indistinguishable from the street environment. Therefore, it is rea-
sonable to assume that policing strategies directed to controlling
street crime are equally applicable to crimes committed at designated
bus stops. In fact, bus stops are normally incorporated into the
patrol patterns of district-level police.

C. Relationship Between Various Policing Strategies and Transit Crime

1. How Effective are the Various Strategies?

Police use a number of overt and covert patrol activities to
counter crime in transit systems. Strategies include:

- Fixed posts: (assignment of patrol officers to a given
  station).

- Riding posts: (train patrol).

- Mobile, random patrol: (coverage of multiple stations).

- K-9 teams: (patrolman - dog team).

- Saturation patrol: (substantial increase in manpower at a
  given location to maximize visibility).

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- Decoys: (officers posing as potential crime victims).

- Stakeouts: (covert surveillance).

Fixed posts, riding posts and mobile patrol are the most frequently
employed strategies. Only two systems (PATCO and SEPTA) use K-9
teams. Saturation patrol, decoys and stakeouts are instituted as
responses to specific problems such as a series of robberies exhibiting
a similar pattern or fare evasion.

In the course of normal transit policing operations, several
strategies are employed simultaneously. This makes evaluation of
specific strategies difficult and compounds problems concerning
attribution of outcomes to activities. To date, few evaluations have
been performed for specific strategies and those that have mainly focus
on the impact of saturation patrol on crime levels and citizen percep-
tions of security in urban mass transit systems. Fixed posts, riding
posts, random patrol and K-9 teams have not been evaluated. Similarly,
little research has been directed toward assessing stakeout and decoy
activities. The lack of documented evidence does not imply that the
strategies are ineffective.

While it is generally accepted that policing reduces or controls
crime, few studies have been conducted that clearly demonstrate the
effectiveness of various patrol strategies in terms of reduced crime
levels. There are several studies on the affect of transit policing
on crime that conclude that various strategies might reduce crime
for a short time interval.

A study of the Chicago system during 1971 and 1972 shows the
visible patrol deters crime.[46] However, the deterrent effect may be
limited to the areas where the patrols were deployed since "Officers
temporarily present in mezzanine or turnstile areas may be totally
unaware of crimes occurring out of their view on platforms or stair-
wells."[47] This study also observes that riding posts had little
impact on the crime level on problem routes.[48]

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[46] Improvement of Mass Transit Security in Chicago, pp. xxxi, 204-205.

[47] Ibid., p. 205.

[48] Ibid., p. 204.

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The Philadelphia Police Department received a one million dollar grant from The Law Enforcement Assistance Administration in 1973 to expand its transit unit. The size of the unit was increased from 165 to 195 plainclothes and regular patrol officers and the number of K-9 teams in the unit was more than doubled from 20 teams to 50 K-9 teams. The police department anticipated that the increase in manpower would:[49]

- reduce the incidence of Part I and Part II crimes on the public transit system;

- increase the clearance rates of crimes that do occur; and

- reduce citizens' fear of being involved in a criminal incident when using the system.

An evaluation[50] of the program showed that the crime reduction goal was not achieved. Part I crimes increased by 1.5 percent and Part II crimes by 154 percent for comparable time frames (April through September 30) during 1973 and 1974. A pre-test/post-test questionnaire of transit users and non-users showed that:

- more people felt crime in the subway had increased;

- more people felt unsafe; and

- more people (a very small increase) said they saw police while using the system.

The effectiveness of the program in relation to clearance rates was not addressed by the evaluation report. The evaluation has several serious methodological problems. First, no firm statistical base exist upon which to draw comparisons. It is conceivable that some percentage of crimes are either unreported or reported to authorities other than the transit unit. Second, the number of crimes reported

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[49]Reagon, Michael, V., et al., Final Report, Public Transit Crime Reduction Program Philadelphia Police Department, prepared for Governor's Justice Commission, Evaluation Management Unit, January 1975.

[50]Final Report, Public Transit Crime Reduction Program Philadelphia Police Department.

during the evaluation period could be an artifact of increased police presence. In this situation possible reduction in the actual number of incidents could have been obfuscated by increases in reporting. Third, the method of selecting a sample ("judgement random") for the survey part of the study is not sufficiently explained. Details provided by the text of the Philadelphia study suggest inherent biases concerning the representativeness of the sample. Fourth, the statistical analysis is incomplete. There is no attempt to control responses by mode, test levels of association, or determine if before-and-after differences are significant.

Two other studies also examine the effectiveness of increased police visibility to deter potential criminals and control crime. During the 1960's, the Chicago Police implemented two projects designed to increase surveillance and visibility. One project created riding posts on subway/elevated lines, while another project deployed uniformed patrolmen in marked cars to periodically stop buses and check with drivers. The Chicago Police Department reported a decrease in robberies, but due to other demands on police manpower, both projects were short lived. An assessment of these projects, as part of a much larger research effort focusing primarily on assaults and robberies of bus drivers, concluded that police surveillance strategies are costly. Further, such approaches to deter transit crime "can...probably only be considered practical for short periods of time in concentrated programs."[51]

A study of the New York subway system from the mid-1960's through the early 1970's focused on the impact of police activity--primarily saturation patrol--on transit-related robberies. The evaluation concluded that saturation patrol of the subway system led to a reduction in felonies during the times of intensive deployment, although the magnitude was not established.[52]

Saturation patrol also has been employed by the Chicago Police Department's Transit Unit. "Operation Saturation," inaugurated December 26, 1974, flooded the subway system with police; the net

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[51]Reduction of Robberies and Assaults of Bus Drivers--Volume I: Summary and Conclusions, p. 8, 24-25.

[52]The Impact of Police Activity on Crime: Robberies on the New York City Subway System, p. 63.

effect was that arrests during an eight-and-one-half month period rose from 16,000 to 29,000, robberies declined by 52 percent, and major crimes were down 26 percent.[53]

With regard to covert operations, transit police officials consider stakeout operations effective, especially when implemented to target specific crimes such as pocket-picking and fare evasion. Decoy operations also are credited as being successful. The New York City Transit Authority Police Department reports that its decoy squad, implemented during the fall of 1975, "made more than 250 arrests, mainly for felonies such as assaults and robberies," during its first three months of operation. According to the Department's Chief, "the decoys have been a significant factor in the 13 percent decline in serious crime in the subways" during 1975.[54] Some transit police chiefs are quick to point out that this tactic may encounter the legal issue of entrapment possibly resulting in the dismissal of charges against defendants by courts.

In addition to traditional patrol activities, transit police often engage in other support activities. These activities are directed primarily toward controlling crime through prevention and include:

- community relations;

- liaison with schools, courts, and local police/transit authority; and,

- courses on inter-personal relations for drivers.

In many cases, several support activities are used concurrently, frequently in conjunction with patrol oriented activities. The following examples illustrate the type and range of support activities currently employed by transit police.

Community liaisons is one component of MARTA's (Atlanta) overall approach to controlling transit crime. Liaison officers set up

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[53] Planning Division, Metropolitan Atlanta Rapid Transit Authority (MARTA) Proceedings of the MARTA Security Seminar, October 9-10, 1975, p. 3. Also see: Porep, Ronald E., "Chicago Police Cut Crime 52% on Public Train Service," Police Times, May 1975.

[54] Treaster, Joseph B., "Police Decoy-Victim Strategy Takes To Subways," New York Times, January 7, 1976, p. 48.

community meetings in response to trouble in a specific section of the city. At these meetings they emphasize the vital service provided to members of the community by MARTA and the impracticability of maintaining this service if trouble continues.

In the PATCO (Camden/Philadelphia) system, police conduct a two-prong community relations effort: K-9 demonstrations and talks to school children. During 1975 the department gave 11 K-9 demonstrations and the Captain gave 37 talks in 32 schools.

Continuous liaisons with the schools is an essential part of the MTA's (Baltimore) effort to counter crime. School security personnel cooperate by identifying both the problems and the sources. Once individual trouble-makers are identified, they are counseled by security force personnel and school officials. Additionally, the MTA security force, in conjunction with the schools, runs a bus safety project. Two police officers and a route supervisor give a one-half hour presentation on bus operations to all sixth graders. The presentation, rather than emphasizing a large number of "Don'ts," focuses on the services provided by the system and how the system works.

To counter incidents of vandalism and disorderly conduct associated primarily with teenagers using buses to travel to and from school, SCRDT (Los Angeles) and the public schools have implemented two basic anti-crime strategies. First, teachers ride school-hour buses on an intermittent basis. Their familarity with students, according to the chief of the security department, has an inhibiting effect. Second, SCRTD maintains a two-man school team. These men interface with school officials, present lectures to students, and get to know the "trouble-makers." Operation Teamwork, inaugurated in April 1975, is an offshoot of the lecture series. Developed for fifth and sixth grader the program consists of a film staring two members of the Los Ang es Rams. The film, about 15 minutes long, provides an overview of SCRTD operations and compares various aspects with similar actions on a football team. When available the football players attend the movie, follow with their own short presentation, and answer questions.

The MBTA (Boston) police also offer an education program. Aimed specifically at discouraging vandalism among grade school children, the program utilizes coloring books coupled with classroom instruction to teach students details of the MBTA and the problems involved in dealing with crime.

In addition to its community relations effort, MARTA maintains close liaison with the schools and courts. Their court program focuses on aggressive prosecution. MARTA prosecutes every case having a witness and ensures the court that bus operators will testify. In the case of vandalism, parents are notified and presented with the option of making restitution within a certain number of days. If restitution is not made, MARTA proceeds to petition the court. Moreover, MARTA offers a $500 reward for information leading to the prosecution and conviction of persons assaulting either passengers or drivers.

Finally, both MARTA and SCRTD require bus drivers to take courses on inter-personal relations specially designed to reduce driver provoked incidents. The courses utilize sensitivity training, stress the importance of being courteous, and emphasize avoiding confrontations.

Transit police generally believe that support activities are effective and help control transit-related crime. However, the various activities have not been evaluated; hence, very little is known about their actual impact on transit crime and security.

### 2. Are Proactive Strategies More or Less Effective Than Reactive Strategies?

Transit police units usually take a proactive approach to controlling crime. Practically all the manpower in a given unit are assigned to patrol specific geographic areas via fixed, mobile, or riding posts. At times, units employ covert proactive strategies such as decoys and stakeouts. However, as the previous discussion suggests, relatively little hard data have been generated and validated under controlled conditions to demonstrate the effectiveness of various policing activities, especially within the transit environment.

The Kansas City study of preventive patrol[55] is perhaps the most ambitious attempt to date to assess the effectiveness of proactive and reactive police patrol. The study specifically examines the deterrent effects of uniformed officers patrolling in marked cars. The experimental design divided the study area into proactive, reactive and control beats. After assessing the data, collected from October 1, 1972 through September 30, 1973, the evaluators concluded "that decreasing or increasing preventive patrol within the range tested in this experiment had no effect on crime, citizen fear

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[55]Kelling, George, Tony Pate, Duane Dieckman, and Charles E. Brown, The Kansas City Preventive Patrol Experiment A Summary Report, Police Foundation, 1974.

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of crime, community attitudes toward the police on the delivery of police service, police response time, or traffic accidents."[56] The findings indicate that visible motorized patrol as a general crime control strategy fares no better or worse than providing rapid response capabilities to the occurrence of crime.

It is not clear whether the findings from the Kansas City experiment are applicable to transit environments and especially subway/elevated lines for several reasons. First, the primary mode of preventive patrol on transit systems is foot patrol. Second, crime seems to be concentrated in well defined segments of the transit system. Third, establishing patrol posts at high crime stations or on trains might well serve the multiple purposes of providing police presence, facilitating crime reporting and reducing response time. Authors of the Chicago study state that traditional police patrol has limited deterrent effect and argue that good response capability would be less costly and perhaps more effective. For transit-related crimes, quick response (five minutes or less) led to apprehensions in over 60 percent of the cases.[57] However, response time is a function of a number of factors including headway, passenger density, communications, location of offense relative to location of the responding officers, size of the transit system, number of patrol officers and so on. Any combination of these factors in a given transit system may limit the effectiveness of reactive strategies based on a quick response capability. For example, it may not be feasible for transit units with few officers to employ a reactive strategy. If the officers were located in some central point, they would be unable to respond quickly to calls for service originating at distant points of the system. However, it may be advantageous for larger transit units to experiment, integrating proactive and reactive approaches.

### 3. Does a Combination of Strategies Produce An Optimal Mix For Deterring and Preventing Transit Crime?

Knowledge concerning the effectiveness of individual policing strategies in a transit environment is limited, at best. To date, few evaluations have been performed and those that have, with several exceptions, lack rigorous methodological controls. Case studies and longitudinal studies predominate, relying primarily on reported crime and/or crime rates and secondarily on citizen perceptions to assess effectiveness. The research designs do not control for many

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[56]The Kansas City Preventive Patrol Experiment A Summary Report, p.16.

[57]Improvement of Mass Transit Security in Chicago, pp.202-206.

threats to validity and the data sources contain measurement errors.
Confidence in the conclusions, presented in the evaluations, is there-
fore often muted.

Additionally, measuring deterrent and/or preventive effects of
police activities is problematic. Simple before-after comparisons
are not designed to tap events that did not happen. Comparisons of
reported crime (or crime rates) with projections based on past trends
often do not account for exogenous factors or the interaction of
previous treatments with the current experimental intervention.

Typical problems associated with attribution of outcomes to
activities also are apparent. They are magnified when a number of
policing strategies are employed concurrently. This is because "most
research designs are incapable of separating the conceptually distin-
guisable crime control effects and attributing them to a particular
activity."[58]

Because of these problems, it is very difficult, with the
available information, to determine what mix of strategies would
have an optimal effect on deterring and preventing transit crime.
This is compounded by the very real possibility that combinations of
strategies may have differential effects on various crimes with one
mix of strategies having greatest impact on vandalism and another
mix on robbery.

### 4. Do the Strategies Actually Reduce Crime or Do They Reduce The Rate of Increase?

Information culled from the literature and gathered during site
visits suggests that some policing activities may have deterrent
effects. What is unclear is the magnitude of the effect; i.e., to
what extent crime rates are affected by anti-crime measures. (It is
known that many socio-economic variables may also impact on crime,
but it often is difficult to take these factors into account during
the course of evaluation. Nonetheless, their potential influence
should be recognized when attempts are made to attribute changes in
crime to specific policing strategies.

Only one research effort has thus far addressed the specific
question of the impact of policing strategies on the magnitude of

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[58]What's Known About Deterrent Effects of Police Activities,
p. 4.

crime. The particular study examines the impact of a large increase
of police officers, from 1219 to over 3100 men, on subway/elevated
crime in New York City.[59] Using an interrupted time series design,
the authors observed that the substantial increase in manpower did
have an impact on crime.

> The primary finding was that the number of reported
> subway felonies and misdemeanors decreased numeri-
> cally immediately after the manning change and
> remained approximately constant for two years.
> Thereafter, they increased at about the same
> annual rate of increase as prior to the manning
> change. Reported subway robberies, which accounted
> for about 20 percent of the felonies, decreased
> numerically at the time of the manning change,
> but their annual rate of increase was unchecked,
> remaining approximately constant for a period of
> seven years.[60]

Since publication of the original report,[61] the accuracy of the
data has been questioned. Chaiken recently re-evaluated the data
and concluded "that there was a crime decrease, but its magnitude has
been disguised."[62]

Available data thus suggest that a specific strategy consisting
of a substantial increase of manpower can affect crime levels, at
least for a short period of time. However, the effect of other police
activities, including magnitude and duration of impact, remains the
subject of further research endeavors.

### 5. Do The Strategies Produce Displacement and If So, How Much?

The focus of some police activities may inhibit potential offenders
from committing crimes at certain times or places. The displacement

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[59]The Impact of Police Activity on Crime: Robberies on the New York
City Subway System.

[60]What's Known About Deterrent Effects of Police Activities, p. 16.

[61]The Impact of Police Activity on Crime: Robberies on the New York
City Subway System.

[62]What's Known About Deterrent Effects of Police Activities, p. 17.

of crime to other times or locations is often hard to detect, however. Without a specific hypothesis, it may be difficult to discern where or when displacement occurs.[63] Further, it may be hard to determine the extent of displacement in jurisdictions where the number of transit crimes is small in comparison to the number of crimes committed against a suitable control area.[64]

An assessment of two strategies employed by the Chicago Police suggests that riding posts on subway/elevated lines and uniformed patrolmen in marked cars periodically stopping buses and checking with drivers resulted in some apparent displacement.[65] The New York City study, which examined the impact of a large increase in police (from 1219 to over 3100 officers), also addressed the possibility of displacement. In light of some questions concerning the accuracy of the data, Chaiken re-interpreted the original report's findings. He concluded that "an apparent displacement of nighttime to daytime robberies was observed...as an effect of the added manpower at night."[66]

D. Impact of Mechanical and Electronic Security and Communication Devices on the Effectiveness of Transit Policing

1. How Effective Are the Various Mechanical and Electronic Security and Communication Devices?

Increasingly, transit police have turned to mechanical and electronic support capabilities to counter crime and improve the effectiveness of manned patrol. Some devices; for example, bullet-proof token booth enclosures and protective shields for bus drivers, seek to prevent crime by hardening the environment. Other devices such as 2-way radios, silent alarms, emergency telephones, closed-circuit television (CCTV), and helicopters are used to aid detection and apprehension by means of surveillance, recording evidence of a crime,

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[63]What's Known About Deterrent Effects of Police Activities, p. 7.

