

**Transit stops, Robbery, and Routine Activities: Examining Street
Robbery in the Newark, NJ Subway Environment**

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Robbery: background of the crime

Robbery represents an offense that has traditionally struck fear in the heart of the American public (Cao and Maume p.11). The crime involves the use of violence, or threat of such action, in order to coerce one into surrendering his or her property. The textbook definition of robbery is stated as “the felonious and forcible taking from the person of another goods or money to any value by violence or putting him in fear” (Adler et al. p.29). Being the victim of such an action is most probably a terrifying experience. In addition to the citizenry, law enforcement also acknowledges the seriousness of this offense. This fact evidences in the FBI classifying the crime as a Part I offense in the Uniformed Crime Report.

The danger of robbery lies in its potential to transform into more serious, and harmful, crime. If violence manifests during the robbery attempt, other crimes such as shootings, assaults or, in the worst cases, homicides could result. Needless to say, victims face grave danger in these situations. However, danger is not restricted to the immediate robbery victims. Third parties, whether attempting to intervene or simply passing through the area, could experience victimization when violence materializes during a robbery attempt.¹

In comparison to other Part I UCR offenses, robbery occurs on a relatively frequent basis. Factors of the crime, such as it occurring mostly among strangers and its potential to occur in a variety of settings, make the likeliness that citizens will fall victim

¹ Newark Star Ledger reporter Barry Carter’s story “Off-duty Newark cop is shot trying to protect victims of robbery attempt” provides an example of how intervening parties can become victims of violence. The article appeared in the October 8, 2002 edition of the Star Ledger. The article can be retrieved online at **URL:** [Off-duty Newark cop is shot trying to protect victims of robbery attempt](/taxis/search/story.html?table=sl2002&id=3da2f3aad). A copy of the article appears in Appendix A of this paper.

to robbery higher than their chance of being victimized by other Part I offenses (Cao and Maume p.12).

Facts as these may impact the citizenry's perception of robbery. A natural response may be a belief that the occurrence of robbery is dispersed everywhere. The public may view the crime as rampant and, consequently, unable to be prevented.

Concentration of robbery

Despite the seemingly rampant nature of criminal behavior, research has shown that predatory crime often manifests as clusters, or “hot spots.” Robbery in no way excludes itself from this finding. In fact, previous studies have found that concentration is greater for robbery than other predatory offenses (Sherman et al. 1989; Roncek & Maier 1991).

This presence of robbery “hot spots” suggests that a factor may exist that causes the crime to occur in clusters. Though it is not the only previously offered explanation, mass transit stops within a city can serve as a factor leading to the clustering of robbery.

Mass Transit stops and Robbery

Transit stops usually correlate with high human activity. Additionally, these areas also correlate with high crime activity. Literature suggests that the “presence of a transit station often affects the relative danger in the immediate area” (Block and Block p.138). This suggests that mass transit stations and stops serve as behavior settings conducive to criminal activity. The Brantinghams describe a behavior setting as a location where desired behavior may be carried out (1993 p.6). For example, an empty household may be a behavior setting for a person seeking to commit burglary. A department store may be a behavior setting for a teenager who desires to steal a new outfit. Similarly, the area

around transit stops may serve as a behavior setting for individuals looking to commit robbery, due to the routine activities of the transit riders, others in the area, and the environment itself.² Simply put, “areas with...high rates of public transportation usage find more people in public places, thereby increasing the opportunity for a crime to occur” (Cao and Maume p.15).

The very nature of transit stops facilitates the occurrence of robbery. As explained by Block and Block (2000)

“[Transit stops] are transitional breaks in transportation, where standing around is not suspicious activity. By definition, transit stops are easy to enter and exit. Potential targets usually live some distance from the transit stop, are not always familiar with the surrounding area, and are unlikely to have previously met potential offenders” (p.138).

As exhibited by the quote, the transit stop environment encompasses factors whose presence is necessary for the commission of crime. Lack of suspicion by others aids in the offender diverting attention from him or herself. Easy entrance and exit keep the risk of getting caught relatively low. Finally, the target’s lack of knowledge about the area and others in the area leave him or her susceptible to victimization.

