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# DESIGNING FOR SECURITY IN MÉTÉOR: A PROJECTED NEW MÉTRO LINE IN PARIS

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by

**Marina L. Myhre**

**Rutgers, The State University of New Jersey**

and

**Fabien Rosso**

**Universite d'Aix-Marseille III**

***Abstract:** Design plans for *Météor*, a projected new Métro line in Paris, provide the opportunity to compare its security features with those of the existing Paris Métro and two subway successes in Washington, DC, and Hong Kong. *Meteor* includes a wider range of situational measures than the existing Metros in Paris, Washington, DC, or Hong Kong, and its security features are consistent with the most recent developments in crime prevention strategies (Clarke and Homel, in press). If the projected design plans are properly implemented, *Météor* promises to be a crime-control success.*

## INTRODUCTION

Subway systems provide ample opportunities for crimes to occur. There is a guaranteed supply of people on their way to work, going shopping, or returning from a night out with friends. People are sometimes preoccupied, tired or heavily laden with packages. Stations, platforms, and trains are often located in cavernous spaces, underneath bustling cities. Lighting can be dim, surroundings dirty, and unpleasant smells may fill the air. In addition, paths may be circuitous, signs unclear, and security or station personnel scarce. Overall, many subway systems are uninviting

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Address correspondence to: Marina L. Myhre, School of Criminal Justice, Rutgers University, 15 Washington Street, 12th Floor, Newark, NJ 07102.

and unappealing, but when in need of fast and cheap transportation, subways tend to be chosen over buses, taxis, and automobiles.

There are also exceptions to this picture of the dreary, "crimes are just waiting to happen" subway scenario. The Régie Autonome des Transports Parisiens (RATP) has recently released the projected design plans for Météor, a new Metro line in Paris, that appear to be promising in terms of their application of situational measures (Clarke, 1992) aimed at controlling and preventing crime. The Washington, DC Metro (see La Vigne, in this volume), and the Hong Kong Mass Transit Railway (MTR) (Gaylord and Galliher, 1991; Gaylord and Lester, 1994) serve as two examples of subway systems that have appeared to be relatively crime-free environments (López, 1996).

This paper has three objectives: (1) to compare the security features depicted in Météor's projected design plans with those of the existing Paris Métro; (2) to consider whether the new Paris Météor line will fare as well as, or better than, its older Washington, DC, and Hong Kong counterparts; and (3) to apply the most-recent crime prevention model of Clarke and Homel (in press), setting out sixteen techniques of situational crime prevention, in an analysis of Météor's projected design plans. Before launching into these comparative analyses, however, this article first explains why Météor is being constructed and how designers and planners have made Météor an integral part of the existing Paris Métro.

### **SUBWAY TRANSPORTATION IN PARIS**

The Régie Autonome des Transports Parisiens (RATP) is developing Météor as part of a larger overhaul of public transportation in Paris (RATP, 1995). Météor (METro Est-Ouest Rapide) is designed, first, to ease the rush-hour traffic on the over-crowded east-west link of the Réseau Express Régional (RER), a long-distance metro serving the distant suburbs of Paris (RATP, 1995; RATP, 1994a). Second, Météor will serve the neglected northern and southern suburbs of Paris, where a single metro line (line # 6) is the only current mode of public transportation. Third, Météor is intended to play an active role in Paris's increasing economic development.

Météor, eight kilometers in length, will extend from the north-west suburbs and through the high-traffic areas in the center of Paris down to the south-east suburbs. Its eight stations will provide direct connections with eleven existing Paris Métro lines, five RER lines, numerous bus lines, and two railroad stations (Gare Saint Lazare and Gare de Lyon) (RATP, 1994a). Météor is designed to encourage economic development through

its fast and direct links to Paris's new business center at Bercy and the "Paris Seine Rive Gauche" site that includes the Palais Omnisports de Paris Bercy (a multi-activity center), the Ministry of Economy and Finances, and the Library of France (RATP, 1995).

