TRAVEL PATTERNS OF PEOPLE WITH DISABILITIES IN CACHE COUNTY UTAH

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EXECUTIVE SUMMARY

The information needed to plan and operate transit services for people with disabilities is little known to transit agencies and also difficult to obtain. This report is based on a study that was undertaken to determine the travel patterns and transportation needs of people with disabilities, and also to assess the extent to which those needs are met in Cache County, Utah.

Data were collected through telephone interviews with over 1,200 randomly chosen people. The major form of disability among the population was found to be mobility related. It was also found that the majority of the people with disabilities are 65 years or older and the primary purpose of their trips is for medical care. Most people with disabilities have access to either a private vehicle or have their own vehicle. Thus, public transit use was extremely low.

A cluster analysis was performed to determine the spatial distribution of people with disabilities. It was found that the population is clustered around the main (Logan) city in the Cache County, where most of the primary medical and social services are available.

CHAPTER 1

INTRODUCTION

Availability, affordability and accessibility of transportation are key determinants of personal mobility. But designing a public transportation system and providing a service that meets every individual's mobility needs is difficult, if not impossible. When the individuals to be served have a disability, the task of designing and operating transportation systems becomes even more complex and costly because of their diverse needs. This difficulty of tailoring systems to user needs and the resultant products is perhaps one reason for the very small share of the people with disabilities--less than 1% of non-elderly people with disabilities according to Rosenbloom (1992) — that have used transit systems in the past.

Mobility needs and travel patterns are largely governed by the type and degree of disability. For example, needs of a blind individual are quite different from those of an individual in a wheelchair. Also, trip frequency and purpose, to some extent, are dependent on the type of disability. A comparison of the elderly and people with mental impairments by Starks (1986), for instance, showed that the elderly use special transportation primarily to access social and recreational activities, and medical care. People with mental impairments, on the other hand, travel mostly to day-programs or sheltered workshops, school, and employment (Rosenbloom, 1992).

As far as the relationship between desired transportation service attributes and user characteristics are concerned, Pagano and McKnight (1983) found that for people with disabilities under age 65, reliability is the most important attribute followed by the extent of service. These relationships reflect the fact that people with disabilities in this age group are more likely to be employed and, therefore, such attributes are more important. However, wheelchair users under age 65 ranked vehicle access as the second most important service

attribute. The elderly wheelchair users and non-wheelchair users ranked safety as the most important attribute.

Previous studies (Rosenbloom, 1992) have also addressed the changing demographics of the population with disabilities and the service types (i.e., demand responsive, fixed route with wheel chair access, shared taxi cabs, etc.) that can best serve user needs in the future (Rosenbloom, 1992). However, there is little information available on the mobility needs of the current non-users or potential users of public transportation systems that can be used to tailor a system to meet those needs. For example, from the point of view of potential service providers, it is more important to know the geographic distribution of potential users within the planned service area, and the current travel needs that could be served by a public system. This information is particularly crucial in rural areas where the density is low and activity widespread. Unfortunately, these data are not readily available from any of the conventional sources accessible to transit providers. Nineteen-ninety U.S. Census data, for instance, may provide the approximate location in the form of block group totals, but not regarding the type of disability.

This report is based on a study conducted in one of the counties in Northern Utah to assess the fundamental mobility needs of people with disabilities. The needs were defined in terms of travel patterns such as trip purposes, distribution of origins and destinations, etc. The study examined the salient characteristics such as mode choice, trip frequency, and accessibility, and the factors that influence these characteristics. The main findings were then compared with those of previous studies on the mobility of people with disabilities living in rural areas. The study also found that the only means of obtaining reliable information on the above items is through telephone interviews, which are costly and time consuming.

CHAPTER 2

DATA COLLECTION

2.1 Study Area

The study focused on the population of Cache County, which is comprised of 19 small cities, including the City of Logan where Utah State University (USU) is located. Nineteen Ninety U.S. Census estimated the population of the area at 70,183. Approximately 31,000 of those people lived in Logan. The county covers an area of 1,175 square miles and has a population density of 86 persons/square mile.

2.2 Sample Size

Estimates of the size of the population with disabilities, as a percent of the total population in Cache County, vary from 4 to 16%. Local social service agencies and other volunteer organizations estimate the percent of people with severe disabilities to be around 3% and according to U.S. Department of Commerce people with all forms of disabilities account for more than 16% of the total population (U.S. Department of Commerce, 1992). A third source, the Utah State University's (USU) Center for Persons with Disabilities (CPD), estimates the number to be 4%.

With this variation in estimates, it was difficult to determine the best sample size for the study. The study team decided to obtain a random sample of 1,200 non-commercial phone numbers from the Cache County telephone book, which amounts to approximately 5% of the total listed phone numbers. Each of these listings was assumed to represent a single household. However, to reach 1,200 persons, approximately 3,700 randomly selected numbers were called.

2.3 Questionnaire

A questionnaire survey to gather pertinent information was designed by the study team in conjunction with the CPD and input from the study advisory committee, which comprised of representatives from local social service agencies and transit service providers.

The questions in the survey given in Appendix A can be classified into five categories. The first category was aimed at capturing information on the type of disability, need for special assistance, etc. The second category was designed to obtain information on modes of transportation and types of service available to the respondents. The third category of questions are related to travel patterns such as trip type, frequency, and origins and destination. Trip purposes were categorized as primary and secondary in order to gain more insight into the travel patterns as a function of time of day. The remaining questions on personal information such as age, gender, income, and address were optional.

2.4 Survey

The telephone numbers were selected randomly from each page so that every page, column and letter of the alphabet were covered. When the number selected was a business or institution, the one immediately after it was selected. Initially, calls were made during the day. This schedule was repeated for one week, excluding Saturday and Sunday. It proved difficult to make contact during this time period, and only a limited number of surveys were completed. After the first week, calls were made during the evening which resulted in an increased contact rate.

Each time a call was answered, the respondents were asked three screening questions (questions 1, 2, and 3 in the survey form). If responses were received to these questions, this was considered a successful contact, and if the remaining questions were answered, it was considered a completed questionnaire.

Less than half the persons contacted were willing to respond to the first three questions, and even those willing were reluctant to answer questions relating to specific addresses or locations of travel. Many were reluctant because they were apparently uncertain as to who might see the data. The low completion rate was either because no one in the household had a disability or they chose not to self-identify. This survey included the population with disabilities of all ages.

CHAPTER 3

CHARACTERISTICS OF THE POPULATION WITH DISABILITIES

3.1 Target Population Demographics

Of the 1,200 contacts made, only 94 households had a person with a disability live there. None of these households had more than one person with a disability. These 94 people with one or more disabilities amount to approximately 7.8% of the total population in Cache County, which is close to the 6.2% estimate from the 1992 Census for people with disabilities over the age of 16.

Table 1 gives the percentages of people with different disabilities as revealed by the survey. It was found that of the 2.5% respondents in the "other" category in Table 1, approximately 17% had more than one disability. Also, out of the 94 respondents, six had a disability not listed on the questionnaire and three were unwilling to reveal the disability. Thus, four of the six were grouped as having a mobility related disability, and the other two were considered to have cognitive disabilities.

3.2 Age Distribution

This survey demonstrates that there is a clear connection between people with disabilities in general and people with disabilities related to aging. These two groups have long been separated at administrative social service levels, primarily due to the difficulty of determining the age at which disabilities related to old age starts. The question, therefore, is how to distinguish between persons with disabilities and elderly people. As far as people with transportation-related disabilities are concerned, whether over or under the age of 65, and regardless of when the disability began, the need for special transportation exists. Respondents were, therefore, asked to give the age when their disability began. Of the 94

respondents, 18 people declined to answer. Clearly there is cause to reflect upon the arbitrary nature with which age related disabilities have been treated to date and their true significance in addressing needs of people with disabilities.

Table 2 gives the age distribution of the respondents and when the disability began. Even though almost half of the respondents were over the age of 65 (48.2%), over 70% of this sample had a disability before the age of 65.

3.3 Transportation Needs

Respondents were asked if they or the person with the disability in the household needed special assistance to access and use their regular mode of transportation. Even though some answers did not directly specify the needs, results are useful for planning purposes. One respondent mentioned a driver with a great deal of patience is very much appreciated. Table 3 gives the percentages of different types of assistance preferred.

3.4 Transportation Accessibility

One objective of the survey was to determine the different modes of transportation available to the individual. Almost every respondents had their own vehicle or had access to other private vehicle. A relatively small number had access to the Logan Transit District (LTD) fixed route and on-call services. No one mentioned the taxi service as a mode that they had access to even though it does exist. Under "other transportation modes," independent bus services (offered by social service agencies) and school buses were identified. Some respondents had access to more than one mode of transportation. As given in Table 4, there are over 28% of the respondents who have access to two modes, and 7% that have access to three modes.

3.5 Trip Purpose

To classify trips in order of importance and understand travel patterns, respondents were asked to give the primary purpose for which transportation services are needed. As seen from Table 5, of the 94 responses, 44.7% needed transportation to access medical care. Work and school trips followed suit with 19.1% and 18.1% respectively. A reason for the high need of transportation for medical care is perhaps because the sample contains a high percentage of people over 65 years of age. These people are more likely to be retired and are less likely to be attending school/college or working.

