

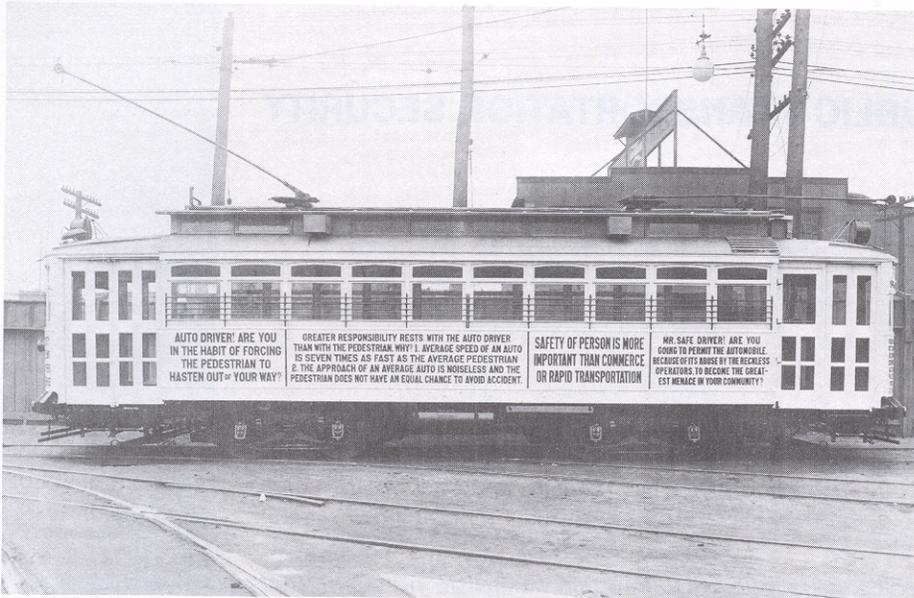
## Chapter 18

### PUBLIC TRANSPORTATION SECURITY

LESTER A. HOEL

The occurrence of crime and vandalism on public transportation systems is a subset of the larger problem of violence against citizens and destruction of property in urban areas. Fear for personal safety and the evidence of vandalism to buildings and property may cause changes in habits and life-styles. People may stay away from high crime areas, move to other neighborhoods, or avoid walking alone at night if there is the perception of danger. Since public transportation systems, both bus and rail, are located within cities and serve all residents, the possibility exists that crime will occur as people travel. Walking to a bus or rail station, waiting for the vehicle to arrive, and traveling on the system are all situations where a person could be assaulted.

Public transportation planners consider attributes such as travel time, cost, comfort, convenience, and availability when evaluating and designing alternatives, but usually underestimate the safety aspect. Transit patrons, however, are becoming more sensitive to their personal safety, and their beliefs will influence decisions to use public transportation. If the system is viewed as dangerous, it is likely that a person will select another mode or defer the trip. In a recent study of the influence of personal security fears on women's travel patterns it was concluded that these concerns should be given a higher profile in transportation planning. Many women, the study noted, avoid placing themselves in vulnerable positions, sometimes not traveling at all.<sup>1</sup> Accordingly, public transportation systems, in addition to being designed on the criteria of economy and efficiency, must include planning procedures that address passenger security. This chapter describes the extent of crime occurrences in public transportation, the options (or countermeasures) available for mitigating the likelihood of crime, and procedures for developing a security program when planning or operating public transportation.



**Figure 18-1** "Transit carries people—there is no more precious cargo."  
 —B. R. Stokes, "A Record of Transit Safety," *Transit Journal*, 2, no. 3 (August 1976), 12.  
 (photo courtesy of American Public Transit Association)

#### EXTENT OF CRIME ON PUBLIC TRANSPORTATION

One of the earliest attempts to measure the number of crimes on public transit was done by Thrasher and Schnell in 1971. The study included 37 U.S. and 4 Canadian systems accounting for 60% of the total vehicle-miles and passenger revenues for all transit authorities in the United States. The study concluded that the risk of being involved in a criminal incident is at least 2 times greater when riding in most major transit systems than in nontransit circumstances.<sup>2</sup> Of 20,899 crimes recorded on the U.S. systems studied, 1623 (or 7.6%) were violent crimes. Data were not reported for bus and rail separately. The extrapolated data indicated that between 33,000 and 39,000 crimes occurred annually on U.S. transit systems. The cost of vandalism was estimated to range between \$7.7 and \$9.9 million of the nation's transit bill for 1971. While vandalism costs were usually less than 0.5% of operating costs, this expense did not reflect indirect costs, including lost revenue while vehicles are being repaired, loss of ridership, insurance and legal fees, and intangibles, such as passenger and employee welfare, customer ill will, and injuries caused by acts of vandalism (for example, throwing stones).

