

# Addressing the Security Needs of Women Passengers on Public Transport

Martha J. Smith

School of Community Affairs, Wichita State University, Kansas, USA.  
E-mail: martha.smith@wichita.edu

Managers of public transport systems seeking to maintain or increase ridership need to be aware of the security needs of passengers on their systems. A recent review, edited by Smith and Cornish (2006), of five different types of crime and disorder on public transport looked at situational crime prevention measures currently used, or proposed for use, against these offenses. The present analysis draws on this work to present a framework for analyzing the security needs of women passengers. The discussion reviews previous research in four key areas: (1) women's reported victimization, (2) issues related to calculating the risk of being a crime victim, (3) the rationality of women's fear of crime and disorder, and (4) the need for effective and comprehensive crime prevention measures to address these security-related issues. The "whole journey" approach is used to highlight aspects of the transit journey for women passengers that require special attention among transport providers, local governmental authorities (including police departments), policy makers, and researchers.

*Security Journal* (2008) 21, 117–133. doi:10.1057/palgrave.sj.8350071

**Keywords:** public transport; situational crime prevention

---

## Introduction

This paper builds on previous situational crime prevention analyses of crime and disorder on public transport to look at some of the important issues that transport providers, local governmental authorities, police, and researchers in the field should consider when thinking about the needs of women passengers. It is not intended to be a comprehensive review of all research in this area. Nevertheless, patterns of victimization, risk, and fear of crime among women – and the situational preventive measures that may be used to address these problems – are examined here using a "whole journey" approach.

## Why look at women passengers

A recent volume on crime and disorder on public transport edited by Smith and Cornish (2006) looked in depth at five different types of crime clusters: anti-social behavior; crimes against passengers; crimes against employees of transit systems; vandalism and graffiti; and line-of-route<sup>1</sup> offenses. Each of the crime-cluster analyses in that volume used the

---

<sup>1</sup> "Line-of-route" offenses refer to crimes of vandalism or trespass that occur along the routes of trains, trams, or buses that may interfere with the safe passage of those vehicles.

problem-oriented policing (POP) approach, initially developed by Goldstein (1990), and used to great effect in the series of guides developed by the Center for Problem-Oriented Policing (see [www.popcenter.org](http://www.popcenter.org)). The SARA method – of Scanning, Analyzing, Responding, and Assessing (Eck and Spelman, 1987) – allowed the researchers to look for commonalities and differences across settings, methods, crime targets, and preventive measures for each crime cluster. Differences between male and female victimization patterns can be very important because they may help crime prevention specialists determine the types of measures that are most appropriate for preventing particular crimes. For example, if women are having their gold chains snatched at subway stops, it may be more effective and economical to suggest that they remove them during rush-hour travel than it would be to place more police officers on patrol to increase the risks of detection and apprehension.

The POP approach used in the Smith and Cornish volume also highlighted the importance of looking carefully at the contexts in which crimes occur. These contexts are important during the scanning phase, when problems are thoroughly identified, as well as in the response phase, when solutions to problems are developed and implemented. At first glance, this may not appear to be a reason to look at women travelers; however, part of the context for understanding crime on public transport involves appreciating that the presence of crime and disorder – and fear of these incidents – can have a substantial effect on ridership. One U.K. study found that the number of transit trips could rise by 10 per cent if passengers felt more secure – and that most of this increase would be at off-peak times (Crime Concern and Transport and Travel Research, 1997). Similarly, a study in New York City found that one in 10 respondents had avoided using the subway in the previous 7 days due to personal safety concerns (Audits and Surveys Worldwide, 1996).<sup>2</sup> This potential market for public transport disproportionately includes women since their concerns about crime and disorder appear to be greater than those of men, and therefore are more likely to affect their travel decisions. Research on women travelers has indicated that presence of crime and disorder not only affects the threshold decision of *whether* to use public transport but also affects riders' decisions about *when* to use it and which mode is preferred (e.g., buses vs. subways) (see GLC, 1985).

Ridership also has important implications for crime prevention. Not only can it affect how much money can be spent on crime prevention measures, but also it is directly related to the number of people present on the system (employees as well as passengers), which in turn affects the mix of potential targets, offenders, and guardians (see discussion of risk below). Maxson *et al.* (2001) have also noted that potential partners in crime-reduction efforts are more likely to join the process if they can see a direct effect on their interests: hence, crime effects on ridership can also affect the likelihood that transport operators will see that they have a stake in the process.

Apart from the concerns of transit providers looking for potential ways to increase ridership, there are other important reasons to look at women passengers. Research has found that, in some cities, a large percentage of women are “transit captive,” that is, they have little

---

<sup>2</sup> That report provided detailed calculations of the lost revenues due to concerns over personal safety and the potential amounts that could be recouped if security changes were made in the service for different categories of riders from different locations in the metropolitan New York area.

access to other forms of transportation. For example, in Toronto, one study found that 66 per cent of women had no access to cars (TTC *et al.*, 1989). Access to public transport, therefore, may be vitally important to many women's access to employment, educational, shopping, and leisure opportunities.

Historically, women's security needs have been recognized as being different from men's. Brooks' (1997) discussion of the history of the New York City subway included an illustration from *Harpers' Illustrated Weekly* in 1871 of two women about to board a horse-drawn tram while several men leer at them from the windows. This harassing type of situation is still prevalent today and can often involve more than a glance or verbal comment. For example, "Eve teasing,"<sup>3</sup> the name given in India to acts that range from the sexual harassment of women to their murder by men, appears anecdotally to be a widespread concern among women when they venture out into a variety of public places (Frederick, 2002), including public transport.

### **The whole journey approach**

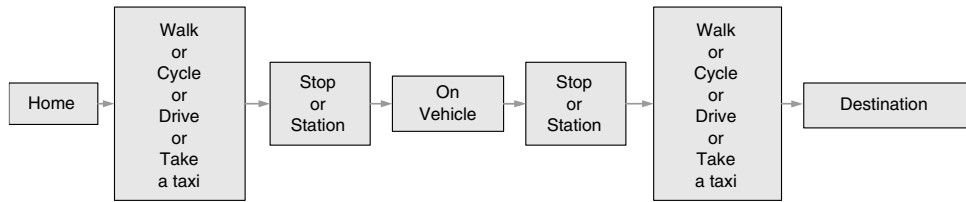
Researchers in the field of public transport crime have long appreciated the need to distinguish the various stages of the passenger trip when looking at crime and fear of crime on public transport. This has often been discussed in terms of particular types of places. For example, Thrasher and Schnell (1974) found that respondents in a qualitative study of subway and El riders in Chicago reported having different levels of anxiety at different points in their transit journeys – approaching the platform prior to boarding, riding on the train, and alighting onto the platform after being on the train. Similarly, Levine and Wachs (1986) looked at bus passenger victimization (primarily larceny and robbery) on a bus, at a bus stop, and to/from bus stops in Los Angeles.<sup>4</sup> The highest numbers of Part I crimes reported occurred on the bus itself, with lower numbers occurring at a bus stop and during the journey to or from the bus stop.