## **MÉTÉORS PROJECTED DESIGN PLANS AND SECURITY FEATURES**

Météor does not just represent an overhaul of Paris's public transportation system in terms of meeting its riders' needs. It is also illustrative of a larger move to focus on security and crime prevention in France. In January 1995, the French legislature passed a law (la Loi Pasqua du 21 janvier 1995) that provides general guidelines for the implementation of situational crime prevention measures, such as the placement of closed-circuit television cameras (Gleizal, 1995).

To help designers plan the construction of Météor's stations, the RATP surveyed riders who pass through the more dangerous stations about their perceptions of the Métro system during the last six months of 1995.<sup>1</sup> For instance, people surveyed reported feeling insecure and uncomfortable in dark or dirty places where no transport agent could be seen. After closely examining existing Paris Métro stations, RATP officials realized the potential safety and security risks posed by open access to the tracks. The risks and proposed design solutions are discussed below.

Météor's design plans are also in line with contemporary trends in architecture with their innovative and extensive use of open spaces, clear lines of vision throughout the station and their use of natural and reflected lighting (Mason, 1996; Iovine, 1996).<sup>2</sup> Driven to create a refreshingly bright and exciting subway experience for its riders, our analysis of Météor suggests that Météor's architects and planners strategically chose specific designs and reflective materials to increase surveillance potential, decrease the fear of crime, and enhance the comfort of their subway line so that riders would enjoy their journeys underground (RATP, 1994a; RATP, 1994b; RATP, 1994c). These designs are described in the following four sections.

### **Stations, Entrances, and Lobbies**

Météor's designers planned only one or two entrances and exits at each station. Météor ticket seller booths are to be centrally located in its lobbies, enclosed by a glass screen, spacious, and well lit. The turnstiles, in full view of the ticket seller are designed to reject previously used, tampered

with, or counterfeit fare tickets. Although there was no mention in the RATP documents (RATP, 1995; RATP, 1994a; RATP, 1994b; RATP, 1994c) of a plan to increase spot checks specifically on the Météor line, the RATP has announced: (1) a fifty-percent increase in the number of uniformed agents who will check for fraud; (2) the development of anti-fraud turnstiles for existing Metro and RER stations; (3) clearer signs illustrating the monthly fare ticket regulations; and (4) the development of logos and a computer chip on the monthly fare ticket to make counterfeiting more difficult (RATP, 1995). These recent developments represent the RATP's concern about fare evasion as a problem and their intention to use security measures to combat it.

The open design of Météor station entrances will allow natural light to enter the platforms and the spacious lobby areas (RATP, 1994b). The semi-transparent and semi-metallic construction of the elevators for disabled access and the street-level glass-cubed areas and skylights will also enable more natural light to enter the station (RATP, 1994b). In the station's interior, Météor's artificial lighting systems highlight certain areas of the station and should draw the riders' attention to various connections, exit routes, and service announcements. These lighting systems are designed to enable the passengers to "see the light but not the source," as well as easing the problems of sight for the visually-impaired (RATP, 1994b). Transparent and reflective materials on the walls and lightly colored granite floors are designed to accentuate the effects of the recessed and reflective lighting and create a light and bright atmosphere. Arched and vaulted ceilings and wide passageways will result in a spacious design, while overhead cross-overs at the mezzanine will allow passengers to look down on the platforms and trains. The absence of dark corners, nooks, and unused spaces will also help to create a relaxed and comfortable underground environment (RATP, 1994b).

## **Platforms**

The most important new feature of Météor's platforms will be glass barriers to prevent access to the tracks (see Figure 1) (RATP, 1994b). The glass barriers will allow riders to enter the train cars only when the doors of each train car have pulled up to match the barriers' doors (RATP, 1994c). They should eliminate opportunities for suicide attempts (Clarke and Poyner, 1994), the intentional pushing of riders, and the deposit of narcotics on the tracks for later sale. In addition, because the glass barriers will be arched over the tracks and extend to both platforms, they should not disrupt the clear view from one platform to the other (RATP,

1994a). The platforms' arched walls, vaulted ceilings, and barrier surfaces will have graffiti-resistant finishes, enabling Météor personnel to remove any graffiti within hours of detection (RATP, 1994b).