[64]Security of Patrons on Urban Public Transportation Systems, p. 11.

[65]Reduction of Robberies and Assaults of Bus Drivers - Volume I: Summary and Conclusions, pp. 24-25.

[66]What's Known About the Deterrent Effects on Police Activity, pp. 17-18.

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or facilitating crime reporting and police response. Electronic surveillance such as CCTV as well as alarms may also produce deterrence if potential offenders are aware of their presence.

Frequently, these mechanical and electronic devices are used for purposes unrelated to security. For example, BART uses CCTV primarily to monitor elevators for the handicapped and only incidently for security. Similarly, PATCO employs CCTV, a public address system, and direct-line emergency telephone to lend assistance to patrons having problems with the automatic fare collection system as well as monitor, deter and apprehend fare evaders. Communication devices have been installed for a variety of reasons including security against robberies and assaults. Other equally important reasons are to answer riders' questions and to provide a means for passengers to "obtain emergency assistance in the case of accidents and breakdowns."[67] Decisions concerning the purchase and implementation of equipment are usually made by top management of the operational side of the transit companies. Reasons unrelated to policing often are given as much weight as potential security-related benefits.

Target hardening devices such as protective shields for drivers and bullet-proof token booth enclosures have not been evaluated in terms of effectiveness. Research in this area has only addressed the relative acceptability of various equipment by transit management and employees.

Other research has focused on devices intended to increase surveillance and/or response time capabilities.

Most major bus systems are equipped with 2-way radios. As a countermeasure, 2-way radios seem to impact on general disturbances usually created by groups of teenagers, but have little effect on robbery or assault. Bus drivers often are warned by robbers against using 2-way radios, thereby reducing their effectiveness. "As a crime countermeasure, there is no available evidence to indicate that installation of 2-way radios has resulted in major reductions of robbery or has had significant effects on tracing or apprehension of the offenders."[68] Nevertheless, drivers support the use of the 2-way radio by citing its benefits in reducing feelings of "aloneness" and increasing feelings of security.

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[67]Reduction of Robberies and Assaults of Bus Drivers, p. 35.

[68]Ibid., p. 36.

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The use of silent alarms as a security device began to spread among bus systems during the early 1970's. Evaluative findings generally suggest that silent alarms do not, by themselves, have a significant impact on transit crime. Most offenders escape before police arrive in response to an alarm. "Of 73 holdups in five cities in which alarms were sounded, only three resulted in on-site captures."[69] Further, about 90 to 95 percent of the alarms are false. This high rate of false alarms often discourages police cooperation. In Atlanta, MARTA officials are attempting to counter the false alarm problem by implementing a nonverbal call back verification between bus drivers and the communication center.

Transit police universally use personal portable 2-way radios (walkie talkies) to maintain constant communication between officers in the field and headquarters. With the transit police force distributed throughout the system, this communication link is essential for coordination and control. It is also expected that better communication will improve response time. An evaluation of a demonstration project conducted in New York during the mid-1960's concluded that "message delay...was reduced 99 percent to fractions of a second."[70] However, impact on crime was much less clear:[71]

> Because of the large increase in police coverage
> in April, 1965 on all lines from 8 P.M. to 4 A.M.,
> as part of the City's anti-crime program (...), the
> ratio of arrests to crimes reported in these hours
> rose 95%. However, a percentage improvement of
> 8 percent in the remaining 16 hours of the day was
> also noted, and this is more likely due to the
> radio.

Later the report reverses its stance stating that "the improvement of 8 percent in the test area may be due however to the relatively greater coverage, rather than to the radio."[72]

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[69] Reduction of Robberies and Assaults of Bus Drivers, p. 23.

[70] New York City Transit Authority, Two-way Radio Communication Mass Transportation Demonstration Project, p. 3.

[71] Two-Way Radio Communication Mass Transportation Demonstration Project, pp. 2-3.

[72] Ibid., p. 79.

Rapid rail systems make extensive use of telephones. They are placed on trains (in the operator's booth), in station attendants' booths, in station lobbies and on station platforms. Intended to facilitate communication in emergency situations, telephones usually are linked directly to transit police or transit communication centers. While telephones have not been evaluated in terms of their effectiveness in reducing crime, transit police cite two major problems with telephones accessible to the public:

- vandals ripping the telephone out of the walls; and

- persons purposely taking the receivers off the hook or forgetting to hangup after using the telephones.

Both of these problems impact on potential effectiveness. As a consequence, telephone systems are now incorporating anti-vandalism features and automatic locator and hangup capabilities.

CCTV is the most elaborate electronic security device used to counter crime in transit systems. Operational in several rapid rail systems, CCTV is currently being installed on an experimental basis on two other subway/elevated lines. CCTV systems often are designed to integrate with other security devices such as public address systems, alarms, telephones and videotaping capabilities. (The latter may provide valuable evidence aiding investigation leading to apprehension).

To date CCTV has not been evaluated to determine its impact on transit-related crime. Despite its advanced technological capabilities, experience with CCTV in both transit and non-transit environments suggest several potential problems:[73]

> Disadvantages to the CCTV system are that it requires
> constant monitoring, which can be costly, depending
> on the design and coverage of the system, it is
> subject to vandalism, and it may be impractical to
> install in locations which are not easily covered
> visually from a few fixed locations, such as old
> transit stations which have numerous hiding places
> not covered by cameras.

Additionally, constant surveillance, especially of a centrally located bank of TV screens, can lead to monitor fatigue. While some of these problems may be readily amenable to solution, others may be difficult to solve.

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[73] Security of Patrons on Urban Public Transportation Systems, pp. 27-28.

Other devices designed to augment manned patrol include:

- equipping buses with four-way flashers; and

- painting numbers on top of buses permitting surveillance by helicopter patrols.

Some transit police believe the above two strategies may aid manned patrol to counter transit-related crime; however, evaluations have not been conducted.

### 2. Do Security Devices Reduce Response Time Sufficiently to Impact on Police Effectiveness?

Police use a variety of communication and surveillance equipment intended to improve detection and response capabilities. Study findings suggest a fairly strong association between response time and apprehension/conviction rates. Analysis of response time to transit-related crime by the Chicago police indicates apprehensions in over 60 percent of the cases where response time was five minutes or less.[74] Other studies reveal "that police solve two-thirds of the crimes they respond to in less than 2 minutes, but only one out of five when the response time is 5 minutes or longer."[75]

Response time is generally measured in terms of time elapsed from receipt of call by police until an officer arrives at the scene of the crime. In a transit environment, response time is a function of a number of factors including headway, passenger density, communications, location of crime relative to location of responding officers, size of transit system, number of patrol officers and so on. This does not take into account call time, i.e., time elapsed from the occurrence of the crime to receipt of the call. In this context, call time is primarily a function of citizen delay in initiating calls (especially in the case of alarms and telephones but less so for CCTV) and the number of links between the caller and police. In some systems the call may have to go through four or five intermediate points; for example, from victim to station attendant to transit authority communication center to police communication center to transit police. Figure 3 shows the communication linkages between the victim and police existing during the early 1970's in Chicago.

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[74]Improvement of Mass Transit Security in Chicago, p. 202.

[75]National Advisory Commission on Criminal Justice Standards and Goals, Police, 1973, p. 193.

WEAK LINK

STRONG LINK

VERY SELDOM USED

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*FROM IMPROVEMENT OF MASS TRANSIT SECURITY IN CHICAGO, p. 202.

FIGURE 3
EXISTING CHICAGO CRIME COMMUNICATION AND RESPONSE SYSTEM*

The relationship between call time and apprehension has not been examined in a transit environment. Nevertheless, data concerning response time suggest that a decrease in call time will lead to an increase in apprehensions. This may be brought about by either shortening citizen mobilization (time elapsed between occurrence of crime and initiation of citizen call to police) or improving linkages between citizens and police. Decreasing citizen mobilization time may be extremely difficult, especially in cases like assault where the victim may be dazed or injured and unable to immediately call for police assistance.

It is intuitively evident that security and communication devices generally improve police response, shortening the delay between the occurrence of a crime and police arrival on the scene. However, it is unclear as to the actual impact of the various devices on either call or response time and whether the impact is significant in terms of police effectiveness in controlling transit-related crime.

E. Effectiveness of Different Types of Policing Units

1. Is There a Need for a Dedicated Transit Police Unit?

Need may be defined in terms of the scope of the transit crime problems and the special characteristics of transit systems that differentiate them from other areas covered by police patrols.

In jurisdictions where transit crime problems are serious and persistent, a dedicated unit can provide continuous patrol-type coverage not often afforded by non-dedicated units faced with other crime-related priorities.[76] This is true whether the transit system is comprised of buses, subway/elevated lines or both. To what extent this continuity of service and sole responsibility of patrolling the system lead to more effective crime control on transit systems has not been evaluated, however,

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[76]Arthur Young and Co., A Report on the Requirement for Establishing a Metro Security Program, Washington, D. C., December 1972. Also see: Comparative Evaluation of Public Safety Services in Selected Metropolitan Areas with Rapid Transit Systems, Department of Public Safety, Metropolitan Washington Council of Governments, February 1973. Also see: Proceedings of the MARTA Security Seminar, Planning Division, Metropolitan Atlanta Rapid Transit Authority (MARTA), October 9-10, 1975.

The advantages of a dedicated unit are further amplified in conjunction with rapid rail lines. A number of system characteristics such as the following complicate the performance of police functions.

● isolation of the system from the rest of the community;

● rush-hour crowding;

● high personal mobility for both offenders and victims;

● hazards associated with high-speed vehicles, tunnels, and third rails;

● possible calls to provide emergency assistance to large numbers of victims; and

● difficulties involved with enforcing the law on systems that cross political boundaries.

These complications appear to call for specialization via training and continuous on-the-job experience normally associated with dedicated units.

Within this context and in light of the decisions by half-a-dozen or so cities in the United States to commence building rapid rail system during the next several years, future research concerning dedicated transit police units should focus on questions dealing with:

● the number of officers needed to safeguard systems of various dimensions;

● the most appropriate organizational structure, especially in light of other duties, such as revenue protection, often assigned to transit police units;

● the type and length of training needed both to police the system and provide emergency services associated with possible fires, train wrecks and other disasters;

● the scope of authority necessary for the dedicated units to properly and effectively perform their job; and

● the coordination between dedicated transit police, especially those under management of a transit authority, and local city police.

## 2. Should Policing of the System be the Responsibility of the Transit Company or the Local Police?

A number of factors including politics, economics, historical precedent and jurisdictional boundaries must be taken into consideration when addressing this issue. Thrasher and Schnell provide perhaps the most succinct overview:

> A system that contemplates maintaining its own security force must be prepared to allocate relatively sizable funds for the purpose. The advantages of having one's own special police force should be compared with other alternatives such as hiring off-duty policemen for occasional seasonal employment to contracting with local police to provide certain services. It seems advisable to organize a separate, specialized transit police force only in the largest companies and then only when demand for security services clearly exceeds capabilities of local police forces: when the company operates in different government jurisdictions and the crime problem is serious.[77]

The need for a transit authority police force becomes greatest when a transit system serves multiple jurisdictions. An inter-jurisdictional mandate provides continuity between political boundaries. Further, it may defuse or circumvent potential rivalries between neighboring city- or county-level police departments. This is often of paramount importance, especially where transit systems cross major political boundaries; for example, the Washington Metropolitan Area Transit Authority (WMATA) is equivalent to a tri-state system, the Port Authority Trans-Hudson (PATH) and the Port Authority Transit Corporation of Pennsylvania and New Jersey (PATCO) are bi-state systems, the Massachusetts Bay Transportation Authority (MBTA) provides service to Boston and 78 surrounding communities and the San Francisco Bay Area Rapid Transit District (BART) traverses four counties including Alameda (Oakland) and San Francisco.

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[77] Thrasher, Edward J. and John B. Schnell, "Summary Report on Vandalism and Passenger Security in the Transit Industry," Crime and Vandalism in Public Transportation, Transportation Research Board, No. 487, 1974, pp. 52-53.

When transit systems operate within a single jurisdiction, local police usually prefer to provide passenger security services. Historical precedent and city ownership of a large portion of the subway/elevated facilities in Philadelphia provide the basis for the city police department to be responsible for policing the Southeastern Pennsylvania Transit Authority (SEPTA). In San Francisco, the city police contend that the most effective and efficient way to control crime in the streets and on the transit system is via a unified police force. They maintain a special transit unit to protect Municipal Railway (MUNI) passengers and are strongly against MUNI inaugurating and operating an in-house transit police unit consisting of sworn personnel. The San Francisco police stance also carries over to BART facilities. For those BART stations located in San Francisco, BART and the San Francisco police share responsibility for protecting patrons and safeguarding property. The BART police handle the area inside the entrance/exit fare gates and the San Francisco police cover the free area as part of their routine patrol beat.

The situation is much less clear-cut for systems such as the Chicago Transit Authority (CTA), the Mass Transit Administration-- Baltimore (MTA), and the Southern California Rapid Transit District (SCRTD) serving large metropolitan areas encompassing several counties. On the one hand, MTA maintains an in-house police unit consisting of sworn personnel while, on the other hand, the CTA and SCRTD depend on city police to control crime problems.

If the city police are vested with the responsibility to protect the transit system, safeguards should be built into the arrangements to insure adequate coverage. During the 1960's, several police department transit units were understaffed and given low priority, gaining a negative reputation as the last stop for malcontents and less able personnel. Recent public pressure, resulting from increased concern over transit-related crime, has led to a re-ordering of police departments' priorities and an upgrading of the transit units.

In jurisdictions where the city police operate transit units, transit companies usually maintain parallel liaison units. These units provide a regular channel for coordination between the police and transit authority. Often, liaison units also are charged with safeguarding revenue, protecting company property, providing assistance in the event of an accident, fire, or other emergence, and maintaining contact with the surrounding community, schools, courts, and media.

CONTINUED

1 OF 2

F.  Impact of Various Policing Strategies on Passenger Perceptions
    of Security

    1.  Which Police Strategies/Security Measures Increase
        Passenger Perceptions of Security?

    There is a general belief that selected police strategies and/or
security measures can influence positively the public's perception of
security in mass transit systems.  Perhaps the best method for deter-
mining which strategies are most likely to bolster passenger confidence
in mass transit systems is the public attitude survey.  The results
of surveys treating this subject suggest that more police patrol of
stations and on trains would achieve the greatest positive impact
on passenger perceptions of security in urban mass transit systems.

    One fairly recent survey concluded that the presence of additional
police on trains and at stations gave passengers at least "a sense of
feeling safer."[78]  In another survey,[79] looking at personal security
on the mass transit system in Chicago, more definitive conclusions
appear to have been reached.  The survey instrument, containing a list
of eight items, focused on improvements that could bolster public con-
fidence in the security of the system.  The list of eight items and
their mean ranks are presented in Table IV.  Here, too, the most
important factors for achieving the desired improvements in security
levels had to do with increases in the number of police at stations
and on transit vehicles.  The next most desired improvements (Items 3
and 4) were related to the initiation of a communications network
and an alarm system on vehicles and at stations.  Items 5-8 are all
related to characteristics of the station and of the riding stock,
with increased passenger density per car being the lowest ranking
item.  A caution, noted by the research team as well, is in order
when making use of these results.  Comments made by passengers
returning the survey instrument reflected a strong recognition on the
respondents' part that security was the focus of the questionnaire
and this may very well have biased the results and altered the degree
to which people perceived security.

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[78] Transportation Research Board, National Research Council, Newsline,
Current Research in Public Transportation Development, Vol. 2,
No. 7, August 1976.

[79] Ferrari, Neal D. and Michael F. Trentacoste, "Personal Security
on Public Transit," Transportation Research Forum, 15th Annual
Meeting, 1974, pp. 214-223.

TABLE IV

RANKING OF IMPROVEMENT ITEMS

| RANK | IMPROVEMENT ITEM | MEAN RANK |
|------|------------------|-----------|
| 1 | INCREASE THE NUMBER OF POLICE AT STATIONS | 3.15 |
| 2 | INCREASE THE NUMBER OF POLICE ON THE VEHICLES | 3.24 |
| 3 | INITIATE A COMMUNICATION NETWORK | 3.29 |
| 4 | INITIATE AN ALARM SYSTEM | 3.62 |
| 5 | IMPROVE THE STATION AND SYSTEM LIGHTING | 4.31 |
| 6 | INCREASE THE FREQUENCY OF CARS | 4.52 |
| 7 | IMPROVE THE NEIGHBORHOOD SURROUNDING THE STATIONS | 4.72 |
| 8 | INCREASE THE PASSENGERS PER CAR BY REDUCING THE NUMBER OF CARS PER TRAIN | 5.91 |

SOURCE:  "PERSONAL SECURITY ON PUBLIC TRANSIT," p. 221.