Shopping was found to be the highest (34.1%) secondary trip purpose. Trips to recreational activities and medical care followed at 27.2% and 12.7% respectively. Eleven respondents made secondary trips for varied purposes while 3.3% of secondary trips were to church. The breakdown for the secondary purposes is also given in Table 5.

3.6 Mode Vs. Trip Purpose

Modes of transportation available to respondents in Cache County were considered to be: (1) individual's own vehicle, (2) a private vehicle driven by someone else, (3) non-profit (social service agency) services, (4) private for-profit services (taxi cabs), (5) city bus (limited to Logan City), and (6) walking. For the primary trips, 45.7% of the respondents reported that they are driven by another person. An equally large percentage (42.6%) drive their own car. All responses in the "other" category depended on a school bus.

The distribution of percentages is similar to that of modes used for primary trips. The largest group (45.9%) are driven, while 36.9% drive their own car. More than one option was selected by 19 of the respondents. Four respondents gave no answer to this question. Only one response was given for "other purpose". School bus was given as the only "other" mode

for secondary trip purposes and, therefore, it replaced the "other" category. Table 6 gives the percentages of the modes of primary and secondary trip purposes.

3.7 Trip Frequency Vs. Purpose

As shown in Table 7, more than 33% of the respondents were found to make two or more primary trips a day, while 28.0% of the respondents make one trip a day. This could be due to the fact that almost 40% of the primary trips are for work, school and social services.

Over 21% of the respondents make more than two trips a week, but there are more than 4% who make one or no trips at all in a given month. The percentages of respondents making a trip, once a week and more than once a week are 10.8% and 21.5% respectively.

Frequencies of secondary trips follow the same pattern as primary trips except on a monthly basis, respondents made more secondary trips than primary trips.

CHAPTER 4

AGGREGATE DATA

To determine the overall travel pattern, primary and secondary purposes were combined. The following discussions are based on the aggregated data.

4.1 Purpose of Trip

Figure 1 indicates that over 25% of the trips are shopping trips, and almost 24% of trips are for medical care. The share of trips for recreational activities is 18%, while school and work trips each account for about 11% of total trips.

4.2 Mode Choice

As seen from Figure 2, mode choice for all trips, primary and secondary, are similar to the disaggregate choices. Over 46% of the respondents are driven and almost 40% drive their own vehicles.

4.3 Trip Frequency

Like mode choice, the general pattern of trip frequencies when data are aggregated remains the same as for primary and secondary trips separately. As seen from Figure 3, over 33% make two or more trips a day, while 28% make at least one trip. Overall, there are more people that make at most one trip a day.

4.4 Trip Cost

Estimated out-of-pocket round trip cost per trip for transportation services was found by calculating the average cost per trip for primary and secondary purposes and then taking the average of the two. Only 34 people responded to the question on cost of transportation for primary trips, of which 8 respondents did not know the cost. For secondary trips, 33

respondents gave an answer and 9 did not know the cost. The average cost per trip was estimated to be approximately $5.

CHAPTER 5

CROSS CLASSIFICATION

This analysis was performed to determine if there is a relationship between the following: age and mode of transportation, age and trip purpose, day of week and mode choice, type of disability and mode choice, income and mode choice, trip purpose and mode choice, time of day and mode choice, travel time and mode choice, and wait time and mode choice.

5.1 Age and Mode Choice

It can be seen from Figure 4 that those in the over 65 age group are more likely (more than 25%) to be driven, whereas those in the 23-64 age group (over 20%) tend to drive their own vehicles. In other words, majority of the people with disabilities who are older than 65 years of age are driven, whereas the majority of 23-65 year old people drive their own vehicles. Less than half of those in latter age group are currently driven by another person, and less than 1% use other modes. The difference in mode choice is a result of the 23-65 year age group having a higher likelihood of being employed, and hence prefer the greater flexibility of their own vehicles. As expected majority of the time the 0-3 year and 4-22 year age groups are driven by another person.

5.2 Age and Trip Purpose

It is seen from Figure 5 that, of all trips made, 17% are made for medical care by people who are over the age of 65. This group also makes more shopping trips (15% of all trips) and recreational trips (6% of all trips). In other words, those over 65 years make more medical and shopping trips than the 24-65 year old age group, who tend to make more work and school trips. More school trips are made by the 4-22 year age group whereas the 0-3

year age group make an equal number of medical, school, social service, recreational, and shopping trips. These findings seem to be fairly consistent with what would be expected of those age group in any population regardless of the health conditions.

5.3 Type of Disability and Mode Choice

Of all respondents, almost 25% who are generally driven by another and 21% who drive their own vehicles, have a mobility related disability. This group, as seen from Figure 6, is also the largest group that uses the demand responsive (on-call) public transit services, while people with speech impairments use the fixed route transit service. People with visual impairments are mostly driven by another or they use the service agency vehicles.

5.4 Trip Purpose and Mode Choice

Figure 7 shows that most people who are driven (over 13%) go for medical care, whereas those who drive their own car use it for all types of trip purposes.

5.5 Travel Time Vs. Mode of Transportation

As seen from Figure 8, the length of most trips is between 5 and 10 minutes. On trips of this duration, almost 25% drive their own car and 24% are driven. The LTD on-call service, social service agencies, and the LTD fixed route are used almost in equal proportions for these short trips. Private vehicle is the only mode of transportation of the respondents that have a travel time between 30 and 60 minutes. This relationship probably reflects the smaller service areas of the LTD and other social service providers versus the freedom to make longer trips in one's own vehicle.

5.6 Wait Time and Mode Choice

As seen from Figure 9, over 20% of the respondents who are driven, have a wait time of 5-10 minutes and about 22% have to wait 15-30 minutes. All those who use the LTD on-call service or social service agency vehicles wait 5-10 minutes. When driving their own car the waiting or access time for over 18% of them is less than 5-minutes. Some service agency transport and LTD fixed route users have a 0-5 minute wait time, which indicates that users are timing their travel patterns according to bus schedules. But most service agency transport users have to wait 15-30 minutes.

5.7 Disability and Trip Purpose

Most people with disabilities in the sample, as seen earlier, are mobility impaired. This explains why the highest percentage of trips (56% of all trips) are made by this group, and most trips (14% off all trips), as seen in Figure 10 are made for medical care. People with mobility impairments and who are visually impaired, make a relatively large share, (17% and 11%) for shopping and recreation. The highest percentage of trips made by people with hearing impairments are for shopping. This group also make several for medical care and recreational activities. The distribution of trip purposes for people with disabilities related to speech, cognitive, and other problems is approximately uniform.

5.8 Cluster Analysis of Demand

The purpose of a cluster analysis is to dissect a population into homogeneous groups. Objects in a cluster have similar characteristics, but are different from objects in other clusters. Cluster analysis can be used to demonstrate the origin and destination of trips spatially. This can help planners and service providers know the spatial distribution of people with similar transportation needs.

Cluster analysis in the present case was started by collecting a street map of the Cache County. A grid system was set up from this map. Since most cities in the Utah counties have their own main and center streets and the dwelling unit numbers and street numbers of these cities ascend from the intersection of main and center street. For the purpose of this study Logan's Main/Center intersection became the reference for all locations regardless of which part of Cache county being examined. For example, if a respondent gave an address, origin or destination as 300 South Main in Smithfield, which is directly north of Logan, it was changed to 5500 North Main. After all addresses, origins and destinations were synchronized with the established grid system, they were entered into a database. Addresses that were south and west were entered as negative numbers and addresses that were north and east were entered as positive numbers. The SAS statistical software package was used to do the cluster analysis.

Grouping the origin of trips can illustrate the distribution of the demand for special transit services. Figure 11, for instance, illustrates the clustering of the origins of primary trips. As seen from this Figure, the origins are concentrated in and around Logan, which provides most medical, employment and shopping services.

Different methods can be used (i.e. hierarchical clustering) to cluster the demand. For example, if it is desirable to determine several locations for vehicle depots, demand can be clustered into several clusters and the quantity of demand can be determined. Clusters can be further merged or divided if necessary. Likewise, destination of trips can be grouped. Figure 12 shows the trip destinations from the survey data for primary trip purposes. Cluster analysis can be used to determine the percentages of trips made to each destination. For the present set of data, the medical center located in Logan was the destination for 19% of the trips. Cluster analysis can also be performed on the origins of the trips that go to any

desired destination. Figure 13 shows the origins of the cluster of the trips destined for the medical center.

Cluster analysis is a valuable tool for spatial analysis of origins and destinations. Spatial and statistical representation of demand and the destinations of the demand can help planners and transit providers better understand and plan for the transportation needs of people with disabilities.

CHAPTER 6

CONCLUSIONS

The estimated percentage (7.8%) of people with disabilities in all the age groups in Cache County is reasonably close to the findings of 1990 U.S. Census which estimates the population with disabilities for 16 years and older at 6.2%. This study provided more complete transit demand data than the Census, since it considered people under 16 years old. Many of the relationships and analysis are consistent with those of populations without disabilities. This relationship should not nullify the impact of the specific information provided by this study, in that quantitative data is the key to allocating transportation services for any population. These data are also useful in explaining or understanding user preferences, travel patterns, etc., and may be compared to other user groups in determining future transportation solutions. This is an indication that the sample is fairly representative of the general population with disabilities in the study area.

