Public Fear of Crime and Its Role in Bus Transit Use

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Information about how personal safety concerns influence bus transit use in smaller cities is not readily available. Bus riders and residents in Greensboro, North Carolina, were surveyed in April 1993 to determine attitudes, ridership levels, and motivations for choice. It was found that most riders are frequent users, but residents rarely ride. Resident concerns about personal safety were two to three times greater than riders' concerns, but both groups were less concerned about personal safety on or near the bus system than about general safety in the community. Residents were most fearful of activities in downtown Greensboro. Both residents and riders saw the major bus-related problems as disorderly conduct, drunkenness, and panhandling. Residents and riders feel safest at home and in their neighborhoods. Only a few residents or riders have personally experienced a crime problem in the last 2 years. Generally, blacks, whites, men, and women all experienced similar concerns: the big difference was between riders and residents (generally nonusers of the service). More than 50 percent of residents take precautions to protect personal safety, primarily avoiding drunken people, strange-looking people, groups of teenagers, and travel alone or after dark. Women take more precautions than men. But reduced concerns about safety would not increase bus ridership as much as basic service improvements. It is concluded that image links between bus service and perceived high-crime areas such as downtowns are major deterrents to increased ridership, even though bus service itself is perceived as quite safe.

Images of crime cast wide shadows over American cities. Fact or fabrication, accurate or not, the public's perception of crime in the city creates an image of city centers that are less safe than their suburbs, causing their workers to flee to the "safer" suburbs after work and giving most downtowns the appearance of ghost towns during evening and night hours. Fear of crime alters the spatial, economic, and social dynamics of cities.

Public fear of crime spills over into the provision of public transit. A mounting body of evidence suggests that public concerns about personal safety may well be one of the most important reasons that many people choose not to use public transit, particularly within larger urban centers. Although there is some disagreement on just how concerns about personal safety affect ridership, fear of crime and concern for safety do appear to be key elements in the decision to ride or not. Yet transit has a relatively good personal safety record, particularly in smaller urban areas. Does the evidence which comes from research in larger cities apply equally well to smaller ones? Does fear for personal safety and the perception that crime occurs more on or near transit facilities inhibit ridership in smaller cities? These are the primary questions addressed in this study.

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STUDIES AND FINDINGS ON TRANSIT CRIME

Concern about the relationship between crime, personal safety, and use of public transportation systems is not a new issue, and although the literature is not vast, much is written on the topic. Previous research generally focuses on such issues as

- Fear of crime as a deterrent to use,
- Driver and agency personnel safety,
- Station design for crime reduction,
- Legislative actions, and
- Police and other staffing issues.

Several studies have touched, directly or indirectly, on the public's view of crime and personal security in travel choices. In the mid-1960s, Paine et al. found that personal security was the top item of 33 variables that influenced use of transit in Philadelphia (*1*). In analyzing these data, Hartgen concluded that personal safety and security was a key overlooked variable in transportation service (*2*). Thrasher and Schnell showed the security problem (both perception and reality) to be widespread among U.S. transit companies (*3*). They estimated that the risk of being a crime victim in a transit situation was more than twice the risk in a non-transit situation. In more recent work Wachs and others have investigated and quantified crime in Los Angeles (*4,5*). Wachs estimated more than 800 "serious crimes" on the Southern California Rapid Transit District bus system in 1981. The vast majority of these were in only a few high-crime areas.

More recently, Ball and Mierzejewski found that only 16.1 percent of respondents in a nationwide survey thought bus was the safest mode of travel, behind 58.9 percent for the automobile (*6*). In his chapter on security and public transportation, Hoel notes that "transit crime is extensive in most large US cities, and its magnitude may be far greater than is shown by the published statistics" (*7*). In a summary of studies of attitudes and travel behavior, Benjamin and Sen found that 9 of 23 studies identified security to be an important factor in transportation choice (*8*). Koppleman and Pas found that the more abstract concept of "psychological comfort" was a significant predictor of travel decisions (*9*). Certain segments of the population appear to be especially vulnerable to transit crime; the elderly (*10,11*) and women (*12,13*) have been identified as particularly at risk. In both cases, the data point to a high perception of risk and fear of use of the transit by these groups, particularly at night.

In several states, notably Illinois and New York, legislative commissions in the past 10 years have studied the issue of transit crime—primarily on the subway—and ways to control it. The suggestions have been wide-ranging but usually involve increas-

ing policing and security forces and patrols (*14*). Local agencies have also studied the issue, generally concluding that more police, better lighting, and greater surveillance with camera and radio contact is the key to reduction of crime (*15,16*).

It is a rare study of transit crime that does not end with a list of suggested countermeasures intended to reduce the problem. Typically, these measures fall into several broad categories:

- More security and patrol, such as adding more transit police, increasing the frequency of visits to stations, police on trains or buses, and better coordination with transit police and city police;
- Use of technology, including surveillance cameras, radio contact, and warning or emergence systems on vehicles;
- Design actions, particularly station layout to increase visibility, better lighting, recessed walls, limited access to restrooms and elevators, platform layouts, and column locations; and
- Better information, including media campaigns, posters helpline instructions, antidrug messages, and similar items.

Thus the literature is replete with studies about transit crime, the vast majority of which focuses on environments in large cities or subways, especially station design and police task forces. Less is known about bus system crime and even less about crime on bus systems in smaller cities.