Previous research validates the claim that the characteristics of transit stops and their surrounding environment facilitate the occurrence of predatory crime. Thrasher and Schnell (1974) estimated that transit riders run twice the risk of being victims as non-transit riders in the same city. Routine Activities theory can be used to explain why such environments give rise to predatory criminal behavior.

Routine Activities and Mass Transit

² The role Routine Activities play in robbery around transit stops will be elaborated upon later in the paper.

Routine Activities theory switches focus from the individual who commits a crime to the environment in which crime takes place. According to Routine Activities, certain prerequisites must be fulfilled before a crime can occur. The theory proposes that crime occurs due to the convergence of three factors. These factors are 1) the presence of a potential target (victim), 2) the presence of a motivated offender, and 3) the absence of a capable guardian (Cohen and Felson, 1979). Interestingly, the authors offer that capable guardians are normally not police officers nor other officials of law enforcement. Although police do fall into the category of guardian, normal citizens more frequently play the role.

Mass transit moves large amounts of people simultaneously through a city. This group can be composed a couple of different ways. First, the group could be composed of all suitable targets. These targets are transported to areas where offenders can victimize them. Secondly, the group of travelers can be composed of both suitable targets and potential offenders. This scenario is most likely the reality at peak times for transit use, when the traveler population is at its highest.

It is undoubtedly true that capable guardians are present within these groups. I would argue that at least one of the other types of individuals (potential victim and offender) is always present, but a guardian need not be. The March 13, 1964 murder of Kitty Genovese, who was stabbed repeatedly for over 20 minutes while neighbors witnessed, proves that capable guardians are not always present, even within large groups.³ Capable guardians do exist, nonetheless. However, this group of travelers will disperse eventually. The riders do not all share the same destination. Due to this fact, the

³ For more information about the Kitty Genovese murder visit http://www.crimelibrary.com/serial_killers/predators/kitty_genovese/1.html?sect=2

capable guardians amongst the riders get filtered out. As the group separates the probability that capable guardians would thwart a robbery shrinks, simply because of their decreased presence.

Mass transit shaping crime patterns

Brantingham et al. 1991 acknowledge the role transportation plays in the type, location, and timing of crimes within a city. More precisely, they pointed to the specific “mode of travel” as being a key factor in the clustering of crime. The type of transportation used is said to affect crime patterns in five distinct ways.

Firstly, different forms of transportation cluster people together in different ways. Mass transit leads to a cluster that is distinctly different from one formed through private automobile travel. Automobiles usually contain small groups of acquaintances that, obviously, are insulated from others. The group normally shares similar demographic characteristics. People riding on mass transit usually do not know most others riding along side them. The group is also very diverse in nature. Furthermore, the individuals are in no way isolated from the group. The experienced risk levels also vary. Automobile drivers only exit their mode of transportation upon arrival at a destination node. Therefore, they only face substantial risks of victimization at these areas. Public transit riders are exposed to risk at the destination node, as well as the pathway to the node. They also face more danger at the actual node than do automobile riders. Riders of mass transit frequently have to walk within a node more than automobile riders in order to arrive at their final destination (Brantingham et al p.92).

Secondly, different modes of travel shape travel times differently. Obviously, drivers can operate their private automobiles whenever they please. Public transit runs on

a fixed schedule. Riders must gather at specific times and places in order to catch a train or bus. Patrons of mass transit find themselves exposed to risk more frequently, and at much more predictable times than private automobile drivers (Brantingham et al p. 92).

Thirdly, Brantingham et al 1991 pointed to the fact that different modes of transportation cluster destinations differently. Private automobile riders can move between numbers of destinations. Public transit riders do not possess a great number of options in respect to where to exit a bus or subway. Stops are present at specific locations (Brantingham et al p.92). Consequently, potential victims become clustered at predictable locations, and are more susceptible for target selection by potential offenders (Angel, 1968).

Fourthly, different modes of transportation tend to cluster travel paths differently. Automobile riders can travel on a variety of paths in order to arrive at a specific destination. Public transit riders are restricted to a single route. Unless traveling along a specific route for the first time, riders are not able to add new areas into their awareness spaces. If the mode of transit travels underground or on elevated paths, as is normally the case with subways, trains, and light rails, riders cannot add anything to their awareness spaces. Due to these factors, crimes associated with mass transit riders tend to be more clustered than crimes associated with private automobile users (Brantingham et al p.92-93).