Yet a third study[80] of public attitudes found that survey respondents equated a heightened sense of security with sizable increases in police patrols at stations and on trains. The study also concluded that the central theme underlying passenger perceptions of security is the assurance that police assistance can be obtained rapidly. Most survey respondents believed that the best hope for increasing passenger confidence in the level of security lay in "the deployment of more police (including K-9 patrols) to the station platforms and on trains or in the knowledge that quick assistance could be obtained in any emergency."[81] Thus, any public transit system which could convince its ridership that its police force responds rapidly is likely to increase the level of confidence in its system.

Table V is extracted from a fairly extensive survey[82] of passenger choices for improvements in mass transit. These are expressed in terms of ranking proposed security features in terms of perceived security. A full-time security guard received the highest mean rating, followed by a platform-level alarm system, with the third highest rating being accorded closed-circuit television monitoring of the platform area. As in the case of the survey items listed in Table IV above, passenger density per area was the variable viewed as adding the least to overall passenger perception of safety.

In sum, those strategies which appear to most bolster passenger confidence in mass transit systems are sizable increases in police patrol of stations and on vehicles and the implementation of communication capabilities to ensure rapid response by security or police personnel when assistance is needed.

## 2. Do Passenger Perceptions Influence Ridership Behavior?

Research exploring the relationship between passenger perceptions and ridership behavior present conflicting conclusions. Studies in

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[80] Shellow, Robert, James P. Romualdi and Eugene W. Bartel, "Crime in Rapid Transit Systems: An Analysis and a Recommended Security and Surveillance System," Crime and Vandalism in Public Transportation, Transportation Research Board, No. 487, 1974.

[81] "Crime in Rapid Transit Systems: An Analysis and a Recommended Security and Surveillance System," p. 5.

[82] Broad and Columbia Subway Development Study: Final Report, Broad and Colubmia Subway Study Group, Temple University, prepared for U.S. Department of Transportation, Assistant Secretary for Environmental and Urban Systems, August 1971.

TABLE V

MEAN RATINGS OF PERCEIVED PERSONAL SAFETY
FOR PROPOSED SAFETY FEATURES

| ITEM | MEAN |
|---|---|
| 1. FULL-TIME SAFETY GUARD | 4.06 |
| 2. PLATFORM-LEVEL ALARM SYSTEM | 3.74 |
| 3. CLOSED-CIRCUIT TV MONITORING OF PLATFORM AREA | 3.49 |
| 4. ELIMINATION OF HIDDEN CORNERS | 3.27 |
| 5. IMPROVED LIGHTING OF STATION AREA | 3.15 |
| 6. OPEN AIR DESIGN | 3.06 |
| 7. SHORTENING PLATFORM LENGTH | 2.91 |
| 8. ATTRACTING GREATER NUMBER OF PEOPLE TO THE STATION AREA | 2.85 |

SCALE OF 1 TO 5

1 = NO SAFER
2 = SLIGHTLY SAFER
3 = MUCH SAFER
4 = VERY MUCH SAFER
5 = EXTREMELY SAFE

SOURCE: Broad and Columbia Subway Development Study: Final Report.

Chicago, Philadelphia, Washington, D. C., and Cleveland indicate that passengers' ridership patterns are influenced by perceptions of personal security. By contrast, studies in Milwaukee, Baltimore, and Chicago suggest that passenger perceptions of security have minimal, if any, impact on ridership behavior. The reader should be cautioned that these studies contain methodological problems. Competing factors besides crime levels that might explain riders' behavior often were not addressed in the survey. In some cases the sample of respondents was not representative of the population of users or potential users and, in other cases, the questions posed were of dubious validity. The reader also should be cautioned that the various studies utilize different parameters in defining objectives, intervening and outcome variables. Both the methodological problems and research differences vitiate the meaningfulness of the aggregation or comparison of these studies.

The Carnegie-Mellon attitude survey of the Chicago system found "a pervasive lack of public confidence in transit security. Furthermore, this perception of insecurity has significantly affected ridership."[83] The study reported that a large portion of the riding public cited the apparent lack of security as a rationale for not using some or all of the mass transit system. "About one-fifth of those who do not use transit and 16 percent of rapid-transit-only riders cited the lack of security from harassment and crime while riding or waiting for the bus as reasons for not using the bus system."[84] Additionally, 25 percent of non-transit riders and 30 percent of bus-only riders also cited lack of security as their reasons for not riding the El-subway system.

Other effects noted include behavioral changes where individuals tended to avoid the transit system altogether during time periods when crime was perceived as being high. Over 80 percent of all respondents indicated a reluctance to ride the system between 6 p.m. and 6 a.m. and cited personal security as the predominant reason. All but four respondents out of a total sample of 713 stated they would not ride the system after midnight.

In another study of passenger perceptions completed for the Philadelphia system, it was found that 48 percent (2876 out of a

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[83]"Crime in Rapid Transit Systems: An Analysis and A Recommended Security and Surveillance System," p. 3.

[84]Ibid.

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sample of 5904) of the respondents perceived themselves as unsafe when riding the transit system. Significantly, the unsafe responses were appreciably higher for non-users than for users of the system,[85] thus suggesting that passenger perceptions of security influence ridership behavior.

Similarly, findings from a questionnaire survey of riders of one bus route in Washington, D. C. lend further support to the hypothesis that perception of crime and security affects ridership. Approximately "30 percent of the respondents said there are times when they prefer not to ride the bus for reasons of personal security." Many "reported personal experience with rowdyism, robbery, or assault." Further, "more than 40 percent of the passengers who preferred not to take the bus and 13 percent who had no objection to taking the bus thought personal security "on the route was poor."[86]

An internal study conducted by the Cleveland Transit System attempted to determine the effect of a homicide at one of the rapid transit stations on ridership levels. The study concluded that the murder had a negative, short-term impact, but that ridership returned to normal within several weeks.[87]

On the other hand, studies focusing on transit systems in Milwaukee, Baltimore and Chicago (one of several conducted in Chicago) found little or no support for the hypothesis that passenger perceptions of crime adversely influence ridership behavior.

In the case of the Milwaukee study, which focused on riders on one specific bus route, conflicts were found within the data. For example, some findings indicated that considerations of personal security did not affect passenger patronage. However, the data also revealed that riders were more intensely concerned "when they personally witnessed serious rowdyism." Still other data suggested that passenger ridership decisions were strongly influenced by considerations of personal security. The authors of the Milwaukee study rejected this last finding, arguing that it was contradicted by cross-checks, and concluding that "the data developed by the survey did

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[85]Final Report, Public Transit Crime Reduction Program Philadelphia Police Department.

[86]"Studies of Public Attitudes Toward Transit Crime and Vandalism" pp. 30-31.

[87]Ibid.

not confirm the hypothesis that incidents of transit crime and vandalism have a major influence on ridership..."[88]

Essentially, the same conclusion was reached in a case study undertaken in Baltimore[89] to examine if a well publicized criminal incident, an armed robbery of driver and passengers on a city bus, affected ridership levels on that route in the short run. However, methodological problems concerning the accuracy of the data and possible competing hypotheses tend to seriously undermind confidence that may be placed in the study's conclusion.

The third study in this category, a six question survey of passenger attitudes carried out for the Chicago Transit Authority, concluded that personal security is not a major influence on passenger decisions to ride the mass transit system.[90] Once again, methodological shortcomings limit confidence. Only one of the six questions directly dealt with personal security: "There is no reason to be concerned about riding the CTA during the day." Further, the time restriction denoted by "during the day" may have biased responses; many passengers who feel relatively safe using the system during the day may be afraid of riding the system during the nighttime hours solely because of concern for personal security.

In sum, when greater weights are given to those studies employing more methodologically sound data gathering and analyses techniques, it seems reasonable to draw at least the following tentative conclusions regarding passenger perception of security and ridership behavior:

- Transit crime appears to influence passenger perceptions and decisions concerning use of mass transit systems.

- Perceptions seem to vary with volume of crime in the area served by the route, availability of alternative modes of transportation and time of day.

- Perceptions of transit crime are more likely to influence rapid rail than bus riders.

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[88]"Studies of Public Attitudes Toward Transit Crime and Vandalism," pp. 27-28.

[89]Ibid., p. 30.

[90]Ibid., p. 31.

- Negative perceptions of security are sometimes greater for individuals who do not or infrequently use the system; however, all riders' concern for security intensify when they personally are victimized or are witnesses to the victimization of others.

3. Are Passenger Perceptions Accurate in Terms of the Magnitude of Transit Crime?

The general public's perception of the magnitude of transit crime appears to be relatively accurate. Transit users not only make distinctions between the transit environment and streets in terms of crime levels, but also perceive differences within various segments of the systems.

The Carnegie-Mellon/Chicago study found that the public views the transit environment as more hazardous than walking via city streets to and from the transit system.[91] This finding corresponds with research on risk conducted by the American Public Transit Association. Based on a survey of 37 transit properties in the United States, the American Public Transit Association estimated that the relative risk of victimization on transit systems, where average exposure time was assumed to be 15 minutes, was approximately twice as great as on the streets.[92] Chaiken also addresses the question of risk and arrives at a similar conclusion. Using an index based on "crimes per passenger year," he suggests that subways, at least, are more dangerous than the streets.[93]

The Carnegie-Mellon[94] and the Ferrari/Trentacoste[95] studies of the impact of crime on passenger perceptions found that substantial variations in perceptions exist among the sub-groups of transit users. Both surveys indicate that "the highest levels of perceived crime come

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[91]Improvement of Mass Transit Security in Chicago, p. 189.

[92]Vandalism on Urban Mass Transit Systems in the United States and Canada, pp. III-i to III-36.

[93]Security of Patrons on Urban Public Transportation Systems, pp. 51-53.

[94]Improvement of Mass Transit Security in Chicago, pp. 185-194.

[95]"Personal Security on Public Transit," pp. 214-223.

from lower income, black and the older aged segments of our society,"
However, the "higher income, white segment cite security more often
as the reason they do not ride public transit."[96]  One explanation for
this situation has to do with degree of choice.  The former group is
comprised largely of persons who tend to be either more likely users
or captives of the system.  Since they ride more frequently, they are
more often exposed to crime, thereby heightening their levels of con-
cern about the magnitude of crime within the system.

Another area where perceptions of crime appear to be reasonably
accurate relates to crime differences between modes of transportation
(i.e., bus vs. rapid rail).  The Chicago surveys found that an over-
whelming majority of respondents sampled perceived the rapid rail
system as less safe than the bus system.  The surveys asked respon-
dents directly which mode of transportation they considered most
safe and 70 percent chose buses while only 16 percent chose trains.
Moreover, in the same study bus-only riders cited security as the
second most predominant reason for riding the system whereas concern
for security on buses by rapid transit-only riders rated no better
than sixth in the total of responses.  "Riders using both buses and
trains felt that trains were most dangerous" and all respondents
"perceived station areas as more dangerous than riding on the trains."[97]
These observations/perceptions were confirmed by reported crime data
which showed that most transit crime occurs on the rapid rail rather
than the bus system, and within the rapid rail system itself, more
crime occurs at the stations than on trains.  Thus, it can be stated
that perceptions of insecurity on the part of some urban mass transit
passengers accurately reflect the location of crime occurrence on the
system.  Of course, these results are based on data collected and
analyzed for a single city and are therefore not generalizable.  They,
nevertheless, provide evidence that crime magnitude is at least
accurately perceived by some of the riding public and that the more
frequently one uses a system the more accurately perceptions of crime
parallel actual crime occurrence.

Finally, any discussion of transit crime magnitude as it relates
to passenger perceptions must include some mention of the influence
of the news media.  Although the media tend to cover most opera-
tional aspects of urban transit systems, its coverage and presentation

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[96] Security of Patrons on Urban Public Transportation Systems,
pp. 18-19.

[97] Ibid., p. 18.

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of crime problems within the system may often lead to distortions in
passenger perceptions of crime magnitude.  The impact of the media
on passenger perceptions, however, has not been addressed by current
research efforts.

### 4.  Which Policing Strategies Increase Ridership?

The assumption (stated in question form above) that selected
security measures increase urban mass transit ridership involves a
chain of two assumptions basic to transit policing operations (see
Figure 2 above, Section V-B-2.).  First, some police activities
influence public perceptions of transit security in a favorable man-
ner.  Second, positive changes in public perceptions lead to increased
ridership.

The relationship between policing activities and ridership levels
has not been formally addressed by current research efforts.  However,
a member of studies have examined the two assumptions linking police
activities to ridership levels.

In the case of the first assumption (see Section VI-F-1.), the
data suggest two strategies key to bolstering public perception con-
cerning urban mass transit security:

● increased police patrol of stations and on trains; and

● implementation of communication capabilities to ensure
rapid response by security or police personnel when
assistance is needed.

Findings pertaining to the second assumption (see Section VI-F-2.),
while sometimes conflicting, generally indicate that passenger percep-
tions influence ridership behavior.  Crime and lack of security often
are cited as reasons for using public transportation either on a limited
basis or not at all.

The data and underlying chain of assumptions imply that more
police presence and improved communication capabilities are the two
policing strategies holding greatest potential for increasing rider-
ship levels.  However, implementation of either strategy does not,
in and of itself, ensure increased ridership.  For example, if percep-
tions are based on minor offenses, these strategies may very well be
effective in reducing public fear and increasing passenger load.  By
contrast, if perceptions stem basically from serious crimes, others
policing actions emphasizing apprehensions such as stakeouts and decoys
may be needed.  In any case, transit environments are continually
evolving.  Vandalism may be the primary crime problem one year and

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robbery the next. These differences may lead to changes in public perceptions. This suggest a need for multiple policing strategies and modification of activities to meet changing crime situations.

G. Appropriate Measures of "Success" for the Various Policing Strategies?

Measurement of success of policing and other security activities in the mass transit system is a crucial issue for evaluation and for utilizing evaluation in management decisions. There are three questions that may be asked concerning measurement:

- What measures are used to determine transit crime trends and levels, and passenger risk?

- What are the appropriate measures of achievement of policing and other security strategies?

- What are the relative levels of cost-effectiveness of the various strategies?

1. What Measures Are Used to Determine Transit Crime Trends and Levels, and Passenger Risk?

In transit systems, crime levels are usually expressed as number of crimes reported per unit time (by the month or year). Crimes are most often broken out by type; the categories employed differ from one system to another. Some systems include categories of crime not usually used outside of transit systems such as vandalism and fare evasion. Crime trends are most frequently expressed as time series, usually over a 12-month period, as percent changes from year-to-year, between comparable periods in different years, or over a time span of several years. Some transit police officials have stated that the total count of criminal offenses on a transit system is not a meaningful indicator of the seriousness of the crime problem. To measure crime trends and help shape policing responses, some transit police compile criminal offense statistics to show when and where the offenses occur and who are the victims. The following victims categories have been suggested:

- Crimes directed against transit personnel - this includes booth robberies, robberies of concessionaires and attacks against operating personnel.

- Crimes related to school population - in this category the victims are generally youthful and the crime problem is concentrated in relatively short periods of time during school days.

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- Crimes directed against specific groups of adult passengers - the aged, the infirm and the female passenger tend to be more likely victimized in proportion to their numbers in the transit system than others.

The categories currently being used in a particular transit system are based on historical precedents, the preference of the top transit police official or the crime situation unique to that system. There is a lack of uniformity in the classification and reporting of transit crimes among jurisdictions. If the levels and trends of transit crime are to be assessed nationally, more careful measurement of crime and development of standardized reporting are needed across systems.

Passenger risk (or victimization rate) is an important measure for both the assessment of crime in a transit system and for the evaluation of anti-crime activities. There are conflicting opinions over the proper denominator to use in expressing transit victimization rates on systems. Rates have been calculated on the basis of estimated number of riders per year, revenue passenger miles per year, vehicle miles per year, number of vehicles and the average number of people in a station (or on a bus) per hour.

Depending on the choice of the denominator, the victimization rate on a transit system can be shown to be higher or lower than crimes per 100,000 population outside the transit system. Researchers generally agree that victimization rate is partly dependent on a passenger's exposure time in the system (as measured by the average length of a trip in hours), but it is typically difficult to estimate a representative value for this factor. This "exposure time" factor also raises the question whether it is meaningful to compare transit crime rates against street crime rates that take into account only the size of the population at risk but not the amount of time spent on the streets or at home. Yet, there are clearly advantages to be gained in developing a commonly acceptable method for calculating crime rates on transit systems. Crime rates for transit systems should take into account changes in number of passengers using the system as well as their length of time at risk. Comparisons should be made across systems (assuming other aspects of crime measurement are equal), across time periods and at different parts or at different times within the same system.

Several rapid rail systems are collecting detailed data on crime levels by time of day, day of week, month and by location (stations, line or route, and trains vs. stations). No system has merged passenger traffic data with crime level data to calculate crime rate.

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The comparison of risks of victimization inside and outside the transit system is on shakey grounds, considering the difficulty of accurately estimating time at risk for various possible crimes outside the system. The most important application of victimization risk measurement is to identify within a given system where and when to concentrate transit police resources and what types of crime targets be given priority attention. Comparison of victimization rates across similar systems (rapid rail or bus) may be of some use also. In sum, passenger risk data have multiple uses: as an outcome measure of anti-crime activities, a tool for planning anti-crime activities and for passenger education.