Results also showed that a large portion of people with disabilities are over the age of 65. A large percentage of people with disabilities have mobility impairments and, therefore, need special assistance (a walker or a cane).

The majority of primary trips are made to obtain medical care. However, the majority of secondary trips are make for shopping and recreational purposes. The overbearing weight of the secondary purposes made shopping the largest overall trip purpose, followed by medical and recreational trips. An overwhelming percent of the respondents stated that they are either driven by another in a private vehicle or they drive their own car for all types of trips. Results also showed that many of the

respondents travel at least once a day. Percentage of trips made at least once is the same for primary, secondary, as well as all purposes.

Analysis showed that there is no definite relationship between age and mode of transportation. People in all age groups are mostly driven with the exception of the 23-64 year age group most of whom drive their own vehicle. However, LTD fixed route, LTD on-call, and service agency is mostly by the 4-22 year age group.

There is a clear correlation between age and trip purpose. Medical trips followed by shopping and recreational trips are made mostly by those over 65. Trip purposes are almost evenly distributed for the 23-64 year age group. School is the most common trip purpose for the 4-22 age group.

It was difficult to see a correlation between day of the week and mode of transportation because a large amount of respondents stated that the day of the week they travel varies. However, for each day of the week category, driving is the most common mode of transportation, yielding greater flexibility for the user.

Most people with disabilities are driven the majority of the time. Own vehicle is the second most used mode of transportation for three disability categories. However, LTD fixed route service followed second with quite a large percentage of respondents with hearing and cognitive disabilities using it.

According to the survey, there are not many users of public transportation services. As a result of this, obtaining suggestions for improving public services was difficult. However a few respondents suggested expanding these services outside the Logan area.

This project lays the foundation for a new approach to defining disabilities and especially age related disabilities. The Americans with Disabilities Act of 1990 seems to mostly address needs of people with age related disabilities. The survey data found herein

may be used as one more argument for addressing both age related disabilities and the currently legislated definition of a disability together. To continue to treat these two communities separately only spreads already limited resources too thin and misses the intent of providing equal treatment for all people with disabilities.

REFERENCES

"1990 Census of Population and Housing, Summary Social, Economic, and Housing Characteristics Utah", U.S. Department of Commerce, Issue May 1992.

Pagano, A. M., C. E. McKnight, "Quality of Service in Special Service Paratransit: The Users' Perspective", Transportation Research Record No. 934, pp. 14-23, Washington, DC., 1983.

Rosenbloom, S. K., "The Transportation Disadvantaged", from "Public Transportation", by Gray, G.E., L. A. Hoel, Second Edition, Prentice Hall, NJ., 1992

Starks, J. K., "Overview of the Transportation Demand of Mentally Retarded Persons", Transportation Research Record No. 1098, pp. 1-8, Washington, DC., 1986.

APPENDIX A

Project ACTION Telephone Survey

Survey # _____
Date: _____
Time: _____

Telephone:
Address:

I am calling to conduct a survey on transportation needs of people with disabilities in Cache Valley.

1. Do you have just a few minutes to answer some questions?
1 = YES 2 = NO

Your cooperation will enable us to plan for transportation services for people with disabilities and will be greatly appreciated.

For this survey, a person with a disability includes people with **mobility impairments** who have **difficulty getting around**, people with **blindness** or only **partial sight**, people with **deafness** or who are **hard of hearing**, people with **speech-related difficulties**, and people with **developmental** or **mental disabilities**.

2. According to this definition, is there anyone with a disability in your household?
1 = YES 2 = NO

IF NO GO TO QUESTION No. 3
IF YES GO TO QUESTION No. 4

3. Is there anyone in your household who may need any help or assistance with transportation because of a disability?
1 = YES 2 = NO

IF NO TERMINATE THE CONVERSATION, Thank the person for their assistance.
IF YES, GO TO QUESTION No. 4

4. May I speak with the individual or can you give some information on the individual? (Identify the interviewee
1 = Individual with disability 2 = Surrogate person

5. (IF QUESTIONS ARE ANSWERED BY A SURROGATE) Can I talk with the person who is best qualified to discuss the individual with the disability?
1 = YES 2 = NO

6. (IF QUESTIONS ARE ANSWERED BY SURROGATE) What is your relationship with the individual?
1 = Spouse
2 = Family/friend
3 = Social worker
4 = Volunteer
5 = Hired help (i.e., nurse, teacher)
6 = Other (please specify) _____

7. Under which of the following would you classify your (the individual's) disability?
1 = Mobility
2 = Sight
3 = Hearing
4 = Speech
5 = Cognitive
6 = Other (please specify) _____

8. What type of help or assistance do you (the individual) need for transportation?
1 = Wheel chair
2 = Vehicle with ramp/elevating device
3 = Visual aid
4 = Hearing aid
5 = Understanding/comprehension aid
6 = Other(s) (please specify) _____

9. What kinds of transportation do you (the individual) presently have access to (not necessarily use)?
1 = Drive own car
2 = Private vehicle (someone else drives)
3 = LTD Fixed Route Service
4 = LTD On-call Service
5 = Taxi
6 = Service agency
7 = Walk
8 = No transportation
9 = Other (please specify) _____

10. If you (the individual) use modes other than your (the individual's) care, do you (the individual) need to make prior arrangements (reserve rides)?
1 = YES 2 = NO

11. If yes, with whom do you (the individual) have to arrange the trip?
1 = Relatives/friends
2 = Cab companies
3 = Social/welfare agencies
4 = LTD
5 = Other (please specify) _____

12. If yes, how far in advance do you (the individual) have to arrange the trip?
1 = One hour
2 = Less than 24 hours
3 = 24 hours
4 = 48 hours
5 = Other (please specify) _____

13. What is the **primary** purpose for which you (the individual) would need transportation services (give one answer only)?
1 = Work
2 = Travel to doctor's office/medical services
3 = Travel to school
4 = Travel to social service
5 = Travel for social/recreational purpose
6 = Shopping
7 = Other (please specify) _____

14. For what other **purpose(s)** do you (the individual) need transportation services? (Mark all that apply.)
1 = Work
2 = Travel to doctor's office/medical services
3 = Travel to school
4 = Travel to social service
5 = Travel for social/recreational purpose
6 = Shopping
7 = Other (please specify) _____

15 & 16. What is your (the individual's) mode of transportation for the purpose mentioned?

PRIMARY PURPOSES (15)
1 = Drive own car
2 = Private vehicle (another driver)
3 = LTD Fixed Route Service
4 = LTD On-call Service
5 = Taxi
6 = Service/welfare agency
7 = Walk
8 = Other (please specify)
_____

SECONDARY PURPOSES (16)
1 = Drive own car
2 = Private vehicle (another driver)
3 = LTD Fixed Route Service
4 = LTD On-call Service
5 = Taxi
6 = Service/welfare agency
7 = Walk
8 = Other (please specify)
_____

17 & 18. What time of the day do you (the individual) make this trip?

PRIMARY PURPOSE (17)
1 = morning
2 = afternoon
3 = evening
4 = different times

SECONDARY PURPOSE (18)
1 = morning
2 = afternoon
3 = evening
4 = different times

19 & 20. How often do you (the individual) need transportation for the purpose mentioned above?

PRIMARY PURPOSE (19)
1 = more than once a day
2 = once a day
3 = more than once a week
4 = once a week
5 = more than once a month
6 = once a month
7 = less than once a month
8 = other (please specify)
_____

SECONDARY PURPOSE (20)
1 = more than once a day
2 = once a day
3 = more than once a week
4 = once a week
5 = more than once a month
6 = once a month
7 = less than once a month
8 = other (please specify)
_____

21 & 22. Which days do you (the individual) make this trip?

PRIMARY PURPOSE (21)
1 = Monday-Friday
2 = Saturday
3 = Sunday
4 = all above
5 = days vary

SECONDARY PURPOSE (22)
1 = Monday-Friday
2 = Saturday
3 = Sunday
4 = all above
5 = days vary

23 & 24. Where is the origin of your (the individual's) trip? (give the closest intersection i.e. 200 North 100 East)

PRIMARY PURPOSE (23)
_____

SECONDARY PURPOSE (24)
_____

25 & 26. Where is the destination of your (the individual's) trip? (give approximate location)

PRIMARY PURPOSE (25)
_____

SECONDARY PURPOSE (26)
_____

27 & 28. Do you (the individual) pay for the service?

PRIMARY PURPOSE (27)
1 = YES
2 = NO

SECONDARY SERVICE (28)
1 = YES
2 = NO

29 & 30. If yes, how much do you (the individual pay for the service?

PRIMARY PURPOSE (29)

1 = $_____ per round trip
2 = $_____ per one-way trip
3 = $_____ per week
4 = $_____ per month
5 = Donation $_____ per month
6 = Other (please specify)

_____

SECONDARY PURPOSE (30)

1 = $_____ per round trip
2 = $_____ per one-way trip
3 = $_____ per week
4 = $_____ per month
5 = Donation $_____ per month
6 = Other (please specify)

_____

31 & 32. If the trip is pre-arranged, how long do you (the individual) have to wait for the ride?

PRIMARY PURPOSE (31)

1 = 0-5 minutes
2 = 5-10 minutes
3 = 10-30 minutes
4 = 30 minutes-1 hour
5 = more than 1 hour

SECONDARY PURPOSE (32)

1 = 0-5 minutes
2 = 5-10 minutes
3 = 10-30 minutes
4 = 30 minutes-1 hour
5 = more than 1 hour

33 & 34. How long is your (the individual's) travel time one-way for each trip?