In the U.K., Crime Concern developed the whole journey approach to highlight the need to look not only at the stages of the trip, but also to consider the trip as a whole (Maxson *et al.*, 2001). They noted that the decision by a potential traveler to undertake a journey was dependent upon an assessment of how dangerous the *most dangerous* part of the journey was seen to be by the traveler, with the least-safe element determining whether the journey was made (Crime Concern and Transport and Travel Research, 1997). This approach therefore seems especially well suited for looking at women's security needs on public transport.

Adopting a whole journey approach requires one to look at the trip from point of origin to destination (and back again). Figure 1 presents a simple passenger journey on public transport. It covers only one-half of the "whole journey," but does take into account that passengers may use more than one mode of transport (walking, cycling, driving, or taking a taxi) to get to the transit node (stop or station). This simple passenger journey is, in essence, a passenger "script" (see Cornish, 1994) whose use in future analyses, therefore, should be

<sup>3</sup> I am grateful to Professor Mangai Natarajan for telling me of this practice and its importance to women travelers.

<sup>4</sup> I am grateful to Professor Diane Zahm for pointing out that Levine and Wachs looked at the stages of the journey in their analysis of bus crime in Los Angeles.



**Figure 1.** A simple passenger journey on public transport

able to benefit from the theoretical insights developed as part of routine activity theory (Cohen and Felson, 1979), crime pattern analysis (Brantingham and Brantingham, 1984), and the rational choice perspective (Clarke and Cornish, 1985).

This simple passenger journey can be built up to represent more complex journeys, reflecting the complex travel patterns of many women. This is termed “trip chaining” or “trip linking.” Women’s travel frequently includes trip chains, with shopping trips or picking up children as part of the return-from-work journey (see, e.g., McGuckin and Nakamoto, 2005). Looking in detail at trip chains is seen as important for encouraging greater use of public transport, but it may also be useful for describing the special vulnerabilities of women in relation to these activities when they are using public transport. For example, carrying shopping bags may make women more likely to be victims of bag snatches or less able to guard themselves from a sexual rubbing on a crowded vehicle, two crimes for which women are more likely to be victimized than men (see discussion below).

It is also possible to expand the simple journey into even more discrete stages, depending on the particular physical features of different systems, areas, or types of places that have been shown to be correlated with victimization. For example, Audits and Surveys Worldwide (1996), when looking at crime on the New York City subway, broke the subway journey into extra stages at the station prior to boarding the train (entering the subway station from the street, including any passageways or stairs; going from the entrance stairs to the turnstiles; getting to the platform from the turnstiles; and waiting on the platform for the train) and after alighting (getting from the platform to the turnstiles; going from the turnstile to the stairs that lead to the street; and exiting the subway station onto the street), doubling the five stages in Figure 1 to 10 stages overall.

A number of researchers have identified the areas around stations or stops as having higher numbers of crime events than other places: Block and Davis (1996) found that the areas immediately around train stops in Chicago were robbery hot spots; Robinson (1998) discovered that there were relatively higher numbers of either burglary or street crimes in the immediate areas around SkyTrain stations in Vancouver in comparison to areas further from the stations; and Smith (2003) identified the high number of robberies around some train stations in the U.K. These findings suggest that the simple passenger journey needs to be expanded to include rail-station or bus-stop environs as a separate stage in analyses, unless there are specific reasons for not doing so.

## Women as victims on public transport

Research has usually shown that men are more often crime victims on public transport than are women (see Morgan and Smith, 2006). Exceptions to this trend have been noted for some types of crime. For example, women have usually been found to have higher rates of victimization for sex crimes (Beller *et al.*, 1980; TTC *et al.*, 1989) than men. Sex crimes encompass serious sexual offenses such as rape and sodomy, but also, more often, exposure and the types of sexual touching or rubbing facilitated by crowded conditions. Recent U.K. research on lifetime rates of victimization for less severe sex crimes found, however, that men had higher rates than women (British Transport Police, 2004), which may be due to greater use of public transport by men than women, hence more time at risk of being victimized. Sometimes, studies cluster sexual rubbings or touchings with other forms of harassment so it is not always clear which crimes are occurring most often (e.g., Audits and Surveys Worldwide, 1996). Harassment crimes often go unreported either to police or to transit officials.

Women have also been found to have higher rates of victimization than men for snatch thefts (bag and jewelry snatching – Smith *et al.*, 1986b), and, in some places, for the stealth crime of pickpocketing. Smith *et al.* (1986b) found a higher percentage of women among pickpocketing victims on the New York City subway while Stafford and Pettersson (2004) reported similar rates among men and women in the U.K. on all forms of public transport. These differences may reflect differing definitions of the underlying crimes or differences among the types of persons targeted in New York (women carrying bags) in comparison to London (tourists of both sexes), but they certainly reinforce the importance of doing place- and mode-specific research of crime patterns.

Gaps in the official recording of crimes make it particularly difficult to gain an accurate picture of public transport victimization in terms of the whole journey (see Newton, 2004 (U.K.) and Benjamin *et al.*, 1994 (U.S.)). Some information is, however, available comparing self-reported victimization in different places along the whole journey,<sup>5</sup> but most of this either does not report the crime figures separately for women and men (e.g., Smith *et al.*, 1986b) or only reports on women's crime victimization (e.g., GLC, 1985; Lynch and Atkins, 1988). A recent exception to this is a study by Loukaitou-Sideris (2005) of male and female victimization on buses and at bus stops in which women were found to be more often victimized than men. A street was found to be the most common place for harassment for women in Southampton, U.K. (Lynch and Atkins, 1988) and for both attacks and threats in London (GLC, 1985), although public transport stops and vehicles (and public parks or open spaces in London) were also the sites of women's victimization. Again, the differing patterns in different cities points to the need for place-specific analysis of crime patterns. It is unclear from some of the studies that include street incidents which of these occurred as part of a public transport journey. This is also a problem with research on fear of crime and walking (see discussion below). Information about the destination of the journey is important for policy makers who want to include transport providers, and business people who benefit from public transport use, in the problem-solving process.

---

<sup>5</sup> Sometimes it is difficult for victims to identify where the crime occurred, as with stealth crimes such as pickpocketing where something is taken from the victim in one place and the theft is not discovered until much later in some other place.

## Risk of victimization

In the past, turnstile counts of passengers entering the system at particular stations were used as one way to estimate passenger volume, the denominator in a crimes/passengers risk calculation (see Smith *et al.*, 1986a). Researchers also sought to estimate time on the system (Shellow *et al.*, 1975) to approximate time at risk of victimization. Today, with smartcards, it is theoretically possible to get much more precise information about where and when an individual is entering and exiting the system, allowing better calculations of system-wide crime risks.