The large, open platforms are designed to prevent passenger crowding and the absence of supporting columns should remove potential hiding places for offenders. Emergency intercoms, call buttons, and alarms are clearly marked. The seating is sparse and separated so as to discourage loitering or sleeping off a drunken stupor on the platforms. Meteor's architects plan to employ seating that reflects the curvilinear design of the underground environment (see Figure 1, where the curved arm-rest mirrors the arch in the glass barrier and the platform's ceiling) (RATP, 1994b). Platforms are constructed of lightly colored granite, chosen for its durability and reflective capacity (RATP, 1994b). Closed-circuit television cameras (CCTV) situated at the end of each platform and station employees with two-way radios directly linked to a command center are two security features that can increase surveillance potential (RATP, 1994c).

## **Trains**

Météor designers have included computer-controlled trains in their plans, allowing the replacement of the train operator with a uniformed station attendant who will be free to perform a patrolling function anywhere within Météor stations, platforms, and trains. Meteor's trains will make use of a "straight through" format, with clear doors between train cars, where both employees and passengers alike will be able to have unobstructed views of the entire train (RATP, 1994c). La Vigne (1996) identified windows between train cars as a feature that assisted Washington, DC Metro's security officers in patrolling trains. Frequent and highly predictable scheduling of trains reduces opportunities for crime commission because passengers are not left alone on the platforms as targets waiting to be victimized (La Vigne, in this volume). Since the rapid scheduling of trains also leaves no reason for anyone to loiter on the platforms, Météor station attendants will be able to easily identify loiterers and ask them to be on their way (RATP, 1995; RATP, 1994b).

**Figure 1: The Projected Design of Météor's Madeleine Station**



RATP/audiov.

The projected design plans depict intercom connections in every train car that will be directly linked to the command center ("PCC") (RATP, 1994c). Riders will be able to request help through the intercoms or ask that the camera in each train be activated.<sup>3</sup> Train door locks will be able to be activated from the command center to prevent a suspected offender from entering or exiting the train. Finally, color-coded, numbered, and clearly labeled train lines should also reduce the possibility of riders becoming lost or confused (RATP, 1994b).

### **System-wide**

Météor staff and security personnel, equipped with two-way radios linked to the command center, will receive training in vigilance and will patrol stations, platforms, and trains. The command center will be responsible for constant surveillance and dispatching of transit police. Intercoms

and emergency alarms will be present throughout the system to promote the safety of riders and increase their sense of security. A public address system will be available to direct riders and police patrols (RATP, 1994a; RATP, 1994c).

Since the RATP has announced that it intends to pursue stricter law enforcement policies against fare evasion, loitering, and disorderly and drunken persons on the existing Paris Métro and RER lines, it is likely that similar stringent law enforcement practices will be applied to Météor (RATP, 1995). Météor's design plans promise the prompt, system-wide removal of graffiti and vandal-resistant seating construction should protect Météor's seating from being damaged (RATP, 1994b). Recessed lighting should make the theft of the light bulbs or the vandalism of the fixtures nearly impossible. Food vendors, small shops, musicians, and telephones that are common in many Paris Métro stations, but which promote loitering and serve as targets for theft and robbery, have been prohibited. More plentiful and clearly marked trash bins should reduce littering. Clearer signs, highlighting the different Metro lines, good connections within the station, and emergency intercoms should help riders find their way without delay or confusion (RATP, 1994a; RATP, 1994b; RATP, 1994c).

## **COMPARISON BETWEEN MÉTÉOR AND THE PARIS MÉTRO**

The existing Paris Métro has 13 lines that run both above and below ground. Most of the stations are dark, have multiple entrances or exits, and have long and winding corridors and passageways. Platforms, lined with more than ample seating (three sets of ten attached seats line most platforms), have open access to the tracks. There are few CCTV cameras within the system and neither Métro personnel nor CCTV cameras are linked to a command center. Météor's projected design plans indicate that many of the features of the existing Paris Métro, which furnish crime opportunities and create an unattractive and sometimes uneasy environment, have been either completely eliminated, corrected, or improved. (See Table 1 for a detailed list of Météor's security and design features.)

