OKLAHOMA TRANSPORTATION CENTER

ECONOMIC ENHANCEMENT THROUGH INFRASTRUCTURE STEWARDSHIP

HUMAN TRANSPORTATION NEEDS IN RURAL OKLAHOMA

D. CHONGO MUNDENDE, PH.D.

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Oklahoma Transportation Center
2601 Liberty Parkway, Suite 110
Midwest City, Oklahoma 73110

Phone: 405.732.6580
Fax: 405.732.6586
www.oktc.org

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16. ABSTRACT

Mobility is extremely important, especially in rural areas, which have dispersed populations and locations. This study was conducted among rural minority populations to evaluate human transportation needs of the underserved rural population in Oklahoma, with particular emphasis on vehicle availability and accessibility. Three surveys were conducted with 142 randomly selected individuals, 32 tribal governments, and 113 randomly selected municipal governments, respectively. Results indicate that vehicle ownership levels are high. Respondents indicated that there exists very little public transportation, and those who do not own automobiles or cannot drive such as the elderly, have limited mobility, in most cases relying on family members and relatives for their travel. Because of monetary constraints and limited usage of public transportation, municipal and tribal governments are reluctant to provide transportation services.

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SI (METRIC) CONVERSION FACTORS

Approximate Conversions to SI Units

Symbol	When you know	Multiply by	To Find	Symbol
	LENGTH			
in	inches	25.40	millimeters	mm
ft	feet	0.3048	meters	m
yd	yards	0.9144	meters	m
mi	miles	1.609	kilometers	km
	AREA			
in^2	square inches	645.2	square millimeters	mm
ft^2	square feet	0.0929	square meters	m^2
yd^2	square yards	0.8361	square meters	m^2
ac	acres	0.4047	hectares	ha
mi^2	square miles	2.590	square kilometers	km^2
	VOLUME			
fl oz	fluid ounces	29.57	milliliters	mL
gal	gallons	3.785	liters	L
ft^3	cubic feet	0.0283	cubic meters	m^3
yd^3	cubic yards	0.7645	cubic meters	m^3
	MASS			
oz	ounces	28.35	grams	g
lb	pounds	0.4536	kilograms	kg
T	short tons (2000 lb)	0.907	megagrams	Mg
	TEMPERATURE (exact)			
°F	degrees Fahrenheit	(°F-32)/1.8	degrees Celsius	°C
	FORCE and PRESSURE or STRESS			
lbf	poundforce	4.448	Newtons	N
lbf/in^2	poundforce per square inch	6.895	kilopascals	kPa

Approximate Conversions from SI Units

Symbol	When you know	Multiply by	To Find	Symbol
	LENGTH			
mm	millimeters	0.0394	inches	in
m	meters	3.281	feet	ft
m	meters	1.094	yards	yd
km	kilometers	0.6214	miles	mi
	AREA			
mm^2	square millimeters	0.00155	square inches	in^2
m^2	square meters	10.764	square feet	ft^2
m^2	square meters	1.196	square yards	yd^2
ha	hectares	2.471	acres	ac
km^2	square kilometers	0.3861	square miles	mi^2
	VOLUME			
mL	milliliters	0.0338	fluid ounces	fl oz
L	liters	0.2642	gallons	gal
m^3	cubic meters	35.315	cubic feet	ft^3
m^3	cubic meters	1.308	cubic yards	yd^3
	MASS			
g	grams	0.0353	ounces	oz
kg	kilograms	2.205	pounds	lb
Mg	megagrams	1.1023	short tons (2000 lb)	T
	TEMPERATURE (exact)			
°C	degrees Celsius	9/5+32	degrees Fahrenheit	°F
	FORCE and PRESSURE or STRESS			
N	Newtons	0.2248	poundforce	lbf
kPa	kilopascals	0.1450	poundforce per square inch	lbf/in^2

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HUMAN TRANSPORTATION NEEDS IN RURAL OKLAHOMA

FINAL

SEPTEMBER 30, 2012

Principal Investigator:

D. Chongo Mundende, Ph.D.
Associate Professor and
Director, Center for Outreach Programs
Langston University
323 E.L. Holloway Agriculture Center
Langston, OK 73050

Sponsoring Agency:

Oklahoma Transportation Center
2601 Liberty Parkway, Suite 110
Midwest City, OK 73110

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Executive Summary

Providing public transportation in rural areas is challenging. As a result, rural families depend on their own vehicles or the kindness of others for their travel needs. The purpose of this study was to evaluate human transportation needs of the underserved rural population in Oklahoma, with particular emphasis on vehicle availability and accessibility. Three surveys were conducted to gauge rural needs. The first survey was conducted among small and underserved populations. The second survey was sent to municipal governments and tribal governments, respectively.

This study focused on answering the following questions: what are the major transportation needs in rural areas? How do those who do not drive or do not own an automobile get around to shops and medical appointments, pick up medical prescriptions, or execute necessary functions associated with mobility? How can municipal and tribal agencies solve some of those challenges? The specific objectives of this study were: (1) Generate population distribution maps identifying underrepresented population groups for each Oklahoma county, (2) Survey rural residents to ascertain transportation needs , and (3) Survey municipal and tribal governments to ascertain transportation needs.

The 2010 census data show that Oklahoma, Tulsa, and Comanche counties had the highest concentrations of minority populations. The counties that experienced the largest increases in minority populations were Rogers and Wagoner in the northeast; Canadian, Cleveland, and Logan in central Oklahoma; and Marshall in the south central Oklahoma. The counties surrounding Comanche County either lost population or grew very slowly. The Hispanic or Latino Americans as well as the Native Hawaiian and Other Pacific Islanders grew by over 80 percent.

The survey involving 142 individual respondents in rural Oklahoma indicated that 85 percent of the respondents owned at least one vehicle, while 15 percent did not own any. Mobility for those who did not own any vehicle was limited. These were mainly the elderly who could not drive because of age or medical conditions. Those who did not own a vehicle relied on others, mainly family members to take them to places of service including medical facilities

and other destinations such as shopping centers. Some of the respondents used public transportation where it was available. Most of the respondents lived more than 10 miles away from either a shopping center or a medical facility.

Accessibility, or the ability to reach needed services and facilities, is a big issue in rural Oklahoma because the automobile still dominates the transportation scene. Public transportation played only a minor role among the respondents because even where it was available, few respondents knew about it. Respondents who did not have means of transportation had unique challenges in that medical and shopping facilities were located at least 10 miles from their residences, a challenging distance to walk.