A study of transit crimes in Chicago during 1971 and the first 6 months in 1972 indicated that crimes on rail rapid transit accounted for 84% of all Chicago Transit Authority (CTA) robberies, 92% of all transit crimes against persons, and 53% of all transit battery incidents.<sup>3</sup> Of all transit crimes on the CTA system, 75% occurred on rail rapid transit. When measured against ridership, rail rapid transit crimes were 7.2 crimes per million persons, whereas bus crimes were 0.7 crimes per million persons, or a ratio of 10 to 1.

The Southeast Michigan Council of Governments (SEMCOG) conducted surveys in 1979 and 1981 to determine the extent of crimes on public transportation in the United States and Canada.<sup>4,5</sup> The SEMCOG study divided crimes in two parts. Part 1 included violent crimes, such as murder, robbery, and serious assault, and Part 2, less serious crimes, such as vandalism, drunkenness, and disorderly conduct. When comparing rail and bus, the study data revealed that 29% of crimes on rail rapid transit were Part 1 crimes (serious) compared with only 7% on bus transit. The SEMCOG studies reported that in 1980 there were 31,378 serious incidents (Part 1 crimes), 95,659 less serious incidents (Part 2 crimes), and 155,589 local ordinance violations. The most common types of serious crime were larceny (58%) and robbery (24%). Other serious crimes were motor vehicle theft and burglary (6%). Murder and rape were infrequent, constituting less than 0.4%. The SEMCOG study results indicated that security planning should focus on crimes such as larceny (purse snatching, pickpocketing, and the like), robbery, vandalism, drunkenness, and disorderly conduct.

A survey of transit crime incidence on buses was conducted in 1983 and 1984 for west central Los Angeles by Levine and Wachs.<sup>6</sup> Rather than using crime data as reported by transit authorities, this study, based on a survey drawn from a random sample, interviewed people living in the area. The study also included crimes that occurred when walking and waiting for the bus in addition to crimes on the bus itself. (Many transit authorities resist including crimes outside the system.) The study found that the incidence of bus and bus-related crimes, as reported in the telephone survey, was considerably greater than was reported by the Southern California Rapid Transit District. By extrapolating the incidence rate secured from 1088 households interviewed, it was estimated that between 17,000 and 30,000 bus-related crimes occurred in 1983 within the survey area, compared with only 843 crimes reported for the entire service area. The total number of crimes on the bus ranged from 7000 to 12,000 (46%); at the bus stop, 6000 to 10,000 (32%); and to and from the bus stop, 4000 to 7000 (22%). This study suggested that transit crimes may be significantly underreported for crimes on the system and are a sizable portion of crimes off the system. Sources of bias were underreporting by victims of a crime, an inadequate transit crime recording information system, lack of follow-up by police, and failure to correctly attribute a crime occurrence as transit related. The results suggested that bus transit crime may be a far more serious problem than earlier studies had concluded.

## SECURITY MEASURES FOR BUS TRANSIT

Crimes related to bus transit can occur in three separate environments: (1) while traveling on the bus, (2) while waiting at a bus stop, and (3) while walking to or from the bus stop.

### SECURITY ON BUSES

The problem of robbery of bus drivers has largely been eliminated by the exact-fare, lock-box system used by most public transportation authorities. The threat of an assault always exists, however, as does the possibility of vandalism and rowdy behavior.

There are three strategies to reduce assaults against bus drivers and passengers: (1) create an environment in which a crime will not be attempted (deterrence), (2) furnish devices to enable the driver to summon help (thwarting), and (3) improve the means for capturing the criminal suspect subsequent to the crime (apprehension).<sup>7</sup> Table 18-1 lists various methods that might be used to reduce such assaults.