**Table 1: Summary of Météor's Key Design and Security Features: Improvements Over the Existing Paris Métro**

<p><b><i>Stations, Entrances, and Lobbies</i></b>  limited entrances and exits  natural light  artificial lighting, enhanced by lightly colored construction materials  wide passageways prevent crowding  spacious lobby areas, with arched and vaulted ceilings  overhead crossovers for passengers at mezzanine  open views down to platforms and trains  absence of corners, long passageways, nooks, and unused spaces  centrally located ticket seller booth with glass screen  turnstiles and escalators in view of ticket seller  turnstiles reject insufficient and counterfeit fares  monthly ticket with computer chip and photo and number identification  vendors, musicians, or pay phones prohibited  clearly marked trash bins</p>
<p><b><i>Platforms</i></b>  glass barrier preventing track access  high, arched ceilings  large, open platforms so no crowding  limited seating  vandal-resistant seating  2 CCTV cameras at platform ends (activated by rapid movement and loud or shrill voices)</p>
<p><b><i>Trains</i></b>  computer-driven trains free operator for surveillance function, replaced by station attendant  command center (PCC) monitors and operates trains  clear doors between train cars for unobstructed views  response microphones, intercoms, CCTV cameras linked to PCC in each car  1.5 to 2 minute intervals between trains  train door locks can be activated to prevent suspect's escape  enhanced color-coding and labeling of train lines</p>
<p><b><i>System-wide</i></b>  staff and security personnel equipped with two-way radios  staff vigilance training  uniformed station attendant always present  command center (PCC) surveillance  staff, police, and CCTV linked to PCC  intercoms, call buttons, or emergency alarms throughout  public address system (directs riders and police patrols)  increased spot-checking for fare evaders  stringent law enforcement  prompt graffiti removal  graffiti and vandal-resistant materials and finishes  maximum use of natural and indirect lighting: skylights, glass cubing, reflective, transparent material  clearer signs: maps and paths direct riders  clearer signs indicate rules</p>



## **COMPARISON OF MÉTEOR WITH THE WASHINGTON, DC METRO AND THE HONG KONG MASS TRANSIT RAILWAY**

To better evaluate Météor's crime control potential, the following section compares the design philosophy and security measures in Météor's design plans to those of two apparent subway system successes: the Washington, DC Metro (Metro) (La Vigne, in this volume; La Vigne, 1996) and the Hong Kong Mass Transit Railway (MTR) (Gaylord and Galliher, 1991; Gaylord and Lester, 1994).<sup>4</sup>

Although legislative guidelines for situational prevention were not part of their respective political climates, as they were for Météor, transit officials of both the Metro and the MTR expected that both systems would be designed with crime prevention in mind. To meet these expectations, planners of the Metro focused on "designing in" security measures that would maximize its crime prevention capacity (La Vigne, in this volume). The MTR designers turned to the police for advice in reaching their goal of a crime-free subway system (Gaylord and Galliher, 1991). At this juncture, however, the design similarities between the Washington, DC and Hong Kong public rail transportation systems begin to diverge. Each system's designers and planners relied on a different philosophy and aesthetically different designs to guide the evolution of their respective subways. The Metro adheres to a minimalist design, with large, quiet, spacious, cavernous environments that subdue riders and order them efficiently along their way. For instance, limited entrances and exits control its riders. Long escalators marshal riders from outdoor station entrances down into the Metro's cavernous stations, limiting the number of winding passageways where offenders may hide. An "exact fare" system rejects insufficient or counterfeit fare cards to control fare evasion. CCTV cameras, visible at both ends of the large, open platforms and a public address system remind riders that they are being surveilled (La Vigne, in this volume).

The MTR designers, on the other hand, adhered to a "building as policeman" philosophy, priding themselves on an architectural design that regiment the riders' journeys in an orderly fashion throughout the system. In the MTR "everyone enters into and exits from the system in the shortest possible time ... passenger behaviour is so purposeful, orderly, and readily observable, aberrant behaviour stands out and is easily recognized" (Gaylord and Galliher, 1991:24). One-way flow patterns and temporary stainless steel barriers regulate crowd density. An MTR police constable in every station, equipped with a two-way radio that is directly

linked to a command center, is responsible for crime problems and order maintenance (Gaylord and Galliher, 1991).

