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The Mass Transit Needs Of A Non-driving Disabled Population

Authors
Golledge, Reginald G.
Costanzo, C. Michael
Marston, James R.

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FINAL REPORT

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Reginald G. Golledge
C. Michael Costanzo
James R. Marston

Department of Geography
and
Research Unit on Spatial Cognition and Choice
(RUSCC)

University of California
Santa Barbara

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Abstract with Key Words
In this paper we examine further characteristics of the activity patterns of blind and vision impaired non-driving populations previously discussed in California PATH Working Paper #UCB-ITS-PWP-96-1. We begin by exploring activity patterns of blind or vision impaired people, then evaluate the impact of non-driving on employability and movement potential of the disabled non-driving group. We then examine the results of a survey of blind and vision impaired users of public transit facilities (primarily bus travel) in a moderate sized city in California USA. In addition to detailing some of the particular characteristics of dependency as far as movement is concerned by this population we attempt to define what characteristics of travel behavior and travel modes are deemed most frustrating, most useful, and most difficult to use via a survey questionnaire. Possible assistive technologies to aid in making travel decisions and undertaking travel are discussed from both the survey population's point of view and from the view of the most favored assistive technologies likely to be supported or currently being supported by private and public transportation organizations. In particular the negative impacts on activity patterns and quality of life produced by non-driving in the United States environment are emphasized, and suggestions made for ways to improve the accessibility of public transit for disabled groups. We explore differences between car using and non-car using populations, and also explore differences between frequent and intermittent users of mass transit.

Key Words:
Disabled blind persons; public transit; assistive devices; user survey; user attitudes

Executive Summary

To date, most attention and compliance to the ADA mandates for equal access to transportation has been focused on the non-ambulatory/wheelchair bound traveler. These modification costs have been tremendous. Buses and trains have had to be refitted or new equipment purchased to provide wheelchair lifts and designated seating areas. Much transit infrastructure has been totally rebuilt to allow for elevators to bypass stairs, level access boarding and other costly structural modifications. Not so subtle grumbling is heard when few wheelchair users are seen in these facilities or on the expensive retrofitted buses.

The blind and visually impaired, in this country, represent a significantly large group of disabled persons who also need help with transportation modifications. The good news, uncovered in this survey, is that their needs do not seem to require anywhere near the massive outlays required by the adaptations for wheelchair users.

What we found was that the blind and visually impaired do not need many physical adaptations to existing equipment and infrastructure. Traveling for visually impaired people means moving through a world lacking many or all of the visual cues that sighted travelers, and many transit providers, take for granted. The absence of visual cues such as bus stop signs, bus numbers and street signs are the main barriers to equal access to transportation reported in this study. This group's main need is simply more and better INFORMATION.

1. The single most important characteristic of public transit use for blind and vision impaired people is not related to hardware improvement but rather to improving access to information.

2. The type of information most needed consists of:

   (a) Brailled or large print timetables and schedules, produced in a usable format.
   (b) Larger signs on transit vehicles to identify their routes.
   (c) Information at transit stops regarding whether or not a vehicle has just passed and wait time for next vehicle; most prefer some type of auditory message.
   (d) Clearer PA systems in terminals and on board vehicles.
   (e) Announcements of stops - either mechanical or verbal.
   (f) Auditory messages and signals at lights when change of vehicle or route necessitates crossing the street.
   (g) Talking Signs on transit vehicles and in terminals, accessed by sonic or radar receivers.
   (h) Joint auditory/tactile information in terminals (e.g., talking tactual maps on devices such as NOMAD).
   (i) Transit HOT LINES with human operators, not touch-tone access to pre-recorded messages, voice-mail, or computerized query systems: the latter are universally disliked.

3. Survey results indicate that improving information access should relieve many of the frustrations blind and vision impaired people experience when having to use public transit.

4. Auditory messages are needed to complement the abundance of visual messages currently available to sighted travelers.

5. For relatively little outlay, it may be possible to improve the attractiveness of public transit for this group.

6. Since many members of the disabled population travel free, economic factors and standard economic reasoning about travel mode is largely irrelevant.

7. Our respondents indicated that they needed more information about services for disabled travelers, that transit information was not always easy to obtain and that it was not always easy to understand and use.

8. Some of these needs can be addressed simply with better enforcement of existing procedures. Our respondents heaped praise on the local bus drivers for their assistance with their required stops, but a common theme was that bus stops and streets were not always announced, leading to missed stops and confusion. Also mentioned was the poor quality of

announcements at the hub terminal. Both of these concerns could be addressed with stricter enforcement of existing regulations, or if needed, a taped announcement, either manual or automatic.

9. Another problem that is easily addressed is that seats reserved for disabled, located near the door and the driver, were not always available for their intended patrons. Again stricter enforcement of existing rules would alleviate this problem. Our blind and visually impaired travelers also rated the telephone hot-line, with human operators, as very valuable. Some travelers, however, were not aware of this service.

10. When asked to rate difficulties when using transit the problems were not with entering or exiting, paying the fare or other design issues. The most difficulty was rated for lack of information issues like knowing which bus to enter, knowing their location on a moving bus and dealing with transfers and crossing the street. More easily provided information was shown by their desire for timetables in suitable format, large print or Braille, available onboard.

The few technological helps they desired are certainly not as costly as infrastructure or equipment retrofitting. They showed a preference for auditory prompts at terminals and bus stops giving bus numbers and times of arrival of the next bus. Given the inability of many in the general public to read or understand transit schedules, these investments in auditory information systems would likely increase ridership in the total population. High preference was also shown for “talking signs,” identifying output from a bus or sign that is transmitted to a hand held auditory device. They also indicated concern when crossing streets and therefore requested auditory traffic signals. These requests are the only technological aid requested that would be used only by the visually impaired.

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1. The Original Proposal

1A. Summary

i. Problem Statement.

Persons without disability often cannot really understand the problems, the frustrations, or the specific needs of disabled people. Despite innovative efforts of non-disabled engineers, planners and decision-makers in the transportation area, those best efforts have attracted slightly more than forty percent of the eligible (captive) non-driving disabled population. We plan to elicit information about transit needs from the disabled populations themselves. Our object is to try to determine what mismatch of needs and offerings might account for the failure of more than fifty percent of non-driver disabled people to use mass transportation services. This project then is designed to increase availability of mass transportation to disabled people. It should add to increased ridership of mass and para-transit facilities, thus taking more drivers off the roads, consuming less fuel, lowering air pollution, and contributing to the more effective and efficient operation of transit systems. It will address ADA concerns and seek ways to improve quality of life for disabled non-drivers. And, it will contribute to our understanding of disabled travel behavior, thus bringing them closer than ever to the freedoms enjoyed by their non-disabled counterparts.

ii. Research Plan.

The purpose of this research is to investigate possible ways to make transit systems more acceptable for use by disabled populations. The particular disabled population to be focused on will be the blind and vision impaired. In this first period of research emphasis will be placed on bus transportation (MTD systems) and the lighter more terminally elastic systems that are available for disabled travelers, including mini-buses, special vehicles, or different types of ride-sharing activities. Our initial project will be focused within the Santa Barbara area. Here different forms of regularly scheduled and personalized systems are available. Admittedly the Santa Barbara population does not have the same range of opportunities open to them as do residents of the larger California cities. However, our aim is to develop a procedure for evaluating felt needs, and comparing these with the types of services offered.

The felt needs of the blind and vision impaired population represent but one segment of the non-driving disabled population. This in turn represents but one segment of the total non-driving population. The latter particularly includes the elderly and children. As a means for potentially expanding the applicability of our research to the larger non-driving population generally, we proposed jointly working with the research team from the University of California at Davis under the direction of Professor Paul Jovanis. Jovanis' team, like ours, is interested in the question of improving mass transit ridership by examining both demand and supply sides of the transit use equation. This larger project is more ambitious than ours. It also focuses more on elderly populations on the demand side but covers all aspects of transit service on the supply side. By folding our project into the Jovanis project, we hope to be able to produce a more comprehensive and more significant survey. We also hope to cooperate with the Jovanis team in later year expansions of this project to cover California's principal metropolitan areas.

Thus, after reviewing these match-ups between felt needs and services offered we hope to expand our study to larger metropolitan areas in future years, and to provide more insights into the peculiar and particular needs of other disabled populations. Understanding such needs appears to be an increasingly important part of the national agenda as agencies endeavor to interpret and conform to the Americans with Disabilities Act (ADA). Since fast, efficient, cheap, and direct transportation is a matter of concern to the population at large, and since the search for ways to achieve these goals are paramount on the research agenda, ADA would imply that understanding these needs in various disabled populations should also be a paramount agenda item.

Deliverables for our part of the project will consist of:

1) Our basic survey that will address the felt needs and actions of a specific disabled population, the blind and vision impaired.
2) Suggestions for expanding this survey tool to cover other disabled non-driving populations.
3) The analyzed results of the survey of blind and vision-impaired people.
4) Itemized and weighted lists of the reasons for current dissatisfaction of this particular population with existing mass transit and para-transit facilities.
5) Hypotheses concerning the degree to which the attitudes, feelings, and beliefs of this pilot population are likely to be reflected more widely in other disabled populations.
6) Highlighting of the specific frustrations and shortcomings of current services from the point of view of actual non-users and potential users.
7) A representation of the attributes of mass or para-transit services that would increase ridership by blind and vision-impaired people or will improve their satisfaction with a willingness to use existing services.

1B. Background.

i. a. Related research in problem area.

As part of the process of understanding the needs of disabled people for safe and reasonable access to mass transit to the same degree that non-disabled people have, we first need to pay some attention to the problem of what it means for a disabled person to be a non-driver. Much of transportation research has been directed towards improving transportation for the independent driver, and such problems are under investigation in the IVHS and other areas supported by UCTC and CalTrans. For many mass transit users, driving is still an option, although of course there is a segment of the population without privately owned vehicles that relies heavily on mass transit. But for many disabled people, particularly those who are blind or severely vision impaired, there is no such alternative. This situation leaves the individual with a sense of deprivation. We plan at first to examine the nature of this deprivation, and then to attempt to evaluate how the provision of mass transit can combat this feeling or indeed relieve it considerably. Our hypothesis is that attempts to improve use of mass transit by disabled people will be hampered until we know what feelings and frustrations produced by being a non-driver can possibly be addressed either in terms of providing a new form of transportation or in terms of convincing this potential ridership that existing forms of mass transit can compensate for their disenfranchised feelings.

A second objective is to determine the characteristics of mass transit that are most acceptable and unacceptable to disabled people. In this we will attempt to begin an evaluation of existing and possible future characteristics of transit services such as increasingly dispersed origins and destinations, flexible routes, and the acceptable frequency with which transfer or interconnection between services is required. This objective is also part of the Jovanis proposal and our suggestions can be incorporated into the more extensive design of that proposal. We will also examine the degree to which traveler information can or should be made available discretely to disabled persons and the acceptable mechanisms by which this information can be dispensed (i.e., an ATIS component applicable to the pre-planning state of route selection). Making automated passenger information systems available to disabled people could, by itself, be a significant way of increasing mass transit patronage by the disabled. One of our objectives will be to evaluate people's responses to different information systems, and thus to help prevent unnecessary expenditure on trialing different pilot systems. We will evaluate potential user acceptance of the practicality of exploratory devices such as telecommunication links over designated cable channels, low-floor vehicles, talking signs, the location of auditory tactile maps or graphic designs at central and commuting stations, definition of auditory pathways, and other devices such as the development of personal guidance systems for pedestrians (their equivalent of the automated vehicle guidance systems now being introduced into private motor vehicles - see Golledge et al 1991).

The 1992 World Almanac recently revealed that approximately sixty-seven percent of the United States population are drivers. There is no doubt that the ability to drive and

the freedom that it gives with respect to economic and social interactions are seen as a tremendously important parts of the American way of life. Non-driving disabled people are not able to enjoy this facet of everyday existence. They must face a range of problems starting with the frustrations of trying to arrange transportation, to battling the beliefs that they are imposing on people's time, to resigning themselves to missed appointments or interactions when arranged transportation does not arrive in time or at all, to being unaware if they are standing at a bus stop as to whether a bus has already departed or is still on its way, to facing a host of problems concerned with being able to get to sites of recreation, shopping, work, or social interaction, in a convenient and non-dependent or non-threatening way. Certainly, having a driver's license gives one the sense that one is in control of the decision process concerning where one can go, when one can go, and how one can get there. It is, in fact, an extraordinarily integral part of time budgeting in all daily and longer term episodic patterns in the USA. While congenitally blind non-drivers can never be truly aware of the potential freedoms that they could have if they were drivers, those adventitiously blinded (i.e., blinded in life after having had vision for some time), are deeply and disturbingly aware of the sudden contraction of their activity spaces and the entire range of their social interactions. The question that arises is, how do they compensate for this loss? For some, family, relatives, friends, or work-mates fill the gap to a reasonable and acceptable extent. Others seek to minimize a felt dependence on others (i.e., in the form of constantly asking for help). Some turn to mass transportation alternatives to solve their travel problems, but this number is far short of what it could be. Others simply turn off and stay at home for they do not feel strong enough or confident enough to become dependent on others or to learn how to use mass transportation systems not designed for them. Thus, it is patently obvious that undertaking research on people's feelings and attitudes towards the problem of movement, and uncovering the frustrations and dependencies that are part and parcel of everyday life for the disabled non-driver, should provide us with clear insights into what is missing from the current state of the art in terms of provision of transportation services for this population. It is necessary to know if these frustrations and dependencies can be reduced by a more effective use of existing mass transportation systems, or whether only new modes of movement can deal with this problem. Solving this question becomes paramount in the attempt to try to define how it is possible to preserve autonomy and dignity in non-driving disabled populations and to help them avoid social isolation. Over four hundred cities nationwide provide mass transportation or specialized transportation that is supposed to be accessible to disabled people. Not all deal with questions of physical or other impairments in a similar way (i.e., user habits learned for one system do not necessarily transfer to systems in other environments. The way that each population has to deal with existing mass transportation systems has a significant impact on the way they are able to operate and live their life on a daily basis.

A study by Kirschner, McBrue, Nelson, and Graves (1992) found that forty-nine percent of their legally blind subject populations who traveled independently to work used mass transportation; only six percent of a comparable sighted population used mass transportation. None of the legally blind subjects walked to work on a regular basis compared to six percent of the sighted subjects who walked to work.

Gaining control over one's transportation needs is one way of removing a felt transportation disability. Driving epitomizes independence. For disabled non-driving people, something has to replace or to substitute for this feeling of dependence and one must estimate the extent to which it might be possible for a mass transportation device to perform this substitution.

We do, therefore, anticipate obtaining information from blind and vision-impaired people as to the nature of mass transit and para-transit facilities that could act as primary modes of travel. We propose to determine the degree to which existing offerings can compensate for the non-driver disadvantages felt by this population. And we expect to do ensuing investigation of the form in which information can be transmitted to potential users so as to help increase their use of mass transportation systems.

ii. Project scope, objectives, and motivation, in light of California's IVHS program.

This research addresses the question of how to fit technology to the needs of a specific targeted population. An obvious implication is that this research design and methods of this pilot study can be adapted to addressing similar questions for other targeted populations including the elderly, children, poor, and so on. This elaboration of potential use can be made very effective by cooperative research with the UC Davis group.

This project, designed as it is to increase availability of mass transportation to non-driving disabled people, will: (i) attempt to find ways to increase ridership of mass and para-transit facilities, thus taking more people off the roads, consuming less fuel, contributing less to air pollution, and contributing to the more effective and efficient operation of transit systems; (ii) it aims to find ways to improve quality of life for the disabled non-driver population; (iii) this study should provide insights on how California transit systems can be brought more into line with ADA requirements; and, (iv) finally, this study will add to our understanding of the travel behavior of disabled people, hopefully in the longer term helping them to pursue the freedoms enjoyed by their non-disabled counterparts.

The Americans with Disabilities Act (ADA) has brought increasing awareness of the need to ensure that the myriad of daily actions and activities available to non-disabled populations, are made available to their disabled counterparts. This Act has introduced a new dimension into ongoing research by encouraging examination of the needs, behaviors, limitations, and ideals, of various disabled people. Some research exists on the use of train and light rail systems in large cities (Svenson, 1994) but little appears to have been done to assess those things disabled people want in travel systems and to evaluate how these needs can be met by existing forms of transportation. As with many other areas related to disability, too often there is a gap between the assessment of need by disabled persons and the solutions proposed for them by non-disabled decision-makers.

1C Methods.

Working with the local Braille Organization and other agencies such as La Vista Foundation and the California State Rehabilitation Services, we plan to survey vision impaired and blind populations to determine how non-driving impacts their quality of life and how it forces them into daily activity modes and patterns that inhibit their full integration into social and economic activity of their local area.

Particular questions that will be addressed in the first part of the survey include:
How do non-driving disabled populations arrange transportation?
What forms of transportation do they use and in what proportions?

What advantages and disadvantages do they see associated with each of these forms of transportation?
How reliable to they rate each form of transportation?
What levels of frustration are felt because of the non-driver status?
What is the strength of the feelings of dependence on others for transportation?
What is a non-driver's attitude towards this feeling of dependence?
How does this dependence vary among people used to provide transportation service (e.g., family, friends, co-workers, para-transit operators, etc.)?
How is non-driving seen to affect life style?
What is the estimate of non-drivers of the relative costs of providing transportation for them as opposed to drivers?
What are the major problems seen associated with existing mass transportation devices?
What are the major frustrations experienced with existing forms of mass transportation by non-drivers?
How do non-drivers deal with erratic services?
How do non-drivers deal with no-shows?
What types of information about mass transportation would be most appropriate for delivery to non-drivers?
What is the most appropriate format for such information?

What would be the appropriate constitution of an advanced traveler information service (ATIS) for non-drivers?

How well do disabled non-drivers feel that different categories of people (relatives, friends, mass transit providers or drivers, etc.) understand their logistical needs and respond to them?

To what extent do disabled non-driving people believe that use of mass transportation is undignified?

To what extent do disabled non-driving populations believe that use of mass transportation deprives them of autonomy?

To what extent do disabled non-driver populations believe that use of mass transportation enforces social isolation? And vice versa?

What travel preferences do disabled non-drivers have (i.e., how are different forms of travel rank ordered in terms of preference)?

What proportion of disabled non-driving people rate themselves as independent travelers as opposed to those who are dependent on a sighted guide outside the home or those who need assistance in somewhat familiar areas?

Also, we plan to include questions about what type of transportation is most preferred for different type of activities - work, visit, friends, socializing, shopping, recreation, and so on. This should be interfaced with data on similar questions asked for other special populations to show overlap on non-coincidence of needs and preferences. Unfortunately, research on the needs of special populations has often resulted in unforeseen disadvantages. For example, architects, planners, and engineers who focused on the needs of the wheelchair bound, invented the idea of a gradually sloping curb-cut that would ease the wheelchairs passage at intersections and dispense with the need to lift wheelchair and occupant over steep curbs onto sidewalks. It was not anticipated, however, that these curb-cuts would become hazardous for other special populations. For example, the independent blind travel using only a long cane often cannot pick up the gradual slope of the curb-cut and proceeds directly into a road where he or she is immediately put at danger by oncoming traffic. One way of overcoming this has been to corrugate the curb cuts so that the person yielding a long cane does have warning and does not venture directly into the street. Another planning device to help the wheelchair bound was to develop telephone booths with only a sheltering upper portion so that a wheelchair could fit under the booth and give protected access to the phone. Again, the independent blind traveler is disadvantaged when walking with a long cane where the cane slides under these top-only devices and often results in the traveler coming violently into contact with the upper wall of the booth. By integrating the results from our study on the blind and vision-impaired population with those concerning other special populations, including the elderly for example, we should be able to get some idea whether a modification designed to help one subgroup could possibly negatively impact another subgroup. Under these circumstances some interesting trade-off problems emerge which have to be solved before wide-spread implementation of such modifications.

Another Question: What obstacles are rated highest by blind as opposed to visually impaired people with respect to the frustration felt involved in trying to travel?

The above questions and some derivatives and supplements will be developed in survey form. Organizations dealing with local disabled populations will be contacted and their lists of clients obtained. These client lists will be surveyed to determine the number of people prepared to undertake this proposed survey. Potential respondents will be: (a) surveyed by mail using a Braille questionnaire; (b) interviewed at a central location (local Braille Institute); or, (c) surveyed using auditory cassettes. Thus, those not able or willing to come to a central location for a personal interview and who do not read braille, will be sent a survey on audio tape, together with cassettes for responding. By using these three different methods, we should be able to access a significant number of subjects and to evaluate which medium produced the most useful responses.

This multi-method procedure for contacting clients should provide useful information to feed back to the UC Davis group as they prepare to conduct a more substantial survey than can be covered by our pilot study. Given the limits of funding to be made available

to our project, and its substantial personal time and effort that is needed in the individual interview process, it is unlikely that we will be able to survey large numbers of blind or vision impaired people.

2. The Survey:

2.A Survey Design and Subject Selection Problems

2.A.1 Why study activity patterns of the disabled?

1990 Census figures show that nationwide less than 23% of disabled people of working age are in the labor force. Many believe this dismal statistic is a result of the difficulties non-drivers have in gaining access to employment. Another 4.6 million people over the age of 65 report a mobility limitation. Many of these people are denied their independence and freedom of movement, a privilege most Americans take for granted. Americans with Disabilities, 1992 study showed that for people age 21-64 only 45.6 percent of those with difficulty reading newsprint are employed and of those unable to read newsprint only 25.6 are employed. These numbers do not include those who are under-employed. Disabled people are much more likely to live alone than the general population.

The 1990 Census shows that 35% of all disabled live alone, and this figure escalates to over 60% among the elderly disabled. This lack of household assistance combined with high rates of non-driving leads to drastically reduced independence and number of trips reported.

Census data show that disabled people have lower education levels and economic status than any other group, making them the most disadvantaged population in the US. We believe that a major cause of this disadvantage is lack of transportation and that all of society benefits when public transportation is made available to the disabled, and consequently, when they are granted access to employment, education and social opportunities.

2.A.2 Who are the disabled and how many are there?

Table 2A.1 shows there are more than 43 million disabled people in the United States and that over 3 million are severely vision impaired or legally blind. Preliminary estimates from the 1990 census raise this figure to 50 million.

Another 3-4 million suffer severe visually impaired so that they cannot drive or have difficulty reading signs or printed matter.

Table 2A.2 shows the functional limitations that the Census Bureau uses to define disability. From the 1990 census, a distinction is made between “mobility” and “self care” disabilities. We will be better able to monitor the impact of disabilities in the future using these two categories, but in this report we concentrate on mobility disability.

1990 Census has two questions on disabilities. In the preliminary findings they show 34 million adults have a functional disability, and for 15 million of these, their disabilities are severe. Fewer people have problems with activities of daily living (8 million, of which 3.9 require assistance).

The elderly have a disproportionate share of the disabled (Figure 2A.1). Disability rates are higher for those with low education.

Table 2A.1

Estimates of Types of Disability: USA, 1986

Physical Disability	
Non-Paralytic Orthopedic Impairments	12,470,000
Neurologic Impairments	3,440,000
Brain Dysfunction	2,580,000
Other Physical Disabilities	860,000
Sensory Impairments	
Blindness/Significant Vision Loss	3,010,000
Hearing/Speech/Language Impairments	2,580,000
Cognitive Impairments	
Mental Retardation (moderate/severe/profound)	1,290,000
Other (traumatic brain injury, learning disability, etc.)	945,000
Mental Illness	
Chronic and Severe Mental Illness	1,290,000
Other Serious Health Impairments	
Heart Disease/Vascular Disease	6,880,000
Pulmonary/Respiratory Disease	2,150,000
Cancer/Diabetes/Renal/Other	4,730,000
Epilepsy/Seizure Disorders	1,204,000
TOTAL	43,429,000

Source: Harris Survey, 1986.

Table 2A.2

Functional Limitation

a. Difficulty in lifting or carrying a weight of 10 pounds or more.

b. Difficulty in walking three city blocks.

c. Difficulty in seeing words in ordinary newsprint.

d. Difficulty in hearing what is said in a normal conversation with another person.

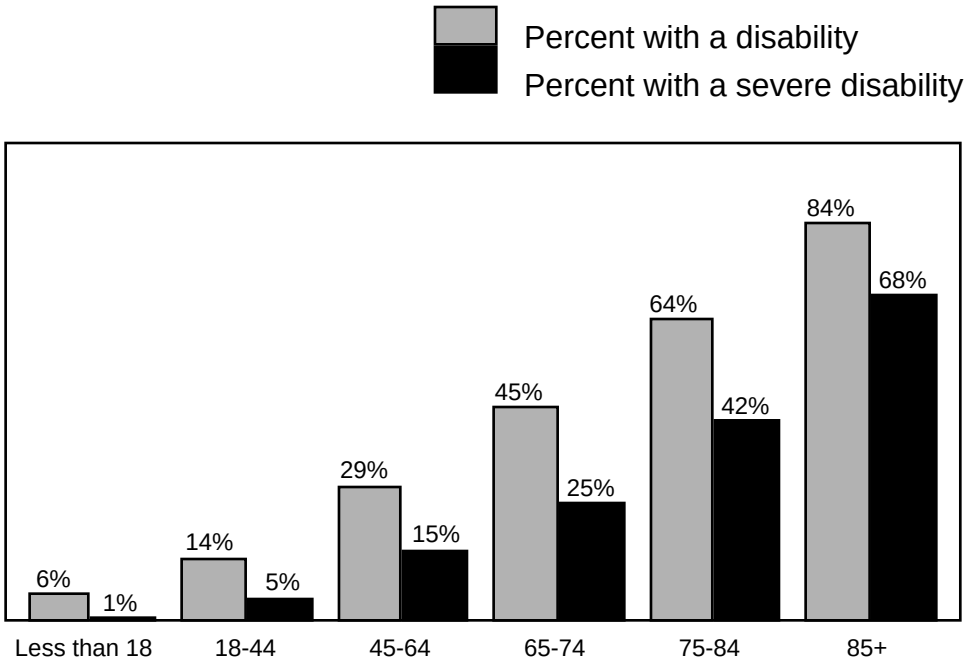
e. Difficulty in having one's speech understood.

f. Difficulty in climbing stairs.

Figure 2A.1

With Increasing Age Comes a Greater Likelihood of Having a Disability

Percent of persons with a disability and percent with a severe disability, by age group: 1991-92



2.A.3 Survey design and procedures

We studied the blind and visually impaired in Santa Barbara, CA and its surrounding area. We felt we needed at least fifty subjects to get a valid survey. Braille Institute data estimates that 0.7% of the general public have severe vision loss. Taking the assumption that only half of the disabled people use transit, we would have had to make 14,000 RDD calls to met our modest goals. Instead, we contacted four local agencies that deal with the visually impaired. We used the UCSB Disabled Students Program to reach the large student population in town. The local Braille Institute also provided subjects along with the State Department of Rehabilitation. We also used the local bus service MTD to sample their riders. Our response rates were surprising high. Even though the survey took about an hour to complete, two of the agencies we used had response rates over 50%, indicating a strong interest from the visually impaired regarding public transit. To reach the most people we offered the survey by mail, telephone, in-home interview and in large print or Braille.

Our final subject pool consisted of 55 individuals. These were obtained as follows: from State Rehabilitation - 24; from the MTD - 10; from the Braille Institute - 11; from the Campus - 10.

Fifty-three (53) percent of the sample population preferred a mail (large print) survey, 33 percent a telephone survey, and 15 percent preferred an in-person interview. None requested a survey in Braille. Sixty-two (62) percent of our respondents were female and 38 percent were

male. The bulk of the respondents came from two zip-code areas - 93101, the central area of Santa Barbara, and 93117, the primary Goleta area. About 25 percent of the total respondents came from each of these zip-codes. The other 50 percent were scattered throughout the Santa Barbara and Goleta area, and several respondents came from North County towns of Lompoc and Santa Maria. Eighty-nine percent were legally blind. The average age of the onset of blindness was forty-two (standard deviation ± 31). Only 16.7 percent of the sample used Braille which is consistent with the national percent of blind people who use Braille. Three subjects still intermittently drive a car and 10 participants either owned a private mode of transportation or lived in a household in which a private mode of transportation was owned. Most of these were autos. Our sample was surprisingly highly educated. Twenty (20) percent had post-graduate training; 16.4 percent had four year college or university background; 23.6 percent had junior college; 25.5 percent had a high school diploma; and 14.5 percent had less than high school. No member of the subject pool was less than twenty years old, but the rest were distributed fairly uniformly through twenty year intervals; 21.8 percent were aged between twenty and thirty-nine, 20 percent between forty and fifty-nine, 29.1 percent between sixty and seventy-nine, and 29.1 percent were eighty or older. On the whole, therefore, there is a bias towards older individuals of sixty plus in the sample, but this is consistent with national trends for blindness and vision impairment (see Table 2A.3).

However, it does indicate that some of the results we present from this survey have application not only to vision impaired and blind people but also to the elderly.

Table 2A.3

Prevalence of Severe Vision Impairment by Age Group
United States, 1989

Age Range	Population	Impairment Per 1000	Number Severe Vision Impairment
0-24	90,428,000	.528	47,746
25-34	43,835,000	1.23	53,917
35-44	36,503,000	1.68	61,352
45-5425,897,000	4.8	119,505	
55-64	21,593,000	7.8	168,425
65-74	18,182,000	47.0	854,554
75-84	9,761,000	99.0	966,339
85 +	3,042,000	250.0	760,500

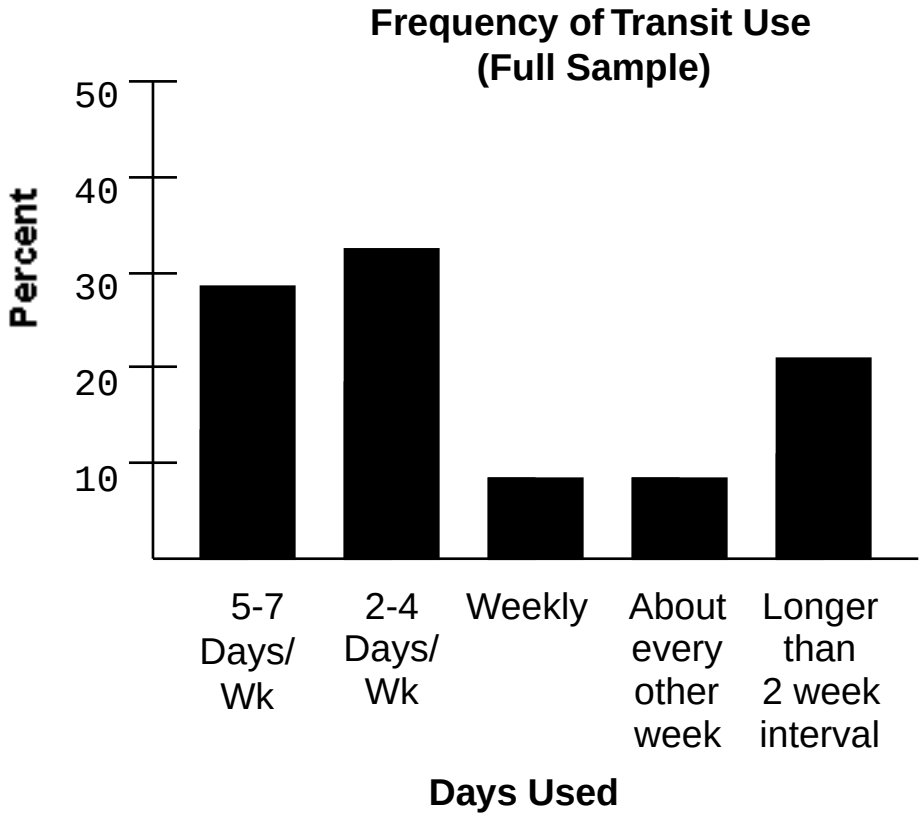
Source: Unpublished Data, Department of Commerce, Bureau of Census
Prevalence based on National Center for Health Statistics, Supplement on Aging, 1994

2.B Subject Travel Characteristics and Activity Patterns

2.B.1 Frequency of transit use

Nationwide about 5 or 6 percent of the population use public transit. Recent surveys have shown that less than half (46%) of disabled travelers use transit. We conducted this survey to examine reasons for and against transit use by the visually impaired. At first glance our survey results were similar to the estimate that less than half of the disabled use transit. 51% listed local bus as their primary mode of travel (Figure 2B.1).

Figure 2B.1



On average, members of our sample lived three blocks form the nearest transit stop. Sixty point four (60.4) percent of the sample agreed that they had no serious restrictions affecting the use of the public-transit system except for the problems resulting from lack of vision. Thirty eight (38) percent required some special aid in order to move around freely. More than half the sample (56.4 percent) had no serious problem in walking while 29 percent of the sample had some difficulty in standing. Twenty three point six (23.6) percent had difficulty climbing stairs and 71 percent had difficulty reading newsprint or transit schedules. Ninety-three (93) percent agreed that their greatest difficulty was in reading signs or vehicle route numbers.

2.B.1.1 Car versus non-car use

When we looked at the frequency of transit use among those who had no access to a household car, the results were encouraging for transit's role in serving this population. 36% used transit 5-7 days a week and another 38% used it 2-4 days a week, So almost 3/4 used it on a regular basis. Only 14% used transit once every two weeks or less, compared to 89% for those with an available car. Of the 43 respondents with no household car available 28 (2/3) listed local bus as their primary mode and another 7 listed walking as their primary mode. Two people used friend's cars and the rest used EZ lift or agency vans.

Sixty (60) percent sample members expected to wait more than 15 minutes when preparing to make a trip using public transport modes. But, non-car users expected to wait less time for a bus than for access to a car! For car users, sixty-two (62) percent expected to wait more than 30 minutes for public transit. When not using public transit, fifty (50) percent of car users expected to wait less than 5 minutes. Although, as we shall see later, this was not categorized as being extremely troublesome, the difference in waiting time between car users and those using public transport is worthwhile noting. Some differences existed between the non-car users and car users with respect to why they would use public transit (Table 2B.1), but the two top reasons, "meeting needs" and "cost" were the same. However, while car users in general agreed that the service met their needs (av = 2•4), non-car users were not as enthusiastic (av = 3•5)! Note that for legally blind users, public transit (bus) travel in Santa Barbara is free.