Opinion data reveals that fear of crime is a major consideration in travel plans for many transit users, particularly the elderly and women in larger cities. Again, however, comparatively little is known about how fear of crime might act as a deterrent to transit use in smaller cities.

RESEARCH QUESTIONS AND HYPOTHESES

This study was begun to determine how issues of personal safety affected the decision to use bus transit in smaller urban centers. Previous work suggests that concerns about personal safety could harm public attitudes about using transit services in larger urban centers. To explore how personal safety or crime issues would inhibit ridership in smaller cities, a project based on survey research was designed to examine the relationship between fear of crime and bus ridership in Greensboro, North Carolina, a mid-sized city of about 200,000 population. On the basis of two exploratory focus groups (used to probe more deeply into reasons for riding buses or not), and the literature, a series of research questions and hypotheses was formed:

Research Question 1

How does fear for personal safety affect bus ridership in Greensboro?

- Hypothesis 1a: Fear of crime inhibits bus ridership.
- Hypothesis 1b: Perceptions of crime and personal safety on or near the transit system vary significantly by gender and race.
- Rationale: In the literature personal safety issues emerged as a critical issue affecting ridership in large systems and in subways. Results of focus groups done in Greensboro supported the link between safety and ridership. Both the literature and focus groups indicated that women were more concerned about victimization and had significantly different perceptions of crime than men, and blacks had different perceptions of crime and safety than did whites.

Research Question 2

Do the perceptions of crime and personal safety of riders differ significantly from those of nonriders?

- Hypothesis 2: Perceptions of potential victimization will vary by experience with the bus system; riders will have less fear of victimization and nonriders greater concern for crime and personal safety.
- Rationale: Since riders are more familiar with bus service, they would perceive less of a link between crime and bus service than nonriders, assuming of course that bus systems are generally safe. Results of the focus groups, once again, verified this assumption.

METHOD

The research questions and hypotheses were addressed using a combination of survey techniques to collect the data. First, focus groups in two cities in North Carolina (Charlotte and Greensboro) were used to clarify the research questions and identify the key relevant terminology and phrasing for survey questions. Next, three additional surveys were done: a survey of the general population that was administered by telephone; a survey of bus riders administered as a face-to-face, on-board survey; and a face-to-face survey of bus drivers. This paper deals primarily with the phone survey of the general population (resident survey) and the on-board rider survey. The full study, undertaken by the Transportation Institute at North Carolina A&T State University, Greensboro, is reported elsewhere (*17*).

On-Board (Transit Rider) Survey

The on-board survey was conducted to explore the feelings and perceptions of Greensboro transit riders of their bus system and their own personal safety. Survey respondents were drawn from the general (bus riding) public that faced the "reality" of crime and safety on Greensboro's transit system. Questions were composed to query the survey respondents on a number of issues: frequency of use, problems (both those personally experienced and those perceived) in and around buses, precautions taken to ensure safety while moving about in Greensboro, attitudes toward personal safety in various locations, and various demographic variables.

The on-board questionnaire was administered in Greensboro using face-to-face interviews with transit riders, primarily during peak ridership hours. Surveys were conducted at bus stops throughout the city from April 27–29, 1993. Most the surveys were completed at the downtown transfer locations where a large number of riders usually gathered for their next transfer. Riders at these locations were easier to approach because they were seated and more relaxed and because they felt relatively secure in the numbers of people that surrounded them. Overall, 389 riders were surveyed, but incomplete responses about race and gender limited the usable data set to 317 cases.

Telephone (Residential) Survey

The phone survey was directed toward a broader (nonriding) segment of the general public who lived within reasonable access to bus service. Data collection and analysis, indeed the research questions, were predicated on the ability to directly compare the views of both transit riders and the general, nominally nonriding public. Thus, many questions on each survey instrument were worded exactly the same. Since more information could be collected during the phone interviews than during the busy bus trip, the phone questionnaire was longer and more comprehensive than the on-board instrument.

Surveying was done by the Urban Institute at the University of North Carolina-Charlotte. Households were randomly selected from the Greensboro phone book. Only households within phone prefixes adjacent to the transit routes were included in the sampling frame. Calls were made during the evening hours. Survey durations averaged 5 to 7 min, and the final sample size of the phone survey was 500.

FINDINGS

Summarizing Survey Results

Overall the survey sample successfully mirrored the general population from which it was drawn. Respondents to the resident (phone) survey were reasonably close in race and age characteristics and in average family size and employment status to the broader population of Guilford County in which Greensboro is located (Table 1). The phone sample underrepresented the percentage of men in the general population.

The rider (on-board) survey showed that most riders were black, women, and under 30 years old. This compared closely to recent national profiles of transit ridership but was quite dissimilar to the general population characteristics of Guilford County and the resident survey.

Ridership Patterns

Results of both surveys indicated substantial differences in transit ridership patterns of residents and riders (Table 2). In the aggregate, only 1.6 percent of residents reported using the bus to get to work or shopping and only 2.8 percent to get to school. Most residents (94.1 percent) either did not use the system or used it only rarely. Those bus trips reported by residents were overwhelmingly work and personal business and were primarily morning and late afternoon trips. In the rider survey respondents reported using the system frequently or occasionally (77.9 percent). Patterns of ridership—frequency of use—were substantially similar for blacks, whites, males, and females.