The whole journey approach, with its opportunity theory undergirding, however, requires a more complex approach to the issue of risk (see Clarke (1984) for a more general discussion of opportunity theory and crime rates). First, the assessments must be crime-specific. Second, the denominator of the risk calculation (the person or target at risk) must be closely related to the crime (see Boggs, 1965). This requires that we know something about the “choice-structuring properties” of the crime (Cornish and Clarke, 1987). These choice-structuring properties will include factors related to “target suitability” (Cohen and Felson, 1979) since there will be little or no true risk of a particular crime occurring if there is no suitable target for that type of crime present. Similarly, as a third factor, features of the micro-environment of the place through which a passenger travels, such as overcrowding (for sexual rubbing or pickpocketing) or lack of supervision (for a robbery), should be considered as they too are choice-structuring properties of many transit crimes (see discussion in Smith and Clarke, 2000) and, therefore, are factors that are likely to affect risk. And, finally, when considering risk calculations, we must take into account the crime risks of the areas through which the journey is made, particularly where there are permeable points (such as stops and stations) that intersect with the journey. Research has repeatedly shown the importance of area crime levels on the crime rates of public transport places (e.g., Chaiken *et al.*, 1974; Newton, 2004), although some environmental and design features appear to lessen these affects in some systems (see LaVigne, 1996; Loukaitou-Sideris *et al.*, 2002).

These considerations suggest that risks may have to be calculated separately whenever one of these four factors changes, making such calculations virtually impossible to carry out except on a micro-level. In practice, as a substitute for the more traditional type of calculation of risk, much work has been done to look at the risks presented in micro-environments on public transport through the use of security or safety audits, asking study participants about how safe they feel in particular areas, such as in relation to the crime of sexual assault in and around a transit system (e.g., TTC *et al.*, 1989), or when passing through transit environments in a transit system (see Maxson *et al.*, 2001). These are “gender audits” if they look at the needs of men and women separately (see, e.g., DETR, 2000).<sup>6</sup> Part of the justification for the safety audit as a means of identifying unsafe places is that traditional risk calculations tend to be based on reported crime, which undercounts sexual offenses (TTC *et al.*, 1989) as well as many minor crimes and anti-social behaviors. Sexual assault was used as the reference crime in the Toronto safety audit, according to the authors, because it was thought that if women felt safe from sexual assault, then everyone would feel safer.<sup>7</sup>

---

<sup>6</sup> The Women's Design Service (<http://wds.org.uk>) also provides toolkits on how to conduct gender audits. I am grateful to Professor Paul Ekblom for pointing out this resource to me.

<sup>7</sup> See Fisher and Sloan (2003) for support for the idea that fear of rape is a “shadow” fear for fears of other crimes.

## Fear of crime and the whole journey

Women not only generally report higher levels of fear in relation to their travel than men, they also sometimes are afraid of different things. For example, in the U.K., men reported that they were concerned about the presence of groups of other men while women were concerned about a single person, especially if it was a man (Crime Concern, 2004). Similarly, men reported fearing violent assault while women reported fearing rape and sexual assault (Crime Concern and Transport and Travel Research, 1997). So are these different assessments irrational if they do not match levels of reported victimization?

The present analysis assumes that fear of crime exists and is a rational response, at least in part, to the information that women, as passengers, have about crime and disorder in the transit environment. It assumes that women's fear of crime along the whole journey is, at least in part, a response to limited knowledge about the crime choices being made by offenders and potential offenders. To demonstrate that women passengers are very likely to operate with limited knowledge and that this response is "rational," one needs only compare them to crime prevention researchers and theorists. For example, researchers and theorists are not always sure how to distinguish motivated offenders from others, so we often find it useful to assume that there are motivated offenders present, or potentially present in an environment (see Clarke, 1992). This may be similar to what women do in the transport environment. Researchers are also not always sure about when, if, or in relation to what factors minor offenses escalate into major ones.<sup>8</sup> Nor do we always know what makes some targets and environments more suitable than others, even if we suspect that these must be related to "the choice-structuring properties of crime" (Cornish and Clarke, 1987). Given the difficulties of calculating true crime risks (discussed above), the limited data on actual victimization (particularly for crimes involving social disorder, such as harassment), and the uncertainties highlighted here, it is not surprising that women's assessments of concern for their safety on public transport have often been much higher than their reported victimization.

Treating women's fear of crime as rational has a number of advantages. First, it takes the views of female passengers seriously. Second, it suggests that women passengers are not just passive users of public transport, but keen comparison shoppers concerned about the quality of the product they may have little choice about using. Third, it focuses attention on the physical environment and the cues presented there that may signal crime opportunities and suggests that changes in the cues that affect crime opportunities may also affect levels of fear. This approach also suggests that some fear of crime will remain even after opportunity cues and factors are addressed, if the fear is influenced by age- and experience-related factors that are independent of the transit environment itself. And, finally, it reminds those who seek to eliminate crime opportunities along the whole journey that prevention measures that alarm passengers or do not convey that they are able to respond to crimes-in-action may also be seen as fear inducing.

As noted above in the discussion of risk, different parts of the transport journey (as well as different places in the transport environment) have been shown repeatedly to elicit different fear responses from women (and men). Research has generally shown that the stage of

---

<sup>8</sup> Innes and Fielding (2002) used the term "signal crime" to indicate the type of lower-level crime or disorder condition that may be seen as a sign that another type of more serious crime is possible in that situation.

the journey from home to transit node (bus stop or train station) is sometimes considered relatively unsafe, but is not necessarily the most fear inducing (Audits and Surveys Worldwide, 1996). While there is research on feelings of security or safety while walking in one's own neighborhood at night, however, sometimes these results have not been compared to being in other places, nor looked at as part of a public transit journey or examined separately for men and women. Crime Concern's (2004) study of men and women's perceptions of safety at different transport locations, however, clearly differentiated between men and women's fears at ten different transport locations, with travel on a bus being given the lowest "unsafe" rating among both men and women. The study by Audits and Surveys Worldwide (1996) asked respondents to think about the last time they avoided the subway because of concerns with personal safety and identify the part of the trip that made them most nervous or concerned about personal safety. The highest concern ratings (among 10 choices) were for: (1) waiting on the platform for the train; (2) being on the train; (3) entering the subway station from the street; and (4) getting to the subway. Respondents also have been shown to distinguish between different destinations in terms of their feelings of insecurity (see, e.g., Benjamin *et al.* (1994), where different places in Greensboro, NC were distinguished as being fear inducing by those who regularly rode public transport in comparison to those who rarely traveled by public transport). While results such as this call for responses to environmental conditions that are closely tailored to individual places, they also serve as a reminder that not all travelers (or potential travelers) will react to areas similarly. This means that problem solvers must consider (or consult) a broad spectrum of users when safety audits or assessments are done.