An upward slope at each end of every train car enhances surveillance possibilities for MTR police and security personnel. Computer-controlled trains, like the those on the *Météor* line, leave the operator free to oversee the overall security and safety of the train's riders. Train doors lock, if a crime is thought to be in progress, to trap the offender until police respond. MTR security personnel can rely on the CCTV cameras to track a suspect from the platform to the station if a police officer is unable to apprehend the person while underground (Gaylord and Galliher, 1991).

Table 2 presents a summary comparison of the design and security features of the Metro and the MTR subway systems, using the list of *Météor*'s projected features as a standard (see Table 1). For instance, the glass barriers preventing track access and the use of natural light are two key features, both of which are not present in either the Metro (La Vigne, in this volume) or the MTR (Gaylord and Galliher, 1991), that should enable *Météor* to increase the safety of its environment (RATP, 1994b). *Météor* also plans to have a CCTV camera in each train car (RATP, 1994c) a security measure that is lacking in both the Metro (La Vigne, in this volume) and the MTR (Gaylord and Galliher, 1991). The Metro, MTR, and *Météor*, on the other hand, all have limited entrances and exits, turnstiles that reject insufficient and counterfeit fares (RATP, 1995), wide passageways, and limited platform seating.

### **MÉTÉOR: CONSISTENT WITH CURRENT CRIME PREVENTION?**

Although the Paris *Météor*'s design plans exhibit many security features that exist in the Washington, DC Metro and the Hong Kong MTR, they contain additional security design characteristics that render a simple comparison between the subways of the three cities insufficient. *Météor* is the product of a design philosophy that, in emphasizing the somewhat diverse goals of excitement, comfort, safety, and security (RATP, 1994a; RATP, 1994b), differs from the minimalist and functionalist philosophies of the Washington, DC and Hong Kong subway systems, respectively. To reach their goals, Meteor architects plan to incorporate a wide variety of design and security features representative of a broad range of crime prevention techniques. The next section sets out the sixteen techniques of situational crime prevention presented by Clarke and Homel (in press). We then examine how consistent the features of Meteor are with these techniques.

**Table 2: A Comparison of Design Elements and Security Features in the Washington DC Metro and the Hong Kong MTR to those in the Proposed Paris Météor Line**

Design Elements and Security Features:	Washington, DC, Metro	Hong Kong MTR
<i>Stations, Entrances, and Lobbies</i>		
uniformed station attendant at mezzanine	+	+
limited entrances and exits	+	+
turnstiles reject insufficient and counterfeit fares	+	+
stored value ticket with computer chip*	+	+
wide passageways prevent crowding	+	+
spacious lobby areas	+	+
vendors, musicians, and pay phones prohibited	+	+
clearly marked trash bins	+	+
lobbies and platforms with arched and vaulted ceilings	+	-
overhead crossovers for passengers at mezzanine	+	-
open views down to platforms and trains	<	<
absence of corners, long passageways, nooks, and unused spaces	<	<
centrally located ticket seller booth with glass screen	<	+
turnstiles and escalators in view of ticket seller	<	+
artificial lighting, enhanced by lightly colored construction materials	-	+
convex mirrors on blind corners	-	+
monthly ticket with photo and number identification	-	-
natural light	-	-
<i>Platforms</i>		
large, open platforms so no crowding	+	+
limited seating	+	+
vandal-resistant seating	+	+
high ceilings	+	+
arched ceilings	+	-
glass barrier preventing track access	-	-
# of CCTV camera(s)	2	1
<i>Trains</i>		
frequent trains	+	+
computer-driven trains	+	+
train operator controls doors and emergencies	+	+
command center monitors and operates trains	+	+
train door locks can be activated to prevent suspect's escape	+	+
intercoms in each car	+	+
color-coded and clearly labeled train lines	+	+
upward slope at ends of train cars enhances surveillance	-	+
train operator monitors CCTV	-	+
clear doors between train cars for unobstructed views	-**	+
train operator replaced by station attendant free to patrol s, p, t	-	-
CCTV in each car	-	-
<i>System-wide</i>		
presence of intercoms, call buttons, or emergency alarms	p,t	t
average # of CCTV cameras per station	8	5
staff and security personnel equipped with two-way radios	+	+
staff vigilance training	+	+
command center surveillance	+	+
public address system (directs riders and police patrols)	+	+
stringent law enforcement	+	+
prompt graffiti removal	+	+
graffiti and vandal-resistant materials and finishes	+	+
signs indicate rules	+	+
clear signs: maps and paths direct riders	<	+
staff, police, and CCTV linked to command center	<	+
maximum use of natural and indirect lighting: skylights or reflective material	-	+
spot-checking for fare evaders	-	-