PRIMARY PURPOSE (33)

1 = 0-15 minutes
2 = 15-30 minutes
3 = 30 minutes-1 hour
4 = more than 1 hour

SECONDARY PURPOSE (34)

1 = 0-15 minutes
2 = 15-30 minutes
3 = 30 minutes-1 hour
4 = more than 1 hour

35 & 36. Do you (the individual) share the ride with others?

PRIMARY PURPOSE (35)

1 = YES
2 = NO
If yes, how many people on average _____

SECONDARY PURPOSE (36)

1 = YES
2 = NO
If yes, how many people average _____

37 & 38. Do you have any comment or suggestion to improve the service?

PRIMARY PURPOSE (37)

1 = NO
2 = YES (please specify)

_____

SECONDARY PURPOSE (38)

1 = NO
2 = YES (please specify)

_____

THE FOLLOWING QUESTIONS ARE OF PERSONAL NATURE, IT IS OPTIONAL FOR YOU (THE INDIVIDUAL) TO ANSWER THEM.

39. At what age did your (the individual's) disability begin? _____

40. How would you describe your (the individual's) employment status?
1 = Full-time employed
2 = Part-time employed
3 = Student
4 = Homemaker
5 = Unable to work
6 = Retired
7 = Other (please specify) _____

41. In which age group do you (the individual) fall?
1 = up to 3 years old
2 = 4-22 years old
3 = 23-64 years old
4 = 65 years and older

42. What is your (the individual's) level of total income?
1 = none
2 = up to $7,000
3 = $7,000-10,000
4 = $10,000-15,000
5 = $15,000-20,000
6 = $20,000-25,000
7 = $25,000-30,000
8 = $30,000 and over

43 & 44. What is your (the individual's) main source of income? Are there other sources of income?

MAIN (43)
1 = employment
2 = benefits (i.e. SSI)
3 = other(s) (please specify)
_____

OTHER (44)
1 = employment
2 = benefits (i.e. SSI)
3 = other(s) (please specify)
_____

45. There will be a follow-up survey related to disabled transportation technologies and services. Would you (the individual) like to participate in this survey?
1 = YES
2 = NO

If yes, would you (the individual) like to give your (the individual's) name, or another phone number so that we may more easily contact you?

OTHER COMMENTS

TABLES

Table 1. Percentages of Primary Disabilities

DISABILITY	PERCENTAGE
Mobility	55.9
Sight	15.3
Hearing	14.4
Speech	5.9
Cognitive	5.9
Other	2.5

Table 2. Age Distribution of Respondents and Start of Disability

AGE (YEARS)	PERCENT OF RESPONDENTS	START OF DISABILITY (%)
birth-3	2.4	22.4
4 - 22	21.1	12.1
23 - 64	28.3	35.6
65 and over	48.2	28.9

Table 3. Classification of Needs

NEEDS	PERCENTAGE
Wheelchair/ramp	8.8
Visual Aid	13.2
Hearing Aid	18.7
Comprehension Aid	7.7
Walker/Cane	22.8
Help with Climbing	5.2
Oxygen Pack	5.2
Crutches	2.1
Walker & Oxygen	4.4
No Comment	2.1

Table 4. Transportation Modes Accessible to Respondents

MODE	PERCENTAGE
Own Car	33.6
Other Vehicle	43.1
LTD Fixed Route	5.8
LTD ON-CALL	5.8
Social Agencies	2.9
Walk	3.7
Other	2.9
No Access	1.5
No Comment	0.7

Table 5. Percentages of Trip Purposes

PURPOSE	PRIMARY TRIP (%)	SECONDARY TRIP (%)
Work	19.1	6.9
Medical	44.7	12.7
School	18.1	6.4
Social Service	2.1	6.4
Recreational	3.2	27.2
Shopping	9.6	34.1
Other	3.2	6.4

Table 6. Transportation Mode Distribution for Trips

PURPOSE	PRIMARY TRIP (%)	SECONDARY TRIP (%)
Own Car	42.6	36.7
Other Driver	45.7	45.9
LTD Fixed Route	3.2	5.5
LTD ON-CALL	3.2	4.6
Taxi	0.0	0.0
Service Agency	2.1	4.6
Walk	0.0	1.8
School Bus	3.2	0.9

Table 7. Frequency of Trip Purpose

FREQUENCY	PRIMARY TRIP (%)	SECONDARY TRIP (%)
> 1 Trip/Day	33.3	33.3
1 Trip/Day	28.0	27.8
> 1 Trip/Week	21.5	21.1
1 Trip/Week	10.8	10.0
> 1 Trip/Month	2.2	4.4
1 Trip/Month	1.1	2.2
< 1 Trip/Month	3.2	1.1

FIGURES

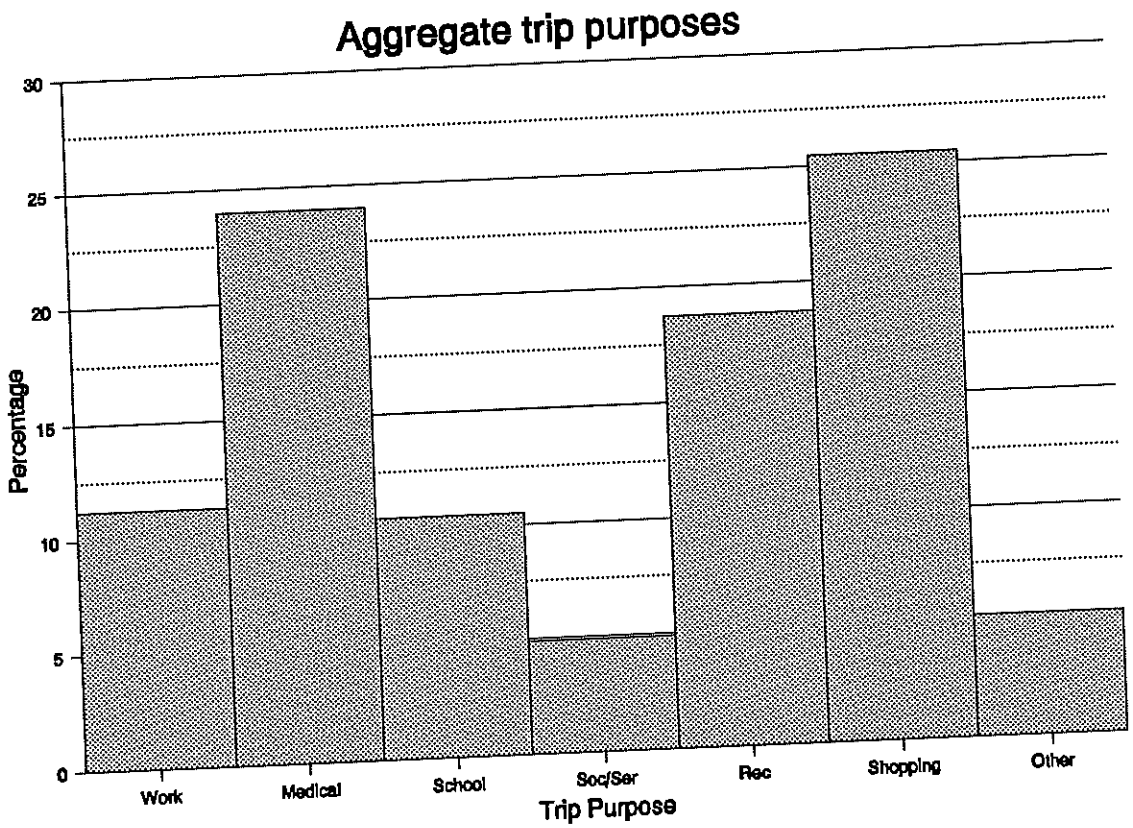

Aggregate trip purposes
30
25
20
15
10
5
0
Percentage
Work
Medical
School
Soc/Ser
Rec
Shopping
Other
Trip Purpose

