

Security Assessment of San Diego Light Rail Transit Service

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Comments from citizen groups and recent media attention describing crimes at or near light rail stations spurred the San Diego Metropolitan Transit Development Board (MTDB) to request that the San Diego Association of Governments (SANDAG) investigate the impact of introducing light rail service on crime activity in the community. SANDAG was also asked to evaluate the perceptions of trolley safety of both trolley riders and nonriders. In Phase 1 of the crime analysis, SANDAG reviewed crime data provided by local police and the San Diego County Sheriff's Department. The study area is located in the east suburban portion of San Diego County. Changes in property and violent crime rates were compared over a 5-year period for the communities surrounding light rail stations, for the study area as a whole, and for the San Diego region. Phase 2 of this study focused on crimes within a radius of $\frac{1}{8}$, $\frac{1}{4}$, and $\frac{1}{2}$ mi of station loading platforms. Crime rates were evaluated before and after the service extension in 1989. The violent crime rate increased less in communities surrounding trolley stations than in the study area as a whole. The overall property crime rate decreased more than in the study area. However, Phase 2 identified a dramatic increase in crime within a $\frac{1}{8}$ -mi radius of trolley loading platforms. Property crimes, most notably car theft, increased the most. (Since most stations were built on vacant land, any type of development would be expected to increase the number of crimes occurring there.) Two surveys, one of trolley riders and the other of MTDB area residents, were also conducted by SANDAG and provide

insight into the perceptions of safety and security of trolley users and of the general public. Crime stands out as a major concern for San Diego residents.

Crime is the primary problem facing the San Diego region, according to a recent survey of San Diego residents conducted by the San Diego Association of Governments (SANDAG) on behalf of the San Diego Metropolitan Transit Development Board (MTDB) and San Diego Trolley, Inc. (SDTI). It is no coincidence that safety and security issues have become important topics when discussing proposed light rail transit (LRT) service with community groups. Comments center on whether the extension of light rail service will bring crime into the community and whether the trolley is safe to use. On the basis of these comments and recent media attention describing crimes at or near light rail stations, MTDB requested that SANDAG investigate the impact of introducing light rail service on crime activity in that community. SANDAG was also asked to evaluate the perceptions of trolley safety of trolley riders and nonriders.

Many areas throughout the country are experiencing similar problems, with community groups and elected officials voicing concern over potential impacts of light rail service on their communities. This paper documents efforts to quantify the incidence of crime occurring at or near light rail stations and how riders and nonriders

perceive personal safety at light rail stations and on board the trolley. Also discussed is how these efforts led to actions by MTDB and SDTI to improve both security and perceptions of security.

This report presents a compilation of the results from the three separate studies conducted by SANDAG. SANDAG serves as the Metropolitan Planning Organization for the San Diego region and, as such, provides technical support to local transit agencies through the Assistance to Transit Operators (ATO) work program. Funding for this program comes primarily from Section 9 planning funds.

To evaluate the impact on crime of the introduction of LRT service into a community, SANDAG—in Phase 1—reviewed crime data provided by local police and the San Diego County Sheriff's Department. The study area is located in the east suburban portion of San Diego County. The changes in property and violent crime rates were compared over a 5-year period for communities surrounding light rail stations, for the study area as a whole, and for the San Diego region. Phase 2 of this study focused on crimes within a radius of $\frac{1}{8}$, $\frac{1}{4}$, and $\frac{1}{2}$ mi of station loading platforms. Crime rates were evaluated both before and after the service extension in 1989. The results of this analysis are discussed.

Also given are the findings from a survey SANDAG conducted on board the trolley to solicit opinions of the relative safety of trolley service. This survey of 1,247 trolley riders was conducted in November 1992.

The following year SANDAG conducted a telephone survey of 2,574 MTDB area residents, including riders and nonriders, to collect information on the public's use, awareness, and perceptions of public transit service. Included in the survey were questions about perceptions of safety on board the trolley and at trolley stations. Also investigated was how these safety perceptions were formed. A discussion of the results is included.