### **Situational crime prevention on public transport**

"Situational crime prevention" is the term used by Ron Clarke (1992) and others to refer to a variety of techniques and individual measures that attempt to change the "person-situation interaction" (Cornish, 1993) in a way that makes the crime less likely to occur – and it does this without requiring that individual offenders be identified. This approach to preventing crime is particularly well suited for use in a public transport context where large numbers of strangers come into close contact with each other across a wide variety of settings. It is also useful in situations where potential victims are unsure about the crime risks presented. Because it is "situational," it operates best where it fits the crime opportunities present in the place in which it is implemented. Five over-arching categories of techniques have been identified: (1) increasing the effort required for the crime; (2) increasing the risk of detection, and possibly apprehension; (3) reducing the rewards of carrying out the crime; (4) reducing the situational provocations for crime; and (5) removing excuses that may make the crime more likely to occur (Cornish and Clarke, 2003). Within each of these five general types of mechanisms, five separate techniques have been identified (see Table 1). For example, those who seek to prevent crime can increase the effort of offenders through one of five currently identified techniques: (1) target hardening; (2) controlling access to facilities; (3) screening exits; (4) deflecting offenders; and (5) controlling tools or weapons. When this categorization scheme is presented in table form, it is possible to identify quickly how a particular measure may operate to help prevent a crime from

occurring. To help prevent pickpocketing, encouraging passengers to secure their wallets by placing them in the inside pockets of clothes or bags “hardens” the target (the wallet) by increasing the effort required to take it by stealth (see box at the top left-hand corner of Table 1).

Table 1 is based on the analyses of crime and disorder on public transport set out in Smith and Cornish (2006). It focuses on the analyses of anti-social behavior by Cornish and Smith (2006) and crimes against passengers by Morgan and Smith (2006). These crime clusters were chosen because they cover the types of crimes that women are most frequently the victims of and that they fear most – such as harassment and sexual assault. This focus does not mean, however, that other types of crime on public transport do not also affect women passengers or influence their travel decisions. For example, women who witness crimes against employees may be particularly fearful in that situation because they may worry that they will be the next victim and that the person who otherwise might be expected to come to their aid (the transit employee) has been shown to be ineffective in protecting him or herself.

The 25-technique table format can also allow other features of the situational approach to be easily displayed. For instance, in Table 1, measures in which the potential victim is required to take primary responsibility for his/her own safety are shown in bold. Eight out of 68 (or fewer than one in eight) measures have been highlighted in this manner. This provides at least a *prima facie* challenge to the argument made by Radford and Stanko (1994: p. 156) that situational crime prevention has “mov[ed] the responsibility for crime prevention to the individual, by stressing personal security and precaution measures.” Crime prevention advice may sometimes focus on these factors (see, e.g., Home Office, 2001), but transit systems should, and do, employ a much broader range of preventive measures that seek to address a broad range of crimes and disorder offenses. The whole point of the 25-technique table is to identify a range of measures that can be used to prevent crime – and to stimulate thinking in this area to develop additional measures for use against particular crimes in particular places, which, in the present case, is the public sphere of transportation.<sup>9</sup>

The whole journey approach, on the other hand, requires transport planners to go beyond the confines of the transport system – to venture out where Radford and Stanko’s concerns may better reflect the reality faced by women (and men) travelers, that is, that they are often left to their own protective devices during the final stage of the transport journey home. This need not necessarily be the case, however, as recent research in this area is beginning to demonstrate. For example, in 2002, the Metropolitan Police Service, Transport for London, the Mayor of London, and the Greater London Authority launched a collaborative initiative to reduce the number of sexual offenses committed by illegal minicab drivers<sup>10</sup> in London. Among the changes that were implemented were a marshaled taxi rank, a one-number taxi booking service, and local travel information on boards at clubs and pubs (Burton, 2006).

---

<sup>9</sup> What is more, transport systems cannot be expected to address crime problems that are removed from their mission. Other types of crime-specific measures need to be designed for these problems.

<sup>10</sup> Minicab drivers operate private cars as part of a livery service rather than using the traditional special-purpose vehicles used by hackney cab drivers and, thus, can be difficult to distinguish from unlicensed drivers.

**Table 1** Twenty-five situational techniques for preventing anti-social behavior and crimes against passengers – theft, robbery, assault, and sexual assault – on public transport (based on Cornish and Smith, 2006; Morgan and Smith, 2006)

<i>Increase the effort</i>	<i>Increase the risks</i>	<i>Reduce the rewards</i>	<i>Reduce provocations</i>	<i>Remove excuses</i>
<p>1. <i>Target harden</i></p> <ul style="list-style-type: none"> <li>Interior screens for bus drivers</li> <li>Hard-to-damage equipment</li> <li>Graffiti-resistant surfaces</li> <li><b>Encourage passengers to secure their valuables (e.g., wallets deep in bag)</b></li> </ul>	<p>6. <i>Extend guardianship</i></p> <ul style="list-style-type: none"> <li><b>Travel with a friend</b></li> <li><b>Know routes and help points</b></li> <li><b>Carry a mobile phone</b></li> <li><b>Avoid empty carriages and deserted areas</b></li> <li>Don't allow children to travel alone</li> </ul>	<p>11. <i>Conceal targets</i></p> <ul style="list-style-type: none"> <li><b>Encourage passengers to conceal their valuables (e.g., do not use mobile phone leaving station)</b></li> </ul>	<p>16. <i>Reduce frustrations and stress</i></p> <ul style="list-style-type: none"> <li>Staff informed of disruptions in operations</li> <li>Delays kept to a minimum</li> <li>Updated information re: departure and arrival times, delays, and alternative travel options</li> <li>Design and light for calm atmosphere</li> </ul>	<p>21. <i>Set rules</i></p> <ul style="list-style-type: none"> <li>Bye-laws applicable to transport setting posted</li> </ul>
<p>2. <i>Control access to facilities</i></p> <ul style="list-style-type: none"> <li>Restrict access to fare-payers</li> <li>No abusive or drunk passengers on late-night buses</li> <li>No slam-doors or drop-light windows</li> <li>Automatic train doors</li> </ul>	<p>7. <i>Assist natural surveillance</i></p> <ul style="list-style-type: none"> <li>Good lighting and sightlines</li> <li>Shelters with glass sides, well-lit, located near shops</li> <li>Close-off carriages off-peak</li> <li>Use designs with open sightlines</li> </ul>	<p>12. <i>Remove targets</i></p> <ul style="list-style-type: none"> <li>Rechargeable smartcards (Oyster cards) instead of disposable passes</li> <li>Real-time arrival indicators</li> <li>Assisting swift travel of passengers through the system</li> </ul>	<p>17. <i>Avoid disputes</i></p> <ul style="list-style-type: none"> <li>Simple fare structures and exact-fare systems</li> <li>"Quiet" carriages on trains</li> <li>Separate football supporters from other fans and other travelers</li> </ul>	<p>22. <i>Post instructions</i></p> <ul style="list-style-type: none"> <li>Signs drawing attention to important rules posted</li> </ul>
<p>3. <i>Screen exits</i></p> <ul style="list-style-type: none"> <li>Require tickets for exiting</li> </ul>	<p>8. <i>Reduce anonymity</i></p> <ul style="list-style-type: none"> <li>Registry of school uniforms</li> <li>Staff with name tags</li> <li>DNA-recovery kits</li> </ul>	<p>13. <i>Identify property</i></p> <ul style="list-style-type: none"> <li><b>Security mark "hot property" (e.g., mobile phones, notebook computers, iPods)</b></li> </ul>	<p>18. <i>Reduce emotional arousal</i></p> <ul style="list-style-type: none"> <li>Employees trained to handle difficult confrontations</li> <li>Avoid public disputes with passengers</li> </ul>	<p>23. <i>Alert conscience</i></p> <ul style="list-style-type: none"> <li>Use of CCTV posted</li> <li>Use posters noting the unacceptability of these crimes, the potential harms, and the long-term consequences</li> </ul>