Riders mentioned a wide variety of reasons for using the bus. The single most important reason was for "transportation to work," mentioned by 28.6 percent of riders, followed by "lack of other transportation" (25.5 percent), "shopping" (12.1 per-

TABLE 1 Statistics on Residents and Riders

			Percent of Respondents		
		Guilford Co.		Resident Survey	Rider Survey
Gender	M	164,204	47.2	36.2	42.8
	F	183,216	52.8	63.8	57.2
			100.0		
Race	African-American	91,655	26.6	22.0	85.3
	White	249,584	72.4	75.4	14.4
	Hispanic	2,887	0.8	0.8	0.3
	Other	818	0.2	1.9	---
			100.0		
Age	18-21	27,464	10.2	11.9	24.9
	22-29	47,713	17.7	18.0	25.9
	30-39	58,445	21.7	21.5	20.9
	40-49	46,751	17.3	15.4	8.8
	50-59	32,365	12.0	11.7	6.6
	60-69	29,577	10.9	11.3	6.6
	70 +	27,358	10.2	10.1	2.8
		269,673	100.0		
Employment	Full Time			50.7	
	Part Time			12.7	
	Retired			18.6	
	Student			11.7	
	Other			6.3	
Family Size	1	36,576	26.6	18.3	
	2	47,509	34.5	39.5	
	3	25,024	18.1	17.5	
	4	19,008	13.8	16.5	---
	5	6,553	4.8	7.7	
	6	1,980	1.4	0.4	
	7+	1,054	.8		
Sample Size		137,695	100.0	497	297

TABLE 2 Modes of Travel and Frequency of Bus Use (%)

	Resident Survey			Riders
Mode of Travel	**Work**	**School**	**Shop**	
1. Drive alone	68.7	14.2	72.9	
2. Ride with family	4.8	2.0	19.9	
3. Carpool (non-family)	2.6	1.2	2.6	
4. Bus	1.6	2.8	1.6	
5. Walk	1.6	4.2	0.4	
6. Other	0.8	0.6	1.2	
7. Don't go to ___	19.9	74.9	1.4	
	100.0	100.0	100.0	----
Frequency of Bus Use (N=497)				
1. Never		88.3		----
2. Rarely (few trips/yr)		5.8		16.1
3. Seldom (1-3 days/mo)		1.6		10.1
4. Occasionally (1-4 days/wk)		2.6		22.1
5. Frequently (5+ days/wk)		1.6		50.8
6. DK/NR		-----		0.3
		100		100
Purposes for bus use (N=46)				
1. Work		30.4		
2. School		6.5		
3. Shopping		10.9		
4. Social recreational		17.4		
5. Personal business		23.9		
6. Other		10.9		
		100		----
Time of Day of Bus Use (N=42)				
1. Morning 6-9 am		28.6		
2. Late Morn 9-12 am		19.1		
3. Early Afternoon 12-3 pm		9.5		
4. Late Afternoon 3-6pm		9.5		
5. Evening		2.4		
6. Commuter (am & pm)		28.6		
7. Other		2.4		
		100		

cent), and "school" (8.2 percent). One of these four reasons for riding was given by more than 75 percent of all riders. Other reasons for riding were scattered among 32 other responses.

On the other hand, respondents from the resident survey who said that they were riders listed somewhat different reasons for riding. Three responses accounted for 64.5 percent of all the reasons residents gave for riding the bus: "lack other transportation" (43.5 percent), "convenient" (12.9 percent), and "special event" (8.1 percent). Although they used the bus occasionally, the resident-survey bus users saw the system as a backup to use when other modes were unavailable.

Reasons for Not Using Bus Services

In the resident survey, nonriders were asked why they did not use bus service. A variety of reasons were given (more than 30 were mentioned) but most respondents focused on just a few reasons. Most respondents in the resident survey perceived the system as personally unnecessary, inconvenient, not available, not efficient and unsafe. Almost 38 percent said they did not ride because they "had a car," 19.9 percent said it was "not convenient," 13.1 percent said they had "no need to use" buses, 11.8 percent said buses were "not available near home," 4.6 percent said they had "no information" about buses, 2.6 percent mentioned reasons of "personal safety," and 2.1 percent said buses were "not time-efficient."

Clearly in Greensboro there was a lack of bonding between most residents and the bus system. Given the pervasiveness of these images among residents, it was surprising the system had as much ridership as it did.

Perceptions of Personal Safety Problems

Both the rider and resident questionnaires included sections that focused on perception and actual experience with a series of "problems" or criminal activities. Among the problems listed in the questionnaires were obscene language, panhandling, drunkenness, vandalism, verbal or physical threats, drug use or sale, robbery, and violent crime such as assault, rape, and murder. Perception of personal safety was measured by asking respondents if these matters were a problem around bus areas and in their own neighborhoods. Respondents were also asked about their personal experiences with these problems. Table 3 indicates how residents and bus riders responded to these questions.