**TABLE 18-1**  
**Methods for Reducing Robberies and Assaults on Buses**

DETERRENCE	Reduce crowding Eliminate or reduce cash availability Isolate driver in separate booth Furnish extra personnel on buses Furnish police or security guards Publicize security measures
THWARTING	Furnish means to isolate the criminal Furnish alarms on buses Use impregnable strongboxes Immobilize criminal with mace Furnish protective clothing for drivers
APPREHENSION	Furnish two-way radios on buses Furnish covert alarms on buses Use bus-locator systems Mark property with identification Mark criminals with dyes or radioactive particles Use closed-circuit television Photograph bus patrons Take voice prints

Source: Adapted from Paul Gray, "Robbery and Assault of *Bus Drivers*," *Operations Research*, 19, no. 2 (March-April 1971), 261.

Some measures that involve the driver directly, such as being isolated in a booth, carrying firearms or mace, wearing protective clothing, isolating or immobilizing the criminal, and traveling with a security guard, have been found to be unworkable. A

more acceptable approach is the use of alarms intended to aid the driver in summoning help. Types of alarms include (1) a flashing light to signal nearby police, (2) two-way radios, and (3) silent alarms sent to police headquarters (similar to devices used in banks). Coupled with the alarm system could be the use of automatic vehicle monitoring (AVM) systems. AVM, which has been used successfully in rerouting of buses, is based on coded identification located on the sides of the vehicle that is "read" electronically by posts located along the route.

There is some doubt that alarm systems can be effective in thwarting a crime in progress, unless police help happens to be nearby, because of the time required to transmit the alarm, process the information, dispatch aid, and proceed to the site of the crime. Even if alarms or two-way communication were effective in thwarting assaults, they would not likely be used because drivers tend to forget to activate the alarm or are instructed by the criminal (who is generally aware of the system) not to move. The possibility that alarms will be accidentally or falsely triggered always exists, further limiting the credibility of the devices. Despite the general ineffectiveness of alarms and vehicle monitoring systems to stop a crime in progress, they do furnish some reassurance to the driver and passengers. For example, the two-way radio is especially useful as a means of communicating with the dispatcher's office, and although not effective as a crime deterrent, it is used to report a crime, to notify the police of disturbances on the bus (vandals, rowdies, sudden illness, and the like), and to report traffic accidents, breakdowns, bottlenecks, and other emergencies.

The use of photography, perhaps during high-crime periods, has been suggested as a means of identifying criminals active on buses. Although every person would be photographed, the film is processed only when a crime occurs. This method would assist in apprehending the criminal and could be a deterrent. Although widely used by banks to record holdups in process, it is not deemed cost effective for transit buses, nor has acceptance by the riding public been determined.

Some cities have resorted to special transit crime task forces during periods when assault on drivers and passengers became a highly visible problem. These crisis periods occur following a highly publicized assault (for example, a murder) or a series of assaults either on a specific bus route or within a high-crime area of the city. The usual response has been to furnish a police detail that is assigned to the problem. For example, following a series of assaults on bus drivers in the Los Angeles area, a special roving unit of the Inglewood (California) Police Department was given the problem. Their approach was to be highly visible to the riding public, to follow buses and board them at random times, and to respond rapidly to calls for help. Similar techniques have been used in other cities when public outcry demanded immediate attention. In the Los Angeles area, the program was discontinued after the problem was "solved." The technique of assigned police protection, highly visible and randomly applied, is extremely effective, because it provides an element of surprise. The uncertainty in the criminal's mind as to the likelihood of capture severely reduces illegal activities, and criminals move elsewhere. This method, however, is costly and has been used primarily when special problems arise and not during periods when relative calm prevails.

## SECURITY FOR BUS STOPS

The study by Levine and Wachs examined three bus stop locations where the largest number of crimes had occurred. Factors contributing to crime differed for each stop, which suggests that a site-specific analysis is required to correct security problems.<sup>8</sup> This result is consistent with findings for accident locations at urban intersections. Each location must be examined separately to determine the root cause of the problem and then countermeasures implemented to correct the situation.

The causes reported for the three high-crime bus stops were:

1. Pedestrian crowding. Petty thieves could snatch purses, pick pockets, and easily remove jewelry.
2. Dangerous urban location. The stop was near an area that fostered a criminal element. Activity included prostitution, drug sales, adult book stores, and bars.
3. Elderly residence near a high school. Intense crowding when school closed encouraged rowdiness, and petty thefts.

The following strategies were proposed.

