
# Crime in and Around Transit Stations

## Exploring the Utility of Opportunity Theories of Crime

# Overview

- Theories of criminal events/opportunity
- Findings from transit crime studies
- 1996 study of crime on DC Metro
  - Focus primarily on underground area
- 2011 study on crime in Metro's parking areas
  - Focus on parking facilities design and security features
- What are implications for crime prevention in both rail and parking area settings?

# Theories of Criminal Opportunity and Prior Research on Transit Crime Prevention

- CPTED, Defensible Space
- Rational choice and routine activities
- Environmental criminology
- Common themes:
  - Assumes offenders respond to environmental cues
  - Suggests different approaches for different places
  - Consistent with principles of situational crime prevention
- Access control, surveillance – equal partners
- Rail and Parking areas prevent distinct opportunity structures

# The Setting

- Washington, DC Metro System
  - Serves greater Washington area (3.5 million people)
  - 86 stations
  - Average nearly 700,000 riders each work day
- Long-term Parking Facilities
  - 51 facilities (mix of surface lots and garages)
  - 56,382 parking spaces
- 60% of all Part I crimes on Metro occur above-ground
- Largest share (58%) are car-related

# Methodology to Examine Metro's Crime Prevention Impact

| |
|---|
| **Metro's environmental design and accompanying enforcement practices were compared qualitatively to theories of criminal opportunity** |
| **Metro's crime rates (per 1 million riders) were compared to those of three other United States subway systems (Metropolitan Atlanta Rapid Transit Authority (MARTA), the Metropolitan Boston Transit Authority (MBTA), and the Chicago Transit Authority (CTA)), isolating rail crime from total subway crime rates to ensure that parking facility crimes were not driving comparisons. F-tests (using the Scheffe correction for multiple comparisons) of an ANOVA (analysis of variance) compared mean rates per rider** |
| **Metro's crime rates (per 1 million riders) were assessed for their degree of stability over time, comparing crime rates by month for a 24-month period by calculating Pearson correlation coefficients for Metro crime rates by station in 1993 to those in 1994** |
| **Metro's crime rates (per 1 million riders) were compared over time to crime rates (per 100,000 residents) in the areas served by Metro, employing F-tests to compare coefficients of relative variation (SD/mean)** |
| **Metro's crime rate trends were compared to crime rate trends for the greater Washington, DC area, employing Z-scores to standardize for differences in base rates between the two data sets** |

# Design Features: Cameras and Arched Ceilings

# Design Features: Natural Surveillance

# Design Features: Train Cars

# Design Feature: Long Escalators

# Access Control: SmarTrip Cards


# Friendly Environment

# Tests of Crime Prevention Effectiveness

- Design features consistent with theory and past research
- Crime rates lower than other subway systems'
- Crime rates insulated from above ground variations
- More stability in crime rates station to station
- More stability in crime rates over time
- Exception: assaults

# Parking Area Research Objectives

- Identify environmental characteristics, management practices of long-term parking lots creating criminal opportunities
- Analyze incidence, prevalence, and distribution of crimes
- Identify promising strategies
- Implement one selected strategy in half of 50 commuter lots through blocked randomized experimental design
- Analyze effectiveness of intervention

# Methodology of Metro Parking Study

**Analyses of historical reported crime incidents to identify concentrations of and variations in crime by facility and predict environmental factors influencing crime rates**

**Collection and analysis of reported crime incidents in the areas surrounding each Metro parking facility (spanning seven independent jurisdictions)**

**Review of Metro's administrative data on parking facilities, such as hours of operation, staffing, and parking facility utilization**

**Interviews with MTP staff on reporting, patrol, and investigative practices**

**Systematic site observations of environmental features in each of Metro's 52 parking facilities, including lighting, layout, natural surveillance, access control, and the surrounding environment**

# Data Sources & Study Areas

- Crime records from 7 jurisdictions:
  - Washington, DC; Montgomery County, MD; Prince George's County, MD; Arlington County, VA; Fairfax County, VA; and the cities of Alexandria, Fairfax, and Falls Church, VA
- All Part I crimes within one-mile radius of Metro stations, January 2004 through December 2009
- Administrative data on Metro operations, including: hours of parking lot operation and staffing, parking lot utilization, and Metro policing practices
- Environmental characteristics of each facility and immediate area, including: lighting, layout, natural surveillance, access control, and usability

# Site Observations

- *Access Control-* majority of facilities (90%), payment was collected upon exit
- *Entrances/Exits*- three in four facilities had vehicle entrances/exits immediately adjacent to each other
- *Facility Surroundings*- majority of facilities were adjacent to residential areas (71%)
- *Attendant Booths*- About half had attendant booths from which most or all of the parking spaces in the facility were visible
- *Employee Surveillance*- parking attendant on duty at 60% of facilities during the time of the site observation

# The Intervention

- First choice, increased access control via SmarTrip cards, rejected as infeasible
- Instead, installed cameras at exits in half the facilities
- Included prominent signs
- Procured cameras with recording capabilities
- Intended to link to license plate recognition software

# Matching Criteria

- Total number of matched facilities: 50 (25 pairs)
- Dimensions used to match facilities:
  - CRIME RATE for the ½ mile surrounding each facility
  - CAPACITY of the facilities
  - PAYMENT POLICY (AM or PM payment)
  - FACILITY TYPE (Garage, Lot, or Combination)
  - LINE (NW Red, NE Red, NE Green, SE Green, W Orange, E Orange, E Blue, S Blue, S Yellow, Red/Green)

# Parking Area Study Findings

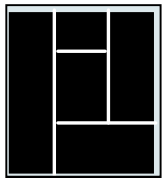
- Cameras had no impact
- Limited placement
- Focus on perceptions rather than actual surveillance
- Lack of implementation fidelity
  - Not integrated into investigations, LPR software
  - Officers may lack awareness of cameras

# Bridging the Two Studies

| Crime Prevention Feature | Metro's Rail Areas | Metro's Parking Areas |
|---|---|---|
| **Access control** | High: SmarTrip card needed upon both entry and exit | Low: can pay by cash to exit; some stations require payment upon arrival, with no attendants stationed at exits during afternoon/evening hours |
| **Natural surveillance** | High: absence of columns and corners, ambient lighting | Variable: moderate in surface lots, poor in multi-level garages |
| **Employee surveillance** | Moderate: station attendants positioned at most exits/entrances during all hours of operation | Low: station attendants not consistently positioned at all exits/entrances during all hours |
| **Formal surveillance** | High: relatively high volume of cameras, strategically placed, with some degree of live monitoring by station attendants | Low: very few cameras, only one-third functional, no ability for live monitoring |

# Addendum

- 2008 – present, Metro implemented additional measures
- SmarTrip card *upon both entrance and exit of the facility*
- Additional cameras at the booths
- Additional mobile towers affixed with cameras
- Local law enforcement agencies supplied with free SmartTrip cards to patrol facilities
- Over 50% drop in crimes from 2008 to 2012 (WMATA 2013).
- Implications: Crime prevention measures should be multi-faceted, enhancing both access control and surveillance, and implemented comprehensively, rather than as an isolated undertaking



**URBAN INSTITUTE**
Justice Policy Center

**Nancy La Vigne**

NLaVigne@urban.org

**For more information on justice policy research, please visit the Urban Institute website at:**
**http://jpc.urban.org/**

**To receive monthly email updates of JPC research, send an email to jpc@urban.org**