Residents generally viewed the problems in Table 3 as community-wide problems more than ones that characterized their own neighborhoods. Vandalism and robbery were mentioned most frequently as problems (in neighborhoods); about 28 and 26 percent of residents thought that vandalism and robbery, respectively, were problems in their own neighborhoods. Fewer than 15 percent of residents thought that any of the remaining problems were prevalent in their neighborhoods. When asked if these problems

TABLE 3 Perceptions of Personal Safety Problems by Residents and Bus Users (%)

Problem	Residents: Is This Problem in Your Neighborhood	Residents: Problem on Buses	Residents: Problem Around Buses	Riders: Problem Around Buses
Vandalism	27.8%	10.0	18.4	6.0
Robbery	26.4	8.3	13.3	1.6
Obscene language/disorderly conduct	15.5	23.0	26.9	22.7
Drunkenness	14.0	18.2	23.5	17.4
Drug use/sales	12.5	9.0	13.4	3.8
Violent crimes	12.1	3.9	8.1	2.2
Panhandling/begging	10.1	13.9	23.2	8.8
Verbal/physical threats	7.8	8.5	7.8	4.4
	N=490	N=201	N=245	N=317
Personally experienced a problem?		15% Residents		8.2% Riders

were prevalent around buses, both residents and riders suggested that all problems were less significant on buses or around buses than in their own neighborhoods. In all but two cases, bus riders perceived problems to be much less severe (50 to 70 percent less) around buses than did residents.

There were, however, three notable exceptions to the general feeling that such problems were less significant near buses than in neighborhoods. Both residents and riders perceived obscene language and disorderly conduct, drunkenness, and panhandling and begging were problems that were (30 to 60 percent) more prevalent near or on buses than in the neighborhoods. In fact, the results suggest that these three problems may well be important factors in accounting for negative perceptions of transit and fear for personal safety near transit.

Coming to an appreciation of how such relatively lower order "crimes" or problems influence ridership depends, in part, on recognizing that perception of crime, safety, or "problems" around bus systems does not necessarily have to come directly from actual experience. Only 15.0 percent of residents and 8.2 percent of riders had actually experienced one of the "problems" that the authors asked about during the previous 2 years. Of those residents who said they had experienced crime-related problems, most mentioned robbery (49 percent), vandalism (39 percent), obscene language (28 percent), and panhandling (26 percent) as things that they had actually witnessed or experienced. However, relatively few residents had experienced these problems on or near buses (Table 3). Among bus riders, the top two problems personally experienced were obscene language/disorderly conduct (46 percent) and drunkenness (50 percent).

Surprisingly, perceptions of and experience with "problems" around buses did not vary substantially by demographic groups (Table 4). Generally all residents—black, white, male, female—had the same general perception of bus-related crime problems. However, the differences between riders and nonriders (residents) were marked. Residents generally were three to four times more likely to perceive that these were more of a problem on or near buses. On some problems—obscene language and drunkenness—riders and nonriders had relatively the same responses.

Perceived Safety in Various Circumstances

Both riders and residents were asked how safe they felt in various Greensboro circumstances (Table 5). In this instance, the questionnaires for riders and residents differed. Riders were asked only about circumstances related to buses.

Residents felt safest in familiar and private surroundings such as their home, neighborhoods, and cars (Table 5). Only 2.8 percent of residents felt unsafe while relaxing in their homes; 12.1 percent felt unsafe walking in their neighborhoods; and 18.1 percent unsafe traveling in a car in downtown Greensboro. However, once out of protected spaces (engaged in shopping in suburban malls, waiting at suburban bus stops, riding the bus, walking to catch a bus, or walking downtown) concerns about personal safety among residents increased sharply. Between 24.0 and 32.4 percent of residents felt unsafe in these common, everyday situations. Downtown Greensboro was viewed as particularly unsafe. More than 40 percent of residents felt unsafe in typical downtown-oriented activities, including using bus services in downtown.

Riders, on the other hand, displayed considerably less concern about safety. Only 6 to 7 percent felt unsafe in downtown. Ironically, however, bus riders expressed greater concern about walking to catch a bus in the suburbs (18.3 percent) than about bus use or walking in downtown environments.

More detailed analysis (Table 6) indicated some demographic variations in these patterns. Generally, women expressed greater concern than men (about 15 to 20 percent more than average) for personal safety; white residents expressed greater concern (10 to 15 percent more than average) than blacks; but black bus riders (primarily female) expressed greater concern than white bus riders. However, these effects were mild compared with the primary effect: residents expressed two to five times more concern about personal safety on the bus system as riders did.

Precautions To Protect Against Perceived Risk

To determine the extent to which familiarity with the bus system influenced the types of precautions taken by respondents to these surveys, both surveys asked about particular types of avoidance behaviors, or precautions. Table 7 gives a summary of the results of these questions. In general all types of precautionary behavior were two to three times higher among residents than among transit riders. Of all the precautions listed, more residents avoided people who were drunk (86.1 percent) or strange looking (80.2 percent). More than half of the residents also stated that they avoided

TABLE 4 Percentages of Residents and Bus Riders Personally Witnessing Problems near Buses: Demographic Breakout