Figure 1

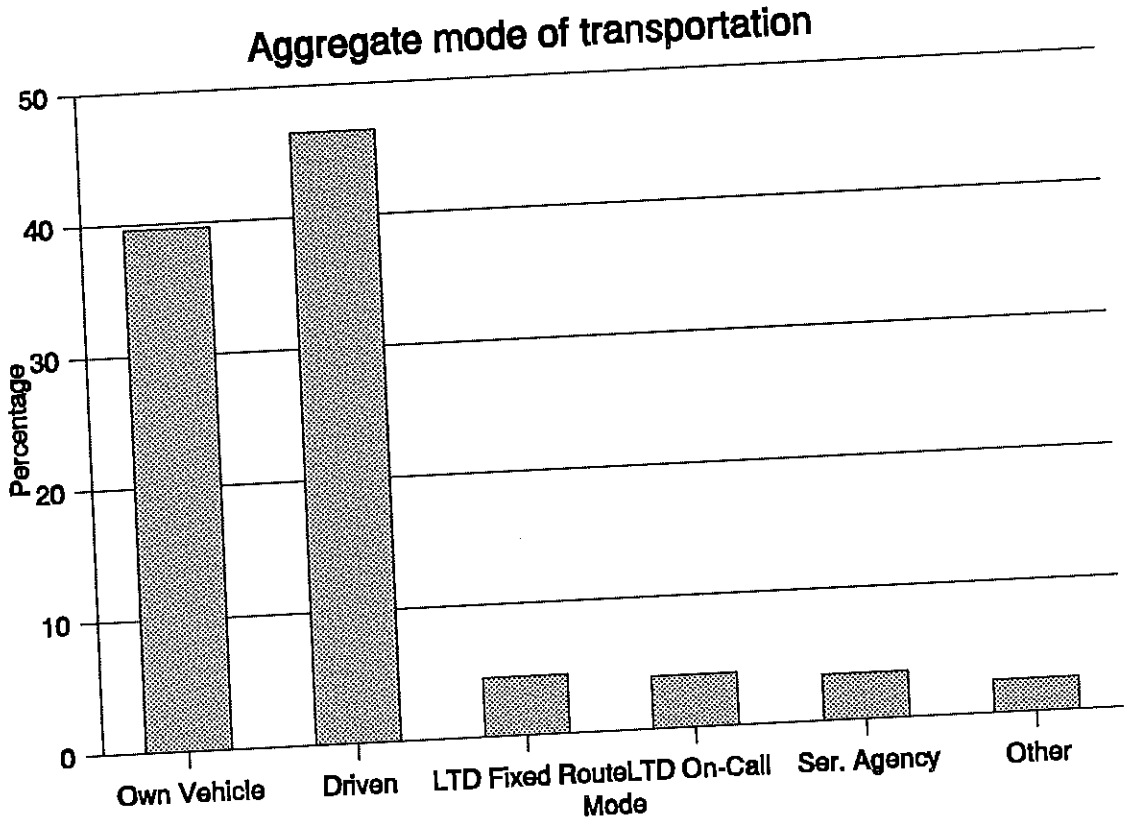

Aggregate mode of transportation
Percentage
50
40
30
20
10
0
Own Vehicle
Driven
LTD Fixed Route
LTD On-Call
Ser. Agency
Other
Mode

Figure 2

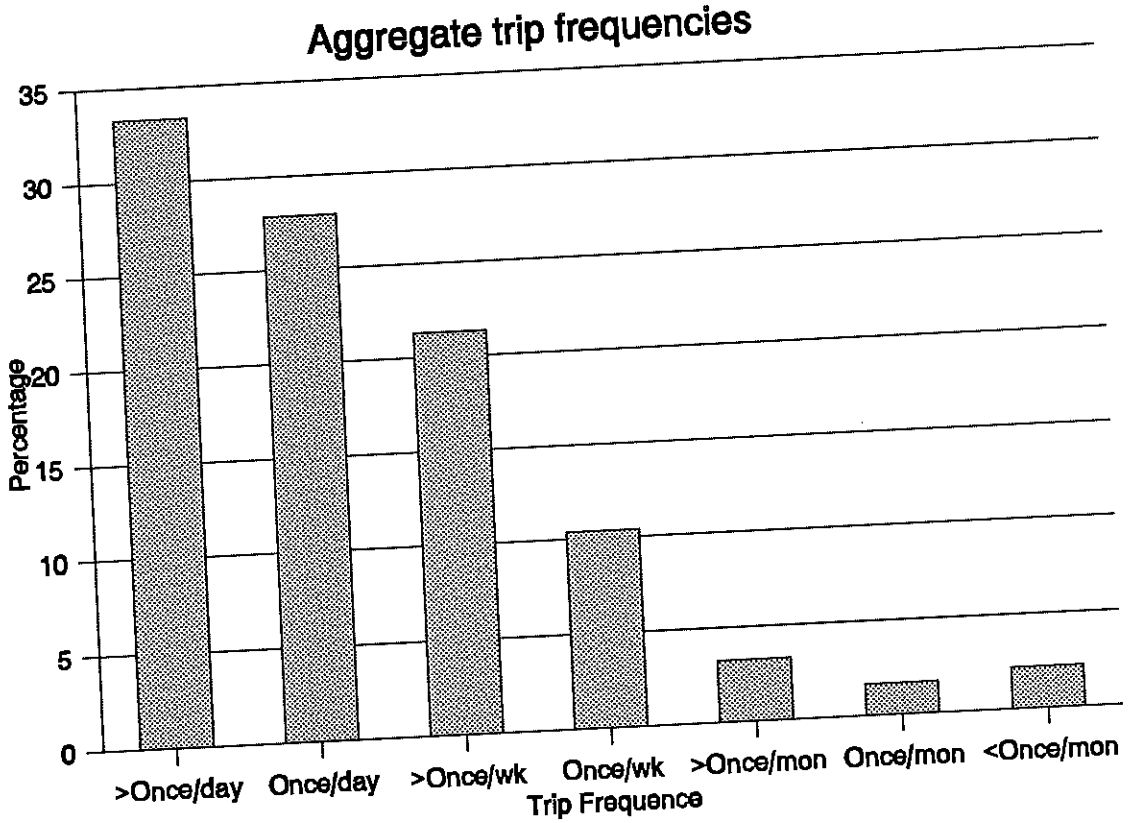

Aggregate trip frequencies
35
30
25
20
15
10
5
0
Percentage
>Once/day
Once/day
>Once/wk
Once/wk
>Once/mon
Once/mon
<Once/mon
Trip Frequence

Figure 3

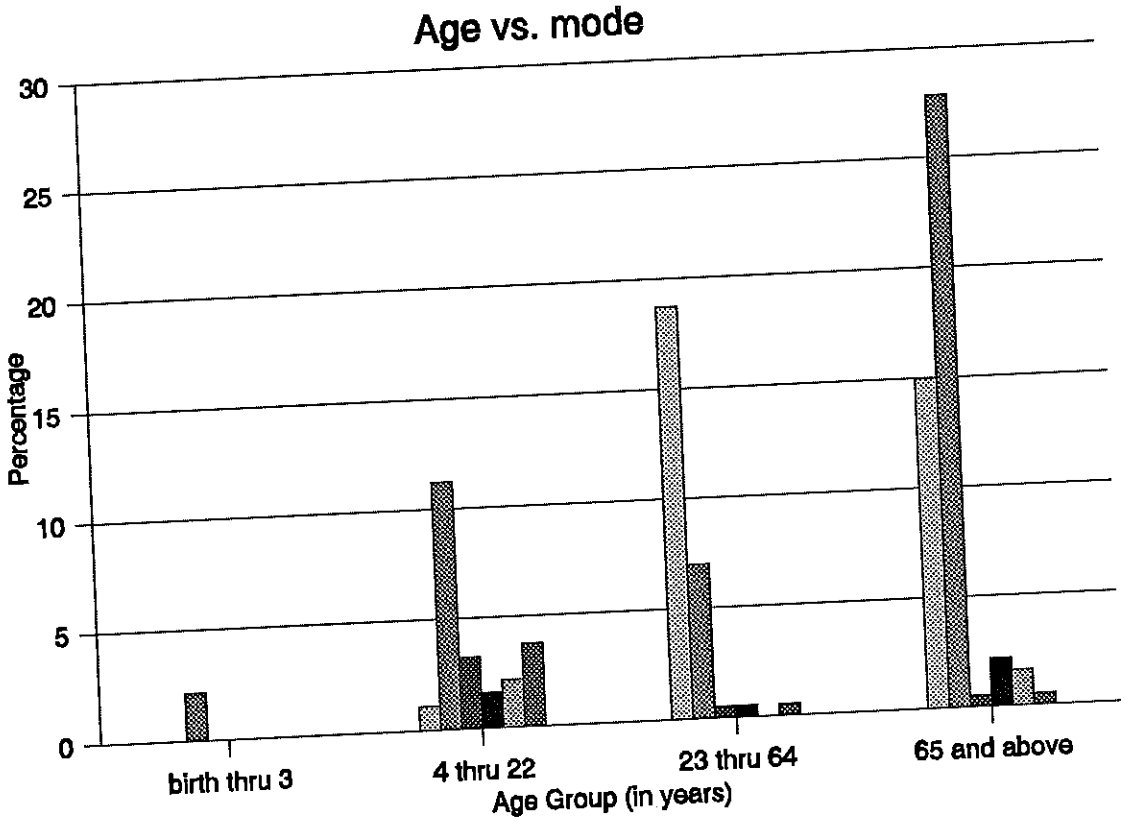

Age vs. mode
30
25
20
15
10
5
0
Percentage
birth thru 3
4 thru 22
23 thru 64
65 and above
Age Group (in years)