One serious problem in crime measurement is the ability of police to increase or decrease reported crime through their activities without any necessary change in the "actual" amount of crime. Thus, increased surveillance (such as in fare evasion programs or decoys) may increase the number of reported crimes, while de-emphasizing enforcement of certain common illegal behaviors may decrease reported crime. This problem is especially relevant for those criminal activities that are not reported to a high degree by victims or where there is no personal victim. Decoy units present a special situation. On one hand, they may be considered to "create" crime. On the other hand, it may be argued that decoys merely divert the same criminal behavior from a "real" victim, thus not changing the amount of the crime.

There is also the question of crime displacement, i.e., the "movement" of crime from one area to another or from one time to another due to the effects of police activity. Displacement is predicated on the assumption that the number of people who commit crimes remains stable and that police actions may cause shifts in where and/or when crime is committed, rather than a net reduction in total crimes. Displacement of crimes outside the transit system may be difficult to measure. As the number of most types of crimes committed in the transit system is small compared to that outside the system, displacement often is hard to detect given the "natural" variation in street crime. For this reason, displacement effects are rarely addressed in past evaluations.

Most crime measurements are subject to well-known limitations. This is true of transit crime which may be subject to additional problems: the reporting of crime to non-transit police who do not record the incidents as transit-related; crimes occurring on the boundaries of the system (crimes leaving rapid rail stations and at bus stops) and thus related to transit use but recorded as street crimes; and unreported anti-social behavior including harassment, rowdyism, and public intoxication, etc. which may affect passenger feelings of security even more than the usual reported crimes.

2. What Are the Appropriate Measures of Achievement of Policing and Other Security Strategies?

Appropriate measures are dependent on the goals and objectives of the policing and other security activities under consideration. Four categories of measures of crime control may be delineated. They are: measures of crime; measures of perceived passenger security; measures of ridership volume; measures of revenue.

Measures concerned with the reduction or control of crime in general, or for specific crimes within the confines of the transit system, are relevant to most strategies. Problems involved in making accurate, complete and consistent measurement of criminal activity have been discussed previously. Before measurement of crime is undertaken, the linkages between the activity (or activities) under study and its effects on crime should be clearly stated. This will provide a basis for delineating appropriate measures. Among the important crime measures which have and may be used to assess effectiveness of policing and other security strategies are:

- crime incidents

  - number of crimes reported,

  - changes in the number/percent/rate of different types of crimes for some previous time frame or against some comparison, and

  - displacement measures of general and specific crimes (numbers and rates),

- victimization

  - number of victims,

  - changes in the number of victims for some previous time frame or against some comparison, and

  - passenger victimization risk and changes in that risk,

- apprehension

  - number of apprehensions, and

  - apprehension rates,

- prosecution/adjudication

  - number/percent of cases accepted by district
    attorney for prosecution (where the district
    attorney screens cases) or number/percent of
    indictments by grand jury,

  - number/percent of convictions, and

  - conviction rates.

Many of these suggested measures should be specific to type of
crime, location and time when relevant to the security activity under
investigation. Some of the measures listed are relevant to short-
term achievement while others may be more relevant to intermediate-
and long-term periods.

A second set of measures for evaluating the effects of policing
and other security strategies involve passenger perceptions and feelings
of security. Goals and objectives of passenger perceptions of security
may be directly tied to certain police and security activities or
indirectly through reduction of crime. Among measures of passenger
feelings of security are:

- overall feelings of security from criminal attack and
  harassment while in the transit system;

- perceptions of the amount and type of crime in the
  system;

- willingness to ride the system alone and/or at off-peak
  hours;

- feelings of being able to summon help in an emergency
  and knowing there will be a quick response;

- willingness to use public transportation vs. other
  alternatives;

- knowledge and experience with police and other sources
  of aid on the system;

- victimization experience:  direct, observed, from
  others, through media; and

- considerations of personal security when making
  decisions to use the transit system.

Information may be obtained through on-the-spot surveys, telephone
surveys or larger household surveys. Passenger perceptions may be a
short-term measure in those investigations concerned with public
awareness of changes in security operations such as increased visible
patrol or installation of surveillance equipment, alarms or communica-
tions devices for the public. On the other hand, crime reduction pro-
grams would most likely use passenger perceptions as intermediate- or
long-term measures of achievement, after the crime reduction effects
presumably have taken place and the results communicated to or
experienced by the public.

A third group of achievement measures are those dealing with
adding new riders and greater system usage by present riders. These
are usually longer term measures of effectiveness of policing and other
security activities as they are expected to change after the effects
of crime reduction and improved perceptions of security have taken
place. Increases in number of new passengers and greater system usage
by those presently using the system are probably the most difficult
outcomes to attribute to the effects of policing activities as so
many other factors may have contributed to the changes or interacted
with the security activity to influence the results.

A fourth set of measures concern changes in transit revenues.
Changes in security activities may reduce crime, improve pas-
senger perceptions of security, increase the number of passengers
and eventuate in a growth in revenues. However, increased transit
revenues may be the direct consequence of specific security activities
aimed at reducing crimes against the system such as fare evasion. In
the latter case, passenger levels may remain constant while revenues
rise.

In order to attribute outcomes to activities, it is necessary
to carefully monitor and document project implementation using a
set of short-term measures. The implementation measures may range
from the location and number of crimes detected by CCTV to the actual
movement of patrol on an hour-to-hour basis. It is necessary to
continuously monitor the operations of the activity under study over
time, to ensure that the activity is being carried out as planned or
at least to identify those quantitative and/or qualitative changes
that may affect outcomes.

In order to properly assess the achievements of policing and
other security activities, baseline or comparative data for all of
the five categories of measures are needed. Although rigid experi-
mental designs which eliminate most sources of validity threats will
seldom be possible, measurement should be done as carefully as possible
in terms of accuracy and reliability. Potential sources of influence

on results, other than the direct, indirect and interactive aspects of policing activities, should be considered and measured, if not controlled.

### 3. What are the Relative Levels of Cost-Effectiveness of the Various Strategies?

Cost-effectiveness analysis as a tool for decision-making may be used in several ways:

- To compare two or more activities when both costs and effectiveness may vary.

- To compare two or more activities when either, but not both, costs and effectiveness may vary.

- To evaluate a program or policy (no external comparisons).

- To optimize the utilization of fixed resources.

A cost-effectiveness analysis of security activities in mass transit systems is constrained by the limitations on valid measurement of both costs and effectiveness. The most difficult problems involved in this type of analysis probably concern meaningful and quantitative measures of effectiveness. The major measurement problems are the quantification, in dollar terms, of outcomes of particular security activities so as to relate them to cost figures. Reduction of certain criminal activities such as vandalism, theft of revenues, fare evasion, purse snatching and robbery may be conceptually easy to translate into dollar terms. In the case of personal injury caused by crimes, medical costs, loss of income, costs to the transit system (damage suits, increase in insurance premiums, injury or other loss of transit employee services) may also be translated into dollar figures. However, indirect costs of crimes such as decrease in transit usage attributable to fear of crime and the side effects of crime on individuals are far more difficult to quantify and measure.

Another approach to measuring the effects of crime reduction is to give categories of crime scale values reflecting such dimensions as seriousness to the victim (injury, fear), monetary loss, disruption, etc. The type of scale (ordinal, interval or ratio) will depend on how it is constructed. Effectiveness is then expressed as changes in the total scale values of crimes reported in a transit system. Thus, costs can be compared to incremental changes in total scale values. The PATH system categorizes crimes in terms of seriousness using injury and monetary loss to individuals as well as to the system as the basis for scaling.

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Other effectiveness measures may include increase in riders and resulting increase in passenger revenues or increase in other revenues assumed due to crime reduction, police presence or other methods of increasing passenger perceptions of security.

Process-oriented measures such as provision of certain amounts of police coverage or response time may also be employed as effectiveness measures and related to costs needed to produce them. The New York City Transit Police have developed a number of "productivity" measures. In that system, the number of open felony complaints (those citizen initiated complaints not cleared within a day or two) has been used to measure police effectiveness on a month-to-month and year-to-year basis. Number of felony arrests or number of felony arrests leading to convictions per patrolman or decoy or stakeout is another possible form of effectiveness measure that can be related to the cost of alternative anti-crime strategies.

Three other problems in cost-effectiveness analysis, also evident in other types of analysis, are:

- the attribution of effectiveness to the activities under consideration;

- the relationship between cost and effectiveness; and

- determination of hidden or unmeasured costs and their potential impact.

In general, costs are usually less of a measurement problem. With regard to specific police and other security activities, costs can be identified and calculated in terms of personnel (including benefits and support), equipment purchase and/or maintenance, operational costs to the transit system, and costs to others who may be involved (outside police forces, federal funds). When existing resources are used to provide some new activity with no increase in personnel, equipment, or other additional costs, one needs to measure the loss (if any) in effectiveness resulting from shifting the allocation of resources. For example, re-deployment of security forces from one area to another may lead to an increase in crime in the area left, decrease in passenger perception of safety, morale problems, etc. Additionally, any crime reduction program may lead to displacement within or without the system. If this can be measured and some agreed upon cost figures used it should go into the cost calculations. Transit officials may not consider displacement of crime outside the transit system a legitimate cost, however.

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Review of the literature on transit security did not produce any formal studies of the cost effectiveness of police or other security activities on mass transit systems. However, there has been much informal use of cost-effectiveness analysis in justifying transit police budgets and applying for grants.

A model for calculating costs and benefits was published by Robert Greene in the Carnegie-Mellon Report.[98] In this model, Greene, using several simplifying assumptions and cost estimates (based on the Chicago Transit and other data), developed an equation in which annual gain in dollars is computed from increased ridership, plus reduction of the cost of crimes, minus the annual cost of closed-circuit television and other related station costs. In his example, he made assumptions about:

● the percent reduction in vandalism, robbery, and assault;

● dollar figures for hospitalization due to assault;

● the percent of assault victims needing emergency care or hospitalization;

● the annualized cost of CCTV per station;

● the number of stations with CCTV; and

● extra station operation costs due to the CCTV.

He solved the equation for the number of increased riders per year needed to pay for the estimated CCTV and associated costs. The major assumption used in this particular equation was that CCTV was effective in reducing the crimes targeted. The solution dealt with the trade-off between cost of CCTV and increased riders given a reduction in crime and its associated reduction in costs. Greene's article also estimates the cost of a one shift per day, seven day per week, two-man patrol, and calculates that such a team would have to cover 8 to 9 stations to equal the projected CCTV costs, assuming equal effectiveness.

In dealing with cost-effectiveness analysis regarding security operations, direct and some indirect costs of specific security activities are relatively clear. Take the budgeted costs of security departments as an example: among the systems studied by MITRE, the

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[98]Security of Patrons on Urban Public Transportation Systems, Appendix III.

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budgets for security range from slightly over $80,000 per year for the 7 person Cleveland department to $97 million for the 3,000 person New York City Transit Authority Force. Budgets for transit security range from under one percent to approximately 10 percent of a system's total operating cost.

Costs are also available on security related equipment and associated maintenance. For example, the Metropolitan Atlanta (MARTA) system estimates that $1.8 million was spent in 1974 to purchase silent alarms and radio units for 735 buses, mobile units for security supervisors, a computer based communication center plus 2 years of maintenance service. Manpower costs to operate the communications center total an additional $180,000 per year. The SEPTA system in Philadelphia estimates the cost of installing 10 CCTV cameras per station at $100,000.

Dollar costs have also been estimated for specific types of crime. The Southern California Rapid Transit District estimated vandalism costs at slightly over $200,000 per year while the New York City Transit Police calculated that their program of detecting and apprehending fare evaders has reduced the percent of riders who are fare evaders from about 4 percent to about .8 percent and has saved the system $17,000,000. In the model by Greene mentioned previously, costs for robbery and assault were estimated in terms of minimum dollar loss per robbery, average emergency room charge for victims of assault and average daily hospital costs for victims needing hospitalization. Other economic, quantifiable costs to victims may also be used to estimate the costs of crime and the dollar values of crime reduction efforts.

Chaiken, Lawless and Stevenson,[99] in their study of the effects of large increases in number of police patrolmen in the New York City subways on crime, state:

> Even guaranteeing that every train had at least one policeman on it, which is in a practical sense close to saturation manning, was not adequate to reduce the felony rate on the trains below about one crime every other night...The added cost to the City for producing this two-thirds reduction in felonies at night was

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[99]The Impact of Police Activity on Crime: Robberies on New York City Subway System, p. 22.

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a: least $13 million per year (gradually increasing
with inflation), which amounts to about $35,000
per felony crime deterred.

This may be considered an oversimplified approach to the analysis of
an extensive, high cost crime reduction program.  The cost analysis
does not take into account personal injury, medical costs, and loss
of employee services among other factors.

Precise relationships between various security activities and
crime reduction, passenger perception and increased transit revenues
are not known.  Thus, the use of cost-effectiveness as a means of
chosing between two or more programs, policies, or approaches to
policing on an a priori basis is a guessing process at best.

SECTION VII

RECOMMENDATIONS

A review of crime and policing of urban mass transit systems
reveals the existence of important knowledge gaps.  To date research
efforts have been uneven, clustering around several topic areas while
ignoring many others.  Much of the research concentrates on evaluating
the impact of a sizable increase in police patrol, assessing the
effectiveness of exact fare and investigating citizen perceptions of
transit crime and security.  Comparatively little, if any, research
has been done to assess the impact of other police activities (e.g.,
stakeouts, decoys, random versus fixed patrol) or evaluate the effec-
tiveness of surveillance and communication devices (e.g., CCTV, two-
way radio, silent alarms).  Further, available findings often are
beset by data reliability and validity problems inherent in weak
methodological designs.

Given the current state of knowledge (or lack of it), the follow-
ing topic areas are recommended for future research and evaluation
efforts.  Several of these recommendations are discussed in greater
detail in an accompanying volume entitled Policing Urban Mass Transit
Systems:  Evaluation Designs and Recommendations for Future Research.

A.  Develop Projects Directed Toward Controlling Juvenile Crime

Profiles of mass transit criminals indicate that a significant
number of offenders are juveniles.  Transit police in a number of
cities including Baltimore, Los Angeles, Philadelphia and San Francisco
state that juveniles are a major, if not the primary, source of transit-
related criminal incidents.  Some transit systems have had some success
with school trippers (buses specially designated to transport students
to and from school) and school programs emphasizing the vital service
provided to the community by mass transit.  However, juvenile-ralated
crime remains a serious transit problem.

This suggests a continuing need to develop projects directed
toward controlling juvenile crime on transit systems.  One possible
project could involve the creation of a juvenile unit staffed with
civilian specialists including counselors and youth workers.  Such a
unit could be based on similar units operational in a number of city
police departments.  Another possible project could be based on the
concept of restitution and depends on close cooperation between the
courts and transit police.  Juveniles convicted of transit-related
crimes would be referred by the court to the juvenile unit.  In turn,
the juvenile unit would supervise offenders, provide counseling,
and oversee work oriented toward cleaning up the transit environment
such as removing graffiti and other signs of vandalism.

## B. Improvement of Mechanical and Electronic Security-Related Equipment

The use of counterfeit coins and tokens to gain access to rapid rail trains is a growing problem in the large and older systems. CCTV often is poorly integrated with other security activities and the impact of monitor fatigue on effectiveness remains unknown. Automatic coin-change and ticket vending machines frequently are unreliable, requiring constant maintenance.

In this context, transit company officials, police and researchers see a need for the following types of improvements:

- Developing fare collection equipment to detect the use of slugs;

- Hardening automatic coin-change and ticket vending machines;

- Improving the capability of CCTV surveillance equipment and integrating the use of this equipment with transit police operational requirements; and

- Improving radio communication capability in subways to facilitate the coordination and control of operations involving general city police, transit police, fire and rescue units.

Additionally, research is needed to analyze human engineering problems associated with extensive use of CCTV equipment. For example, transit crime exhibits a bimodal frequency distribution, peaking during morning and evening rush hours; if people monitoring CCTV cameras finish their eight-hour shift at the end of the evening rush hour, fatigue may reduce potential surveillance and anti-crime capabilities of CCTV. Research would provide information concerning the hours of monitor shifts (e.g., shifts starting at the beginning of rush hours or limiting shifts to four hours) and possibly enhance the effectiveness of CCTV.

## C. Improvement of Fire Prevention and Detection Capabilities

Acts of arson pose serious threats to passengers and transit properties, although only isolated incidents have been reported thus far. In 1976, a fire set on board a subway train caused two to three million dollars damage in the Toronto system. A similar incident occurred in Oakland (BART), resulting in $200,000 to $300,000 worth of damage to subway cars. Prevention and early detection capabilities need to be developed for subway trains to fight against arson.

## D. Evaluation of the Effects and Effectiveness of Specific Security Strategies

Transit police often employ different strategies to counter similar crime problems. For example, several police chiefs rely on preventive patrol to deter potential robbers. Other transit police chiefs believe that preventive patrol merely pushes crime away from targeted areas and anti-robbery operations need an apprehension dimension in order to be successful. Hence, they have combined preventive patrol with decoy activities. Similarly, some bus systems depend on police riding patrols to protect drivers and passengers from robberies and assaults, while other systems rely on silent alarms and two-way radios.

Rigorous evaluations of specific security activities can provide decision-makers with valuable information concerning the effectiveness of various strategies. Examined within the perspective of the nature and extent of the problem and resources available, evaluations can address key questions such as the potential transferability of specific strategies as well as the need to modify current activities and develop innovative approaches to transit policing.

