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***Accessibility and
Distribution of Centro Bus
Shelters***

Spring 2006



Community Benchmarks Program
The Maxwell School of Syracuse University



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EXECUTIVE SUMMARY
Accessibility and Distribution of Centro Bus Shelters
Spring 2006
Community Benchmarks Program
The Maxwell School at Syracuse University

Introduction

This study reports the distribution, cleanliness and accessibility of bus shelters on the Central New York Regional Transport Authority (Centro) bus lines in Onondaga County. Most of the shelters recorded are located in the City of Syracuse. Based on a literature review, criteria were identified to assess the accessibility of Centro shelters for people with disabilities. Researchers also determined the cleanliness of the shelters and presence of light sources. This study is the first of other research projects that will examine the availability of public transportation to Onondaga County residents. This report represents the combined efforts of the community geographer in the Geography Department and the Community Benchmarks Program (CBP) in the Public Affairs program, both based at the Maxwell School of Citizenship and Public Affairs at Syracuse University.

Methods

The data for this survey were collected using a direct observation instrument designed by researchers with the CBP. The CBP also developed a survey, which was administered to Centro riders at various bus shelters. The direct observation study recorded data for most bus shelters in Onondaga County. Readings were conducted between Feb. 5, 2006 and Apr. 15, 2006. A total of 120 out of 124 bus shelters were observed by the CBP. Shelters not included in the data were left out because of project limitations. Researchers used Global Positioning System (GPS) units, tape measures and scientifically developed observation methods to complete this portion of the research. The rider survey assesses the attitudes of any rider who was approached and willing to fill out a survey. The survey was distributed between Feb. 7, 2006 and Mar. 24, 2006. The target population was all Centro bus riders. Since there are no data on the demographics of ridership, this may not be a representative sample, but rather a snapshot of bus riders' attitudes. The CBP administered a total of 337 surveys.

Findings

Direct Observation

Lighting

1. 66% of shelters have a light within 50 feet of them. (n=120)
2. 59% of shelters have one or two lights within 50 feet of the shelter. (n=118)
3. 65% of exterior lights are within 30 feet of shelters. (n=104)

4. 56% of lights located more than 50 feet from a shelter are across a two lane street. (n=41)
5. 93% of the shelters have no internal lighting. (n=119)

Appearance

6. 65% of shelters are clean and free from vandalism. (n=120)
7. 74% of the unclean and/or vandalized shelters contain litter. (N=42)
8. 66% of shelters have interior seating. (n=120)

Schedule Panels

9. 93% of shelters have schedule panels. (n=120)
10. 66% of shelters have one schedule panel. (n=117)
11. 96% of shelters have no empty schedule panels.(n=120)
12. 83% of shelters have a route map posted. (n=120)

Curb Cuts

13. 87% of shelters have curb cuts at the nearest crosswalks. (n=119)
14. 14% of curb cuts were found to have broken glass, debris and snow/ice buildup. (n=103)

Accessibility

15. 91% of shelters have three sides. (n=120)
16. 74% of shelters have at least 96 inches between the front of the shelter and the curb and/or street. (n=104)
17. 94% of shelters have a minimum of 30 inches by 48 inches of free floor space within the shelter. (n=120)

Centro Rider Survey

18. 58% of respondents are between the ages of 19 and 39. (n=332)
19. 54% of respondents are female. (n=335)
20. 44% of respondents surveyed identified themselves as White. (n=325)

21. 66% of respondents do not have accessibility to a car. (n=331)
22. 76% of respondents use the Centro bus line as their primary mode of transportation. (n=330)
23. Whites (77%) and non-whites (76%) did not differ significantly in their use of Centro as a primary mode of transportation. (n=319)
24. Transportation to and from work is the reason most respondents cite for using the bus (59%). (n=337)
25. 71% of respondents spent under seven minutes walking to a bus stop. (n=327)
26. 45% of respondents are “very satisfied” or “satisfied” with Centro Bus System. (n=322)
27. 48% of white respondents and 43% of non-white riders are “very satisfied” or “satisfied” with the Centro bus system. (n=311)
28. 41% of respondents say the condition of the bus shelters are “excellent” or “good.” (n=335)
29. 63% of respondents say they “always” or “usually” feel safe while waiting at Centro bus shelters. (n=337)
30. 51% of respondents say the buses “always” or “usually” leave at the scheduled time. (N=333)

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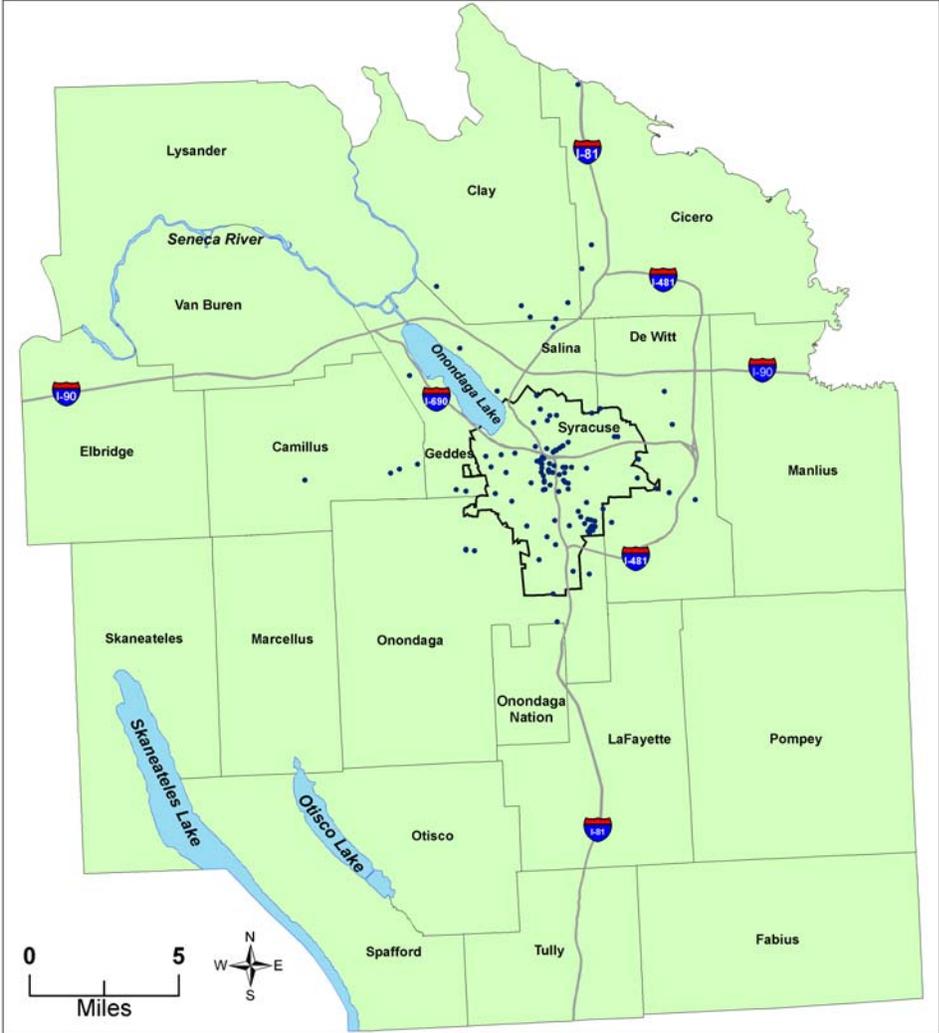
ACKNOWLEDGEMENTS

The Community Benchmarks Program would like to thank those who cooperated with and provided data for this project.

We would especially like to acknowledge:

- Jonnell Allen, community geographer in the geography department of Syracuse University, for her assistance with the geographic analysis and map creation.
- Rich Landerkin, director of planning for Centro, for his information about Centro operations.
- Brian von Knoblauch, GIA (Geographic Information Analysis) lab manager, for his help with the GPS (Global Positioning Systems) units.
- Centro, Central New York Regional Transportation Authority, for their permission to survey riders, analyze the condition of bus shelters and for providing data on shelter locations.
- Syracuse University Community Geographer Steering Committee, for supporting this research.

Centro bus shelters in Syracuse and surrounding areas



Bus shelter assessments were conducted in Spring 2006 by the Community Benchmarks Program
Map created by the SU Community Geographer

INTRODUCTION

This study reports the distribution, cleanliness and accessibility of bus shelters on the Central New York Regional Transportation Authority (Centro) bus line in Onondaga County. Centro serves more than 12 million passengers a year. This report will begin to lay the foundation for identifying the location of all bus shelters and bus stops for mapping purposes. Future research will look at the locations in relation to necessary services, such as child care centers, food markets and youth services. Studying the accessibility for people with physical disabilities, the cleanliness of shelters and the rider survey became additional components of the project. The Community Geographer Steering Committee was instrumental in moving this study forward. The Community Benchmarks Program (CBP) at the Maxwell School of Citizenship and Public Affairs at Syracuse University conducted the research.

Since the end of World War II, highways have been subsidized and vehicle transportation has grown in importance in the United States. People who cannot afford cars are dependent on public transportation. For this reason, it is crucial that public transportation be easily available to frequent users. According to the report "Moving to Equity", transportation inequity can restrict the access for minority and low-income populations to "social and economic opportunities, including job opportunities, education, health care services, places of worship, and other places such as grocery stores" (Sanchez, 2003, p.vi).

Rich Landerkin, the Director of Planning at Centro, reported that Centro has a board sanctioned standard to place bus shelters in any location that is used by more than 50 riders a day, more than 25 senior citizens daily or for other reasons that are approved by Centro (personal communication, 2006, March). Centro studies all locations and determines which areas need a shelter. Community members do not need to petition for a shelter, although this does happen.

Centro has commissioned several studies concerning rider satisfaction in the past including the *Title VI* report and the 2005 Onboard Rider Survey. The *Title VI* report by the Syracuse Metropolitan Transportation Council, reported Centro services are sufficiently distributed. According to the report, "Centro has an excellent distribution of transit services for the various populations in its service area; it serves a wide range of geographic disparity, as evidenced through the numerous census tracts served, including those with higher populations of minorities, elderly and low-income populations" (*Title VI*, 2004, p. 78). The research conducted by the CBP shows that riders are generally satisfied with Centro bus services. A majority of riders say the bus shelters are in good or excellent condition and they feel safe at the shelters while waiting for a bus.

This report can be used to supplement Centro's prior research which studied the attitudes of bus riders.



Camillus Nursing Home

DIRECT OBSERVATION METHODS

Instrument Design

The direct observation instrument was designed by the CBP. The first draft was created on Jan. 22, 2006. Carol Dwyer, the CBP director, received the instrument for review on Jan. 24, 2006. The CBP research team conducted the final review and revision process on Feb. 2, 2006. The purpose of the direct observation instrument is to collect information on the location, cleanliness, lighting and accessibility of Centro bus shelters in Onondaga County.

A small group of researchers piloted the instrument to collect bus shelter data on Feb. 5, 2006. After testing the observation instrument, the CBP made revisions on Feb. 9, 2006.

The CBP designed the direct observation instrument using information from the Disability Access section in the Americans with Disabilities Act of 1990 (ADA) and standards set by the Federal Transportation Authority (FTA). The CBP incorporated relevant bus shelter information from the ADA for use in the direct observation instrument on Jan. 24, 2006. Specifically, the researchers established checklists of the following minimum guidelines:

- shelter opening of 32 inches
- presence of curb cuts on cross walks
- minimum free space of 30 x 48 inches of floor area within the shelter
- minimum of 96 inches (8 feet) from the street to the front of the shelter

Curb cuts impact those with physical disabilities and people pushing strollers, among others. It should be noted that in Central New York, maintenance of curb cuts are the responsibility of local governments, not Centro.

Target Population

The target population is all bus shelters for the Centro bus lines in Onondaga County, including some shelters located outside the City of Syracuse. While the CBP was conducting research, Centro was in the process of a shelter replacement program. Researchers were not aware of the replacement program until midway through the project. Some of the shelters for which data were collected have either already been replaced or will be replaced by June 2006. Rich Landerkin said, about 30 shelters will be replaced. This means that portions of the data collected by the CBP may not be representative once the replacement program is complete. Some shelters may be placed at current sites and others may be moved slightly.

Method of Contact

Originally, the CBP received data about shelter locations from Centro in January 2006. Data were collected between Feb. 5, 2006 and Apr. 15, 2006 from bus shelters in Onondaga County. Centro sent an updated list of bus shelters on Feb. 23, 2006. The CBP collected data on the additional shelters on Mar. 31, 2006.

Centro's master list of shelters was divided between six research teams. Each team visited their assigned bus shelters twice and collected two or three GPS readings along with subjective observations.

Quality of Data

Researchers were trained in the use of Global Positioning System (GPS) units by Jonnell Allen, the community geographer in the Geography Department of Syracuse University. Although the CBP researchers conducted their measurements using GPS units normally meant for recreational use, confidence in the accuracy level of the data is high. Each team used two GPS units and obtained between two and three readings per shelter. A reading was taken if the GPS unit showed an accuracy reading less than 30 meters. When using a GPS unit, the lower the accuracy rating, the more reliable the reading. Typically, CBP readings averaged between 15 and 20 meters. The GPS units would have a reading of 30 meters or more during inclement weather, when tall buildings were in the vicinity or because of improper usage. The researchers revisited the shelters until an accurate measurement was recorded. Using the GPS units to record shelter locations enables the production of a visual representation of the data with mapping.

The CBP evaluated the accessibility of the shelters for people with physical disabilities during shelter inspections using criteria established by the ADA and standards set by the FTA. Tape measures were used by researchers to obtain readings of all distances. Since some of the tape measures were shorter than the distance measured, the measurements may not be precise due to human error.

Data Problems

While the GPS readings and measurements are believed to be accurate, there are problems with the data because of discrepancies in the lists of shelters provided by Centro. The original list was given to the community geographer in Jan. 2006. On Feb. 23, 2006, a revised list was provided to the community geographer, midway through the project.

The observations were completed by different groups, so it is possible that some bias may exist. The ranking for cleanliness is an example of potential bias. The direct observation instrument provided examples for each level of cleanliness, but the term is ambiguous and subject to personal interpretation.

In some instances bus shelter entrances do not face the street. There was not a section included in the direct observation for this finding, but researchers marked it in the notes section of the instrument. There is a possibility that some teams did not include additional comment on the direct observation instrument sheet if a shelter was found to face away from the street.

Finally, some shelters were located directly on the street. These shelters were recorded as having curb cuts because the shelter is accessible to someone in a wheelchair. Some of the groups may not have recorded that the shelter was located on the street and the curb cut variable may have been recorded differently.



S. State & Madison (Southbound)

RIDER SURVEY METHODS

Instrument Design

The rider survey was first designed by a CBP research team on Jan. 24, 2006 and edited on Feb. 2, 2006. The CBP tested the survey and identified and corrected any problems. The survey was finalized on Feb. 9, 2006.

Target Population and Sample

The target population is every paying Centro bus rider. Most Syracuse University students who were on campus were excluded because they are able to ride the bus for free on campus or by showing a student ID for certain routes. Approximately 500 people were approached to fill out the survey. A total of 337 people agreed to answer the survey questions. The results are not considered to be a scientific sampling of the population because the representativeness of the respondents is unknown. The information contained in this report is a snapshot of the opinions of some Centro riders.

Method of Contact

CBP researchers approached people standing at bus shelters to fill out the survey. Researchers administered the survey from Feb. 7, 2006 to Mar. 24, 2006. The participants were not asked to provide their name to protect confidentiality. The CBP used two methods of distribution. Respondents either filled out the survey themselves, or they responded to the questions orally while researchers recorded their answers. One hundred eighty-nine of the total 337 (56 percent) surveys administered were recorded by the researchers. The survey was not distributed randomly and consequently there could be bias in who was asked to complete a survey.