Figure 4

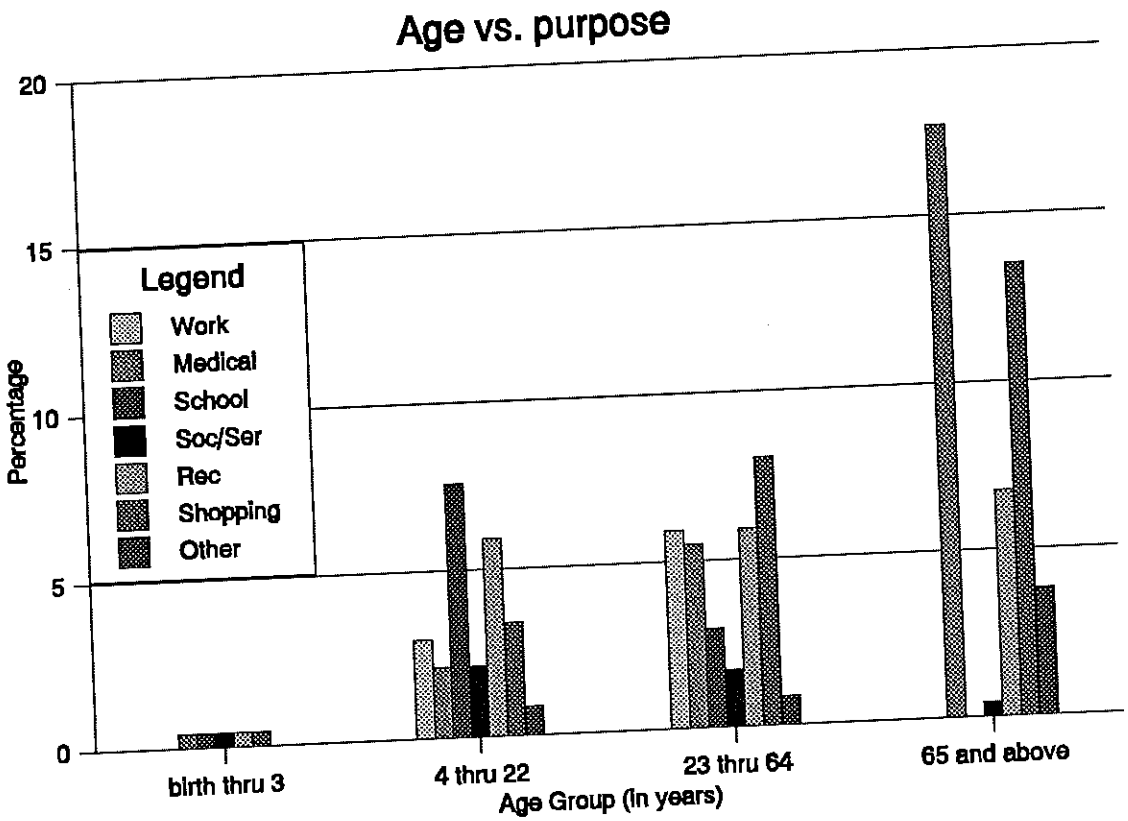

Age vs. purpose
20
15
10
5
0
Percentage
Legend
Work
Medical
School
Soc/Ser
Rec
Shopping
Other
birth thru 3
4 thru 22
23 thru 64
65 and above
Age Group (in years)

Figure 5

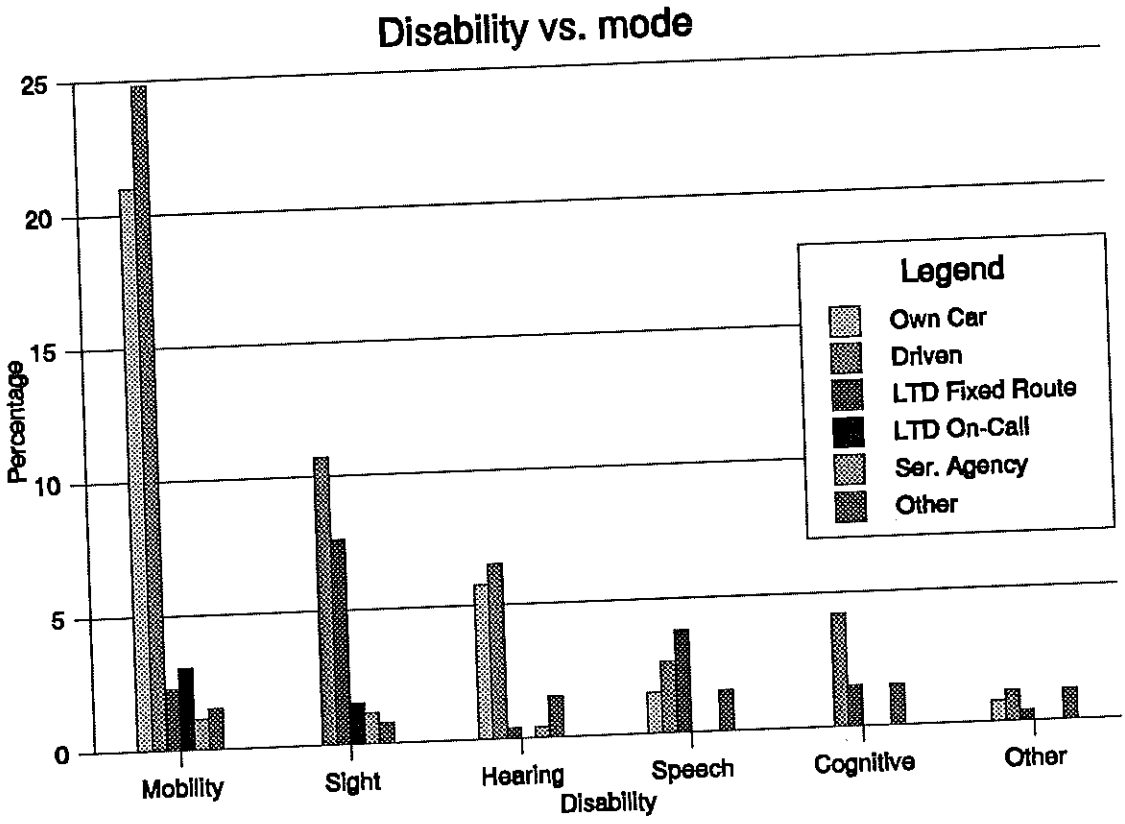

Disability vs. mode
25
20
15
10
5
0
Percentage
Legend
Own Car
Driven
LTD Fixed Route
LTD On-Call
Ser. Agency
Other
Mobility
Sight
Hearing
Speech
Cognitive
Other
Disability

Figure 6

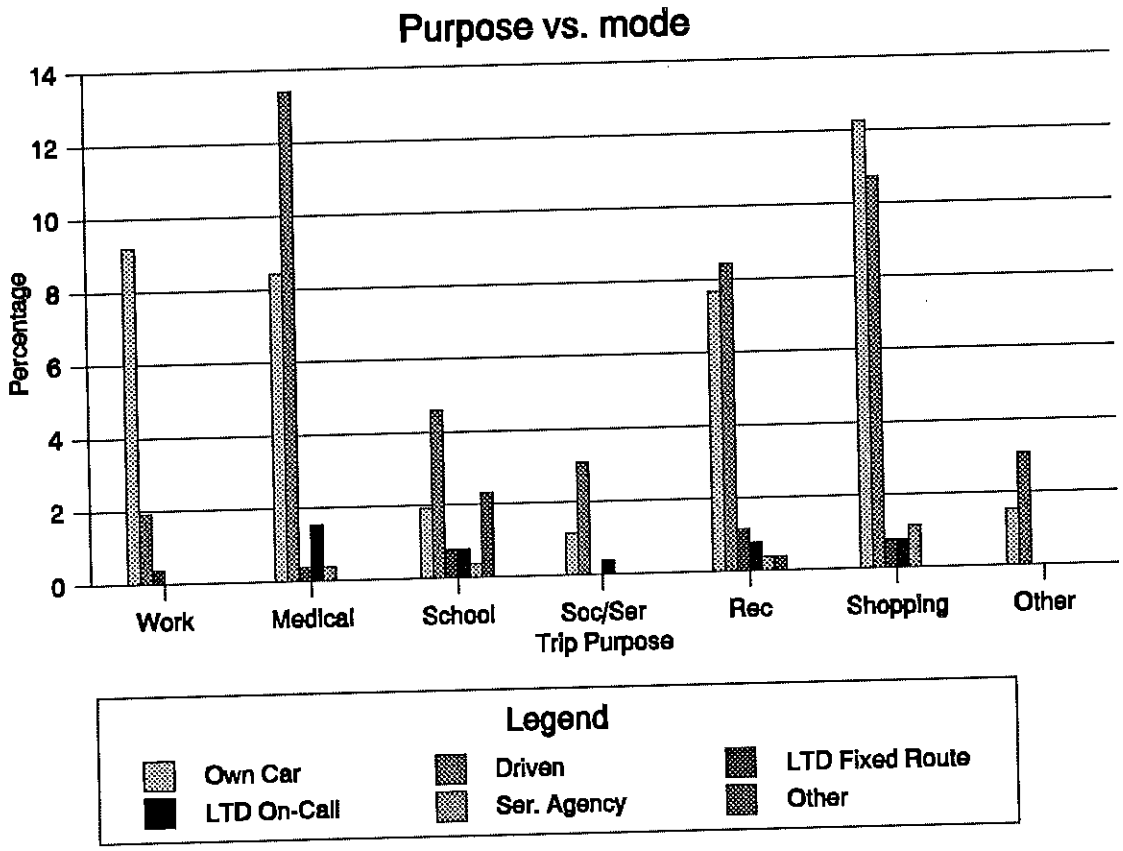

Purpose vs. mode
14
12
10
8
6
4
2
0
Percentage
Work
Medical
School
Soc/Ser
Rec
Shopping
Other
Trip Purpose
Legend
Own Car
LTD On-Call
Driven
Ser. Agency
LTD Fixed Route
Other