Case 1: Create a bus shelter that separates the waiting passengers from other pedestrians on the sidewalk.

Case 2: Move the bus stop to a safer location several blocks away where lighting was better. Close down the bar near the bus stop that was the center of the drug trade.

Case 3: Furnish a limited police presence at school closing hours, reschedule buses to reduce crowding, and institute an education program at the high school.

An interagency task force, comprised of transit agency personnel, police, and elected officials, was appointed to consider the various options, because coordination and cooperation among interested and responsible groups are essential for success. The only strategy that was implemented was to close down the bar in case 2.

## SECURITY WHEN WALKING

Countermeasures for crimes that occur while walking to or from a bus stop are also related to the environment in which the crimes occur. Elderly or transit-dependent riders are most likely to be assaulted because they ride most often and are perceived as vulnerable. People feel most safe in daylight hours and many are fearful to ride transit during the evening. This problem can be addressed by a neighborhood effort to provide more lighting, escort services, police, and sidewalks. A "business watch" similar to neighborhood watches, using private security personnel with local police coordination, would create a safer sidewalk environment.

## SECURITY MEASURES FOR RAIL RAPID TRANSIT

Transit security measures for rapid transit systems have been directed primarily at station areas, because these are the locations of highest crime occurrence and greatest passenger vulnerability. The principal objective of station-related security countermeasures is that passengers be visible to transit personnel, police, and other passengers so that criminal acts are prevented or help is summoned quickly and so that passengers have the perception of a safe environment. Accordingly, architectural design of transit station areas should include consideration of the following features:

- Clear lines of sight unobscured by columns and concessions. Ticket collection booth centrally located for greatest visibility. Straight corridors and passageways, with ample width and good lighting.
- Closed-circuit TV monitors on platform areas and other hidden locations.
- High levels of illumination.
  - Clearly defined station and circulation areas no larger than needed for passenger boarding and alighting.
  - Provision of variable-size areas for peak and off-peak periods to avoid passenger isolation and feelings of vulnerability.
  - Minimum number of exit and entry points.
- Locked and supervised toilet facilities.
  - Clearly defined corridors and waiting areas partitioned from storage and nonpublic spaces.
  - Fences, one-way gates, and other directional devices to control passenger flow.

Rapid transit stations and vehicles can also be made more secure by the provision of communication aids to summon help if a crime occurs. Two types are available: alarms and closed-circuit television.<sup>9</sup>

A simple warning alarm could be used to attract attention or summon police. Silent alarms, for example, are sometimes used by transit ticket agents to alert police of a problem in the station. As with alarms on buses, these devices suffer from the fact that response time is usually too long, passengers may be fearful of attracting attention and not activate the alarm, little information is transmitted by an alarm, and many calls will prove to be false. Telephones with a direct line to the security office can also act as alarm devices, and these have been installed in some transit systems. Telephones can serve to reassure passengers and furnish information as well as assist in calling for help.

Continuous closed-circuit television monitoring is an effective means of visually inspecting station areas from a central control point. Cameras directed at various places, such as passageways, stairs, platforms, and telephone locations, can be called up on a central monitor, when desired, to furnish information about activity anywhere in the station. These devices may also be used to verify a telephone request for help or information. The benefits of continuous television monitoring of transit station areas

could suffer from the effects of boredom or fatigue on the observer's ability to detect and report a crime in progress. The likelihood that a crime will be observed at all further depends on the presence of an active television scan at the time. Accordingly, four features are recommended in a surveillance system:

1. *Movable gates or barriers.* Limit the accessible platform area to the space required by a reduced train length during off-peak hours.
2. *Emergency telephones.* Locate direct-line, push-button-activated telephones in the restricted area. The calls are automatically placed to a central security area.
3. *Closed-circuit TV cameras.* Provide cameras activated by push bars or telephone.
4. *Public address systems.* Provide a system for use by staff observing the television monitors to reassure passengers, call to vandals, or provide information.

### FACTORS INFLUENCING TRANSIT SECURITY

A procedure for assessing the adequacy of transit station security was developed for use on the San Francisco Bay Area Rapid Transit (BART) system by the University of California at Berkeley.<sup>10</sup> The procedure was based on station and environmental attributes and expectations regarding impacts on security. The following elements provide the highest levels of security according to this evaluation:

- Aerial and surface stations.
  - Fewer station levels.
  - Higher passenger volumes.
  - Suburban stations in residential areas.
  - Lower land-use densities.
  - Absence of parking.
  - Limited number of exits.
  - Short walking distances to station agents, major user paths, or courtesy phones.
  - Good lighting.
  - Open areas unsuitable for hiding.