Quality of Data

This is not a scientific survey because the CBP does not have demographic data of ridership and CBP researchers did not visit all bus shelters/stops. The results of the survey are viewed as a snapshot and cannot be considered representative. The survey asked for demographic information and no inference is made of representation. The following tables report the demographic information collected:

Respondents' Gender		
Gender	Frequency	Percentage
Female	180	53.41%
Male	154	45.70%
Missing	2	0.59%
Can't Interpret	1	0.30%
Total	337	100.00%

Respondents' Age		
Age	Frequency	Percentage
18 and Under	30	8.90%
19 to 29	134	39.76%
30 to 39	60	17.80%
40 to 49	54	16.02%
50 to 59	43	12.76%
Over 60	11	3.26%
Missing	5	1.48%
Total	337	100.00%

Respondents' Race/Ethnicity		
Race/Ethnicity	Frequency	Percentage
White	144	42.73%
Black	132	39.17%
Hispanic	24	7.12%
Asian	10	2.97%
Latino	9	2.67%
Other	4	1.19%
Missing	12	3.56%
Can't Interpret	2	0.59%
Total	337	100.00%

The majority of surveys were distributed at the Centro bus depot at Fayette and South Salina streets. This location was selected because it is a transfer site and is believed to represent a much broader sample of riders.

Survey Distribution		
Location	Surveys Ditrubuted	Percentage
Downtown Syracuse	244	72.40%
East Syracuse	33	9.79%
Syracuse University	33	9.79%
Carousel Center	20	5.93%
Northwest Syracuse	6	1.78%
Missing	1	0.30%
Total	337	100.00%

Data Problems

A small number of respondents left some of the questions blank. This explains why the frequencies are not the same for each graph. The sample size represents the number of people who answered the question.



James St. and Catherine (Inbound)

GEOGRAPHIC ANALYSIS METHODS

GIS Methods

The CBP teams obtained shelter locations using the Garmin etrex Legend Global Positioning System (GPS) unit. The Legend is designed to provide precise GPS positioning using correction data obtained from the Wide Area Augmentation System (WAAS). The etrex Legend provides position accuracy to less than three meters when receiving WAAS corrections (Garmin, www.garmin.com).

The geographic coordinates of all bus shelter locations were downloaded from the GPS units to ArcMap. When more than one measurement for a bus shelter was taken, only the most accurate point was saved. This was determined from the direct observation instrument where researchers recorded the accuracy of each GPS unit. The Garmin etrex Legend GPS unit displays the estimated accuracy, in meters, when points are recorded. When more than one measurement for a shelter was taken but the accuracies of the measurements were not available or discernable in the direct observation, the community geographer compared the shelter locations to the Onondaga County street network and used the points that appeared to be closest to the location descriptions provided by Centro.

The shelters listed at Adams Street and CD Road were collapsed into one point (BUS001) because the shelters were adjoined. The shelters at Route 92 and Pleasant Street and Route 11 and Woodwind Apartments were the same shelter so Route 92 and Pleasant Street was omitted. Several other bus shelters were physically missing, and thus omitted from the dataset. These included the shelters at Bellvue and West Onondaga, Court and Syracuse China, James Street and Leo Avenue, Old Liverpool Road and Harborside, and South Avenue and Cortland. The shelter at the Tri-County Mall in Baldwinsville was determined to be too far to travel, and the shelter at Wegmans and Pond Street was removed during the observation period as part of the replacement program. In total, 119 bus shelters out of a total of 124 were mapped.

Final maps overlaying the locations of the shelters and various socio-demographic characteristics of Onondaga County's population were created using ArcGIS 9.1. Socio-demographic data are from the 2000 US Census. The geographic unit of analysis for the maps is a census tract. "Census tracts are small, relatively permanent statistical subdivisions of a county. Tracts are delineated by a local committee of census data users for the purpose of presenting data. Census tract boundaries normally follow visible features, but may follow governmental unit boundaries and other non-visible features in some instances; they always nest within counties." Census tracts are designed to be relatively homogeneous units with respect to population characteristics, economic status, and living conditions, and typically average about 4,000 inhabitants (U.S. Census Bureau, www.census.gov). There are 144 census tracts in Onondaga County.



S. Salina & Brighton St.

COLLECTIVE METHODS

Statistical Definitions

Mean: The average value of a set of numbers.

Median: Relating to or constituting the middle value in a distribution.

Standard Deviation: The standard deviation is one of several indices of variability that statisticians use to characterize the dispersion among the measures in a given population.

Data Cleaning

All the data were originally entered and corrected in Microsoft Excel. The data were then transferred into SPSS for analysis because it is easier to analyze data and create tables in this program. Once the analysis was complete, the graphs were created in Microsoft Excel.

Rider Survey

On Mar. 25, 2006, members of the CBP cleaned the Microsoft Excel data set to eliminate errors, discrepancies and other problems. The researchers did not consider that in the survey codebook the data set had a column used to identify each survey with a unique number. The original data set was saved in the event of any problems.

Most of the blank cells within the Excel data sheet were changed to “99” which is defined as a missing value in the codebook. Exceptions to this process occurred when dealing with yes/no variables like “WORK” or “LAUNDRY”. In these cases, blank cells were interpreted to correspond with a blank check box on the survey, which indicates a “no” response and these cells were recoded as “2.”

One survey contained the following entry for the date; “3/213/21/2006.” This was recoded as “3/21/2006.”

After the “OTHER” variable was coded as “2” (no), the “OTHER DESCRIP” variable was often coded as “2” (no) also. Since this is repetitive, all such cases were recoded as “88” (not applicable). After the “OTHER” variable was coded as “1” (yes), the “OTHER DESCRIP” variable was coded as “88” (not applicable). This is inaccurate and the coding was changed to “99” (missing data) because no description was included. Survey 5_14 had “OTHER” coded as “2” (no) and “OTHER DESCRIP” as “church”. “OTHER” was then recoded as “1” (yes).

Any entries of “many,” “multiple,” or “all” for “ROUTE” were changed to “77” (data cannot be interpreted).

“A lot” and “too long” for riding time were both recoded as 77 (data cannot be interpreted).

Many respondents did not list route numbers, but rather the name of a street or place. It was impossible to determine whether this was a reference to a destination or a specific route. Most

routes are sections of a larger base route, so a specific route number could not be determined when the respondent did not list the number. The Centro Web site was used to determine some of the route numbers, but any text entry that corresponded with a destination or route that had multiple route numbers was recoded as “77” (data could not be interpreted). If a text entry corresponded with a destination or route that had only one route number, the entry was recoded as that number. Few met these criteria, and all were listed as either “Auburn” or “Nob Hill.”

Direct Observation

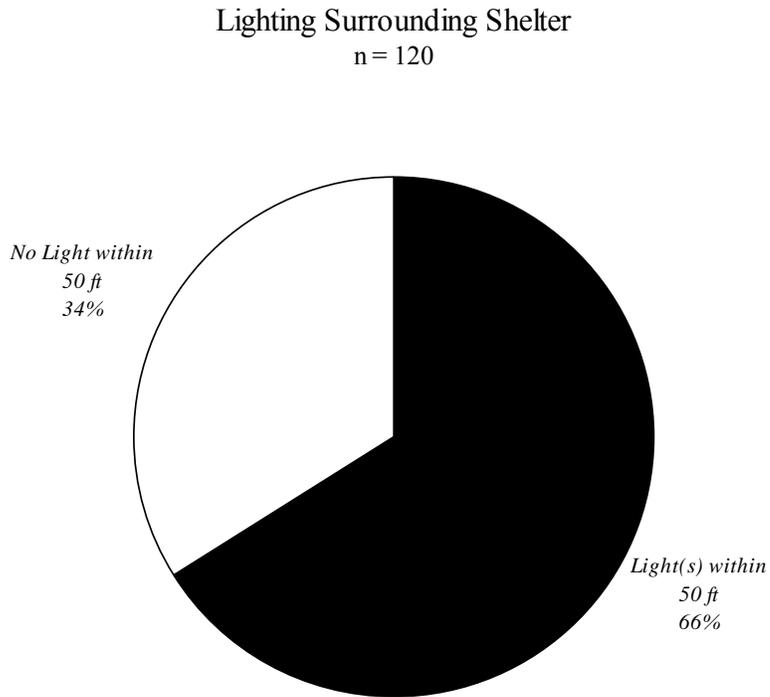
On March 30, 2006, members of the CBP cleaned the Microsoft Excel data set in order to eliminate errors, discrepancies and other issues.

The entrance of 16 shelters face away from the street. When the shelters faced the street, measurements were taken from the front of the shelter to the street. When measuring the backwards facing shelters, some researchers classified these stops as having 96 inches in front of them, in order to be in accordance with the ADA. Groups lacked consistency in recording this measurement for shelters with entrances that do not face the street. These shelters were reclassified as “88” (not applicable).

Some of the shelters were located directly on a street and therefore there was no need for a curb cut. The purpose of the questions about curb cuts is to determine if a person in a wheelchair could access the shelter. Since the shelters were accessible, any data that were recorded as a “2” (no) for “CURBCUT” was changed to “1” (yes). When the “CURBCUT” data were changed to “1” (yes), the “CURBOTHER” section was also changed from “88” (not applicable) to “2” (no).

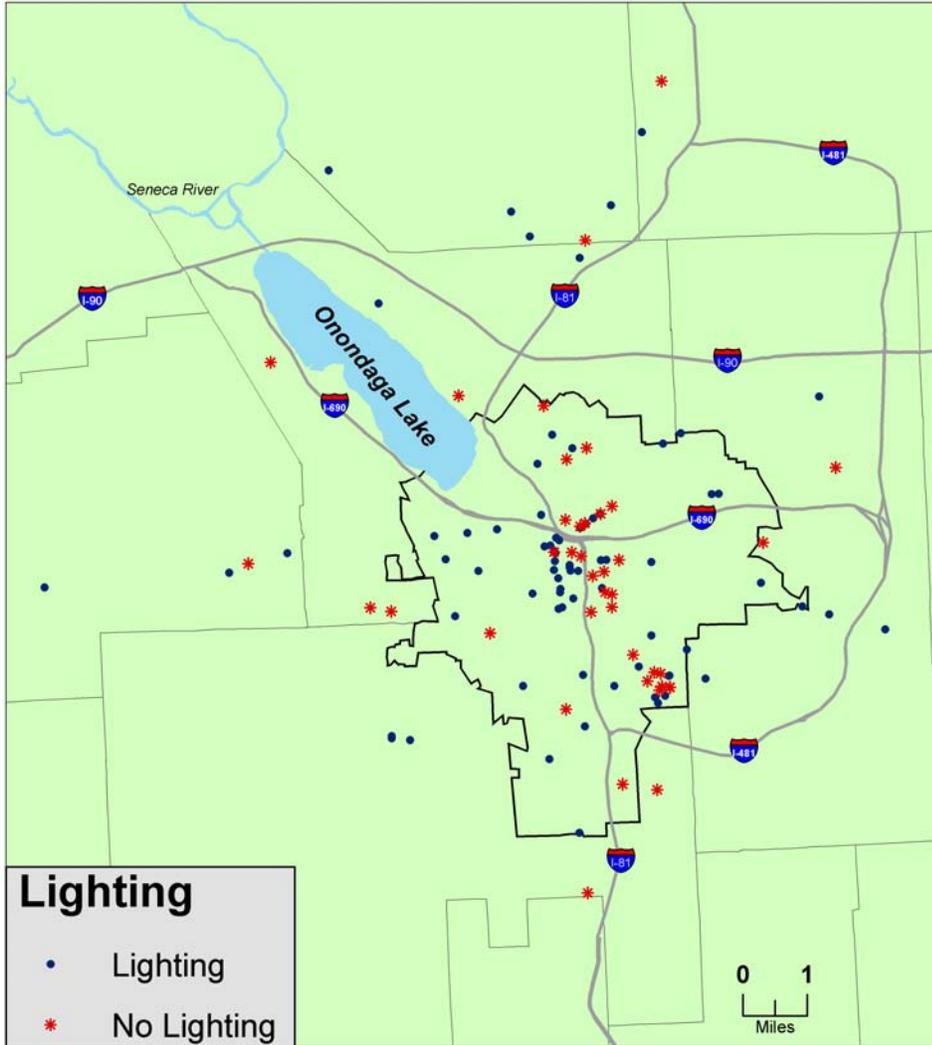
DIRECT OBSERVATION FINDINGS

1. 66% of shelters have a light within 50 feet.



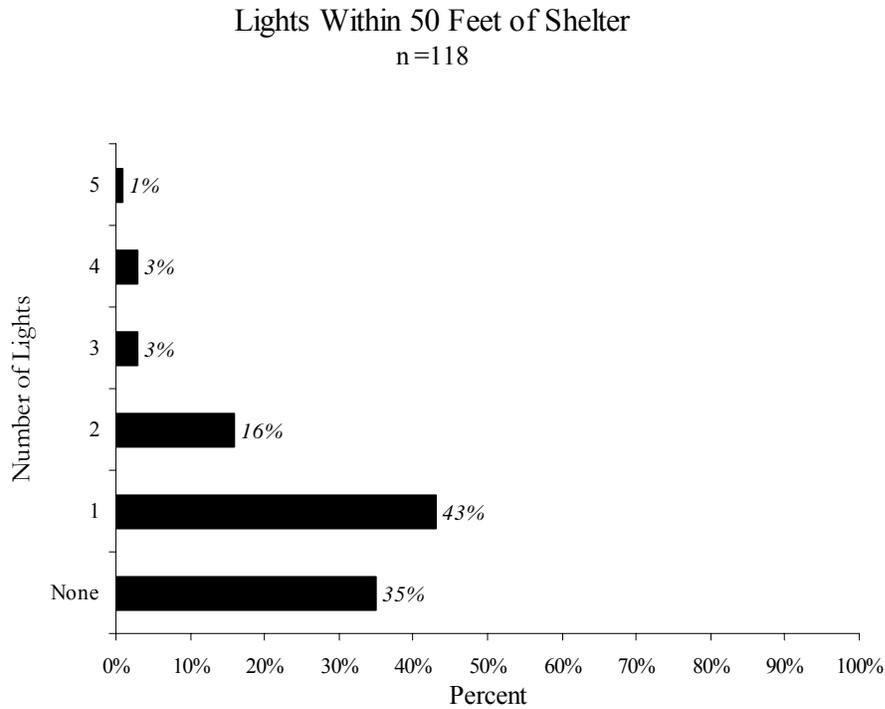
Source: Data collected in Spring 2006 using instrument designed by CBP researchers for direct observation of Centro bus shelters

Lighting



Bus shelter assessments were conducted in Spring 2006 by the Community Benchmarks Program
Map created by the SU Community Geographer

2. 59% of shelters have one or two lights within 50 feet of the shelter.