Table 2B.1

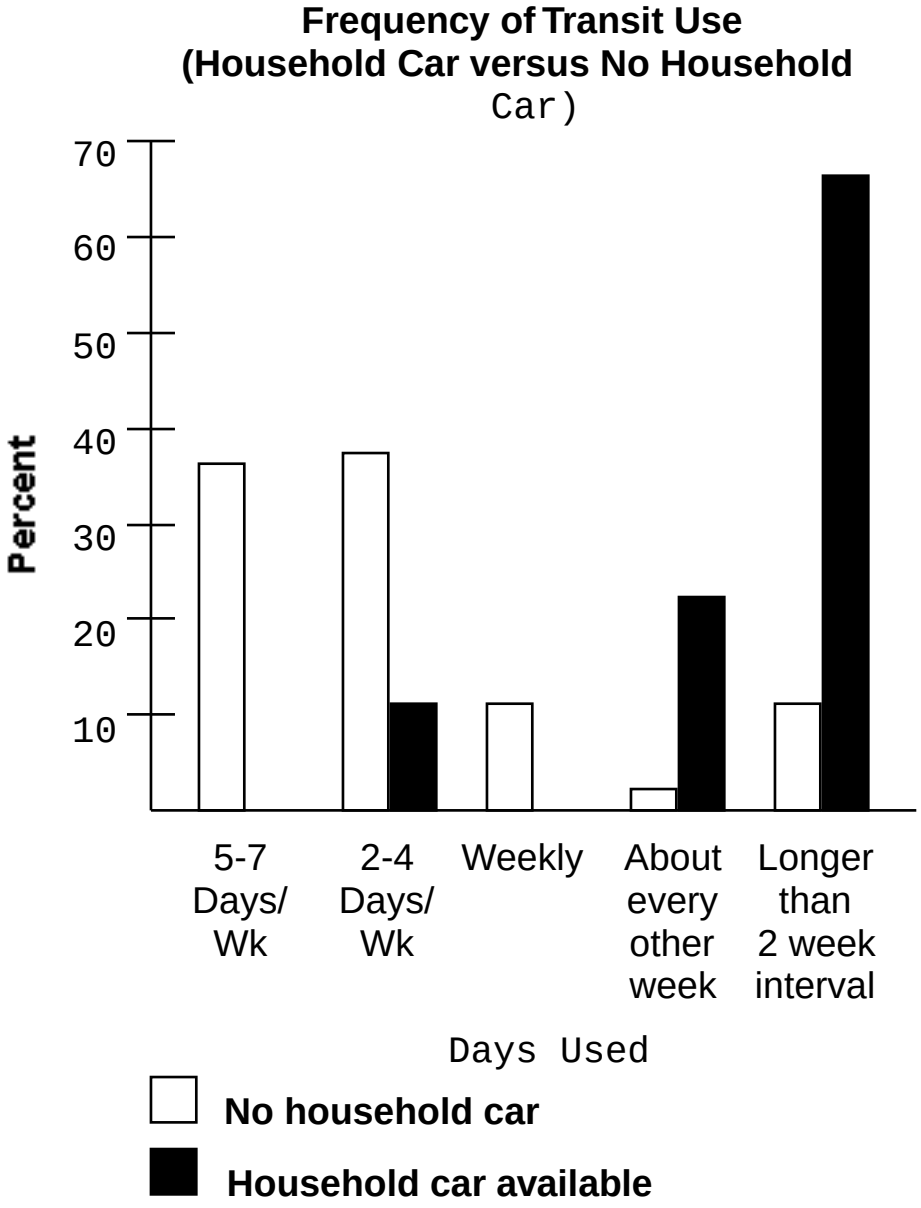
Why Use Public Transit?

(Ranked Reasons)

Non-car Users		Car Users	
1.	Service meets my needs	1.5	Service meets my needs
2.	No alternative	1.5	Cost
3.	Cost	3.	Coverage of service area
4.	Driver/operator courtesy	5.	Time of day of service
6.	Ease of getting to pick up/drop off point	5.	No alternative
8.5	On-time service	5.	Ease of arranging trips
8.5	Ease of arranging trips	8.	Driver/operator courtesy
8.5	Coverage of service area		
8.5	Time of day service is available		
11.5	Safety		
11.5	Other		
13.	Security		
14.	Comfort		

When non-car users were asked to name the primary activity for which participants needed travel assistance, 40 percent listed shopping, 17.1 percent education, 14.3 percent medical, and 8 percent work related and non-family social. Car users reported shopping (30 percent), medical (30 percent), and work (20 percent) as the major categories. The relative significance of this profile of activities differs little from what one might expect from among a randomly selected population of elderly people where relatively small percentages have regular employment.

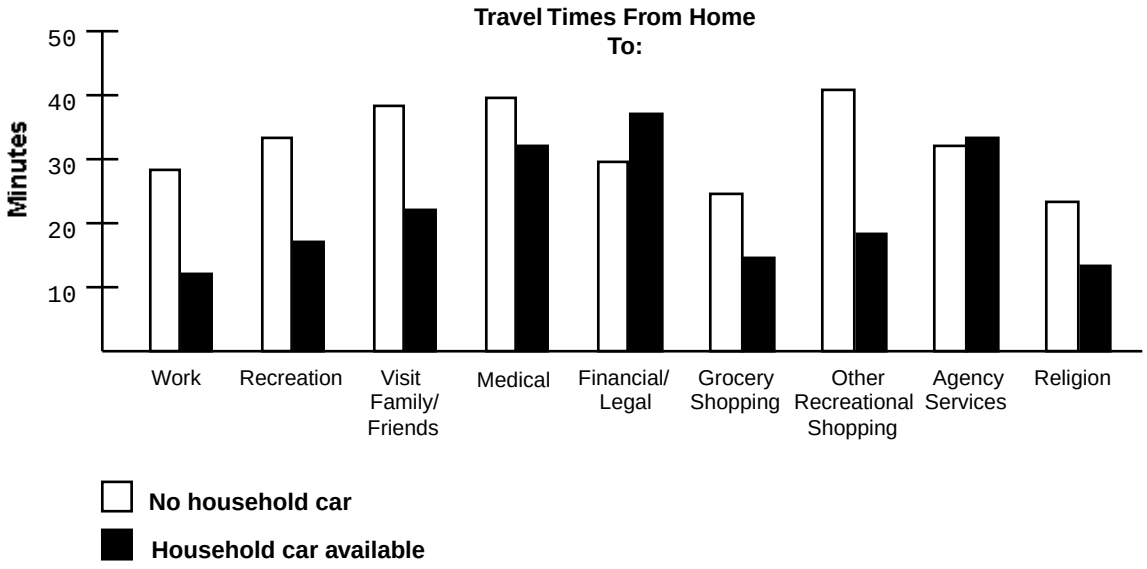
Figure 2B.2



Seventy-four (74) percent of non-car users elected public transit as their primary mode of travel at least twice a week (Figure 2B.2). Thirty-six (36) percent of the sample use it daily. Only eleven (11) percent of car users selected public transit as their primary mode more than twice per week. When estimating how long their usual travel time was from home to a variety of destinations, the significance of using the public transit system became obvious (Figure 2B.3).

As a rule, car users halved travel times. This implies that there is a tendency for workers in our sample group to live somewhat close to their work, and in accordance with conventional urban theory, they have relatively quick access to grocery shopping and religious activities. It should also be noted that many non-car users walked to activities such as shopping, and that the mixture of walking and busing expanded average travel times.

Figure 2B.3



We should also note that car users lived on average more than 5 blocks from the nearest transit stop, whereas non-car users averaged only about 3 blocks. Not having a car constrains location for this group because of the travel time and waiting factor. Participants frequently shared their mode of travel with others. This varied however between car users and non-car users; sixty (60) percent of the former never, rarely or sometimes shared, while sixty-seven (67) percent of the latter shared often or always.

Given the relatively high frequency of use of public transit (slightly over 50 percent) we asked participants to state up to three reasons why they use this mode. The dominant reason was that the service meets their needs such as having convenient routes, and convenient pick-up times. A significant proportion, however, indicated that they really had no alternative. The third most frequently expressed factor was the cost - in the local area most vision impaired or blind people can register with the MTD and travel free. A significant factor, however, was the courtesy and assistance offered by drivers or operators of the transit vehicles. Insignificant responses were given with respect to reasons such as comfort, safety, security, on-time service, ease of arranging trips, ease of getting to or from drop-off points, coverage of service area, and time of day of service (i.e., accessibility factors).

There were 10 respondents who had access to a household car, and showed a preference for the private automobile. When we looked at this group who had a car available, there was no one who used transit 5-7 times a week and only 11% used it 2-4 times a week. 67% used transit less than every two weeks and 22% used transit about every two weeks. Therefore, for those who had a household car available, 89% used transit only one day every two weeks or less.

2.B.2 Activity patterns and residential location

Activity patterns were found to be little different from the sighted. The respondents reported trips to work, school, shopping, social, recreational, personal business and religious activities. Some significant differences were found however, and these included:

a. Sunday travel was restricted because of limited transit schedules
b. Late night travel was restricted because of limited transit schedules.
c. Some disabled persons needed assistance in traveling, regardless of purpose, and
d. More than 2/3 of those with no household car lived 2 or fewer blocks from a bus stop (i.e., had a restricted choice of home location).

For those with a car at home the average distance from a bus stop was 5 blocks, with a median of 3 blocks. Our blind and visually impaired users also lived close to shopping and other

needs and were able to walk to many activities. They agreed that their disability limited their choice of residence and also agreed that a service to provide residential choice information would be helpful. Many areas of Santa Barbara are not served by transit and we have evidence here that the disabled, especially those with no household car, obviously must consider their activity needs when choosing from possible residential locations, so that areas less well served by transit are eliminated from their residential choice process.

2.B.2.1 Travel times for transit and car users

Long waiting times have frequently been used to explain low transit use. The advantage of an available household car is clearly shown when comparing the arranging and waiting time using transit than when using the household car. 50% said it took less than 5 minutes to get a ride in the car, while 66% said it took over 30 minutes to get a ride using transit (Figure 2B.4; Figure 2B.5).

However, when the non-car users were surveyed they actually reported less time in arranging and waiting time for transit than for getting a ride not using transit. Only 33% waited more than 30 minutes for transit, while 37% waited that long for a non transit trip. Overall, those who had no access to a household car had an average wait time that was less for transit than for non transit rides. When there is no convenient access to a car it appears that transit competes well with the automobile.

Wait times for travelers with no available household car was less than for those who had a household car. 12% waited and walked less than 5 minutes for transit and another 26% reported times less than 15 minutes. 65% of those with no household car waited less than 30 minutes compared to only 33% of those with a household car. 66% of those with a household car said that their arrangement and waiting time was more than 30 minutes. The median wait times, with no household car available, is 15 minutes, while the median for those with a car is 30-60 minutes. These differences are probably due to better information about and familiarity with the transit system and also the closer location of their residences to transit stops.

As expected the arranging and wait times for non transit rides shows the advantage of having a household car available. 50% of those with a household car waited less than 5 minutes.

Figure 2B.4

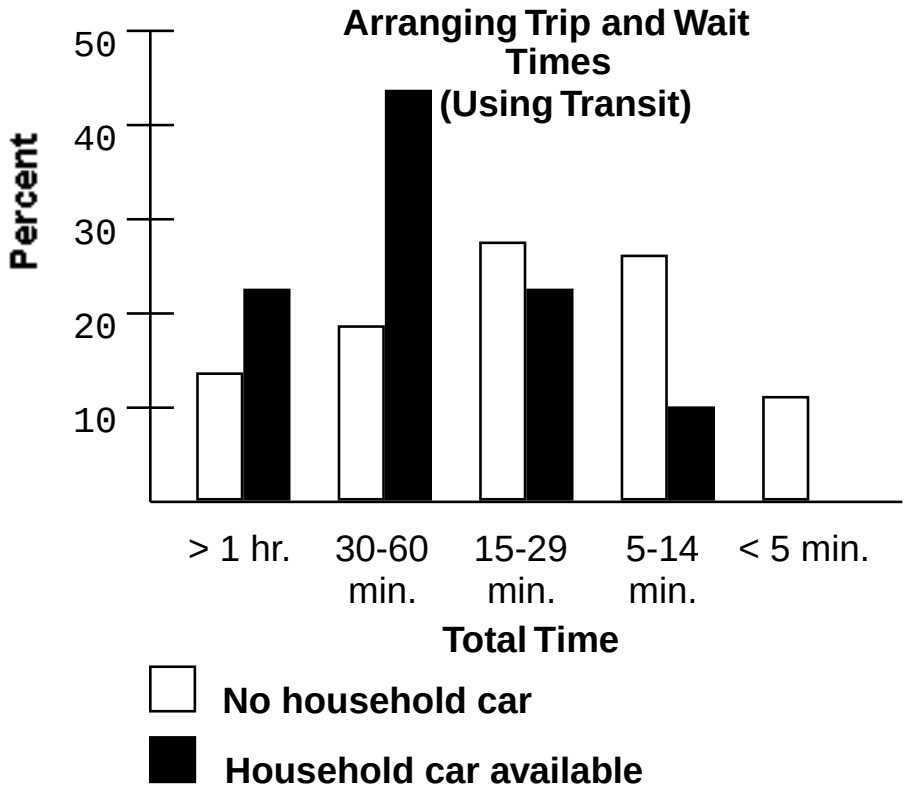
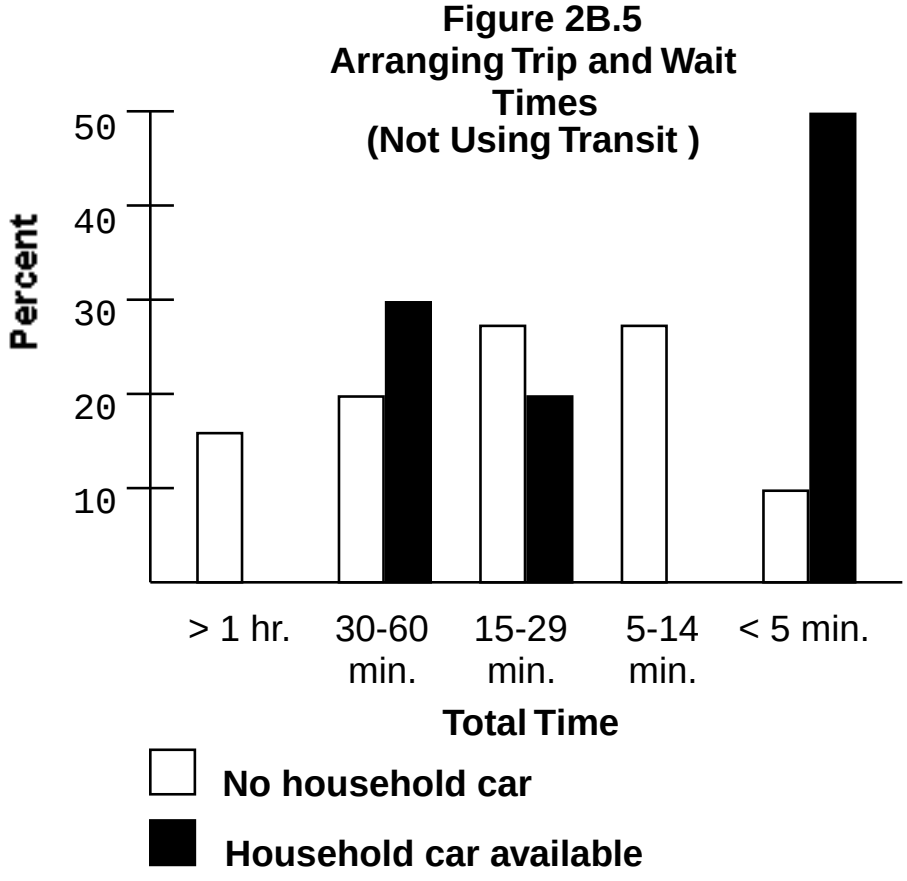


Figure 2B.5



3. Survey Results

3.A Descriptive Summary Statistics

3.A.1 Assistive devices

In conformance with our previously recorded independence of movement, 60 percent of our subjects indicated that they required only a long-cane, crutches, or walker to allow them to navigate or travel. Only one subject used a guide dog. Since there are over 1.3 million blind and vision impaired people in the United States and only ten thousand of them use guide dogs, this statistic is not surprising. Twenty-three point five (23.5) percent of the sample used spotting telescopes - primarily to assist them in picking out route numbers on buses or when reading street signs. A significant proportion used a short-cane to help them avoid obstacles when walking. Fifteen point four (15.4) percent referred to typed, Brailled, or handwritten signs on cards describing their route and the nature of the buses or transit stops. Other assistive devices such as laser canes, Mowat Sensors, sonic guides, tape recorded directions, tactual maps, wheelchairs, magnified copies of schedules, and verbal instructions, were mentioned but not in significant numbers. With the exception of a higher use pattern of spotting telescopes for non-car users, the profiles of assistive technology use are similar for both groups.

Even at this stage what is emerging is that for this population, assistive devices that help them process written or numerical information are the most important aids to navigation and travel. The many technical devices available to assist travel that are now readily available at relatively inexpensive prices, were not favored or used by this group. It is also evident that members of this group are capable of using public transit and that the almost fifty (50) percent nationwide that do not currently use it could potentially be encouraged to do so if the information environment relating to the transit service suited their needs. More on this later.

3.A.2 Activity patterns of blind and vision impaired individuals in the Santa Barbara area

Since the majority of subjects indicated they needed some type of assistance when traveling outside the home, our first task was try to determine what type of assistance that was needed and for what purpose. Considering that the majority of our participants were able to walk freely, it is not surprising that many of them indicated that they needed no technical assistance in order to complete a variety of trip purposes. A few things stand out. First for non-car users. Relatives other than immediate family members are rarely if ever used for any trip purpose. Co-workers are likewise not generally favored for trip purposes although sometimes they are used for trips to or from work. It may be that subjects do not want to put an unusual burden on others in their work place. Doing so could cause a deterioration in the general work atmosphere. Most of the participants also avoided having their friends drive them to work or to social, medical, agency, or business activities. Room-mates and neighbors were again not generally used for work trips but were more likely to be used for recreation and social activities. Of all the different types of personal assistance that most frequently favored was that offered by the spouse or significant other. This was very important with respect to grocery shopping, social activities, and agency activities. As a rule, therefore, there appeared to be a sentiment not to bother co-workers, neighbors, and relatives other than the immediate family, for assistance when making a wide variety of trips. For car users the assistance pattern varied somewhat, with more emphasis being placed on spouses and significant others, family members and volunteer assistants. The other trends observed in the behavior of non-car users was basically repeated. This family oriented assistance may not be as feasible for single blind or vision impaired persons. According to recent census results, approximately thirty-five (35) percent of all disabled people live alone; this figure escalates to more than sixty (60) percent among the elderly disabled.

3.A.3 Mode of travel by trip purpose

We next examined what modes of local travel were used for different trip purposes. As far as travel to and from work was concerned, for those with access to a household car, it was the most frequent travel mode for both car users and non-car users. For the latter group, however, we must remember that only a small percentage worked. Other modes were used sometimes while social services paid taxies and mini-buses were not used, because they were not generally available in

our study area. For grocery shopping the household car (or friends car) was the most frequently mentioned travel mode when one was available. Since many participants lived near shopping places, walking was also favored. Social services paid taxies (not generally available in the study area), hired limousines, power transit lift vans, and motorcycles or bicycles or self-paid taxi services and express buses, were rarely if ever used.

Local bus services were only moderately used for all the different trip purposes, which is somewhat surprising given that fifty (50) percent or more of the participants claimed to use local buses and to use them on average more than twice per week. Express buses appeared to be used for educational activities and somewhat for shopping goods such as clothes, shoes, etc., but otherwise were not popular. No doubt this is because of the selected routes they follow, many being to and from the suburban university area. Mini-buses were used fairly frequently to access agency services; this is understandable since the Braille Institute for example runs a fleet of mini-buses that ferry clients to and from the Institute. However, arguments were offered that it often takes 24-36 hours advance notice to reserve and use these flexible forms of mini-transit. Others argued that drivers often filled their vehicles prior to a scheduled pickup and then did not make an expected stop. Waiting times were also seen to be excessive for these forms. Taxis are used very infrequently as are limousines for any particular purpose. Hired drivers, sometimes perhaps for the household car, are often used. Lift or paratransit vehicles were again used primarily for medical and health related services and to a lesser extent for work related activities. Volunteer drivers were used intermittently. This profile indicates a fairly independent population that is capable of using a variety of transportation modes, but like many other of their able-bodied peers, prefers to use local bus services and household or friend's cars regardless of the trip purpose. We shall return to this point much later in the survey when we examine some of the preferences, perceptions and feelings and attitudes of our subject group.

3.A.4 Perceptions and attitudes.

In this section we asked the opinions, perceptions, and attitudes of participants with respect to how they feel about the condition of dependency in which their disability places them. This dependency is couched in terms of navigation, movement, and use of transit. Subjects were asked to strongly agree (scale score of 1), agree, to state uncertainty, disagreement, or strong disagreement (score 5), with each of the series of statements. Full details follow.

Participants in both car and non-car user groups in general followed a similar profile of agreement on questions covering a variety of perceptual, attitudinal, and informational topics. All realized their dependence on others for the provision of transportation though this realization was stronger for car users than non-car users. There was general agreement that this dependency produced frustration. Most agreed that they were familiar with the different mode choice options available to them. Car users were more reluctant to agree that the existing public transit service met their local travel needs.

There was a general tendency to agree that public transit was safe. Most agreed that non-driving had a negative impact on their quality of life, including impacting their freedom to choose a residence. There was a tendency to agree that information about public transit information is easy to obtain, but were somewhat less certain that it was easy to understand and use.

There was strong disagreement with the statement that using public transit was undignified, and most also disagreed with the statement that there were no disadvantages associated with being a non-driver. Evidently this group is quite willing to accept that public transportation is a necessary mode of travel for many trip purposes and does not impinge on their personal dignity. This is somewhat at odds with the results obtained in the Corn and Sacks article previously quoted. Obviously this group recognizes the significance of the auto oriented U.S. society and the consequent distribution of urban functions that require considerable movement to access them. There is here an indication that reliance on public transport is perhaps a little more of a disadvantage than subjects are prepared to admit. For example, when asked "Non-driving limits my freedom to choose a residence," most people agreed with this. In other words, given that they did rely on public transit for many of their daily and weekly activities, there was a sentiment that it was unwise to live too far from a transit stop on a regularly scheduled transit line. Such feelings are greatly magnified in larger cities. The disadvantages of non-driving were all too obvious to this group. We then asked "I believe that having to use public transit does not affect my independence" and this produced an ambivalent or uncertain relationship with a slight

tendency towards agreement. For the most part, however, our subject group had indicated that they were independent travelers and that as such they made use of environmental circumstances as much as possible as part of this independent lifestyle. We next focused specifically on social activities stating "I believe that having to use public transit restricts my social life." Again, there was some slight tendency towards agreement, but for the most part responses were uncertain. This may reflect the age of our population. Other studies (e.g., Corn and Sacks, 1994) have indicated that this is a strong sentiment expressed by younger blind and vision impaired individuals. Since we have relatively few younger people in our sample our result is not surprising. The next social factor we examined is reflected in the statement "I believe that having to use public transit isolates me from society." There was a certain amount of disagreement with this statement. The mean of all responses tended towards uncertainty, but indicated there was a trend more to disagree than to agree. Obviously our particular subgroup had learned how to integrate public transit modes into their lifestyle and to use such modes effectively in social interactions. And for some, it may be that fellow transit riders are important social contacts. The next statement specifically addressed this issue. "Non-driving has a negative impact on my lifestyle and quality of life." There was modest agreement with this statement. Obviously, lacking the freedom of movement by private auto, some restrictions inevitably occur with respect to the places one can visit, the frequency with which one can go to those places, and the types of interactions that one can experience. Finally, we offered the statement "I feel frustration because I am a non-driver." Again, there was consistent agreement with this statement, indicating that our particular subject group saw themselves as being somewhat different or apart from the bulk of the population within the local area and distinct from their able-bodied peers.

To summarize, in terms of the total sample, the following results are significant:

(1) 67% of the sample is dependent on others for transportation and 78% reflect positive degrees of frustration from this dependence.

(2) The majority of the sample is familiar with the existing range of services for disabled people in the local community, but only 58% agree that it suits their current needs.

(3) 93% agree that using the local public transit is safe and there is no fear of crime.

(4) 64% agree that public transit information is easy to obtain, but the majority feel that it is not easy to use.

(5) Less than 10% think that using public transit is undignified for non-work trips.

(6) 90% agree that non-driving produces a significant disadvantage while living in today's environment, while 73% agree that non-driving limits their choice of a residence.

(7) Approximately half the sample agree that using public transit does not affect their independence, i.e., they can continue an independent life style even without individualized travel modes. Only 44% agree that having to use public transit restricts their social life. And, even less (33%) agree that reliance on public transit helps to isolate them from society in general. On the other hand, 62% agree that non-driving negatively impacts their quality of life and more than 70% agree that they experience frustration because of being a non-driver in today's society.

3.A.5 Attitude towards public transit.

In our next set of questions we asked individuals to evaluate the degree of difficulty they felt they would have when using public transit. Again, a five-point scale was used ranging from never difficult (score of 1) to sometimes difficult, difficult, often difficult, and always difficult (score of 5). The same format was used here as in the last section in which statements are offered and individuals selected the appropriate scale term that indicated their feelings.

The majority of the group agreed that it was sometimes difficult but not often or always difficult to plan a route to a given destination This is a little surprising because the group does not generally have access to maps. Participants experienced only some difficulty in finding where to board a transit vehicle, but there was more agreement it was difficult to recognize which vehicle to enter. However, estimating when the vehicle will arrive at their stop was only classified as

sometimes difficult, as was knowing when to exit the vehicle. Estimating where the individual was when in transit was usually evaluated as difficult and dealing with layovers with mode or route change was also regarded as difficult. Most participants had no difficulty entering and exiting public transit vehicles or finding empty seats, paying the fares, using the fare crediting system, or signaling the driver to stop. However, dealing with a crowded vehicle was regarded as difficult and getting from the last stop of the transit system to a final destination was sometimes difficult. Finding the transit point when two or more different vehicles or modes have to be used is classified as difficult, and learning how much time remains before the connecting mode arrives is similarly rated as difficult. Getting from home to the transit stop, finding the correct stop, and getting the transfer ticket, are classed as never or only sometimes difficult, indicating that our subject group were experienced transit travelers. However, finding the transfer point if it is across the street or elsewhere is regarded as difficult and learning whether the connection is on time is similarly regarded as difficult.

In this section, therefore, we find that for this particular group, even though many are elderly, very little difficulty is expressed in terms of entering or exiting vehicles, finding seats, knowing where one has to get off, and paying fares. The most difficulty is found when it is required to cross the street in order to make a transfer, when dealing with layovers or route changes, and when dealing with a crowded vehicle. All produce significant problems. None of these problems require great investment in transport infrastructure (i.e., vehicles or terminals) in order to correct.

In Summary:

(1) 72% experience little difficulty in finding which route to take; possibly because of the simplicity and linearity of the Santa Barbara Transit system. Finding where to board is evaluated as being only somewhat difficult by 70% of the sample.

(2) Less than 50% of the sample regarded it as never or only somewhat difficult to recognize which vehicle to take, and most (65%) say it is never or only somewhat difficult to estimate arrival times at a designated stop.

(3) Exiting the bus appears to be not a significant problem for 72% of the sample, but 54% experience difficulty by estimating where they are when traveling. Finding an empty seat and paying fares present little difficulty in our study area because the blind and vision impaired travel free if they have an MTD identification card. Indeed, much of the on-route activity such as communicating with the driver as to where to stop, dealing with a crowded vehicle, signaling approaching drivers to stop, and getting to and from the nearest transit stop, are at best seen as being somewhat difficult.

(4) However, only 15% argue that it is never difficult in finding pick-up points for different transportation modes and 25% say it is never difficult to learn the intervals between connecting services. Only 11% never have difficulty crossing the street to find a transfer point and only 28% never have difficulty learning whether their connecting service is on time.

3.A.6 The importance of relevant information

The next two sets of questions focused on how useful subjects found certain types of information for planning trips. We then asked for evaluations of the usefulness of various types of assistive technologies and devices as an aid to trip planning. Categories of responses ranged from extremely useful (1.0), to very useful, useful, not very useful, and not at all useful (5.0). Things generally regarded as useful but on the side of not very useful included printed transit district schedules, cable TV messages, regular radio messages, written signs posted at pickup and drop off points, timetables or schedules available only at a central terminal area, timetables or schedules distributed via mail, and e-mail schedules available on home computers. Types of information that were regarded as very useful included verbal cues from transit system drivers or operators (i.e., calling out street names at various transit stops or giving advice on which numbered route to take), transit district telephone information hot-lines, timetables in large print or Braille available onboard different modes of travel. The most useful forms of information, however, generally agreed on by the sample included information directly from drivers and auditory messages at pickup and drop-off points and talking signs.

(1) Only 34.5% of our sample found standard printed schedules to be very or extremely useful. However, alternatives that have been the subject of experimentation in many different areas of the country were not warmly supported by our sample. For example, the possibility of having continuous cable TV channel information on bus routes, locations, and arrival times were seen to be or extremely useful by only 24.5% of our subjects. Only 44% regarded a transit district information hot line to be very or extremely useful while others suggested remedies such as radio messages giving bus arrival or location information were seen to be very or extremely by only 24.5% of our subjects.

(2) The traditional way of offering information to a sighted public by having written signs at stops was seen to be extremely or very useful only by 29% of the group; 69% preferred to get their information from bus drivers or operators of vehicles. The availability of time tables and schedules only at the main terminal was seen to be useful by less than 10% of our subjects and distributing schedules to potential users by mail was seen to be very or extremely useful by less than one-third of the group. Other suggestions consistent with today's increasing technology such as e-mail access to schedules was seen to be very useful by only 21% of the group. Large print schedules on busses faired a little better with 43% agreeing that this would be very useful. Without exception, the most heavily supported means of obtaining information about transit operations was seen to be auditory messages (64%) in talking signs (67%).

(3) Other informational aids that have been suggested in the literature and trialed in other areas in other countries proved not to be viewed as useful by our population. Only 31% agreed that tactual route maps would be useful and 33% agreed that tactual maps of the urban area would be useful. This percentage rose to 47% when verbal information was added to the tactile base regardless of whether it was in the route or city context. Little support was given for computer assisted telephone response or advise services (36% found it potentially very or extremely useful), and the same proportion evaluated verbal or visual cable TV schedules as being very useful. As the dominance of technology diminished, however, attitudes changed. For example, 73% regarded telephone hot-lines with human operators as being very or extremely useful compared to 30% who regarded computer assisted or voice mail type information services to be very useful.

(4) Generally, a combination of auditory and tactile information systems was perceived to be useful by about half the population but concentrating information only at the central facility was not viewed as very useful. Defusing information sources, however, was supported quite strongly with 67% arguing that it was very or extremely useful to have visual and auditory prompts available at transit stops scattered throughout the urban environment. Radio messages were supported by less than 50% of the group.

Next we asked participants to use the same scale of usefulness to indicate the degree to which a set of devices could be used when planning their trips. Those considered less useful included tactual maps of specific routes, and tactual maps of the urban area in which they are traveling. Tactual maps of a route with verbal descriptions spoken at key places when touched, and tactual maps of a city with verbal information given at key points, were rated as being very useful. Computer assisted telephone instructions, and location and timetable information presented visually and verbally on cable TV channels were regarded as NOT being useful, and a similar evaluation was given to computerized telephone service using push button keys to provide route and timetable information. Auditory and tactile information systems located in terminals were seen as potentially very useful, but tactual maps or diagrams of routes available at central locations, personalized tactual maps at the location of pickup and drop-off points in your home or work neighborhoods were not favored. The idea of a personal guidance system to help navigate to or from your home or work to a transit point on special radio broadcasts giving continuous information on transit operating conditions such as delays, current location of vehicles by route number, and so on were seen as not very useful. The two most supported devices were visual and auditory prompts at transit stops to tell when the last pickup occurred and when the next is due, and telephone hot-lines with human operators to provide route and timetable information. Again, this is consistent with our previous information which indicated that since the bulk of our subjects were elderly and blind or vision impaired, they were not particularly inclined to use state-of-the-art technical aids when planning, navigating, or traveling. Telephone hot-lines with human

operators received the strongest support overall, but talking signs, auditory prompts, and recorded messages which indicated if an expected transit vehicle had already passed the spot or when it was due to arrive, appeared to be the most uniformly supported ideas. In all these areas, the response profiles of car users and non-car users were similar.

3.A.7 Concerns with public transport

More than 80% of our respondents expressed little fear of crime on the local transit system. Less than half were concerned with the timeliness of operation or the frequency of offerings. Crowding was only a limited concern to 31% of the group. Relatively few people (31.5%) were concerned by lack of civility by drivers and operators, indicating a high degree of satisfaction with local operating personnel.

System operation also received high marks with 31.5% again expressing concern over timeliness of arrival, but 50% expressed considerable concern with lack of knowledge as to whether or not a vehicle had already passed the pick up point at which they were waiting. Considering the nature of our subject population which included many retired individuals, it is understandable that only one-third are concerned about the waiting time for vehicle pick-up. This might also be a function of the equitable year-round climate in the Santa Barbara area.

Little or no concern was evidenced in terms of locating final destinations or with the lack of connectivity to ongoing services. There was indeed reasonable satisfaction with the existing services offered but 40% evinced some concern that there was a lack of services to places that they needed to travel to. About 46% of the population was concerned with having to cross streets in order to transfer between different transit lines.

Our next task was to evaluate what concerns the subjects had with respect to public transit. Again, a five-point scale was used ranging from extremely concerned (1.0), very concerned, concerned, not very concerned, and unconcerned (5.0). Subjects indicated considerable concern with having to cross streets to get to distant points for a connecting service, not knowing whether a transit vehicle had already passed their point of pickup, and waiting around for a service vehicle to show up. Other concerns related to the timeliness of the operating system and their frequency of service.

Some concern was expressed with respect to becoming a victim of crime on a transit vehicle, crowding, lack of civility by drivers or operators, being unsure of arrival times at designated stops, or poor location of transit stops. Additional concerns were expressed with respect to the lack of connectivity to other systems, and a lack of service to places that one needed to visit. These are transit routing problems that depend very much on the configuration of functions and services within a particular environment.