\* Météor's stored value ticket is a monthly pass and fare ticket.

\*\* Metro has clear windows between train cars, but no clear doors.

<b>Key:</b>	
+	= feature present
<	= feature present in fewer locations than in Météor
-	= feature absent
s, p, t	= stations, platforms, trains

## **Sixteen Techniques of Situational Crime Prevention**

The rational choice perspective (Clarke, 1992; Cornish and Clarke, 1986), which is the theoretical basis of situational crime prevention, posits that an offender engages in purposive behavior when deciding to commit a crime. The offender's decision to commit that specific crime involves a consideration of the risks, efforts, and rewards involved, but is often limited or constrained by time, the information available, and the offender's ability to process that information (Clarke, 1995). Clarke (1992) arranged an earlier classification of twelve situational crime prevention techniques into three groups, along the lines of the rational choice perspective, designed to address three aspects (risks, effort, and rewards) of the decision to offend. Recently, however, Clarke and Homel (in press) have amended the three category headings of this earlier classification to reflect the importance of the offender's cognitive and perceptual perspective of the crime situation (Clarke, 1995). In this latest classification of sixteen situational techniques, Clarke and Homel (in press) have added *Inducing Guilt or Shame* as a fourth category of techniques designed to achieve greater feelings of guilt and shame in the specific situations where offenders could commit an offense. For instance, the posting of "Bloody Idiots Drink and Drive" signs in pubs is designed to deter people from drinking alcohol beyond the legally permitted amount.

## **Météor, Analyzed Along Situational Crime Prevention Lines**

Table 3 illustrates that the wide variety of security features depicted in Météor's design plans, as well as some of the features retained from the existing Paris Métro, furnish examples of the complete range of Clarke and Homel's categories of situational prevention techniques. This provides support for the view that Météor's security features are consistent with the most current developments in crime prevention. For instance, Météor's plans combine innovative measures, such as glass barriers preventing track access and a monthly fare ticket with a computer chip, with measures in the existing Paris Métro, such as the absence of seating in the stations and station closings from 1:00 a.m. to 6:00 a.m., that may *increase perceived effort*. Météor's planned command center surveillance, staff vigilance training, and the maximum use of natural and indirect lighting and open spaces, on the other hand, represent vast improvements

**Table 3: An Application of the Sixteen Techniques of Situational Crime Prevention (Clarke and Homel, in press) to Météor**