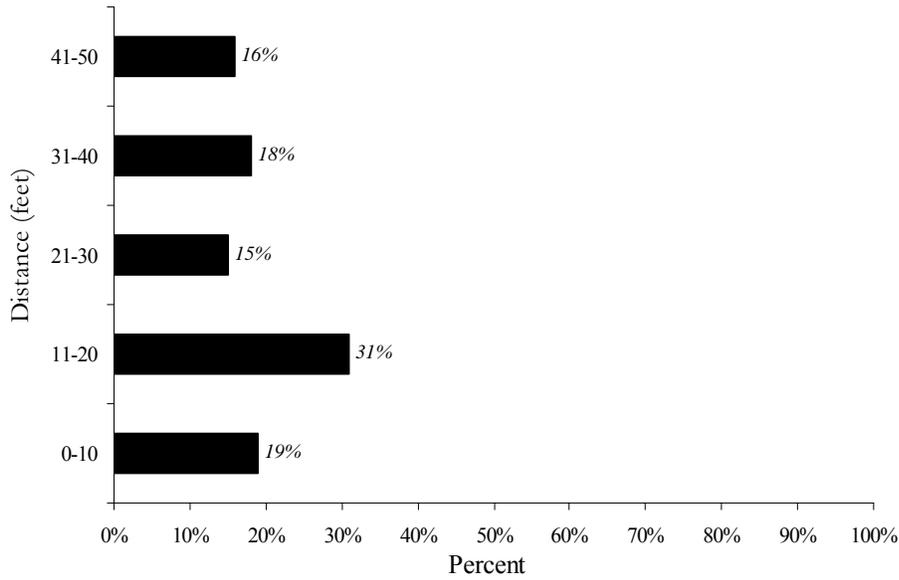
Source: Data collected in Spring 2006 using instrument designed by CBP researchers for direct observation of Centro bus shelters

Comment:

The number of shelters presented in this finding differs from the previous lighting finding because the number of lights located within 50 feet were not recorded at two shelters.

3. 65% of exterior lights are within 30 feet of the shelters.

Light Distance from Shelter
n = 104



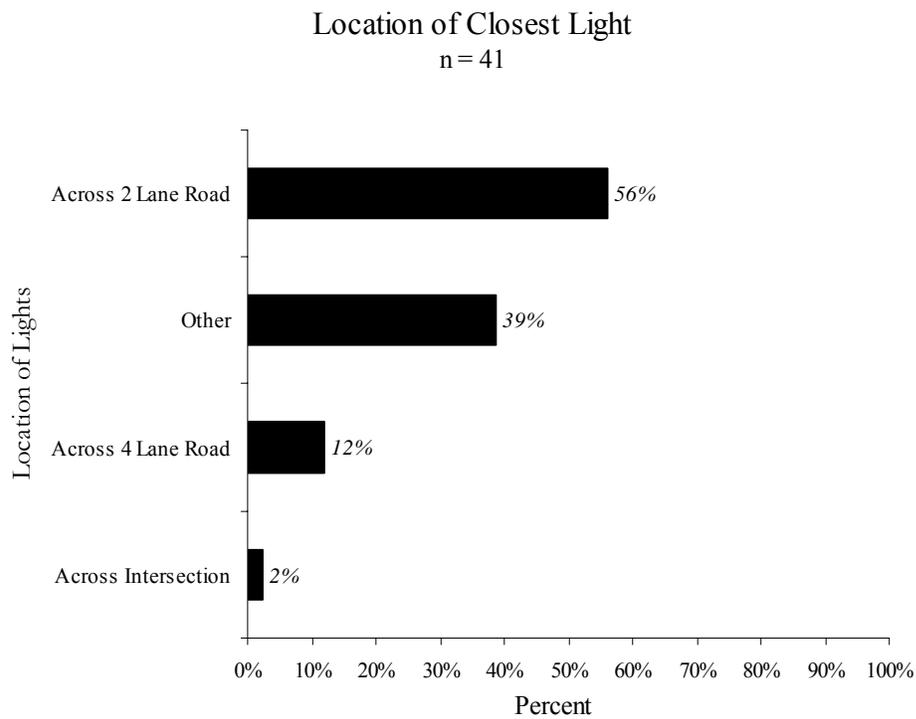
Mean	Median	Standard Deviation
23.8	20.5	14.5

Source: Data collected in Spring 2006 using instrument designed by CBP researchers for direct observation of Centro bus shelters

Comment:

Definitions of mean, median and standard deviation are provided in the methods section.

4. 56% of lights located more than 50 feet from a shelter are across a two lane street.



Source: Data collected in Spring 2006 using instrument designed by CBP researchers for direct observation of Centro bus shelters

Comments:

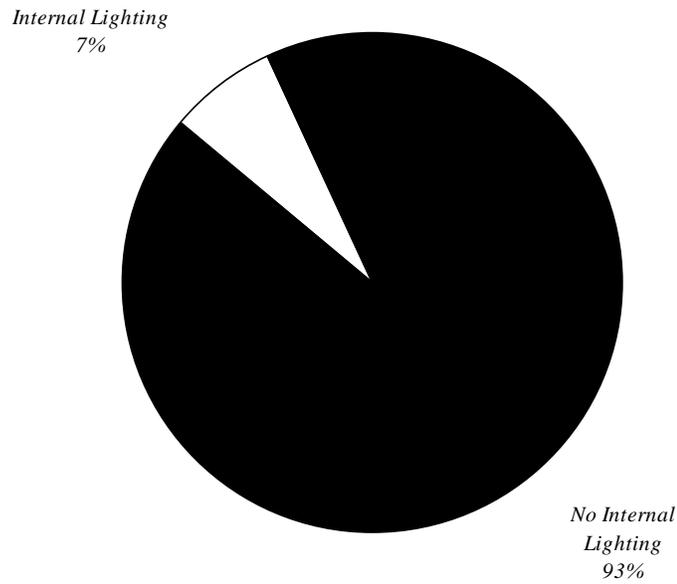
Percentages do not equal 100% because a light may be across a two or four lane street and fit the “Other” category.

The “Other” category refers to a shelter that had lighting visible from the shelter but was not located across a two lane street, across a four lane street or diagonally across an intersection.

The “Across Intersection” category refers to a light that was located diagonally across an intersection.

5. 93% of the shelters have no internal lighting.

Internal Shelter Lighting
n = 119



Source: Data collected in Spring 2006 using instrument designed by CBP researchers for direct observation of Centro bus shelters

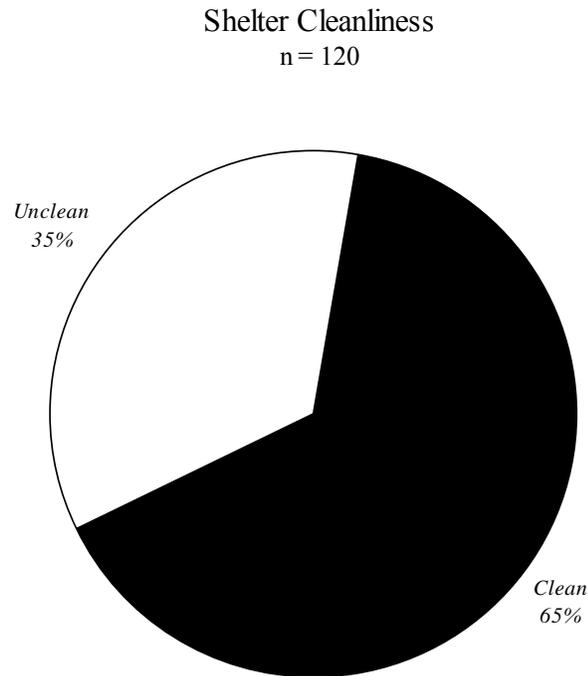


Bus 050 N. Salina and E. Genesee



Bus 074 Harrison St.

6. 65% of shelters are clean and free from vandalism.



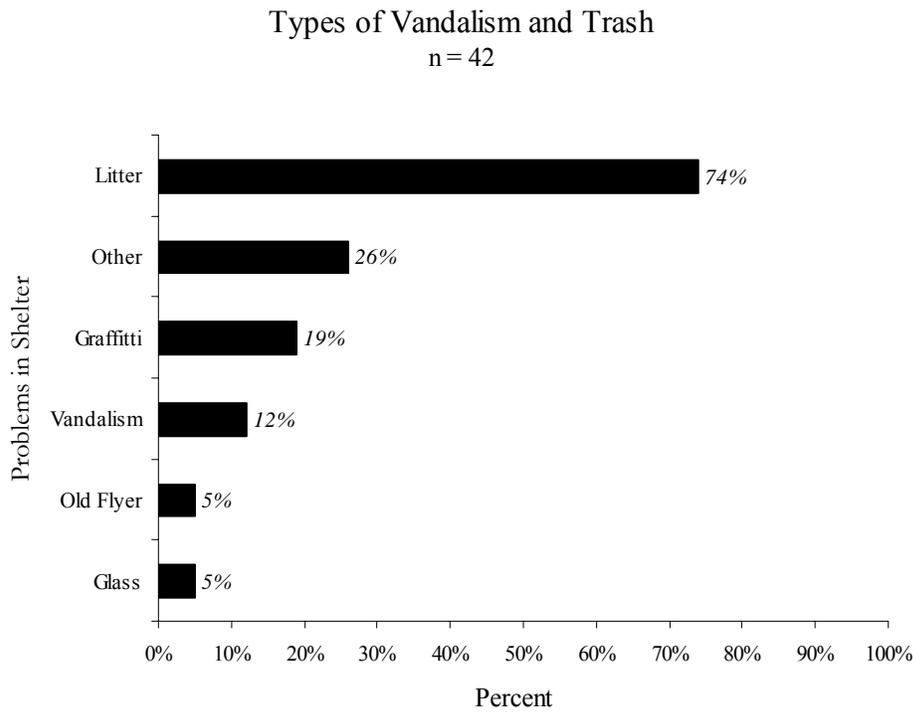
Source: Data collected in Spring 2006 using instrument designed by CBP researchers for direct observation of Centro bus shelters

Comments:

If there were no signs of litter, glass, vandalism, out-of-date advertisements, graffiti or other types of observed filthiness, the shelter was determined to be clean.

“Other” characteristics that would contribute to a rating of unclean include broken chairs, cigarette butts, dirty glass, missing panels, dirt and/or mud, scratched glass panes, clothing, and a shopping cart inside the shelter. (See Appendix C1)

7. 74% of the unclean and/or vandalized shelters contain litter.



Source: Data collected in Spring 2006 using instrument designed by CBP researchers for direct observation of Centro bus shelters

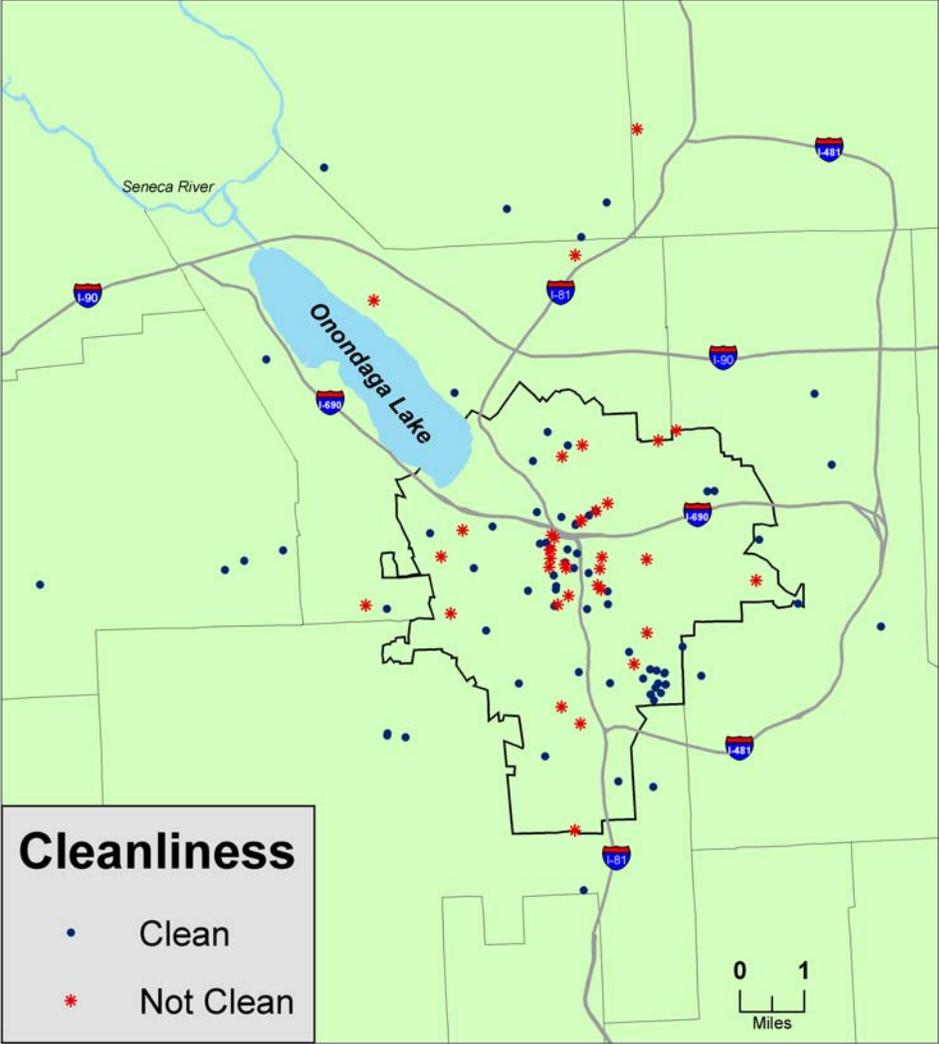
Comments:

Descriptions of “other” problems included:

- Broken bench
- Discarded cigarette butts (x3)
- Dirty glass panels
- Missing panels
- Mud
- Scratched glass panels
- Old shirt
- Broken shopping cart
- Writing scratched into shelter wall

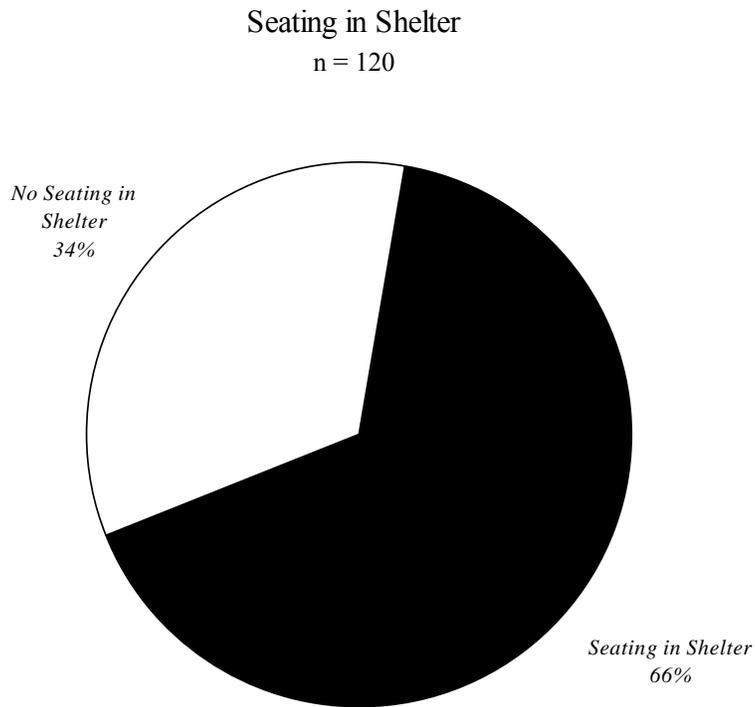
The percents do not equal 100% because shelters may have displayed more than one type of damage or uncleanliness.