## E. Develop and Implement Uniform Crime Reporting for Transit Systems

There are a variety of crime classification schemes in use. Some departments group criminal incidents into the three following categories:

- Violent crime against persons;

- Offenses against personal property; and

- Offenses against system property.

Other transit police units classify crime according to "who," "when," and "where." Additionally, definitions of what constitutes various criminal acts vary among departments.

These differences complicate comparisons between systems in terms of crime levels and problems. The differences also preclude aggregation of data (at several points in time) needed to determine national transit-related crime trends. Development and implementation of a uniform crime reporting format for transit systems would normalize definitions, standardize information collected for each crime type and provide a concrete basis for comparisons between systems.

F.  Develop Handbook for Passenger Perception Measurement

Passenger perceptions of transit crime and security provide impor-
tant outcome measures of policing operations.  To date, passenger per-
ceptions have been the primary subject of about half-a-dozen studies
and a secondary concern of several other research efforts.  Unfortunately,
most of these studies are poorly designed and, further, use different
parameters in defining objectives, intervening and outcome variables.
The methodological problems undermine confidence in the findings and
the research differences obviate meaningful comparisons of these studies.

Development of a passenger perception measurement handbook for
transit authorities would go a long way toward solving these problems.
The handbook should contain guidelines for the administration and
interpretation of passenger perception surveys, sample data collection
forms, and appropriate analyses frameworks.  As such, the handbook
would provide transit officials with a methodology for systematically
assessing passenger perceptions of transit crime and security and a
means of evaluating security activities.  Widespread use of the hand-
book also would promote comparability of findings among transit systems.

G.  Case Study of the Washington Metropolitan Area Transit Authority
    (WMATA)

The Washington, D. C. rapid rail transit system provides a
unique opportunity for a case study.  WMATA, which initiated passen-
ger services at the end of March 1976 on a limited basis, will
expand operations in planned phases over the next several years.
This presents a situation where the rapid rail transit system will
continue to expand while the police force will remain relatively
constant in terms of manpower and equipment.  A case study of WMATA
over the next several years can provide information concerning the
effects of substantial changes in system parameters on policing
operations and effectiveness.  Data collected during the case study
also can be used to discern the development of crime patterns, assess
the responses of the police unit, document the relations between WMATA
and local police departments in terms of cooperation and conflict,
and investigate the impact of both crime and policing on passenger
perceptions and use of the transit system.  Information gained from
this study would be valuable for new rapid rail transit systems cur-
rently in the planning/building stages.

POLICING URBAN MASS TRANSIT SYSTEMS:
AN OVERVIEW OF SITE VISITS

Information gathered during the site visits suggests that a
plethora of factors play a role in shaping and limiting the opera-
tions of transit police units.  Many of these factors can be grouped
into three categories:

● Environmental characteristics (including system and rider-
  ship characteristics);

● Police characteristics; and

● Crime characteristics.

Figure A-1 shows the factors comprising each of the three categories.
The list, while not exhaustive, attempts to present the key factors.

A general profile of the transit systems visited can be readily
developed with these three categories of factors (see Table A-I).  The
type and range of policing strategies implemented in a given system
can be linked to one or more of the characteristics prevailing in
that system.  For example, subway stations designed to heighten
visibility allow police to integrate close-circuit television sur-
veillance with manned patrol patterns.  Auto theft and larceny from
cars are problems limited to those transit systems with unattended
"park 'n' ride" facilities with cars left for lengthy periods (10 to
12 hours).  Motorized patrol and stakeouts are the typical transit
police response to these types of crime.

Available evidence indicates that there are major differences
between modes of transportation (bus/street cars versus subway/
elevated) in the types of crime problems and policing operations.

The two following sections of this chapter explore separately
and in more detail the impact of environmental, police and crime
variables on the selection and operation of anti-crime strategies
for bus systems and for subway/elevated lines.

Bus Systems

Buses, while traversing predetermined surface routes, represent
a highly mobile form of urban mass transportation.  In large urban
areas, 1000 to 2000 or more buses operate during rush hours, criss-
crossing city streets.  Passengers usually embark and exit from

ENVIRONMENTAL CHARACTERISTICS

- Mode of transportation (buses, subway/elevated lines)
- Number of vehicles
- Number of route miles
- Number of stations
- Hours and days of operation
- Number of jurisdictions served
- Method of fare collection
- Station design (lighting, visibility, etc).
- Number of passengers
- Peak passenger load and associated times
- Passenger mix (commuters, school children, inner city residents, suburbanites)

CRIME CHARACTERISTICS

- Type of crime
- Number committed per week/month/year
- Places where crime most frequently occurs
- Times when crime most frequently occurs
- Span of time needed to commit crime
- Modus operandi
- Offender profile
- Victim profile

POLICING CHARACTERISTICS

- Organizational affiliation
- Type of department (sworn or non-sworn personnel)
- Size of force (number of men, rank, organizational structure)
- Vehicles
- Operating budget, percent of company's total budget
- Areas of responsibility (company property, passengers, revenue)
- Mechanical and electronic devices used (as adjuncts to or substitutes for manned patrol)
- Anti-Crime Strategies

FIGURE A-1

CATEGORIES OF FACTORS RELEVANT TO TRANSIT POLICING ASSESSMENT

TABLE A-I

OVERVIEW OF TRANSIT SYSTEMS AND POLICING

| SYSTEM | ENVIRONMENTAL CHARACTERISTICS | | CRIME PROBLEMS | POLICE CHARACTERISTICS | |
| --- | --- | --- | --- | --- | --- |
| | MODE | SYSTEM CHARACTERISTICS | | ORGANIZATION/RESOURCE FACTORS | ANTI-CRIME STRATEGIES |
| CHICAGO TRANSIT AUTHORITY (CTA) | SUBWAY/ELEVATED BUS | HIGH-SPEED, SEMI-AUTOMATIC RAPID RAIL AROUND THE CLOCK SERVICE LARGE, 90 MILES OF PASSEN-GER REVENUE LINE MIXTURE OF OLD AND NEW STATIONS FARE COLLECTION - AUTO-MATED AND BY CONDUCTORS--COIN OPERATED TURNSTILES BUSES - LARGE INNER CITY SYSTEM 2500 VEHICLES EXACT FARE | ROBBERY BATTERY ASSAULT INDECENT EXPOSURE CIVIL LAW VIOLATIONS (SMOKING, TRUANCY, AND CURFEW) | CHICAGO POLICE DEPARTMENT'S MASS TRANSIT UNIT 239 OFFICERS FOCUS ON SUBWAY CTA SECURITY DIVISION 60 MEN FOCUS ON COMPANY PROPERTY CHICAGO POLICE DEPARTMENT'S DISTRICT COMMANDS HANDLE BUSES | SATURATION - PLAINCLOTHES AND UNIFORMED OFFICERS FIXED POSTS MOBILE POSTS TACTICAL UNDERCOVER TEAMS K-9 CORPS |
| MASSACHUSETTS BAY TRANSPORTATION AUTHORITY (MBTA) | SUBWAY (TROLLEY) BUS | LARGE, PRIMARILY INNER CITY SYSTEM MEDIUM-TO-HIGH-SPEED SUBWAY AND TROLLEY LINES LIMITED SERVICE 5:55 AM - 12:45 AM WEEKDAYS 5:55 AM - 1:45 AM WEEKENDS OLD STATIONS FARE COLLECTION - CHANGE BOOTHS AND QUARTER COIN MACHINES BUSES - ABOUT 1200 VEHICLES | POCKET-PICKING VANDALISM INTERNAL THEFT LARCENY | DEDICATED, IN-HOUSE, SWORN POLICE 61 OFFICERS | FLEXIBLE DEPLOYMENT IN PATROL CARS, STATIONS, AND ON TRAINS PLAINCLOTHES STAKEOUTS COMMUNITY RELATIONS |

TABLE A-I (CONTINUED)

OVERVIEW OF TRANSIT SYSTEMS AND POLICING

| SYSTEM | ENVIRONMENTAL CHARACTERISTICS | | CRIME PROBLEMS | POLICE CHARACTERISTICS | |
|---|---|---|---|---|---|
| | MODE | SYSTEM CHARACTERISTICS | | ORGANIZATION/RESOURCE FACTORS | ANTI-CRIME STRATEGIES |
| NEW YORK CITY TRANSIT AUTHORITY (NYCTA) | SUBWAY/ELEVATED BUS | 4-BUROUGH SYSTEM OF 230 ROUTE MILES - LARGEST IN UNITED STATES AROUND THE CLOCK SERVICE MOSTLY OLD STATIONS FARE COLLECTION - TOKENS SOLD BY STATION ATTEN-DANTS--TOKEN OPERATED TURNSTILES BUSES - 4,256 VEHICLES | ROBBERY PURSE-SNATCHING FARE EVASION VANDALISM | DEDICATED, IN-HOUSE, SWORN POLICE APPROXIMATELY 3000 OFFICERS CITY POLICE HANDLE BUSES | FLEXIBLE DEPLOYMENT IN STATIONS AND CARS PLAINCLOTHES STAKEOUTS DECOYS LIAISON WITH PROSECUTORS TARGET HARDENING (BULLET-PROOF ENCLOSURES AND SECURITY SHIELDS) |
| SOUTHEASTERN PENNSYLVANIA TRANSPORTATION AUTHORITY (SEPTA) | SUBWAY/ELEVATED BUS | PRIMARILY INNER-CITY SUBWAY - 24.1 MILES 2150 BUSES AROUND THE CLOCK SERVICE OLD SUBWAY STATIONS SUBWAY ATTENDED BY CASHIER BUSES - EXACT FARE/SCRIP | ROBBERY LARCENY VANDALISM ROWDYISM INTERNAL SECURITY | PHILADELPHIA POLICE DEPART-MENT DEDICATED TRANSIT UNIT - SUBWAY 160 OFFICERS (PLUS 50 DOGS) TRANSIT COMPANY SECURITY DEPARTMENT - 22 MEN INTERNAL AND PROPERTY SECURITY CITY POLICE DEPARTMENT DISTRICT PATROLMEN HANDLE BUSES | FIXED POSTS, MOBILE FOOT PATROLS AND RIDING POSTS - DEPLOYMENT ASSOCIATED WITH CRIME AND RIDER-SHIP PATTERNS STAKEOUT, DECOY AND PLAINCLOTHES TACTICS ON AN "AS THE SITUATION DICTATES" BASIS MONITORING (BY TRANSIT COMPANY SECURITY DEPARTMENT) |

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TABLE A-I (CONTINUED)

OVERVIEW OF TRANSIT SYSTEMS AND POLICING

| SYSTEM | ENVIRONMENTAL CHARACTERISTICS | | CRIME PROBLEMS | POLICE CHARACTERISTICS | |
|---|---|---|---|---|---|
| | MODE | SYSTEM CHARACTERISTICS | | ORGANIZATION/RESOURCE FACTORS | ANTI-CRIME STRATEGIES |
| WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY (WMATA) | SUBWAY/ELEVATED BUS | SUBWAY - UNDER CONSTRUC-TION, 4.6 MILES AND 5 STATIONS CURRENTLY OPERATING DOWNTOWN (TO BE GREATLY EXPANDED) LIMITED SERVICE:  6 AM TO 8 PM WEEKDAYS EXACT FARE AND STATION ATTENDANTS PARKING LOTS BUSES - LARGE INNER CITY/ SUBURBAN SYSTEM 2,030 VEHICLES EXACT FARE | SUBWAY - VERY LITTLE CRIME REPORTED SO FAR | DEDICATED, IN-HOUSE SWORN POLICE PLUS SPECIAL POLICE:  ABOUT 100 SWORN POLICE AND 67 SPECIAL POLICE LOCAL POLICE DEPARTMENTS HANDLE BUSES | FIXED AND MOBILE PATROLS ON TRAINS, IN STATIONS, PARKING LOTS AND CONSTRUCTION AREAS DEPLOYMENT BASED ON TRANSIT CRIME DATA AND CRIME DATA OF AREAS SURROUNDING STATIONS PLAINCLOTHES USED IF NECESSARY |
| MASS TRANSIT ADMINISTRATION OF MARYLAND (MTA) (BALTIMORE) | BUS | MEDIUM SIZE - 1021 VEHICLES PRIMARILY INNER CITY - SOME SUBURBAN AROUND THE CLOCK SERVICE EXACT FARE PARKING LOTS | ASSAULT THEFT ROBBERY POCKET-PICKING VANDALISM DISORDERLY CONDUCT | MTA SECURITY FORCE SWORN POLICE 36 MEN CITY AND COUNTY POLICE DEPARTMENTS FOR BALITMORE AND ANN ARUNDEL COUNTIES AND MARYLAND STATE POLICE ON AN AS NEEDED BASIS | GENERAL PATROL OF BUSES IN UNIFORM STAKEOUTS - PLAINCLOTHES PATROL BY CARS OFFICERS ASSIGNED DAILY TO RIDE SCHOOL TRIPPER LIAISON WITH LOCAL POLICE AND SCHOOL AUTHORITIES BUSES EQUIPPED WITH SILENT ALARMS AND 2-WAY RADIOS |

TABLE A-I (CONTINUED)

OVERVIEW OF TRANSIT SYSTEMS AND POLICING

| SYSTEM | ENVIRONMENTAL CHARACTERISTICS | | CRIME PROBLEMS | POLICE CHARACTERISTICS | |
|---|---|---|---|---|---|
| | MODE | SYSTEM CHARACTERISTICS | | ORGANIZATION/RESOURCE FACTORS | ANTI-CRIME STRATEGIES |
| PORT AUTHORITY TRANS-HUDSON CORPORATION (PATH) | SUBWAY/SURFACE SEPARATE GRADE | HIGH-SPEED RAPID RAIL SUBURBAN COMMUTER LINE SMALL - 13.9 MILES 13 STATIONS AROUND THE CLOCK SERVICE MIXTURE OF OLD AND NEW STATIONS AUTOMATIC FARE COLLECTION --COIN OPERATED TURNSTILES | ROBBERY ASSAULT THEFT OF COIN CHANGE MACHINES MINOR JUVENILE OFFENSES/VANDALISM | DEDICATED, IN-HOUSE SWORN POLICE 53 PATROL OFFICERS 11 SUPERVISORY OFFICERS 4 DETECTIVES (PART OF A LARGE PORT AUTHORITY POLICE FORCE WITH 1200 MEN) | FLEXIBLE DEPLOYMENT (IN CARS, ON FOOT, ON TRAINS) COMMUNITY EDUCATION PROGRAMS CLOSED-CIRCUIT TELEVISION |
| PORT AUTHORITY TRANSIT CORPORATION OF PENNSYLVANIA AND NEW JERSEY (PATCO) | SUBWAY/ELEVATED | HIGH-SPEED, SEMI-AUTOMATIC RAPID RAIL SUBURBAN COMMUTER LINE SMALL - 14.5 MILES AROUND THE CLOCK SERVICE MIXTURE OF OLD AND NEW STATIONS AUTOMATED FARE COLLECTION --GATES OPERATED BY MAGNETIC CARD PARKING LOTS | THEFT OF AND LARCENY FROM CARS FARE EVASION VANDALISM | DEDICATED, IN-HOUSE SWORN POLICE 21 MEN PLUS 4 DOGS | FLEXIBLE DEPLOYMENT (IN CARS, ON FOOT, ON TRAINS) STAKEOUTS COMMUNITY RELATIONS CLOSED-CIRCUIT TELEVISION |
| SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART) | SUBWAY/ELEVATED | HIGH-SPEED, SEMI-AUTOMATIC RAPID RAIL SUBURBAN COMMUTER LINE LARGE - 77 MILES LIMITED SERVICE: 6 AM TO MIDNIGHT WEEKDAYS NEW STATIONS - MIXTURE OF ARCHITECTURAL DESIGNS AUTOMATED FARE COLLECTION -- GATES OPERATED BY MAGNETIC CARD PARKING LOTS | THEFT OF AND LARCENY FROM CARS FARE EVASION/TICKET FRAUD VANDALISM INTERNAL THEFT | DEDICATED, IN-HOUSE SWORN POLICE 77 SWORN PEACE OFFICERS PLUS 19 CIVILIANS | FLEXIBLE DEPLOYMENT WITHIN ZONES (IN CARS, ON TRAINS) BASED ON PIN MAPS STAKEOUTS SATURATION - MIXTURE OF PLAINCLOTHES AND UNI-FORMED OFFICERS COMMUNITY RELATIONS |

TABLE A-I (CONTINUED)