<i>Increasing Perceived Effort</i>	<i>Increasing Perceived Risks</i>	<i>Reducing Anticipated Rewards</i>	<i>Inducing Guilt or Shame</i>
<p><b>1. Target hardening:</b></p> <ul style="list-style-type: none"> <li>- glass screen for ticket seller</li> <li>- graffiti and vandal-resistant materials</li> </ul>	<p><b>5. Entry/exit screening:</b></p> <ul style="list-style-type: none"> <li>- turnstiles in front of ticket seller</li> <li>- turnstiles reject insufficient and counterfeit fares</li> <li>- train door locks prevent suspect's escape</li> </ul>	<p><b>9. Target removal:</b></p> <ul style="list-style-type: none"> <li>- recessed light bulbs</li> <li>- frequent trains</li> <li>- vendors and musicians prohibited</li> <li>- pay phones prohibited</li> <li>- clear signs; color-coded, labeled train lines and clear paths direct riders</li> </ul>	<p><b>13. Rule setting:</b></p> <ul style="list-style-type: none"> <li>- signs indicate rules</li> <li>- no smoking, eating, or drinking</li> <li>- "Fare Evasion is Punishable With a \$40 Fine"</li> </ul>
<p><b>2. Access control:</b></p> <ul style="list-style-type: none"> <li>- glass barrier preventing track access</li> <li>- only valid ticketholders allowed</li> <li>- loiterers excluded</li> </ul>	<p><b>6. Formal surveillance:</b></p> <ul style="list-style-type: none"> <li>- command center (PCC) surveillance</li> <li>- PCC monitors and operates trains</li> <li>- uniformed and undercover police patrols</li> <li>- spot-checking for fare evaders</li> <li>- visible CCTV cameras at platform ends</li> <li>- intercoms and call buttons linked to PCC</li> </ul>	<p><b>10. Identifying property:</b></p> <ul style="list-style-type: none"> <li>- photo and number identification on monthly pass and fare ticket</li> </ul>	<p><b>14. Strengthening moral condemnation:</b></p> <ul style="list-style-type: none"> <li>- self-policing of riders is part of Paris mainstream subculture on public transport</li> </ul>
<p><b>3. Deflecting offenders:</b></p> <ul style="list-style-type: none"> <li>- stations closed 1 a.m. - 6 a.m.</li> <li>- no seating in the stations</li> <li>- limited or separated platform seating</li> <li>- limited station entrances and exits</li> </ul>	<p><b>7. Surveillance by employees:</b></p> <ul style="list-style-type: none"> <li>- staff vigilance training</li> <li>- two-way radios for station staff</li> <li>- station attendant always present</li> <li>- address system directs riders &amp; police patrols</li> </ul>	<p><b>11. Reducing temptation:</b></p> <ul style="list-style-type: none"> <li>- absence of corners, long passageways, nooks, and unused spaces</li> </ul>	<p><b>15. Controlling disinhibitors:</b></p> <ul style="list-style-type: none"> <li>- loitering, drunkenness, overnight stays prohibited</li> </ul>
<p><b>4. Controlling facilitators:</b></p> <ul style="list-style-type: none"> <li>- monthly fare ticket with computer chip</li> </ul>	<p><b>8. Natural surveillance:</b></p> <ul style="list-style-type: none"> <li>- natural, artificial, and indirect lighting</li> <li>- wide, open spaces and high, arched ceilings</li> <li>- clear views of station down to platforms/trains</li> <li>- clear doors between train cars</li> </ul>	<p><b>12. Denying benefits:</b></p> <ul style="list-style-type: none"> <li>- prompt graffiti removal</li> </ul>	<p><b>16. Facilitating compliance:</b></p> <ul style="list-style-type: none"> <li>- clearly marked trash bins</li> </ul>

over the existing Paris Metro system and serve as situational measures that may *increase perceived risks*.

In addition, recessed light bulbs, frequent trains, clear signs and prompt graffiti removal are just some of the measures that may *reduce the anticipated rewards* of committing a particular crime in Météor's underground environment. Signs indicating rules — "Fare Evasion is Punishable With a \$40 Fine" and loitering, drunkenness, and overnight stays are prohibited — and the presence of clearly marked trash bins<sup>5</sup> are examples of how the new system may *induce guilt or shame* in the offender, and thereby deter him or her from committing a specific offense.

It must be noted, however, that certain measures of *inducing guilt or shame* were not readily applicable to Météor indicating that special care must be taken to apply the situational crime prevention classification of techniques in a system-specific fashion. For instance, the informal policing of riders is a *strengthening moral condemnation* measure that is already a part of Paris mainstream subculture on public transport.