Some respondents had more than one reliable vehicle and did not see any major problem or any need for public transportation. They indicated that they would not consider using public transportation if it were available. Consistent with this finding was the opposite response by those who did not have vehicles who stated that they would use public transportation if available. Some respondents could not drive or did not have a car or access to a car to drive. These were mainly the elderly, who could be assumed to have had lower fixed income.

The representatives from the municipal and tribal governments indicated that they did not provide public transportation. Some knew of other agencies that provided transportation services.

The study concluded that travel in rural areas is challenging for some people because they do not own vehicles. There is a need for public transportation. However, it is difficult to provide a regular bus service in rural areas because of inadequate use, remoteness of some places, and funding constraints. Although public transportation is available, most of the respondents did not know about its availability. Municipal and tribal governments indicated that it was expensive to provide public transportation in rural environments.

Introduction

Statement of Problem

Providing public transportation in rural areas is a challenge, leaving families to depend on the use of their own vehicles or those of family members and friends. The purpose of this study was to evaluate human transportation needs of the underserved rural population in Oklahoma, with particular emphasis on vehicle availability and accessibility. The underserved populations include groups of people who are vulnerable because of their membership in their respective groups irrespective of their individual traits and characteristics. These individuals may be the last to know about programs and services. They may have low incomes, or be members of racial and ethnic minorities, or the elderly.

The findings from the study will help in making informed decisions on rural transportation by agencies such as the Oklahoma Department of Transportation (ODOT), county governments, and local municipalities in meeting their short-term and long-term transportation planning efforts.

Modern transportation researchers rarely study rural areas [1], which suffer from a lack of many services, including public transportation. Research studies conducted in the 1960s and 1970s were linked to civil disturbances of that period. In the 1960s, inadequate transportation was found to contribute to high rates of unemployment among African Americans [2]. Following the Los Angeles civil rights protests, the National Advisory Commission on Civil Orders [3] recommended improved transportation opportunities for central city residents as a solution to improved socioeconomic conditions of the people.

Why is reference to urban riots important? It is important because lessons from those civil rights protests can be used to understand the consequences of unmet needs in both rural and urban areas. For example, rural residents who do not have reliable means of transportation may be negatively impacted both socially and economically. They may not get a job outside their town that may bring in money to meet their basic needs.

High Ownership of Vehicles

The United States, one of the richest nations in the world, is characterized by high vehicle ownership levels and little public transportation in rural areas. Reliable and affordable transportation is critical in any thriving economy. People have to go to work, the sick need to reach medical and health care facilities, and all the people have to get to their destinations for various reasons. Some researchers have concluded that consistent, reliable, and affordable transportation can lead to an economic advantage [4]. Also, as the population of the United States continues to gray, new challenges in the transportation industry will continue to be encountered because of unique challenges of the increasing rural elderly.

This study was an attempt to answer the following questions. What are the major transportation needs in rural Oklahoma? How do those who don't drive or do not own an automobile get around to shops, medical appointments, pick up medical prescriptions, or carry out a number of other necessary functions associated with mobility? What are some of the transportation challenges? How can municipal and tribal agencies solve some of those challenges?

The Center for Outreach Programs at Langston University (the Center) organizes seminars around the state of Oklahoma. The staff at the Center has found that few producers travel long distances to go to seminars that are designed to help them in their farm or ranch operations. So the staff has to organize many local seminars if it wants the people to participate.

Car ownership seems to be the most critical issue in rural areas [1]. What are the common challenges in rural transportation? How do local transportation agencies try to solve some of those challenges? What could be some of the solutions to be implemented? Providing transportation services could be a challenge for local governments, especially during times of scarce resources, such as the current financial meltdown. Experience shows that in efforts to reduce costs and improve efficiency in most agencies, probably the first to be terminated are those services that affect the already underserved minority populations.

When compared to urban areas, rural areas tend to have higher rates of car ownership because of factors such as open space (lack of congestion), absence of public transportation

systems, less air pollution problems, and greater need for vehicle ownership due to lack of alternatives [1, 5, 6]. To obtain services, rural residents travel longer distances to higher-order centers of economic activities, making mobility difficult for those who do not have reliable transportation. Due to many factors, including distances to Emergency Medical Services (EMS), location of acute care facilities, patient not recognizing the severity and extent of injury, and lack of a communication system such as 911, chances are more than 50 percent that someone will more likely die from trauma in a rural than in an urban setting [2, 7]. Additionally, initial response time may be compromised in rural areas because most facilities are manned by volunteers. Young et al. [8] found that although private vehicles were used to transport patients with minor injuries, for major/fatal injuries, patients over 64 years of age used ambulances more than other age groups [8, 9 - 11].

Availability and Accessibility

Although distance to a service provider (in addition to fees for service and availability of regular physician) highly correlates with service utilization [12], at least some studies reveal that distance alone does not fully explain the utilization of services [13]. Nemet and Bailey [14] state that, for the elderly, physician availability maybe more important than distance. Lack of accessibility creates problematic issues in rural development. Income and remoteness may be some of the most potent issues to deal with. For example, communities that have access to transportation will have higher levels of employment, good quality transportation infrastructures, urban-rural migrants who may artificially increase rural house prices, and increase labor market costs. Transportation costs are simply a small part of overall business costs [15].

Considering the effects of access to consistent, reliable, and affordable transportation, Thakuriah et al. [4] concluded that a significant economic gap exists in adolescents and young adults between those who have means of transportation and those who do not. In the rural US, poverty and immobility tend to move together, reinforcing each other. Poor rural residents without a car tend to be employed in lower-paying jobs that are closer to their homes. Also, low mobility is associated with unemployment or underemployment [16]. Even in urban areas that do not have reliable transportation, people find it difficult to get jobs; including entry-level

positions that are usually available in the evenings when public transit systems (where they exist) are either limited or out of service [17]. Rural residents are likely to withdraw from the labor market or leave the area if they want to be employed at a higher paying job [18]. There seems to be a relationship among transportation, mobility, employment, and poverty [16].

Given that Oklahoma is a rural state, it has vast remote areas with low population densities that make providing public transportation a huge challenge. Such a situation poses incredible problems to rural residents with respect to transportation, accessibility, and communications, resource provision, and resource utilization.