Shelter cleanliness



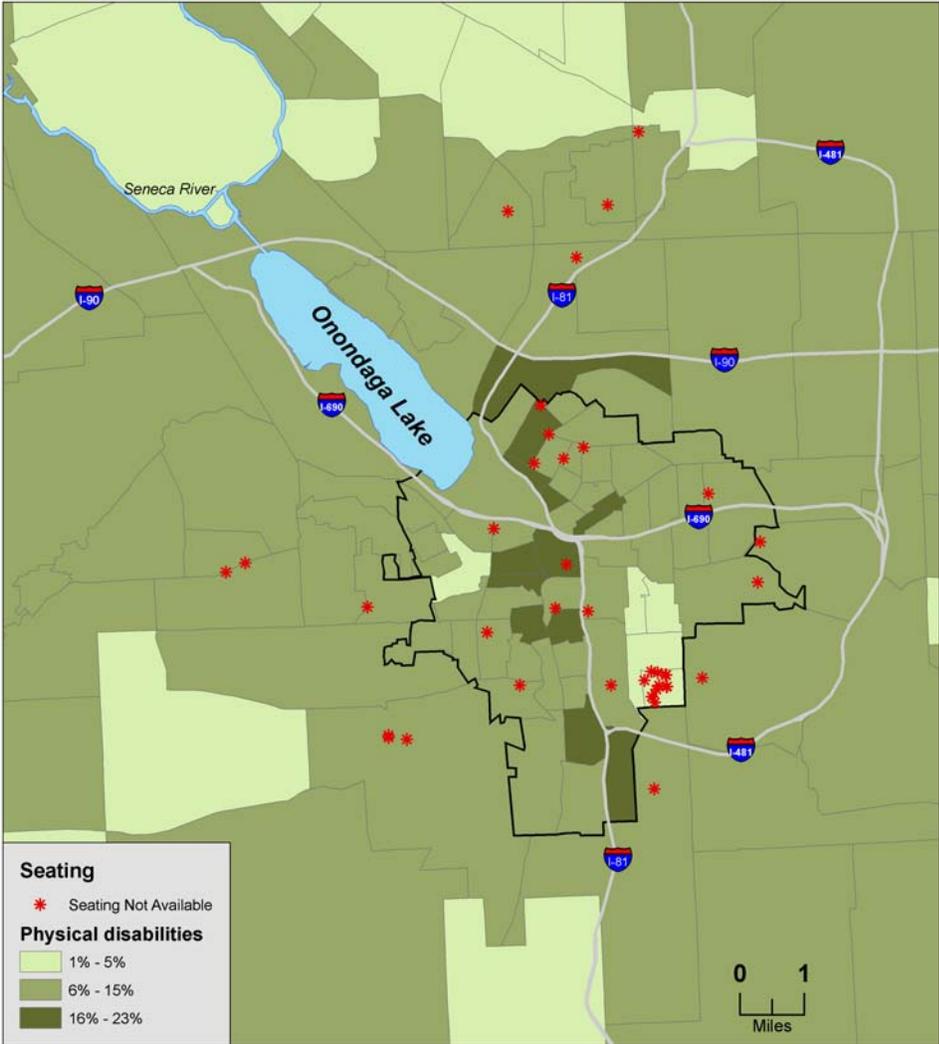
Bus shelter assessments were conducted in Spring 2006 by the Community Benchmarks Program
Map created by the SU Community Geographer

8. 66% of shelters have interior seating.



Source: Data collected in Spring 2006 using instrument designed by CBP researchers for direct observation of Centro bus shelters

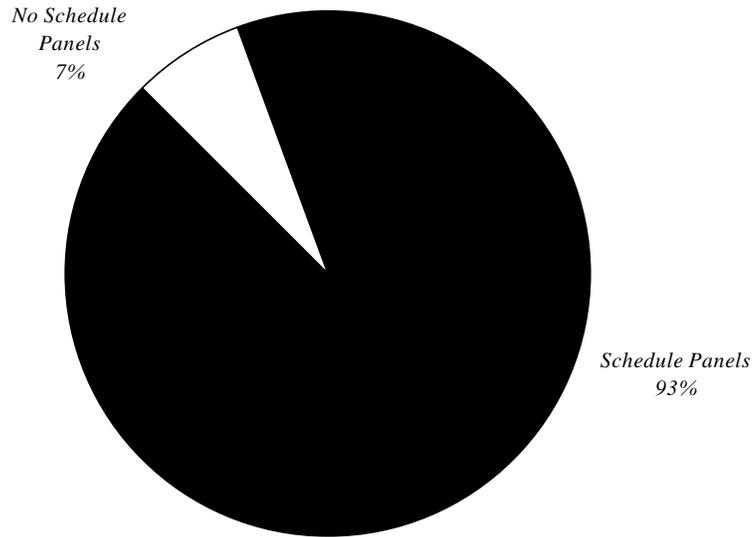
Shelter seating and percent of population with physical disabilities (2000 Census)



Disabilities are calculated for the civilian, noninstitutionalized population 5 years and over (2000 US Census)
 Bus shelter assessments were conducted in Spring 2006 by the Community Benchmarks Program
 Map created by the SU Community Geographer

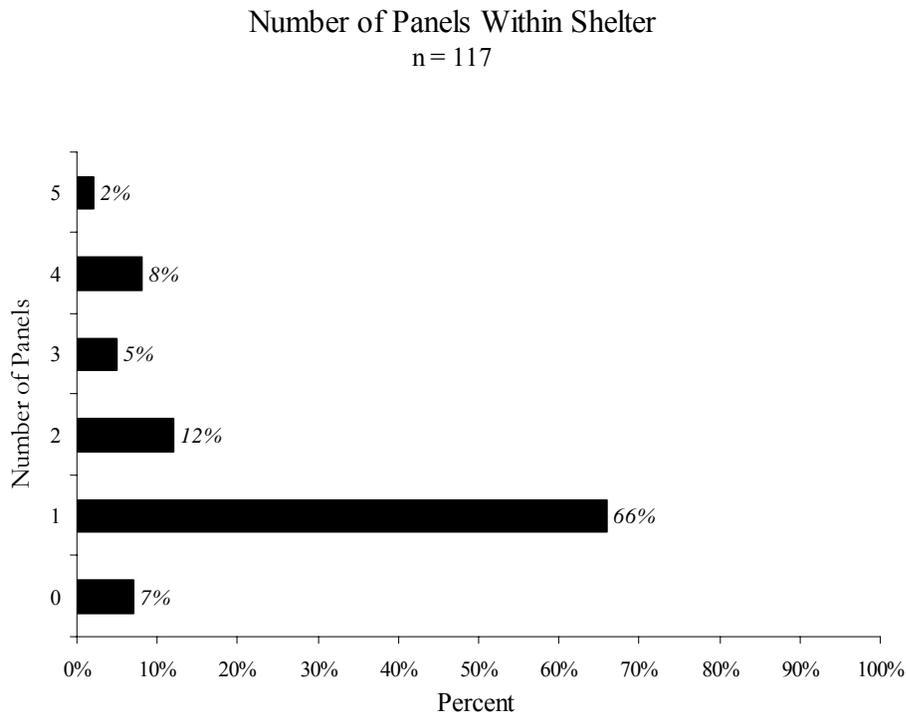
9. 93% of the shelters have schedule panels.

Shelters With Schedule Panels
n = 120



Source: Data collected in Spring 2006 using instrument designed by CBP researchers for direct observation of Centro bus shelters

10. 66% of shelters have one schedule panel.



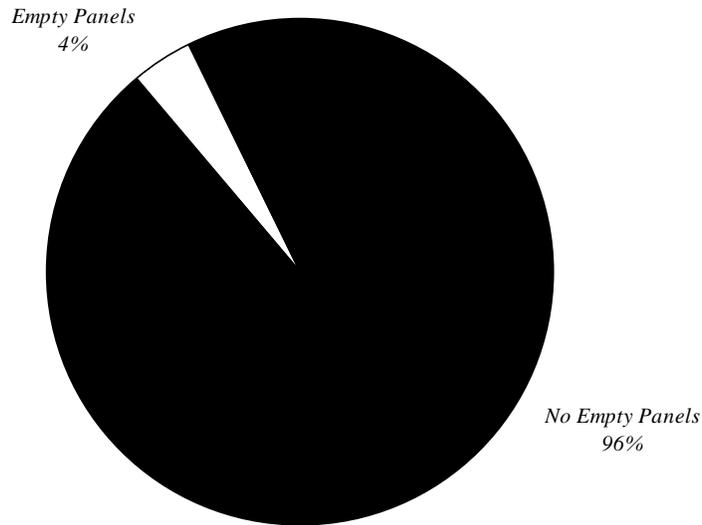
Source: Data collected in Spring 2006 using instrument designed by CBP researchers for direct observation of Centro bus shelters

Comment:

The number of shelters presented in this finding differs from the previous schedule panels finding because the number of schedule panels was not recorded for three shelters.

11. 96% of shelters have no empty schedule panels.

Shelters With Empty Panels
n = 120



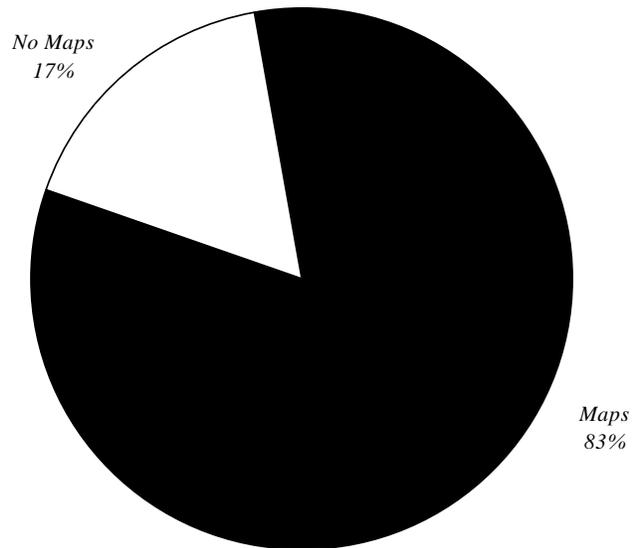
Source: Data collected in Spring 2006 using instrument designed by CBP researchers for direct observation of Centro bus shelters

Comment:

Of the 5 shelters that have empty panels, all have one empty panel.

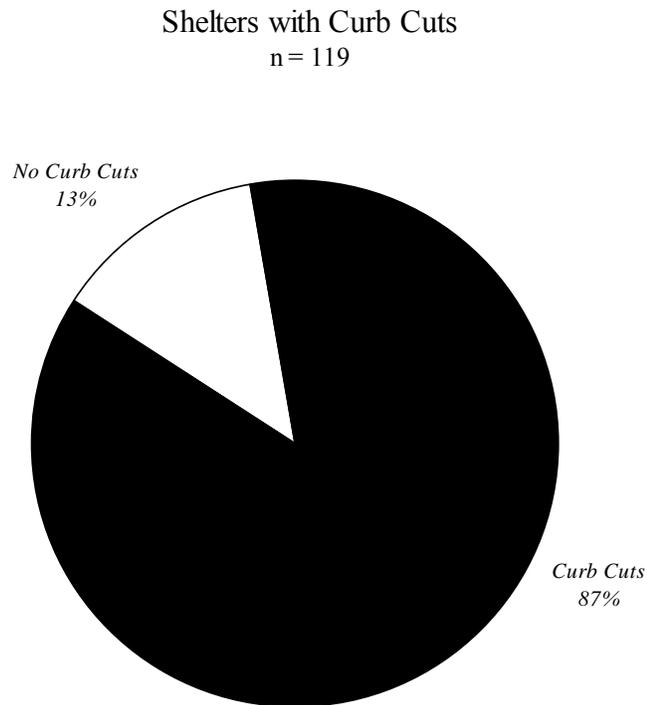
12. 83% of shelters have a route map posted.

Route Map in Shelter
n = 120



Source: Data collected in Spring 2006 using instrument designed by CBP researchers for direct observation of Centro bus shelters

13. 87% of shelters have curb cuts at the nearest crosswalks.



Source: Data collected in Spring 2006 using instrument designed by CBP researchers for direct observation of Centro bus shelters

Comment:

A curb cut is a gradual incline in the cement used to transition from the street to the sidewalk.

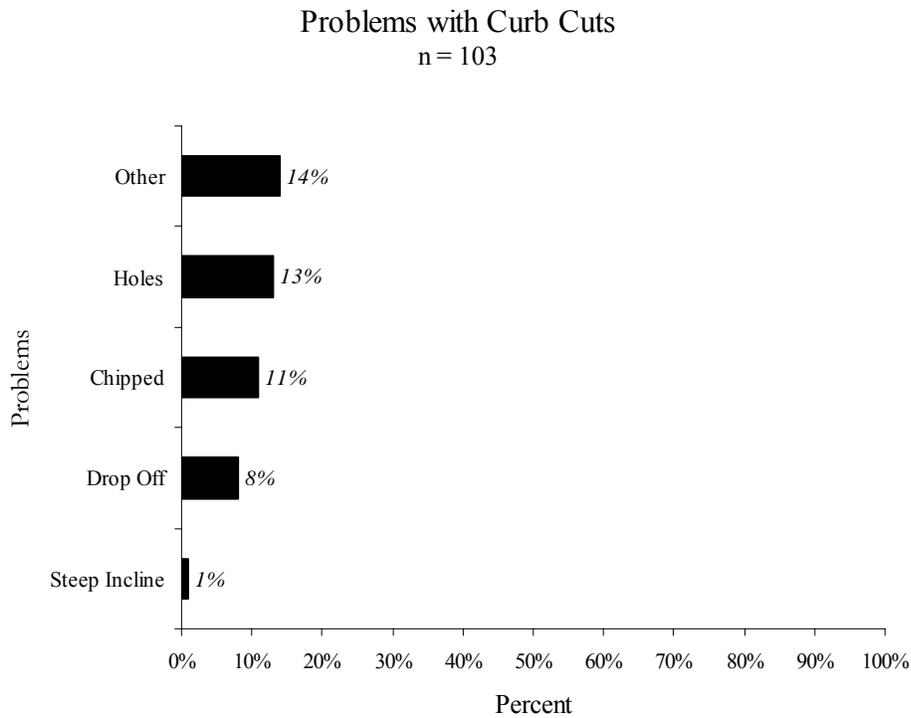


East Genesee and Jewish Center



W. Onondaga at Providence House

14. 14% of curb cuts were found to have broken glass, debris and snow/ice buildup.