Conclusions from these studies and a summary of some of the actions taken by MTDB and San Diego Trolley, Inc., in response to study results are presented.

ANALYSIS OF CRIME TRENDS

This preliminary study assesses changes in crime over the period from 1987 to 1991 and provides comparisons between the region overall, a defined study area, and the communities surrounding trolley stations located in the study area. The study area is located in the east suburban part of San Diego County (Figure 1) and was chosen because of the recent trolley extension there and the availability of crime data from the Automated Regional Justice Information System (ARJIS) both before and after the extension. ARJIS includes crimes re-

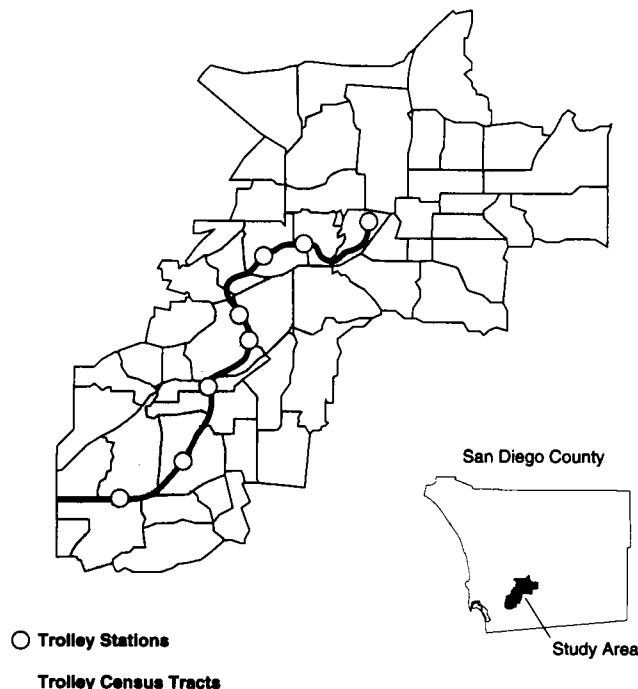


FIGURE 1 Study area and census tracts identified as near a trolley station.

ported to nine municipal police departments and the San Diego County Sheriff's Department.

The study however, focuses primarily on FBI index crimes, which tend to be more serious offenses and likely to be reported to police. FBI index crimes include violent offenses (homicide, rape, robbery, and aggravated assault) and property crimes (burglary, larceny theft, and motor vehicle theft). Two other types of crime (malicious mischief and simple assault) were also included to measure other types of activity that may be of concern in areas surrounding trolley stops. Malicious mischief crimes include vandalism and trespassing. Simple assault is defined as an assault without the use of weapons and with no aggravated or serious injury to the victim.

This study is divided into two phases. The first phase looks at FBI index crimes at the census tract level, including property and violent crimes for the three geographic areas. The changes in crime rates per 1,000 residents were evaluated over a 5-year period, from 1987 to 1991, with a comparison between the region, the study area, and census tracts near trolley stations within the study area. Figure 1 shows the location of trolley stations within the study area and the census tracts identified as being near a trolley station.

The second phase of the study addresses the change over 5 years in the number of crimes within specified distances from trolley station loading platforms in the

study area, up to $\frac{1}{2}$ mi. Because accurate population estimates are not available within the specified distances from trolley stations, the change in the number of crimes was analyzed rather than the crime rate. The level of crime was evaluated at distances of $\frac{1}{8}$ mi, $\frac{1}{4}$ mi, and $\frac{1}{4}$ to $\frac{1}{2}$ mi from the station loading platform.

Study Results

In 1987 trolley stations did not exist in the study area. Therefore, part of this analysis is comparing crime activity before and after those trolley stations were built in 1989. The trolley has introduced a great deal of activity into the study area. On an average weekday in 1991 more than 7,000 persons were boarding the trolley in the study area. Just under 1,700 parking spaces were created, with more than half of them occupied at any given time on an average weekday. As a result, the numbers of potential victims and crime targets, such as motor vehicles, have increased in these areas. In general, the data show that the impact of the trolley has been primarily on crimes occurring within $\frac{1}{8}$ mi of the trolley stations. The change in the level of crime within that radius may be related, in part, to introduction of the trolley, but it also may be associated with changes in land use patterns surrounding the trolley stations, such as shopping, restaurants, and theaters.