Whereas accessibility is the ability to reach needed services and facilities, mobility is the amount of travel undertaken. Vehicle accessibility in light of vehicle availability and an individual's ability to drive affects mobility, especially among the older people [19]. Mobility ensures that one can participate in social interaction and other activities. As a result, mobility affects one's quality of life and independence [20].

Accessibility is a big issue in rural areas because the car still dominates the transportation scene. In the United States, 97 percent of rural households own a car and over 91 percent of all trips are made by car [15]. The patterns of use seem to be the same irrespective of age, race, and income. Also, because of longer distances traveled, mobility levels in rural areas are higher than in urban areas. "In one sense the rural transport problem has been solved and there is no debate in the USA, as those without cars are politically invisible as their numbers are so small" [15, p. 460]. There are people who cannot drive or do not have a car or access to a car to drive. Usually, these people can be classified as too young, too poor, or too old to drive [15, 21]. Older people (those over 64 years of age) who have lower income, especially women and minorities, and those who have lower automobile accessibility, suffer more in terms of accessibility and mobility [21]. They therefore depend on others or public transportation. They may have to live near available services and facilities. In fact, older populations severely restrict their activities because of lack of transportation [21].

Travel demand patterns in rural areas are usually small and diffuse, creating a need for private rather than public transportation. It would be difficult to provide a bus service in that kind of environment. Public policy is then extremely important in assuring provision of services

but that do not subsidize higher costs by offering whole ranges of services and facilities in rural areas. “The longer distances make it more expensive and harder to provide the same level of provision as in urban areas, and this problem is magnified by the lower levels of demand in rural areas” [15, p. 461].

A need exists to coordinate transportation with business priorities so that those who are at risk can be identified and their access to employment promoted. If ensuring access to services and employment is not promoted through transportation and/or location policies, some people will be consistently excluded, making private transportation a major barrier, because a lack of access to transportation is associated with a poor quality of life.

Project Goals and Objectives

Given that Oklahoma is a very rural state, it has vast remote areas with low population densities that make provision of affordable public transportation difficult. Such a situation should pose incredible problems to rural residents with respect to transportation, accessibility, and communications, resource provision, and resource utilization. But because of the perceived high levels of car ownership in Oklahoma, it may be assumed that no problem exists in mobility and accessibility. The goal of this project was to identify human transportation needs in rural Oklahoma. Three surveys were conducted among rural populations. The first survey was conducted among the underrepresented minority populations with respect to accessibility to vehicles and mobility to certain destinations, including health and shopping centers. Respondents were asked to identify perceived needs with regard to transportation. The second and third surveys were targeted at tribal and municipal governments respectively, requesting information on whether or not they provided public transportation as well as their perceived transportation needs in their areas.

This study focused on answering three questions. First, what are the major transportation needs in rural areas? Second, how do those who do not drive or do not own an automobile get around to shops, medical appointments, pick up medical prescriptions, or execute necessary functions associated with mobility? Third, how can municipal and tribal agencies help to solve some of these challenges? The specific objectives of this study were to:

(1) Generate population distribution maps identifying underrepresented population groups for each Oklahoma County, (2) Survey rural residents to ascertain transportation needs , (3) and Survey municipal and tribal governments to ascertain transportation needs.

The following assumptions were made: (a) Residents with a consistent and reliable means of transportation were more mobile than those without it. (b) Residents without consistent and reliable means of transportation traveled only short distances. (c) Residents with consistent and reliable means of transportation had a higher socioeconomic status than those without it.

Methods Used

The study was conducted using three sources of information. First, the 2010 U.S. decennial census data were used to make maps of African Americans, Native Americans and Alaska Natives, Asian Americans, Hispanic/Latino Americans, and Hawaiian and Pacific Islanders in Oklahoma.

Second, two self-administered questionnaires were developed. Langston University targets 44 out of the 77 counties of Oklahoma in its cooperative extension and outreach programs (Table 1). The project area covers eastern Oklahoma (Region 1), southeastern Oklahoma (Region 2), central Oklahoma (Region 3), south central Oklahoma (Region 4), and southwestern Oklahoma (Region 5). These are the counties that were sampled for this study. Over the years, a database has been created for those individuals and families that have sought the services of Langston University in addition to those who have attended workshops, seminars, agricultural field days, and conferences. Approximately, 1,000 names are in the database. In order to understand the transportation needs of these individuals, after the Langston University Institutional Review Board approved the execution of the study (Appendix 1), a custom self-administered questionnaire was sent to 150 randomly selected individuals (Appendix 2). The selected individuals provided demographic information (age and gender); economic status (income and occupation); and geographic information (distance traveled to work and service center, transportation availability and accessibility, vehicle ownership, service locations, mobility, travel patterns, and rural transportation needs as respondents perceived

them). Initially, only 14 individuals responded. A second mailing three weeks later yielded another 44 responses. The third and final mailing two months later brought the total responses to 142, or a response rate of 94.7 percent.

Table 1. Targeted Counties

Region 1	Region 2	Region 3	Region 4	Region5
Adair	Choctaw	Creek	Carter	Beckham
Cherokee	Latimer	Kingfisher	Garvin	Caddo
Craig	Le Flore	Lincoln	Okfuskee	Canadian
Delaware	McCurtain	Logan	Pontotoc	Comanche
Mays	Pushmataha	McIntosh	Pottawatomie	Cotton
Nowata		Muskogee	Seminole	Custer
Ottawa		Oklahoma	Stephens	Grady
Rogers		Okmulgee		Greer
Sequoyah		Payne		Jackson
Tulsa		Wagoner		Kiowa
				Tillman
				Washita

Another self-administered questionnaire was developed for municipal and tribal governments (Appendix 3). It was mailed to the manager or the office responsible for transportation, or close to that function. It was assumed that some of their agencies provided or could provide public transportation services. Oklahoma has 39 federally recognized tribes and nations. The questionnaires were sent to these tribes or nations. Of the 39 tribal governments, 32 responded the first time the survey instrument was mailed to them. Five did not provide much information and as a result, were removed from the analysis, yielding a net response rate of 69.2 percent. Municipal governments were randomly selected and questionnaires were sent to the manager or someone in charge of, or connected to, providing transportation. Of the 150 questionnaires we sent out, we received 115 back, two of them were not useable. So, we had a response rate of 75.3 percent from municipal governments.