OVERVIEW OF TRANSIT SYSTEMS AND POLICING

| SYSTEM | ENVIRONMENTAL CHARACTERISTICS | | CRIME PROBLEMS | POLICE CHARACTERISTICS | |
|---|---|---|---|---|---|
| | MODE | SYSTEM CHARACTERISTICS | | ORGANIZATION/RESOURCE FACTORS | ANTI-CRIME STRATEGIES |
| METROPOLITAN ATLANTA RAPID TRANSIT AUTHORITY (MARTA) | BUS | MEDIUM SIZE – 735 VEHICLES AROUND THE CLOCK SERVICE PRIMARILY INNER CITY, SOME SUBURBAN SPECIAL SCHOOL TRIPPERS EXACT FARE PARKING LOTS | ROBBERY VANDALISM ASSAULT | IN-HOUSE SECURITY UNIT – 5 MEN | LIAISON PROGRAMS WITH COMMUNITY, SCHOOLS, COURT, PRESS, AND POLICE AGGRESSIVE PROSECUTION REWARDS FOR IDENTIFICATION OF CRIMINALS INTER-PERSONAL RELATIONS COURSE FOR DRIVERS ALARMS, 2-WAY RADIOS, EXACT FARE CONTRACTING WITH OUTSIDE SECURITY FIRM HIRING OFF-DUTY POLICE |
| SAN FRANCISCO MUNICIPAL RAILWAY (MUNI) | BUS | MEDIUM SIZE – 1074 VEHICLES AROUND THE CLOCK SERVICE INNER-CITY LINES USED BY STUDENTS TO GO TO AND FROM SCHOOL EXACT FARE | ROBBERY ASSAULT POCKET-PICKING PURSE-SNATCHING VANDALISM | SAN FRANCISCO POLICE DEPARTMENT TRANSIT FORCE 9 OFFICERS IN-HOUSE SECURITY SERVICES SECTION 11 MEN FOR SECURITY OF PROPERTY AND LIAISONS WITH POLICE, SCHOOLS, AND COURTS | TARGET PROBLEM ROUTES RIDE BUSES – PLAINCLOTHES TRAIL BUSES ON MOTORCYCLES SUPERVISE CETA PROGRAM PARTICIPANTS (WHO ARE TRAINED AS TRANSIT SECURITY PERSONNEL) |

TABLE A-I  (CONCLUDED)

OVERVIEW OF TRANSIT SYSTEMS AND POLICING

| SYSTEM | ENVIRONMENTAL CHARACTERISTICS | | CRIME PROBLEMS | POLICE CHARACTERISTICS | |
|---|---|---|---|---|---|
| | MODE | SYSTEM CHARACTERISTICS | | ORGANIZATION/RESOURCE FACTORS | ANTI-CRIME STRATEGIES |
| SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT (SCRTD) | BUS | LARGE – 2,243 VEHICLES AROUND THE CLOCK SERVICE INNER CITY AND SUBURBAN EXACT FARE PARKING LOTS | ASSAULT ROBBERY VANDALISM DRUNK AND DISORDERLY CONDUCT | IN-HOUSE SECURITY DEPARTMENT 46 MEN – PROTECT PROPERTY AND PATROL BUSES | LIAISON WITH POLICE, SCHOOLS AND COMMUNITY OPERATION TEAMWORK – MOVIE STARRING L. A. RAMS SHOWN TO SCHOOL STUDENTS DRIVER-PASSENGER RELATIONS PROGRAM MARKER LIGHTS, NUMBERS PAINTED ON ROOFS, 2-WAY RADIOS, SILENT ALARMS POLICE DEPARTMENT RIDE-ALONG PROGRAM |

NOTE:  CRIME PROBLEMS LISTED ARE:  (1) THOSE STATED BY AGENCY REPRESENTATIVES DURING INTERVIEWS, AND (2) THOSE DEDUCED FROM EXAMINATION OF TRANSIT-RELATED CRIME DATA FURNISHED BY TRANSIT PROPERTIES AND/OR LOCAL POLICE DEPARTMENTS.

ANTI-CRIME STRATEGIES LISTED ARE:  THOSE STATED BY AGENCY REPRESENTATIVES DURING INTERVIEWS.  IT IS POSSIBLE THAT OTHER IMPORTANT ACTIVITIES IN RELATION TO RESOURCE ALLOCATION (IN TERMS OF MAN-HOURS, FOR EXAMPLE) WERE NOT MENTIONED.

designated open-air street corner stops; terminals and/or stations are relatively rare. Most systems require passengers to pay exact fare and many buses are equipped with electronic devices such as two-way radios and silent alarms.

Currently there are a number of policing strategies employed to counter bus-related crime:

- Targeting problem lines via analysis of crime data;

- Police, both in plainclothes and uniform, riding buses;

- Police trailing buses, on motorcycles, in marked or unmarked cars;

- Liaison with schools, communities, courts and local police;

- Courses on inter-personal relations for drivers; and

- Hiring off-duty policemen to occasionally ride buses.

Additionally, many transit companies have or are in the process of equipping their buses with electronic devices such as two-way radios and silent alarms. These are crime control measures and are adjuncts to policing strategies. They are intended to aid in protection of drivers and passengers and deterrence and apprehension of criminals by providing a means of rapid communications to police. Silent alarms and two-way radios are not, however, policing strategies per se. Therefore, they are not further explored in this section.

Each police unit uses several strategies simultaneously to counter bus-related crime. The nature of the strategies is, at least in part, related to the type of police unit, i.e., whether the unit is comprised of sworn or non-sworn personnel. Baltimore (MTA) and San Francisco (MUNI) are examples of units consisting of sworn personnel. The Baltimore unit operates under the jurisdiction of the transit company, whereas the San Francisco unit is part of the city police department. Both units tend to rely on traditional police measures such as targeting problem routes, posting uniformed and plainclothes patrols on buses, and following buses in cars or on motorcycles. Atlanta (MARTA) and Los Angeles (SCRTD), on the other hand, are examples of units comprised of non-sworn personnel operating as departments within the transit company. Of significance, these two departments refer to themselves as security units. Both emphasize non-patrol oriented activities; for example, liaisons with the police, community and courts, and designing and presenting on-the-job training courses for drivers dealing with inter-personal

A-9

relations. Patrolling buses is performed either by local police on an as-needed basis or by off-duty police hired intermittently when serious problems arise.

It should further be noted that police/security units operating under the jurisdiction of transit companies have, in addition to passenger and driver safety, other primary responsibilities. In each case examined, the units allocate considerable resources to protect company properties such as garage facilities, bus depots, and other corporate property. Several of the departments also assign men to monitor various phases of revenue collection.

The type of crime and its related characteristics also influence the selection of policing or other forms of anti-crime strategies. Vandalism is usually associated with teenagers riding buses to and from school and is somewhat restricted in terms of time of occurrence and routes. The typical response across systems is to institute non-policing measures such as school trippers to further isolate the problem, maintain liaison with school officials, and present programs to students describing transit operations and the benefits the system provides to the community.

Robbery of passengers is considered a serious problem in Baltimore, San Francisco, and Los Angeles. The typical robbery is carried out in a matter of a minute or two and most offenders quickly exit the bus to escape on foot. Of the three transit properties, only Baltimore maintains an internal police unit consisting of sworn personnel. San Francisco and Los Angeles maintain security departments comprised of non-sworn personnel. To counter passenger robbery, Baltimore relies on random patrol with transit officers riding buses. San Francisco and Los Angeles, on the other hand, request assistance from local police.

These cases are not intended to show that all bus systems face the same problems or that they implement similar counter measures. San Francisco (MUNI), for example, is the only bus system visited where purse snatching and pocket-picking are deemed major crime problems. Similarly, in response to assault, Los Angeles (SCRTD) relies on liaison with city police while Atlanta (MARTA) emphasizes an inter-personal relations course for drivers and hiring off-duty police to ride problem-route buses on an as-needed basis.

### Subway/Elevated Lines

Subway/elevated lines operate on grade-separated right-of-ways and fixed routes. Scheduling is geared toward passenger density with the number of vehicles in each train and the headway changing throughout the day; being highest during rush hours and lowest

during the late night/early morning hours. In addition to the vehicles, the subway system includes the stations. Characteristics of stations such as the type of platform (island or sidewall), location of token/ticket booth, light level, visual obstructions, and access points differ from one system to the next and are generally related to the age of the stations.

In order to control subway-related crime, transit police units utilized a number of strategies (see Table A-I above). Basic among these anti-crime strategies are:

- Flexible patrol utilizing fixed posts and riding posts with officers deployed both in uniform and plainclothes;

- Saturation of specific areas with officers both in uniform and plainclothes;

- Decoys and stakeouts; and

- Community relations including liaison with neighborhood groups, schools, courts and transit companies.

Several transit properties, in addition, have or are currently installing closed-circuit television (CCTV) as a means to monitor activities in station areas. Like silent alarms and two-way radios installed on buses, CCTV is a crime control measure and an adjunct to manned patrol. Its constant surveillance capabilities are intended to deter potential offenders, aid police in detecting crimes and apprehending criminals, and provide patrons with a sense of security. However, CCTV has not, as yet, been well integrated into police day-to-day operations; the cameras are monitored by transit operations personnel.

To deter crime on subway/elevated lines and protect passengers, transit police units usually employ several strategies concurrently. With minor exceptions, strategies used to police subway/elevated lines emphasize the standard range of patrol-type operations such as fixed and mobile posts, stake-outs and decoys.

Rapid rail systems are always policed by units consisting of sworn officers. In two instances—Chicago (CTA) and Philadelphia (SEPTA)—the units are part of the city police department, while other systems are policed by units under the management control of the transit authorities. While this difference may impact on effectiveness (via personnel selection and assignments, areas of responsibility outside the transit system, and jurisdictional limitations), it seems to have very little bearing on strategy selection. Other factors such as the size of the transit police force relative to

the number of stations and passenger route miles may have greater impact on the deployment of manpower and the selection of strategies.

Additionally, decisions concerning selection of strategies take into account crime-related characteristics. Fare evasion, a crime carried out in a matter of seconds and hundreds of times each day, offers an interesting example. Surveillance by uniformed patrolmen, who have many other areas to cover besides fare gates, has a deterrent effect but only when an officer is visible. Apprehensions are minimal. Several transit police units in New York City, Philadelphia/New Jersey and Oakland/San Francisco (NYCTA, PATCO, and BART) target specific fare collection areas with plainclothes stakeout teams. Transit police chiefs indicate that this tactic increases apprehensions and, when combined with aggressive prosecution, increases deterrence.

Robbery, unlike fare evasion, is not limited to a well defined area and may occur at any place in the system; although it is more likely to take place on station platforms than on trains. To counter this problem, transit police employ random or saturation patrol in an attempt to create an image of omnipresence. When a particular modus operandi or pattern emerges, transit police then target specific locations, using plainclothes personnel in stakeout or decoy operations.

Variables such as the crime level in the neighborhoods surrounding subway stations and the transit company's operating policies frequently impact on the selection of policing strategies. For example, around the clock, fixed patrol posts are established only in stations located in high crime neighborhoods, or a company decision to install CCTV in a number of subway stations may influence a transit police chief to redeploy his men, concentrating on stations not covered by electronic surveillance.

# APPENDIX B

## ENVIRONMENT, OFFENDER AND VICTIM PROFILES

The subsections that follow outline what has been learned from several studies of mass transit crime in recent years. To provide a ready comparison, the details are presented in three profiles of the crime environment, the offender and the victim. They are drawn largely from three studies conducted during the last 10 years and an issue-oriented workshop report:

- Stanford Research Institute and University of California, Reduction of Robberies and Assaults of Bus Drivers, December 1970 (Cited as SRI and University of California, Reduction of Robberies);

- Carnegie-Mellon University, Improvement of Mass Transit Security in Chicago, June 1973 (Cited as "The Chicago Study");

- J. M. Chaiken, et al., The Impact of Police Activity on Crime: Robberies on the New York Subway System, January 1973 (Cited as "The New York Study"); and

- Carnegie-Mellon University, Transportation Research Institute, Security of Patrons on Urban Public Transportation Systems, Pittsburgh, Pennsylvania, 1975.

A number of articles and derivative studies are also used where the presentation lends itself to the tabular format used below.

### Environmental Profile

The most serious crimes, especially robberies, occur primarily at night when patronage levels drop after the evening rush hour, during the latter half of the week, and in subway stations more than on subway trains. By contrast, assault and battery and pocket-picking tend to occur when mass transit systems are more heavily used--during daylight hours. The consequences of mass transit crime range from injuries to passengers from assault to cash losses from robberies.

Data reflecting studies of the circumstances of mass transit crime, whose focus has been largely on robbery, are summarized below. See Table B-I for details of the environmental data.

| ENVIRONMENTAL CHARACTERISTICS | | CARNEGIE-MELLON UNIVERSITY "SECURITY OF PATRONS" | | RONALD JOHNSON, "MASS TRANSIT IN CHICAGO." | PAUL GRAY, "ROBBERY AND ASSAULT OF BUS DRIVERS." | SRI AND UNIVERSITY OF CALIFORNIA, "REDUCTION OF ROBBERIES AND ASSAULTS OF BUS DRIVERS.": V.I. |
|---|---|---|---|---|---|---|
| SETTING | PLATFORMS | VARIANCE OF 40 AMONG STATION CRIME RATES. (p.12) "HIGHEST CRIME STATIONS ARE...IN THE AREAS HAVING THE HIGHEST NON TRANSIT CRIME RATE" (p.12) (ALSO TRUE FOR NYC-- p.35) | "MOST ROBBERIES [IN CHICAGO] OCCURRED ON STATION PLATFORMS." (p.34) OR IN LOBBIES AGAINST STATION AGENTS (p.34) 30% ON TRAIN 70% IN STATION (p.35) | 478 (61.2%) OF 782 (p.231) PLATFORMS 304 (38.8%) OF 782 OTHER (CARS) = 304 OF 1086 TOTAL (p.231) | | |
| | LOBBIES | | | | | |
| | SUBWAY CARS/BUSES | | | | | |
| | HIGH CRIME NEIGHBORHOODS | | | | | |
| | UNKNOWN | | | | | |
| MONTH (BY QUARTER) | JANUARY-MARCH | | | | | |
| | APRIL-JUNE | | | | | |
| | JULY-SEPTEMBER | | | | | |
| | OCTOBER-DECEMBER | | | | | |
| | UNKNOWN | | | | | |
| DAY OF WEEK | MONDAY | | | | | |
| | TUESDAY | | | | | |
| | WEDNESDAY | | | | | |
| | THURSDAY | "HEAVIEST ROBBERY PERIODS OCCURRED ON FRIDAY AND SATURDAY NIGHTS." (p.33) | | "50% OF ALL ROBBERIES OCCURRED ON THE WEEK- ENDS [FRIDAY-SUNDAY] (p.229) | | |
| | FRIDAY | | | | | |
| | SATURDAY | | | | | |
| | SUNDAY | | | | | |
| TIME OF DAY | MIDNITE-4 A.M. | "MORE TRANSIT ROBBERIES...DURING NIGHTTIME...THAN... DAYTIME" (p.12) | | (OAKLAND) n = 116 (1967) 78% ROBBERIES OCCURRED BETWEEN 6 P.M. AND 6 A.M. (p.262) | "GREAT MAJORITY OF CRIMES OCCURRED BETWEEN 6 P.M. AND 6 A.M." (p.11) | |
| | 4 A.M.-8 A.M. | | | | | |
| | 8 A.M.-NOON | | | | | |
| | NOON-4 P.M. | | | | | |
| | 4 P.M.-8 P.M. | (CHICAGO) "MAJORITY ...OCCURRED...BETWEEN 6 P.M. TO [SIC] MIDNIGHT" (p.33) | | | | |
| | 8 P.M.-MIDNITE | | | | | |
| | UNKNOWN | | | | | |
| TYPE OF WEAPON | GUN | GUNS "RARELY USED... AGAINST PASSENGERS" (p.12) [CHICAGO] EVEN DIVISION "BETWEEN ARMED AND STRONG- ARMED OFFENSES" (p.33) | | | 60% CASES GUN WAS USED. (n = 707) (p.11) | |
| | KNIFE | | | | | |
| | BODILY | | | | | |
| | OTHER | | | | | |
| | UNKNOWN | | | | | |
| RELATION OF VICTIM TO OFFENDER | STRANGER | | | | | |
| | ACQUAINTANCE | | | | | |
| | RELATIVE | | | | | |
| | UNKNOWN | | | | | |
| MODUS OPERANDI | APPROACH | | | 70% ROBBERIES NOT ON BUS (p.262) | 70% ROBBERS NOT ON BUS (p.11) "TYPICAL...TIMES ARE LESS THAN THREE MINUTES" (p.11) | |
| | CONDUCT | | | | | |
| | ESCAPE | "AS RAPIDLY AS POSSIBLE" (p. 12, 33) | | "GREAT MAJORITY" ON FOOT (p.262) | 97.5% ROBBERS ESCAPED USUALLY ON FOOT (p.11) n = 707 | |
| CRIME CONSEQUENCES | INJURY | "MORE CAUCASIAN THAN BLACK VICTIMS RECEIVED INJURIES." (p.34) PASSENGER LOSS AVERAGED <$20 STATION AGENT >$100 | | 20% ROBBERIES LED TO INJURIES (p.262) AVERAGE LOSS = $117 (p.262) | 85% DRIVERS WERE NOT INJURED (p.11) AVERAGE TAKE = $101 (p.11) | |
| | DEATH | | | | | |
| | LOSS | | | | | |