**Table 1** Continued.

<i>Increase the effort</i>	<i>Increase the risks</i>	<i>Reduce the rewards</i>	<i>Reduce provocations</i>	<i>Remove excuses</i>
<p><b>4. Deflect offenders</b></p> <ul style="list-style-type: none"> <li>• Women-only waiting rooms and carriages</li> <li>• School buses for pupils</li> <li>• Separate waiting passengers from non-passengers</li> <li>• Separation of rival football supporters</li> </ul>	<p><b>9. Utilize place managers</b></p> <ul style="list-style-type: none"> <li>• Staff moved from "back-stage"</li> <li>• CCTV use in unsupervised areas, designated waiting areas and high-crime areas, and with public address systems</li> <li>• Employ wardens on vehicles</li> </ul>	<p><b>14. Disrupt markets</b></p> <ul style="list-style-type: none"> <li>• Licensed buskers</li> <li>• Alternative means of helping beggars/homeless (e.g., donations of used Travelcards)</li> <li>• <b>Get passengers to help close down shops that buy or un-block stolen mobile phones (or other hot products)</b></li> </ul>	<p><b>19. Neutralize peer pressure</b></p> <ul style="list-style-type: none"> <li>• Credible role models for good behavior</li> <li>• Popular peers used to maintain standards at bus stops and on buses</li> <li>• Student dispersal via a variety of routes and at different times</li> </ul>	<p><b>24. Assist compliance</b></p> <ul style="list-style-type: none"> <li>• Litter bins</li> <li>• Safety zones for passengers designated with painted lines</li> <li>• Toilets open late</li> <li>• Alternative meeting places for station loiterers</li> <li>• "Wet centers"</li> </ul>
<p><b>5. Control tools/weapons</b></p> <ul style="list-style-type: none"> <li>• Limited sales of spray paint to over-16s</li> <li>• No benches</li> <li>• No fast food outlets</li> <li>• Pay phones limited</li> </ul>	<p><b>10. Strengthen formal surveillance</b></p> <ul style="list-style-type: none"> <li>• Train captains, transport wardens, "Travel Safe" officers, and bus monitors</li> </ul>	<p><b>15. Deny benefits</b></p> <ul style="list-style-type: none"> <li>• Classical music over public address systems at train and bus stations</li> </ul>	<p><b>20. Discourage imitation</b></p> <ul style="list-style-type: none"> <li>• Rapid removal of graffiti</li> <li>• Media attention to details of anti-social acts discouraged (e.g., "surfing")</li> </ul>	<p><b>25. Control drugs and alcohol</b></p> <ul style="list-style-type: none"> <li>• Special "dry" trains for football supporters</li> <li>• Public transport settings designated as "alcohol-free" zones</li> </ul>

**(Bold** entries are factors passengers have to take primary responsibility for carrying out).

**Table 2** Situational crime prevention measures at each stage of a simple passenger journey by public transport

<i>Mode (Journey stage)</i>	<i>Increase the effort</i>	<i>Increase the risks</i>	<i>Reduce the rewards</i>	<i>Reduce provocations</i>	<i>Remove excuses</i>
<i>Walking</i> Any stage	<ul style="list-style-type: none"> <li>• “Secure valuables” advice</li> </ul>	<ul style="list-style-type: none"> <li>• Improve lighting along main routes</li> <li>• CCTV and foot patrols</li> <li>• “Travel with a friend”</li> <li>• Escorted walking</li> <li>• Help points</li> </ul>	<ul style="list-style-type: none"> <li>• Property marking</li> <li>• Concealing property</li> <li>• Clear street signs</li> </ul>	<ul style="list-style-type: none"> <li>• Discourage media from publishing details of crime techniques</li> </ul>	<ul style="list-style-type: none"> <li>• Use of CCTV posted along main routes</li> </ul>
<i>Bicycle/car</i> In use and while stored at station/stop	<ul style="list-style-type: none"> <li>• Require ticket to exit parking/storage areas</li> <li>• Require secure bicycle locks and locked cars</li> <li>• Valuables in car trunk</li> <li>• Special registration for station pickups</li> <li>• Call-ahead services</li> </ul>	<ul style="list-style-type: none"> <li>• CCTV and security personnel at storage/parking areas</li> <li>• Improve lighting along main routes</li> <li>• Picture IDs of drivers</li> <li>• Cameras in taxi</li> <li>• GPS tracking</li> </ul>	<ul style="list-style-type: none"> <li>• Property marking</li> <li>• Concealing property</li> </ul>	<ul style="list-style-type: none"> <li>• Discourage media from publishing details of crime techniques</li> </ul>	<ul style="list-style-type: none"> <li>• Post notices re: penalties for theft</li> </ul>
<i>Taxi</i> Any stage	<ul style="list-style-type: none"> <li>• Remove public seating</li> <li>• Separate seating for passengers and non-passengers</li> <li>• Secure valuables</li> <li>• Women-only waiting rooms</li> </ul>	<ul style="list-style-type: none"> <li>• Require pupil ID cards</li> <li>• CCTV and security personnel</li> <li>• Improve sightlines</li> </ul>	<ul style="list-style-type: none"> <li>• Property marking</li> <li>• Concealing property</li> </ul>	<ul style="list-style-type: none"> <li>• Fares and rules clearly posted</li> </ul>	<ul style="list-style-type: none"> <li>• No seating up front</li> <li>• Require nighttime prepayment</li> </ul>
<i>At station or stop</i> Outbound, inbound, transfers	<ul style="list-style-type: none"> <li>• Separate seating for passengers and non-passengers</li> <li>• Secure valuables</li> <li>• Women-only waiting rooms</li> <li>• Platform doors</li> <li>• Secure valuables</li> </ul>	<ul style="list-style-type: none"> <li>• Require pupil ID cards</li> <li>• CCTV and security personnel</li> <li>• Improve sightlines</li> </ul>	<ul style="list-style-type: none"> <li>• Locate stops away from pubs</li> <li>• Property marking</li> <li>• Concealing property</li> <li>• Clear signs for exiting and routes</li> <li>• Property marking</li> <li>• Concealing property</li> </ul>	<ul style="list-style-type: none"> <li>• Discourage media from publishing details of crime techniques</li> <li>• Train staff to identify unusual behavior</li> </ul>	<ul style="list-style-type: none"> <li>• Alcohol-free zones</li> <li>• Provide alternative venues for station loiterers</li> </ul>
<i>On platform</i> Waiting to board and alighting	<ul style="list-style-type: none"> <li>• Platform doors</li> <li>• Secure valuables</li> </ul>	<ul style="list-style-type: none"> <li>• CCTV and security personnel</li> <li>• Remove columns</li> </ul>	<ul style="list-style-type: none"> <li>• Property marking</li> <li>• Concealing property</li> </ul>	<ul style="list-style-type: none"> <li>• Discourage media from publishing crime details</li> </ul>	<ul style="list-style-type: none"> <li>• Post signs re: unacceptability of crimes</li> </ul>
<i>On vehicle</i> Bus or Rail	<ul style="list-style-type: none"> <li>• Require and check tickets</li> <li>• Women-only areas</li> <li>• Secure valuables advice</li> </ul>	<ul style="list-style-type: none"> <li>• CCTV and security personnel</li> <li>• Improve sightlines</li> <li>• Control # of vehicles-in-use to match passenger density</li> <li>• 2-for-1 concessions</li> </ul>	<ul style="list-style-type: none"> <li>• Property marking</li> <li>• Concealing property</li> </ul>	<ul style="list-style-type: none"> <li>• Control crowding due to special events</li> <li>• Discourage media from publishing details of crime techniques</li> </ul>	<ul style="list-style-type: none"> <li>• Alcohol-free zones</li> </ul>