3.A.8 Frustration

In this question we attempted to evaluate the degree of frustration that our participants felt with traveling. Again, we used a five-point scale ranging from extremely frustrated (1.0), very frustrated, frustrated, not very frustrated, to not at all frustrated (5.0). There was a considerable degree of frustration generally expressed. Specific items with which a lack of frustration was indicated included the need to carry special equipment as an aid to navigation and obstacle avoidance, or when a blind or vision impaired person had to negotiate narrow doors and steps to enter a bus or train. Obviously if the sample included other disabled groups such as the wheelchair bound, the importance of these two factors could change dramatically. There is an indication, however, that even though our subject population is primarily over 60, these factors do not produce frustration and are not of major concern to them. A certain degree of frustration is felt when an individual has to accept offers of personal transportation from others, such as when they may have missed their transit vehicle and would otherwise be forced to wait a long period of time before the next one is due to leave. Evidently the attitude of our particular group, since it was dominated by elderly people, was that basically they had little else that put a great demand on their time schedules and that waiting for the next transit vehicle, under reasonable environmental conditions, was not a major problem.

The greatest degrees of frustration were felt when the individual had to request a ride to a destination after missing a transport connection, when there was a significant need to rely on the

donation of other people's time and scheduling in order to get to a destination, and when non-disabled people occupy seats and locations reserved for the disabled. Higher degrees of frustration are experienced when difficulties emerge in getting access to information about scheduling, and when a potential traveler needs to explain to someone their inability to get to a specific location that is not served by public transit.

High degrees of frustration are obtained when travelers exit a transit mode at a wrong stop because of inadequate information provided by drivers or operators or as a result of being unable to exit the vehicle because of crowding (as in rush hours).

Extreme frustration was expressed with respect to the poor clarity of voice announcements over public address systems used to announce locations or times of arrival or departure of transit vehicles. This seems to be exaggerated for elderly people if they also have suffered some hearing loss. There is also frustration expressed with improper and inaccessible locations and legibility of Braille or large print signs designed to give information about routes or timetables. Poor location of elevators or stairs is again a frustrating experience. This might occur when elevators are provided to bypass stairs but are hidden away in less obvious places to prevent their overuse by the general public. The existence of many obstacles in terminals is also a source of frustration. These might include non-permanent waste baskets, moveable plants, shopping carts, moveable seats, and so on. These things are particularly important for the blind and vision impaired person who in essence may have to learn a completely new layout configuration every time they go into a terminal. Considerable frustration is also expressed with poorly located and poorly designed "you are here" maps, particularly if they are flat maps and have no tactual surface or auditory explanation. Many also felt high degrees of frustration when they found that entranceways to transit terminals were not clearly marked.

In Summary:

(1) 43% of the population were either very or extremely frustrated with the difficulties in obtaining information on scheduling. Frustration was also evidenced by 58% of the population when they could not travel independently but had to rely on others in order to go places. 60% felt frustration in having to request rides after missing transit connections but only 21% experienced frustration when having to accept offers from others in these circumstances. 31% were very or extremely frustrated at having to explain to others whether unable to get to some place (e.g., to keep an appointment or to attend a social gathering).

(2) Only 16% of this population experienced degrees of frustration in having to negotiate narrow doors or steps. Greater levels of frustration were experienced with non-disabled persons occupied seats explicitly designated for the disabled in transit vehicles and this level of frustration increased to 56% when there was a communication breakdown and they were not let off at the correct exit.

(3) Approximately 50% also experienced frustration when not being able to exit vehicles within the time allotted for the normal able population to exit the vehicle. However, more than anything else, the poor clarity of voice announcements on vehicles or in terminals produced high levels of frustration (52.5%).

(4) Significant frustration was experienced when signs were poorly located or illegible, or where elevators were located in hard to find places. Features which add to the architectural or design diversity of an environment were often regarded as obstacles by this population and consequently produced high degrees of frustration.

(5) Similarly, maps that are designed to tell people where they are (You-Are-Here maps) produced some levels of frustration (38%) when poorly located and 47% agreed that it was frustrating when such maps had not auditory output associated with them. 56% evinced high moderate to high degrees of frustration when it was difficult to find a stopping place for transit vehicle.

3.A.9 The ideal situation

We finally asked subjects to indicate their beliefs with respect to the importance of a variety of features of a public transit system in terms of how well they would ideally suit their needs for transportation. A five-point scale of importance ranging from very important (1.0), to somewhat important, important, somewhat unimportant, and very unimportant (5.0) was used. The most important potential addition to existing transit systems was seen to be spoken messages at transit stops indicating the time of arrival of the next vehicle and its destination. Next in importance was in-vehicle visual and/or auditory displays of vehicle location on route so that one would always know where one was. Many thought it was somewhat important to have a volunteer or guide to help disabled people through the first few uses of a particular transit mode. Other features that were seen to be particularly useful were some type of early warning system that would alert mode operators that a disabled person was waiting at a pickup point. Other innovations that would be useful included mini systems that serve areas between the major transit lines, thus eliminating the need to walk long distances to transit stops or to have to go all the way into the center and out on a different line in order to get to a relatively nearby location. Systems that offered terminal flexibility including home and work pickup and delivery are also seen as being somewhat important. Of less importance was the need to provide ground level access to different modes so that steps or lifts could be avoided. Lukewarm support was given for mechanisms such as cable televised maps and visual and verbal descriptions of the location of different transit vehicles at all times. Somewhat stronger support was offered to the provision of housing relocation schemes that consider transit needs when searching to find a living place, in our environment they were not regarded as being as important as other features. Perhaps in larger urban areas this need would be evaluated as being much more important.

In Summary:

(1) To help in making decisions when in transit, 63% thought it was somewhat or very important to have an in-vehicle display of routes and 58.5% regarded it as very or extremely important to have early warning systems to alert drivers that a disabled person was waiting at a pick-up point.

(2) Since the major proportion of our sample was elderly there was no surprise that 56% agreed it would be somewhat or very useful to have ground-level access in transit vehicles, something that also assists wheelchair disabled people.

(3) Little more than half our subjects (56%) said that terminal flexibility for transit vehicles would be very or somewhat important, but more than 60% suggested it would be somewhat or very important to have more interstitial services between major radial service lines.

(4) Again, only 40% said it would be somewhat or very useful to have cable TV tracking of vehicle locations, but more than 70% agreed that it would be somewhat important to have Braille or spoken messages on arrival times of the next vehicle available at dispersed transit stops (52% of the example regarded this as being extremely important).

(5) The difficulty of becoming familiar with transit services was evidenced by the fact that 44% said it was extremely important to have volunteers to guide a disabled person through their first few uses of a transit system and this increased to 63% by others also considering it important.

(6) Approximately 46% of the population regarded it as important to have some type of housing relocation services available that would help isolate potential residences within easy access of transit stops.

3.A.10 Summary

With respect to this population, 50.9 percent regarded a local bus service as their primary mode of travel. Eighteen point two (18.2) percent relied on a household car, 12.7 percent on walking, 7.5 percent on easy-lift vans, and the remainder on institutional shuttles, retirement home shuttles, or friends' vehicles. When we asked individuals what would be the most

significant things that had to be done to improve travel for them, a variety of responses were elicited. These are summarized in Table 3A.1. Almost invariably the information that could most help this subgroup was auditory, tactile, or large print. Auditory information included access to human operators on phones, access to auditory information at transit stops and in the main terminals, and regular announcement by drivers of nearest cross streets at stops. Certainly the announcement of streets and stops by drivers came out time and time again as a critical factor. Although many transit systems may have this as a policy, it is not always implemented. This fact places a substantial burden on the blind or vision impaired traveler who has no real alternative to determine where they are. It is impossible to count stops because many transit stops are bypassed at particular times of the day when travel is light. For those with low vision or legal blindness, it is impossible to pick up environmental cues to determine where one is currently located. What is left is reliance on an internal sense of timing which can vary dramatically by varying traffic conditions, or momentary or more extensive distractions - such as a seat partner talking to you.

Large print schedules were often indicated as being of great potential value. These should be available either at the central terminal or available for distribution on the buses themselves. Many people argue that the identification number on the buses should be larger. Current numbers cannot be seen at a distance by blind, vision impaired, or low vision people and many have significant difficulty even when close in making out such numbers. Other people indicated that a major contribution would be for some signaling device to be installed at transit stops so that a driver is aware that a disabled person is waiting to be picked up. This could influence actions such as the distance the bus came to stop from the curb, seats, shelters, or other devices that signified the place of stopping.

Other travelers argued that when it was necessary to cross the street in order to make a connection, street crossings at that point should have auditory pedestrian signals. When multiple buses converge on particular stopping areas, as is common in moderate to larger sized cities, devices for indicating clearly which bus is stopped at which pickup point would be extremely useful. This could consist of an auditory message activated by a push button, or by Talking Signs on the vehicles. Others argued that the immediate front seats on both sides of the bus should be reserved for disabled people and the driver should enforce use for these purposes when a disabled person enters the bus. Some disabled people felt extremely uncomfortable when upon boarding the bus and not finding seats available immediately, they were thrown off balance by the driver starting the vehicle before they were able to find a secure hand-hold or a seat. Obviously increasing the sensitivity of drivers to the special needs of disabled people generally and blind and vision impaired persons in particular could have a significant impact on increasing ridership of public transit by these groups.

Some drivers may be self-conscious about calling out streets and stops. One way around this may be to install in each bus a tape which can auditorally play the required street and stop information. This could be driver activated by pressing a button or automatically operated by tying it into the vehicle odometer, radio locator, or other device.

Considerable support was also offered by our subject group for the use of talking signs. These can be placed on buses, on transit stops, or in terminals, and would be activated only by a receiver carried by a disabled person. San Francisco is already experimenting with such talking signs on buses and on their local rail systems (Bentzen, et al. 1995). We see talking signs as a very important part of the process that removes mystery, fear, and frustration from the blind person wishing to use public transit on a regular basis.

Other suggestions made by our participants include things such as onboard locator information, the posting of drivers' names so that more direct and personal communication can take place, and a request that drivers wait for disabled people who are trying to catch a transit vehicle at a particular stop. Here the disabled alert button at the stop, which could be triggered at a distance of up to one-hundred yards, would be of considerable assistance. Other suggestions include relocating the stop cord in buses so that it is at a more convenient level so that a traveler does not have to rise from her/his seat in order to reach it.

Table 3A.1
Improvement Suggestions

Subject ID	Primary Mode	Up to Four Comments			
0	1	Good phone info	Audio info at stop	Onboard locator info	Audio(Cross/Landmark)
1	2	Auditory info posts	AIP on campus		
2	1	Auto announce stops	Alt. FMT. schedules		
3	1	Large print - sched	Better signs on bus		
4	3				
5	1	Announce Stops	Clear handicap seat	Stop as requested	
6	1	Call out streets	Clear announcements	Driver name posted	
7	1	On time more	Later availability	Greater frequency	
8	2	Beepers@cross signal	Closer bus stop		
9	1	Large route # on bus	Large print timetable	Bus left stop notice	
10	1	Help across street	Call out stops	Give directions	
11	1				
12	4				
13	1	>Freq: Line 23 & 25	Announce streets	Don't pass up	
14	1	Bigger bus numbers	Louder/repeat announ	Call out streets	
15	1	Button to alert driver	Talking signs		
16	5				
17	1				
18	4	More vans	More drivers		
19	4	More vans	More drivers	More donations	
20	1	HC seating identif.	Larger sign on bus	Clearer announcement	
21	1	Weekend schedules	Call out stops	Larger bus numbers	
22	6				
23	3				
24	1	Lower steps	Clearer announcement	Wait for passenger	
25	3	Available immediately	Reduce waiting time		
26	1	Announce streets	Bigger bus numbers	Clear term. announce	Route # at bus stops
27	1	Bigger bus numbers	Tactile route maps	Audio tapes of routes	Drop close to lights
28	6				
29	4	More vans			
30	1	More often			
31	3	Need more EZ-Lift			
32	0				
33	0	No crossing street	Larger bus numbers		
34	3	Available more often			
35	1	More buses			
36	3				
37	2	Better sidewalks	More stoplights	Streets repaired	
38	1	Coordinated transfers	Easy on/off	Reachable stop cord	
39	2				
40	3				
41	1	Personal attention...	...at terminal		
42	3				
43	1	Call stops loudly	Auditory Bus ID	Larger bus numbers	Lg. print sched w/o req.
44	3				
45	1	Later service	Lower steps	Call out streets	
46	1	Leave open front seats	Sunday service		
47	2	Call out stops	Reserve seats	Not ahead of schedule	
48	7				
49	2				
50	2	Crosswalks	Signal lights	Driver courtesy	
51	1	More buses	Longer hours	Bus benches w/buses	
52	3				
53	1	Courteous people	Announce stops	Helper at Trnst. Ctr.	
54	1	Call signs and stops	Drivers more considerate	Courteous drivers	

3.B Differentiating Groups by Frequency of Use

In this section we examine the different use and survey response patterns by differentiating between two groups based on user frequency. 64% of our sample used public transit two or more times per week (the high user group) while only 36% used it on a weekly or more intermittent basis. Differences between group responses on significant questions will be highlighted.

In general, 71% of the high use group considered themselves as independent travelers while 81% of the low use group considered themselves independent travelers. The latter include the group

who have access to household cars or who generally walk to most of their places of interaction and patronage. The high use group evinced a higher degree of frustration with their dependence on others (69% strongly agreeing or agreeing that this produces frustration). Almost 60% of the low frequency user group agreed or strongly agreed that having to use transit negatively impacts their independence while only 40% of the high frequency user group agreed with this sentiment. Approximately 56% of the high frequency use group agreed or strongly agreed that non-driving had a negative impact on their lifestyle and quality of life; for the low frequency user group some of whom have occasional access to household vehicles, 67% argued this way. Again, of the high frequency user group approximately 66% percent agreed that they felt frustrated with being a non-driver whereas in the low frequency group this increased to 76%.

The high frequency users rarely found it difficult to find which route they should take on a bus, with 78% of them agreeing that this task was never or only sometimes difficult; this assurance dropped to 65% for the low frequency user group. 81% of the high user group said that it was never or only sometimes difficult to find out where to board a transit vehicle but this level of certainty dropped to 60% for the low user group. With respect to use of the vehicles some differences also emerge between two groups. While long-term users generally agreed (80% of the time) that it is never or only sometimes difficult to exit vehicles, those using public transit less frequently are not quite as enthusiastic about this lack of difficulty (69%). As the more experience bus travelers also find that it is never or sometimes difficult to find a seat (90% of the time) compared to 75% for the frequent users, low frequency users also find it more difficult getting from the last transit stop to their home. Getting to one's house after exiting a transit vehicle is seen to be sometimes or never difficult for 65% of the high frequency users and surprisingly 91% of the low frequency users agree that this is not usually difficult.

Some significant difference between the user frequency groups is also found with respect to their responses concerning usefulness of certain types of information. For example, whereas 68% of the high frequency group thought that cable TV messages were not particularly useful, 85% of the non-user group took this position. A significant difference incurred with respect to the attitude of the two groups towards the usefulness of information obtained from drivers or operators. The high frequency group agreed (62.5% of the time) that such information was very or extremely useful, whereas 86% of the low frequency users assessed this source of information as very or extremely valuable. This is one instance were greater exposure reduced rather than enhanced the perceived usefulness of the information source. The low user group also believed that radio messages could be very or extremely useful (65%) as opposed to the high frequency group which suggested that this source would be very useful, but only 32% of the low user group agreed that a radio source would be very or extremely useful. Onboard time tables were seen to be very useful for 61% of the high user group whereas only 20% of the low user group rated them similarly. Auditory messages were thought to be very or extremely useful for 60% of the high users and 71% of the low users, and talking signs were endorsed by 62.5% of the high users and 76% of the low users.

Neither group was very enthusiastic about the use of various types of tactual maps or graphics with the high frequency group generally providing somewhat more support than the low user group. The support for human operators and hot-line access was considerable among both groups and each exhibited a much cooler attitude towards computerized telephone services. Auditory tactile map combinations was supported less warmly by the high user group (48%) than the low user group (60%) while stand-alone tactual maps received only moderate support from the high user group (48%) and minimal support from the low user group (25%). Visual and auditory prompts at terminals and transit stops were seen useful by 61% of the high user group and this rose to almost 80% for the low user group. Radio broadcasts were seen as only moderately useful or better by 35% for the high user group whereas 58% of the low user group classified them this way.

Neither group exhibited any marked fear of becoming a victim of crime when using transit, and the high user group exhibited a little more concern than the low user group when asked about the timeliness of the operating services. Again, this could be an expected result in that more frequent use means a greater tendency to order one's activity patterns around a public transit schedule whereas the same is not as marked a practice among the low frequency users. High users were similarly more concerned about the frequency and reliability of service (56%) than the low user group (40%). A strange pattern appears where we see that only 37.5% of the high user group are very or extremely concerned with respect to the waiting time for service, whereas

approximately 80% of the low users are not at all concerned. And, finally, having to cross the street in order to get to a connection was seen to be of significant concern to 41% of the high frequency group but increased to 55% for the low frequency group, perhaps indicating their comparative lack of experience with handling normal street traffic conditions.

The pattern of difference created by experience was revealed in that only 30% of the high frequency users experienced high degrees of frustration in terms of accessing transit schedules whereas 50% of the low frequency users exhibited similar levels of frustration when faced with the same problem. 29% percent of low users experienced frustration when they have to accept offers of personal transportation from others compared to only 10% for the high frequency users who experienced the same problem. When non-disabled people occupy seats reserved for the disabled, 22% of the high frequency users experience moderate to high frustration whereas 53% of the low frequency users exhibit the same levels of frustration. Lack of clarity in voice announcements produce frustration in 74% of our high frequency subjects but in only 59% of low frequency use subjects. The poor location of elevators did not unduly disturb the high frequency users (33%) but produced significant amounts of frustration in the low frequency users (71%). The presence of obstacles in terminals produced the same much higher levels of frustration among the low frequency user group (58%) compared to lower levels among the high user group (37%). Dislocated “You Are Here” maps produced high levels of frustration among the high user group (67% of them) whereas low user groups were somewhat less affected by high levels of frustration (50%). Not being able to find a point of entrance into a transit vehicle is seen as highly frustrating by 44% of the high users and is similarly evaluated by an even greater proportion (64%) of the low users.

Terminal flexibility providing home and work pickup was seen to be somewhat or very important by 50% of the high users and 60% of the low users. Serving areas between the main arterial routes were seen to be important for 69% of the high frequency users but only 50% of the low frequency users.

3.C The Quadratic Assignment (QAP) Procedure & Output

The Quadratic Assignment Procedure (QAP) provides a rigorous, yet flexible way to compare the results from two different survey questions or sets of questions. Developed as a general data analysis strategy more than a quarter of a century ago (Mantel, 1967; Hubert and Schultz, 1976), QAP is renowned for its versatility as a tool for testing the statistical significance of social science relationships (Costanzo, 1983).

Procedure

A single application of QAP compares two square matrices. All of the matrices compared in this study were defined by the differences between subjects in their responses to one or more of the survey questions. A total of 15 matrices, comprised of three basic types, were prepared for this analysis.

(1) The simplest type involved the subjects' reported zip codes (survey question B.1) and primary travel modes (C.8). Coded ZIPCODE and PRIMMODE, respectively, each of these matrices was constructed with 55 rows and columns, corresponding to the 55 survey subjects. The element in row i and column j of ZIPCODE, for instance, equals 0 if subject i and subject j reported the same zip code; otherwise this element equals 1. Similarly, PRIMMODE's elements are 0 for pairs of subjects who share the same primary mode of travel, and 1 where subjects rely primarily on different modes.

(2) Five of the matrices are each defined by the absolute value of differences between subjects' responses to a particular survey question. Differences between the ages at which subjects' vision problems were diagnosed (B.4) defined the elements of AGEDIAG, for example, and the elements of HOM2STOP are differences between subjects' estimates of the number of blocks separating their homes from the nearest transit stop (B.12). Differences in reported scale scores (on five-point scales) for questions about waiting time for public transit (question B.14, code WAIT4PUB), waiting time when not using public transit (B.15, WAIT4PRI), and frequency of public transit use (B.17, FREQUEN) were used for the elements of the other three matrices of this type.

(3) The final eight matrices were each defined by the average absolute value of differences between subjects' responses over a group of survey questions, thereby reflecting multivariate differences between the responses of pairs of subjects. One was defined by the differences between subjects' estimates of their average travel times to each of nine separate kinds of destinations (B.18, TRAVTIME). Specifically, the element in row i and column j of TRAVTIME is the average absolute difference between the estimates of subject i and subject j over the kinds of destinations for which they both provided estimates (i.e., not counting any missing or non-applicable responses about particular destinations). The remaining seven matrices summarize the differences between subjects in their responses to the seven sets of opinion and attitude questions (C.1-GENAGREE, C.2-DIFFCULT, C.3-USEFUL1, C.4-USEFUL2, C.5-CONCERN, C.6-FRUSTRAT, and C.7-IMPORTNT, each named after the rating scale used in the associated questions). Elements are the average absolute differences between subjects' five-point scale responses over all of the questions in a particular set, counting for any pair of subjects only those questions applicable to both subjects.

One additional step was performed before each matrix comparison. Matrices were trimmed to exclude any subjects who did not respond to one or the other types of information being compared. Although all subjects reported their zip codes, for example, two subjects did not report their primary travel mode. Therefore, to compare ZIPCODE to PRIMMODE, first it was necessary to eliminate the rows and columns associated with those two subjects from both matrices. Missing data was not a major problem for this study, but it was necessary to remove one or more subjects before completing every one of the comparisons. For the multivariate matrices, type 3 above, elements were not considered missing unless there were no comparable responses between a pair of subjects over all the questions covered.

QAP computes an index of association, namely the sum of cross products between all corresponding elements of the two matrices, that comprises the fundamental elements of Pearson's product moment correlation coefficient. This coefficient is also reported by QAP, along with three measures of statistical significance for the index. Since the matrices are all defined as difference matrices (large values correspond to very different subject responses, and zero values represent identical responses), larger values of the index indicate greater association between the matrices. The three significance tests all attempt to quantify the probability that an index as large as the observed index would occur by chance alone.

One of the measures of significance, based on the normal distribution, is provided for informational purposes only, because the underlying distribution of this index is notoriously skewed (Ascher and Bailar, 1982). The second significance test is based on the Pearson Type III (gamma) distribution (Mielke, 1979), which has been shown to be a more accurate representation (Costanzo, Hubert and Golledge, 1983). A randomization test comprises the third measure of statistical significance reported by QAP. For each application of QAP in this study, the association index was recomputed on the basis of 99 random permutations of the rows and columns of one of the matrices (while the other retained its original order). According to this randomization test, if the observed index is greater than 95 of the indexes based on random permutations, for instance, then it is said to be significant at the .05 level, because an index that large or larger was found just five times out of 100 total permutations. The most extreme significance level possible for the randomization tests in this study is .01, because of the decision to have only 99 random permutations for each test.

Output

In an effort to explain the frequency with which blind and vision-impaired people use public transit, we compared FREQUEN to several of the other matrices. Only PRIMMODE was found to be significantly associated with this matrix (significant associations are quantified in Table 4C.1). This level of association was expected, as the comparison matches subjects with like travel habits to their frequency of using public transit, and is nearly an identity relationship. The next closest association to FREQUEN, not quite significant at the .05 level, was ZIPCODE. Given the first association, this one is not surprising either, as ZIPCODE and PRIMMODE themselves were shown to be significantly associated at the .01 level or better by all three measures. In other words, pairs of subjects who use the same primary travel mode tend to live in the same zip code, and tend use public transit with similar frequency. However, FREQUEN was

not found to be related to any of the matrices based on opinions and attitudes, travel times, waiting times, age diagnosed, or distance in blocks between subjects' homes and the nearest transit stop. We believe that the frequency with which the subjects use public transit is more related to other aspects of their behavior patterns for which we have no current measurements.

Table 3C.1

Significant Associations Uncovered by QAP Applications

	Correlation	**Probability Estimate**		
Matrices Compared	**Coefficient**	**Normal**	**Type III**	**Randomization**
FREQUEN, PRIMMODE	0.47	3.00E-13	0.0000001	0.01
ZIPCODE, PRIMMODE	0.10	0.009	0.019	0.01
HOM2STOP, GENAGREE	0.19	0.007	0.012	0.02
HOM2STOP, FRUSTRAT	0.15	0.022	0.029	0.04
HOM2STOP, WAIT4PUB	0.22	0.001	0.003	0.01
HOM2STOP, TRAVTIME	0.22	0.005	0.020	0.03
AGEDIAG, USEFUL1	0.07	0.021	0.035	0.03
AGEDIAG, USEFUL2	0.15	0.000003	0.001	0.01
AGEDIAG, CONCERN	0.09	0.003	0.015	0.03
PRIMMODE, DIFFCULT	0.15	0.017	0.022	0.03
PRIMMODE, FRUSTRAT	0.10	0.036	0.040	0.05
FRUSTRAT, USEFUL1	0.18	0.0001	0.0003	0.01
FRUSTRATE, USEFUL2	0.24	0.0000000	0.000003	0.01
FRUSTRAT, IMPORTNT	0.18	0.00003	0.0002	0.01

We also compared the distance that subjects live from a transit stop to several of the other variables, to explore the relationship between a person's residential choice vis-a-vis transit service and that person's opinions, attitudes and other characteristics regarding public transit. Significant associations were found between HOM2STOP and GENAGREE, and between HOM2STOP and FRUSTRAT. That is, subjects who live similar distances away from a transit stop tend to have similar opinions about the statements in Question C.1, and they tend to express similar levels of frustration regarding the statements in Question C.6. HOM2STOP also was found to be significantly associated with both WAIT4PUB and TRAVTIME, suggesting that the distance a subject resides from a transit stop has an effect on his or her estimates of both preparation time for transit trips and overall travel times.

The age at which subjects' vision problems were diagnosed seems to be related to their assessments of the usefulness of various travel and information aids listed in Questions C.3 and C.4, and related to their concerns about public transit in responding to Question C.5. These

relationships were revealed by significant associations between AGEDIAG and each of USEFUL1, USEFUL2, and CONCERN.

Subjects' primary modes of travel tend to be related to their estimates of the difficulty of various tasks listed in Question C.2, and to their levels of frustration in response to the Question C.6. These tendencies are reflected in the significant associations found to exist between PRIMMODE and both DIFFCULT and FRUSTRAT.

It seemed likely that there would also be significant associations between the various pairs of matrices based on subjects' opinions and attitudes. Altogether, there are 21 possible pairs of these matrices (corresponding to Questions C.1 through C.7), but only three of these pairs were tested. FRUSTRATE was thereby found to be significantly associated with all three of USEFUL1, USEFUL2, and IMPORTNT. The extremely significant associations shown in Table 3C.1 for these pairs confirms the consistency of subjects' ratings on these various attitude and opinion questions.

4. Conclusions

Lessons learned from Pilot Study and Suggestions for future research

This research was conducted as a pilot study to better understand the needs of disabled and elderly transit users. We also wanted to achieve a better understanding of the reasons why transit is not used by more disabled people. Because of its pilot status, we focused on only one disabled group, the blind and visually impaired, and restricted our study to a medium size urban area.

We found that by far the most important finding of this survey was that the blind and visually impaired do not need major infrastructure changes but relatively simple changes to allow this group access to information, which is usually transmitted visually. Other disabled groups, like the elderly and cognitively challenged, will probably also benefit from the same types of information presentations. The deaf would benefit from substitutions for terminal announcement and driver announced stops and would also benefit from some type of transit district hot-line tied into special services for the deaf, but further research is needed to better understand their needs.

Our survey was not intended to address the needs of different groups in different transit areas. Future surveys based on this pilot study could collapse some of our questions in order to make the survey more versatile, more usable for other groups, and make it easier to complete. We most likely did not need as many categories for travel mode, these could be combined depending on the area. In our survey, we found few who used taxi services, limousines, bicycles and guide dogs. The major modes used from our sample were either the local bus system, private auto (friend's or family's), walking and van service provided for retirement home residents or van rides provided by the local Braille Institute.

There are, however, a few items that would be important to add for future work. It would be helpful to survey activity patterns in more detail. A main concern in disability research should be to quantify any difference in frequency of travel as compared to a control group. Do disabled people stay home or travel less distance because of the inconvenience? If a trip diary cannot be obtained, at least some estimation of the number and distance of trips should be obtained. It might be interesting to have people discuss or list trips they wanted to take but did not because of constraints to their mobility. For those people who used to drive before losing their vision, it would be enlightening to have them list trips they no longer take or discuss changes to their activity patterns and the constrains on independence or freedom of choice in activities imposed by being a non-driver. Our research confirmed that non driving did strongly affect their lives, perhaps some concrete examples could shed light on this limitation. Perhaps subjects could also list the main disadvantages of being a non driver.

Other research has shown that the disabled, especially those who live alone, have highly restricted activity patterns. We did not inquire about household type or living arrangement. Since having access to rides in a private car was shown to be faster and more convenient, it is likely that those who live in a household with a driver would have different travel patterns than those who lived alone. The current social services trend is to try and help people maintain their own residence by matching people to live together. If it is indeed true that living alone restricts travel and independence, these results could help convince people of the advantage of sharing their home with people who have other skills that they lack.

We found that those who used transit as their main mode of travel lived closer to bus stops and also walked to some activities. Residential locations are very important for non drivers. Therefore, their choice of residence is restricted to certain areas and other places are almost completely untenable. It would be interesting to survey our subjects about their residential choices. Did they move after losing their sight, what are the main factors they look for or need when considering a new location?

And finally, there seems to be considerable potential benefit in developing a transit user decision support system for disabled travelers. It would be most useful if this could be a portable piece of equipment. Such a device and its appropriate software could be a target of opportunity for future PATH researchers.

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Appendix A

Papers Presented and Published

Papers Presented:

1. "Disability, Barriers and Discrimination" Paper presented at the Differentiation and .. Discrimination conference, Boston, Massachusetts, November 1994.

2. "GPS, GIS and PGS!" Paper presented at the Transportation and Society Seminar, ... University of Michigan, Ann Arbor, MI, March 1995.

3. "On Reassembling One's Life: Overcoming Disability in the Academic Environment" Paper presented at the Association of American Geographers meeting, Chicago, IL, March 1995.

4. "Public Transit Use by Non-Driving Disabled Persons: The Case of the Blind and Vision Impaired" Paper prepared for the Annual PATH Conference, Richmond Field Station, October 1995.

5. "Activity Schedules of Disabled People: Why They Don't Like to Use Mass Transit" Paper presented at the ORSA/TIMS meeting, New Orleans, LA, October 1995.

Papers Published:

Disability, Barriers and Discrimination. In L. Chatterjee and A. Andersson (Eds.) *Contestable differences: A global dilemma.* (in process)

In Progress:

J.R. Marston; R.G. Golledge, and R.M. Costanzo "Why don't the disabled use public ..... transit: The case of the blind and vision impaired"

R.G. Golledge, C.M. Costanzo, and J.R. Marston "Activity patterns of blind and vision .... impaired public transit users"

C.M. Costanzo, R.G. Golledge, and J.R. Marston "Blind and vision impaired traveler's .... attitudes towards public transit use: A quadratic assignment analysis"

Appendix B

Persons associated with the project:

Dr. Reginald G. Golledge, PI, Professor of Geography, UCSB

Dr. C. Michael Costanzo, Co-PI, President, Costanzo Associated Consultants, Goleta, CA

James R. Marston, Graduate Student, UCSB

Scott M. Bell, Graduate Student, UCSB

Local consultants:

Mary Sanders, State Rehabilitation Services

Joan Marcuse, Santa Barbara Braille Institute

Michael Lazarovits, Santa Barbara Braille Institute

John Murdock, Santa Barbara, Metropolitan Transit District

Bon Burnham, Santa Barbara, Metropolitan Transit District

Staff:

Mary MacDonald, Department of Geography & Research Unit on Spatial Cognition and Choice (RUSCC), UCSB

Howard Pommerening, Department of Geography & Research Unit on Spatial Cognition and Choice (RUSCC), UCSB

Anne Haque, Department of Geography & Research Unit on Spatial Cognition and Choice (RUSCC), UCSB

Appendix C

The Survey

CALTRANS/University of California
PATH PROJECT

MOU 167

Survey of Public Transit Use by Disabled Non-Drivers

March 31, 1995
Phone Survey
Final Version

UCSB Researchers:

R.G. Golledge: Department of Geography, University of California, Santa Barbara, CA 93106

C.M. Costanzo Department of Geography, University of California, Santa Barbara, CA 93106

J. Marston Department of Geography, University of California, Santa Barbara, CA 93106

Hello: Is this (name of interviewee.....pause for response)

Mr/Mrs/Ms _(insert name)_ **you have been selected to participate in a study of the use of and attitude towards public transit by disabled people. This study is jointly sponsored by CALTRANS and the University of California. It's purpose is to determine how frequently disabled people use different forms of mass transit in the Santa Barbara-Goleta area. We are also interested in your opinions about the usefulness of the local public-transit systems. This survey will take about _____ minutes of your time, and we will send you a check for $10.00 if you complete the survey.**

QA1: **Are you willing to participate in this survey now?**
If YES go to QA2
If NO ask: **When would be a convenient time for me to call so that you could complete the survey?**
If YES Record time and say: **"Thank you, I'll call back at that time."**
Call back time: Date: _____ Time: _____
If NO say **"Thank you for your time"** and hang up.

QA2: **Would you prefer to complete the survey by:**
(a) **By continuing this phone conversation and responding to questions over the phone?**

or

(b) **By receiving a mail survey in:**
standard written form (_____)
or Braille(_____)

or

(c) **By meeting an interviewer at your home (_____) or at the Santa Barbara Braille Institute (_____) to fill in answers to the questions.** [Choose one of preceding]

If preference is other than phone, take details of address and zip code for mail surveys:
Mailing address: Street: _____ Zipcode: _____

If preference is for Braille Institute or home, say: **" Fine: we will call you back in a few days to set up a time. Thank you for your cooperation."** (hang up)

QA3: **Do you use public transit?**
If YES ☐ proceed to Section B

If NO ☐ ask:

Can you give me 3 reasons why you do not use public transit?
(Interviewer to list)

_____

_____

_____

Thank you for your time. (Hang up.)
Exit.