	Residents					Riders				
Problem	B	W	M	F	All	B	W	M	F	All
1. Obscene language/disorderly conduct	30.7	25.9	28.4	26.1	26.9	23.8	14.0	25.6	20.6	22.7
2. Drunkenness	----	----	21.8	24.4	23.5	17.9	14.0	16.8	17.7	17.4
3. Panhandling/begging	23.7	22.2	25.0	22.2	23.2	9.2	4.7	9.7	7.7	8.8
4. Vandalism	17.1	18.0	14.1	20.6	18.4	6.4	2.3	5.6	5.9	6.0
5. Robbery	13.6	12.7	12.5	13.7	13.3	2.0	0	.8	2.4	1.6
6. Drug use/sales	18.4	10.5	11.6	14.4	13.4	4.7	0	3.2	4.7	3.8
7. Violent crimes	10.5	6.7	3.4	10.6	8.1	2.8	0	1.6	2.9	2.2
8. Verbal or physical threats	7.9	7.5	3.5	10.1	7.8	4.4	0	5.6	5.9	4.4
n(sample size)	76	161	87	160	247	252	43	125	170	295

B= African American
W= White
M= Male
F= Female

groups of teenagers and travel after dark or alone. Among riders, the top two precautions were avoiding travel after dark (42.6 percent) and strange-looking people (42.3 percent).

With some exceptions, precautionary behavior was similar by race and gender. Generally, women expressed greater precautionary behavior than men, particularly when traveling alone or after dark. Black residents and riders also expressed generally greater precautionary behavior than whites. However, these were relatively minor differences when compared with the fact that two to three times more residents said that they took precautions than did riders.

Exploring Relationship Between Perceived Safety and Ridership

Although the results summarized thus far provided interesting information about why people in Greensboro do or do not ride the bus, they fail to address directly the relationship between perception of safety and ridership. For example, some of the results suggested that not all nonriders felt equally threatened by crime on the bus system. Could it then be assumed that this subgroup of nonriders might be a potential target for a program to increase ridership? More specifically, would it be possible to identify specific concerns or fears that operators might address to entice more nonriders onto the system? In this stage of the analysis the authors sought to determine more specifically the issues, concerns, and demographic and socioeconomic factors that correlated with nonriders' perceptions of safety in or around buses.

To address the specific relationship between safety and ridership, several indexes were created to get an overall feeling of how each citizen felt about personal safety. Specific questions—which appeared on both the residential and rider surveys—were categorized into a cumulative safety index that summarized key aspects of personal safety. Table 8 presents the items in the index. A value of 1 was assigned to each question in each group if the respondent had seen a certain crime, taken a certain precaution, or felt unsafe in a certain location; a value of 0 was assigned if they had not. The sum of all of these values for each respondent and the total of them (cumulative safety index) gives a good description of how safe each respondent perceived their personal environment to be. Thus, the higher the total cumulative safety index, up to a maximum value of 20, the more unsafe that person perceived his or her environment to be. Similar indexes were created for both the rider and the residential survey; however, the authors address only the nonrider/residential group in this analysis. This cumulative safety index ranged from 0 (lowest concern about personal safety) to 20 (highest concern about personal safety). Thus a respondent with a high score of 20 participated in all precautions, believes that all listed criminal activities around bus areas were a problem, and feels unsafe in most situations outside the home. After the cumulative index for residents was completed, it was analyzed for explanations of the variations in the patterns of responses and cumulative scores and to determine what, if any, factors correlated with these cumulative measures of safety. This analysis was performed by using a program called KnowledgeSeeker, which generated classifications of index "trees" for residents.

Figure 1 summarizes the number of respondents in the residential survey (mostly nonriders) who scored at each level (0 to 20) of the cumulative safety index. Of 500 Greensboro residents, only 3.8 percent (n = 19) stated that they had experienced no safety problems and had no concerns about the safety issues listed in the authors' index. Conversely, 0.2 percent (n = 1) said that they had experienced concerns over every situation and taken all the precautions identified in the safety index. Most of the respondents in

TABLE 5 Feelings of Personal Safety in Various Circumstances, Greensboro (%)

	Residents					Riders				
How safe do you feel?	VS	SS	SU	VU	%US	VS	SS	SU	VU	%US
Relaxing you your home	67.8	29.4	2.0	.8	2.8					
Walking in your neighborhood	41.9	46.0	9.0	3.1	12.1					
Traveling in a car in downtown Greensboro	24.5	57.4	14.4	3.7	18.1					
Shopping in a suburban mall area	17.5	57.5	19.5	5.5	24.0					
Stopped at a traffic light in downtown Greensboro	15.9	59.2	18.4	6.4	24.8					
Wainting at a bus stop in Greensboro suburbs	11.0	56.6	25.5	6.9	32.4					
Riding the bus in Greensboro	11.1	57.9	22.8	8.2	30.0					
Walking to catch a bus in Greensboro suburbs	9.8	57.9	25.2	7.2	32.4	37.5	37.5	14.2	4.1	18.3
Walking in a park	15.5	47.2	26.0	11.3	37.3					
Walking in downtown Greensboro	10.8	49.1	28.0	12.1	40.1	41.6	46.7	6.0	1.9	7.9
Transferring at the proposed Depot terminal downtown	7.4	48.0	32.7	12.0	44.7	41.3	45.4	6.3	1.6	7.9
Waiting at a bus stop	6.9	45.4	31.2	16.5	47.7	44.8	45.4	5.4	1.3	6.7
Walking to catch a bus downtown	7.2	46.0	29.7	17.1	46.8					

VS= Very safe
SS= Somewhat safe
SU= Somewhat unsafe
VU= Very unsafe
%US Percent unsafe (SU + VU)

TABLE 6 Feelings of Personal Safety in Selected Circumstances, Greensboro (%)