To illustrate additional situational preventive measures that are available (and to highlight where more work needs to be done), the 25-technique table developed by Clarke and his colleagues has been modified to take account of different stages of the whole passenger journey (see Table 2). Obviously, many of the measures included in Table 1 (particularly those that would be used at bus stops and train stations and on vehicles) have not been included here so that they do not dwarf the more limited number of measures available at this point for the other stages of the journey.

Table 2 represents a first step in adapting the traditional situational crime prevention classification scheme to fit the dynamic and complex environment faced by users of public transport. In the process of trying to fit all of the information into a single table, however, detail about how the measures are thought to operate has been lost. As more measures become available at each stage, however, it will be possible to set out individual, detailed 25-technique tables for each stage. The simple table shown here also does not take into account whether the stage shown (e.g., walking, cycling or driving, or taking a taxi) is at the beginning or the end of the journey, or whether it is taking place in the morning, afternoon or evening. Time of day has been shown to be extremely important to passengers' victimization and to their assessments of fear of crime and will be an important variable to take into account in future analyses.

## **Implications of this analysis – in general**

*Transport Providers* need to coordinate with local governmental authorities to help ensure that the areas around transport stations and stops are more secure and that options are available for transit users to get home from public transport. There are numerous examples of cooperative efforts involving public transport system providers and local authorities and police in the U.K. (see Smith and Cornish, 2006). In the U.S., however, many of the recent cooperative efforts have been focused on preventing terrorism incidents (Taylor *et al.*, 2005), with some exceptions (see, e.g., Hubard (1992), for a discussion of cooperation around the Blue Line in Los Angeles). Efforts need to be made to ensure that transport users notice the changes made to improve security along the whole journey (see Wallace *et al.*, 1999). Trip chaining by women needs to be recognized and accommodated – both in terms of convenience and its victimization implications.

*Local Governmental Authorities (including police)* may be forced to think about their commitment to public transport. This may mean that data about crime victimization needs to be radically expanded to include “place of occurrence” in much broader, and more useful, terms. The links between stops and stations and local crime rates means that those who live in certain areas may be doubly disadvantaged: (1) they live in poor areas with few resources and (2) the existing crime environments there mean that they have risky places to go through to find a way out to employment and other opportunities. Security audits may be a relatively inexpensive way to get the local community mobilized to aid in the crime prevention efforts.

*Policy Makers* may be presented with conflicting goals about where to place scarce transport resources. Terrorism prevention may best be focused on high passenger-volume sites

(see Taylor *et al.*, 2005) while meeting the needs of women passengers may mean putting more resources in deserted places where fear of victimization may be highest. Compromises may be possible, such as setting up safe-routes-home schemes and clustering passengers in waiting areas for taxi pickup late at night.

Problem solvers need to be aware that preventing fear of crime is not enough. Crime must also be prevented. For example, the presence of graffiti may act as a cue for low surveillance and a good escape route – two conditions that might be useful for a rape or a robbery, as well as for further vandalism (see discussion in Smith, 1996). However, it may not be enough to just remove the graffiti. Removing the graffiti may work to lower fear levels among passengers and it may prevent future graffiti at that site (see Smith, 1996), but it may not eliminate it as a good site for a rape or robbery. Policy makers need to set the bar high.

*Women Passengers'* fears are taken seriously with this approach, as is their potential economic influence on public transport systems. Yet this approach also recognizes that many women have special needs as travelers – whether as passengers who may use several modes to accomplish a variety of tasks during a single whole journey or as transit captives who are dependent upon public transport. These needs provide challenges that can be better identified and addressed using a whole journey approach.

*Crime Analysts and Researchers* need to look at individual places and groups of places for patterns in public transport for the whole journey – find the weakest links and direct research efforts there. The blank spaces in the situational crime prevention tables need to be filled with examples of good practice. Researchers also need to keep track of the findings of gender and security audits as a way of testing theories about fear of crime and features of locations (e.g., the Nasar and Fisher (1993) theory about the importance of low prospect, high concealment, and blocked escape for inducing fear among potential crime victims).

## **Implications of this analysis – an illustration**

One example of a research project that can be conducted in public transport environments – a security or safety audit – is briefly described here (see also note 6 below). This type of project might be a useful initial assessment of conditions where official police figures on crime or disorder on public transport are not routinely assessed in the local area, but where local governmental authorities or transit providers appear receptive to improving the security of the system. Security audits can be carried out by researchers along a route (see Maxson *et al.*, 2001) or along several routes from home or work to a single destination. This type of project would benefit from the use of the SARA model developed in POP (see discussion above and Clarke and Eck, 2005).

One group of auditors (working independently of each other) would be used to identify conditions or situations that make them feel unsafe. Official crime figures corresponding to this route (or routes) – and a buffer zone of several blocks around it – would be examined by the researchers in cooperation with the local police. Hot spots would be designated where any crime or disorder incidents have been reported that correspond to places identified by the auditors or where several auditors identified the same conditions or settings as unsafe. A second group, trained in the types of situational crime prevention techniques that can or

have been used on public transport (see Smith and Cornish, 2006), would then be used to identify measures that might be used at each of these hot spots.