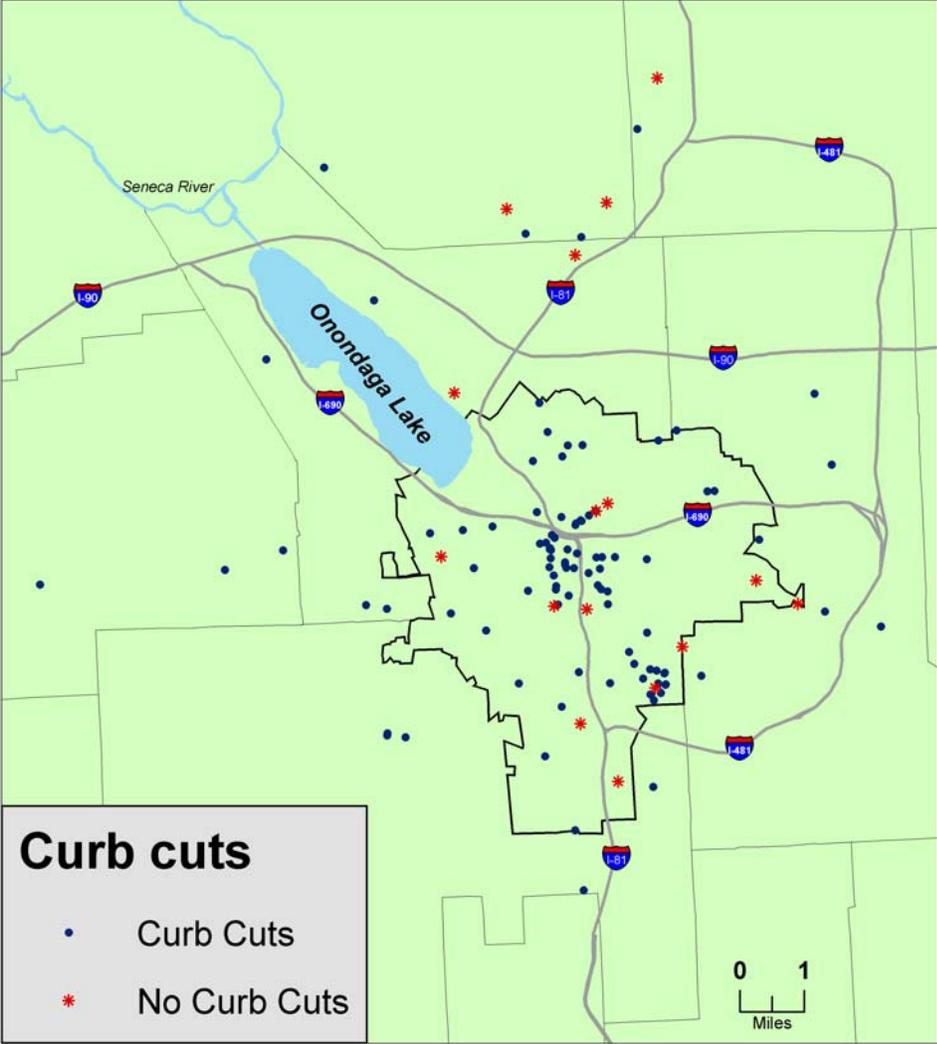
Source: Data collected in Spring 2006 using instrument designed by CBP researchers for direct observation of Centro bus shelters

Comments:

- The other problems consisted of:
 - Snow/ice build up (x12)
 - Road and sidewalks near the curb cut have large holes
 - Broken glass and lots of gravel

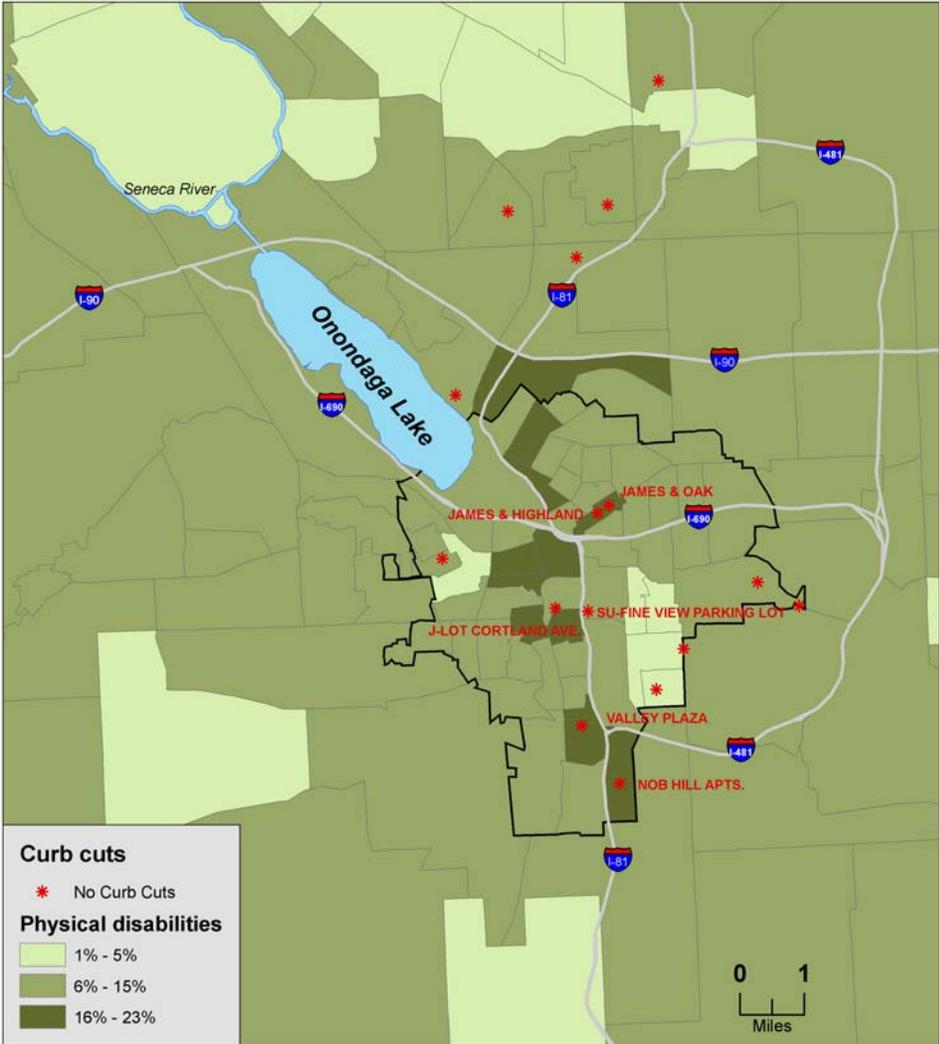
See Appendix C-II for full list

Curb cuts



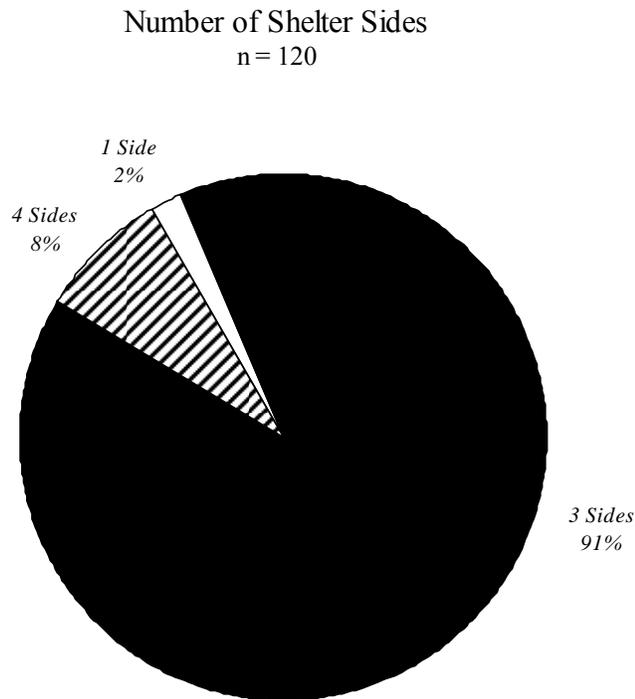
Bus shelter assessments were conducted in Spring 2006 by the Community Benchmarks Program
Map created by the SU Community Geographer

Curb cuts and percent of population with physical disabilities (2000 Census)



Disabilities are calculated for the civilian, noninstitutionalized population 5 years and over (2000 US Census)
 Bus shelter assessments were conducted in Spring 2006 by the Community Benchmarks Program
 Map created by the SU Community Geographer

15. 91% of shelters have three sides.



Source: Data collected in Spring 2006 using instrument designed by CBP researchers for direct observation of Centro bus shelters

Comments:

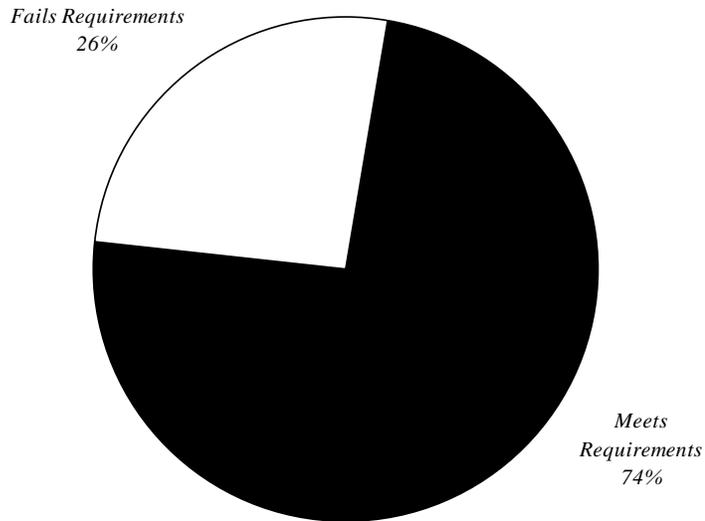
None of the shelters had only two sides.

In accordance with the American Disabilities Act of 1990, all of the four-sided shelters have openings that are a minimum of 32 inches.

16. 74% of shelters have at least 96 inches between the front of the shelter and the curb and/or street.

Distance from Shelter to Street

n = 104



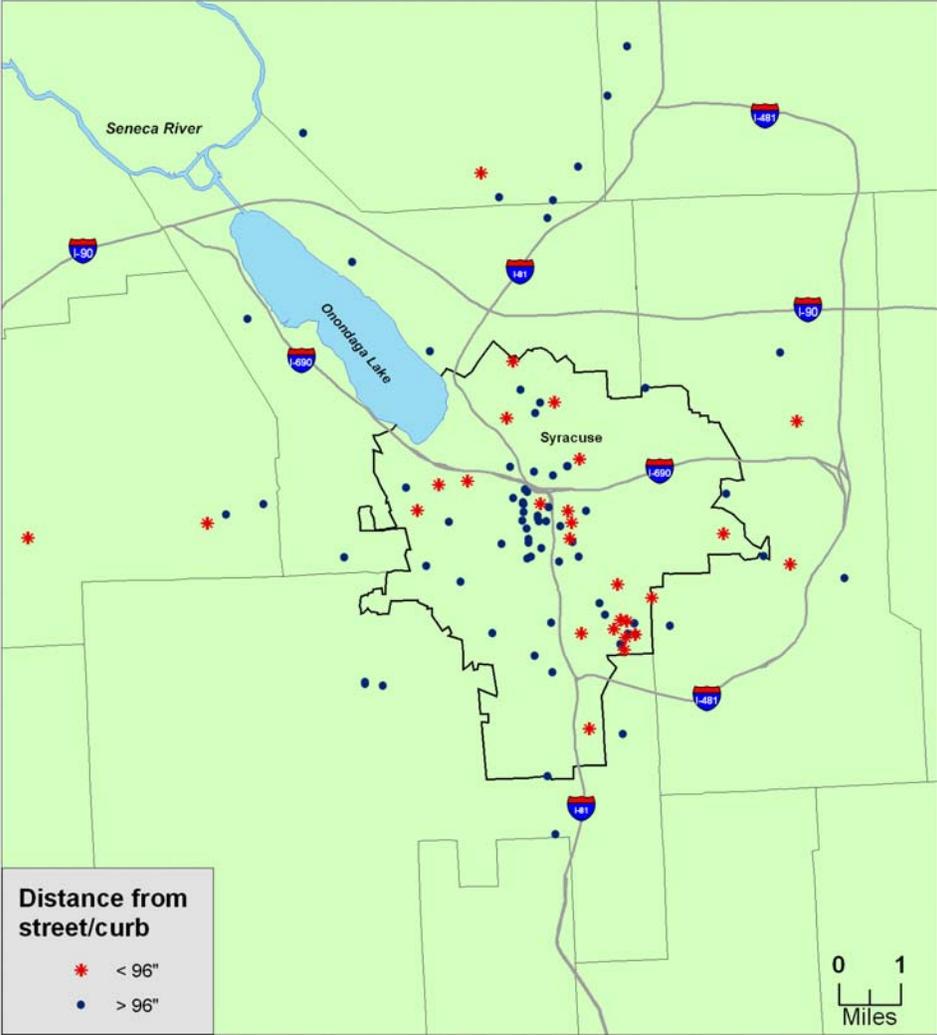
Source: Data collected in Spring 2006 using instrument designed by CBP researchers for direct observation of Centro bus shelters

Comments:

Excluded from this sample are 16 shelters because the front of the shelter was facing away from the street.

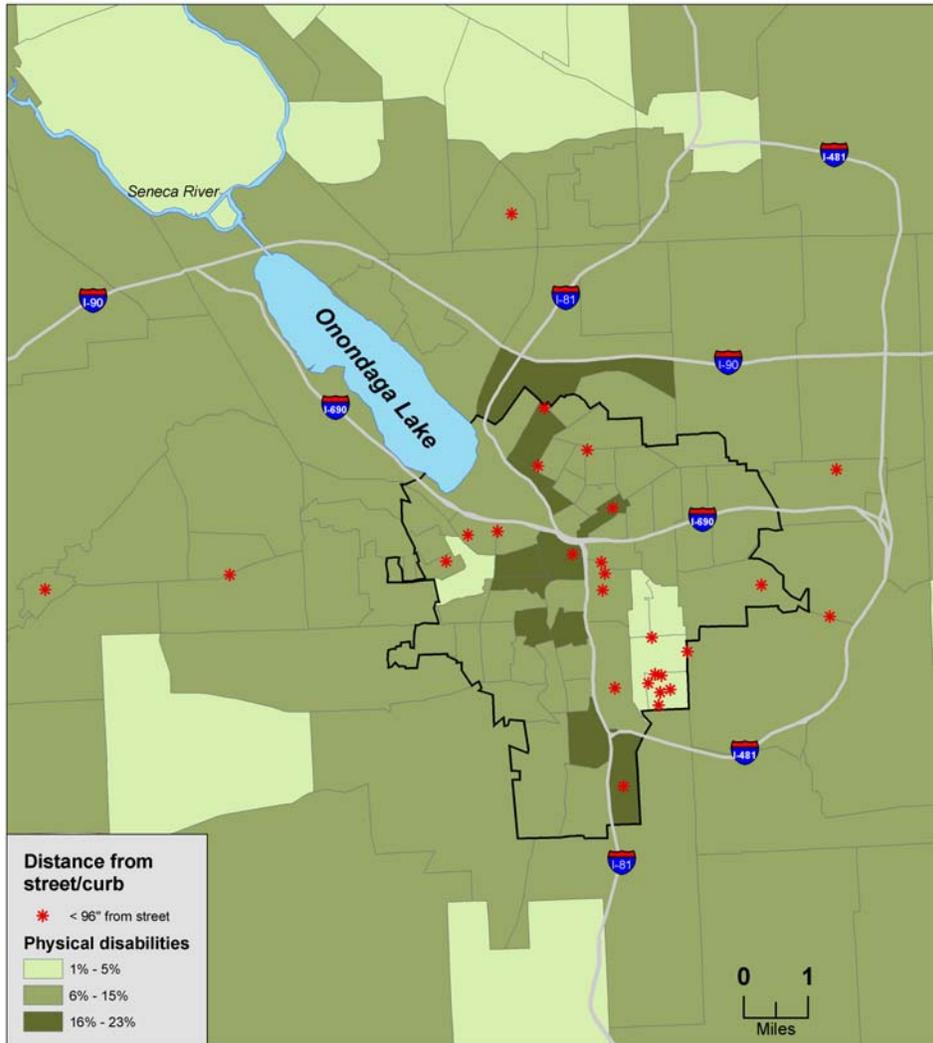
The Americans with Disabilities Act of 1990, in conjunction with the Federal Transportation Authority, requires that there be a minimum of 96 inches of free space between the front of the shelter and the street.