Phase 1 Data Summary

- From 1987 to 1991, the rate of violent crimes increased in the region (32.9 percent), while the property crime rate decreased (-7.9 percent).
- Census tracts near trolley stations in the study area had higher violent and property crime rates in each of the 5 years from 1987 to 1991 than the study area as a whole, but lower rates than the region.
- Violent crime rates in census tracts near trolley stations increased less than in the region and the study area.
- Property crime rates in census tracts near trolley stations declined more than in the study area, but somewhat less than in the entire region.

Phase 2 Data Summary

- Within a $\frac{1}{2}$ -mi radius of trolley stations, property crimes and simple assault increased at a higher rate than in the study area.
- Within a $\frac{1}{2}$ -mi radius of trolley stations, the reported number of violent crimes increased at a rate comparable with that of the study area.
- Within a $\frac{1}{2}$ -mi radius of trolley stations, reported malicious mischief offenses increased at a lesser rate than in the study area and the region.

- The largest increases in crime activity occurred within $\frac{1}{8}$ mi of trolley stations, including violent crimes, property crimes, simple assaults, and malicious mischief. The 78.3 percent increase in property crimes in this area was due, in part, to a significant rise in the number of motor vehicle thefts.

- With the exception of simple assault, all types of crime show less growth more than $\frac{1}{8}$ mi from trolley stations.

CONCLUSIONS

Results of this preliminary study suggest that the focus of enforcement and security should be within $\frac{1}{8}$ mi of the stations. Owing to data limitations, this study does not address a number of related issues, such as the extent to which suspects from outside the area are committing crimes at trolley stations or the impact of changes in sociodemographic and land use patterns at specific stations.

TROLLEY PASSENGER OPINION SURVEY, 1992

SANDAG conducted a survey of trolley passengers to evaluate their opinions as to security and other trolley service issues. To gain a broader perspective of trolley service issues, trolley passengers were asked to provide their opinions of several regional issues. They were also asked to indicate how "safe" they feel at a variety of public places. A questionnaire was distributed to passengers on board the trolley. The questionnaire was printed in English and Spanish.

Passengers on the South Trolley Line and the East Trolley Line were surveyed. Trips were randomly selected for both weekdays and Saturdays. All times of the day were sampled. Surveys were completed by 1,247 trolley riders: 577 on the South Line and 670 on the East Line. Data were collected from November 5 through November 13, 1992. Questionnaires were distributed to passengers after they were seated and were collected by surveyors before the passengers' departure.

Survey Results

Fifty-nine percent of persons responding to the survey use the trolley 4 or more days per week. Twenty-two percent ride between 1 and 3 days per week, with the remaining 19 percent using the service less than once per week.

The economy was ranked as the most important issue facing the San Diego region by 48 percent of trolley passengers surveyed; crime was ranked first by 33 per-

cent. The next highest issue was traffic congestion, with only eight percent of respondents ranking it as first.

Passengers were asked their opinion of various characteristics of trolley service. Operating characteristics such as frequency and hours of service were rated either good or average by well over 90 percent of surveyed passengers. Safety on board the trolley was rated by 89 percent as either good or average. Security at stations and security in station parking lots are rated the lowest, with 78 and 77 percent rating those characteristics either good or average, respectively. South Line and East Line passengers rated service characteristics and station cleanliness similarly. East Line riders rated trolley security somewhat lower than did South Line riders.

Passengers also were asked how additional transit funding should be spent, if it became available. This question required passengers to rank several service improvements in order of need. Construction of new trolley lines was listed by 48 percent of survey respondents as the first project to be funded. Hiring additional security personnel was ranked as first by 25 percent, and providing more frequent trolley service was ranked as first by 17 percent of those surveyed. Overall, increasing trolley service either by building new lines or by increasing the frequency on existing service was identified as the most needed project by 65 percent of passengers surveyed.