Interviewer: **We will begin by collecting background information about your disability and information about your travel patterns. Then we will ask for your opinions and what you see to be problems of using transit.**

START QUESTIONS

Q.B.1. **What is your zip code?** _____

B.2. **What was the cause of your visual disability?** (state type)_____

B.3. **Do you have more than one disability?** (State which) _____

B.4. **Approximately when was your vision problem diagnosed?**
At Birth _____
Other (state age) _____

B.5. **What is your visual acuity:**
legally blind (acuity of 20/200 or less)

☐ **other (state if possible)** _____

B.6. **Do you use Braille?** Yes No

B.7. **Do you use TDD services?** ☐ Yes ☐ No

B.8. **Do you drive a car?** ☐ Yes ☐ No

B.9. **Do you own a private mode of transportation?** ☐

Yes No If "yes" ask for and list mode(s) _____

B10. **What is the highest level of education you have obtained:**
(check one) (Read each column in turn)

_____ **Less than high school** _____ **Jr. college** _____ **post graduate**
_____ **high school** _____ **4 year college/university**

B.11. **What is your age group?**
(check one)

_____ **< 20 years**
_____ **20—39 years**
_____ **40—59 years**
_____ **60—79 years**
_____ **80+ years**

B.12. **How many blocks from your home to the nearest transit stop?** _____ **blocks**

B.13. **Different people have different forms of disability. What are the results of your disability? (Answer YES or NO for each possibility in turn)**

☐ yes	☐ no	**No Serious Restrictions affecting use of a mass transit system.**
☐ yes	☐ no	**Need some special aid in order to move around.**
☐ yes	☐ no	**No serious problems in walking or standing.**
☐ yes	☐ no	**Difficulty in standing.**
☐ yes	☐ no	**Difficulty in walking to curb to meet transit vehicle.**
☐ yes	☐ no	**Some difficulty in climbing stairs (need assistance).**
☐ yes	☐ no	**Cannot read newsprint or transit schedules.**
☐ yes	☐ no	**Am confined to bed most or all of the time.**
☐ yes	☐ no	**Must stay in house most or all of the time**.
☐ yes	☐ no	**Have difficulty in reading signs or vehicle route numbers**.

Question B.14. **When preparing to make a trip by public transit, how much time do you allocate for agency contact and in waiting time? Choose one of the following time intervals.** (Read intervals)

More than 1 Hour	30 minutes to 1 Hour	15-29 minutes	5-14 minutes	Less than 5 minutes

Question. B.15. **When preparing to make a trip when not using public transit, on average how long do you expect to spend in personal contact and waiting time?** (use the same time intervals as for the previous question)

More than 1 Hour	30 minutes to 1 Hour	15-29 minutes	5-14 minutes	Less than 5 minutes

Question B.16. **What is the primary activity for which you need travel assistance?** (Interviewer to interpret response and check only one)

☐ **Work**	☐ **Shopping**
☐ **Recreational**	☐ **Professional services (legal/CPA/Financial)**
☐ **Medical**	☐ **Non-family social**
☐ **Education**	☐ **Religious**
☐ **Family Business**	☐ **Other (state) _____**
☐ **Agency special services**	

Question B.17. **How frequently do you use public transit?** (Interviewer to interpret responses and check only one)

5-7 days per week	2 - 4 days per week	Weekly	About every other week	At longer than 2 week intervals

Question B.18. **On average how long is your usual travel time from home to each of the following destinations?** (in minutes; if not applicable put N.A.)

_____ **Work**				
_____ **Recreation**				
_____ **Visit family or friends**				
_____ **Medical and other health related services**				
_____ **Financial/legal or other professional services**				
_____ **Grocery shopping**				
_____ **Other regular shopping trips**				
_____ **Agency Services**				
_____ **Religious**				

Question B.19. **Using categories of Never, Rarely, Sometimes, Often, or Always, tell me how often you <u>share</u> your mode of travel with others?**

Never	**Rarely**	**Sometimes**	**Often**	**Always**

Question B.20. **Give up to 3 reasons why you use public transit.** (interviewer to record which ones)

_____ **Comfort**

_____ **Safety record**

_____ **Security (low crime)**

_____ **Cost**

_____ **Service meets my needs (e.g. has convenient routes, times, etc.)**

_____ **On time service**

_____ **Ease of arranging trips**

_____ **Ease of getting to or from pick-up or drop-off points**

_____ **Coverage of service area**

_____ **Time of day service is available**

_____ **Driver/operator courtesy and assistance**

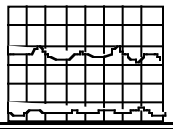
_____ **No alternative**

_____ **Other (specify)**

_____

Question B.21.(a) **Which of the following types of assistance do you use when traveling outside your home? Cross out the appropriate rows for any type of assistance when NO is the response. Then go to 21(b).)**

e.g. rows



Trip Purpose

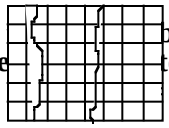
Columns ⇓

.ows ⇒

Column 1	Work	Grocery shopping	Clothes or other shopping	Recreation / leisure	Social Trip (e.g. visit friend)	Religious temple / church	School / educational	Medical	Agency/ Support Services	Business (legal; accounting; financial etc.)
No assistance needed: independent traveler										
Spouse / Significant other										
Other family member (Mother, Father, Child)										
Other relative										
Roommate/ Neighbor										
Friend										
Hired Assistant										
Volunteer Assistant										
Co-worker										

B21(b). **For the list of trip purposes, cross out those columns where you do not undertake trips of this type..**

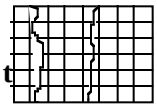
e.g. Columns

B21(c). **Now, indicate in the remaining areas of**  **ble how frequently you use the types of assistance you've indicated for each of the purpose ted. To give your responses, use a scale from 1 —> 5 (1 = always; 2 = often; 3 = sometimes; 4 never)**

Question B.22. **We now want to find out what mode of travel you use for each trip purpose defined in the previous questions.**

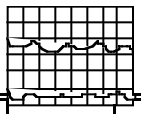
(a) FIRST cross out columns representing unused trip purposes as done in Q. B. 21 before starting this question.

e.g. Columns



(b) Then, please indicate which t you do or do not use ; cross out rows with for modes not used. Then go to 22 (c).)

e.g. rows



Trip Purpose

Columns ⇓

ows

⇒

Column 1	Work	Grocery shopping	Clothes or other shopping	Recreation / leisure	Social trip (e.g. visit friend)	Religious temple / church	School / educational	Medical	Agency Support Services	Business (legal; accounting; financial etc.)
Local Bus Service										
Express Bus Service										
Mini-bus										
Self-paid taxi service										
Social Services Paid Taxi										
Hired Limousine Service										
Hired Driver for personal car										
Household Car										
Friend's Car										
Motorcycle /Bicycle /Tricycle										
Walk (with cane/walker)										
Walk (without cane/walker)										
Guide dog										
Para transit (lift van)										
Volunteer Driver										

B.22(c) **Fill out the above table by using the scale from 1 —> 5**
(1 = always; 2 = often; 3 = sometimes; 4 = rarely; 5 = never) to show how frequently you use each mode for each purpose .
[Example: "Just consider work trips: using always, often, sometimes, rarely or never, tell me how often you use the local bus service? the express bus service? etc.]

Question B.23. **Please indicate (YES OR NO) which assistive devices you currently use to help you navigate or travel:** (Read each in turn and record YES or NO)

Yes	No	
_____	_____	**long cane/crutches/walker**
_____	_____	**guide dog**
_____	_____	**laser cane**
_____	_____	**MOWAT sensor**
_____	_____	**Sonic Guide or Sonic Obstacle Avoider**
_____	_____	**tape recorded directions for travel**
_____	_____	**tactual maps (for on-route assistance)**
_____	_____	**typed, Brailled, or hand written signs or cards describing your route**
_____	_____	**spotting telescopes**
_____	_____	**Wheelchairs (manual)**
_____	_____	**Wheelchairs (motorized)**
_____	_____	**others (please list up to three others)**
_____	_____	_____
_____	_____	
_____	_____	

Interviewer: **We have now completed the travel section of the survey. We would now like to get your opinions about and attitudes towards public transport.**

How do you feel? The next section is the final section and will take about _____ minutes. Would you like to take a short break (e.g. to get a drink?)?

If YES, wait. BREAK

If NO, continue.

(Proceed to section C)

Section C. Interviewer: **In the first part of this section, I would like you to tell me whether you strongly agree, agree, are uncertain, disagree, or strongly disagree with each statement as I read it to you.** (Repeat the response categories again then start).

Question C.1.

				Rating		
	Statement	**1 Strongly Agree**	**2. Agree**	**3. Uncertain**	**4. Disagree**	**5. Strongly Disagree**
a.	**I am dependent on others to provide me with transportation**					
b.	**I am frustrated by the degree to which I am dependent on others.**					
c.	**I am familiar with the different types of transportation services available to disabled people**					
d.	**The existing public transit services in my local area satisfy my transportation needs.**					
e.	**I believe public transportation is safe to use.**					
f.	**I believe that public transit information is easy to obtain.**					
g.	**I believe that public transit information is easy to understand and use**					
h.	**I believe that using public transportation for non-work trips is undignified.**					
i.	**I consider myself to be an independent traveler.**					
j.	**There is no disadvantage to being a non-driver.**					
k.	**Non-driving limits my freedom to choose a residence.**					
l.	**I believe that having to use public transit does not affect my independence.**					
m.	**I believe that having to use public transit restricts my social life.**					
n.	**I believe that having to use public transit isolates me from society.**					
o.	**Non-driving has a negative impact on my lifestyle and quality of life.**					
p.	**I feel frustration because I am a non-driver.**					

Question C.2. **Now I'd like you to evaluate the degree of difficulty you feel that you have (or would have) if and when you use public transit. Use the terms 'Never difficult, Sometimes difficult, Difficult, often difficult, Always difficult' for your responses. Respond "Not applicable" if the statement is irrelevant for your type of disability.** (Read each statement in turn, checking the appropriate response box.)

	Evaluation					
Statement	1 **Never Difficult**	2 **Sometimes Difficult**	3 **Difficult**	4 **Often Difficult**	5 **Always Difficult**	6 **Not Applicable**
1. **Finding which route to take to get me to my destination is:**						
2. **Finding where to board the transit vehicle is:**						
3. **Recognizing which vehicle to enter is:**						
4. **Estimating when the vehicle will arrive at my stop is:**						
5. **Knowing when to exit the vehicle is:**						
6. **Estimating approximately where I am when the vehicle is in transit is:**						
7. **Dealing with layovers with mode or route changes is:**						
8. **Entering and exiting public transit vehicles is:**						
9. **Finding an empty seat is:**						
10. **Paying the fare is:**						
11 **Using the fare crediting system is:**						
12. **Signaling the driver to stop is:**						
13. **Dealing with a crowded vehicle is:**						
14. **Getting from the last stop on the transit system to my final destination is:**						
15. **Finding each transit pickup point when two or more different vehicles or modes have to be used is:**						
16. **Learning how much time remains before the connecting mode arrives is:**						
17. **Getting from my house to the transit stop is:**						
18. **Finding the correct (bus) stop is:**						
19. **Getting a transfer ticket is:**						
20. **Finding the transfer point if it is across the street or elsewhere is:**						
21. **Learning whether the connection (bus / train) is on time is:**						

Question C.3. **For the next two sets of questions, we would like to know how useful you find certain types of information for planning your trips. Use the terms: 'Extremely useful; Very useful; Useful; Not very useful; Not at all useful' for your responses.**

	Rating				
Statement	1 **Extremely Useful**	2 **Very Useful**	3 **Useful**	4 **Not very Useful**	5 **Not at all Useful**
1. **Printed Transit District Schedules are:**					
2. **Cable TV messages would be:**					
3. **Transit District telephone information hotlines are:**					
4. **Transit System drivers / operators are:**					
5. **Regular radio messages would be**:					
6. **Written signs posted at pick-up / drop-off points are:**					
7. **Timetables or schedules available only at a central terminal are:**					
8. **Timetables or schedules of service distributed via mail would be:**					
9. **E-mail (electronic mail) schedules available on home computers would be:**					
10. **Timetables in suitable format available on board different modes of travel are:**					
11. **Auditory messages at pickup/drop-off points would be:**					
12. **Talking signs would be:**					

Question C.4. Again using the different categories of usefulness, indicate the degree to which each of the following would be useful to you when planning your various trips:

Device	Extremely Useful	Very Useful	Useful	Not Very Useful	Not at all Useful
1. **Tactual Map of Transit Routes**					
2. **Tactual map of urban area in which you travel**.					
3. **Tactual map of route with verbal descriptions spoken at key places you touch.**					
4. **Tactual map of city in which you travel with verbal information given at key points**.					
5. **Computer assisted telephone instructions for using a transit vehicle for a given journey.**					
6. **Regular location and timetable information presented visually and verbally on a selected Cable TV channel in your home**.					
7. **Telephone HOT line with human operators to provide route and timetable information.**					
8. **Computerized telephone service using push-button keys to provide route and timetable information (equivalent to voice mail).**					
9. **Auditory/Tactual Information Systems at strategic locations in terminals to provide route, schedule, timing, and other types of information.**					
10. **Tactual Maps or Diagrams of routes available at central locations in transit terminals.**					
11. **Visual and auditory prompts at transit stops to tell when the last pick-up occurred and when the next is due**.					
12. **Tactual map of the location of pick-up/drop-off points in your home or work neighborhoods.**					
13. **Portable Personal Guidance System (PGS) to help navigate to or from your home/work/or other destination to a pick-up /drop-off point for different transit modes.**					
14. **Special radio broadcasts that give continuous information on transit operating conditions (e.g. delays, current location of vehicles).**					

Question C.5. **We would now like to find out about your concerns with respect to public transit. Use the categories "Extremely concerned; Very concerned; concerned; not very concerned; unconcerned" to indicate your concerns:**

	Rating				
When using public transit how concerned are you with:	1 Extremely Concerned	2 Very Concerned	3 Concerned	4 Not very Concerned	5 Unconcerned
1. **Becoming a victim of crime**					
2. **Timeliness of operating system**					
3. **Frequency of service**					
4. **Crowding**					
5. **Lack of civility by operators / drivers**					
6. **Not being sure of arrival time at designated stops**					
7. **Not knowing whether transit has already passed your point of pick-up**					
8. **Waiting time for service**					
9. **Unsatisfactory locations of final destinations of transit service**					
10. **Lack of connectivity to other systems**					
11. **Lack of service to places you need to visit**					
12. **Having to cross streets or get to distant points for a connecting service**					

Question C.6. **We all have some degree of frustration with travel today. Using the terms "Extremely frustrated; Very frustrated; Frustrated; Not very frustrated; or Not at all frustrated" tell us your degree of frustration with each of the following conditions:**

	Rating				
Condition	1 Extremely Frustrated	2 Very Frustrated	3 Frustrated	4 Not very Frustrated	5 Not at all Frustrated
1. When I experience difficulties getting access to information about scheduling, I feel					
2. When I need to rely on others' time and schedules to getme to a destination, I feel					
3. When I must request rides to a destination after missing a transit connection, I feel					
4. When I have to accept offers of personal transportation from others, I feel					
5. When I need to explain my inability to get to a location or function that is in an area not served by transit, I feel					
6. When I need to carry special equipment as an aid to navigation and obstacle avoidance, I feel					
7. When I have to negotiate narrow doors and steps to enter a bus or train, I feel					
8. When non-disabled people occupy seats in locations reserved for disabled, I feel					
9. When I exit a transit mode at the wrong place (e.g. going past my intended destination), I feel					
10. As a result of crowding and then being unable to exit a transit mode (e.g. train) in the time allocated for the stop, I feel					
11. When the clarity of voice announcements of public address systems used to announce locations or times of arrival or departure is poor, I feel					
12. When the location and legibility of Brailled signs or raised lettering or numbering is poor, I feel					
13. When the location of elevators used to bypass escalators or stairs in transit terminals are hard to find or get to, I feel					
14. When there are many obstacles in terminals, I feel					
15. When "YOU ARE HERE" maps are poorly located and oriented, I feel					
16. When "YOU ARE HERE" maps have no voice output, I feel					
17. When I have to ask for help from passersby to identify the route numbers and destination of transit vehicles, I feel					
18. When I cannot find bus stop or point of entrance for transit, I feel					

Question C.7. **Indicate your belief of the importance of each of the following features of a public transit system in terms of how well they would ideally suit your needs for transportation? Use the following 5 point importance scale to indicate the strength of your belief.** (Interviewer to read scale terms).

Feature of System	(1) Very Important	(2) Somewhat Important	(3) Important	(4) Somewhat Unimportant	(5) Very Unimportant
In-vehicle visual and/or auditory displays of vehicle location and route so that you always know where you are.					
Ground level access to different modes, so that steps or lifts can be avoided.					
Terminal flexibility such as home and work pick up and delivery.					
Systems that serve areas <u>between</u> major transit lines.					
Cable TV maps and verbal descriptions of location of different transit modes at all times.					
Early warning system to mode operators that a disabled person is waiting at a pick-up point.					
Brailled or spoken messages at transit stops indicating time of arrival of next vehicle and its destination.					
A volunteer to guide disabled people through first few uses of transit mode.					
Housing relocation services that consider my total transit needs and help me find a convenient new living place.					

Question C.8**. State your <u>primary</u> mode of travel: what three or more things could best improve the service?**

Primary mode: _____

Things that could improve it:

_____

_____

_____

End of Survey: **Thank you for your patience. A check for $10 will be sent to you within the next 10 days.**

Section B: Phone Survey Background Information and transit use characteristics

DEAR SURVEY PARTICIPANT:

THANK YOU FOR YOUR PARTICIPATION IN THE CALTRANS/UCSB SURVEY OF PUBLIC TRANSIT USE BY DISABLED NON-DRIVERS. THE SURVEY IS ENCLOSED IN THIS PACKAGE. PLEASE LET US KNOW IF YOU HAVE ANY QUESTIONS. WE CAN BE REACHED AT (805) 893-2731.

WE WILL PROVIDE ANONYMITY FOR YOUR RESPONSES. HOWEVER, WE DO NEED INFORMATION FROM YOU SO THAT WE CAN PROCESS YOUR CHECK AND FOR OUR ACCOUNTING PURPOSES. THIS FORM WILL NOT BE ATTACHED TO THE SURVEY AND WILL BE RETAINED IN A SEPARATE FILE THEN DESTROYED.

PLEASE FILL IN THIS DATA SHEET AND RETURN IT WITH THE SURVEY IF YOU WISH TO RECEIVE PAYMENT.

(PLEASE PRINT)

NAME: _____
(AS YOU WANT THE CHECK MADE OUT)

MAILING ADDRESS: _____

CITY: _____ ZIPCODE: _____

SOCIAL SECURITY NUMBER: _____

PLEASE LET US KNOW ALSO:

ARE YOU WILLING TO BE CONTACTED IN CASE WE HAVE FURTHER QUESTIONS?

YES NO

WOULD YOU LIKE A SUMMARY OF THE SURVEY RESULTS?

☐ YES ☐ NO

PLEASE DO NOT WRITE BELOW THIS LINE

(ACCOUNTING ONLY)

DATE CHECK SENT ☐ _____ ☐ CHECK NUMBER: _____

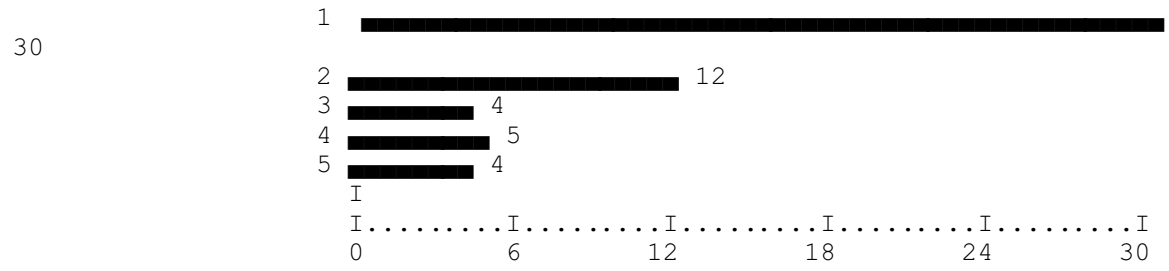
Appendix D

Survey Data

ALL

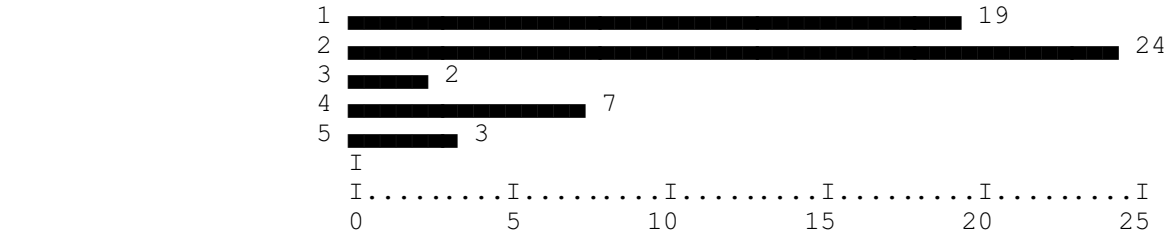
C1A

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	30	54.5	54.5	54.5
	2	12	21.8	21.8	76.4
	3	4	7.3	7.3	83.6
	4	5	9.1	9.1	92.7
	5	4	7.3	7.3	100.0
	TOTAL	55	100.0	100.0	



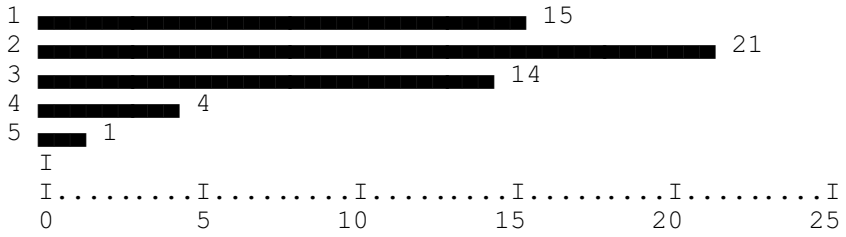
C1B

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	19	34.5	34.5	34.5
	2	24	43.6	43.6	78.2
	3	2	3.6	3.6	81.8
	4	7	12.7	12.7	94.5
	5	3	5.5	5.5	100.0
	TOTAL	55	100.0	100.0	



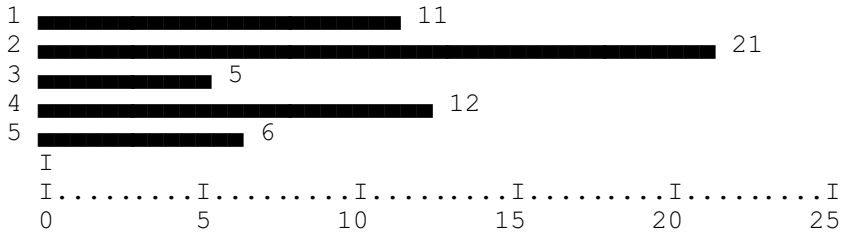
C1C

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	15	27.3	27.3	27.3
	2	21	38.2	38.2	65.5
	3	14	25.5	25.5	90.9
	4	4	7.3	7.3	98.2
	5	1	1.8	1.8	100.0
	TOTAL	55	100.0	100.0	



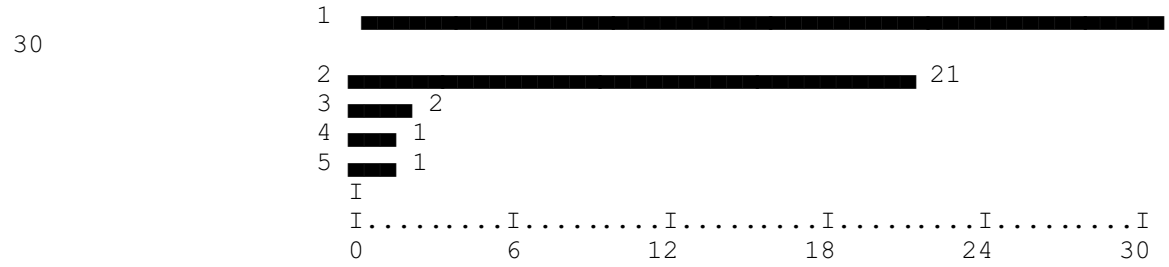
C1D

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	11	20.0	20.0	20.0
	2	21	38.2	38.2	58.2
	3	5	9.1	9.1	67.3
	4	12	21.8	21.8	89.1
	5	6	10.9	10.9	100.0
	TOTAL	55	100.0	100.0	



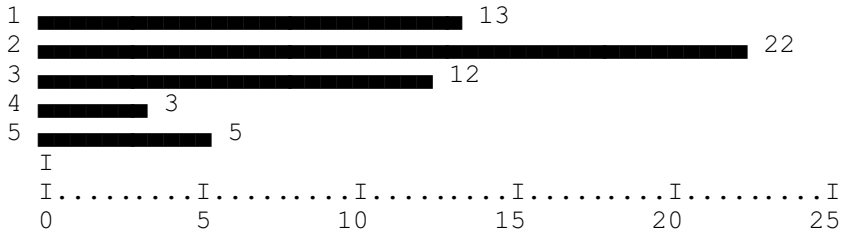
C1E

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	30	54.5	54.5	54.5
	2	21	38.2	38.2	92.7
	3	2	3.6	3.6	96.4
	4	1	1.8	1.8	98.2
	5	1	1.8	1.8	100.0
	TOTAL	55	100.0	100.0	



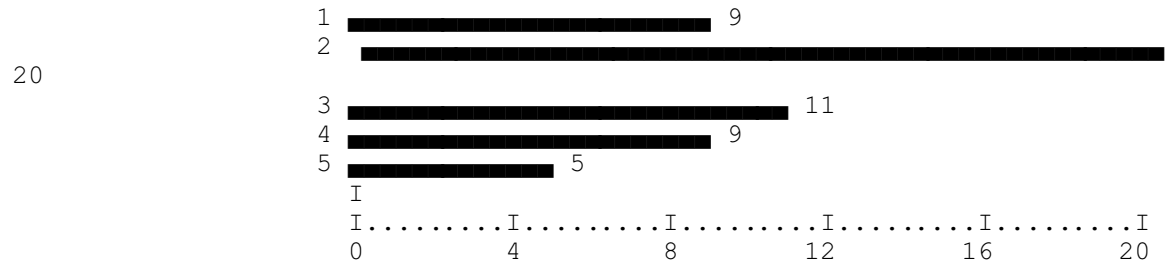
C1F

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	13	23.6	23.6	23.6
	2	22	40.0	40.0	63.6
	3	12	21.8	21.8	85.5
	4	3	5.5	5.5	90.9
	5	5	9.1	9.1	100.0
	TOTAL	55	100.0	100.0	



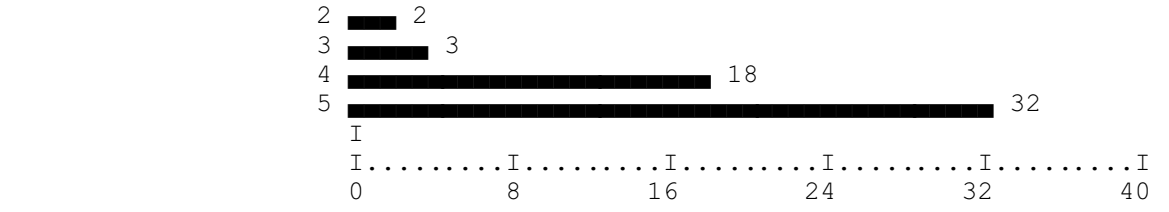
C1G

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	9	16.4	16.7	16.7
	2	20	36.4	37.0	53.7
	3	11	20.0	20.4	74.1
	4	9	16.4	16.7	90.7
	5	5	9.1	9.3	100.0
	0	1	1.8	MISSING	
	TOTAL	55	100.0	100.0	



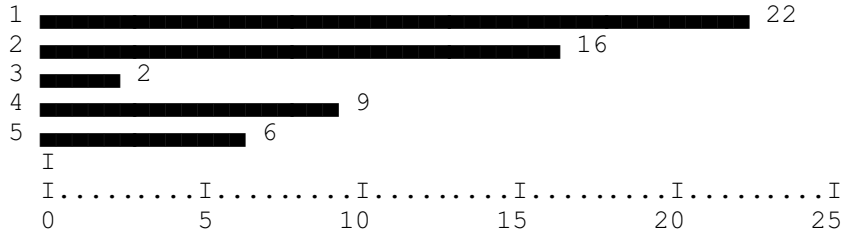
C1H

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	2	2	3.6	3.6	3.6
	3	3	5.5	5.5	9.1
	4	18	32.7	32.7	41.8
	5	32	58.2	58.2	100.0
	TOTAL	55	100.0	100.0	



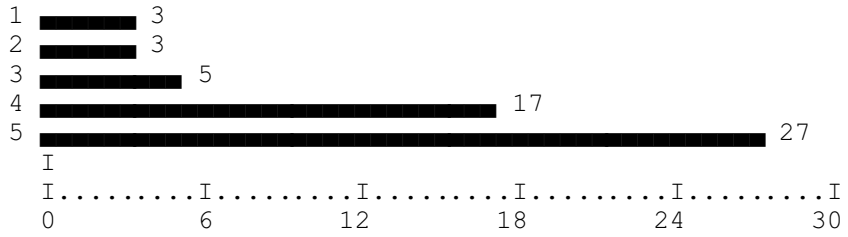
C1I

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	22	40.0	40.0	40.0
	2	16	29.1	29.1	69.1
	3	2	3.6	3.6	72.7
	4	9	16.4	16.4	89.1
	5	6	10.9	10.9	100.0
	TOTAL	55	100.0	100.0	



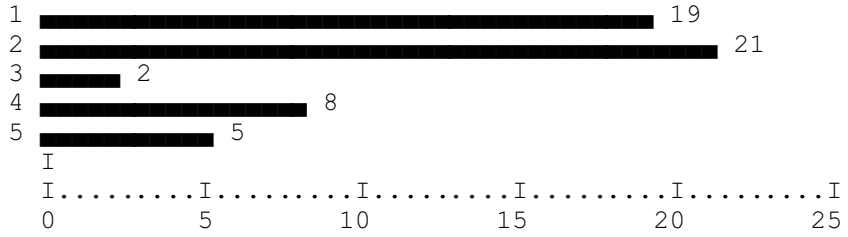
C1J

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	3	5.5	5.5	5.5
	2	3	5.5	5.5	10.9
	3	5	9.1	9.1	20.0
	4	17	30.9	30.9	50.9
	5	27	49.1	49.1	100.0
	TOTAL	55	100.0	100.0	



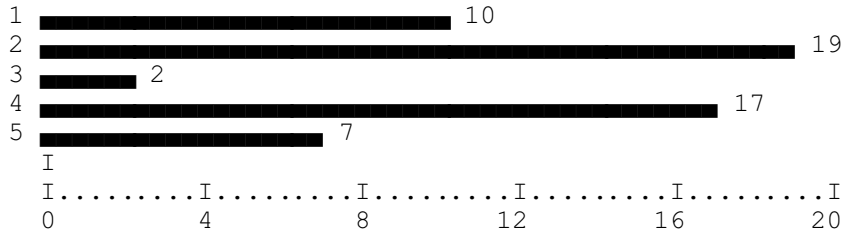
C1K

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	19	34.5	34.5	34.5
	2	21	38.2	38.2	72.7
	3	2	3.6	3.6	76.4
	4	8	14.5	14.5	90.9
	5	5	9.1	9.1	100.0
	TOTAL	55	100.0	100.0	



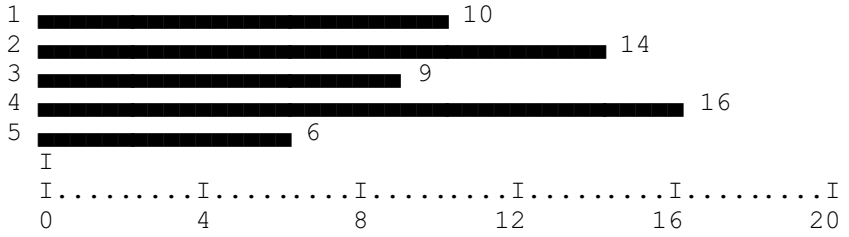
C1L

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	10	18.2	18.2	18.2
	2	19	34.5	34.5	52.7
	3	2	3.6	3.6	56.4
	4	17	30.9	30.9	87.3
	5	7	12.7	12.7	100.0
	TOTAL	55	100.0	100.0	



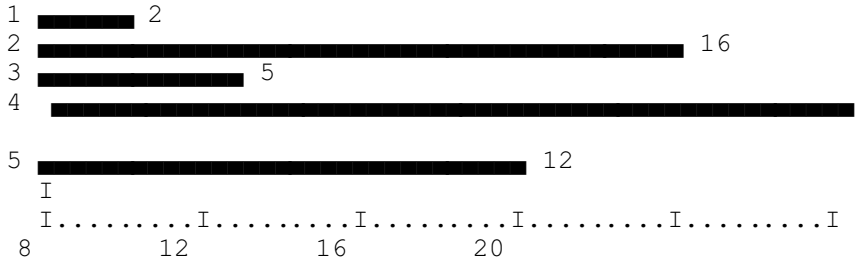
C1M

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	10	18.2	18.2	18.2
	2	14	25.5	25.5	43.6
	3	9	16.4	16.4	60.0
	4	16	29.1	29.1	89.1
	5	6	10.9	10.9	100.0
	TOTAL	55	100.0	100.0	



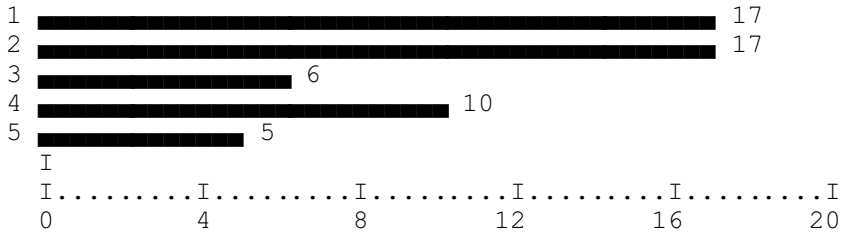
C1N

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	2	3.6	3.6	3.6
	2	16	29.1	29.1	32.7
	3	5	9.1	9.1	41.8
	4	20	36.4	36.4	78.2
	5	12	21.8	21.8	100.0
	TOTAL	55	100.0	100.0	



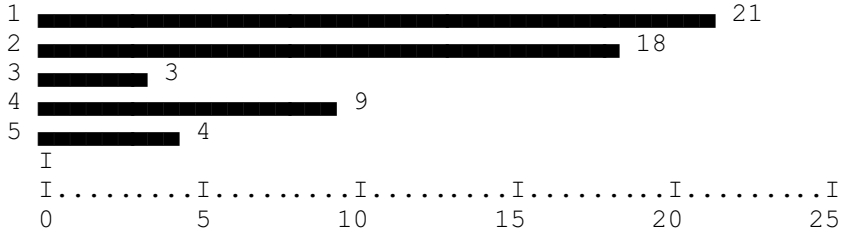
C1O

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	17	30.9	30.9	30.9
	2	17	30.9	30.9	61.8
	3	6	10.9	10.9	72.7
	4	10	18.2	18.2	90.9
	5	5	9.1	9.1	100.0
	TOTAL	55	100.0	100.0	