Assuming that at least some of the measures will be implemented, researchers need to be ready to look at several types of indicators for effectiveness, including crime and disorder figures reported to police, ridership, and feelings of security and satisfaction among passengers, local residents and business people – and even among a third group of auditors.

## Acknowledgements

I thank Carol Zuegner for her assistance and support for this project, and Ron Clarke, Derek Cornish, Russell Morgan, and Phyllis Schultze for their insights and efforts in connection with earlier projects on crime and public transport. I also thank the anonymous reviewer for helpful comments on an earlier draft.

## References

- Audits and Surveys Worldwide (1996) *New York City Transit 1996 Fear and Disorder Survey*. Prepared for the Metropolitan Transportation Authority. New York, NY: Audits and Surveys Worldwide.
- Beller, A., Garelik, S. and Cooper, S. (1980) Sex Crimes in the Subway. *Criminology*. Vol. 18, No. 1, pp 35–52.
- Benjamin, J.M., Hartgen, D.T., Owens, T.W. and Hardiman, M.L. (1994) Perception and Incidence of Crime on Public Transit in Small Systems in the Southeast. *Transportation Research Record*. Vol. 1433, pp 195–200.
- Block, R. and Davis, S. (1996) The Environs of Rapid Transit Stations: A Focus for Street Crime or Just Another Risky Place? In Clarke, R.V. (ed.) *Preventing Mass Transit Crime*. *Crime Prevention Studies*. Vol. 6. Monsey, NY: Criminal Justice Press.
- Boggs, S.L. (1965) Urban Crime Patterns. *American Sociological Review*. Vol. 30, No. 6, pp 899–908.
- Brantingham, P.J. and Brantingham, P.L. (1984) *Patterns in Crime*. New York, NY: Macmillan.
- British Transport Police (2004) *Statistical Bulletin 2003/04*. London, UK: Performance Management Unit, British Transport Police [<http://www.btp.police.uk/documents/Stats%20Bulletin0304.pdf>].
- Brooks, M.W. (1997) *Subway City: Riding the Trains, Reading New York*. New Brunswick, NJ: Rutgers University Press.
- Burton, S. (2006) *Safer Travel at Night: Transport for London*. Winner of the Herman Goldstein Award for Excellence in Problem Oriented Policing 2006 [<http://www.popcenter.org>].
- Chaiken, J., Lawless, M. and Stevenson, K. (1974) *The Impact of Police Activity on Crime: Robberies on the New York City Subway System*. New York, NY: The Rand Corporation.
- Clarke, R.V. (1984) Opportunity-based Crime Rates: The Difficulties of Further Refinements. *British Journal of Criminology*. Vol. 24, No. 1, pp 74–83.
- Clarke, R.V. (1992) Introduction. In Clarke, R.V. (ed.) *Situational Crime Prevention: Successful Case Studies*. Guilderland, NY: Harrow and Heston.
- Clarke, R.V. and Cornish, D.B. (1985) Modeling Offenders' Decisions: A Framework for Research and Policy. In Tonry, M. and Morris, N. (eds) *Crime and Justice: An Annual Review of Research*. Vol. 6. Chicago, IL: University of Chicago Press.
- Clarke, R.V. and Eck, J.E. (2005) *Crime Analysis for Problem Solvers in 60 Small Steps*. Washington, DC: U.S. Department of Justice, Office of Community Oriented Policing Services.
- Cohen, L.E. and Felson, M. (1979) Social Change and Crime Rate Trends: A Routine Activity Approach. *American Sociological Review*. Vol. 44, No. 4, pp 588–608.
- Cornish, D.B. (1993) Theories of Action in Criminology: Learning Theory and Rational Choice Approaches. In Clarke, R.V. and Felson, M. (eds) *Routine Activity and Rational Choice*. *Advances in Criminological Theory*. Vol. 5. New Brunswick, NJ: Transaction Press.

- Cornish, D.B. (1994) The Procedural Analysis of Offending and Its Relevance for Situational Prevention. In Clarke, R.V. (ed.) *Crime Prevention Studies*. Vol. 3. Monsey, NY: Criminal Justice Press.
- Cornish, D.B. and Clarke, R.V. (1987) Understanding Crime Displacement: An Application of Rational Choice Theory. *Criminology*. Vol. 25, No. 4, pp 933–947.
- Cornish, D.B. and Clarke, R.V. (2003) Opportunities, Precipitators and Criminal Decisions: A Reply to Wortley's Critique of Situational Crime Prevention. In Smith, M.J. and Cornish, D.B. (eds) *Theory for Practice in Situational Crime Prevention*. Monsey, NY: Criminal Justice Press and Devon, UK: Willan Press.
- Cornish, D.B. and Smith, M.J. (2006) Anti-Social Behaviour. In Smith, M.J. and Cornish, D.B. (eds) *Secure and Tranquil Travel: Preventing Crime and Disorder on Public Transport*. London, UK: UCL Jill Dando Institute of Crime Science.
- Crime Concern (2004) *People's Conceptions of Personal Security and Their Concerns about Crime on Public Transport: Research Findings*. London, UK: Department for Transport [[http://www.gov.uk/stellant/groups/dft\\_mobility/documents/page/dft\\_mobility\\_029301.pdf](http://www.gov.uk/stellant/groups/dft_mobility/documents/page/dft_mobility_029301.pdf)].
- Crime Concern and Transport and Travel Research (1997) *Perceptions of Safety from Crime on Public Transport*. London, UK: Crime Concern and Transport and Travel Research.
- Department of the Environment, Transport, and the Regions (DETR) (2000) *Women and Public Transport: The Checklist. Guideline No. 1, Gender Auditing: An Overview*. Wetherby, UK: DETR.
- Eck, J.E. and Spelman, W. (1987) *Problem Solving: Problem-Oriented Policing in Newport News*. Washington, DC: Police Executive Research Forum.
- Fisher, B.S. and Sloan III, J.J. (2003) Unraveling the Fear of Victimization among College Women: Is the "Shadow of Sexual Assault" Hypothesis Supported? *Justice Quarterly*. Vol. 20, No. 3, pp 633–659.
- Frederick, P. (2002) Hassled, but Helpless. *The Hindu*. 10 September [<http://www.hinduonnet.com/mp/2002/09/10/stories/2002091000070100.htm>].
- Goldstein, H. (1990) *Problem Oriented Policing*. New York, NY: McGraw Hill.
- Greater London Council Women's Committee (GLC) (1985) *Survey Results: The Overall Findings: GLC Survey on Women and Transport. Women on the Move*. Vol. 2. London, UK: Greater London Council.
- Home Office (2001) *Your Practical Guide to Crime Prevention*. London, UK: Home Office Communication Directorate.
- Hubard, L. (1992) Security for the Los Angeles Metro Blue Line. *Transportation Research Record*. Vol. 1361, pp 312–319.
- Innes, M. and Fielding, N. (2002) From Community to Communicative Policing: "Signal Crimes and the Problem of Public Reassurance. *Sociological Research Online*. Vol. 7, No. 2 [<http://www.socresonline.org.uk/7/2/innes.html>].
- LaVigne, N. (1996) Safe Transport: Security by Design on the Washington Metro. In Clarke, R. (ed.) *Preventing Mass Transit Crime. Crime Prevention Studies*. Vol. 6. Monsey, NY: Criminal Justice Press.
- Levine, N. and Wachs, M. (1986) Bus Crime in Los Angeles: I – Measuring the Incidence. *Transportation Research A*. Vol. 20, No. 4, pp 273–284.
- Loukaitou-Sideris, A. (2005) Is It Safe to Walk Here? Design and Policy Responses to Women's Fear of Victimization in Public Places. *Research on Women's Issues in Transportation – Vol. 2: Technical Papers*. Report of a Conference. Proceedings 35. Washington, DC: Transportation Research Board [<http://onlinepubs.trb.org/onlinepubs/conf/CP35v2.pdf>].
- Loukaitou-Sideris, A., Liggett, R. and Iseki, H. (2002) The Geography of Transit Crime: Documentation and Evaluation of Crime Incidence On and Around the Green Line Stations in Los Angeles. *Journal of Planning Education and Research*. Vol. 22, pp 135–151.
- Lynch, G. and Atkins, S. (1988) The Influence of Personal Security Fears on Women's Travel Patterns. *Transportation*. Vol. 15, pp 257–277.
- Maxson, P., Browne, C., Conway, R., Mather, A. and Ridgway, J. (2001) *Secure Transport Route – Manchester (Victoria) to Clitheroe Pilot*. Report by Crime Concern for the Department of the Environment, Transport and the Regions (DETR). London, UK: DETR.
- McGuckin, N. and Nakamoto, Y. (2005) Differences in Trip Chaining by Men and Women. *Research on Women's Issues in Transportation – Vol. 2: Technical Papers*. Report of a Conference. Proceeding 35. Washington, DC: Transportation Research Board [<http://onlinepubs.trb.org/onlinepubs/conf/CP35v2.pdf>].
- Morgan, R. and Smith, M.J. (2006) Crime Against Passengers – Theft, Robbery, Assault and Indecent Assault. In Smith, M.J. and Cornish, D.B. (eds) *Secure and Tranquil Travel: Preventing Crime and Disorder on Public Transport*. London, UK: UCL Jill Dando Institute of Crime Science.