Fifth and finally, different modes of transit shape the type and occurrence of crimes by creating different opportunity sets for crime. Public transit creates a great amount of target density. Brantingham et al acknowledged that this target density is critical for the occurrence of personal crimes, such as robbery (p.93).

The previous discussion illustrates how public transit systems mold crime patterns. This molding is due to specific characteristics of mass transit. Mass transit clusters targets, moves them along at predictable times and places, and regiments the transport of its patrons. These characteristics can make the transit environment a perennial magnet for robbery. Robbery data collected from 1993 to 1994 and October 1995 through October 1996 in Chicago and the Bronx, respectively, supports this claim (Block and Block 2000). Vancouver, in which each major transit interchange forms the center of a “major crime node,” also serves as testament (Brantingham et al p.92).

Mass transit stops and criminality of place

“Place” can be defined as “a fixed physical environment that can be seen completely and simultaneously, at least on its surface, by one’s naked eye” (Sherman et al 1989 p.31). A sociological concept of place can be defined as “the social organization of behavior at a geographic place” (Sherman et al 1989 p. 32). Just as is the case with people, places can be seen as having routine activities (Sherman et al 1989 p. 32-33).

Mass transit stops and their immediate surrounding environments can be considered places. They fit both the physical and sociological definitions of such. The transit stop environment encompasses its own set of behaviors. This set of behaviors can be considered the Routine Activities of the transit stop environment. These activities add to the potential criminality of the area, and increase the amount of potential targets. As previously noted, mass transit clusters scores of potential victims at transit stops. Additionally, transit stops are often located in areas with high amounts of activity. This adds to the density of victims in the surrounding environment.

Previous studies: findings and limitations

When making a link between mass transit and crime, some may look at activity within transit stations themselves as a measure of crime caused by transit. An idea exists that any crime caused by mass transit stations would occur inside the stations. Much research has been performed under this mind state.

The Washington DC subway system, also known as the “metro,” has been considered one of the safest subway systems in the world since it’s opening in 1976 (La Vigne p. 163). Nancy G. La Vigne studied the occurrence of crime, or lack thereof, in the metro. She concluded that the metro’s design, maintenance, and management led to its crime free state, and offered the subway system’s design as a blueprint for designing safe transit stations (p.189-190).

Contrary to La Vigne’s study, Felson et al 1996 analyzed a transit station with a serious crime problem: The New York City Port Authority bus terminal. A history of crime plagued this station. The authors studied how implemented crime interventions led to the dramatic reduction of crime in the bus terminal.

While the two mentioned studies contribute to the knowledge of preventing crime through physical design, neither captures the full relationship between robbery and mass transit. By focusing on the interior of transit stations, robbery occurring due to the routine activities of the riders in the surrounding environment is not taken into account. It may very well be that robbery occurring in the surrounding environments of transit stations and stops is the main offspring of public transit. Therefore, limiting focus on the stations does not allow for full interpretation and understanding of robbery and public transit.

Anastasia Loukaitou-Sideris focused on crime away from transit stations, and focused on crimes occurring at bus stops in Los Angeles. The author saw hot spots of this bus stop crime manifest from 1994 to 1995, the time frame of the study. About half of all crimes occurred in a 13 square mile area. 7 of the 10 most crime-ridden bus stops were located in downtown Los Angeles with the remaining 3 at the western fringes of downtown. Robbery was the fourth most frequently occurring crime, and the second most frequently occurring violent crime, behind assaults with hands or feet (Loukaitou-Sideris p. 399).

Although the focus moved outside of transit stations, this study may not have analyzed the full extent of crime caused by transit stops. The study only took into account crimes occurring specifically at a bus stop. Crimes occurring a block or two away from the stop, which may be directly related to mass transit, fall outside of this study's scope. This under representation of crime is reflected in the responses collected from a survey conducted by the author. Over half of the crime reported by the respondents involved robbery. This is a great leap from the figure of 8% reflected in the bus stop crime data. The author distributed surveys to a random sample of 95 female and 107 male bus riders found at 6 of Los Angeles' most crime ridden bus stops. The responses revealed that 31.1% of the subjects claimed to have been a victim of a crime during their public transit commute. 45% occurred at bus stops, 18% inside of buses, and the remaining 37% were at "unspecified locations" (Loukaitou-Sideris p. 400). A good number of these unspecified locations may very well be the immediate surroundings of the bus stops.