Shelter distance from the street / curb



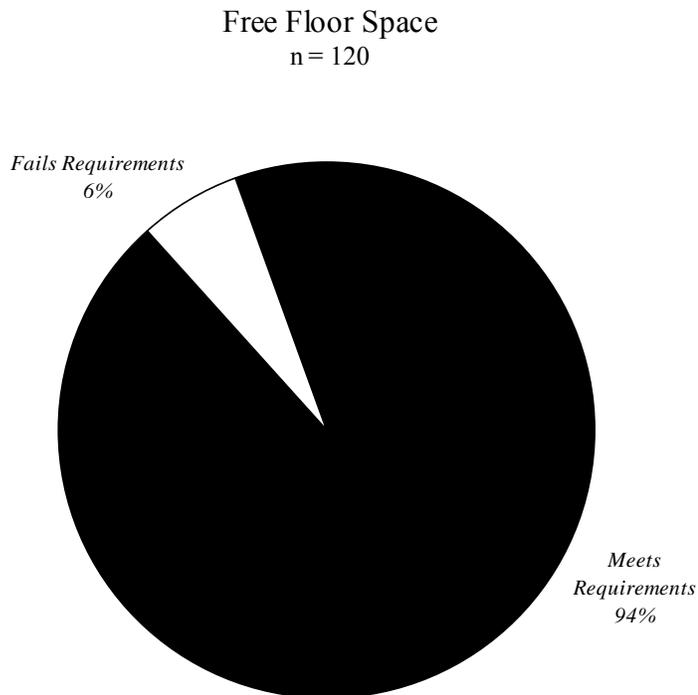
Bus shelter assessments were conducted in Spring 2006 by the Community Benchmarks Program
Map created by the SU Community Geographer

Shelter distance from street / curb and percent of population with physical disabilities (2000 Census)



Disabilities are calculated for the civilian, noninstitutionalized population 5 years and over (2000 US Census)
 Bus shelter assessments were conducted in Spring 2006 by the Community Benchmarks Program
 Map created by the SU Community Geographer

17. 94% of shelters have a minimum of 30 inches by 48 inches of free floor space within the shelter.

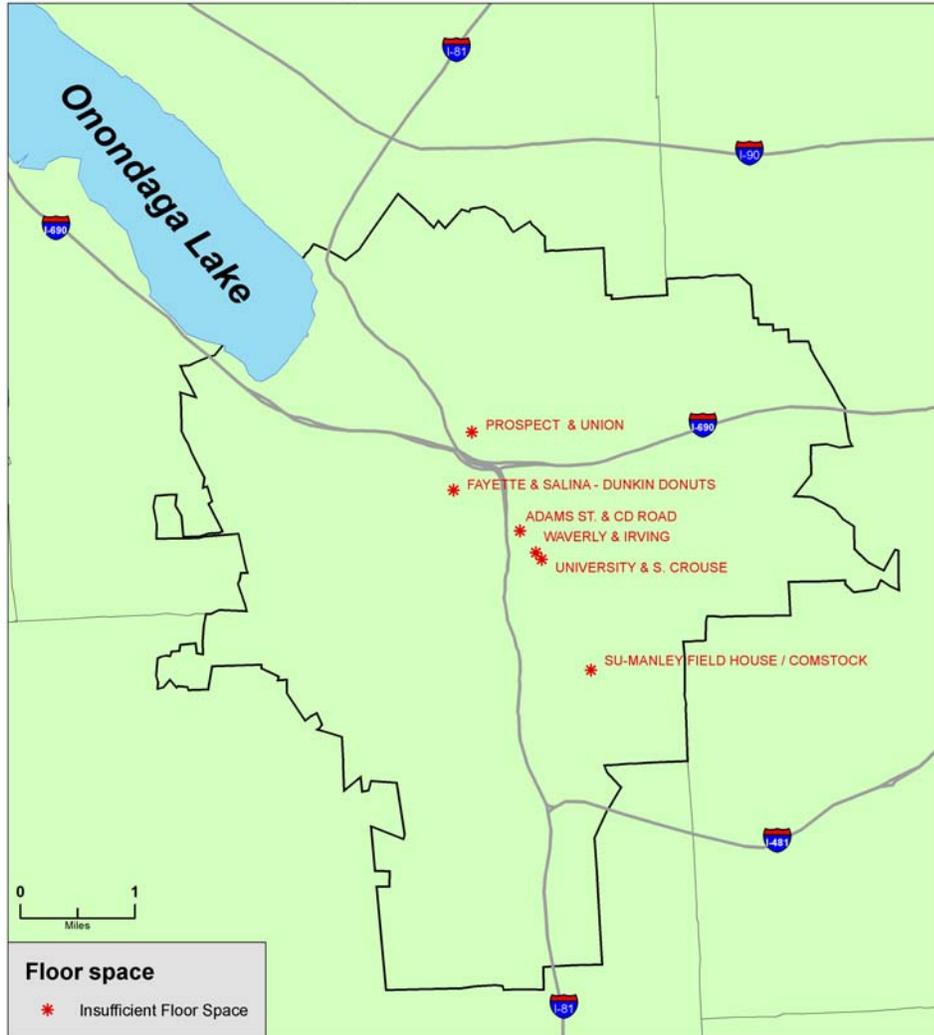


Source: Data collected in Spring 2006 using instrument designed by CBP researchers for direct observation of Centro bus shelters

Comment:

The Americans with Disabilities Act of 1990 requires that there be a minimum of 30 inches by 48 inches of floor space in the shelter.

Shelter floor space less than 30 inches by 48 inches



Bus shelter assessments were conducted in Spring 2006 by the Community Benchmarks Program
Map created by the SU Community Geographer



Milton and Tompkins



James and Highland

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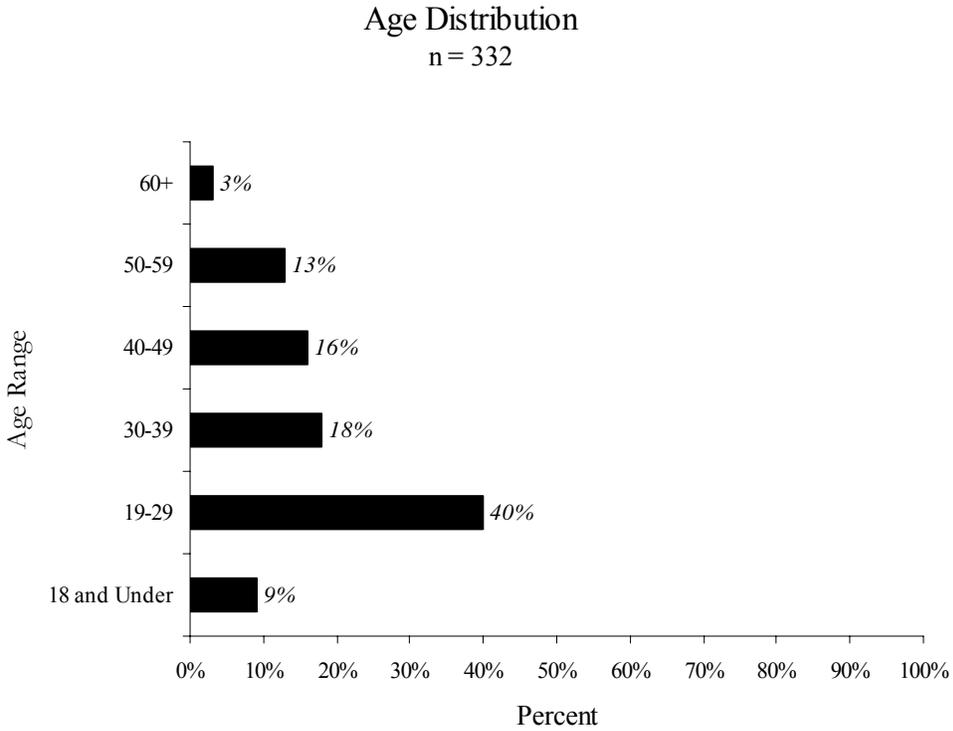
Shelter floor space less than 30 inches by 48 inches and percent of population with physical disabilities (2000 Census)



Disabilities are calculated for the civilian, noninstitutionalized population 5 years and over (2000 US Census)
 Bus shelter assessments were conducted in Spring 2006 by the Community Benchmarks Program
 Map created by the SU Community Geographer

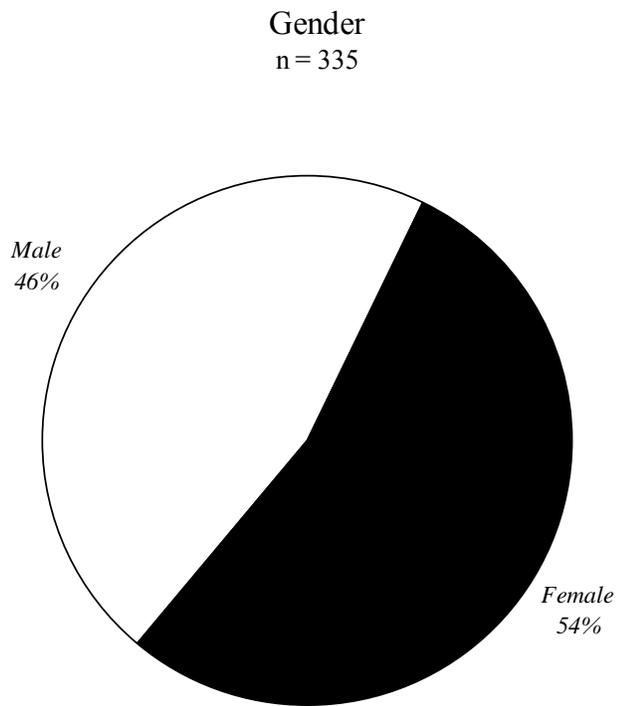
RIDER SURVEY FINDINGS

18. 58% of respondents are between the ages of 19 and 39.



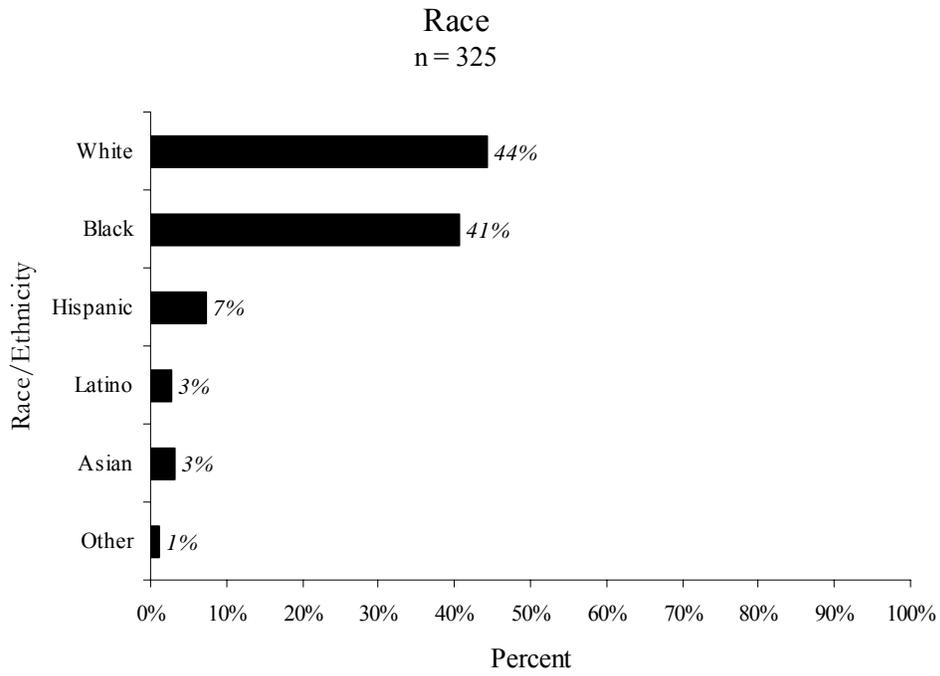
Source: Data collected in Spring 2006 using instrument designed by CBP researchers for survey of Centro bus riders

19. 54% of respondents are female.



Source: Data collected in Spring 2006 using instrument designed by CBP researchers for survey of Centro bus riders

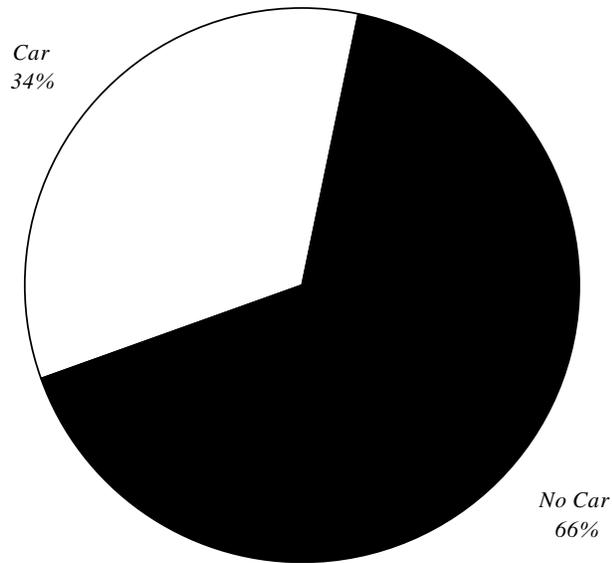
20. 44% of respondents surveyed identified themselves as White.



Source: Data collected in Spring 2006 using instrument designed by CBP researchers for survey of Centro bus riders

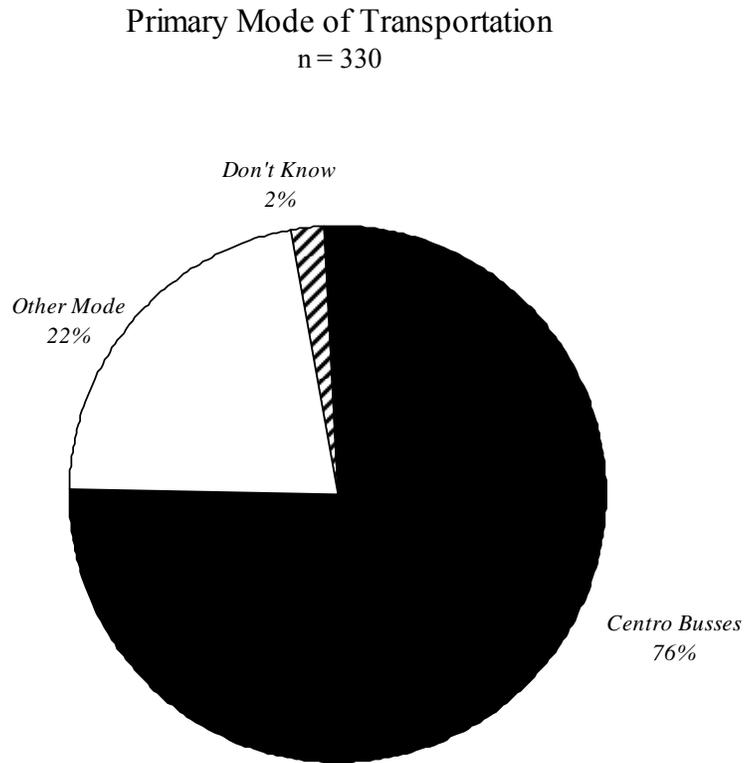
21. 66% of respondents do not have access to a car.

Percent of Riders Have Access to a Car
n = 331



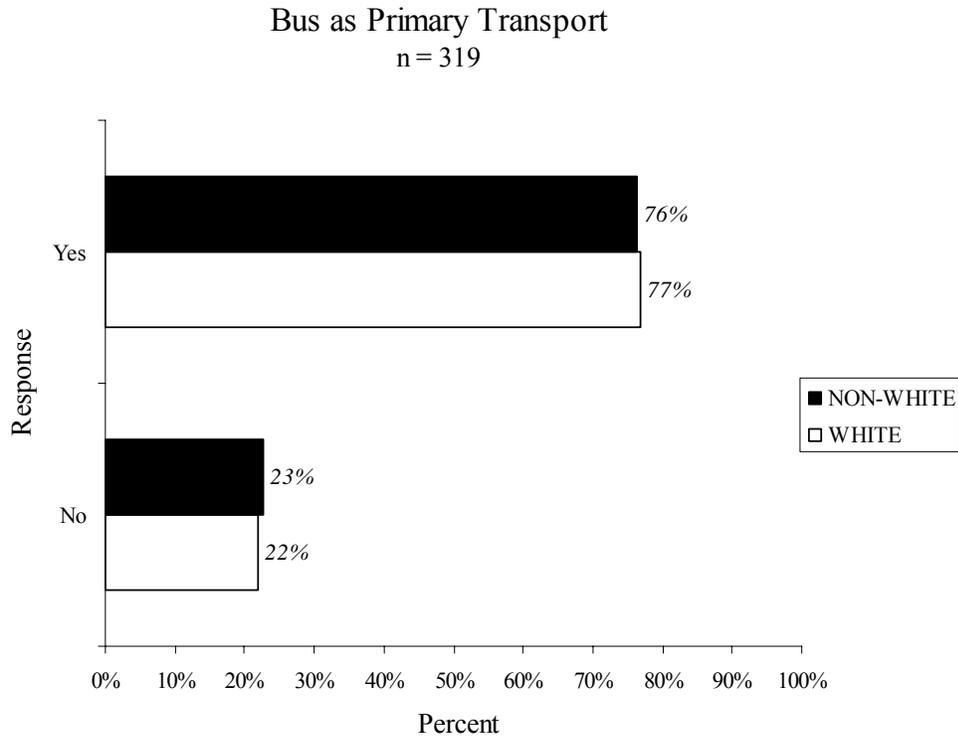
Source: Data collected in Spring 2006 using instrument designed by CBP researchers for survey of Centro bus riders

22. 76% of respondents use the Centro bus line as their primary mode of transportation.