Figure 7

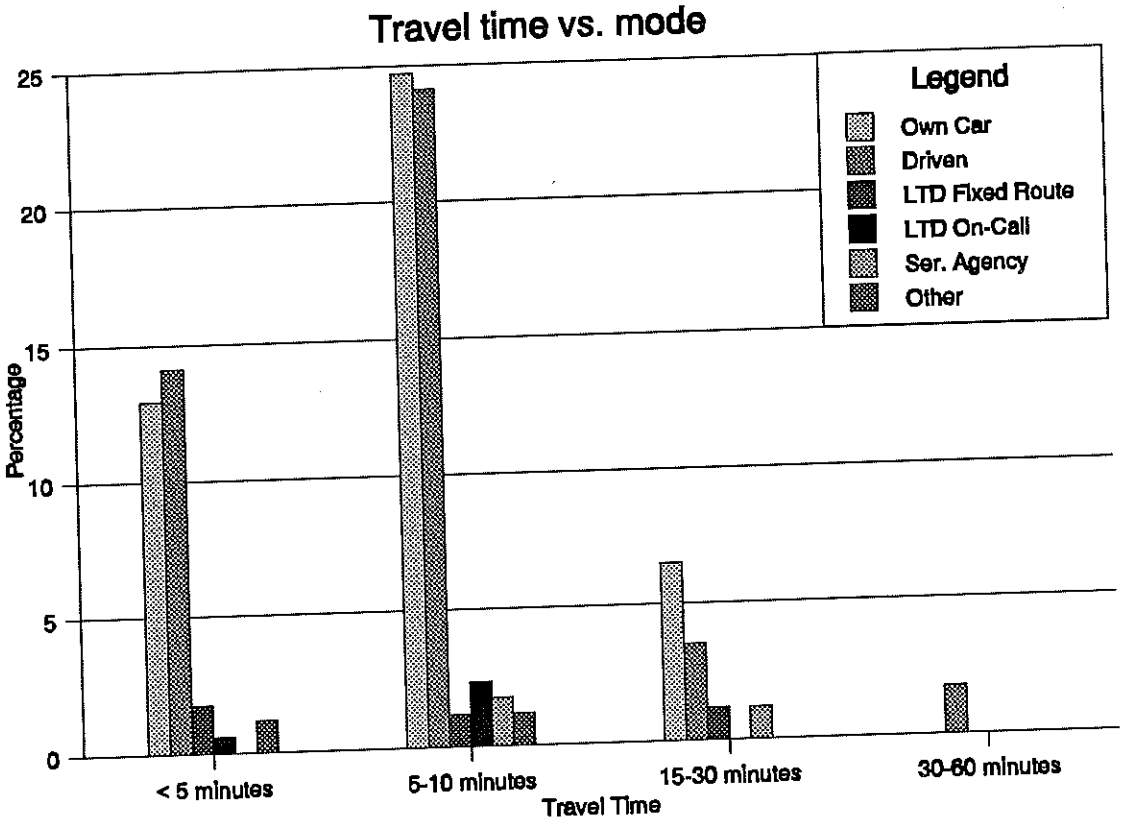

Travel time vs. mode
Legend
Own Car
Driven
LTD Fixed Route
LTD On-Call
Ser. Agency
Other
Percentage
25
20
15
10
5
0
< 5 minutes
5-10 minutes
15-30 minutes
30-60 minutes
Travel Time

Figure 8

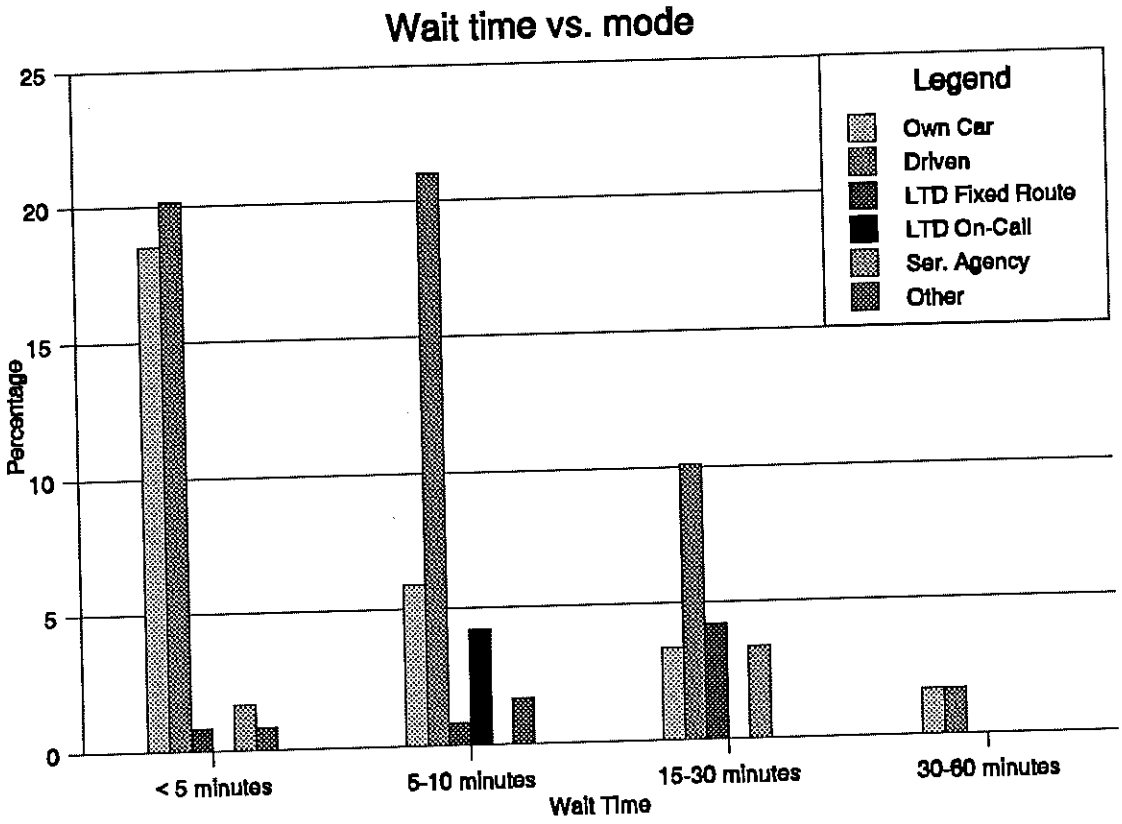

Wait time vs. mode
Legend
Own Car
Driven
LTD Fixed Route
LTD On-Call
Ser. Agency
Other
Percentage
25
20
15
10
5
0
< 5 minutes
5-10 minutes
15-30 minutes
30-60 minutes
Wait Time