Theodore Poister examined crime occurring in the surrounding area of two newly opened rapid rail stations in DeKalb County, Georgia: the Kensington station and the Indian Creek station. Both stations opened in June 1993. Poister found that the incidence of reported crime remained stable in these areas over the 3 years preceding the opening. At the time of opening, larceny, auto theft, robbery, and vagrancy all showed increases in the level of reporting at the Kensington station. Robbery increased the most, experiencing a 74% increase in reporting. Only burglary increased at the Indian Creek station, the less busy of the two stations. Each of these crimes that increased after the opening of the stations returned back to their “normal” rates over several months (Poister p. 72-73).

Two distinct limitations are present in this study. First, it looked at newly opened transit stations. The mere presence of a new structure may be what leads to the crime increase. If this is the case, then the true relationship between crime and transit is not being displayed. Second, and more seriously, the study was conducted in a low crime suburban neighborhood. It would not take many more crime occurrences to dramatically increase the crime rate. For example, it only took an increase of 2.8 robberies per month for the robbery rate around the Kensington station to increase 74% (Poister p. 73).

Richard and Carolyn Block conducted a study of robbery in the mass transit environments of 2 urban areas with old transit stations: Northeast Chicago and the Bronx. The authors identified robbery hot spots in the two cities. They found that 10 of 11 hot spots in Chicago’s northeast area contained a rapid transit station, and all 7 hot spots in the Bronx contained at least one subway station.

The authors effectively analyzed the relationship between transit and robbery. However, the scope of their data may be too great. The data excluded home invasion and commercial robberies. The authors said all other types of robberies were included in the analysis. Offenses such as carjacking may very well be included in the data. Furthermore, robberies that occurred indoors but were not coded as “home invasions” may possibly be taken into account. A robbery could occur in one’s building, hallway, or in front of the door at the apartment entrance. These offenses may not technically constitute a home invasion, but they share more similarities with that crime than with street robbery.

Mass Transit and Robbery in Newark, NJ

Newark is the biggest city in New Jersey, but is not terribly large in comparison to major metropolises in the US. The 2000 census reported a population of 2,032,989 within Newark, NJ. Nevertheless, mass transit plays a vital role in the everyday functions of the city.

Buses serve as the main means of public transport in Newark, NJ. 990 bus stops are present throughout the city. Citizens have access to buses at relatively all of Newark’s blocks.

The city only has one subway line, named the Newark City subway. The subway has 12 total stops, 10 of which are within the boundaries of Newark. The other 2 are in the neighboring towns of Bloomfield and Belleville. However, they are not far from Newark, reaching only blocks beyond the boundary. When traveling into the city, the

Newark City Subway

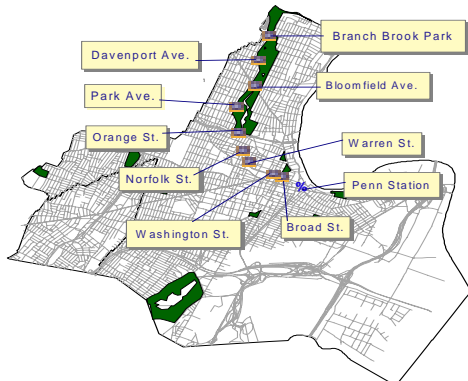


Figure 1

Newark stops appear as follows: Branch Brook Park, Davenport Ave., Bloomfield Ave., Park Ave., Orange St., Norfolk St., Warren St., Washington St., Broad St., Penn Station (Figure 1). The Newark City subway does not have stops in all areas of the city. The subway travels from the North district of the city to the east district, in a diagonal, curving pattern.

Penn station is the major transit station in Newark. Penn station supports the Newark City subway, NJ transit commuter rail, Amtrak long distance trains, PATH train to New York City, and bus services traveling locally, regionally, and nationally. Penn station is located in Newark's East district.