Source: Data collected in Spring 2006 using instrument designed by CBP researchers for survey of Centro bus riders

23. Whites (77%) and non-whites (76%) did not differ significantly in their use of Centro as a primary mode of transportation.



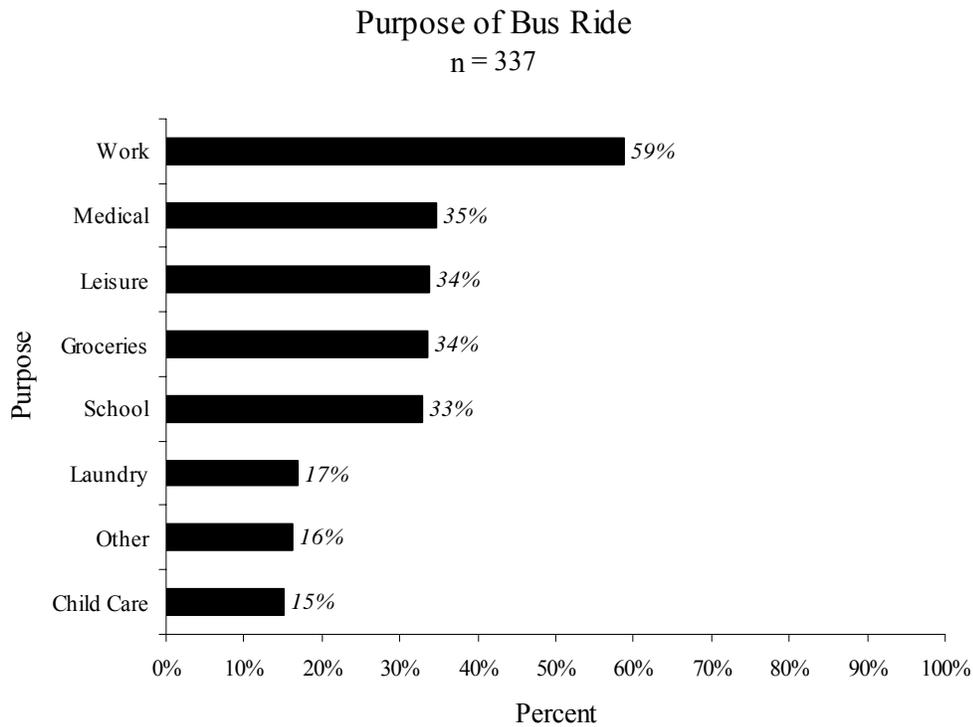
Source: Data collected in Spring 2006 using instrument designed by CBP researchers for survey of Centro bus riders

Comments:

The non-white category includes people who consider themselves Asian, Black, Hispanic, Latino or another race.

There were four "Don't Know" responses

24. Transportation to and from work is the reason most respondents cite for using the bus (59%).



Source: Data collected in Spring 2006 using instrument designed by CBP researchers for survey of Centro bus riders

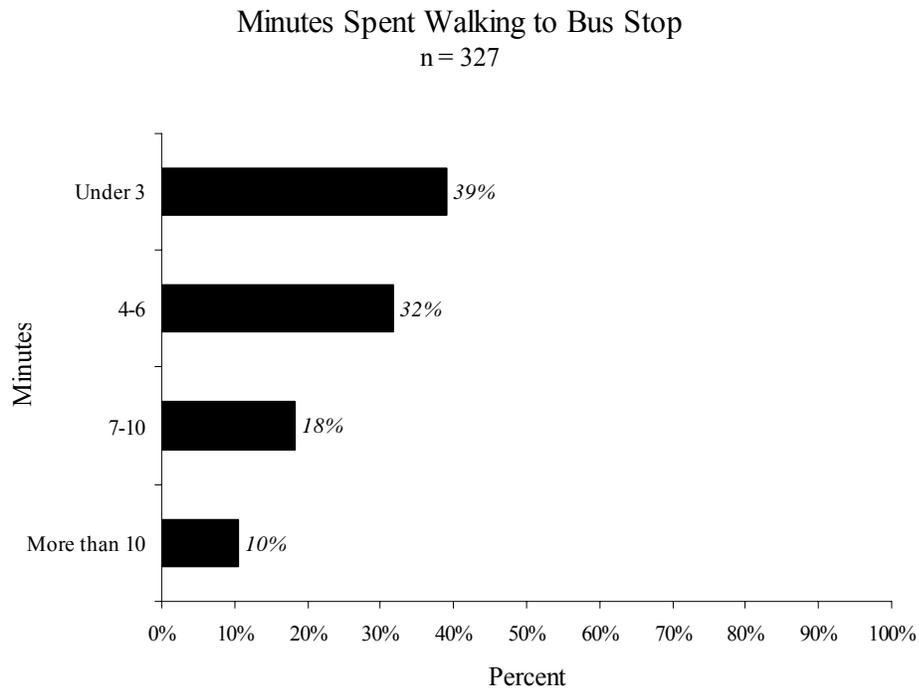
Comments:

The percentages above do not equal 100% because respondents were asked to include *all* the reasons they took the bus.

“Other” Responses included the following:

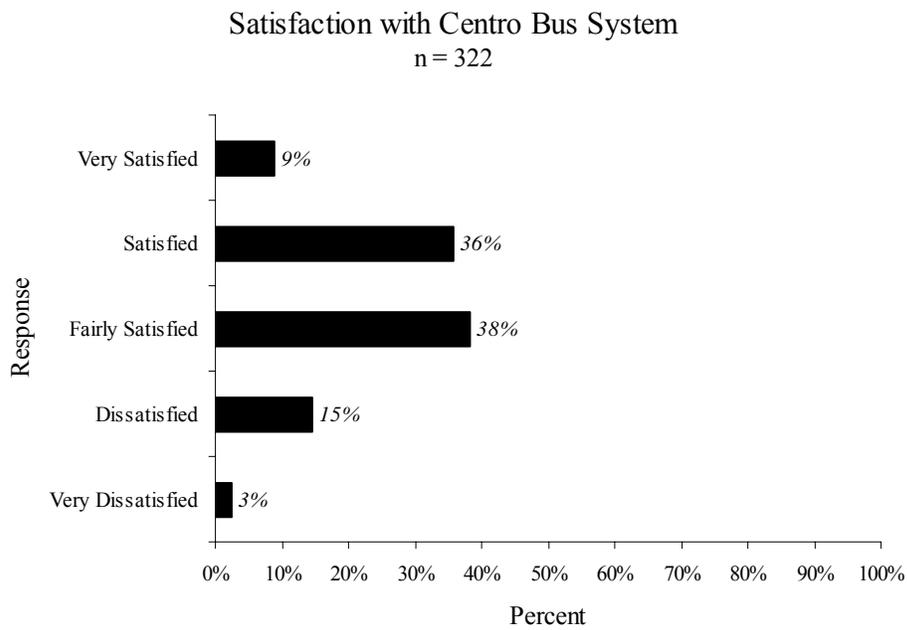
- | | |
|-----------------------|---------------------|
| Visit Friends (2x) | Meetings (3x) |
| Home | Legal Appointments |
| Car in shop | General Use |
| Retired/Disabled Vet | Drama Class |
| Program | Observe |
| Bank (2x) | Sports |
| Treatments | For everything (6x) |
| Research Observations | Church (4x) |

25. 71% of respondents spent under seven minutes walking to a bus stop.



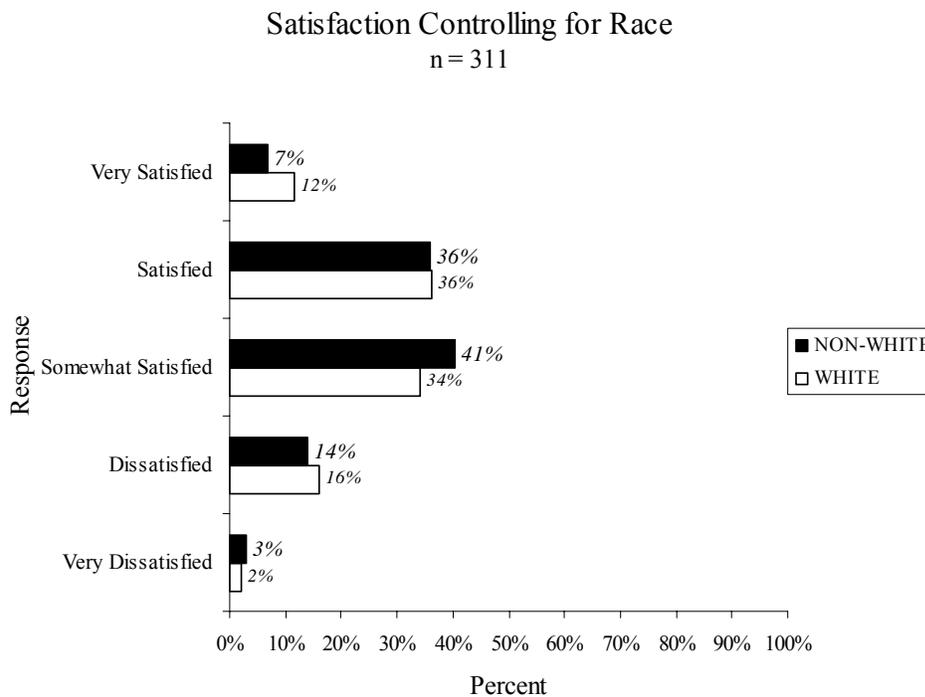
Source: Data collected in Spring 2006 using instrument designed by CBP researchers for survey of Centro bus riders

26. 45% of respondents are “very satisfied” or “satisfied” with the Centro Bus System.



Source: Data collected in Spring 2006 using instrument designed by CBP researchers for survey of Centro bus riders

27. 48% of white respondents and 43% of non-white riders are “very satisfied” or “satisfied” with the Centro bus system.



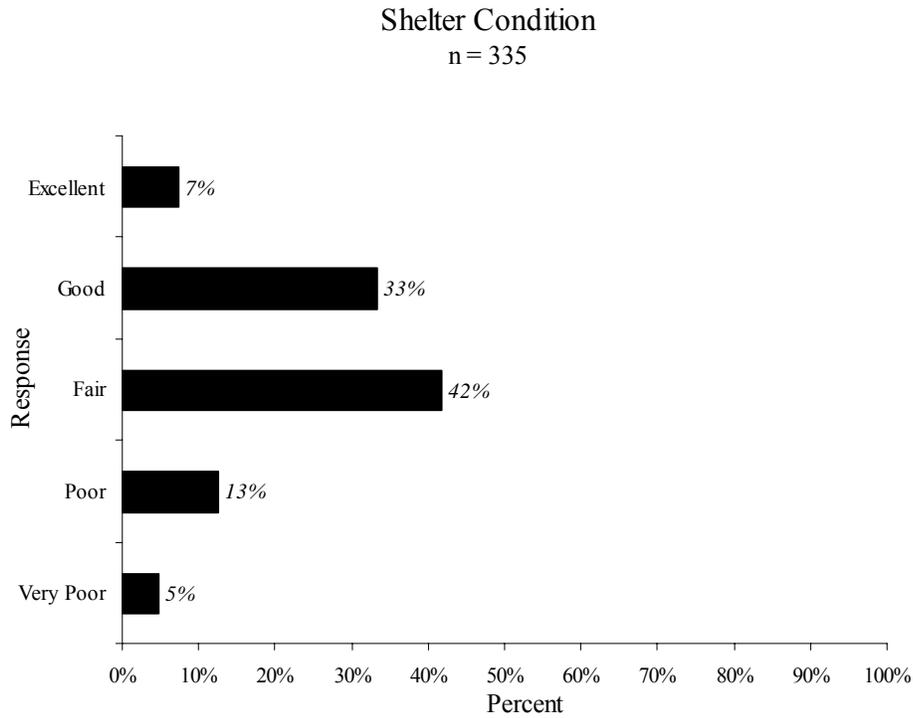
Source: Data collected in Spring 2006 using instrument designed by CBP researchers for survey of Centro bus riders

Comments:

The non-white category includes people who consider themselves Asian, Black, Hispanic, Latino or another race.

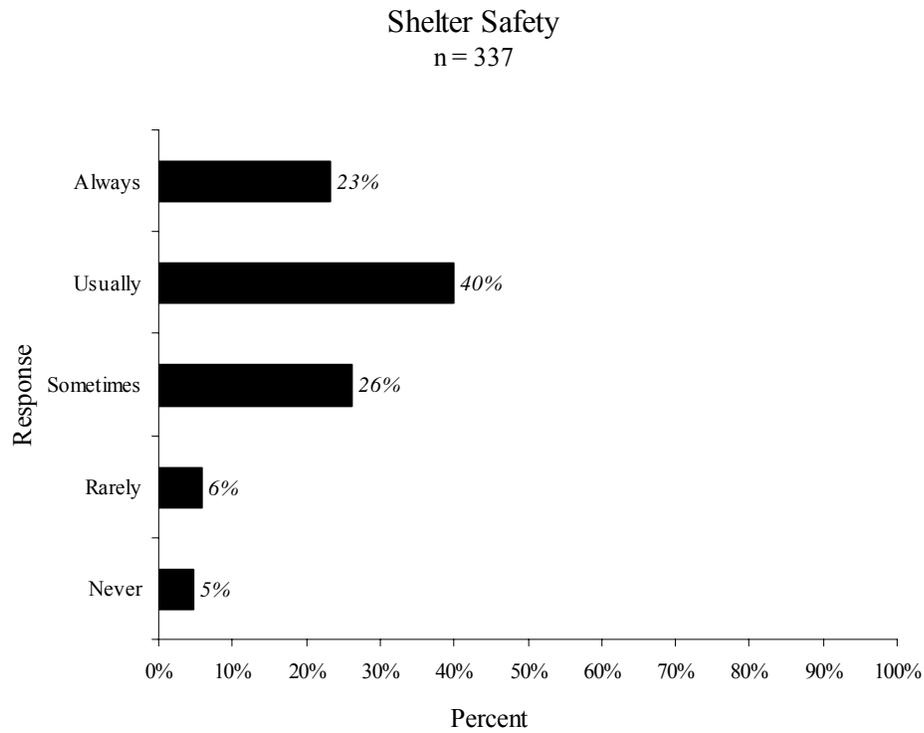
The responses for race in the rider survey allow the choices “Latino” and “Hispanic”. The CBP recognizes that these terms mean the same thing, and both were inserted due to oversight. Since some respondents answered “Hispanic” and some “Latino”, both responses are included in the dataset.

28. 41% of respondents say the condition of the bus shelters is “excellent” or “good.”