The questionnaire was also designed to find out whether passengers believed that service or conditions, either on board the trolley or at trolley stations, had changed over the last 2 years. Fifty-two percent of passengers surveyed had been riding the trolley for more than 2 years. Of those, 57 percent indicated that service had changed during that period. These passengers were then asked to describe how service had changed. Of those responding (270 passengers), 50 percent indicated that service has improved, 21 percent stated that there is more security now, and 12 percent stated that the service is less safe or secure now than 2 years ago. The feeling that trolleys are more crowded now was expressed by 4 percent of responding passengers.

To evaluate trolley security and safety in a broader context, passengers were asked to indicate how safe they feel at five different public locations. Eighty percent of surveyed riders said they felt safe on board the trolley. Trolley stations and shopping center parking lots were considered to be safe by 63 percent of passengers surveyed. Fifty-four percent indicated they felt safe at ATM machines, and fewer than half (47 percent) of the trolley passengers surveyed responded that they felt safe in downtown San Diego.

The questionnaire also requested that passengers write down any additional comments they wanted to provide. Thirty-four percent of respondents made comments. Of these, 30 percent were complimentary of trolley service, 26 percent requested more security and fare

inspector personnel, and 22 percent requested more service.

Conclusions

Survey results show that service characteristics such as frequency and hours of service and safety on board the trolley were rated high by trolley passengers. Security at stations and in station parking lots were not rated as high. Data suggest that although there is some criticism of security at trolley stations, this concern may be more a reflection of the general public's overall concern related to crime and safety issues rather than criticism directed solely at the trolley. One-third of survey respondents indicated that crime was the most important issue facing the San Diego region out of a list that included the economy, traffic congestion, population growth, and air pollution. This concern about crime is consistent with a recent survey of San Diego County residents, sponsored by SANDAG, that identified crime as the primary problem facing the San Diego region. Despite the concern expressed about security at trolley stations, passengers feel at least as safe using the trolley as they do at other public places.

MTDB AREA PUBLIC OPINION SURVEY

In September 1993, SANDAG contracted with a private consulting firm to conduct a telephone survey of 2,574 MTDB area residents. The purpose was to collect information on the public's use, awareness, and perceptions of public transit service. Respondents to the survey were randomly selected residents of the MTDB service area. A minimum of 500 responses was required from each of five subareas. Five percent of the surveys were conducted in Spanish.

The survey covered a wide variety of topics including respondent demographics, security perceptions, media questions, use of public transit, and opinions of public information services and demand response services. This section focuses primarily on questions related to trolley security.

Of all respondents 44.9 percent had used public transit in the last year, 70.7 percent had used public transit within the last 5 years, and 31.8 percent had used the trolley in the last year. The most common reason for using the trolley was recreation or visiting friends.

To better understand the public's relative level of concern regarding crime in general, the survey asked all respondents to rank in order of importance five selected issues facing the San Diego region. Sixty percent of survey respondents rated crime as the most important issue facing the region, with 26 percent rating the economy

as most important. Population growth, air pollution, and traffic congestion were rated as the most important issue by 6, 5, and 4 percent of respondents, respectively. The Trolley Passenger Opinion Survey showed that trolley riders rated the economy as the most important issue, with crime second.

Respondents were asked their perception of safety in several types of public areas. Of those locations listed, shopping center parking lots were considered to be the most safe, followed by on board the bus or trolley, ATMs, bus stop or trolley stations, and downtown San Diego.

These results can be compared with the results of an identical question contained in the 1992 Trolley On-Board Survey. Trolley riders' perception of safety on board and at trolley stations is higher than that of the general public. This indicates an opportunity to improve the general public's perception of trolley safety. Respondents who have used public transit in the last year are much more likely to rate on board the trolley as safe (75 percent of users versus 48.1 percent of non-users). Users also rate bus stops or trolley stations as safe more than nonusers (55.8 percent for users versus 38.7 percent of nonusers).