| ENVIRONMENTAL CHARACTERISTICS | | CARNEGIE-MELLON UNIVERSITY "IMPROVEMENT OF MASS TRANSIT SECURITY IN CHICAGO." | | | J. CHAIKEN, ET AL., "THE IMPACT OF POLICE ACTIVITY ON CRIME." | |
|---|---|---|---|---|---|---|
| SETTING | PLATFORMS | HIGH CRIME AREAS COINCIDE WITH HIGH UNEMPLOYMENT AREAS (p.74) | BUS CRIME DOES NOT SEEM TO CORRELATE TO CRIME LEVELS IN SURROUNDING NEIGHBORHOODS (p.83) | ROBBERS "CONCENTRATE ON A SMALL NUMBER OF STATIONS AND PORTIONS OF TRAIN ROUTES" (p.vii) 1970 = 50%/50% 1971 = 69%/31% STATIONS/TRAINS (p.33) | # ROB. / # STA. / %  <br> 0 — 149 — 30.8 <br> 1 — 105 — 21.7 <br> 2-5 — 159 — 32.8 <br> 6-10 — 53 — 11.0 <br> 10+ — 18 — 3.7 <br> T — 484 — 100 <br> (p.40) | "SUBWAY ROBBERY TENDS TO BE HIGHEST IN AREAS HAVING A HIGH SURFACE CRIME RATE" (p.44) |
| | LOBBIES | | | | | |
| | SUBWAY CARS/BUSES | | | | | |
| | HIGH CRIME NEIGHBORHOODS | | | | | |
| | UNKNOWN | | | | | |
| MONTH (BY QUARTER) | JANUARY-MARCH | APRIL AND AUGUST ARE "LOW DANGER," SEPTEMBER AND DECEMBER ARE "HIGH DANGER" (p.65) | ROBBERIES OCCURRED ON BUSES (p.93) | (JANUARY-APRIL, 1970- 1971) | | |
| | APRIL-JUNE | | | | | |
| | JULY-SEPTEMBER | | | | | |
| | OCTOBER-DECEMBER | | | | | |
| | UNKNOWN | | | | | |
| DAY OF WEEK | MONDAY | | TOKEN BOOTH ROBBERY IS UNIFORM (p.36-37) PASSENGER PEAKS ON SUNDAY | | | |
| | TUESDAY | | | | | |
| | WEDNESDAY | | | | | |
| | THURSDAY | | | | | |
| | FRIDAY | | 50% ROBBERIES ON WEEKENDS (p.59) | | | |
| | SATURDAY | | | | | |
| | SUNDAY | | | | | |
| TIME OF DAY | MIDNITE-4 A.M. | | BUS ROBBERY PEAKED 2-3 P.M. (10%) AND 9 P.M.-MIDNITE (25%) 2 P.M.-MIDNITE (75%) (p.88) | PRE-PATROL: 10 P.M.-6 A.M. 2-4 P.M. POST-PATROL: 2-4 P.M. SOME SHIFT TO PRE 8 P.M. AND POST 4 A.M. (p.36) | | |
| | 4 A.M.-8 A.M. | | | | | |
| | 8 A.M.-NOON | | | | | |
| | NOON-4 P.M. | | | | | |
| | 4 P.M.-8 P.M. | | 67% ROBBERIES OCCUR 6 P.M.-MIDNITE (p.62) (BATTERIES OCCUR ABOUT 2-HOUR EARLIER RANGE) | | | |
| | 8 P.M.-MIDNITE | | | | | |
| | UNKNOWN | | | | | |
| TYPE OF WEAPON | GUN | 33% ROBBERIES/GUNS | | GUN USED ONLY 8% OF PASSENGER ROBBERIES, 3/4 NO WEAPON – TOKEN BOOTH ROBBERIES HAD GUNS OR SIMULATED GUNS IN ALL BUT 7% (p.49) | | |
| | KNIFE | 20% ROBBERIES/KNIVES | | | | |
| | BODILY | 14% ROBBERIES/FISTS, ETC. | | | | |
| | OTHER | 33% ROBBERIES/UNARMED (p.77) | | | | |
| | UNKNOWN | | | | | |
| RELATION OF VICTIM TO OFFENDER | STRANGER | | | | | |
| | ACQUAINTANCE | | | | | |
| | RELATIVE | | | | | |
| | UNKNOWN | | | | | |
| MODUS OPERANDI | APPROACH | SINGLE OFFENDER = FRONTAL APPROACH 2 OFFENDERS = REAR OR FRONTAL OR 2- SIDED APPROACH 3+ OFFENDERS = SEVERAL DIRECTIONS (p.76) | | | | |
| | CONDUCT | | | | | |
| | ESCAPE | QUICKLY ONTO STREET – 75% (p.78) | | ONTO STREET, IN "KNOWN" NEIGHBOR- HOODS (p.vii) | | |
| CRIME CONSEQUENCE | INJURY | 33% ROBBERY VICTIMS HURT (p.77) | | SOME INJURY TO PASSENGER IN ROBBERY (p.49) | | |
| | DEATH | | | | | |
| | LOSS | MONEY, CREDIT CARDS JEWELRY RANGE - $20-$100+ (p.77) | | "TAKE" = $50 PASSENGER ROBBERY $150 TOKEN BOOTH (p.vi) | PASSENGER TAKE RANGE = $41 (1970) $82 (1972) BOOTH = $250 (1970) $127 (1971) (p.50) | |

● Setting

The New York and Chicago studies both show that approximately
one-third of all robberies are targeted on transit system
property--generally token booths. The remaining two-thirds
of the robberies are directed against passengers. Approxi-
mately 70 percent of the passenger robberies studied took
place on subway platforms--many of them "el" platforms located
in older sections of the city that experience high crime
levels. The remaining 30 percent took place inside trains,
either between stations or as they pulled into stations.
Stations and routes that experienced high levels of robbery
tend to be located in areas with high levels of crime on
the surface, although there is evidence from New York that
the mobility offered by mass transit systems permits some
crime to occur in stations and on routes that pass through
otherwise low crime areas (see Figure B-1).

● Month (by Quarter)

Time of year does not appear to be a major factor in the
rate of robberies, although there are indications that the
months of February, May and August are less risky and
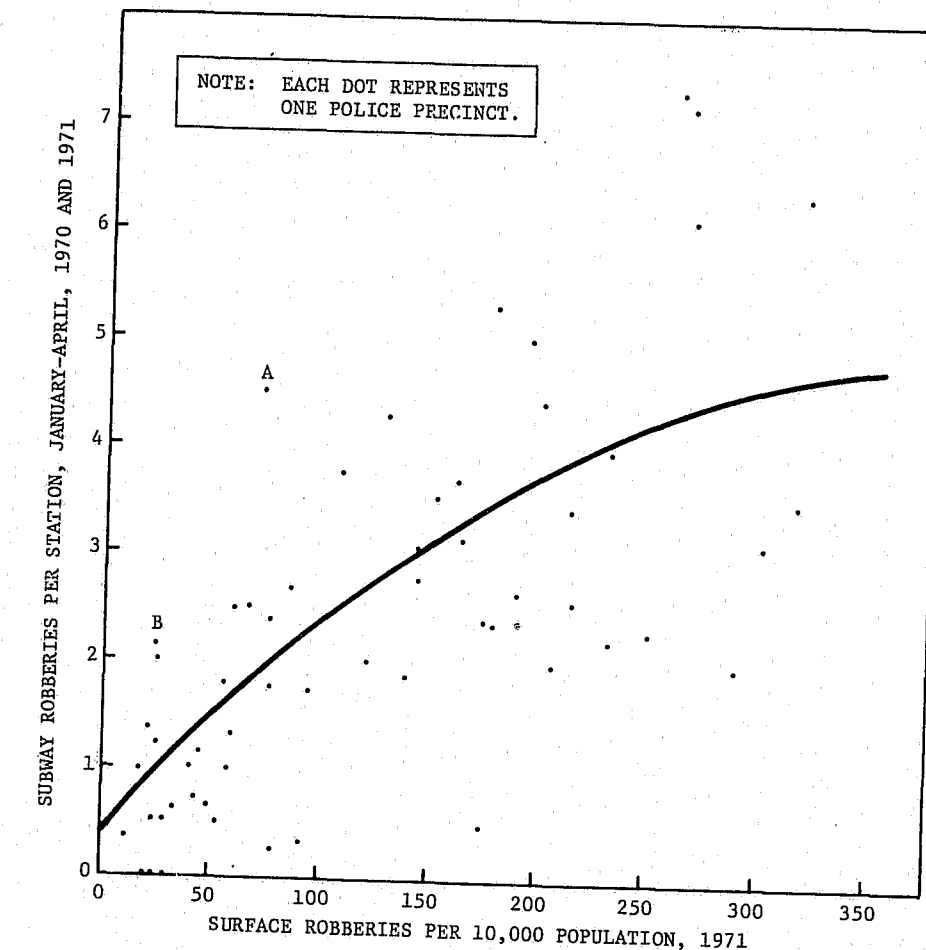September and December are more risky than other times of
the year.

● Day of Week

Subway robbery appears to differ from robbery on buses as
recorded in the 1960's in respect to the day of week. As
with commercial robbery nationwide, station token booth
robbery increases towards the end of the week and on Sunday.
On the other hand, robbery of subway passengers seems to
peak on Wednesdays and falls off on Sundays (see Figure B-2).

● Time of Day

With the exception of a peak between the weekday hours of
2 p.m. and 4 p.m., when schools let out, mass transit robbery
is a crime of the nighttime hours. When bus driver robbery
was a problem, 78 percent of the robberies occurred between
6 p.m. and 6 a.m. The figures vary among the studies, but,
in the absence of intensive policing, robberies peak between
the hours of 6 p.m. and 12 midnight (Figure B-3). In New York,
after intensive patrolling was introduced between the hours
of 8 p.m. and 4 a.m., robberies tended to peak between 6 p.m.
and 8 p.m. and then again between 4 a.m. and 5 a.m. (see
Figure B-4). (The accuracy of these time distributions is
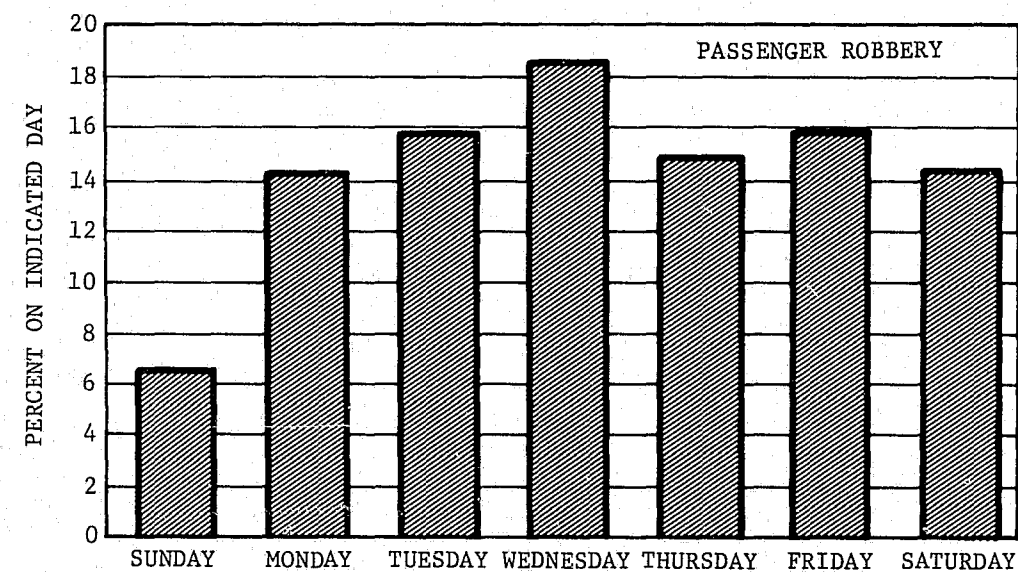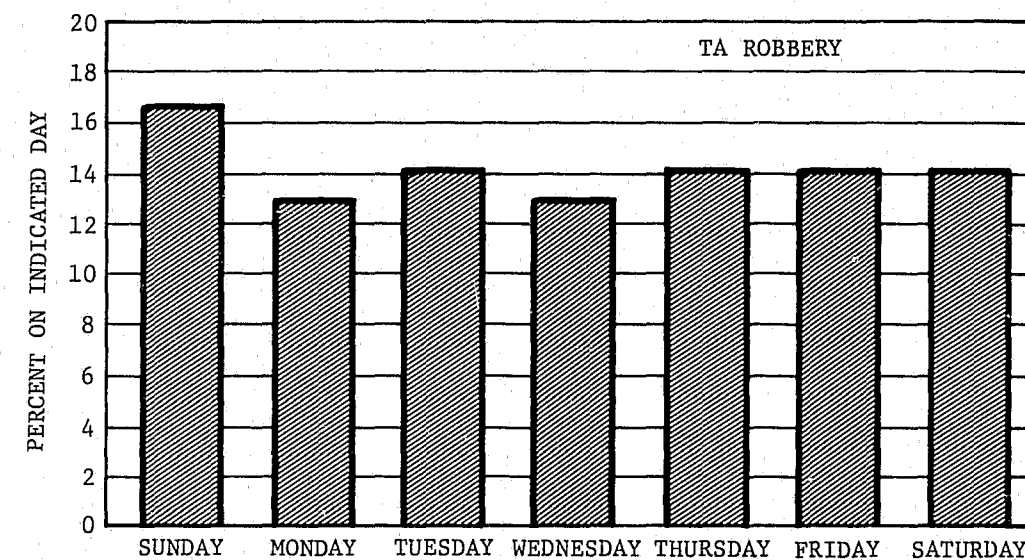questionable because of potential errors in recording the
time of occurrence.)

B-4



EACH POINT ON THE GRAPH REPRESENTS A SINGLE PRECINCT, AND THE
SMOOTH CURVE IS THE LEAST-SQUARES FIT OF A QUADRATIC CURVE TO
THE DATA. (A FEW HIGH-CRIME PRECINCTS INCLUDED IN THE REGRES-
SION ARE BEYOND THE SCALE OF THE GRAPH.) THE CURVE INDICATES
THAT THE SUBWAY ROBBERY RATE INCREASES STEADILY WITH INCREASING
SURFACE CRIME RATES, ALTHOUGH PRECINCTS WITH HIGH SURFACE ROB-
BERY RATES HAVE LESS SUBWAY CRIME, ON THE AVERAGE, THAN WOULD
BE EXPECTED BY EXTENDING THE PATTERN FOR LOW-CRIME PRECINCTS
IN A STRAIGHT LINE. THIS FACT, TOGETHER WITH THE POSITIVE
INTERCEPT OF THE CURVE AT THE AXIS REPRESENTING ZERO SURFACE
ROBBERIES, CONFIRMS THAT THE SUBWAYS DO TEND TO TRANSFER SOME
CRIMES FROM HIGH-CRIME AREAS INTO LOW-CRIME ONES.

[POINTS "A" AND "B" ARE EXTREME EXAMPLES OF THE PHENOMENON.]

SOURCE: Jan Chaiken, et al., The Impact of Police Activity
On Crime, p. 48.

FIGURE B-1
REPORTED SURFACE AND SUBWAY ROBBERIES IN NYC POLICE PRECINCTS

B-5

SOURCE : The Impact of Police Activity on Crime, p. 38.

FIGURE B-2
DISTRIBUTION OF REPORTED SUBWAY ROBBERIES BY DAY OF
WEEK, JANUARY-APRIL 1970 AND 1971
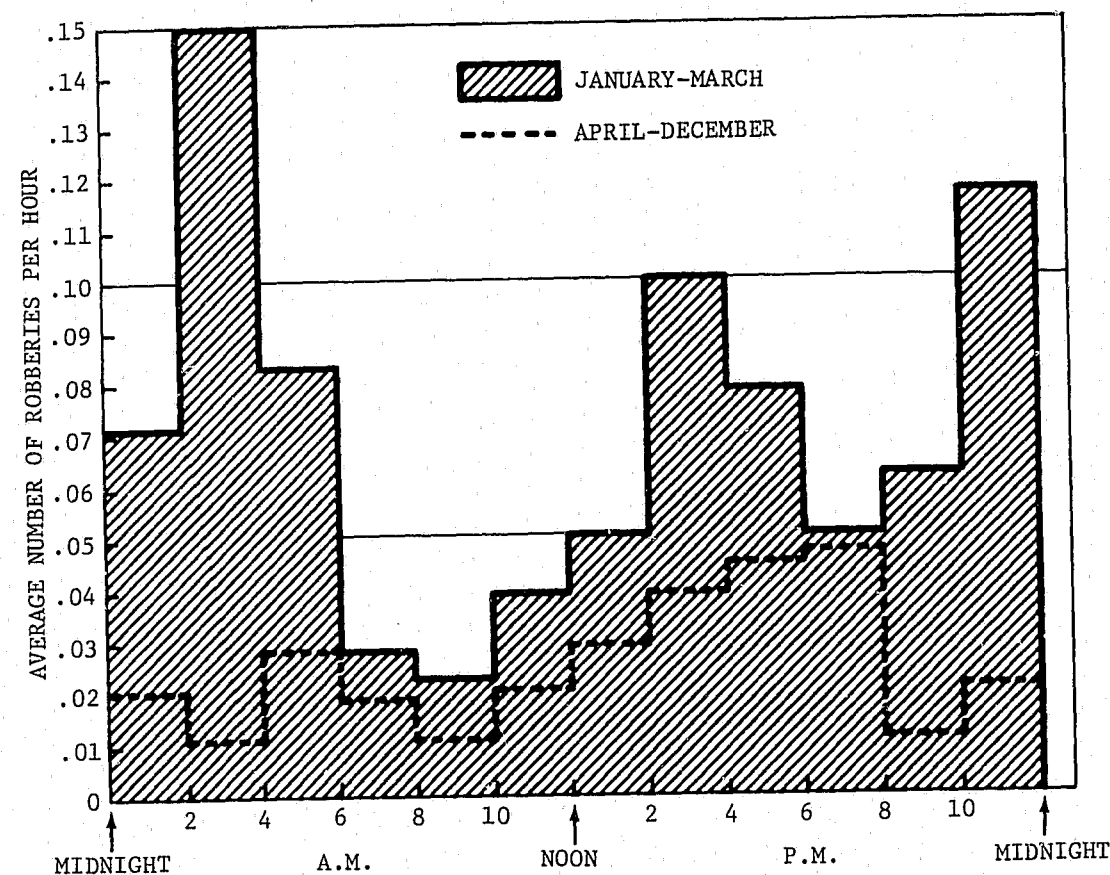
B-6



3 HOUR PERIODS FROM NOON TO NOON THE FOLLOWING DAY

SOURCE: Robert Shellow, et al., "Crime in Rapid Transit Systems: An Analysis and Recommended Security and Surveillance System," In Crime and Vandalism Public Transportation, p. 4.