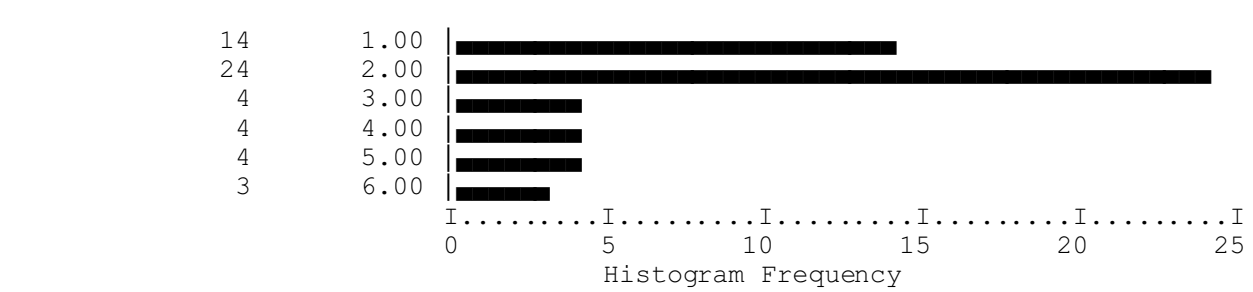
C1P

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	21	38.2	38.2	38.2
	2	18	32.7	32.7	70.9
	3	3	5.5	5.5	76.4
	4	9	16.4	16.4	92.7
	5	4	7.3	7.3	100.0
	TOTAL	55	100.0	100.0	



C2_1

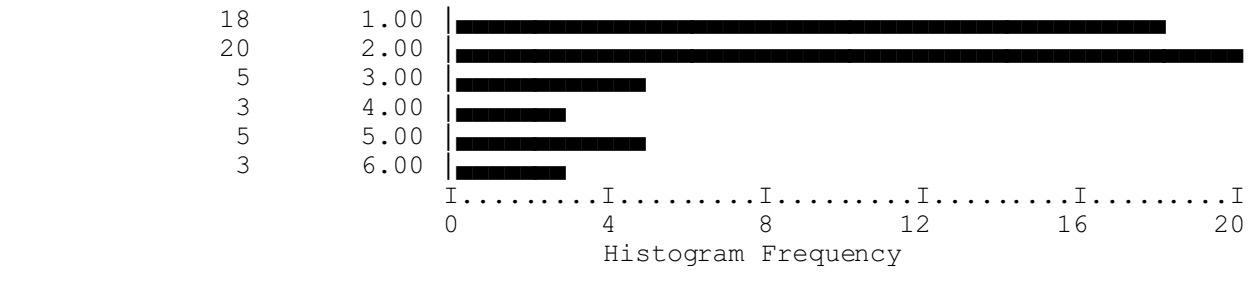
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	14	25.5	26.4	26.4
	2	24	43.6	45.3	71.7
	3	4	7.3	7.5	79.2
	4	4	7.3	7.5	86.8
	5	4	7.3	7.5	94.3
	6	3	5.5	5.7	100.0
	0	2	3.6	MISSING	
	TOTAL	55	100.0	100.0	



C2_2

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	18	32.7	33.3	33.3
	2	20	36.4	37.0	70.4
	3	5	9.1	9.3	79.6
	4	3	5.5	5.6	85.2
	5	5	9.1	9.3	94.4
	6	3	5.5	5.6	100.0
	0	1	1.8	MISSING	
	TOTAL	55	100.0	100.0	

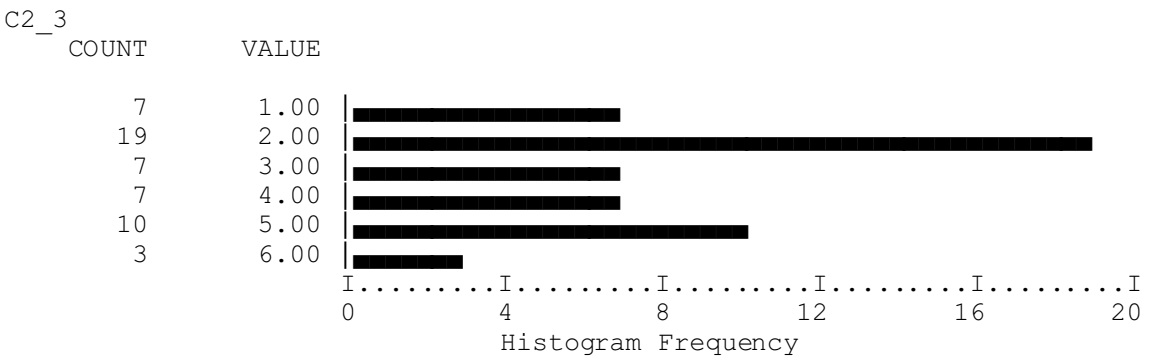
C2_2



C2_3

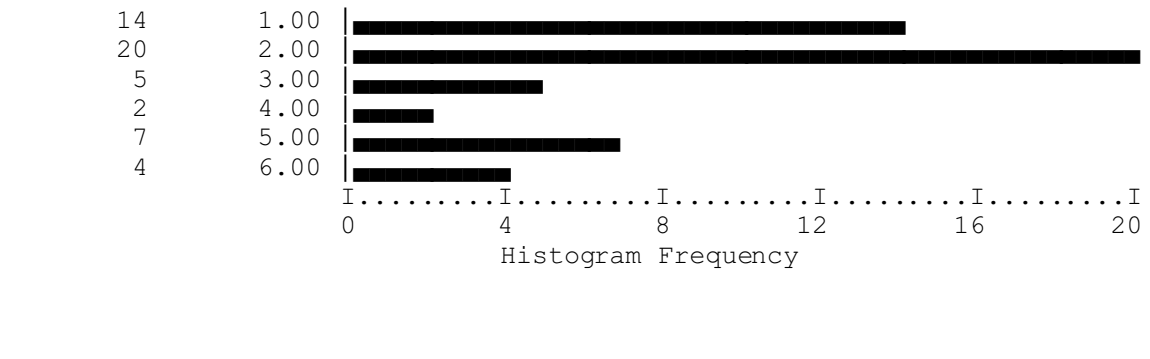
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	7	12.7	13.2	13.2
	2	19	34.5	35.8	49.1
	3	7	12.7	13.2	62.3
	4	7	12.7	13.2	75.5
	5	10	18.2	18.9	94.3
	6	3	5.5	5.7	100.0
	0	2	3.6	MISSING	
	TOTAL	55	100.0	100.0	

C2_3



C2_4

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	14	25.5	26.9	26.9
	2	20	36.4	38.5	65.4
	3	5	9.1	9.6	75.0
	4	2	3.6	3.8	78.8
	5	7	12.7	13.5	92.3
	6	4	7.3	7.7	100.0
	0	3	5.5	MISSING	
	TOTAL	55	100.0	100.0	

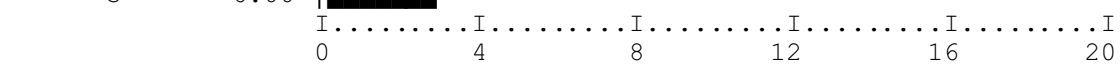


C2_5

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	20	36.4	37.7	37.7
	2	18	32.7	34.0	71.7
	3	4	7.3	7.5	79.2
	4	3	5.5	5.7	84.9
	5	5	9.1	9.4	94.3
	6	3	5.5	5.7	100.0
	0	2	3.6	MISSING	
	TOTAL	55	100.0	100.0	

C2_5

COUNT	VALUE	
20	1.00	
18	2.00	
4	3.00	
3	4.00	
5	5.00	
3	6.00	



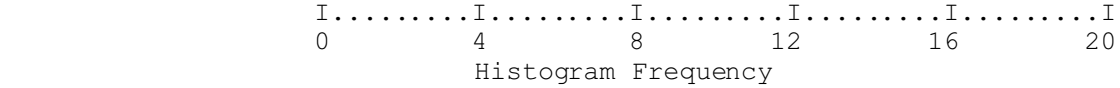
Histogram Frequency

C2_6

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	7	12.7	13.5	13.5
	2	17	30.9	32.7	46.2
	3	10	18.2	19.2	65.4
	4	6	10.9	11.5	76.9
	5	9	16.4	17.3	94.2
	6	3	5.5	5.8	100.0
	0	3	5.5	MISSING	
	TOTAL	55	100.0	100.0	

C2_6

COUNT	VALUE	
7	1.00	
17	2.00	
10	3.00	
6	4.00	
9	5.00	
3	6.00	



Histogram Frequency

C2_7

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	10	18.2	18.9	18.9
	2	14	25.5	26.4	45.3
	3	7	12.7	13.2	58.5
	4	7	12.7	13.2	71.7
	5	7	12.7	13.2	84.9
	6	8	14.5	15.1	100.0
	0	2	3.6	MISSING	
	TOTAL	55	100.0	100.0	

C2_7

COUNT	VALUE	
10	1.00	▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬
14	2.00	▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬
7	3.00	▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬
7	4.00	▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬
7	5.00	▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬
8	6.00	▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬

I.....I.....I.....I.....I.....I
0 4 8 12 16 20
Histogram Frequency

C2_8

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	21	38.2	38.9	38.9
	2	16	29.1	29.6	68.5
	3	13	23.6	24.1	92.6
	4	1	1.8	1.9	94.4
	5	1	1.8	1.9	96.3
	6	2	3.6	3.7	100.0
	0	1	1.8	MISSING	
	TOTAL	55	100.0	100.0	

C2_8

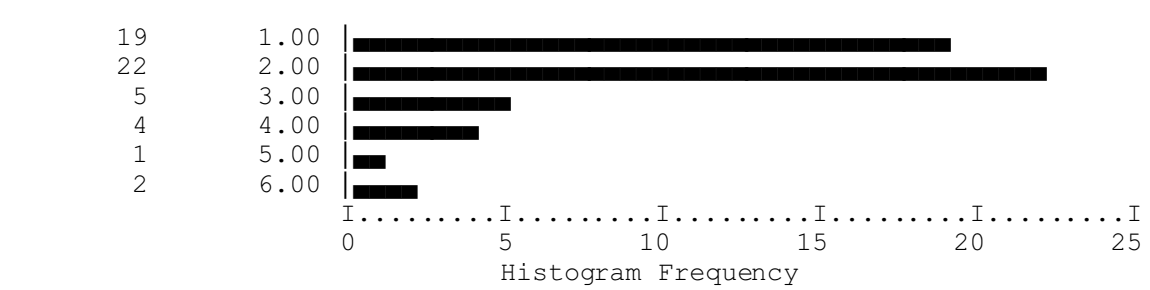
COUNT	VALUE	
21	1.00	▬▬
16	2.00	▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬
13	3.00	▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬
1	4.00	▬▬
1	5.00	▬▬
2	6.00	▬▬▬▬

I.....I.....I.....I.....I.....I
0 5 10 15 20 25
Histogram Frequency

C2_9

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	19	34.5	35.8	35.8
	2	22	40.0	41.5	77.4
	3	5	9.1	9.4	86.8
	4	4	7.3	7.5	94.3
	5	1	1.8	1.9	96.2
	6	2	3.6	3.8	100.0
	0	2	3.6	MISSING	
	TOTAL	55	100.0	100.0	

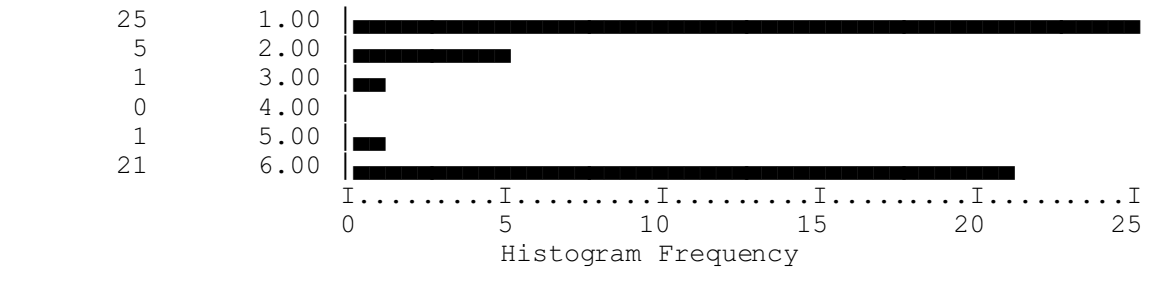
C2_9



C2_10

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	25	45.5	47.2	47.2
	2	5	9.1	9.4	56.6
	3	1	1.8	1.9	58.5
	5	1	1.8	1.9	60.4
	6	21	38.2	39.6	100.0
	0	2	3.6	MISSING	
	TOTAL	55	100.0	100.0	

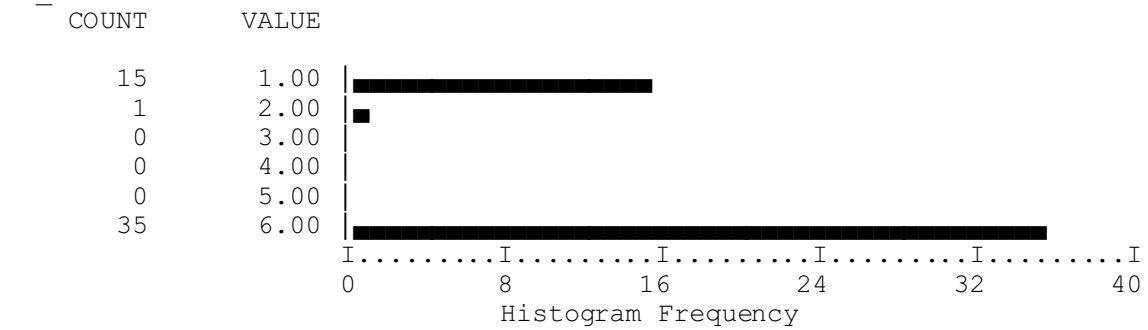
C2_10



C2_11

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	15	27.3	29.4	29.4
	2	1	1.8	2.0	31.4
	6	35	63.6	68.6	100.0
	0	4	7.3	MISSING	
	TOTAL	55	100.0	100.0	

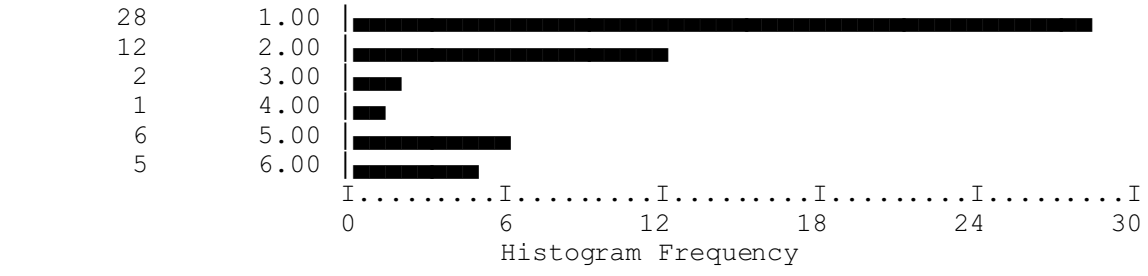
C2_11



C2_12

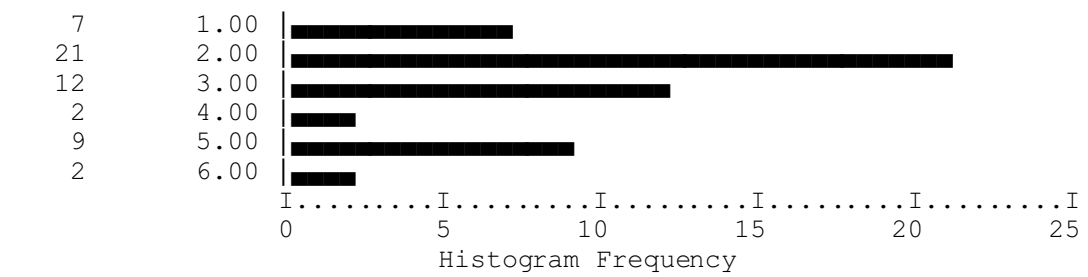
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	28	50.9	51.9	51.9
	2	12	21.8	22.2	74.1
	3	2	3.6	3.7	77.8
	4	1	1.8	1.9	79.6
	5	6	10.9	11.1	90.7
	6	5	9.1	9.3	100.0
	0	1	1.8	MISSING	
	TOTAL	55	100.0	100.0	

C2_12



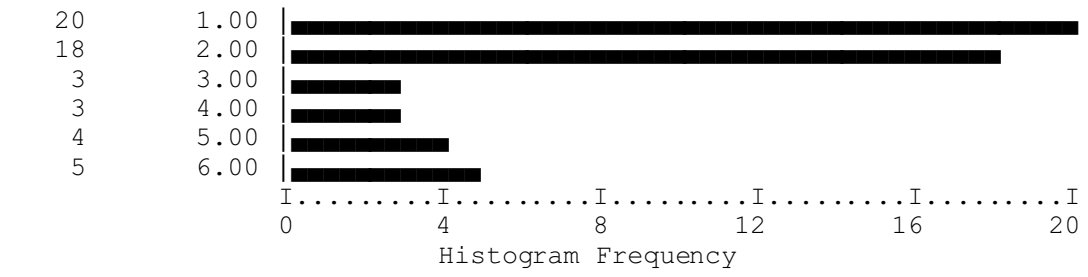
C2_13

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	7	12.7	13.2	13.2
	2	21	38.2	39.6	52.8
	3	12	21.8	22.6	75.5
	4	2	3.6	3.8	79.2
	5	9	16.4	17.0	96.2
	6	2	3.6	3.8	100.0
	0	2	3.6	MISSING	
	TOTAL	55	100.0	100.0	



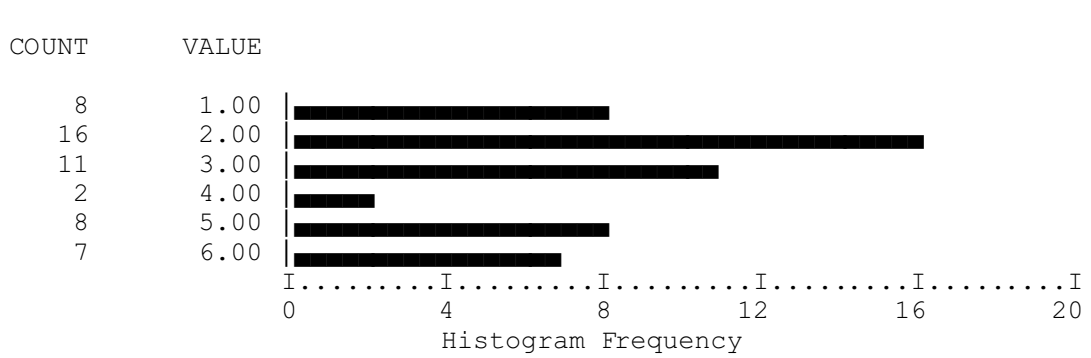
C2_14

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	20	36.4	37.7	37.7
	2	18	32.7	34.0	71.7
	3	3	5.5	5.7	77.4
	4	3	5.5	5.7	83.0
	5	4	7.3	7.5	90.6
	6	5	9.1	9.4	100.0
	0	2	3.6	MISSING	
	TOTAL	55	100.0	100.0	



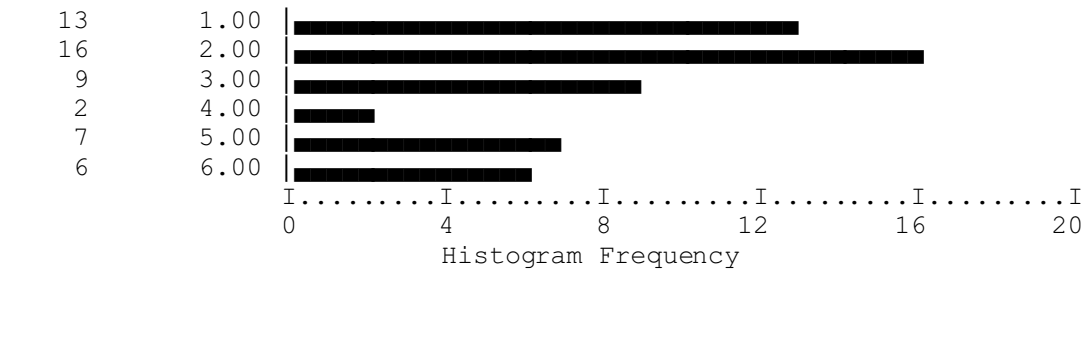
C2_15

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	8	14.5	15.4	15.4
	2	16	29.1	30.8	46.2
	3	11	20.0	21.2	67.3
	4	2	3.6	3.8	71.2
	5	8	14.5	15.4	86.5
	6	7	12.7	13.5	100.0
	0	3	5.5	MISSING	
	TOTAL	55	100.0	100.0	



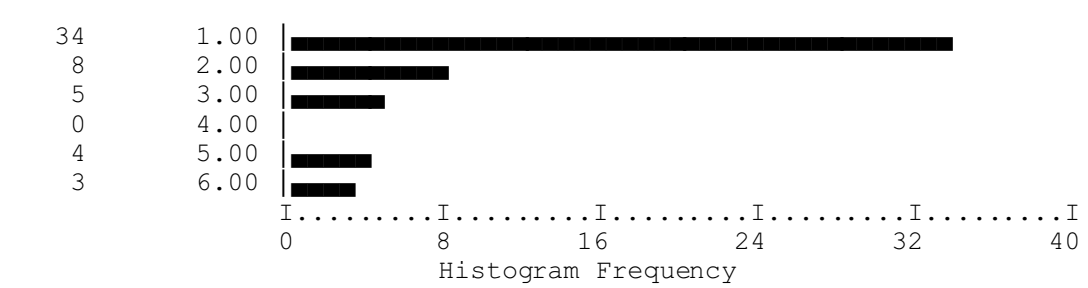
C2_16

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	13	23.6	24.5	24.5
	2	16	29.1	30.2	54.7
	3	9	16.4	17.0	71.7
	4	2	3.6	3.8	75.5
	5	7	12.7	13.2	88.7
	6	6	10.9	11.3	100.0
	0	2	3.6	MISSING	
	TOTAL	55	100.0	100.0	



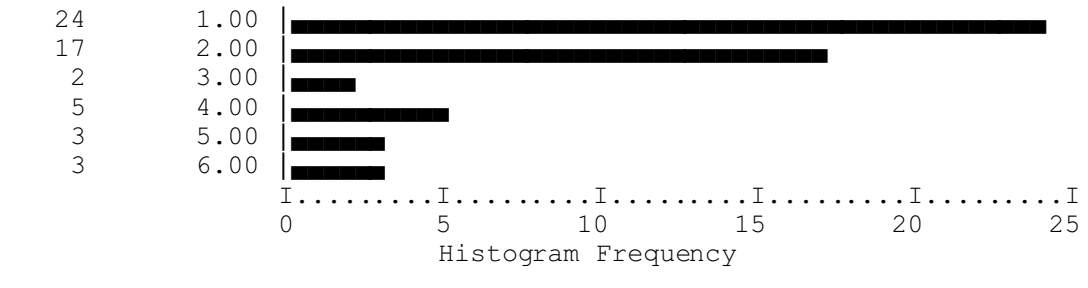
C2_17

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	34	61.8	63.0	63.0
	2	8	14.5	14.8	77.8
	3	5	9.1	9.3	87.0
	5	4	7.3	7.4	94.4
	6	3	5.5	5.6	100.0
	0	1	1.8	MISSING	
	TOTAL	55	100.0	100.0	



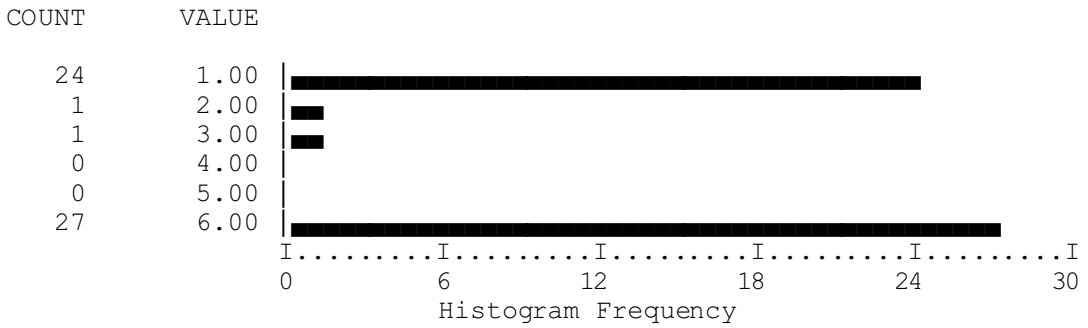
C2_18

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	24	43.6	44.4	44.4
	2	17	30.9	31.5	75.9
	3	2	3.6	3.7	79.6
	4	5	9.1	9.3	88.9
	5	3	5.5	5.6	94.4
	6	3	5.5	5.6	100.0
	0	1	1.8	MISSING	
	TOTAL	55	100.0	100.0	



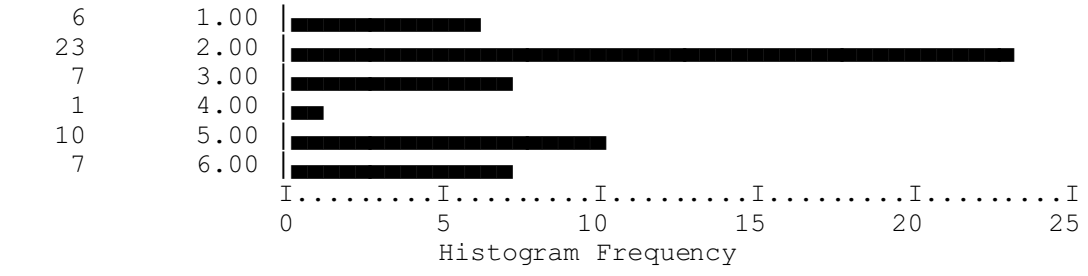
C2_19

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	24	43.6	45.3	45.3
	2	1	1.8	1.9	47.2
	3	1	1.8	1.9	49.1
	6	27	49.1	50.9	100.0
	0	2	3.6	MISSING	
	TOTAL	55	100.0	100.0	



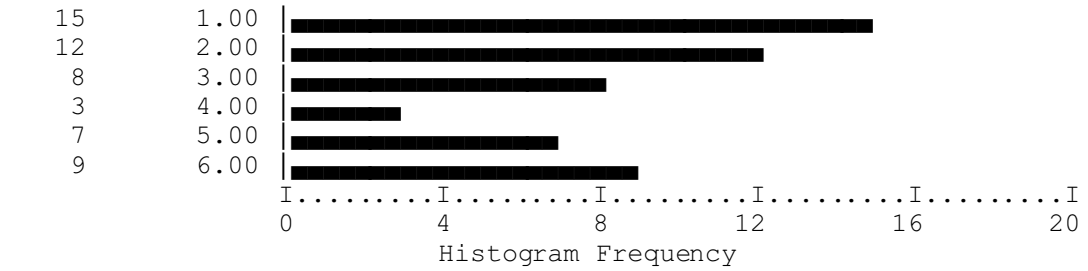
C2_20

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	6	10.9	11.1	11.1
	2	23	41.8	42.6	53.7
	3	7	12.7	13.0	66.7
	4	1	1.8	1.9	68.5
	5	10	18.2	18.5	87.0
	6	7	12.7	13.0	100.0
	0	1	1.8	MISSING	
	TOTAL	55	100.0	100.0	



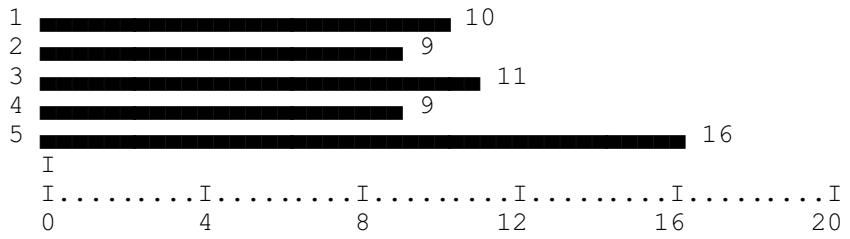
C2_21

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	15	27.3	27.8	27.8
	2	12	21.8	22.2	50.0
	3	8	14.5	14.8	64.8
	4	3	5.5	5.6	70.4
	5	7	12.7	13.0	83.3
	6	9	16.4	16.7	100.0
	0	1	1.8	MISSING	
	TOTAL	55	100.0	100.0	



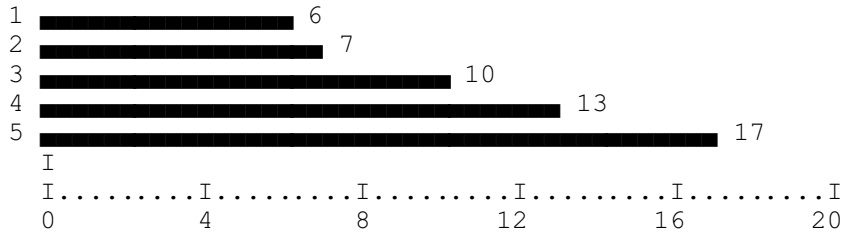
C3_1

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	10	18.2	18.2	18.2
	2	9	16.4	16.4	34.5
	3	11	20.0	20.0	54.5
	4	9	16.4	16.4	70.9
	5	16	29.1	29.1	100.0
	TOTAL	55	100.0	100.0	



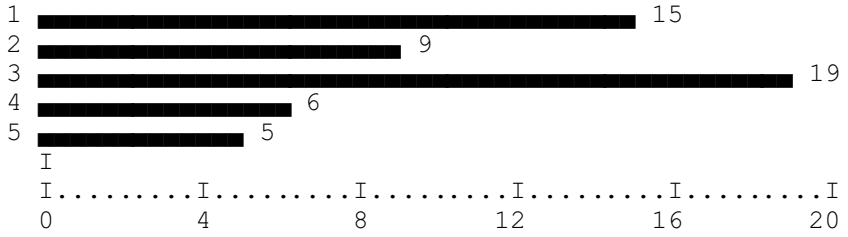
C3_2

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	6	10.9	11.3	11.3
	2	7	12.7	13.2	24.5
	3	10	18.2	18.9	43.4
	4	13	23.6	24.5	67.9
	5	17	30.9	32.1	100.0
	0	2	3.6	MISSING	
	TOTAL	55	100.0	100.0	



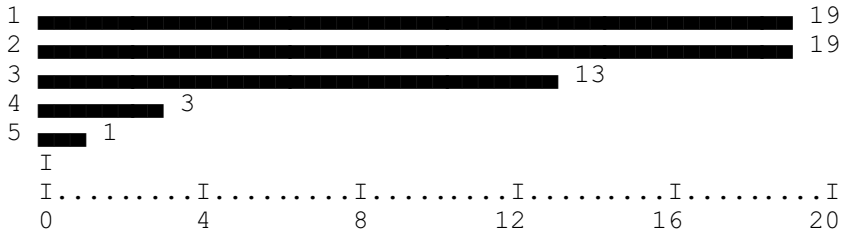
C3_3

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	15	27.3	27.8	27.8
	2	9	16.4	16.7	44.4
	3	19	34.5	35.2	79.6
	4	6	10.9	11.1	90.7
	5	5	9.1	9.3	100.0
	0	1	1.8	MISSING	
	TOTAL	55	100.0	100.0	



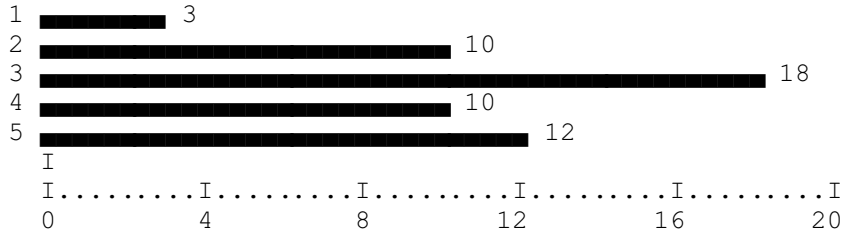
C3_4

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	19	34.5	34.5	34.5
	2	19	34.5	34.5	69.1
	3	13	23.6	23.6	92.7
	4	3	5.5	5.5	98.2
	5	1	1.8	1.8	100.0
	TOTAL	55	100.0	100.0	



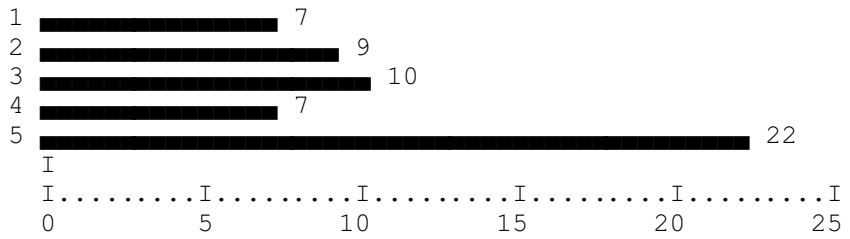
C3_5

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	3	5.5	5.7	5.7
	2	10	18.2	18.9	24.5
	3	18	32.7	34.0	58.5
	4	10	18.2	18.9	77.4
	5	12	21.8	22.6	100.0
	0	2	3.6	MISSING	
	TOTAL	55	100.0	100.0	



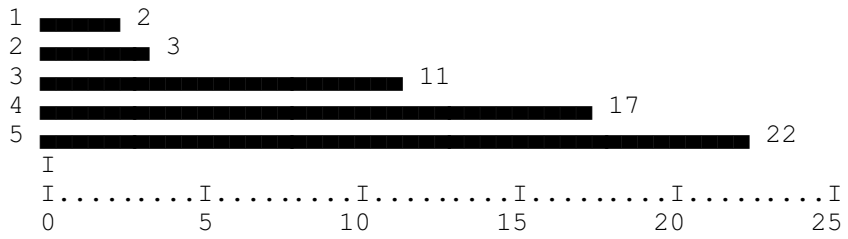
C3_6

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	7	12.7	12.7	12.7
	2	9	16.4	16.4	29.1
	3	10	18.2	18.2	47.3
	4	7	12.7	12.7	60.0
	5	22	40.0	40.0	100.0
	TOTAL	55	100.0	100.0	