Municipal and tribal governments were requested to identify programs and services in public transportation they currently had and the challenges and opportunities they faced in meeting the transportation needs of their populations. The geographic regions included in the study were the ones that had higher concentrations of underserved populations based on the 2000 Census. However, respondents who lived in the metropolitan cities of Tulsa, Oklahoma City, and Lawton were excluded from the study although these cities had the highest concentrations of minority populations per capita.

Microsoft Excel was used to generate statistical data that were used in developing tables and charts for data analysis and interpretation. The results were broken down in two subsections. The first subsection dealt with responses from individual respondents. The second subsection dealt with the responses from municipal and tribal governments. These subsections were deemed necessary in order to highlight the differences in perception with respect to transportation needs as perceived by individuals, municipal governments, and tribal governments, respectively.

Results

2010 Census Results

Figure 1 shows the spatial distribution of minority populations of Oklahoma based on the 2010 Census. The data for each population group was divided into 7 classes. The maps were developed in one hue, blue, to show that the darker the hue, the greater the number of the population under consideration in the respective county. Figure 1 indicates that although the minority populations were concentrated in the eastern part of the state, spatial variations existed throughout the state, with greater concentration in the central and northeastern part of the state. Oklahoma, Tulsa, and Comanche Counties had the highest numbers of minority populations. The counties surrounding these counties had also higher numbers of minority populations. It also appears that the three counties with the highest numbers also had the three largest cities, namely Oklahoma City, Tulsa, and Lawton.

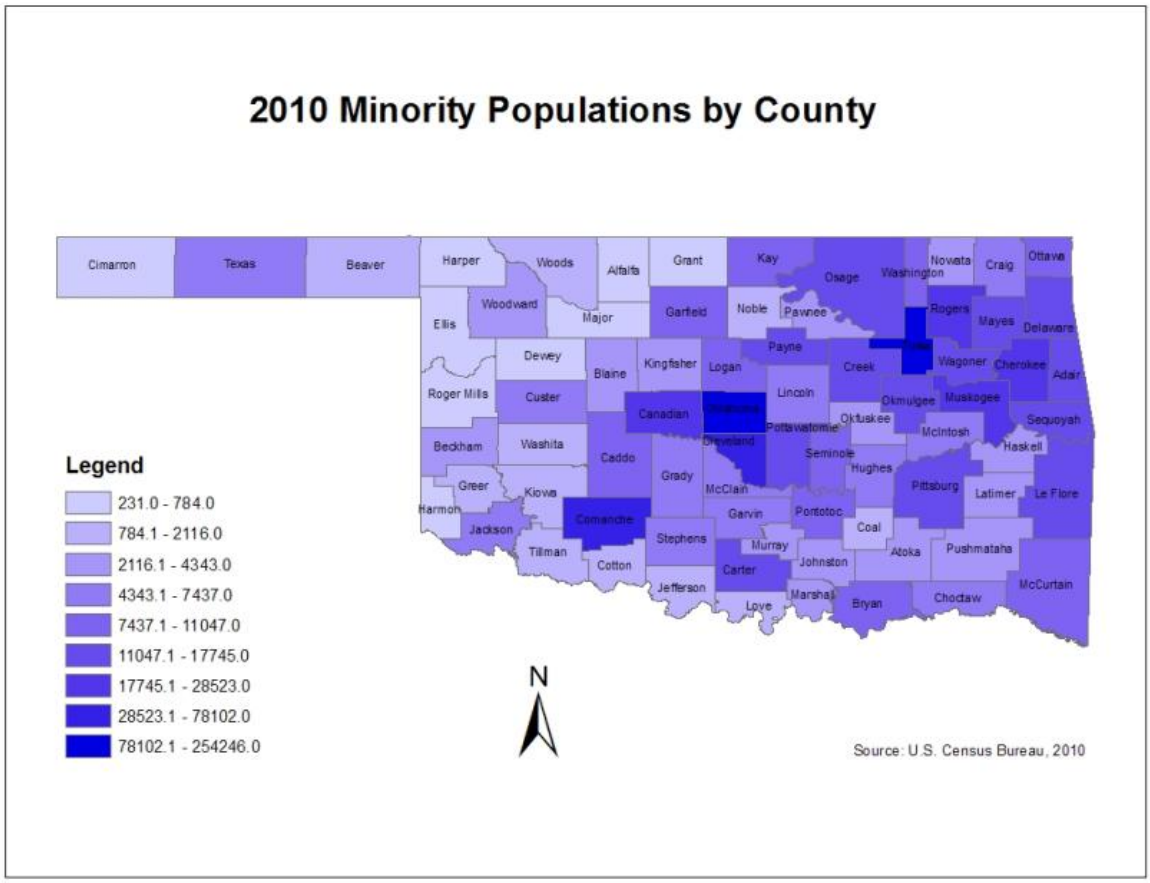

Figure 1. 2010 Distribution of Minority Populations

Black or African Americans were concentrated in the mid-third region, eastern, and southeastern part of the state (Figure 2). Most of the African Americans were concentrated especially in Oklahoma, Tulsa, and Comanche Counties and neighboring counties to these counties. This means that many of them resided in the cities of Oklahoma City, Lawton, and Tulsa and surrounding counties. Additionally, a noticeable concentration of African Americans was in MucCurtain County, in southeastern Oklahoma.