	Residents					Riders				
Circumstance	B	W	M	F	All	B	W	M	F	All
Walking to catch a bus in Greensboro suburbs	30.0	33.5	27.0	37.6	32.4	20.9	12.5	15.0	22.5	18.3
Transferring buses in proposed downtown terminal at Depot	35.7	48.9	29.7	53.6	44.7	7.3	7.9	4.2	9.9	7.9
Waiting at a bus stop in downtown Greensboro	39.5	50.4	35.3	55.0	47.7	6.5	4.8	4.8	7.3	6.7
Walking in downtown Greensboro	42.5	47.9	30.5	56.1	40.1	8.5	4.8	5.7	10.4	7.9

TABLE 7 Precautions To Protect Personal Safety (% yes)

	Residents					Riders				
Precautions	B	W	M	F	All	B	W	M	F	All
Avoid drunken people	82.5	87.3	78.6	90.3	86.1	34.8	30.2	36.0	32.7	34.7
Avoid strange looking people	80.8	80.4	69.7	86.2	80.2	41.7	40.5	47.2	37.3	42.3
Avoid traveling after dark	65.4	54.1	34.1	69.7	56.7	41.1	46.5	45.6	39.2	42.6
Avoid groups of teenagers	61.5	52.0	49.4	57.0	54.2	26.4	18.6	24.0	26.2	25.6
Avoid traveling alone	60.2	46.4	26.0	62.9	50.0	24.8	14.0	18.4	26.8	25.3
Avoid homeless people	50.5	44.4	37.7	49.7	45.3	17.9	15.0	17.9	17.3	17.7
Avoid using bus service	50.0	36.6	33.1	43.2	39.5	14.9	2.3	12.0	13.9	12.9
Avoid people of different races	13.5	14.5	14.1	14.8	14.6	6.8	0.0	4.8	6.6	5.7
sample size	103	350	170	300	470	250	40	123	170	310

TABLE 8 Items in Cumulative Safety Index

Question	Score	
Are these situations a problem around bus areas?	**Yes**	**No**
Obscene language or disorderly conduct	1	0
Panhandling/begging	1	0
Drunkenness	1	0
Vandalism	1	0
Verbal or physical threats	1	0
Drug use/sales	1	0
Robbery	1	0
Violent crimes such as assault, rape, or murder	1	0
***Generally,* do you think you would be very safe, somewhat safe, somewhat unsafe, or very unsafe from crime in the following environment:**	**Very Safe or somewhat safe**	**Somewhat unsafe or very unsafe**
Waiting at a bus stop downtown	0	1
Walking in downtown Greensboro	0	1
Transferring at the proposed terminal at the depot	0	1
Walking to catch the bus in the Greensboro suburbs	0	1
To protect your own safety while out traveling in Greensboro, do you try to avoid?	**Yes**	**No**
Traveling after dark	1	0
Homeless people	1	0
Strange looking people	1	0
Groups of teenagers	1	0
Using the bus service	1	0
Drunken people	1	0
People of different races	1	0
Traveling alone	1	0
All questions listed above		**Sum of all scores**

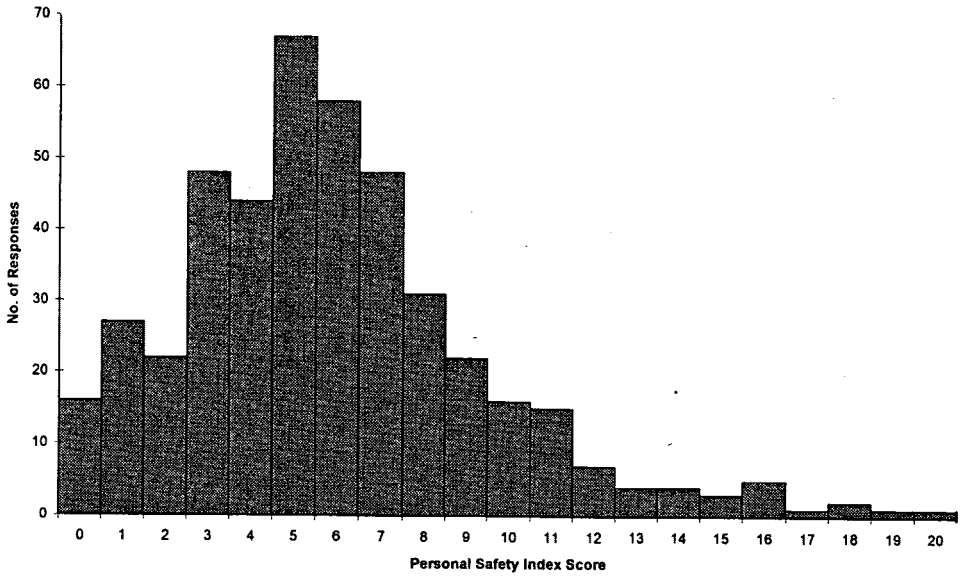

FIGURE 1 Responses for each personal safety index category.

the residential survey scored between 1 and 9 on the cumulative safety index, indicating that most felt relatively safe in the situations described. Overall, the largest clustering of scores ranges from 5 to 7.

Using the search program KnowledgeSeeker, the specific items that most effectively separate those residents who were most concerned and unconcerned about their personal safety were identified. These items are shown as a tree in Figure 2. The critical item—the factor that best predicted how concerned residents were about their own personal safety—was their perception of how safe they would feel "walking to catch a bus downtown."