It should be noted that some of these elements (for example, the absence of parking and lower densities, especially in suburban areas) may not be conducive to increased patronage.

Transit security can be improved by incorporating various policies, procedures, design features, and technologies into a rapid transit system. These crime countermeasures have been divided into five categories: (1) hardware/device related, (2) station/vehicle design related, (3) personnel/operations related," (4) judicial policy related, and (5) land use related." Examples of each type are shown in Table 18-2.

**TABLE 18-2  
Crime Countermeasures**

**HARDWARE/DEVICE RELATED**

Alarm-activated 35mm camera at exit  
 Alarm-activated video tape  
 Burglar-type alarms (hidden) for movement detection  
 Chemical detection devices  
 Closed-circuit TV  
 Locked fareboxes  
 Medium-volume traffic flow  
 Metal detectors  
 Occupancy detection  
 Passenger-activated alarms  
 Prescreened riders  
 Prevention of fare evasion  
 Public address systems  
 Telephone (radio) communication between passengers and security  
 Voice monitors  
 X-ray devices

**STATION/VEHICLE DESIGN RELATED PERSONNEL/OPERATIONS RELATED**

Adaptive space	Aerial patrols
Attractive, clean transit property	Curfews
Automatically sealed exits	K-9 patrols
Barriers and fences	Nonscheduled train stops
Climate control	Plainclothes detectives
Elevated guideways	Police decoys
Elimination of station restrooms	Presence of transit personnel
Good lighting	Publication of incidents
Nonbreakable windows	Reduction of number of cars during off-peak
Open design	Reduction of operating hours
Single exits	Saturation patrols/random patrols
Translucent doors in restrooms	School and community PR programs
Vandalproof surfaces	Selective/off-peak closing of stations\
	Visible, uniformed security force

**JUDICIAL POLICY RELATED**

Differential penalties  
 Mandatory sentencing  
 Rapid processing

**LAND USE RELATED**

Landscaping  
 Site selection  
 Station/use integration

Source: Adapted from I. Jacobson and others, *Automated Guideway Transit System Passenger Security Guidebook*, Final Report, prepared by Dunlap and Associates, Inc., for UMTA, Report no. UMTA-MA-06 0048-79-7 (Washington, D.C.: U.S. Government Printing Office, March 1980), pp. 9-10. Now available through NTIS.

## A PLANNING PROCESS FOR TRANSIT SECURITY

A unified set of procedures for incorporating security concerns in the planning or operational aspects of public transportation has been developed.<sup>12</sup> While intended for transit station application, they are appropriate as well for other transit situations. The steps in the planning procedure are illustrated in Table 18-3.

TABLE 18-3  
Security Planning Process

Step 1:	Assess current situation
Step 2:	Document or anticipate crime problems
Step 3:	Establish security design goals and select possible countermeasures
Step 4:	Evaluate possible countermeasures
Step 5:	Consider limits and constraints
Step 6:	Consider trade-offs with other factors
Step 7:	Establish design and countermeasure strategy

Although the table implies a linear sequence of steps, the process is actually interactive, involving coordination of information, assessment of realistic options, community input, and field testing. A description of each task follows:

1. *Assess the current situation.* Collect relevant information about the existing or proposed transit project, neighborhood characteristics, and crime statistics and surveys of users. The information should include demographic characteristics, perceptions and experiences with crime in each neighborhood, and special area characteristics.
2. *Document or anticipate crime problems.* Identify probable or actual crime problems. For example, areas with a large teenage population or high unemployment rate are likely to have security problems. Area police can provide valuable information.
3. *Establish security design goals and select possible countermeasures.* Determine goals based on the crime problems anticipated (for example, minimize the exposure time of transit patrons). Various countermeasures that complement each other (for example, good lighting, random patrols, and short waits) and are focused on the specific criminal activity involved should be assembled as a package.
4. *Evaluate possible countermeasures.* Evaluate the strategies considered for each situation in terms of effectiveness, operating and capital cost, design implications, feasibility, and flexibility.
5. *Consider limits and constraints.* Consider such factors as finances, politics, community needs, and system functions.