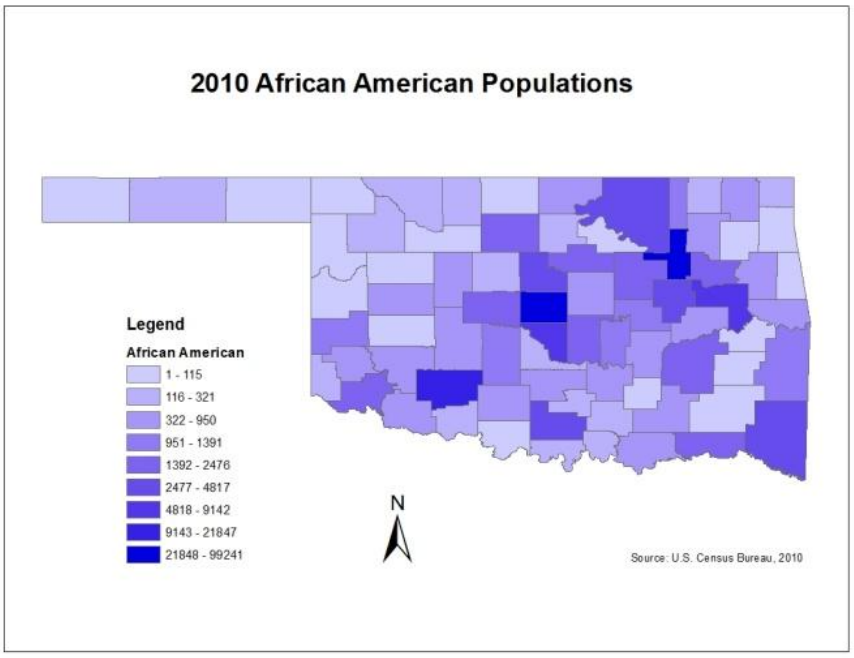

Figure 2. 2010 African American Populations

Native American or Alaska Natives were widely distributed but concentrated in the eastern two-thirds of the state (Figure 3). This pattern was expected because the largest groups: Cherokees, Choctaws, Creeks, Seminoles, and Chickasaws live mainly in eastern Oklahoma.

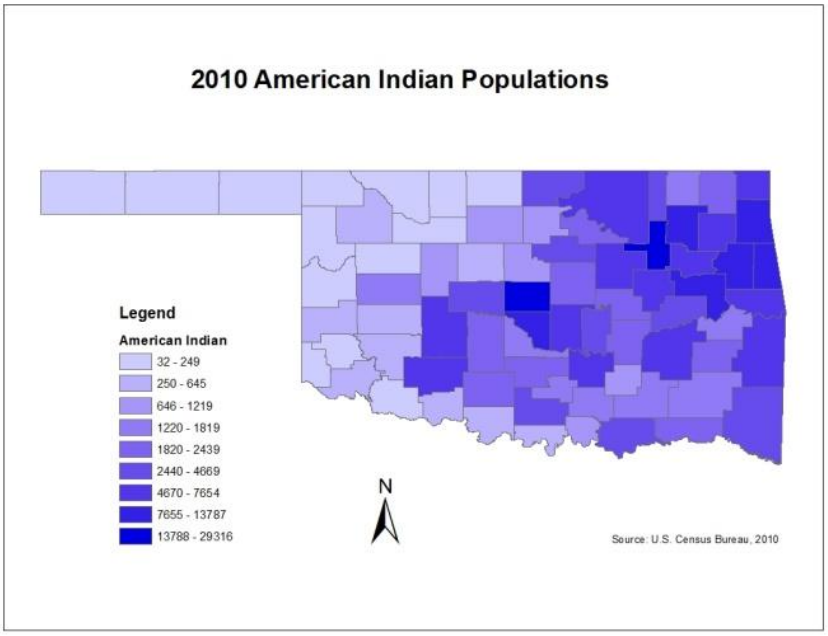

Figure 3. 2010 Native American Population

Like other minority populations, Asian Americans were concentrated in the three counties with the largest cities, particularly Oklahoma and Tulsa. However, they had a noticeable presence in Texas County in the Panhandle (Figure 4). Of all the minority groups, Asian Americans tended to concentrate only in a few counties, and mainly Tulsa, Oklahoma, Cleveland, and Comanche.

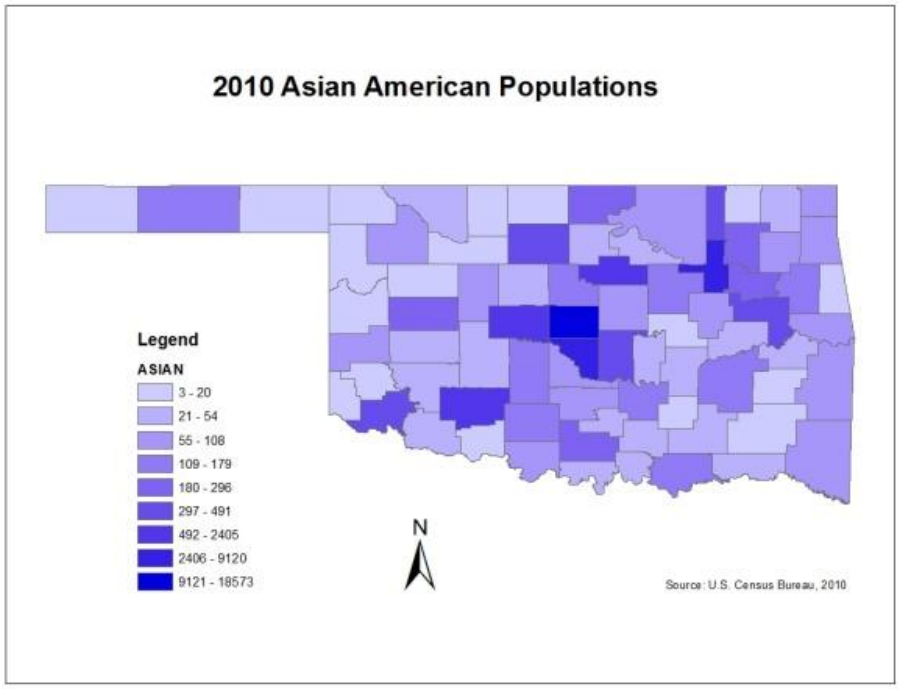

Figure 4. 2010 Asian American Populations

People of the Hispanic and Latino origins were concentrated in southwestern, central, and northeastern Oklahoma. A large concentration of Hispanic/Latino Americans was in the Panhandle (Figure 5).

Minority population groups grew between 2000 and 2010 (Table 2). The percentage of growth differed markedly among the groups. The populations grew slowest among the White Americans (3.0 percent) and Black or African Americans (6.4 percent). The increase was phenomenal in other ethnic groups. For example, the Hispanic and Latino American population grew by 85 percent, Native Hawaiian or Other Pacific Islanders by 89 percent, and Some Other Race by 86 percent. Modest but respectable growth occurred among Asian Americans (39 percent) and American Indian and Native Alaskans (18 percent).