Research Question

This study seeks to identify whether a relationship exists between street robbery, and subway stop, Penn station included. Incorporating bus stops into the analysis would have indeed been ideal. However, data on the bus stop locations were not obtained in time to do so.

Quite simply, this paper asks if street robbery manifests more in surrounding environments of subway stops than in other areas of the city. 4 hypotheses were created

in response to this question: 1) A significant proportion of the total robberies will occur within 1300 feet of a subway stop or Penn station, 2) a significant proportion of the total robberies will have occurred within 2600 feet of a subway stop or Penn station, 3) most of Newark's street robbery "hotspots" will contain a subway stop or Penn station,⁴ and 4) the proportion of robbery occurring within 1,300 feet and 2,600 feet of subway stops will be greater when looking at robberies occurring during service hours.

Conceptualization

The distances of 1,300 feet and 2,600 feet each represent the "surrounding environment" of the transit stops. These distances represent approximately 2 city blocks and 4 city blocks, respectively (Block and Block p. 141).

The term "street robbery" does not encompass all incidents of robbery. Not addressed by the term are commercial robberies, robberies occurring indoors, car jackings, robberies occurring inside of a vehicle, and robberies occurring inside of a subway car or bus. Cases coded by the Newark Police Department as being acts of Domestic Violence were also excluded from the analysis. Conceptually, these particular offenses do not seem to relate with high activity nodes. The culmination of large amounts of individuals would not likely lead to these offenses. Therefore, a better perspective of the relationship between robbery and transit stops is obtained by excluding them.

Methodology

The Newark Police department reported 1,829 total robberies occurring in 2001. After filtering out the unwanted cases 1,359 cases remain. These cases of street robbery

⁴ As previously mentioned bus stop locations was not incorporated in this study. Upon receipt of the data the words "subway stations" will be replaced with "transit stops" to incorporate both subway and bus stops.

represent 74.3% of the total number of robberies to occur in Newark during 2001. As is exhibited, street robbery makes up the vast majority of robbery in Newark. We therefore obtain an adequate picture of overall robbery in Newark through their analysis.

Both the incidents of street robbery and the 10 Newark city subway stops were mapped using the ArcView GIS 3.2 software package. The software was unable to recognize 25 of the street robbery location addresses. Being that this number only makes up 2% of the 1,359 cases, the study is not at all hindered by the missing data.

In order to determine the proportion of robberies occurring around transit stops, 2 sets of buffers around the subway stops were created in ArcView. The first buffer was 1,300 feet in diameter, and the second 2,600 feet in diameter. Arc View's "select by theme" function was used in order to compute the number of robberies occurring within these zones.

To discover the concentration of street robbery, ArcView's calculate density function was utilized. The most intense hot spots were identified through the use of the identify function. The density levels of 2001 robbery hot spots range from 0 to 1.04. The closer to 1.04 the number is, the more activity is taking place at that particular hot spot. It is then noted which hot spots, if any, encompass or lay adjacent to subway stations.

Results

The 1,300 foot buffer around the subway stations revealed that 137 robberies occurred within these areas. This number represents 10.7% of total street robberies. The

Robberies within
2 blocks of stations

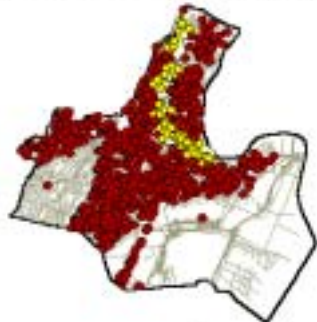


Figure 2

Robberies within
4 blocks of stations

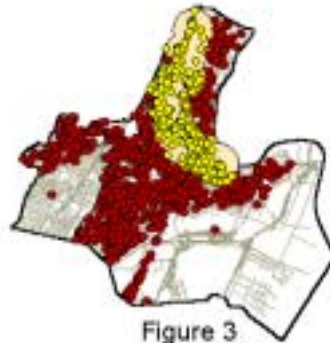


Figure 3

2,600 foot buffer around the subway stations revealed that 348 robberies occurred within this distance of a subway stop. This is 25% of all street robberies occurring in 2001.