6. *Consider trade-offs with other factors.* Consider any conflicts that security considerations may have with other transit system goals. For example, single exits are preferred for security purposes but can pose safety hazards. Exact-fare requirements are used to limit robberies but may be an inconvenience. Similarly, some security measures may cause difficulties for handicapped persons.

7. *Establish design and countermeasure strategy.* Design key features into the system to provide a minimum set of countermeasures that provides adequate levels of perceived security. Provide selective treatment for targeted high-crime areas. Focus major security efforts where needed. Rank possible countermeasures for each site, assess economic limits, and select the most cost-effective solution within given constraints.

## VANDALISM

*Vandalism*, the willful destruction of property, is a constant problem for transit agencies. Vandals are usually school-age children, and the crime is viewed as an aspect of juvenile delinquency. The types of destruction to transit property include breaking windows, ripping seats, graffiti, and stoning moving vehicles.

The short-term goals of transit agencies are to protect its patrons, to protect its property, to apprehend and prosecute those who vandalize, and to minimize adverse effects on ridership. The long-term goal is to modify the behavior of vandals in such a manner that they will not choose to destroy transit property. Thus, techniques used by transit agencies to combat vandalism include (1) requiring vandals to do community service removing graffiti, (2) using vandalproof materials for seats and windows, (3) using easy-to-clean surfaces to facilitate removal of graffiti, (4) eliminating or making it difficult to purchase spray paint, (5) using police-alarm systems, (6) using helicopter patrols, (7) establishing education programs in schools, (8) cooperating with judicial and school authorities, and (9) maintaining surveillance, fencing, and locked gates to prevent access to storage yards.

Broken windows on buses comprise the largest single replacement cost item. Some transit systems, where problems are minor, are installing low-cost tempered safety glass. More costly break-resistant materials such as coated acrylic or polycarbonate are often used in higher-crime areas. Damaged seats are the second largest cost item, and transit systems have resorted to fiberglass seats that resist the vandal's knife. Hard seats, while puncture-proof, are less comfortable and furnish inviting surfaces for graffiti.

Graffiti is an act of vandalism that is difficult to counteract. The use of strong cleaning compounds, working with suppliers to withhold sales of spray paint, and the use of surface materials that can be cleaned easily have all been tried, but with little success, especially in larger cities. Much graffiti is acquired while the vehicles are in

the storage yard, so secure yards are an important deterrent. The extra expense of yard security can be at least partially offset by lower cleaning costs.

A serious problem is the stoning or derailing of vehicles by youths. These acts cause extensive damage to moving buses and trains and have killed or injured drivers and passengers. The use of helicopters to spot trespassers and vandals on railroad property has been successfully demonstrated. Youths walking on railroad property are in personal danger, and stonings of trains have been costly to the railroads.

Several transit agencies and railroads have worked directly with schools by coupling talks about transit safety with the problems of vandalism. The effectiveness of this approach depends on the ability of the speaker to communicate the seriousness of the problem to the students, the extent of cooperation by school authorities, and the follow-up of the talks with other types of reinforcement. Special programs directed at schools located along rail lines where stonings are a serious problem have contributed to reducing the number of incidents. Football players have been used effectively as role models to make presentations in schools about the problems of vandalism and to explain the students' responsibility as good citizens.

#### FURNISHING POLICE SERVICES

When transit networks cross political boundaries, the question of police jurisdiction over control of the system can become an issue. The matter is especially relevant for large rapid transit systems because of their physical isolation from the city and the many communities that these systems serve.

The viewpoint of many public transit managers is that crime on transit is but a part of the overall urban crime problem and, therefore, is the responsibility of the local law enforcement agency. They contend further that the existence of a rapid transit line does not create new crime and, in fact, the existence of public transit could assist police on foot in moving about the city. Management is also concerned that the additional burden of a separate police force will further strain its budget, and, with rising deficits, the prospect of additional public transit employees added as civil servants is viewed with great concern. Furthermore, transit management has contended that it is the obligation of local law enforcement agencies to protect citizens in their jurisdiction and that such agencies are better trained and qualified to undertake this mission.