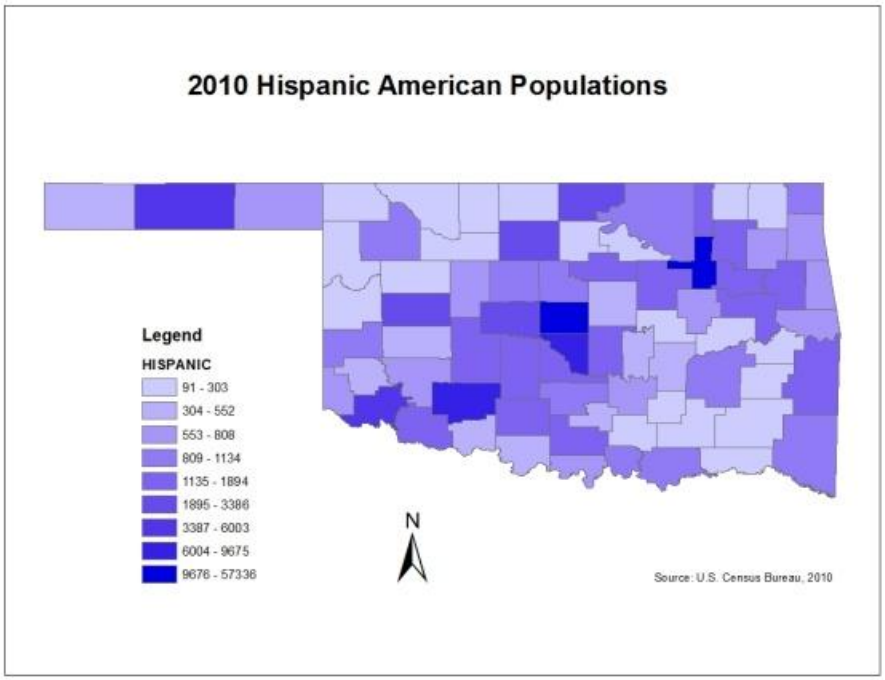

Figure 5. 2010 Latino and Hispanic Populations

Table 2 also indicates that the largest minority groups were Hispanic or Latino Americans (9.2 percent), American Indian or Alaska Natives (8.9 percent), and Blacks or African Americans (7.7 percent). The fastest growing minority group consists of people from the Hispanic or Latino Americans. Of course, the two largest groups are separated by only a few hundreds of people.

Table 2. Percentage Growth of Minority Populations, 2000 - 2010

Ethnic Group	Percent Growth 2000-2010	Percent of Oklahoma Population
White American	3.0	75.8
Black or African American	6.4	7.7
American Indian or Alaska Native	17.7	8.9
Asian American	39.1	1.8
Hispanic or Latino American	85.2	9.2
Native Hawaiian and Other Pacific Islander	89.2	0.1
Some Other Race	86.3	0.1

Source: http://quickfacts.census.gov/qfd/states/40000.html

Demographic Survey Results

Of the 142 respondents, slightly over 50 percent were females. Six or 6 percent of the individuals did not indicate their gender. Forty-two percent were males and 52 percent females (Figure 6).

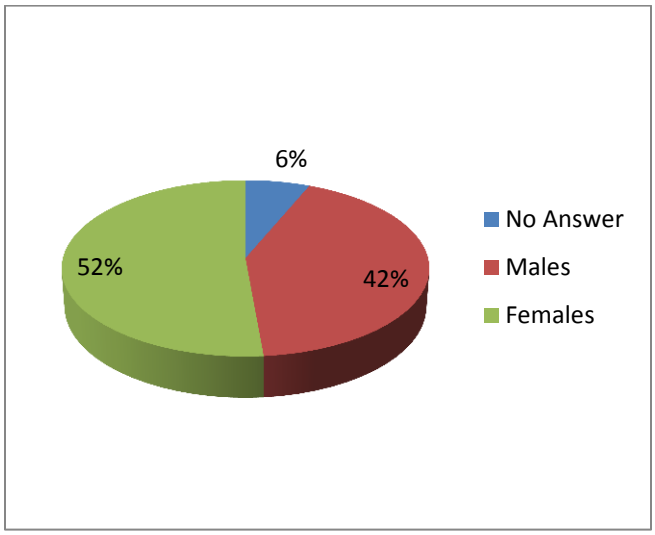

Figure 6. Gender of the Respondents

Although there were some younger respondents, most of them were older (more than 40 years of age). Over a third (37 percent) of the respondents was at least 60 years old (Table 3). There were fewer respondents who were 40 years or younger. This age distribution was expected because most of respondents on the mailing list were farmers and ranchers. The age distribution of this group of people reflected the national trends that show that most of the farmers and ranchers were older. For example, according to the 2007 U.S. Census of Agriculture, the average age of farm operators was 55.3 in 2002 and 57.1 in 2007. The average age for Oklahoma farm operators was 56.0 in 2002 and 57.6 in 2007 [22].

Table 3. Age of Respondents

Age (Years)	Number	Percent
No Answer	9	6.34
Less Than 20	3	2.11
20-29	5	3.52
30-39	7	4.93
40-49	25	17.61
50-59	39	30.28
70 or More	11	7.75
Total	**142**	**100**

Just slightly over 50 percent of the respondents indicated that they lived in households with 2-4 persons. About a third of the respondents lived alone, and the rest, about 13 percent, lived in households with at least 5 people (Table 3).

Table 4. Number of People in the Household

Category	Number	Percent
Alone	45	31.69
2-4	78	54.93
5 or More	19	13.39
Total	**142**	**100.00**

Income is important in people's lives. Respondents indicated a wide range of income. Most of the respondents earned less than $50,000, and of those the majority earned between $10,000 and $29,000 (Figure 7). About six percent earned less than $10,000 a year.