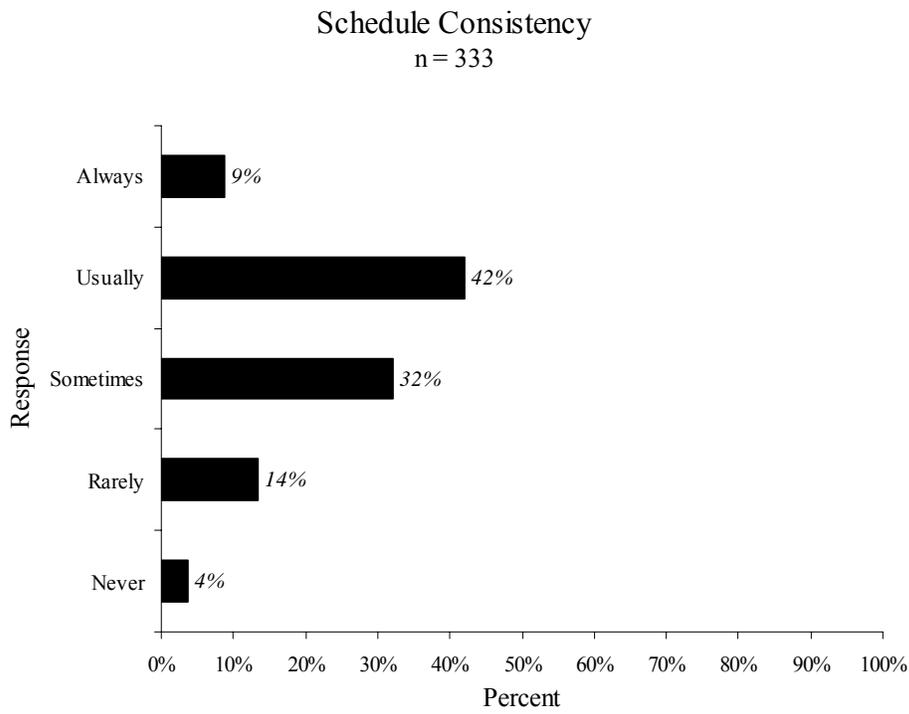
Source: Data collected in Spring 2006 using instrument designed by CBP researchers for survey of Centro bus riders

29. 63% of respondents say they “always” or “usually” feel safe while waiting at Centro bus shelters



Source: Data collected in Spring 2006 using instrument designed by CBP researchers for survey of Centro bus riders

30. 51% of respondents say the buses “always” or “usually” leave at the scheduled time.



Source: Data collected in Spring 2006 using instrument designed by CBP researchers for survey of Centro bus riders



Data Collection

WORKS CITED

- Code of Federal Regulations, Title 49, Vol.: Transportation Services for Individuals with Disabilities (Part 37) GPO Access CITE: 49CFR37, Pages 374-551.
- Downs, D. (2005-2006 Winter). Fear factor: how scary are bus stops? [Electronic version]. *Institute of transportation studies review*, 4 (1).
- Sanchez, T., Stolz, R., & Ma, J. (2003). *Moving to equity: addressing inequitable effects of transportation policy on minorities*. Cambridge, MA: The Civil Rights Project at Harvard University.
- Syracuse Metropolitan Transportation Council (2004, August). *Title VI: Central New York Regional Transportation Authority*. Syracuse, NY: Jennifer Weldin.
- United States Census Bureau (2000). *United States Census*. Accessed on March 24, 2006 from <http://www.census.gov>

APPENDICES
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Appendix I: Blank Direct Observation Instrument.....A-I

Appendix II: Blank Rider SurveyB-I

Appendix III: Open Ended Responses.....C-I

Appendix IV: Codebooks

- i. Direct Observation.....D-I
- ii. Rider SurveyE-I

Bus Shelter Observation Instrument

Date _____

LOCATION

- 1. Unique Identifier _____
- 2. Intersection listed on Centro Inventory _____
- 3. Latitude _____
- 4. Longitude _____
- 5. Address of nearest building _____
- 6. Is the nearest home/business across the street? Yes No
- 7. GPS Unit 1 Code _____ Accuracy Level _____
- 8. GPS Unit 2 Code _____ Accuracy Level _____

LIGHTING

- 9. Are there lights within 50 feet of the bus shelter? Yes No
- 10. If yes, list the number of lights. _____
- 11. List the distance of the one or two closest light(s) located within 50 feet of the bus shelter.
 - a. _____ ft.
 - b. _____ ft.
- 12. If there is not a light within a measurable distance from the bus shelter, indicate if there is a light located in any of the following locations.
 - a. The nearest light is located across a 2 lane street.
 - b. The nearest light is located across a 4 lane street.
 - c. The nearest light is located diagonally across an intersection.
 - d. There is not a light within 50 feet but there is lighting visible from the shelter.
- 13. Is there lighting inside the shelter? Yes No

APPEARANCE

- 14. Indicators that the shelter is not clean. Check all that apply
 - a. ___ Litter (paper, cans, bottles)
 - b. ___ Broken Glass
 - c. ___ Vandalism
 - d. ___ Outdated Ads/Flyers
 - e. ___ Graffiti
 - f. ___ Other—Please Specify. _____

15. If none of the above conditions are checked, please mark this box to indicate that you have inspected the cleanliness of the shelter. Shelter is clean

SHELTER

16. How many sides does the shelter have? _____

17. If the shelter has 4 sides, is the opening a minimum of 32 inches? Yes No

18. If the shelter opening is less than 32 inches, list the width. _____

19. Is there seating within the shelter? Yes No

20. Are there schedule panels? Yes No 20. a. If yes, how many?

21. Are any of the panels empty? Yes No 21. a. If yes, how many? _____

22. Is there a map of bus routes posted? Yes No

CURB CUTS

23. Are there curb cuts at the nearest crosswalks (may be end of the block)? Yes No

24. Record any problems with curb cuts nearest to the bus shelter. (Check all that apply.)
a. ___ Chipped c. ___ Steep incline
b. ___ Holes/Uneven Pavement d. ___ Drops off/Does not transition smoothly to street
e. ___ Other, Please Specify: _____

Remember to take pictures of significant damage/obstructions that hinder accessibility

DISABILITY ACCESS

25. Does the floor area within the shelter have a minimum free space of 30- x 48-inches?
 Yes No Don't Know

26. Is the front of the shelter at least 96 inches (8 feet) from the curb/street? Yes No

27. NOTES

Rider Survey

Please honestly respond to the following questions about your experiences in general with the Centro bus system.

1. How often do you feel safe at most Centro **bus stops/shelters**?
Never Rarely Sometimes Usually Always Don't know
2. What do you consider the condition of the Centro **bus stops/shelters**?
Very Poor Poor Fair Good Excellent Don't Know
3. How often do the buses leave at their scheduled time?
Never Rarely Sometimes Usually Always Don't know
4. How many minutes does it take you to walk to the bus stop that you use most often?
Under 3 minutes 4-6 minutes 7-10 minutes more than
10 minutes

5. Why do you normally take the bus? Check all that apply:
- | | |
|---|-------------------------------------|
| <input type="checkbox"/> work | <input type="checkbox"/> leisure |
| <input type="checkbox"/> groceries/shopping | <input type="checkbox"/> child care |
| <input type="checkbox"/> school | <input type="checkbox"/> laundry |
| <input type="checkbox"/> medical appointments | <input type="checkbox"/> other |

-
6. On average, how much money do you spend per week on Centro? _____ dollars per week
 7. How often do you ride the bus each week (not including transfers)? _____ times per week
 8. On an average day how much time do you spend riding the bus? _____ minutes/hours per day
 9. Overall, how satisfied are you with the Centro bus system?
Very dissatisfied dissatisfied Fairly satisfied satisfied very
satisfied Don't Know

10. Could you recommend any changes to improve the Centro system?

11. Do you have a car at your accessibility? Yes No I don't Know

Open Ended Responses

Direct Observation: Question #14: Indicators that the shelter is not clean. Indicators included: Litter, Broken Glass, Vandalism, Outdated Ads/Flyers, Graffiti and Other

Other indicators included:

“Broken Chair”

“Cigarette butts” (3)

“Dirty glass”

“Missing panels”

“Mud/dirty”

“Scratched Glass Panes”

“Shirt”

“Shopping cart”

“Writing scratched into wall”

Direct Observation: Question #24: Record any problems with curb cuts nearest to the bus shelter.

Other descriptions included:

Snow/ice build up (x12)

“Not plowed” (3)

“Snow/ice built up” (7)

“Big puddle of water, not shoveled”

“Covered with snow and debris”

“Broken glass, lots of gravel”

“Road and sidewalks near the curb cut have large holes”

**Rider Survey: Question #5: Why do you normally take the bus? Check all that apply:
Other descriptions included:**

Only means of transport
Research Observation
Treatments
Legal appointments
General Use
Church x4
Observe
Getting around/all the time
Retired/Disabled vet.
Sports
For everything x4
Visit Friends x2
Car in shop
Volunteer
Bank
Meetings x2
Program
Meetings
Drama Class
Bank

Direct Observation Codebook

	A	B	C	D
1	Q.No.	Q.No	Variable Name	Operational Definition
2	1		UNIQUE ID	Unique Identifier
3	2		LOCATION	Intersection listed on Centro Inventory
4			KIND/SIZE	Is the shelter 2 or 3 bay, standing or cantilever, or advertising?
5			DATE1	Date of first measurement
6	3		LAT1	Latitude1 coordinate of bus shelter
7	4		LONG1	Longitude1 coordinate of bus shelter
8			UNIT1	Unit Latitude1 and Longitude1 were recorded on
9			ACCURACY1	Accuracy of unit recording Latitude1 and Longitude1
10	5		ADDRESS	Address of nearest building
11	6		NEARESTBUILDING	Is the nearest home/business across the street
12	7		DATE2	Date of second measurement
13			LAT2	Latitude coordinate of bus shelter
14			LONG2	Longitude coordinate of bus shelter
15			UNIT2	Unit Latitude2 and Longitude2 were recorded on
16			ACCURACY2	Accuracy of unit recording Latitude2 and Longitude2
17	8		DATE3	Date of third measurement
18			LAT3	Latitude coordinate of bus shelter
19			LONG3	Longitude coordinate of bus shelter
20			UNIT3	Unit Latitude3 and Longitude3 were recorded on
21			ACCURACY3	Accuracy of unit recording Latitude3 and Longitude3
22	9		SHELTERLIGHT	Are there lights within 50 feet of the bus shelter?
23	10		NUMBERLIGHT	If yes, list the number of lights.
24	11 a		DISTANCELIGHT1	List the distance of the one or two closest light(s) located within 50 feet of the bus shelter.
25	11 b		DISTANCELIGHT2	List the distance of the one or two closest light(s) located within 50 feet of the bus shelter.
26	12 a		2LANELIGHT	The nearest light is located across a 2 lane street.
27	12 b		4LANELIGHT	The nearest light is located across a 4 lane street.
28	12 c		INTERSECTIONLIGHT	The nearest light is located diagonally across an intersection.
29	12 d		NOLIGHT	There is not a light within 50 feet but there is lighting visible from the shelter.
30	13		INSIDELIGHT	Is there a light inside the shelter?
31	14 a		LITTER	Is there litter in or around the bus shelter?
32	14 b		GLASS	Is there broken glass in or around the bus shelter?
33	14 c		VANDAL	Does vandalism seem to have been done to the bus shelter?
34	14 d		AD/FLYER	Are there outdated ads or flyers on the bus shelter?
35	14 e		GRAFFITI	Does there appear to be graffiti on the bus shelter?
36	14 f		OTHER	Is there other uncleanliness?
37	14 f2		OTHERDESCRIP	Description of other uncleanliness.
38	15		CLEAN	Shelter is clean
39	16		SIDES	How many sides does the shelter have?
40	17		OPENINGMIN	If the shelter has 4 sides, is the opening a minimum of 32 inches?
41	18		WIDTH	If the shelter opening is less than 32 inches, list the width.
42	19		SEATING	Is there seating within the shelter?
43	20		PANEL	Are there schedule panels?
44	20 a		NUMBERPANEL	If Yes, how many?
45	21		EMPTYPANEL	Are any of the schedule panels empty?
46	21 a		NUMBEREMPTY	If Yes, how many?
47	22		MAP	Is there a map of bus routes posted?
48	23		CURBCUT	Are there curb cuts at the nearest crosswalks (may be end of the block)?
49	24 a		CHIP	Are the curb cuts nearest to the bus shelter chipped?
50	24 b		HOLES	Are there holes/uneven pavement in the curb cuts nearest to the bus shelter?
51	24 c		STEEP	Is there a steep incline to the curb cuts nearest to the bus shelter?
52	24 d		DROPS	Does the curb cut drop off/not transition smoothly to the street?
53	24 e		CURBOTHER	Are there other problems with the curb cut(s)?
54	24 e2		CURBOTHERDESCRIP	Description of other problems with the curb cut(s)?
55	25		FLOOR	Does the floor area within the bus shelter have a minimum free space of 30 x 48 inches?
56	26		FRONT	Is the front of the shelter at least 96 inches (8 feet) from the curb/street?
57	27		NOTES	Notes about bus shelters

Centro Bus Rider Survey Codebook

COLUMN	FIELD NAME	DEFINITION
A	SAFE	How often does the respondent feel safe at Centro bus stops/shelters?
		1= Never
		2= Rarely
		3= Sometimes
		4= Usually
		5= Always
		0= Don't Know
B	CONDITION	What is the condition of the bus stops/shelters?
		1= Very Poor
		2= Poor
		3= Fair
		4= Good
		5= Excellent
		0= Don't Know
C	SCHEDULE	How often do the buses leave at their scheduled time?
		1= Never
		2= Rarely
		3= Sometimes
		4= Usually
		5= Always
		0= Don't Know
D	MINUTES	How many minutes does it take the respondent to walk to the bus stop/shelter that you use most often?
		1= Under 3 Minutes
		2= 4 to 6 Minutes
		3= 7 to 10 Minutes
		4= More than 10 Minutes
COLUMN	FIELD NAME	DEFINITION
E	REASON	Why does the respondent normally take the bus?

F	MONEY	On average, how much money does the respondent spend per week on Centro? (In dollars per week.)
G	OFTEN	How often does the respondent ride the bus each week (not including transfers)? (In times per week.)
H	RIDING	On an average day, how much time does the respondent spend riding the bus? (In minutes/hours per day.) Convert hours to minutes.
I	SATISFACTION	Overall, how satisfied are you with the Centro bus system?
		1= Very Dissatisfied
		2= Dissatisfied
		3= Fairly Satisfied
		4= Satisfied
		5= Very Satisfied
		0= Don't Know
J	RECOMMEND	Can the respondent recommend any changes to improve the Centro system?
K	CAR	Does the respondent have a car at their accessibility?
		1= Yes
		2= No
		0= Don't Know
L	PRIMARY	Is the bus system the respondent's primary mode of transportation?
		1= Yes
		2= No
		0= Don't Know
M	GENDER	What is the respondent's gender?
		1= Male
		2= Female

COLUMN	FIELD NAME	DEFINITION
N	AGE	What is the respondent's age?
		1= 18 and Under
		2= 19- 29
		3= 30- 39
		4= 40- 49
		5= 50- 59
		6= 60 +
O	RACE	What is the respondent's race?
		1= White
		2= Black
		3= Hispanic
		4= Latino
		5= Asian
		6= Other
P	ROUTE	Please list the route numbers the respondent uses most frequently:
Q	WHEN	When was the survey administered?
R	WHERE	Where was the survey administered?

*NOTE: USE VALUE 99 FOR MISSING DATA

*NOTE: USE VALUE 77 FOR DATA THAT CANNOT BE INTERPRETED

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