FIGURE B-3
ROBBERY REPORTS (BY TIME PERIOD)

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.15
.14
.13
.12
.11
.10
.09
.08
.07
.06
.05
.04
.03
.02
.01
0

AVERAGE NUMBER OF ROBBERIES PER HOUR

JANUARY–MARCH

APRIL–DECEMBER

2  4  6  8  10  2  4  6  8  10

MIDNIGHT      A.M.      NOON      P.M.      MIDNIGHT

SOURCE: The Impact of Police Activity on Crime, p. 33.

FIGURE B-4
AVERAGE NUMBER OF REPORTED SUBWAY ROBBERIES PER HOUR
BEFORE AND AFTER INSTITUTION OF TAPD EXTRA SHIFT, 1965

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● Type of Weapon

The use of weapons varies dramatically with the type of
robbery. Token booth and bus driver robberies almost
always (93 percent) involve firearms or simulated guns.
On the other hand, robbery of passengers involves guns
only 8 percent of the time. Ordinarily, fists and strong-
arm tactics are used (75 percent of the instances). The
remaining 17 percent involve knives, clubs or simulated
firearms.

● Relation of Victim to Offender

No data were available. (Presumably the mobility offered
by transit systems would make stranger-to-stranger confronta-
tions likely.)

● Modus Operandi

Little is available about the methods of conducting rob-
beries against transit employees or passengers. The Chicago
study found that passengers were approached by lone robbers
from the front, by pairs of robbers from any direction, and
by three or more from several directions at once. During
the crime itself, there is a great risk of violence, with a
high injury rate. In all instances, the escape of the per-
petrator is rapid, almost always on foot and generally out of
the station or away from the bus via a route not likely to
encounter other individuals.

● Crime Payoff

Estimates of the "take" in mass transit robberies vary con-
siderably. Passenger robberies may net an average as high
as $50, while token booth robberies may average as much as
$150. In some instances of robbery, the take involves
property in addition to cash. Take figures for other crimes
are not given.

Other observations regarding mass transit as an environment for
crime are in order, although they are not derived from the data. Mass
transit is a single-purpose milieu that is designed for moving large
numbers of people along predetermined routes or fixed guideways (i.e.,
rail). Moreover, the dominant activity on a mass transit system is
under a central control: the system operator, whose function is to
maintain system service. Criminal activity is one of a number of
factors that interfere with the delivery of service to riders and
ranks with equipment failure and system maintenance as items for

B-9

operator concern. Consequently, the motivation for fielding counter-measures to crime can vary and may depend as much on transit operator policy as on public response to crime levels.

## Offender Profile

Most mass transit offenders are reportedly young black males whose age and modus operandi vary with the targets of their crime. Passenger robbers are usually not armed, average 17 years of age and operate in groups of two or three. Token booth robbers are usually armed, average 22 years and operate singly or in pairs. The older robbers are likely to have several robberies on their records, although it is not clear that these are always transit-related crimes.

Data on offenders are summarized below and are presented in Table B-II.

- ### Residence

  Little is known about the residence of transit robbers, although the Chicago study found that approximately 26 percent (140) of 540 robberies involved offenders living in the same police district as the reported crimes. It may also be inferred that robbers tend to live close to their mass transit targets from the observation that they choose locations that are well known to them in order to more readily escape.

- ### Location of Offense (In relation to Offenders Residence)

  See Residence above.

- ### Sex

  Subway and bus criminals are almost always male (as much as 95 percent). This figure is consistent with the measurements of robbery perpetrators nationwide.

- ### Race

  The majority of mass transit crimes are reportedly committed by blacks (up to 90 percent), although the ratio of black to white varies according to the type of robbery. It appears that a greater proportion of token booth robbers are white than are passenger robbers.

TABLE B-II

MASS TRANSIT CRIME PROFILE - OFFENDER CHARACTERISTICS

| OFFENDER CHARACTERISTICS | | CARNEGIE-MELLON UNIVERSITY "SECURITY OF PATRONS..." | J. CHAIKEN, "THE IMPACT OF POLICE ACTIVITY ON CRIME..." | SRI AND UNIVERSITY OF CALIFORNIA, "REDUCTION OF ROBBERIES AND ASSAULTS OF BUS DRIVERS," V.I. | CARNEGIE-MELLON UNIVERSITY, "IMPROVEMENT OF MASS TRANSIT SECURITY IN CHICAGO," APPENDIX |
|---|---|---|---|---|---|
| CITY RESIDENT | YES | | | | |
| | NO | | | | |
| | UNKNOWN | | | | |
| | IN OFFENDER'S CENSUS TRACT | | | | |
| | OUTSIDE OFFENDER'S CENSUS TRACT | | | | |
| | UNKNOWN | | | | |
| SEX | MALE | "TEND TO BE...MALE" (p.12) (CF-RAND) (p.33) | | "OVER 95 PERCENT" (p.12) | 1112 (97.8%) |
| | FEMALE | | | | 11 (1.0%) |
| | UNKNOWN | | | | 11 (1.0%) n = 1134 (p.72) |
| RACE | BLACK | "TEND TO BE...BLACK" (p.12) (CF-RAND) | "GENERALLY" (p.vi) "OVER 90 PERCENT" (p.49) 85% ARRESTEES (p.49) | "90 PERCENT" (p.12) | 1094 (96.6%) |
| | WHITE | | | | 18 (1.6%) |
| | CHICANO | | | | 8 (.7%) |
| | OTHER | | | | 13 (.9%) |
| | UNKNOWN | | | | n = 1133 (p.73) |
| AGE | LESS THAN 18 | "TEND TO BE EXTREMELY YOUNG" (p.12) (CF-RAND) | PASSENGER ROBBERS AVERAGE AGE WAS LESS THAN 17 TOKEN BOOTH ROBBERS AVERAGE 22 (p.vi, p. 49) | "MOST...WERE BETWEEN 16 AND 20" (p.12) | <16/87 (8%) |
| | 18-24 | | | | 16-20/495 (46%) |
| | 25-50 | "MOST WERE UNDER 30" (p.33) (CF-CHI., p. 49) | | | 21-30/415 (38%) |
| | OVER 50 | | | | 31-50/72 (6.6%) 51-65/1 (.1%) |
| | UNKNOWN | | | | 16 (1.5%) n = 1086 (p.73) |
| EDUCATION | LESS THAN 8TH | | | | |
| | 8TH-11TH | | | | |
| | HIGH SCHOOL | | | | |
| | MORE THAN HIGH SCHOOL | | | | |
| | UNKNOWN | | | | |
| EMPLOYMENT STATUS | EMPLOYED | | | | |
| | UNEMPLOYED | | | | |
| | UNKNOWN | | | | |
| OFFENDER SITUATIONS | ALONE | | "FREQUENTLY OPERATE IN GROUPS" (p.vi) "TOKEN BOOTH ROBBERS... OPERATE SINGLY OR IN PAIRS" (p.vi) 3/4 OF THESE WERE SINGLE (p.49) | 43% (p.12) 33% (p.12) | 432 (38%) |
| | 2 | "OFTEN BELONG TO GROUPS" (p.12) | | | 313 (28%) |
| | 3 | | | | 247 (22%) |
| | 4 OR MORE | | | | 137 (12%) |
| | UNKNOWN | | | | n = 1129 (p.72) |
| CRIMINAL RECORD | ROBBERY | "SOME...CAREERS INCLUDE A LARGE NUMBER OF CRIMES" (p.12) (CF-RAND) | OF 29 ARRESTEES, MOST WERE ASSOCIATED WITH 3 OR FEWER HOLDUPS (p.51) | | |
| | VIOLENCE | | 18 ARRESTEES WERE RESPONSIBLE FOR 34% OF 663 TOKEN BOOTH ROBBERIES (p. 55) | | |
| | OTHER | | | | |
| | UNKNOWN | | "MANY [TOKEN BOOTH ROBBERS] ARE NARCOTICS ADDICTS" (p.vi) | | |

- Age

  Mass transit robbers are usually young. Passenger robbers
  average 17 years while token booth robbers average 22 years.
  These figures are consistent with the national profile for
  robbers, where the age range is 19 to 24 years.

- Education

  No data are available.

- Employment Status

  No data are available.

- Modus Operandi

  The numbers in which offenders operate depends on the target
  of the crime. Token booth and bus driver robbers tend to
  operate in ones and twos (approximately 75 percent of all
  reported transit property robberies involved one or two
  perpetrators) while passenger robberies involve groups of
  two and three perpetrators at least half the time.

- Criminal Record

  As is true for robbers generally, transit offenders are
  not novices, with many having two to four transit robberies
  to their credit. One sample of 18 arrested suspects found
  that they had committed 34 percent of 663 token booth rob-
  beries in New York in 1970. Another sample showed 24 of 29
  suspects were heroin addicts.

### Victim Profile

Both the Chicago and New York studies show that most targets of
mass transit robbery are either transit system employees engaged in
handling money for the system (token booth operators and bus drivers)
or members of the riding public. Concession operators and transit
employees not handling money are not often robbed. By definition,
the direct victims of vandalism are the properties of the transit
system. Furthermore, there is some speculation that vandalism is
instrumental in eroding the public's sense of confidence in transit
systems, with the side effect of costing the transit companies revenues
from fares. Assault and battery victims are passengers.

The victim data that are available are summarized below and are
presented in Table B-III.

- Residence

  Only sketchy data are available.

- Location of Offense (In relation to Victim Residence)

  No data are available.

- Sex

  The data from the Chicago study indicate that most passenger
  robbery victims are male (67 percent). Other studies are
  less precise, declaring that victims are "generally" male.

- Race

  The race of victims varies with their sex and the nature
  of the crime. Two-thirds of the male robbery victims are
  Caucasian, while only one-third of female victims are
  Caucasian.

- Age

  Data on the age of victims are sketchy. It appears that
  most victims (63 percent) are between the ages of 21 and 50
  and that female black victims tend to be younger than their
  Caucasian counterparts.

- Victim Situations

  The data vary widely regarding the size of victim groups.
  The Chicago study indicated that 75 percent of robbery
  victims on subways were alone, 12 percent were in groups
  of two and 10 percent in groups of three. Almost no groups
  of four or more were robbed. In the case of bus robberies,
  56 percent occurred when no passengers were riding the bus.
  Even when passengers were riding buses, the robbery was
  limited to the bus driver.

- Employment Status

  The Chicago study indicates that most robbery victims are
  transit system employees, students or service workers.

MASS TRANSIT CRIME PROFILE - VICTIM CHARACTERISTICS

| VICTIM CRIME PROFILE | | CARNEGIE-MELLON UNIVERSITY "SECURITY OF PATRONS" | RONALD JOHNSON, "MASS TRANSIT IN CHICAGO." | PAUL GRAY, "ROBBERY AND ASSAULT OF BUS DRIVERS." | SRI AND UNIVERSITY OF CALIFORNIA, "REDUCTION OF ROBBERIES AND ASSAULTS OF BUS DRIVERS," V.I. | CARNEGIE-MELLON UNIVERSITY "INVOLVEMENT OF MASS TRANSIT SECURITY IN CHICAGO." | CARNEGIE-MELLON UNIVERSITY "INVOLVEMENT OF MASS TRANSIT SECURITY IN CHICAGO," APPENDIX |
|---|---|---|---|---|---|---|---|
| CITY RESIDENT | YES | | | | | | |
| | NO | | | | | | |
| | UNKNOWN | | | | | | |
| LOCATION OF OFFENSE | IN VICTIM'S CENSUS TRACT | | | | | | |
| | OUTSIDE VICTIM'S CENSUS TRACT | | | | | | |
| | UNKNOWN | | | | | | |
| SEX | MALE | | "MORE THAN 50% MALE (p.33) | "MAJORITY WHITE MALES" (p.230) | | | 70.2% |
| | FEMALE | | | | | | 28.6% |
| | UNKNOWN | | | | | | 1.2% n = 1041 (p.65) |
| RACE | BLACK | | "OVER 50%" (p.33) | "OF FEMALE VICTIMS, A SIZE-ABLE MAJORITY WERE BLACK (p.230)[38] "MAJORITY... WHITE MALES" (p.230) | | | 40.6% |
| | WHITE | | | | | | 52.9% |
| | CHICANO | | | | | | 4% |
| | OTHER | | | | | | 2% |
| | UNKNOWN | | | | | | .6% n = 1039 (p.65) |
| AGE | LESS THAN 18 | | "MOST...UNDER 50" (p.33) | | | | 3.7% <16 |
| | 18-24 | | | | | | 16 <11.1% <20 |
| | 25-50 | | | | | | 21 <35.7% <30 31 <27.8% <50 |
| | OVER 50 | | | | | | 51 <14.9% <65 65 <4.5% |
| | UNKNOWN | | | | | | 2% n = 997 (p.64) |
| VICTIM SITUATION | ALONE | | "TEND" TO BE ALONE (p.12) ALMOST ALWAYS ALONE (p.33) | "GENERALLY... ALONE" (p.230) | .56% (ALONE BUS DRIVERS, NO PASSENGERS) (p.262) 40% OF 500 CASES, DRIVER WAS ALONE, 30% OF CASES, 1-4 PASSENGERS (NOT ROBBED) (p.11) | "OVER 90%" (p.68) | 93.1% |
| | 2 | | | | | "A FEW" (p.68) | 5.1% |
| | 3 OR MORE | | | | | ALMOST NONE (p.68) | 1.6% n = 1128 (p.64) |
| EMPLOYMENT | EMPLOYED | | "C.T.A. EMPLOYEES...STUDENTS, AND SERVICE WORKERS WERE PREVALENT." (p.33) | | | BUS DRIVERS | CTA EMPLOYEES 18.4% SERVICE 16.7% |
| | UNEMPLOYED | | | | | | STUDENTS 16.4% CLERICAL 13.4% |
| | UNKNOWN | | | | | | OTHERS ---- n = 961 (p.68) |

[38] TWO-THIRDS OF FEMALE VICTIMS OVER AGE 30 WERE WHITE (p.230).

## Summary

As the profiles indicate, the formal examination of crime on mass transit has focused on robbery, with secondary attention paid to problems of assault and battery and the damage suffered by transit facilities due to vandalism. The dimensions of the problem of pocket-picking are not known, although some studies examine the question. Correspondingly, there is little information available on transit losses due to fare evasion.

An excellent overview of what is currently known about mass transit crime appears in the Carnegie-Mellon workshop report and is reprinted here:[100]

The Chicago findings are reinforced and extended somewhat by similar conclusions from the Rand Study of the New York subway system. In the Rand Study they concluded:

• Except for changes clearly attributable to anticrime activities of the Transit Police or the Transit Authority, the rate of serious crime in the subway system has tended to increase steadily from year to year.

• When a particular type of crime proves to be lucrative and relatively safe, additional offenders will be attracted to it, possibly in lieu of other criminal opportunities. This apparently happened in 1969 with bus robberies, for which the data suggest that some individuals who otherwise would have been committing subway robberies were robbing bus drivers instead.

• The geographical locations of subway crimes are not evenly spread throughout the system but are focused on a small number of stations and the portions of train routes that run between those stations. The high-crime locations can be easily identified from historical data and tend to be where surface crime rates are also high. A finding congruent with the Chicago Study.

• Subway robbers are predominantly young and black, but there are substantial differences between those who rob passengers and those who rob token booths. Many passenger robbers are school-age children, and the bulk of their crimes are committed in the afternoon just after school hours. Few

[100] The Security of Patrons on Public Transportation Systems, pp. 35-36.

passenger robberies involve the use of guns, but many are violent crimes. By contrast, token booth robbers are somewhat older and frequently used guns, but do not often use violence.

• In 1970 about half of all robberies took place in the station while in 1971 more than 70 percent of the robberies took place in the station and the remaining 30 percent aboard the train. Again, confirming the findings of the Chicago Study.

APPENDIX C

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