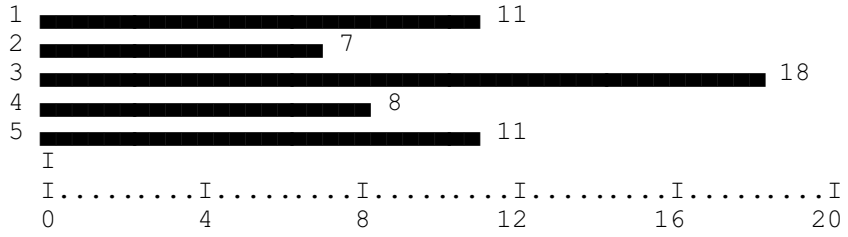
C3_7

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	2	3.6	3.6	3.6
	2	3	5.5	5.5	9.1
	3	11	20.0	20.0	29.1
	4	17	30.9	30.9	60.0
	5	22	40.0	40.0	100.0
	TOTAL	55	100.0	100.0	



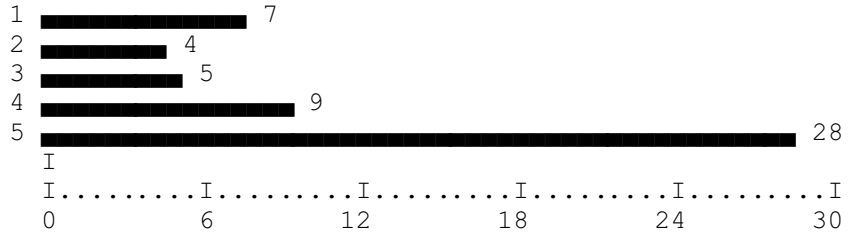
C3_8

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	11	20.0	20.0	20.0
	2	7	12.7	12.7	32.7
	3	18	32.7	32.7	65.5
	4	8	14.5	14.5	80.0
	5	11	20.0	20.0	100.0
	TOTAL	55	100.0	100.0	



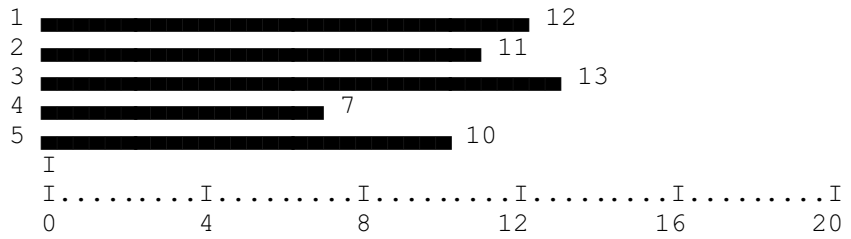
C3_9

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	7	12.7	13.2	13.2
	2	4	7.3	7.5	20.8
	3	5	9.1	9.4	30.2
	4	9	16.4	17.0	47.2
	5	28	50.9	52.8	100.0
	0	2	3.6	MISSING	
	TOTAL	55	100.0	100.0	



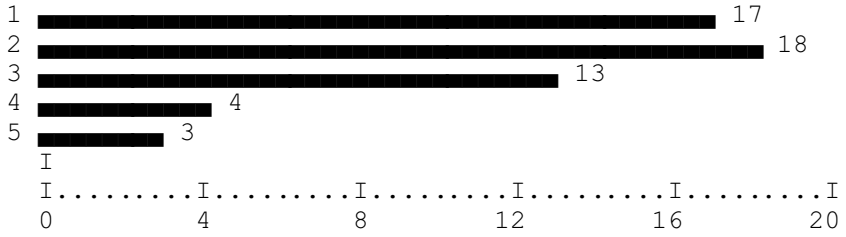
C3_10

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	12	21.8	22.6	22.6
	2	11	20.0	20.8	43.4
	3	13	23.6	24.5	67.9
	4	7	12.7	13.2	81.1
	5	10	18.2	18.9	100.0
	0	2	3.6	MISSING	
	TOTAL	55	100.0	100.0	



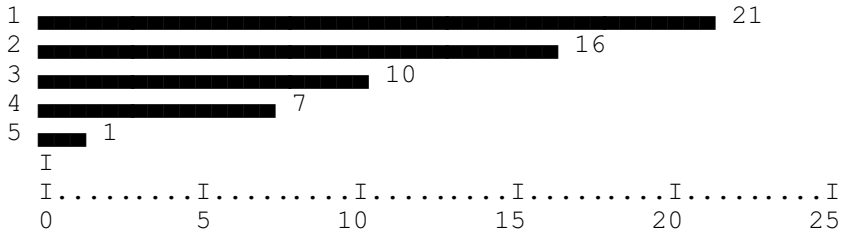
C3_11

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	17	30.9	30.9	30.9
	2	18	32.7	32.7	63.6
	3	13	23.6	23.6	87.3
	4	4	7.3	7.3	94.5
	5	3	5.5	5.5	100.0
	TOTAL	55	100.0	100.0	



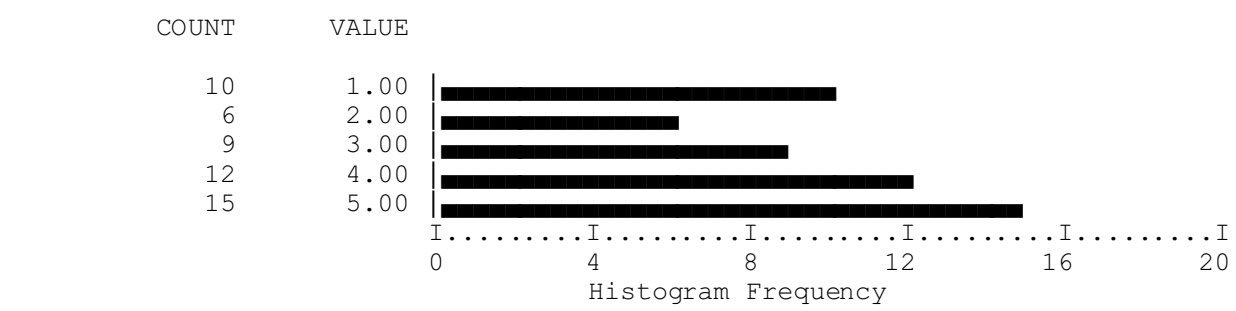
C3_12

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	21	38.2	38.2	38.2
	2	16	29.1	29.1	67.3
	3	10	18.2	18.2	85.5
	4	7	12.7	12.7	98.2
	5	1	1.8	1.8	100.0
	TOTAL	55	100.0	100.0	



C4_1

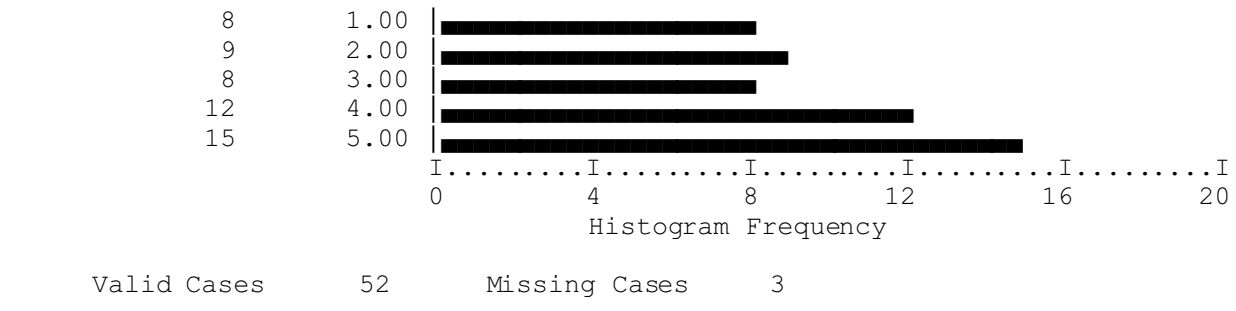
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	10	18.2	19.2	19.2
	2	6	10.9	11.5	30.8
	3	9	16.4	17.3	48.1
	4	12	21.8	23.1	71.2
	5	15	27.3	28.8	100.0
	0	3	5.5	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 52 Missing Cases 3

C4_2

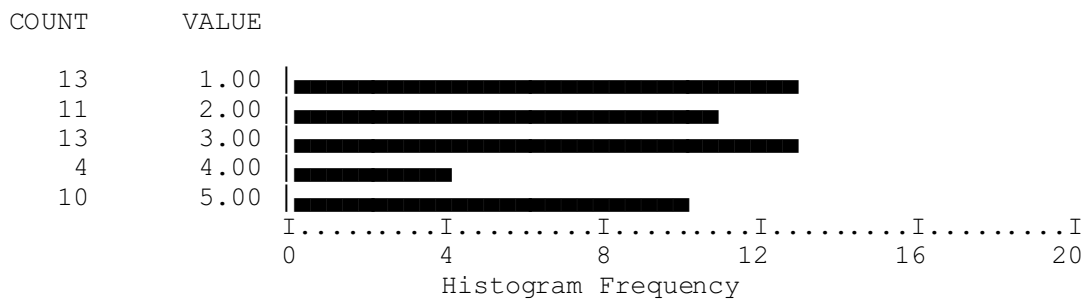
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	8	14.5	15.4	15.4
	2	9	16.4	17.3	32.7
	3	8	14.5	15.4	48.1
	4	12	21.8	23.1	71.2
	5	15	27.3	28.8	100.0
	0	3	5.5	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 52 Missing Cases 3

C4_3

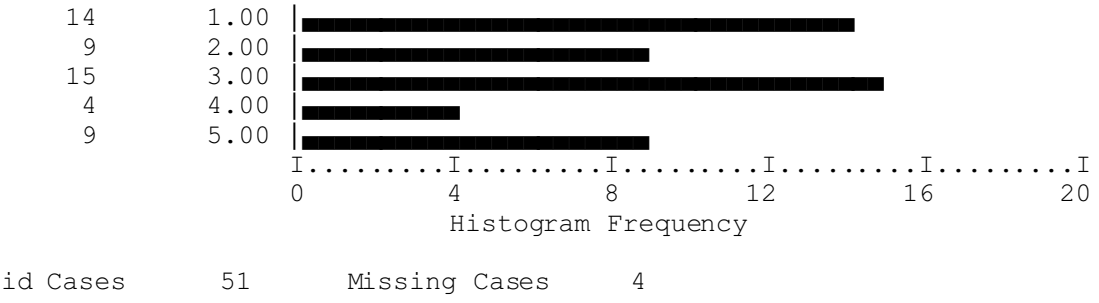
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	13	23.6	25.5	25.5
	2	11	20.0	21.6	47.1
	3	13	23.6	25.5	72.5
	4	4	7.3	7.8	80.4
	5	10	18.2	19.6	100.0
	0	4	7.3	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 51 Missing Cases 4

C4_4

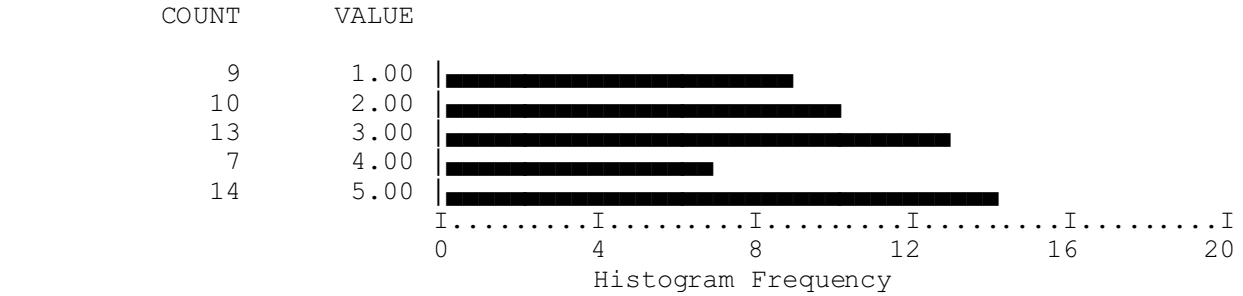
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	14	25.5	27.5	27.5
	2	9	16.4	17.6	45.1
	3	15	27.3	29.4	74.5
	4	4	7.3	7.8	82.4
	5	9	16.4	17.6	100.0
	0	4	7.3	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 51 Missing Cases 4

C4_5

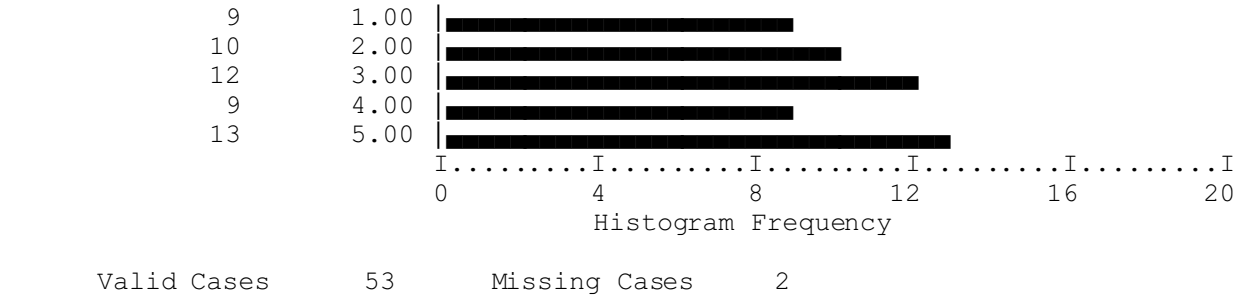
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	9	16.4	17.0	17.0
	2	10	18.2	18.9	35.8
	3	13	23.6	24.5	60.4
	4	7	12.7	13.2	73.6
	5	14	25.5	26.4	100.0
	0	2	3.6	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 53 Missing Cases 2

C4_6

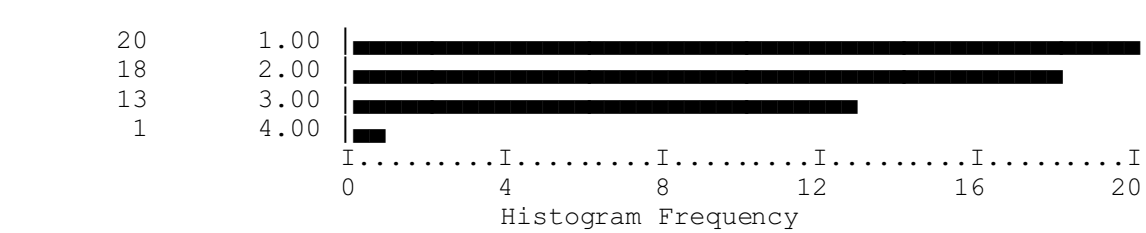
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	9	16.4	17.0	17.0
	2	10	18.2	18.9	35.8
	3	12	21.8	22.6	58.5
	4	9	16.4	17.0	75.5
	5	13	23.6	24.5	100.0
	0	2	3.6	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 53 Missing Cases 2

C4_7

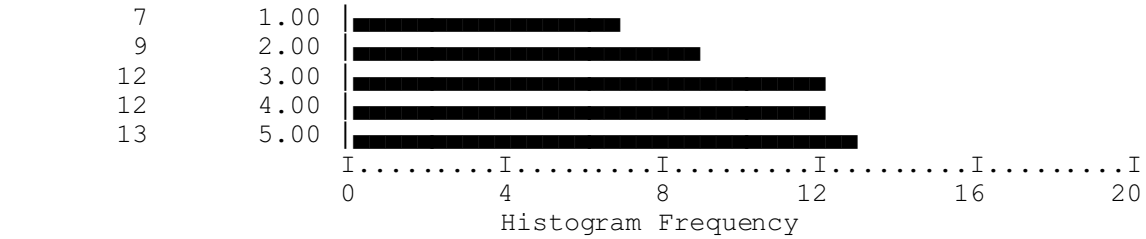
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	20	36.4	38.5	38.5
	2	18	32.7	34.6	73.1
	3	13	23.6	25.0	98.1
	4	1	1.8	1.9	100.0
	0	3	5.5	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 52 Missing Cases 3

C4_8

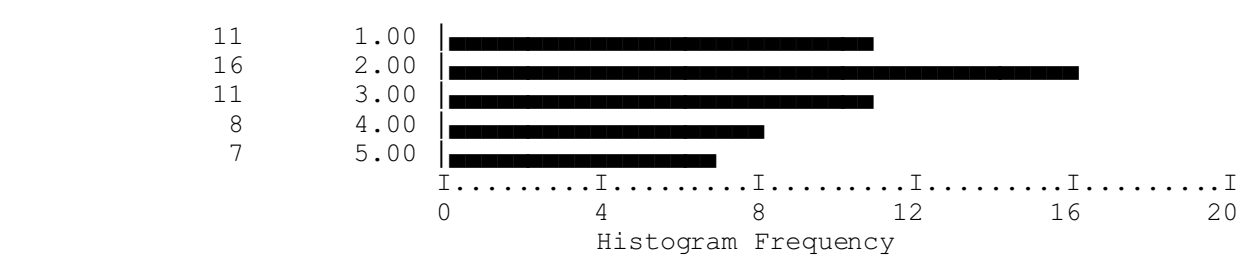
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	7	12.7	13.2	13.2
	2	9	16.4	17.0	30.2
	3	12	21.8	22.6	52.8
	4	12	21.8	22.6	75.5
	5	13	23.6	24.5	100.0
	0	2	3.6	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 53 Missing Cases 2

C4_9

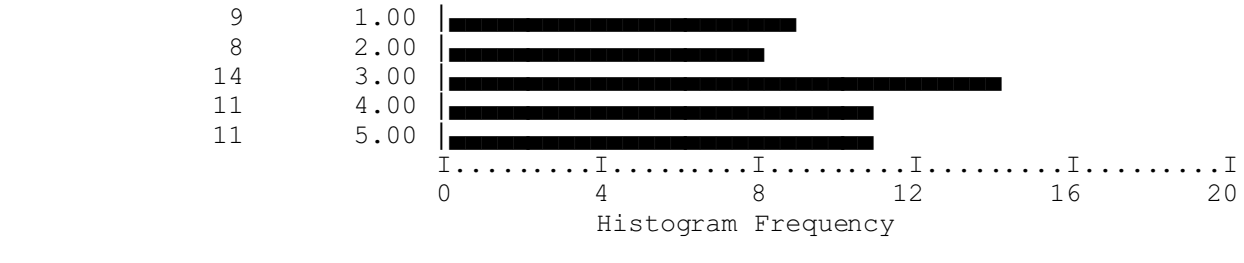
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	11	20.0	20.8	20.8
	2	16	29.1	30.2	50.9
	3	11	20.0	20.8	71.7
	4	8	14.5	15.1	86.8
	5	7	12.7	13.2	100.0
	0	2	3.6	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 53 Missing Cases 2

C4_10

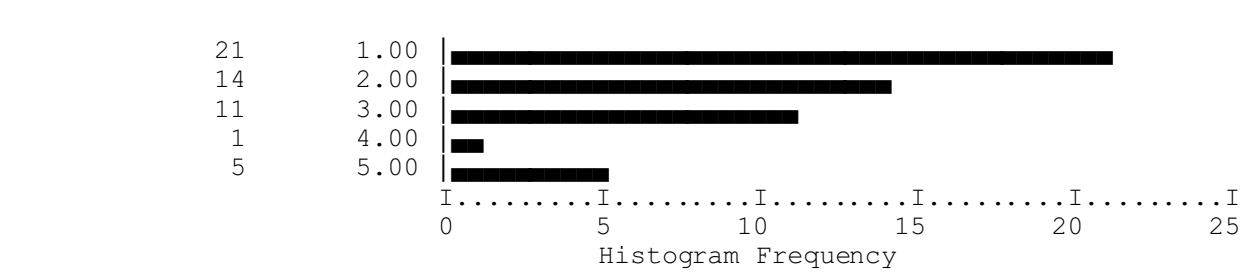
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	9	16.4	17.0	17.0
	2	8	14.5	15.1	32.1
	3	14	25.5	26.4	58.5
	4	11	20.0	20.8	79.2
	5	11	20.0	20.8	100.0
	0	2	3.6	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 53 Missing Cases 2

C4_11

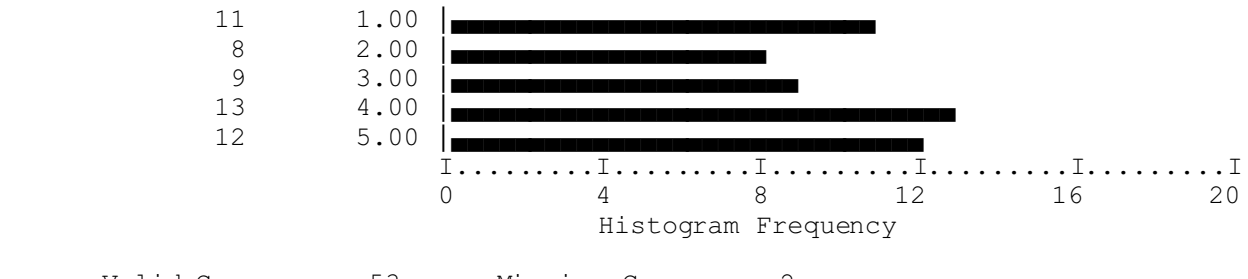
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	21	38.2	40.4	40.4
	2	14	25.5	26.9	67.3
	3	11	20.0	21.2	88.5
	4	1	1.8	1.9	90.4
	5	5	9.1	9.6	100.0
	0	3	5.5	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 52 Missing Cases 3

C4_12

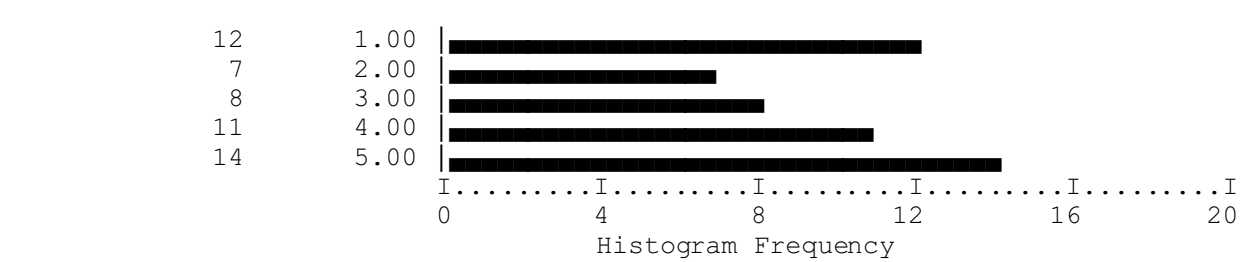
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	11	20.0	20.8	20.8
	2	8	14.5	15.1	35.8
	3	9	16.4	17.0	52.8
	4	13	23.6	24.5	77.4
	5	12	21.8	22.6	100.0
	0	2	3.6	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 53 Missing Cases 2

C4_13

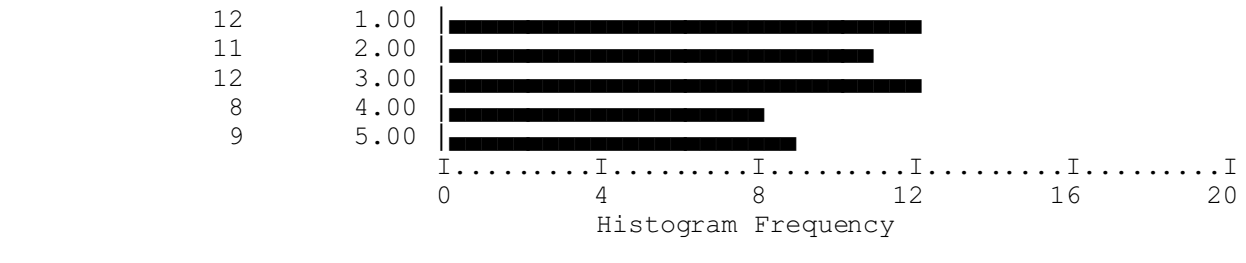
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	12	21.8	23.1	23.1
	2	7	12.7	13.5	36.5
	3	8	14.5	15.4	51.9
	4	11	20.0	21.2	73.1
	5	14	25.5	26.9	100.0
	0	3	5.5	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 52 Missing Cases 3

C4_14

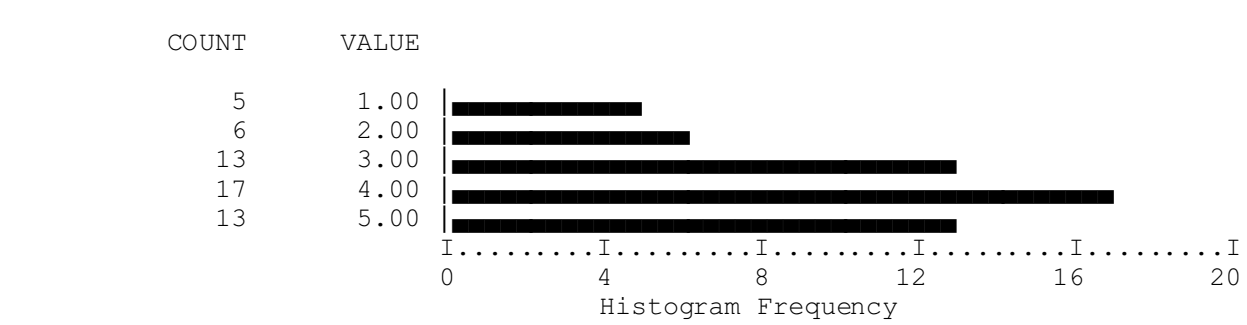
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	12	21.8	23.1	23.1
	2	11	20.0	21.2	44.2
	3	12	21.8	23.1	67.3
	4	8	14.5	15.4	82.7
	5	9	16.4	17.3	100.0
	0	3	5.5	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 52 Missing Cases 3

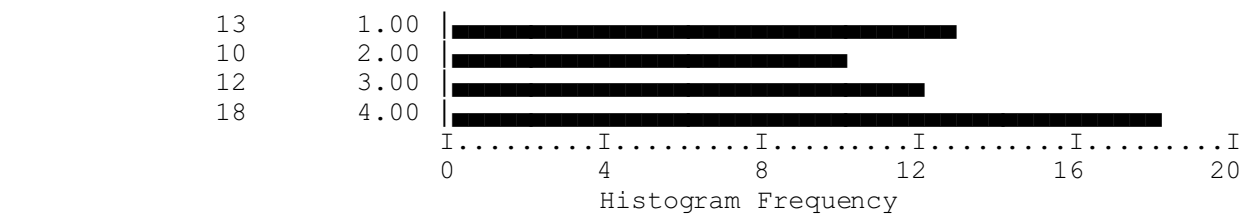
C5_1

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	5	9.1	9.3	9.3
	2	6	10.9	11.1	20.4
	3	13	23.6	24.1	44.4
	4	17	30.9	31.5	75.9
	5	13	23.6	24.1	100.0
	0	1	1.8	MISSING	
	TOTAL	55	100.0	100.0	



C5_2

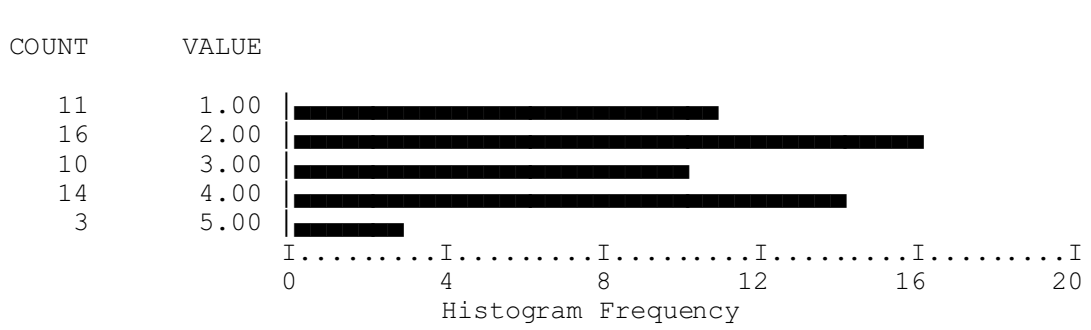
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	13	23.6	24.5	24.5
	2	10	18.2	18.9	43.4
	3	12	21.8	22.6	66.0
	4	18	32.7	34.0	100.0
	0	2	3.6	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 53 Missing Cases 2

C5_3

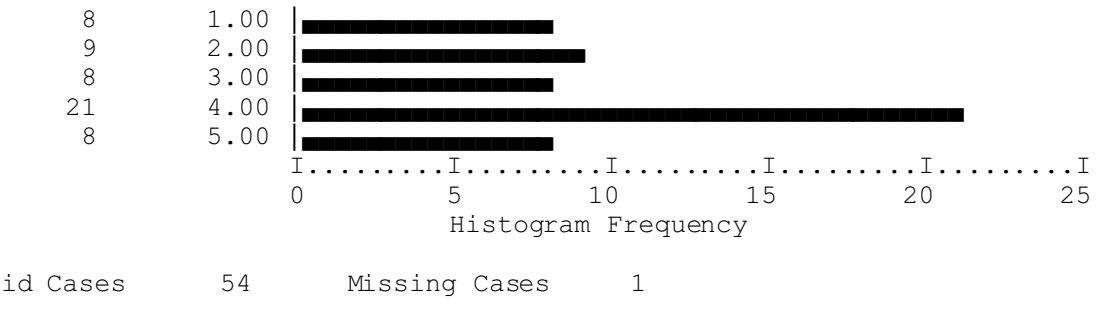
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	11	20.0	20.4	20.4
	2	16	29.1	29.6	50.0
	3	10	18.2	18.5	68.5
	4	14	25.5	25.9	94.4
	5	3	5.5	5.6	100.0
	0	1	1.8	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 54 Missing Cases 1

C5_4

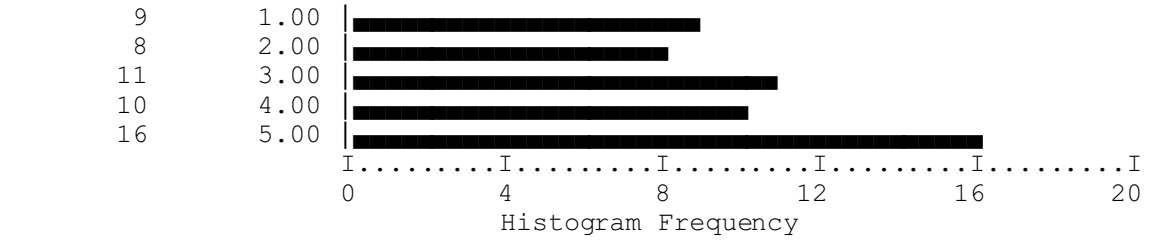
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	8	14.5	14.8	14.8
	2	9	16.4	16.7	31.5
	3	8	14.5	14.8	46.3
	4	21	38.2	38.9	85.2
	5	8	14.5	14.8	100.0
	0	1	1.8	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 54 Missing Cases 1

C5_5

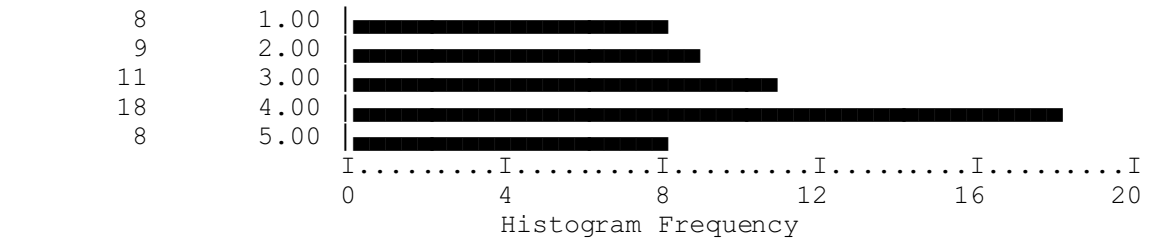
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	9	16.4	16.7	16.7
	2	8	14.5	14.8	31.5
	3	11	20.0	20.4	51.9
	4	10	18.2	18.5	70.4
	5	16	29.1	29.6	100.0
	0	1	1.8	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 54 Missing Cases 1

C5_6

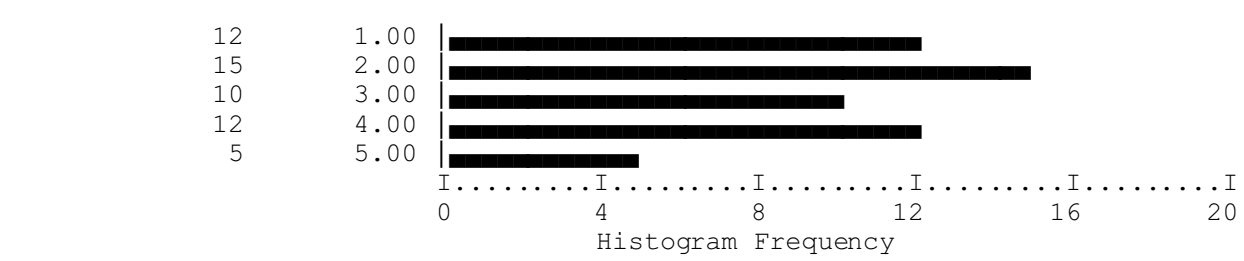
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	8	14.5	14.8	14.8
	2	9	16.4	16.7	31.5
	3	11	20.0	20.4	51.9
	4	18	32.7	33.3	85.2
	5	8	14.5	14.8	100.0
	0	1	1.8	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 54 Missing Cases 1

C5_7

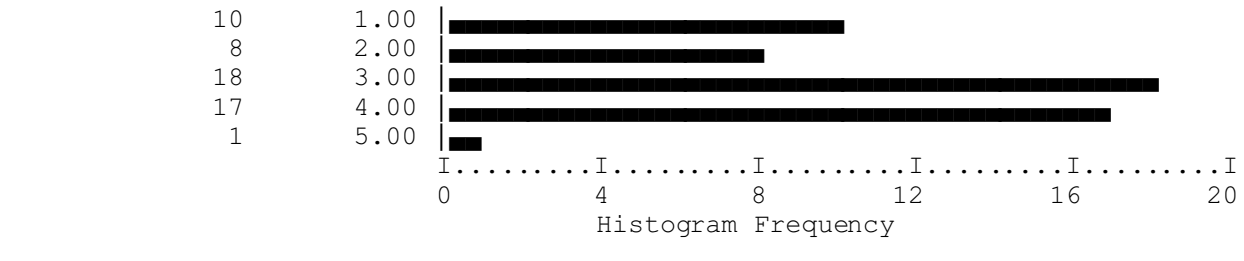
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	12	21.8	22.2	22.2
	2	15	27.3	27.8	50.0
	3	10	18.2	18.5	68.5
	4	12	21.8	22.2	90.7
	5	5	9.1	9.3	100.0
	0	1	1.8	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 54 Missing Cases 1