Figures 2 and 3 give a graphical representation of these findings. The yellow dots represent the robbery incidents occurring within the stated distance of a subway stop.

When focusing on the peak hours of transit use, 90 robberies occurred within 1,300 feet of subways stops, and 182 took place within the 2,600 foot buffer zone. This represents 14.5% and 29.4%, respectively, of all street robberies occurring in Newark during hours of peak usage in 2001. This reveals that even though a smaller gross around stops during hours of peak usage, a higher proportion of the total robberies occurred within the subway environment. Figures 4 and 5 display these findings.

These numbers indicate a moderately strong correlation between robbery and subway stops, especially when taking into account the 2,600 foot buffer zone and incidents during peak hours of rider-ship. Having over 20 % of street robberies cluster around the Newark city subway is a substantial finding. However, statistical tests will need to be performed before affirming the finding's significance.

Robbery during service hours

Robberies within
2 blocks of stations

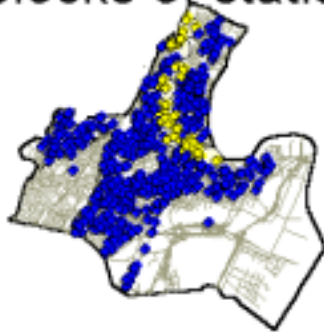


Figure 4

Robberies within
4 blocks of stations

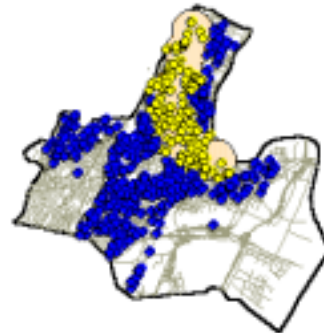


Figure 5

The density analysis produced interesting results. 6 major street robbery hot spots manifested within Newark (figure 6). The densest spot occurred in the Downtown area of the city, on the outskirts of the East district (figure 7). The spot exhibited a density of 1.02 out of a possible 1.04. The center of the spot is the intersection of Broad St. and Market St. The spot has a diameter of 2,200 feet. The Broad St. Subway stop is engulfed by the hot spot. The Washington St station is present at the outskirts of the hot spot. The Warren St. station is also present in the area, being approximately 2,400 feet to the northwest of the spot. This alone shows the concentration of robbery in this area. Penn station is also very close to this area, being only 917 feet away from the hot spot.

This area of Newark has far more mass transit activity than any other section of the city. In addition to Penn station, and the Washington St., Broad St., and Warren St. subway stops, many bus stops exist in this region. At the intersection of Broad St. and

Robbry Hot Spots



Figure 6

Hot Spot 1

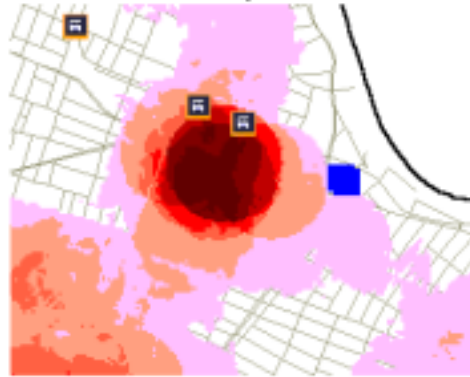


Figure 7

Market St alone stand 4 bus stops. Numerous other bus stops are present along Broad and Market Sts, in addition to other streets in the immediate area. Therefore, it speaks volumes for this area to have the highest concentration of street robbery.

The second to fifth densest hot spots scatter throughout the South and West districts of the city. The densities of the spots, in order of second to fifth, were .58, .415, .415, and .40. None of these hot spots contain any subway stops. Additionally, no subway stops lie adjacent to these hot spots.

The sixth hot spot exhibits a density level of .40. The spot has a diameter of 1,200 feet and has the corner of Bloomfield Ave. and Parker St. as its center. The spot is in between the Bloomfield Ave and Park Ave subway stations. The Bloomfield Ave station lies 1,300 feet from the spot, while the Park Ave station is 2,083 feet away.