Figure 9

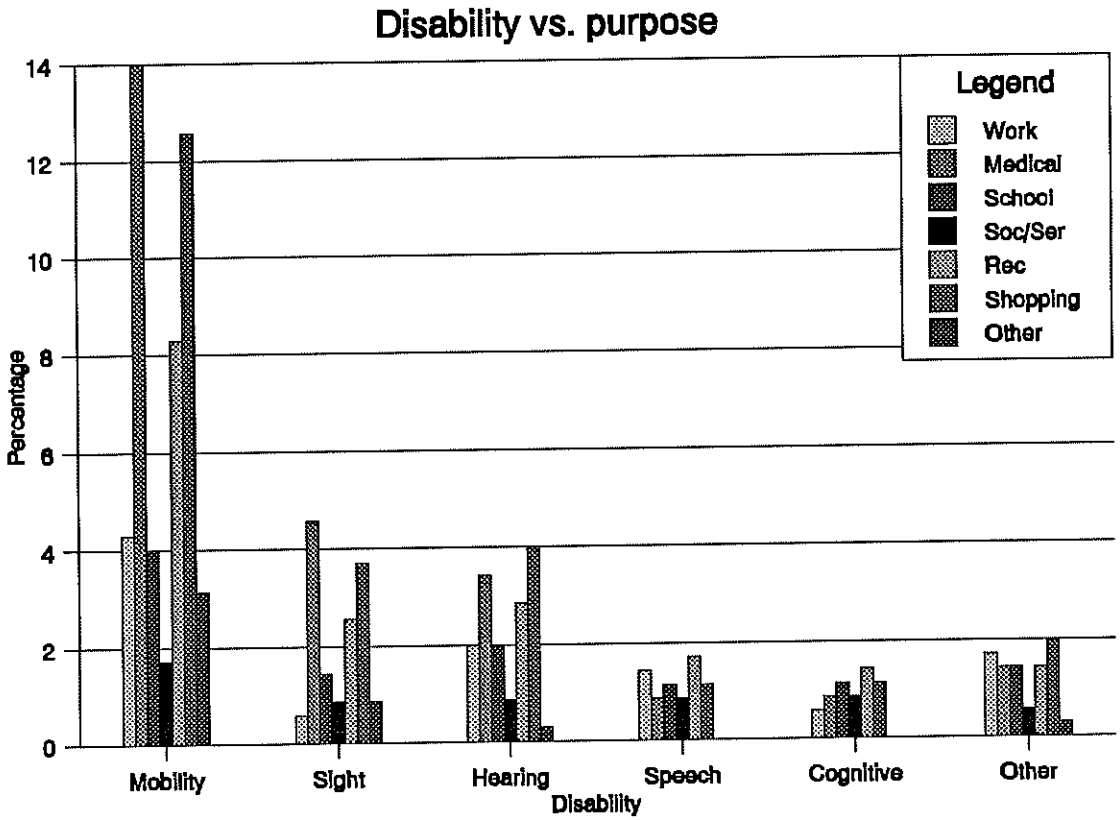
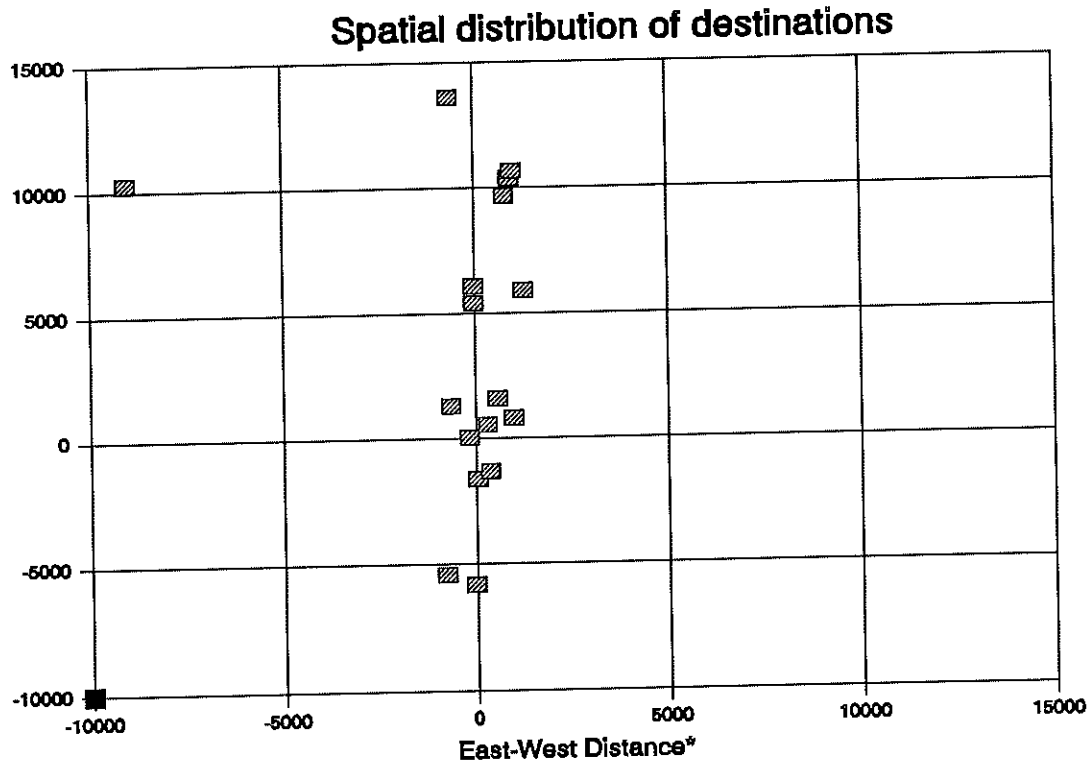
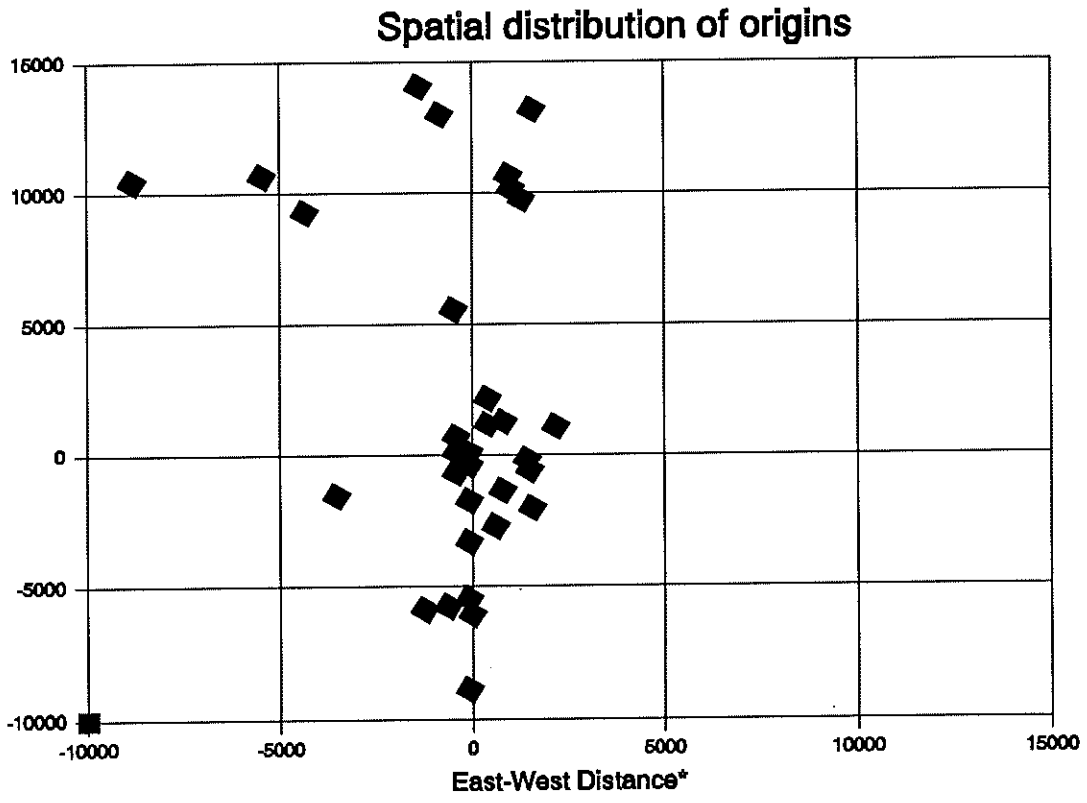

Disability vs. purpose
Legend
Work
Medical
School
Soc/Ser
Rec
Shopping
Other
Percentage
0
2
4
6
8
10
12
14
Mobility
Sight
Hearing
Speech
Cognitive
Other
Disability

Figure 10



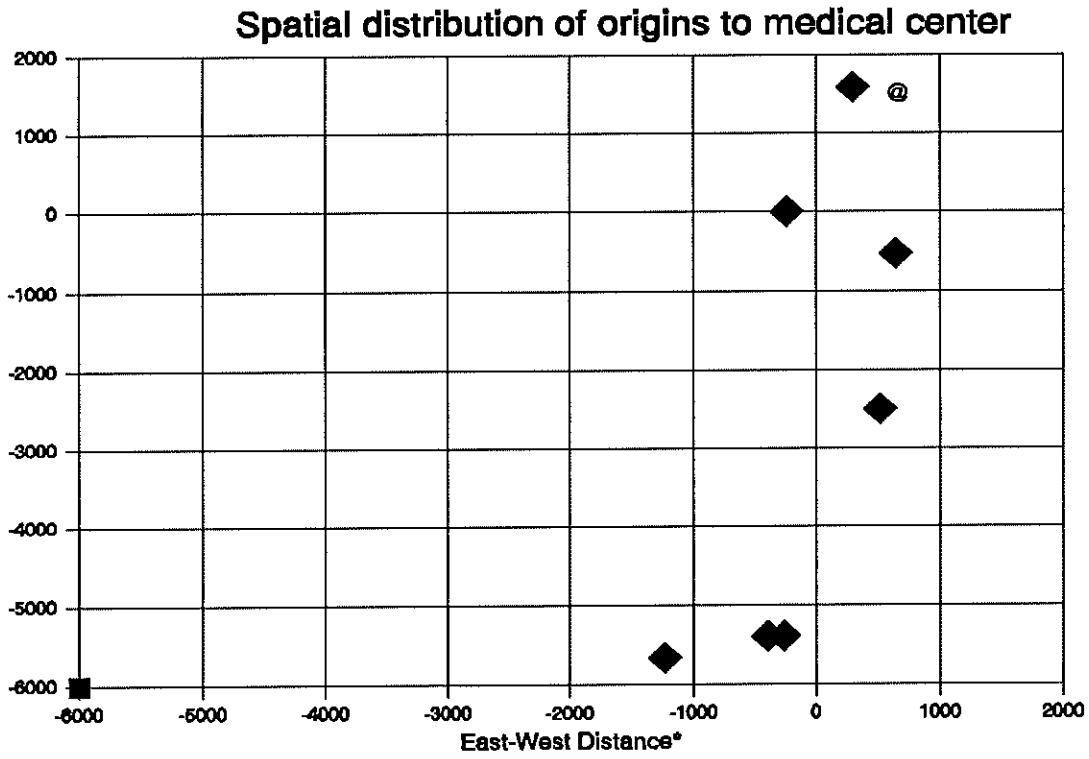
*each division of 100 is approximately .2 miles; negative (-) indicates South and West locations

Figure 11



*each division of 100 is approximately .2 miles; negative (-) indicates South and West locations

Figure 12



*each division of 100 is approximately .2 miles; negative (-) indicates South and West locations
@ Medical Center

Figure 13

Technical Report Documentation Page

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16. Abstract

This report is based on a study that was undertaken to determine the travel patterns and transportation needs of people with disabilities, and also to assess the extent to which those needs are met in Cache County, Utah.

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13. ABSTRACT (Maximum 200 words)

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14. SUBJECT TERMS

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