C5_8

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	10	18.2	18.5	18.5
	2	8	14.5	14.8	33.3
	3	18	32.7	33.3	66.7
	4	17	30.9	31.5	98.1
	5	1	1.8	1.9	100.0
	0	1	1.8	MISSING	
	TOTAL	55	100.0	100.0	

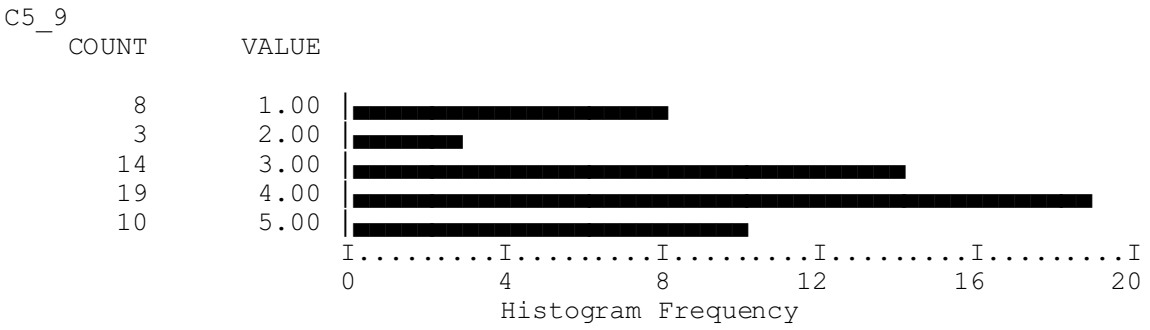


Valid Cases 54 Missing Cases 1

C5_9

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	8	14.5	14.8	14.8
	2	3	5.5	5.6	20.4
	3	14	25.5	25.9	46.3
	4	19	34.5	35.2	81.5
	5	10	18.2	18.5	100.0
	0	1	1.8	MISSING	
	TOTAL	55	100.0	100.0	

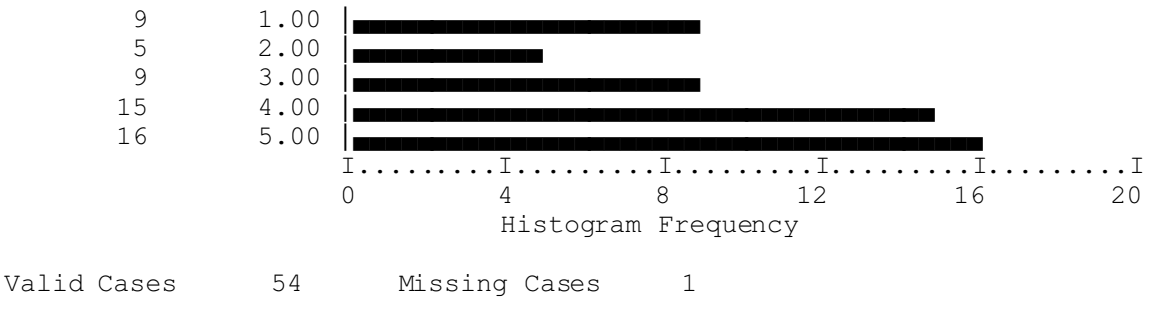
C5_9



Valid Cases 54 Missing Cases 1

C5_10

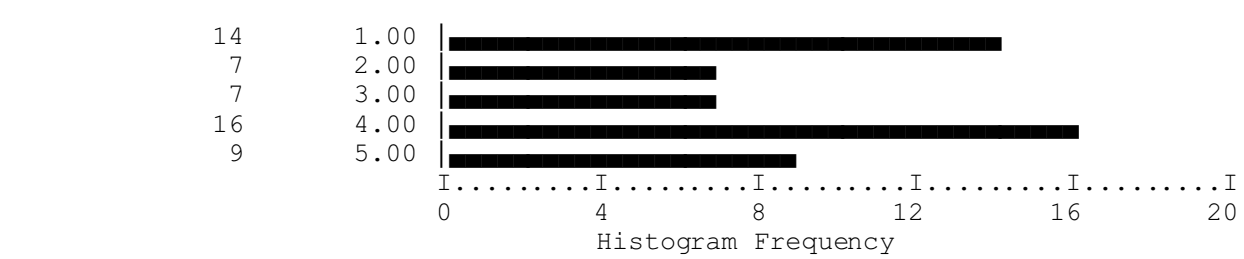
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	9	16.4	16.7	16.7
	2	5	9.1	9.3	25.9
	3	9	16.4	16.7	42.6
	4	15	27.3	27.8	70.4
	5	16	29.1	29.6	100.0
	0	1	1.8	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 54 Missing Cases 1

C5_11

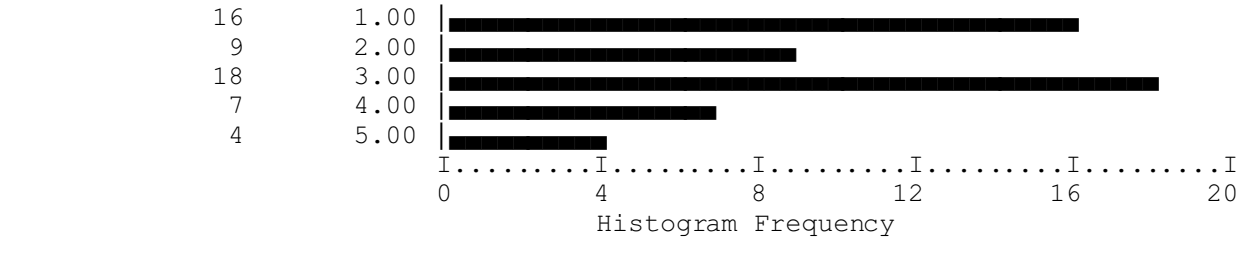
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	14	25.5	26.4	26.4
	2	7	12.7	13.2	39.6
	3	7	12.7	13.2	52.8
	4	16	29.1	30.2	83.0
	5	9	16.4	17.0	100.0
	0	2	3.6	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 53 Missing Cases 2

C5_12

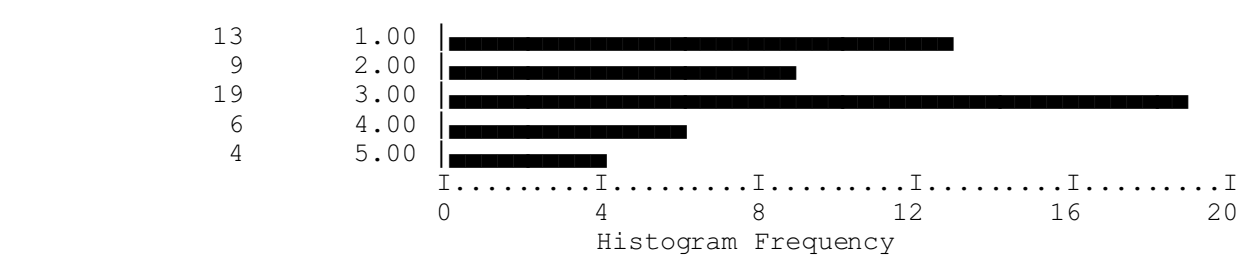
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	16	29.1	29.6	29.6
	2	9	16.4	16.7	46.3
	3	18	32.7	33.3	79.6
	4	7	12.7	13.0	92.6
	5	4	7.3	7.4	100.0
	0	1	1.8	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 54 Missing Cases 1

C6_1

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	13	23.6	25.5	25.5
	2	9	16.4	17.6	43.1
	3	19	34.5	37.3	80.4
	4	6	10.9	11.8	92.2
	5	4	7.3	7.8	100.0
	0	4	7.3	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 51 Missing Cases 4

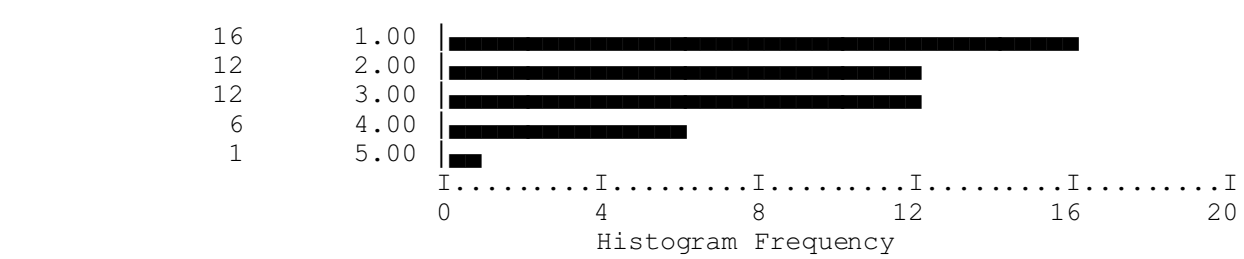
C6_2

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	14	25.5	26.9	26.9
	2	16	29.1	30.8	57.7
	3	14	25.5	26.9	84.6
	4	6	10.9	11.5	96.2
	5	2	3.6	3.8	100.0
	0	3	5.5	MISSING	
	TOTAL	55	100.0	100.0	

Valid Cases 52 Missing Cases 3

C6_3

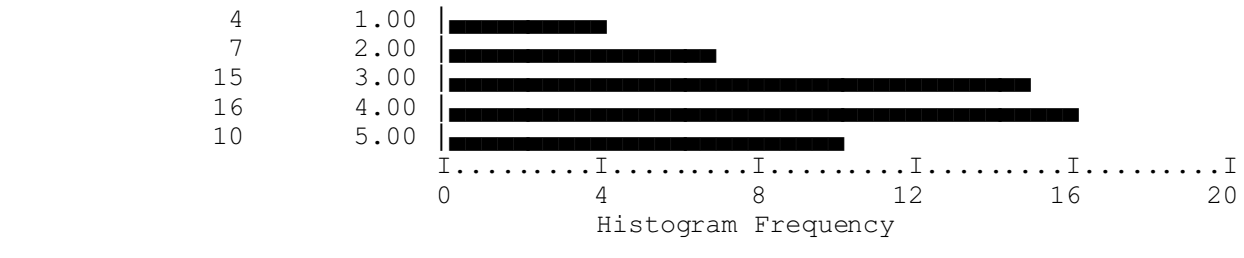
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	16	29.1	34.0	34.0
	2	12	21.8	25.5	59.6
	3	12	21.8	25.5	85.1
	4	6	10.9	12.8	97.9
	5	1	1.8	2.1	100.0
	0	8	14.5	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 47 Missing Cases 8

C6_4

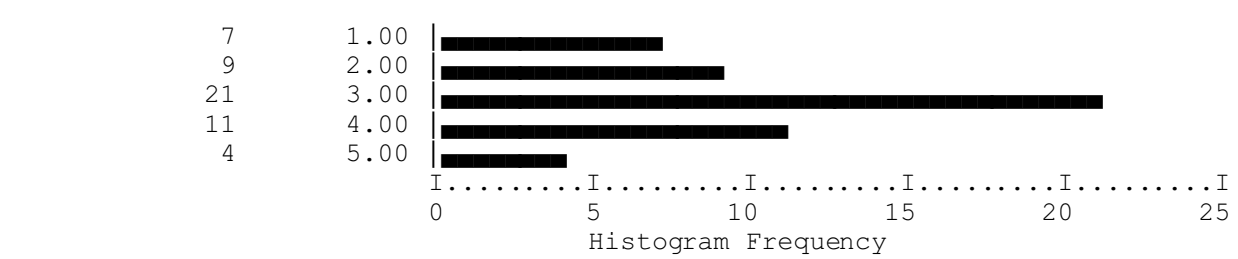
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	4	7.3	7.7	7.7
	2	7	12.7	13.5	21.2
	3	15	27.3	28.8	50.0
	4	16	29.1	30.8	80.8
	5	10	18.2	19.2	100.0
	0	3	5.5	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 52 Missing Cases 3

C6_5

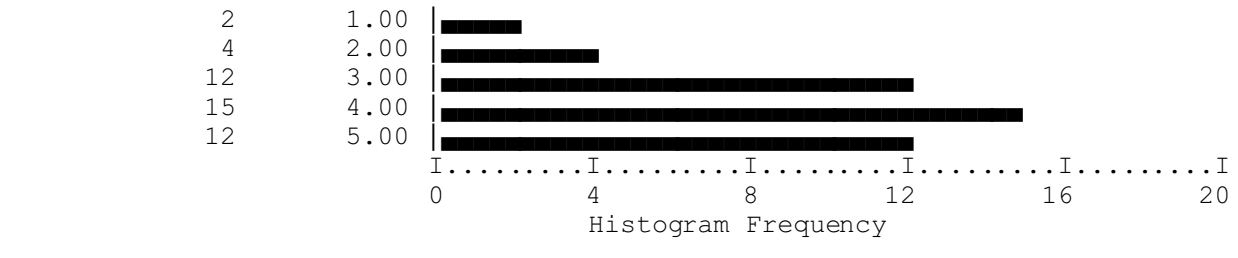
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	7	12.7	13.5	13.5
	2	9	16.4	17.3	30.8
	3	21	38.2	40.4	71.2
	4	11	20.0	21.2	92.3
	5	4	7.3	7.7	100.0
	0	3	5.5	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 52 Missing Cases 3

C6_6

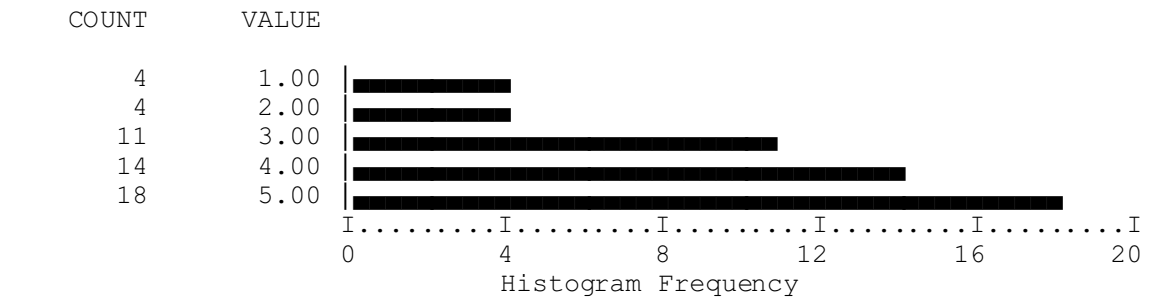
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	2	3.6	4.4	4.4
	2	4	7.3	8.9	13.3
	3	12	21.8	26.7	40.0
	4	15	27.3	33.3	73.3
	5	12	21.8	26.7	100.0
	0	10	18.2	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 45 Missing Cases 10

C6_7

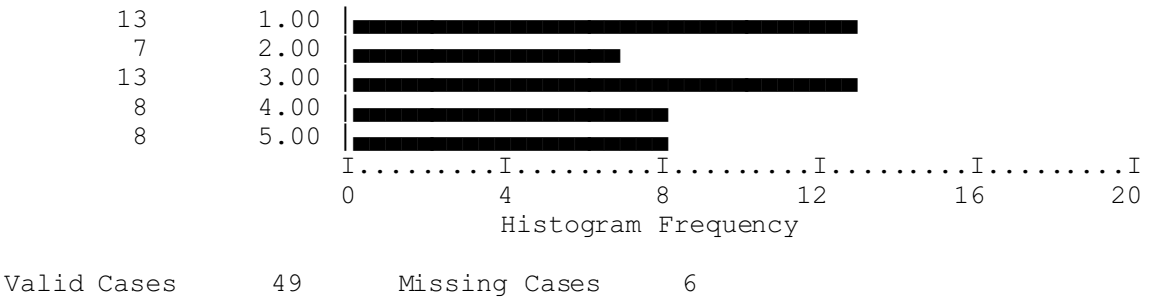
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	4	7.3	7.8	7.8
	2	4	7.3	7.8	15.7
	3	11	20.0	21.6	37.3
	4	14	25.5	27.5	64.7
	5	18	32.7	35.3	100.0
	0	4	7.3	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 51 Missing Cases 4

C6_8

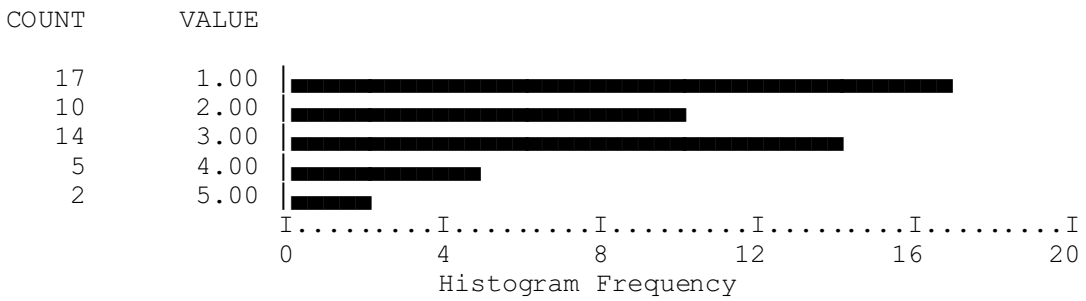
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	13	23.6	26.5	26.5
	2	7	12.7	14.3	40.8
	3	13	23.6	26.5	67.3
	4	8	14.5	16.3	83.7
	5	8	14.5	16.3	100.0
	0	6	10.9	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 49 Missing Cases 6

C6_9

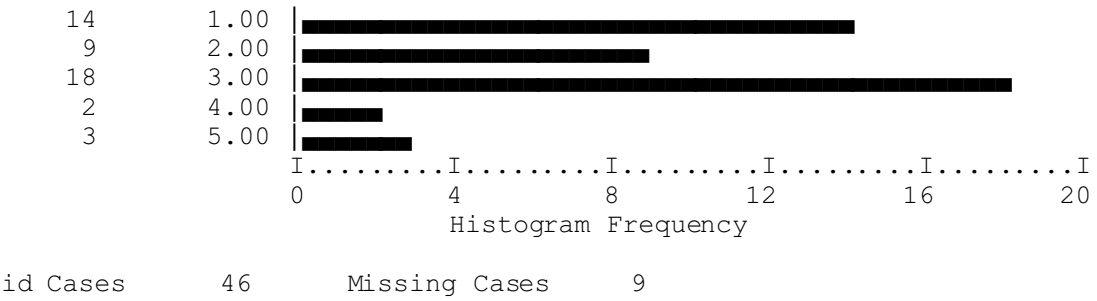
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	17	30.9	35.4	35.4
	2	10	18.2	20.8	56.3
	3	14	25.5	29.2	85.4
	4	5	9.1	10.4	95.8
	5	2	3.6	4.2	100.0
	0	7	12.7	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 48 Missing Cases 7

C6_10

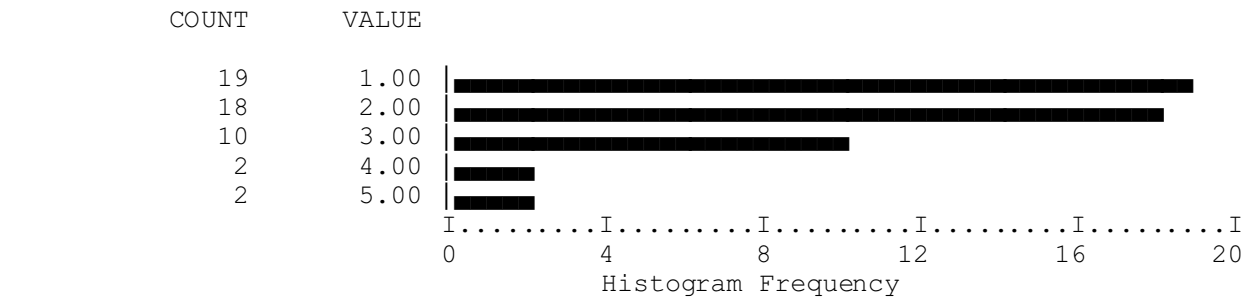
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	14	25.5	30.4	30.4
	2	9	16.4	19.6	50.0
	3	18	32.7	39.1	89.1
	4	2	3.6	4.3	93.5
	5	3	5.5	6.5	100.0
	0	9	16.4	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 46 Missing Cases 9

C6_11

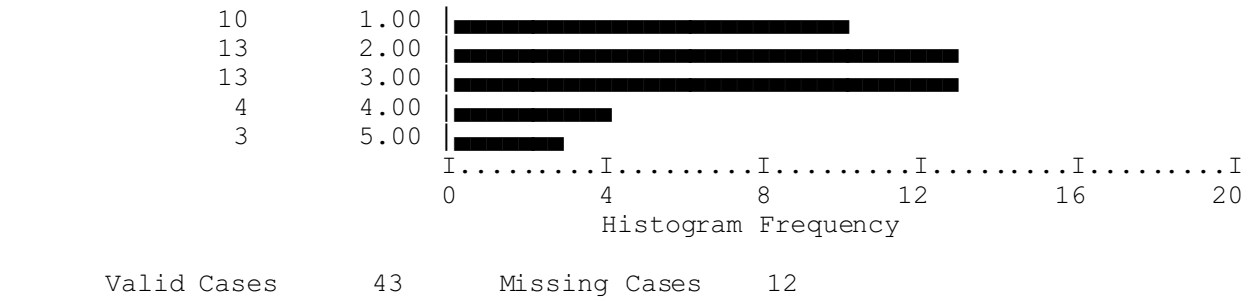
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	19	34.5	37.3	37.3
	2	18	32.7	35.3	72.5
	3	10	18.2	19.6	92.2
	4	2	3.6	3.9	96.1
	5	2	3.6	3.9	100.0
	0	4	7.3	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 51 Missing Cases 4

C6_12

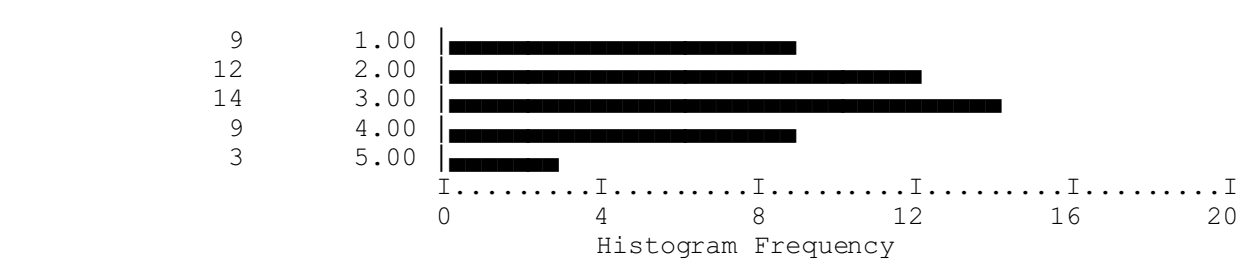
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	10	18.2	23.3	23.3
	2	13	23.6	30.2	53.5
	3	13	23.6	30.2	83.7
	4	4	7.3	9.3	93.0
	5	3	5.5	7.0	100.0
	0	12	21.8	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 43 Missing Cases 12

C6_13

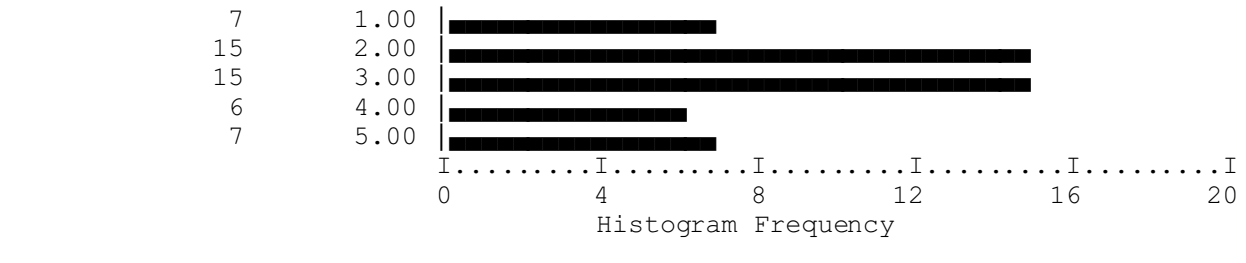
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	9	16.4	19.1	19.1
	2	12	21.8	25.5	44.7
	3	14	25.5	29.8	74.5
	4	9	16.4	19.1	93.6
	5	3	5.5	6.4	100.0
	0	8	14.5	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 47 Missing Cases 8

C6_14

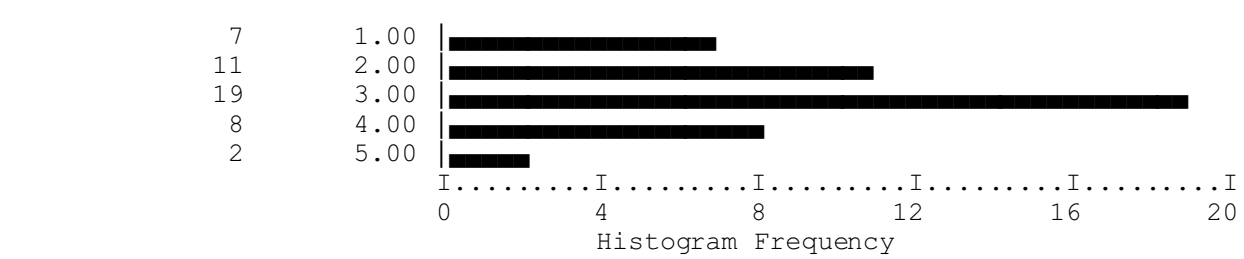
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	7	12.7	14.0	14.0
	2	15	27.3	30.0	44.0
	3	15	27.3	30.0	74.0
	4	6	10.9	12.0	86.0
	5	7	12.7	14.0	100.0
	0	5	9.1	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 50 Missing Cases 5

C6_15

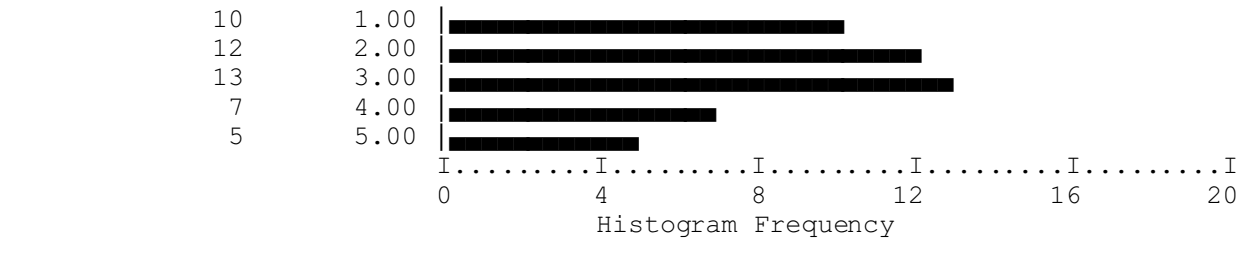
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	7	12.7	14.9	14.9
	2	11	20.0	23.4	38.3
	3	19	34.5	40.4	78.7
	4	8	14.5	17.0	95.7
	5	2	3.6	4.3	100.0
	0	8	14.5	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 47 Missing Cases 8

C6_16

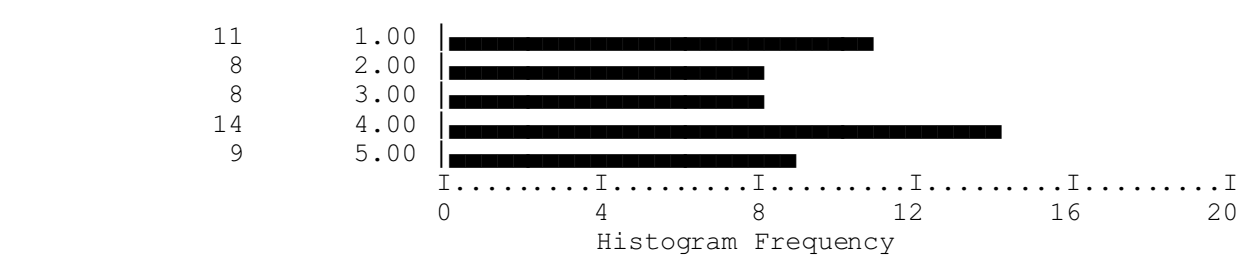
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	10	18.2	21.3	21.3
	2	12	21.8	25.5	46.8
	3	13	23.6	27.7	74.5
	4	7	12.7	14.9	89.4
	5	5	9.1	10.6	100.0
	0	8	14.5	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 47 Missing Cases 8

C6_17

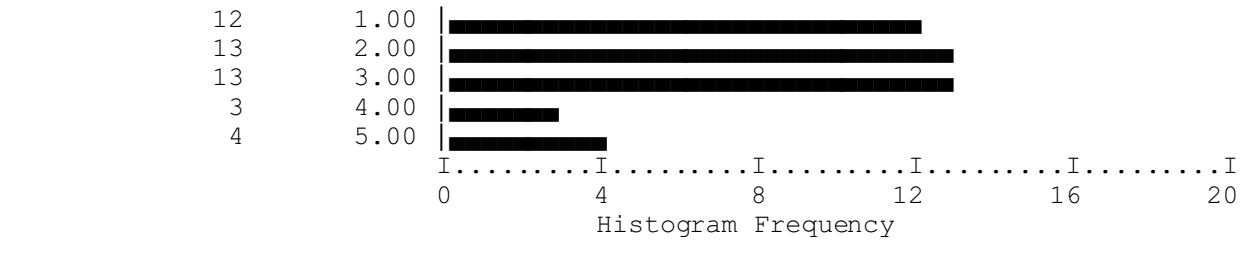
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	11	20.0	22.0	22.0
	2	8	14.5	16.0	38.0
	3	8	14.5	16.0	54.0
	4	14	25.5	28.0	82.0
	5	9	16.4	18.0	100.0
	0	5	9.1	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 50 Missing Cases 5

C6_18

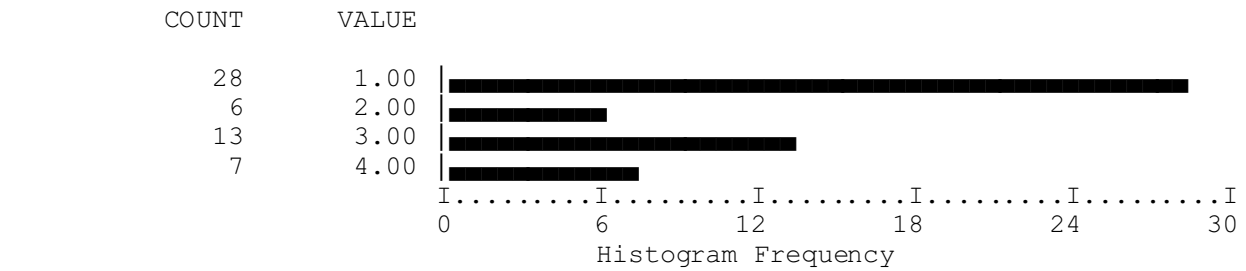
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	12	21.8	26.7	26.7
	2	13	23.6	28.9	55.6
	3	13	23.6	28.9	84.4
	4	3	5.5	6.7	91.1
	5	4	7.3	8.9	100.0
	0	10	18.2	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 45 Missing Cases 10

C7_1

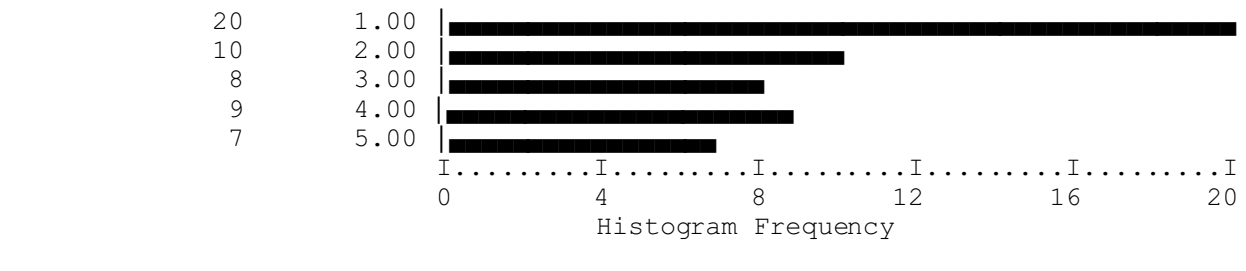
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	28	50.9	51.9	51.9
	2	6	10.9	11.1	63.0
	3	13	23.6	24.1	87.0
	4	7	12.7	13.0	100.0
	0	1	1.8	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 54 Missing Cases 1

C7_2

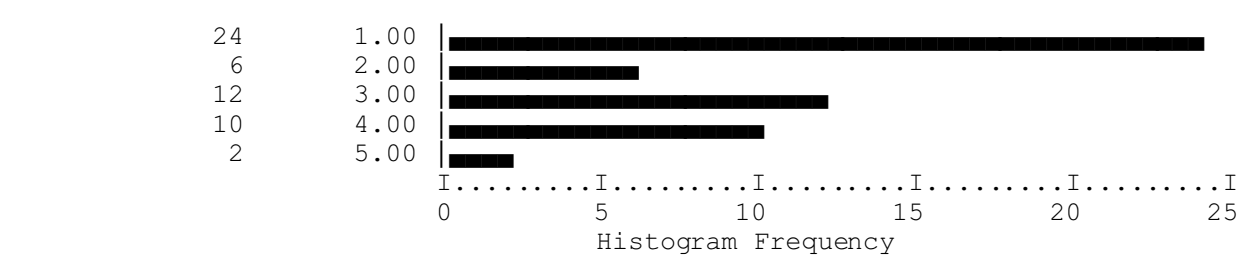
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	20	36.4	37.0	37.0
	2	10	18.2	18.5	55.6
	3	8	14.5	14.8	70.4
	4	9	16.4	16.7	87.0
	5	7	12.7	13.0	100.0
	0	1	1.8	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 54 Missing Cases 1