## DISCUSSION AND CONCLUSIONS

Four important conclusions present themselves from this analysis of the projected design plans of the new Paris Météor line. First, Météor constitutes a substantial improvement over the existing Paris Métro lines. Second, Météor's design plans compare well with two important subway successes, the Washington, DC Metro and the Hong Kong Mass Transit Railway. Third, Météor exhibits security features and design improvements, some of which are not present in its Washington, DC and Hong Kong counterparts, but which are consistent with the latest thinking in situational crime prevention as represented by Clarke and Homel's (in press) recently revised and expanded classification of situational prevention techniques. In conclusion, we think that because Météor's design plans include technologically advanced security features that are broad in range and situational in scope, it will be a crime-control and prevention success.

Although we have been optimistic to this point and have concentrated only on highlighting Météor's most promising security features, there are two characteristics that seem to be less than optimal and merit attention here. First, although Météor's design plans do not explicitly refer to the actual manner of operation of the CCTV cameras, the existing Paris Metro has CCTV cameras that are only activated by inordinately rapid movement or loud yells or screams. This activation feature could either assist those in the command center to focus only on serious disturbances or crimes in

progress on the Météor line or hinder their crime prevention efforts by not allowing for continuous surveillance. Second, although Météor employees can report an offense in progress to the command center, the center must then alert Métro police. This rather complex chain of command may result in a delayed transit police response to the scene and indicates either potential design flaws or a failure to use these security tools to their optimal surveillance capacity.

Nonetheless, only objective and empirical evaluations will clearly substantiate the claims of its potential success or point out the drawbacks of the Météor design and security innovations, but these evaluations must verify whether the design plans were strictly adhered to and properly implemented. An evaluation of Météor, albeit somewhat complicated because Météor is only one Métro line (line #14), should follow three steps. First, evaluators should compare crime rates in Paris and its Métro and RER (Réseau Express Régional) systems before and after Météor. La Vigne (in this volume) employed a similar evaluative method in concluding that the Washington, DC Metro is a successful subway system. Unfortunately, Météor's effects may be difficult to isolate because it is a part of the existing Paris Métro system and because security features are not the only factors that influence crime rates (La Vigne, 1996). Second, in addition to utilizing Paris's city and Métro system crime rate statistics to evaluate Meteor's success, station-specific and Métro line-specific crime rate comparisons should be used to identify if any displacement or diffusion of benefits (Clarke and Weisburd, 1994) occurred as a result of Meteor. Finally, we propose subsequent surveys of Meteor riders, featuring specific questions addressing their perceptions of the Meteor environment. The riders' responses should establish whether Meteor's designers have accomplished their goal of creating an exciting subway line that invites riders in to experience its comfortable and safe stations, platforms, and trains.



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## NOTES

1. Data from the survey itself have not been published. The authors obtained the information presented here from open-ended interviews with RATP personnel from June through November 1995, RATP pamphlets promoting Météor, written in French (RATP, 1994a; RATP, 1994b; RATP 1994c), and the RATP homepage on the Internet (RATP, 1995). Both authors have lived in Paris and are familiar with the existing Métro and RER systems.
2. American architects and designers are also captivated by the interplay between light and space. For instance, Mason (1996: C6) states that "lighter" and "brighter" have become the catchwords of the Valentino and Armani store designer, Peter Marino, who maintains that "access to outdoor light has become very important." On the other hand, for Iovine (1996: 20-21), "light is the crucial variable" that transforms "a nondescript corner into a radiant place of comfort."
3. The closed-circuit television cameras present in the existing Paris Métro are not continuously operating and we do not expect that there will be any changes in the camera systems that will be installed in the Météor line.
4. Although the features of these two systems have been abstracted from published documents, which, in some cases, have been further elucidated by Mark Gaylord and Nancy La Vigne, it was not always easy for the authors to judge whether and to what extent a feature was present. We have drawn on the RATP projected design plans (RATP, 1994a; RATP, 1994b; RATP, 1994c; RATP, 1995) and used our best judgment in evaluating how the features of the Metro and the MTR compare with the features of Meteor.
5. Unfortunately, many trash bins had to be sealed shut during the bomb scares of the summer of 1995, part of a law enforcement policy called Plan Vigipirate, so litter could become an unavoidable problem if such a situation were to recur.

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