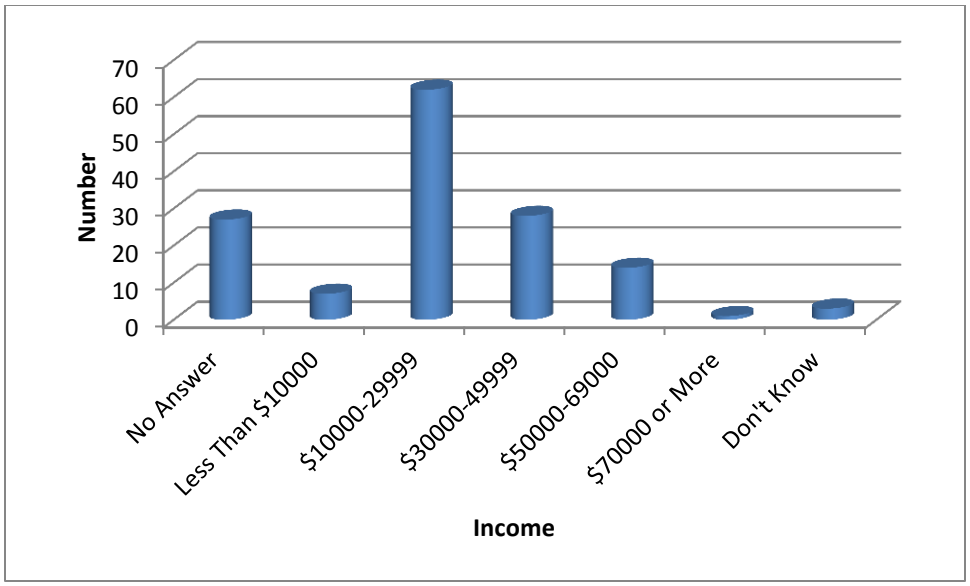

Figure 7. Household Income

Transportation-Related Survey Results

Most of the respondents stated that they owned auto vehicles. Only 15 percent of the respondents did not own a vehicle. About two-thirds owned one to two vehicles. Ten percent owned more than four vehicles; while 9 percent indicated that they owned between 3 and 4 vehicles (Figure 8).

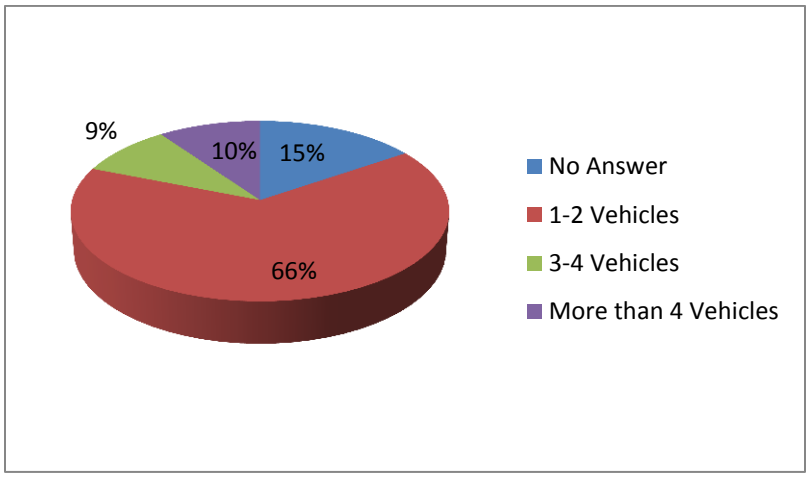

Figure 8. Percent Households with Given Number of Vehicles

Table 5 shows the distance participants traveled to the nearest shopping center. Over 90 percent of the respondents lived more than ten miles away from the nearest shopping center. Of the 142 respondents, only 14 respondents, or 9.9 percent) lived less than 10 miles from the nearest shopping center. As was the case with the shopping center, most (over 90 percent) of the respondents lived at least 10 miles away from the nearest medical center. Only 9 percent lived very close (1-5 miles) to a medical center (Table 6).

Table 5. Distance Traveled to the Nearest Shopping Center

Distance	Number	Percent
Less than One Mile	3	2.11
1-5 Miles	10	7.04
6-10 Miles	1	0.70
More than 10 Miles	128	90.14
Total	**142**	**100.00**

Table 6. Distance Traveled to the Nearest Medical Center

Distance	Number	Percent
1-5 Miles	13	9.15
More than 10 Miles	129	90.85
Total	**142**	**100.00**

Asked about what means of transportation the students used to get to school, a great majority of the respondents did not give any answers. Eighty-one percent of the respondents did not put down an answer. About 15 percent used the school bus while 4 percent drove themselves to school (Table 7). Those who did not own a vehicle depended on others to take them to school or they simply walked to school.

Table 7. Mode of Transportation Used to Go to School

Mode of Transportation	Number	Percent
School Bus	21	14.78
Drove Themselves	6	4.22
No Answer/Not Applicable	115	81.00
Total	**142**	**100.00**

Vehicles in the household performed multiple functions for the members. Twenty-eight respondents did not answer this question. Of these individuals, 22 had indicated that they had

no vehicle. Respondents used vehicles mainly for work, shopping, visiting friends and relatives, and leisure. Respondents listed several uses for their vehicles, and as much as was possible, the responses were grouped together (Table 8). For example, responses for those who stated that they used vehicles to go to work and for shopping, their answers were combined to show one category of "Working and Shopping."

Table 8. Use of Vehicles

Answer	Number	Percent
No Answer	28	19.72
Work	5	3.52
Shopping	4	2.82
Shopping, Visiting Friends and Relatives	37	26.06
Working and Shopping	49	34.51
Working, Leisure, and Visit Friends	16	11.26
Work and Church	3	2.11
Total	**142**	**100**

Almost 40 percent of the respondents did not indicate how they traveled. This was expected because the majority of them (28 respondents) had indicated that they did not own vehicles. Almost half of the respondents used their own vehicles to work, shop, and visit friends and relatives. Two percent indicated that they used public transportation.

Some respondents (17.6 percent) did not drive because of medical conditions or for reasons they did not specify. Many of these were the elderly. Most of these individuals depended on family members or had to walk to places they had to visit (Figure 6).

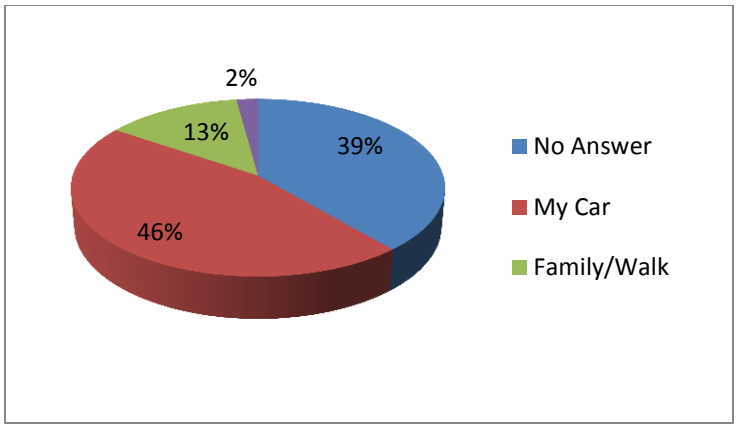

Figure 9. How Respondents Traveled

Asked if there were any transportation problems they knew, over 50 percent of the respondents mentioned that they did not see that there were any. There were some who identified some problems related to transportation, mainly a general lack of public transportation, roads that needed improving, lack of transportation for the elderly, increasing fuel costs, and traffic congestion (Figure 10).