C7_3

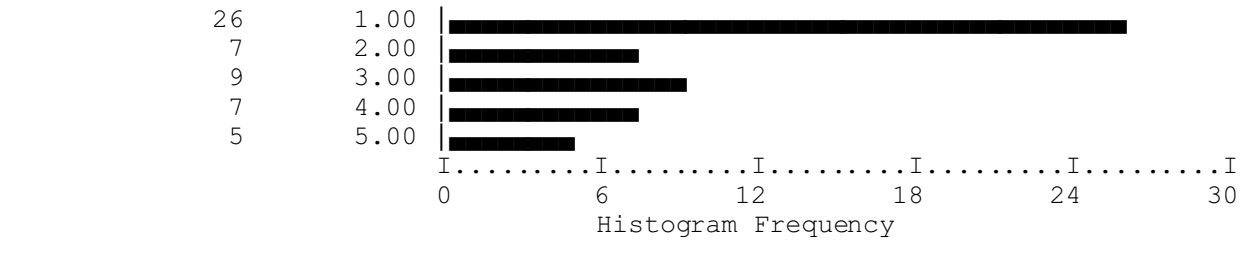
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	24	43.6	44.4	44.4
	2	6	10.9	11.1	55.6
	3	12	21.8	22.2	77.8
	4	10	18.2	18.5	96.3
	5	2	3.6	3.7	100.0
	0	1	1.8	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 54 Missing Cases 1

C7_4

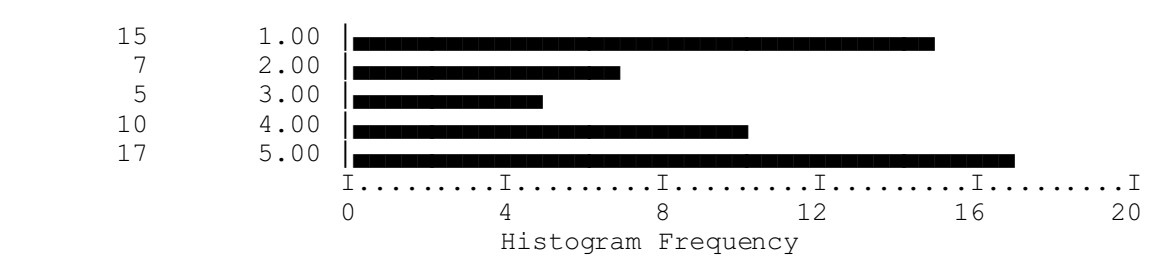
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	26	47.3	48.1	48.1
	2	7	12.7	13.0	61.1
	3	9	16.4	16.7	77.8
	4	7	12.7	13.0	90.7
	5	5	9.1	9.3	100.0
	0	1	1.8	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 54 Missing Cases 1

C7_5

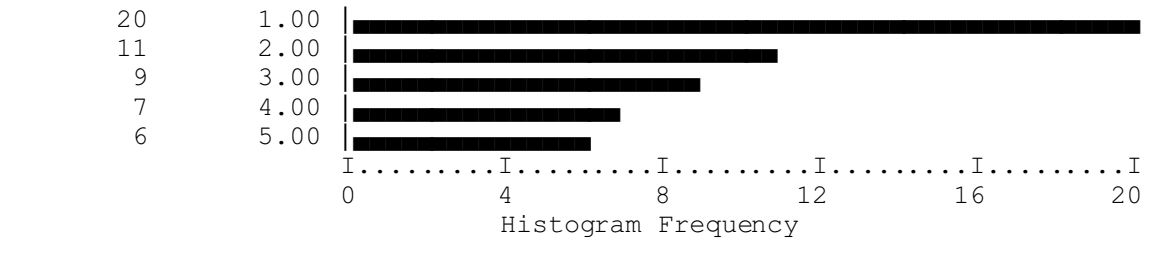
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	15	27.3	27.8	27.8
	2	7	12.7	13.0	40.7
	3	5	9.1	9.3	50.0
	4	10	18.2	18.5	68.5
	5	17	30.9	31.5	100.0
	0	1	1.8	MISSING	
	TOTAL	55	100.0	100.0	



Valid Cases 54 Missing Cases 1

C7_6

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	20	36.4	37.7	37.7
	2	11	20.0	20.8	58.5
	3	9	16.4	17.0	75.5
	4	7	12.7	13.2	88.7
	5	6	10.9	11.3	100.0
	0	2	3.6	MISSING	
	TOTAL	55	100.0	100.0	

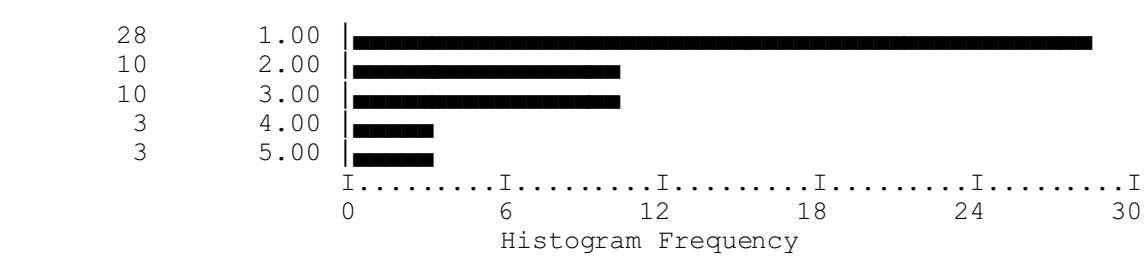


Valid Cases 53 Missing Cases 2

C7_7

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	28	50.9	51.9	51.9
	2	10	18.2	18.5	70.4
	3	10	18.2	18.5	88.9
	4	3	5.5	5.6	94.4
	5	3	5.5	5.6	100.0
	0	1	1.8	MISSING	
	TOTAL	55	100.0	100.0	

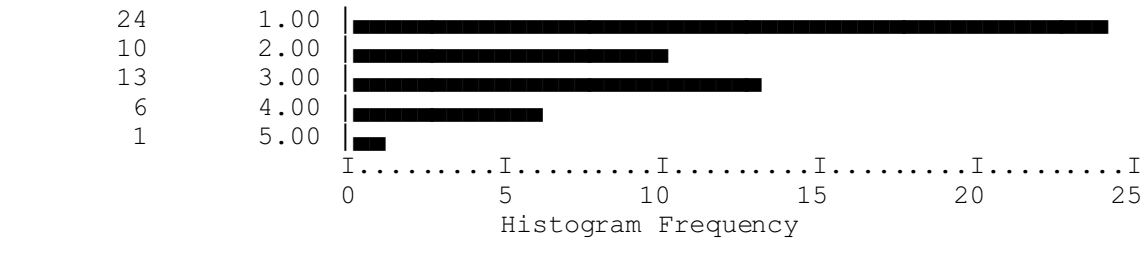
C7_7



Valid Cases 54 Missing Cases 1

C7_8

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	24	43.6	44.4	44.4
	2	10	18.2	18.5	63.0
	3	13	23.6	24.1	87.0
	4	6	10.9	11.1	98.1
	5	1	1.8	1.9	100.0
	0	1	1.8	MISSING	
	TOTAL	55	100.0	100.0	

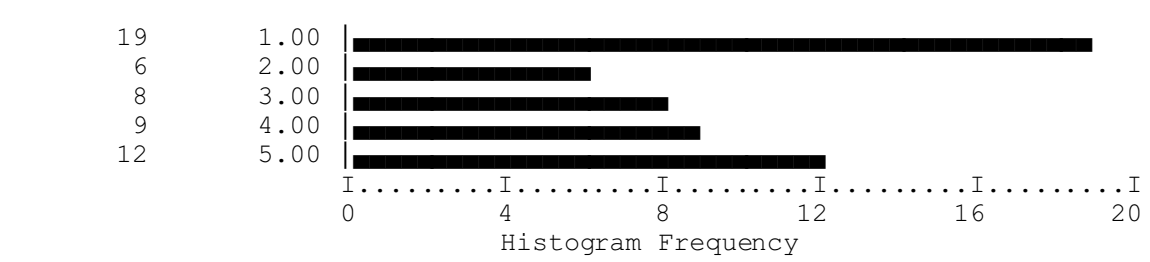


Valid Cases 54 Missing Cases 1

C7_9

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	19	34.5	35.2	35.2
	2	6	10.9	11.1	46.3
	3	8	14.5	14.8	61.1
	4	9	16.4	16.7	77.8
	5	12	21.8	22.2	100.0
	0	1	1.8	MISSING	
	TOTAL	55	100.0	100.0	

C7_9



Valid Cases 54 Missing Cases 1

Appendix E

dBase Data File

The enclosed diskette contains all of the survey data in two dBase IV files. The structure and content of these files are listed in this appendix.

Structure for database: MOSTDAT.DBF

*** To store all data except the big tables (B.21 and B.22) ***

Field	Field Name	Type	Width	Description (Coding Notes)
1	ID	Numeric	4	ID Number (unique to each subject)
2	ZIPCODE	Numeric	5	Five-digit zip code
3	CAUSE_DIS	Character	20	Cause of visual disability (uncoded)
4	OTHER_DIS	Character	20	Other disabilities (uncoded)
5	AGE_DIAG	Numeric	2	Age diagnosed (0=at birth)
6	LGL_BLIND	Character	1	Legally blind? (Y/N)
7	ACUITY_20_	Numeric	3	Acuity denominator (e.g., 80=20/80)
8	BRAILLE	Character	1	Use Braille?
9	TDD	Character	1	Use TDD services?
10	DRIVE_CAR	Character	1	Drive a car?
11	OWN_MODE	Character	1	Own private mode of transport?
12	MODE_TYPE	Character	20	List of modes owned
13	EDUCATION	Numeric	1	Highest educ. level (1=<HS, 7=PG)
14	AGEGROUP	Numeric	1	Age group (1=<20, 5=80+)
15	HOME2STOP	Numeric	3	# blocks from home to nearest stop
16	B13A	Character	1	No serious restrictions-mass transit?
17	B13B	Character	1	Needs special aid?
18	B13C	Character	1	No serious problems-walking/standing?
19	B13D	Character	1	Difficulty standing?
20	B13E	Character	1	Difficulty walking to curb?
21	B13F	Character	1	Need assistance climbing stairs?
22	B13G	Character	1	Cannot read newsprint?
23	B13H	Character	1	Confined to bed?
24	B13I	Character	1	Must stay in house?
25	B13J	Character	1	Difficulty reading signs/route #s?
26	WAIT4PUB	Numeric	1	Contact/wait-public tran? (1=>hr, 5=<5m)
27	WAIT4PRIV	Numeric	1	Contact/wait-private? (1=>hr, 5=<5m)
28	PRIM_ACTIV	Numeric	2	Primary assist reason (1=work, 11=other)
29	FREQUENCY	Numeric	1	Frequency transit use (1=5-7d, 5=>2w)
30	T_WORK	Numeric	3	Avg. minutes to work
31	T_REC	Numeric	3	Avg. minutes to recreation
32	T_VISIT	Numeric	3	Avg. minutes to visit family/friends
33	T_MED	Numeric	3	Avg. minutes to medical/other health
34	T_FINLGL	Numeric	3	Avg. minutes to financial/legal/oth.prof
35	T_GROC	Numeric	3	Avg. minutes to grocery shopping
36	T_OTHSHOP	Numeric	3	Avg. minutes to other regular shopping
37	T_AGCYSVCS	Numeric	3	Avg. minutes to agency services
38	T_RELIGION	Numeric	3	Avg. minutes to religious
39	SHAREMODE	Numeric	1	Freq. share mode (1=never, 5=always)
40	REASON1	Numeric	2	Reason-public tran (1=comfort, 13=other)
41	REASON2	Numeric	2	Reason-public tran (1=comfort, 13=other)
42	REASON3	Numeric	2	Reason-public tran (1=comfort, 13=other)
43	CANE_CR_WA	Character	1	Use long cane/crutches/walker?

44	GUIDE_DOG	Character	1	Use guide dog?
45	LASERCANE	Character	1	Use laser cane?
46	MOWAT_SENS	Character	1	Use MOWAT sensor?
47	SONIC	Character	1	Use sonic guide/obstacle avoider?
48	TAPE_DIREC	Character	1	Use tape recorded directions?
49	TACT_MAPS	Character	1	Use tactual maps?
50	ROUTECARD	Character	1	Use signs or cards describing route?
51	TELESCOPE	Character	1	Use spotting telescope?
52	CHAIR_MAN	Character	1	Use manual wheelchair?
53	CHAIR_MTR	Character	1	Use motorized wheelchair?
54	OTHER_AID	Character	1	Use other aids?
55	OTHAID1	Numeric	1	First other aid (start code)
56	OTHAID2	Numeric	1	Second other aid
57	OTHAID3	Numeric	1	Third other aid
58	C1A	Numeric	1	Dependent on others (agreement codes)
59	C1B	Numeric	1	Frustrated by dependency
60	C1C	Numeric	1	Familiar with services
61	C1D	Numeric	1	Existing services satisfactory
62	C1E	Numeric	1	Public transit safe
63	C1F	Numeric	1	Public transit easy to obtain
64	C1G	Numeric	1	Public transit easy to understand/use
65	C1H	Numeric	1	Public transit undignified, non-work
66	C1I	Numeric	1	Am an independent traveler
67	C1J	Numeric	1	No disadvantage to being non-driver
68	C1K	Numeric	1	Residential choice limited
69	C1L	Numeric	1	Independence not affected by pub.tran.
70	C1M	Numeric	1	Public transit restricts social life
71	C1N	Numeric	1	Public transit isolates from society
72	C1O	Numeric	1	Negative impact on life style/quality
73	C1P	Numeric	1	Feels frustration as non-driver
74	C2_1	Numeric	1	Finding route (difficulty codes)
75	C2_2	Numeric	1	Finding where to board vehicle
76	C2_3	Numeric	1	Recognizing correct vehicle
77	C2_4	Numeric	1	Estimating time of arrival
78	C2_5	Numeric	1	Knowing when to exit
79	C2_6	Numeric	1	Estimating location during travel
80	C2_7	Numeric	1	Dealing with layovers-mode/route change
81	C2_8	Numeric	1	Entering and exiting vehicle
82	C2_9	Numeric	1	Finding empty seat
83	C2_10	Numeric	1	Paying the fare
84	C2_11	Numeric	1	Using the fare crediting system
85	C2_12	Numeric	1	Signaling driver to stop
86	C2_13	Numeric	1	Dealing with crowded vehicle
87	C2_14	Numeric	1	Getting from last stop to destination
88	C2_15	Numeric	1	Finding pickup points, >1 vehicle/mode
89	C2_16	Numeric	1	Learning wait time for connecting mode
90	C2_17	Numeric	1	Getting from house to stop
91	C2_18	Numeric	1	Finding correct stop
92	C2_19	Numeric	1	Getting a transfer ticket
93	C2_20	Numeric	1	Finding transfer point across street
94	C2_21	Numeric	1	Learning whether connection on time
95	C3_1	Numeric	1	Printed schedules (usefulness codes)
96	C3_2	Numeric	1	Cable TV messages
97	C3_3	Numeric	1	Information hotlines
98	C3_4	Numeric	1	Drivers/operators

99	C3_5	Numeric	1	Radio messages
100	C3_6	Numeric	1	Written signs at pick-up/drop-off points
101	C3_7	Numeric	1	Schedules available only at central term
102	C3_8	Numeric	1	Schedules by mail
103	C3_9	Numeric	1	E-mail schedules
104	C3_10	Numeric	1	Timetables in suitable format on board
105	C3_11	Numeric	1	Auditory messages at pick-up/drop-off
106	C3_12	Numeric	1	Talking signs
107	C4_1	Numeric	1	Tactual map of routes (usefulness codes)
108	C4_2	Numeric	1	Tactual map of urban area
109	C4_3	Numeric	1	Tactual map of route with verbal descrip
110	C4_4	Numeric	1	Tactual map of city with verbal info
111	C4_5	Numeric	1	Computer-assisted telephone instructions
112	C4_6	Numeric	1	Regular info, visual/verbal, on cable
113	C4_7	Numeric	1	Hot line with human operators
114	C4_8	Numeric	1	Computerized, push-button telephone svc
115	C4_9	Numeric	1	Aud/Tact info systems in terminals
116	C4_10	Numeric	1	Tactual maps/diagrams in terminals
117	C4_11	Numeric	1	Visual/auditory prompts at stops
118	C4_12	Numeric	1	Tactual map of local pick-up/drop-off
119	C4_13	Numeric	1	Portable PGS for navigation
120	C4_14	Numeric	1	Special radio broadcasts of op. cond.
121	C5_1	Numeric	1	Becoming a crime victim (concern codes)
122	C5_2	Numeric	1	Timeliness of system
123	C5_3	Numeric	1	Frequency of service
124	C5_4	Numeric	1	Crowding
125	C5_5	Numeric	1	Lack of operator/driver civility
126	C5_6	Numeric	1	Unsure about arrival time at stops
127	C5_7	Numeric	1	Not knowing if already missed vehicle
128	C5_8	Numeric	1	Waiting time for service
129	C5_9	Numeric	1	Unsatis. location of transit end
130	C5_10	Numeric	1	Lack of connectivity to other systems
131	C5_11	Numeric	1	Lack of service to necessary places
132	C5_12	Numeric	1	Connecting across streets or over dist.
133	C6_1	Numeric	1	Getting sched. info (frustration codes)
134	C6_2	Numeric	1	Relying on others' time/schedules
135	C6_3	Numeric	1	Requesting rides after missed connec.
136	C6_4	Numeric	1	Having to accept ride offers
137	C6_5	Numeric	1	Needing to explain requirement
138	C6_6	Numeric	1	Needing to carry special equipment
139	C6_7	Numeric	1	Negotiating narrow doors/steps
140	C6_8	Numeric	1	Non-disabled people in reserved seats
141	C6_9	Numeric	1	Exiting vehicle at wrong stop
142	C6_10	Numeric	1	Inability to exit during time allocated
143	C6_11	Numeric	1	Poor clarity of public address systems
144	C6_12	Numeric	1	Poor legibility, Braille/raised letter
145	C6_13	Numeric	1	Hard-to-find, or -to-get-to elevators
146	C6_14	Numeric	1	Many obstacles in terminals
147	C6_15	Numeric	1	Poorly located/oriented U-R-HERE maps
148	C6_16	Numeric	1	U-R-HERE maps without voice output
149	C6_17	Numeric	1	Asking passersby to identify vehicle
150	C6_18	Numeric	1	Cannot find bus stop or entrance point
151	C7_1	Numeric	1	In-vehicle locator (importance codes)
152	C7_2	Numeric	1	Ground-level access
153	C7_3	Numeric	1	Terminal flexibility

154	C7_4	Numeric	1	Systems serving areas btwn transit lines
155	C7_5	Numeric	1	Cable TV maps and verbal descriptions
156	C7_6	Numeric	1	Early warning system to operators
157	C7_7	Numeric	1	Braille/spoken msgs at transit stops
158	C7_8	Numeric	1	Volunteer guides
159	C7_9	Numeric	1	Housing relocation services
160	PRIME_MODE	Numeric	2	Primary mode of travel (start coding)
161	IMPROVMT1	Character	20	Text of first improvement discussed
162	IMPROVMT2	Character	20	Text of second improvement discussed
163	IMPROVMT3	Character	20	Text of third improvement discussed
164	OTH_IMPROV	Character	20	Text of other improvements discussed
165	SOURCE_SUB	Character	1	M=mtd, R=rehab, C=campus, B=braille
166	TYPE_INTVW	Character	1	T=telephone, I=in-person, M=mail
167	SEX	Character	1	M or F

Structure for database: BIGTABS.DBF

*** To store B.21 and B.22 data ***

Field	Field Name	Type	Width	Description (codes: 1=always, 5=never)
1	ID	Numeric	4	ID# - matched to ID in MOSTDAT.DBF
2	B21_A_1	Numeric	1	Independent X work
3	B21_B_1	Numeric	1	Independent X grocery shopping
4	B21_C_1	Numeric	1	Independent X other shopping
5	B21_D_1	Numeric	1	Independent X recreation
6	B21_E_1	Numeric	1	Independent X social trip
7	B21_F_1	Numeric	1	Independent X religious
8	B21_G_1	Numeric	1	Independent X education
9	B21_H_1	Numeric	1	Independent X medical
10	B21_I_1	Numeric	1	Independent X agency svcs
11	B21_J_1	Numeric	1	Independent X business
12	B21_A_2	Numeric	1	Spouse X work
13	B21_B_2	Numeric	1	Spouse X grocery shopping
14	B21_C_2	Numeric	1	Spouse X other shopping
15	B21_D_2	Numeric	1	Spouse X recreation
16	B21_E_2	Numeric	1	Spouse X social trip
17	B21_F_2	Numeric	1	Spouse X religious
18	B21_G_2	Numeric	1	Spouse X education
19	B21_H_2	Numeric	1	Spouse X medical
20	B21_I_2	Numeric	1	Spouse X agency svcs
21	B21_J_2	Numeric	1	Spouse X business
22	B21_A_3	Numeric	1	Oth.Family X work
23	B21_B_3	Numeric	1	Oth.Family X grocery shopping
24	B21_C_3	Numeric	1	Oth.Family X other shopping
25	B21_D_3	Numeric	1	Oth.Family X recreation
26	B21_E_3	Numeric	1	Oth.Family X social trip
27	B21_F_3	Numeric	1	Oth.Family X religious
28	B21_G_3	Numeric	1	Oth.Family X education
29	B21_H_3	Numeric	1	Oth.Family X medical
30	B21_I_3	Numeric	1	Oth.Family X agency svcs
31	B21_J_3	Numeric	1	Oth.Family X business
32	B21_A_4	Numeric	1	Oth.Relative X work
33	B21_B_4	Numeric	1	Oth.Relative X grocery shopping
34	B21_C_4	Numeric	1	Oth.Relative X other shopping
35	B21_D_4	Numeric	1	Oth.Relative X recreation
36	B21_E_4	Numeric	1	Oth.Relative X social trip
37	B21_F_4	Numeric	1	Oth.Relative X religious
38	B21_G_4	Numeric	1	Oth.Relative X education
39	B21_H_4	Numeric	1	Oth.Relative X medical
40	B21_I_4	Numeric	1	Oth.Relative X agency svcs
41	B21_J_4	Numeric	1	Oth.Relative X business
42	B21_A_5	Numeric	1	Roommate/neighbor X work
43	B21_B_5	Numeric	1	Roommate/neighbor X grocery shopping
44	B21_C_5	Numeric	1	Roommate/neighbor X other shopping
45	B21_D_5	Numeric	1	Roommate/neighbor X recreation
46	B21_E_5	Numeric	1	Roommate/neighbor X social trip
47	B21_F_5	Numeric	1	Roommate/neighbor X religious
48	B21_G_5	Numeric	1	Roommate/neighbor X education
49	B21_H_5	Numeric	1	Roommate/neighbor X medical
50	B21_I_5	Numeric	1	Roommate/neighbor X agency svcs

51	B21_J_5	Numeric	1	Roommate/neighbor X business
52	B21_A_6	Numeric	1	Friend X work
53	B21_B_6	Numeric	1	Friend X grocery shopping
54	B21_C_6	Numeric	1	Friend X other shopping
55	B21_D_6	Numeric	1	Friend X recreation
56	B21_E_6	Numeric	1	Friend X social trip
57	B21_F_6	Numeric	1	Friend X religious
58	B21_G_6	Numeric	1	Friend X education
59	B21_H_6	Numeric	1	Friend X medical
60	B21_I_6	Numeric	1	Friend X agency svcs
61	B21_J_6	Numeric	1	Friend X business
62	B21_A_7	Numeric	1	Hired Asst. X work
63	B21_B_7	Numeric	1	Hired Asst. X grocery shopping
64	B21_C_7	Numeric	1	Hired Asst. X other shopping
65	B21_D_7	Numeric	1	Hired Asst. X recreation
66	B21_E_7	Numeric	1	Hired Asst. X social trip
67	B21_F_7	Numeric	1	Hired Asst. X religious
68	B21_G_7	Numeric	1	Hired Asst. X education
69	B21_H_7	Numeric	1	Hired Asst. X medical
70	B21_I_7	Numeric	1	Hired Asst. X agency svcs
71	B21_J_7	Numeric	1	Hired Asst. X business
72	B21_A_8	Numeric	1	Volunteer X work
73	B21_B_8	Numeric	1	Volunteer X grocery shopping
74	B21_C_8	Numeric	1	Volunteer X other shopping
75	B21_D_8	Numeric	1	Volunteer X recreation
76	B21_E_8	Numeric	1	Volunteer X social trip
77	B21_F_8	Numeric	1	Volunteer X religious
78	B21_G_8	Numeric	1	Volunteer X education
79	B21_H_8	Numeric	1	Volunteer X medical
80	B21_I_8	Numeric	1	Volunteer X agency svcs
81	B21_J_8	Numeric	1	Volunteer X business
82	B21_A_9	Numeric	1	Co-worker X work
83	B21_B_9	Numeric	1	Co-worker X grocery shopping
84	B21_C_9	Numeric	1	Co-worker X other shopping
85	B21_D_9	Numeric	1	Co-worker X recreation
86	B21_E_9	Numeric	1	Co-worker X social trip
87	B21_F_9	Numeric	1	Co-worker X religious
88	B21_G_9	Numeric	1	Co-worker X education
89	B21_H_9	Numeric	1	Co-worker X medical
90	B21_I_9	Numeric	1	Co-worker X agency svcs
91	B21_J_9	Numeric	1	Co-worker X business
92	B22_A_1	Numeric	1	Local bus X work
93	B22_B_1	Numeric	1	Local bus X grocery shopping
94	B22_C_1	Numeric	1	Local bus X other shopping
95	B22_D_1	Numeric	1	Local bus X recreation
96	B22_E_1	Numeric	1	Local bus X social trip
97	B22_F_1	Numeric	1	Local bus X religious
98	B22_G_1	Numeric	1	Local bus X education
99	B22_H_1	Numeric	1	Local bus X medical
100	B22_I_1	Numeric	1	Local bus X agency svcs
101	B22_J_1	Numeric	1	Local bus X business
102	B22_A_2	Numeric	1	Express bus X work
103	B22_B_2	Numeric	1	Express bus X grocery shopping
104	B22_C_2	Numeric	1	Express bus X other shopping
105	B22_D_2	Numeric	1	Express bus X recreation

106	B22_E_2	Numeric	1	Express bus X social trip
107	B22_F_2	Numeric	1	Express bus X religious
108	B22_G_2	Numeric	1	Express bus X education
109	B22_H_2	Numeric	1	Express bus X medical
110	B22_I_2	Numeric	1	Express bus X agency svcs
111	B22_J_2	Numeric	1	Express bus X business
112	B22_A_3	Numeric	1	Mini-bus X work
113	B22_B_3	Numeric	1	Mini-bus X grocery shopping
114	B22_C_3	Numeric	1	Mini-bus X other shopping
115	B22_D_3	Numeric	1	Mini-bus X recreation
116	B22_E_3	Numeric	1	Mini-bus X social trip
117	B22_F_3	Numeric	1	Mini-bus X religious
118	B22_G_3	Numeric	1	Mini-bus X education
119	B22_H_3	Numeric	1	Mini-bus X medical
120	B22_I_3	Numeric	1	Mini-bus X agency svcs
121	B22_J_3	Numeric	1	Mini-bus X business
122	B22_A_4	Numeric	1	Self-pd taxi X work
123	B22_B_4	Numeric	1	Self-pd taxi X grocery shopping
124	B22_C_4	Numeric	1	Self-pd taxi X other shopping
125	B22_D_4	Numeric	1	Self-pd taxi X recreation
126	B22_E_4	Numeric	1	Self-pd taxi X social trip
127	B22_F_4	Numeric	1	Self-pd taxi X religious
128	B22_G_4	Numeric	1	Self-pd taxi X education
129	B22_H_4	Numeric	1	Self-pd taxi X medical
130	B22_I_4	Numeric	1	Self-pd taxi X agency svcs
131	B22_J_4	Numeric	1	Self-pd taxi X business
132	B22_A_5	Numeric	1	Soc.pd. taxi X work
133	B22_B_5	Numeric	1	Soc.pd. taxi X grocery
134	B22_C_5	Numeric	1	Soc.pd. taxi X other shopping
135	B22_D_5	Numeric	1	Soc.pd. taxi X recreation
136	B22_E_5	Numeric	1	Soc.pd. taxi X social trip
137	B22_F_5	Numeric	1	Soc.pd. taxi X religious
138	B22_G_5	Numeric	1	Soc.pd. taxi X education
139	B22_H_5	Numeric	1	Soc.pd. taxi X medical
140	B22_I_5	Numeric	1	Soc.pd. taxi X agency svcs
141	B22_J_5	Numeric	1	Soc.pd. taxi X business
142	B22_A_6	Numeric	1	Hired limo X work
143	B22_B_6	Numeric	1	Hired limo X grocery shopping
144	B22_C_6	Numeric	1	Hired limo X other shopping
145	B22_D_6	Numeric	1	Hired limo X recreation
146	B22_E_6	Numeric	1	Hired limo X social trip
147	B22_F_6	Numeric	1	Hired limo X religious
148	B22_G_6	Numeric	1	Hired limo X education
149	B22_H_6	Numeric	1	Hired limo X medical
150	B22_I_6	Numeric	1	Hired limo X agency svcs
151	B22_J_6	Numeric	1	Hired limo X business
152	B22_A_7	Numeric	1	Hired driver X work
153	B22_B_7	Numeric	1	Hired driver X grocery shopping
154	B22_C_7	Numeric	1	Hired driver X other shopping
155	B22_D_7	Numeric	1	Hired driver X recreation
156	B22_E_7	Numeric	1	Hired driver X social trip
157	B22_F_7	Numeric	1	Hired driver X religious
158	B22_G_7	Numeric	1	Hired driver X education
159	B22_H_7	Numeric	1	Hired driver X medical
160	B22_I_7	Numeric	1	Hired driver X agency svcs

161	B22_J_7	Numeric	1	Hired driver X business
162	B22_A_8	Numeric	1	HH car X work
163	B22_B_8	Numeric	1	HH car X grocery shopping
164	B22_C_8	Numeric	1	HH car X other shopping
165	B22_D_8	Numeric	1	HH car X recreation
166	B22_E_8	Numeric	1	HH car X social trip
167	B22_F_8	Numeric	1	HH car X religious
168	B22_G_8	Numeric	1	HH car X education
169	B22_H_8	Numeric	1	HH car X medical
170	B22_I_8	Numeric	1	HH car X agency svcs
171	B22_J_8	Numeric	1	HH car X business
172	B22_A_9	Numeric	1	Friend car X work
173	B22_B_9	Numeric	1	Friend car X grocery shopping
174	B22_C_9	Numeric	1	Friend car X other shopping
175	B22_D_9	Numeric	1	Friend car X recreation
176	B22_E_9	Numeric	1	Friend car X social trip
177	B22_F_9	Numeric	1	Friend car X religious
178	B22_G_9	Numeric	1	Friend car X education
179	B22_H_9	Numeric	1	Friend car X medical
180	B22_I_9	Numeric	1	Friend car X agency svcs
181	B22_J_9	Numeric	1	Friend car X business
182	B22_A_10	Numeric	1	Cycle X work
183	B22_B_10	Numeric	1	Cycle X grocery shopping
184	B22_C_10	Numeric	1	Cycle X other shopping
185	B22_D_10	Numeric	1	Cycle X recreation
186	B22_E_10	Numeric	1	Cycle X social trip
187	B22_F_10	Numeric	1	Cycle X religious
188	B22_G_10	Numeric	1	Cycle X education
189	B22_H_10	Numeric	1	Cycle X medical
190	B22_I_10	Numeric	1	Cycle X agency svcs
191	B22_J_10	Numeric	1	Cycle X business
192	B22_A_11	Numeric	1	Walk-Cane X work
193	B22_B_11	Numeric	1	Walk-Cane X grocery shopping
194	B22_C_11	Numeric	1	Walk-Cane X other shopping
195	B22_D_11	Numeric	1	Walk-Cane X recreation
196	B22_E_11	Numeric	1	Walk-Cane X social trip
197	B22_F_11	Numeric	1	Walk-Cane X religious
198	B22_G_11	Numeric	1	Walk-Cane X education
199	B22_H_11	Numeric	1	Walk-Cane X medical
200	B22_I_11	Numeric	1	Walk-Cane X agency svcs
201	B22_J_11	Numeric	1	Walk-Cane X business
202	B22_A_12	Numeric	1	Walk-No cane X work
203	B22_B_12	Numeric	1	Walk-No cane X grocery shopping
204	B22_C_12	Numeric	1	Walk-No cane X other shopping
205	B22_D_12	Numeric	1	Walk-No cane X recreation
206	B22_E_12	Numeric	1	Walk-No cane X social trip
207	B22_F_12	Numeric	1	Walk-No cane X religious
208	B22_G_12	Numeric	1	Walk-No cane X education
209	B22_H_12	Numeric	1	Walk-No cane X medical
210	B22_I_12	Numeric	1	Walk-No cane X agency svcs
211	B22_J_12	Numeric	1	Walk-No cane X business
212	B22_A_13	Numeric	1	Guide dog X work
213	B22_B_13	Numeric	1	Guide dog X grocery shopping
214	B22_C_13	Numeric	1	Guide dog X other shopping
215	B22_D_13	Numeric	1	Guide dog X recreation

216	B22_E_13	Numeric	1	Guide dog X social trip
217	B22_F_13	Numeric	1	Guide dog X religious
218	B22_G_13	Numeric	1	Guide dog X education
219	B22_H_13	Numeric	1	Guide dog X medical
220	B22_I_13	Numeric	1	Guide dog X agency svcs
221	B22_J_13	Numeric	1	Guide dog X business
222	B22_A_14	Numeric	1	Para transit X work
223	B22_B_14	Numeric	1	Para transit X grocery shopping
224	B22_C_14	Numeric	1	Para transit X other shopping
225	B22_D_14	Numeric	1	Para transit X recreation
226	B22_E_14	Numeric	1	Para transit X social trip
227	B22_F_14	Numeric	1	Para transit X religious
228	B22_G_14	Numeric	1	Para transit X education
229	B22_H_14	Numeric	1	Para transit X medical
230	B22_I_14	Numeric	1	Para transit X agency svcs
231	B22_J_14	Numeric	1	Para transit X business
232	B22_A_15	Numeric	1	Vol. driver X work
233	B22_B_15	Numeric	1	Vol. driver X grocery shopping
234	B22_C_15	Numeric	1	Vol. driver X other shopping
235	B22_D_15	Numeric	1	Vol. driver X recreation
236	B22_E_15	Numeric	1	Vol. driver X social trip
237	B22_F_15	Numeric	1	Vol. driver X religious
238	B22_G_15	Numeric	1	Vol. driver X education
239	B22_H_15	Numeric	1	Vol. driver X medical
240	B22_I_15	Numeric	1	Vol. driver X agency svcs
241	B22_J_15	Numeric	1	Vol. driver X business