The majority (55 percent) of survey respondents believe the trolley and trolley stations to be safe, whereas 32 percent believe them to be unsafe and 13 percent do not know. Of those who believe the trolley or trolley stations to be unsafe, 47 percent base their opinion on news reports, 37 percent base it on their personal experience, and 25 percent base it on the experience of others they know. This illustrates the prominent role the news media play in shaping opinions of trolley safety. Respondents who have used public transit in the last year are more likely than nonusers to rate the trolley as safe (63 percent versus 49 percent).

When asked if they had heard or seen news reports about bus or trolley service, 55 percent indicated they had. Of those who remember media accounts of bus or trolley service, more say the accounts had a negative impact (38 percent) or no impact (33 percent) than say the accounts had a positive impact (28 percent).

A general preference for driving and the longer transit travel time stand out as the most common reasons cited by respondents for not using transit. If ranked in order of how frequently each reason was said to apply, concern for safety would be 9th out of the 12 reasons listed on the questionnaire.

To get some perspective on how security issues compare with other trolley service issues, a question was included that asked those respondents who have used trolley service in the past year to rate different aspects of trolley service. Safety at trolley stations was rated lowest of all trolley service characteristics followed by safety on board the trolley. However, the majority of

riders rate safety as excellent or good. This result is consistent with the Trolley Passenger Opinion Survey.

CONCLUSIONS

The analysis of crime trends around trolley stations was designed to identify a relationship between the implementation of trolley service and an increase in either crime rates or the number of crimes within the affected communities. The violent crime rate increased less in communities surrounding trolley stations than in the study area as a whole. The overall property crime rate decreased more in these communities than in the study area. This does not support the expressed belief of some citizen groups that trolley service has brought criminals into their communities and resulted in an increase in crime.

However, Phase 2 identified a dramatic increase in crime within $\frac{1}{8}$ mi of trolley loading platforms. Property crimes, most notably car theft, increased the most. (Most stations were built on vacant land, and any type of development would be expected to increase the number of crimes occurring there.) One possible reason why crime increased at trolley stations and the immediate surroundings while overall community crime rates did not is that the trolley station, with all its activity, attracted crimes that would have occurred elsewhere if the trolley line had not been built.

Since this study was conducted, the number of trolley security personnel has been increased substantially, and coordination with local police agencies and the Sheriff's Department has been strengthened. Local police have been requested to use trolley station parking lots when they need to stop to fill out paperwork, thereby increasing their visibility at stations. A demonstration project was undertaken using video cameras at selected stations to monitor conditions. These and other efforts have been made to improve security and make security personnel more visible. Data from this study have been used in presentations to community groups to reduce concern over the trolley bringing crime into their community.

The two surveys, one of trolley riders and the other of MTDB area residents, provide insight into the perceptions of safety and security of trolley users and of the general public. Trolley riders expressed less concern about crime than did the general public. Trolley riders rated the economy as the regional issue of most concern, with crime second. The general public by far felt crime to be the most significant issue facing the region, with the economy second. Crime stands out as a major concern for San Diego residents, and that overall concern could have affected perceptions of security at trolley stations as well as other public places.

Trolley riders identified security at stations as their biggest concern, ahead of other service characteristics such as service frequency and hours of service. However, when asked how additional funding should be spent, 65 percent listed either trolley construction or more frequent service first. Additional security was listed first by 25 percent of respondents.

Crime is considered the most serious issue facing the region by MTDB area residents and is reflected in their perceptions of safety at various public places. Their perceptions of safety are markedly lower than those of transit users, especially at trolley stations. The biggest

factor influencing the public's unsafe perceptions of the trolley is the news media, followed by personal experience.

Since these surveys have been conducted, MTDB has taken a more proactive approach toward the news media. They have met with the editorial staffs of various news media, including print and television and radio, to ensure that coverage is balanced. To make passengers more aware, and improve perceptions of safety, MTDB now regularly provides them with information on security improvements, along with other system changes.