Further splits in the tree indicated interesting avoidance measures (Figure 2). For example, those people who were generally less concerned about personal safety (felt very safe walking to catch a bus downtown) generally "avoided strange-looking people" for their safety. Those individuals who felt somewhat safe

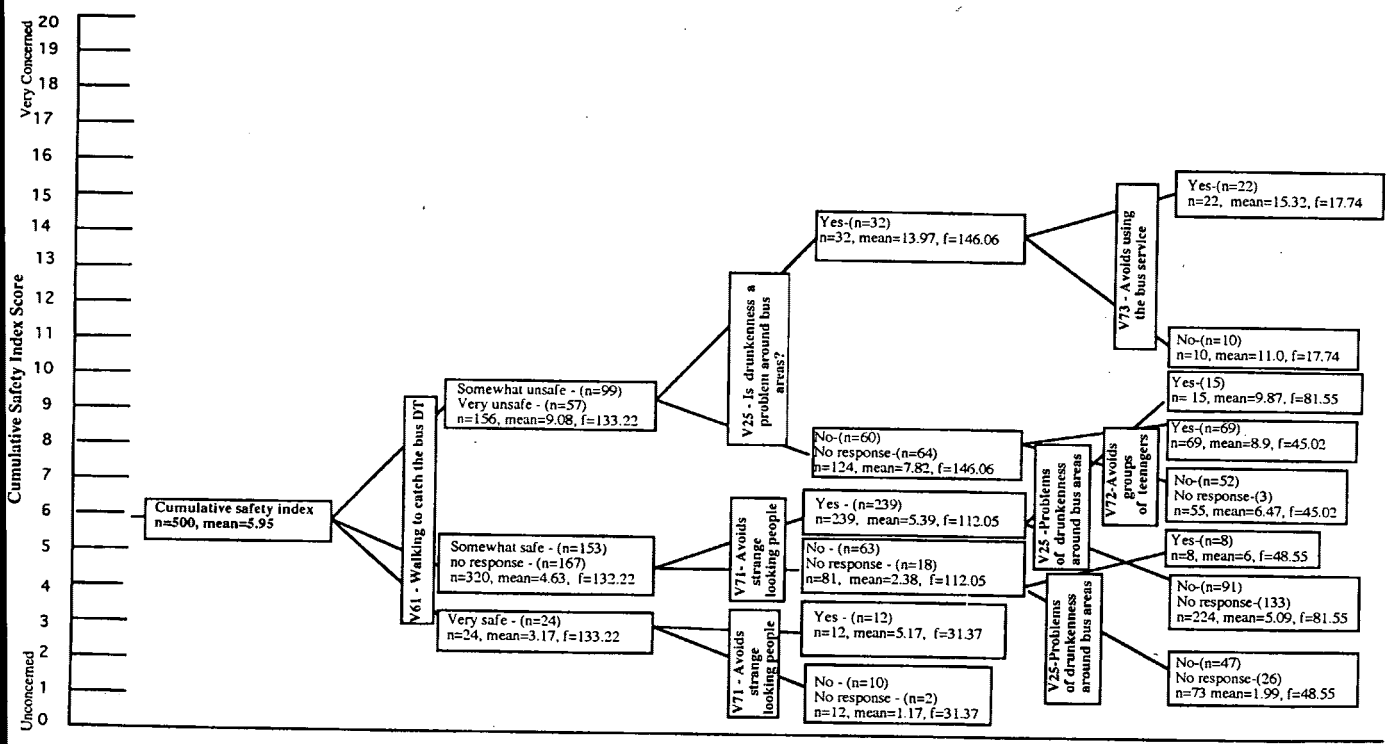

FIGURE 2 Residents' safety concern related to other factors.

when walking to catch a bus in downtown also avoided strange-looking people for their own safety. The single variable that correlated with a high concern and a feeling of being unsafe while walking to catch a bus in downtown was, "is drunkenness a problem around bus areas?" Of the 32 respondents who stated that drunkenness was a problem around bus areas, (n = 22) also stated that they avoid using the bus service for safety concerns.

Analysis of residential cumulative safety indexes using the tree generated by the KnowledgeSeeker strongly suggests that concerns over downtown—specifically, walking to catch a bus downtown—affects how nonriding residents perceive their own personal safety. Since most buses run through downtown along a radial network, residents' safety concerns while walking to catch a bus downtown represent a substantial handicap for the Greensboro bus system. However, even though concern about walking downtown was the critical variable in accounting for the overall safety concerns, residents did not focus on crimes of violence. Instead, drunkenness was the problem that was most correlated with concern about walking downtown. Among residents the relatively "softer" crimes—drunkenness, panhandling, and use of obscene language—appeared to be of more concern to those residents who feel uneasy about walking to catch a bus downtown and thus about their own safety.

SUMMARY, CONCLUSIONS, AND IMPLICATIONS

This analysis of bus patrons (riders) of the Greensboro Transit System and other residents (nonusers) of Greensboro has identified strong similarities with transit use in larger urban settings. Specifically, the authors found that much like transit use in larger urban settings,

- Transit use was relatively low, about 1.6 percent of residents' travel.
- Riders were predominately young, black, and female.
- Riders used the bus system often (5+ days/week), whereas most other residents of the city were rare users of the system.
- Major bus system use was for work and personal business, primarily in early morning and late afternoon hours.
- Riders used the system primarily because they lacked other transportation or had specific destinations or purposes that were accessible by bus.
- Most residents did not use the system because they had a car or other means of transportation and because they perceived that it was not convenient or readily available.