- Nasar, J.L. and Fisher, B. (1993) "Hot Spots" of Fear and Crime: A Multi-Method Investigation. *Journal of Environmental Psychology*. Vol. 13, pp 187–206.
- Newton, A.D. (2004) *Crime and Disorder on Buses: Towards an Evidence Base for Effective Crime Prevention*. Ph.D. Thesis, University of Liverpool. Liverpool, UK.
- Radford, J. and Stanko, E.A. (1994) The Contradictions of Patriarchal Crime Control. *Peace Review*. Vol. 6, No. 2, pp 149–158.
- Robinson, J.B. (1998) Transit Stations as Crime Generators: A Study of Vancouver. Paper presented at the 50th Annual Meeting of the American Society of Criminology. Washington, DC, 11–14 November.
- Shellow, R., Bartel, E.W. and Romualdi, J. (1975) *Security of Patrons on Urban Transportation Systems*. Transportation Research Institute Report No. 6. Pittsburgh, PA: Carnegie-Mellon University, Transport Research Institute.
- Smith, J. (2003) *The Nature of Personal Robbery*. Home Office Research Study 254. London, UK: Home Office Research, Development and Statistics Directorate [<http://www.homeoffice.gov.uk/rds/pdfs2/hors254.pdf>].
- Smith, M.J. (1996) *Assessing Vandalism Cues in an Experimental Setting: A Factorial Design Involving State of Repair, Presence of Graffiti, Target Vulnerability, and Target Suitability*. Ph.D. Thesis. Rutgers University, Newark, NJ.
- Smith, M.J., Belenko, S., Staehs, G., Arriola, R., Shea, R., Truitt, L. and Harsch, D. (1986a) *Transit Crime Study, Vol. 1, Summary of Findings and Policy Recommendations*. New York, NY: New York City Criminal Justice Agency.
- Smith, M.J., Belenko, S., Staehs, G., Arriola, R., Shea, R., Truitt, L. and Harsch, D. (1986b) *Transit Crime Study, Vol. 2, Final Report*. New York, NY: New York City Criminal Justice Agency.
- Smith, M.J. and Clarke, R.V. (2000) Crime and Public Transport. In Tonry, M. (ed.) *Crime and Justice: A Review of Research*. Vol. 27. Chicago, IL: University of Chicago Press.
- Smith, M.J. and Cornish, D.B. (eds) (2006) *Secure and Tranquil Travel: Preventing Crime and Disorder on Public Transport*. London, UK: UCL Jill Dando Institute of Crime Science.
- Stafford, J. and Pettersson, G. (2004) *People's Perceptions of Personal Security and Their Concerns about Crime on Public Transport*. A Report for the Department of Transport by Crime Concern. London: Department for Transport [[http://www.dft.gov.uk/stellant/groups/dft\\_mobility/documents/pdf/dft\\_mobility\\_pdf\\_029303.pdf](http://www.dft.gov.uk/stellant/groups/dft_mobility/documents/pdf/dft_mobility_pdf_029303.pdf)].
- Taylor, B., Loukaitou-Sideris, A., Liggett, R., Fink, C., Wachs, M., Cavanaugh, E., Cherry, C. and Hasse, P.J. (2005) *Designing and Operating Safe and Secure Systems: Assessing Current Practices in the United States and Abroad*. San Jose, CA: Mineta Transportation Institute [[http://transweb.sjsu.edu/mtiportal/research/publications/documents/04-05/MTI\\_04-05.pdf](http://transweb.sjsu.edu/mtiportal/research/publications/documents/04-05/MTI_04-05.pdf)].
- Thrasher, E.J. and Schnell, J.B. (1974) Studies of Public Attitudes Toward Transit Crime and Vandalism. *Transportation Research Record*. Vol. 487, pp 26–33.
- Toronto Travel Commission (TTC), Metro Action Committee on Public Violence against Women and Children (METRAC), and the Metro Toronto Police Force (MTPF) (1989) *Moving Forward: Making Transit Safer for Women*. Toronto, CAN: TTC, METRAC, and MTPF.
- Wallace, R.R., Rodriguez, D.A., White, C. and Levine, J. (1999) Who Noticed, Who Cares? Passenger Reactions to Transit Safety Measures. *Transportation Research Record*. Vol. 1666, pp 133–138.