The results do not reveal as striking a correlation between transit stops and street robbery as past research, namely the Block and Block study. However, the Newark subway system in no way compares, in respect to size, to the Chicago system. Running through all parts of the city, buses serve more of a vital function in Newark's public

transportation system. Taking into account bus stops locations is a necessity in truly understanding the relationship between street robbery and Mass transit in Newark, NJ. Even though, the fact that the densest hot spot has 3 subway stops in its immediate surroundings suggests that a correlation exists between the two phenomena. Analysis of bus stops would fortify such a finding.

4 hypotheses were construed prior to the analysis. They were as follows: 1) A significant proportion of the total robberies will occur within 1,300 feet of a subway stop or Penn station, 2) a significant proportion of the total robberies will occur within 2,600 feet of a subway stop or Penn station, 3) most of Newark's street robbery "hot spots" will contain a subway stop or Penn station, and 4) the proportion of robbery occurring within 1,300 feet and 2,600 feet of subway stops will be greater when looking at robberies occurring during service hours. The results failed to reject hypotheses 2 and 4. 25 % of all street robberies took place within 2,600 feet of a subway stop. Although statistical test would be necessary in determining this finding's statistical significance, the percentage exhibited seems to be of importance. The proportion of robbery occurring 1,300 and 2,600 feet from subway stations increases from 10.7% and 25% to 14.5% and 29.4%, respectively, when only service hour robbery is accounted for.

The results led to the rejection of hypotheses 1 and 3. The 10.7% proportion within the 1,300 foot buffer does not represent a striking amount. Again, statistics will need to be employed in order to determine the actual statistical significance, the percentage does not seem to be of any great magnitude. Only 1 of the 6 hot spots contained a subway stop. Furthermore, only 2 of the spots was adjacent to a subway

Robbery forming shape of city



Figure 8

S. Orange Ave & Springfield Ave

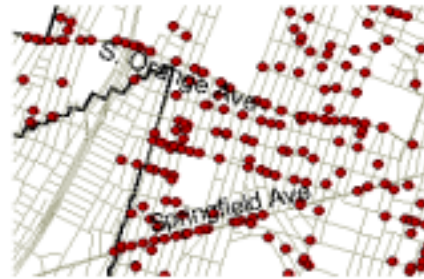


Figure 9

stop. Despite the area with the highest concentration of robbery encompassing 2 stations and being adjacent to another, hypothesis 3 must be rejected in light of the findings.

Implications for future research

As indicated throughout the paper, including bus stops in the analysis is key in fully understanding this phenomenon. Therefore, any future research expanding upon this study should do so. A look at a GIS map displaying Newark, NJ robbery reveals an interesting pattern of the crime. The incidents seem to follow Newark's major roadways. So much so that major street patterns are still evident when removing the streets from the view (Figure 8). South Orange Ave. and Springfield Ave, for example, are almost defined by robbery incidents (Figure 9). This radial pattern suggests that something along the streets contributes to the occurrence of robbery. It may very well be that the presence of bus stops is responsible.

Additionally, previous research suggests that bus stops relate to robbery differently than do subways (Levie and Wachs 1986). Brantingham et al 1991 offered similar notions in their

reporting of 5 ways varying modes of transportation shape crime differently. It would be interesting to see if any differences are present in Newark, NJ.

The inclusion of street robbery data from more years, namely 2000 and 2002, would be vital in future research. The additional 2 years would aid in establishing a long-term trend of robbery. Some of the recognized hot spots may dwindle in concentration when additional years are taken into consideration. Reciprocally, some hot spots may also increase in magnitude. Applying the findings of a study only looking at data drawn from a one-year period is risky. Any assumptions made in such a way could be inaccurate.

In addition to data from different years, data from some of Newark's neighboring towns would enhance the scope and accuracy of future projects. Many subway stops, such as the Branch Brook Park and Davenport Ave stops, are very close to the borders of the city. These borders exist as mere political boundaries, not social boundaries. In no way do they contain crime. Existing hot spots may not be discovered without the inclusion of such data. Furthermore, 2 stops of the Newark City Subway are in Belleville and Bloomfield. Robberies clustering around these stops may provide more insight on the topic.