Local law enforcement agencies, on the other hand, often regard large-scale rapid transit as a special problem beyond their means to address. This attitude is not held in small- and medium-size cities where buses are the only form of public transit and where they are handled simply as another vehicle that operates on public streets. Local police in large cities view large transit systems as a separate government agency with the resources and responsibility to furnish their own security forces or to reimburse local police for this protection. Legally, local police agencies have the responsibility for

the protection and enforcement of laws within their jurisdiction, but often added personnel are required to adequately protect stations, trains in motion, and transit property.<sup>13</sup>

The major problems created by relying solely on a local police force comprised of officers from various communities are:<sup>14</sup>

1. *Jurisdictional confusion.* Which community takes responsibility for the crime, how to handle crimes on trains, what happens when a crime occurring in one community is reported to police in another?
2. *Reporting of and response to crime.* Lack of centralized control of crime reports and standardized procedures cause delays and inconsistency in response. Lack of coordination, ill-defined chain of command, and lack of accountability lead to a loss of confidence by the riding public.
3. *Police patrol coverage.* The number of police assigned to patrol transit properties could vary considerably, especially between inner cities and suburbs.
4. *Crime recording.* Owing to lack of coordination, methods of recording crimes will vary considerably, and compilation of systemwide data would be extremely difficult.
5. *Specialized training required by transit police.* Policing of public transit systems requires special skills and knowledge, including understanding the characteristics of transit riders and crime types, transit system elements, and special problems. On the other hand, a single police force accountable to one jurisdiction would be more effective by furnishing a central location for reporting crimes, specialized patrol procedures, accurate crime reports, and a police force specially trained for transit problems.

The type of police organization available to serve transit systems will affect the level of security that is furnished to its riders. If their services are scattered and without coordination and leadership, then the effectiveness of other countermeasures, which are intended to secure police help quickly, might be limited. Planning for new transit systems and resolving the problems of crime on older ones may require a comprehensive assessment of the organizational and fiscal responsibilities of the transit agency and the local community for security matters.

### SUMMARY

Personal security is an important factor in the decision by many people to use public transportation. While individuals are not attracted to transit simply because it promises a risk-free journey, they are deterred if the system is seen as unsafe, regardless of other positive attributes that the system may possess. People avoid transit at night and during off-peak hours if they perceive themselves as vulnerable.

Transit crime is extensive in most large U.S. cities, and its magnitude may be far greater than is shown by published statistics. While crime rates are probably higher on rapid transit than bus, both show significant occurrences that warrant special attention by planners and operators.

Security measures for bus transit should recognize that crimes can occur while traveling on the bus, while waiting at a stop, or while walking to or from a stop. Each situation requires a separate strategy and consequently must be dealt with on a case-by-case basis.

Rail transit security can be improved by considering five categories of countermeasures: hardware and devices, station and vehicle design, personnel and operations, judicial policy, and land use. A planning process for transit design should include a series of steps that assess the situation; anticipate crime problems; establish goals; select and evaluate countermeasures; consider limits, constraints, and trade-offs; and establish a cost-effective strategy.

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## EXERCISES

- 18-1 Discuss the impact of security in public transportation on ridership. What is the effect on choice and captive riders? Under what circumstances does transit security play a minor role in a person's decision to use transit?
- 18-2 Contact the transit manager in your community to determine the extent to which transit security is a problem. Find out what data are available on transit crimes. Summarize the results in a report that describes the characteristics of crime occurrences in your city.
- 18-3 Summarize the extent of crime on public transportation as described in previous studies.
- 18-4 Explain why crime occurrences on public transportation may be greater than reported in official figures.
- 18-5 Describe the three strategies to reduce assaults against bus drivers and passengers. Illustrate each with two examples.
- 18-6 Select a bus stop location in your community that appears to be unsafe. Describe the situation and suggest possible remedies.
- 18-7 Describe the architectural features that should be included in the design of a transit station to ensure a safe environment.
- 18-8 List the four features of a surveillance system for public transportation security.
- 18-9 List the four classes of crime countermeasures and illustrate each by describing three approaches that could be used. Discuss the advantages and disadvantages.
- 18-10 Select a rail or bus terminal in your city and, using the seven-step planning process, prepare a report that reviews the current situation and recommends a program of improvements.
- 18-11 As a transit manager you are faced with a wave of vandalism in buses parked in the transit garage. Describe what your options are in this situation and how you would proceed to correct the problem.