The characteristics of transit riders and nonriders in this relatively smaller system matched those of larger transit systems.

As far as questions about how perceptions of personal safety might affect bus ridership and whether images of crime and safety differed between riders and nonriders, the results were again in line with the authors' expectations. The authors found that fear for personal safety does affect bus ridership in this mid-sized city. They also found that these images did vary between riders and nonriders but that the variations in perceptions of safety and crime among men and women and blacks and whites were not nearly as strong as between riders and nonriders.

Differences between riders and nonriders on matters of personal safety were illuminating. The authors found that

- Only 2.6 percent of residents—nonriders—specifically mentioned personal safety as their reason for not riding.
- A larger proportion of residents (nonriders) than riders (two to four times as many) perceived problems relating to crime and personal safety issues around buses.
- Both residents and riders saw three problems—obscene language and disorderly conduct, drunkenness, and panhandling and beggingas the primary problems related to personal safety on the bus system.
- Residents (but not riders) perceived that vandalism and robbery were associated with the bus system. These views were uniformly held by black and white, male and female residents.
- Few residents or riders (15 and 8.2 percent, respectively) had actually experienced crime-related problems in the past 2 years, and very few respondents though that these experiences were related to buses.
- Residents and riders felt safest in their homes and neighborhoods and while traveling in their cars.
- Residents (more than 40 percent) felt unsafe outside in downtown Greensboro, including when they used the bus system. Bus riders felt much safer in downtown Greensboro using the bus service but relatively less safe walking in the suburbs. With some exceptions, these attitudes did not vary substantially by race or gender.
- More than 80 percent of residents took some precautions to protect their personal safety. The top two precautions mentioned by residents were avoiding people who were drunk or strange looking. More than half of residents also avoided groups of teenagers, travel after dark, and travel alone.
- Generally, women expressed greater precautionary behavior than men, particularly avoiding travel alone or after dark.
- Government policies to increase bus use might best focus on basic service and information provision rather than on personal safety.

In conclusion, buses in Greensboro might appear safer than the community to the nonrider, but in fact the entire community appeared to be relatively fearsome to most of its residents. The impression left with the authors was a city in which residents lived in fear of personal safety but had little direct personal experience with the crime or threats to personal safety that they said they feared. The bus system was not seen as the problem per se; it was perceived as generally safer than the community as a whole. However, it served areas that were perceived as unsafe or having safety problems. Since the system was radial to downtown, and downtown was seen as unsafe by more than 40 percent of residents, it was unlikely that government action to improve service could, in and of itself, significantly increase bus use by the general population unless safety-related perceptions were changed.

If it is assumed that increasing ridership is a primary goal of transit systems, the results described herein offer some possibilities for designing programs to encourage ridership. For example, among the nonriders interviewed in the telephone survey, a sizable group of respondents held attitudes and perceptions of crime indicating that they were relatively less concerned about their own safety moving about the city and felt less concerned about becoming crime victims. This group practiced less avoidance behavior and had lower estimates of overall crime in the city. This group could become a potential source of future riders, representing as it does, a relatively "clean slate," as far as the negative perception of crime on or near the bus. Well-designed advertising and infor-

mation campaigns could be designed to picture buses as safe from crime, if such programs are coupled with better service, revisions of bus stops, and bus information.

In general, respondents to the phone survey felt negative about downtown Greensboro, perceiving it to be higher in crime problems and opportunities for victimization. However, it is important to distinguish the type of "crimes" about which respondents were most concerned, or which a smaller group had actually experienced. These crimes were activities such as being drunk in public, uttering public obscenities, and panhandling. Technically these activities violate the law, but they fall in the category of "softer" crimes. They are also more likely to occur within the downtowns of American cities; indeed, they are the activities that give many downtowns their negative images. When it is considered that most transit is radial and thus likely to traverse downtowns, it is clear that negative views of downtown are interwoven with negative images of transit. Once again, however, there is a potential remedy involving well-tailored and comprehensive campaigns designed to change images of downtown. If this were coupled with increased presence of public safety officers and stronger efforts to deal effectively with both the social and legal aspects of soft crimes, then perhaps shifts in perception of both downtown and transit would result.

The authors are not suggesting that programs be designed to increase ridership solely by changing perceptions of personal safety downtown. Nor are the authors suggesting that they are easily or quickly accomplished. However, they are suggesting that government agencies focus greater attention on the soft approach to transit safety issues rather than the hardware and high-tech approaches that appear more popular. In addition, programs to change perceptions of downtown and transit safety together would address the concerns of nonriders.

Finally, it appears that many interested parties are willing to collaborate on campaigns to alter negative images of downtown and transit. Downtown employers, retailing, and entertainment establishments, and city and county governments are all concerned about downtowns. Coordinated efforts among these entities and the transit authority over a sustained period might prove effective in bringing the perception of crime in line with the reality of crime both in downtowns and on transit systems.

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Publication of this paper sponsored by Task Force on Transit Safety.