Conclusion

Routine Activities Theory can be applied in attempting to understand the relationship between robbery and mass transit crime. The gathering of individuals in the surrounding environments of mass transit stations provides the prerequisites for crime commission under the framework of Routine Activities. This study exposed a moderate relationship between subway stops and street robbery in Newark, NJ. 25% of all

robberies in 2001 took place within 2,600 feet, or about 4 blocks, from a subway station. This percentage inflated to 29.4% when the scope was reduced to only include street robbery incidents occurring during the service hours of 7:00 am to 7:00 pm. 3 stops existed in the immediate area of the spot with the highest concentration of robbery. However, 4 of the remaining 5 most concentrated hot spots did not contain a subway stop, nor did any lay adjacent to a subway stop.

Taking into account bus stops, 2000 and 2001 Newark robbery data, and robbery incidents from neighboring towns, particularly Bloomfield, Belleville, East Orange, and Irvington, will most likely produce results showing the correlation of robbery and mass transit to be strong. As voiced throughout this work, the inclusion of bus stops in this analysis would also prove to vital.

References

Adler, Freda; Gerhard O.W. Mueller; William S. Laufer (2001) Criminology. McGraw Hill. p. 29

Angel, S. (1968). *Discouraging crime through city planning*. Berkeley: Center for planning and development research, University of California.

Black, Donald (1970) "Production of crime rates" *American sociological review* 35: p.733-748.

Block, Richard and Carolyn Block (2000) "The Bronx and Chicago: street robbery in the environs of rapid transit stations" p.137-152 in Goldsmith, Victor; Philip G. McGuire, John H. Mollenkopf and Timothy A. Ross *Analyzing crime patterns: frontiers of practice* (2000) Thousand Oaks: Sage Publications

Brantingham, P.J.; P.L. Brantingham (1993) "Nodes, path, and edges: considerations on the complexity of crime and the physical environment" *Journal of environmental criminology*. 13: p.3-28.

Brantingham, P.J.; P.L. Brantingham; Paul S. Wong (1991) "How public transit feeds private crime: notes on the Vancouver 'sky train' experience" *Security Journal* 2 (2) p.91-94.

Cao, Liqun and David J. Maume (1993) "Urbanization, inequality, lifestyles and robbery: a comprehensive model" *Sociological Focus* 26 (1) p.11-26.

Cohen, Lawrence E and Marcus Felson (1979) "Social change and crime rate trends: a routine activity approach" *American sociological review* 44: p.588-608.

Felson, Marcus (1987) "Routine activities and crime prevention in the developing metropolis" *Criminology*: 25(4): p.911-931.

Felson, Marcus; M. Belanger; G. Bichler; C. Bruzinski; G. Campbell; C. Fried; K. Grofik; I. Mazur; A. O'Regan; P. Sweeney; A. Ulman; and L. Williams (1996). "Redesigning hell: Preventing crime and disorder at the port authority bus terminal" in Clarke, R.V. *Preventing mass transit crime*. Monsey, NY: Criminal Justice press

La Vigne, Nancy G. (1996) "Safe Transport: security by design on the Washington metro" p.163-197 in Clarke, R.V *Preventing mass transit crime*. Monsey, NY: Criminal Justice press.

Levie, N and M. Wachs (1986). "Bus crime in Los Angeles: I-measuring the incidence" *Transportation research A*: 20 (4): p.273-284.

Loukaitou-Sideris, Anastasia (1999) "Hot spots of bus stop crime: the importance of environmental attributes" *Journal of the American planning association* 65 (4): p.395-411

Poister, Theodore H. (1996). "Transit-related crime in suburban areas" *Journal of urban affairs* 18 (11): p.63-75.

Roncek, Dennis W. and Pamela A. Maier (1991). "Bars, Blocks, and Crimes Revisited: linking the theory of routine activities to the empiricism of 'hot spots'" *Criminology* 29 (4): p.725-752

Sherman, Lawrence W.; Patrick R. Gartin and Michael E. Buerger (1989). "Hot spots of predatory crime: routine activities and the criminology of place" *Criminology*: 27(1): p.27-56.

Thrasher, E and T Schnell (1974) "Scope of crime and vandalism on urban transit systems" *Transportation research record* No. 487 p.34-45.