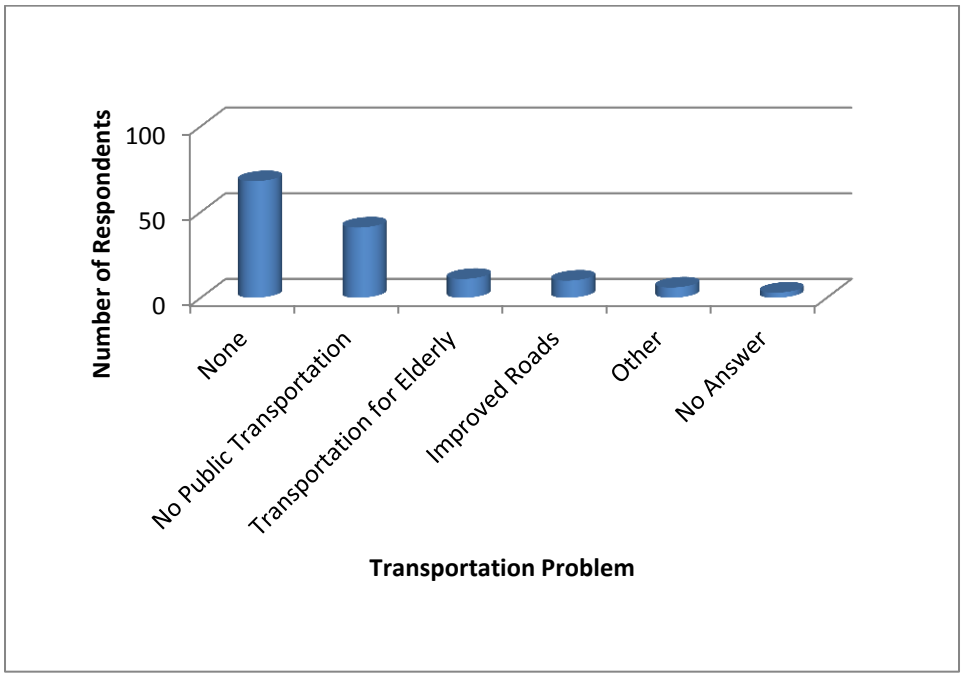

Figure 10. Transportation Problems

Mobility was not a major problem in the area. Only 16 or 11.2 percent of the respondents had missed a medical appointment as a result of not having reliable transportation. They therefore felt a need for public transportation, which approximately 75 percent mentioned that they would consider using if it was available. Only 25 percent indicated that they would not use it (Table 9). These respondents had more than one vehicle at their disposal. For instance, all the respondents with more than four vehicles said they would not use public transportation.

Table 9. Would Consider Using Public Transportation if Available

Answer	Number	Percent
Yes	103	72.54
No	35	24.65
Maybe	3	2.11
Don't Know	1	0.70
Total	**142**	**100.00**

Asked how transportation could be improved in the area, almost half of the respondents left the question blank. Those who answered the questions mentioned that providing public transportation, making certain that the elderly had access to that transportation, improving road conditions, providing adequate funding, enforcing speed limits, and making railway crossings safer by building overpasses were the major solutions for improvement (Figure 11).

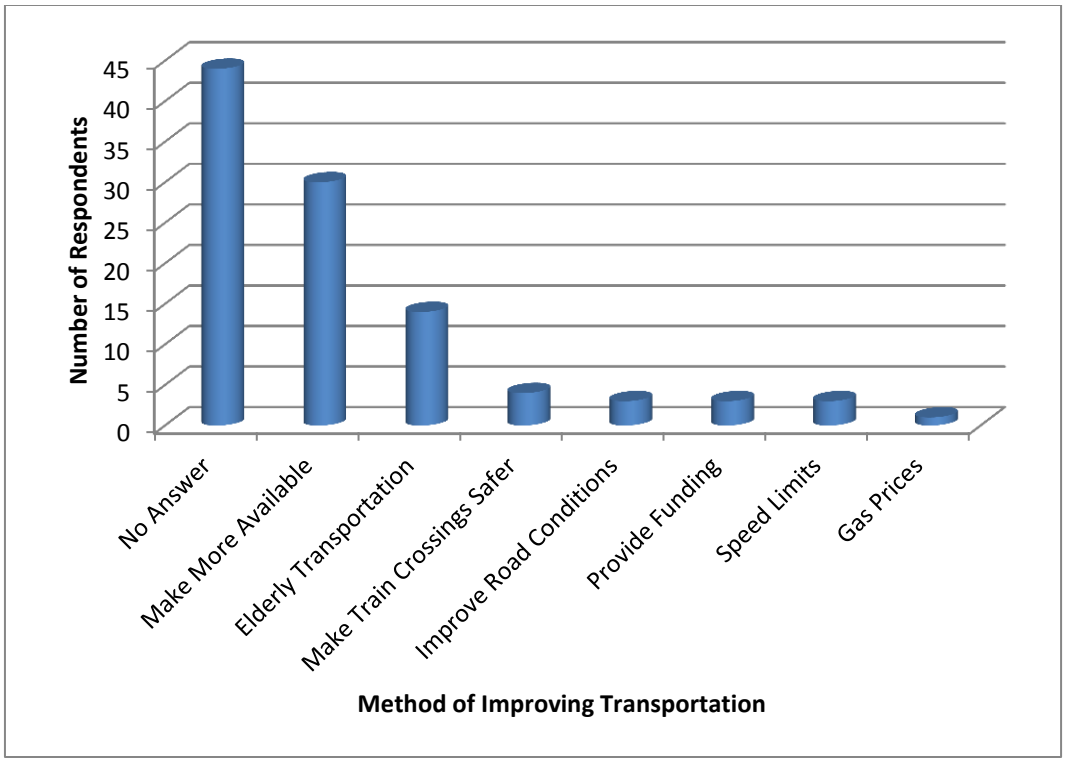

Figure 11. How Transportation Could Be Improved in the Area

Responses from Municipal and Tribal Governments

As was expected, the answers were similar and different from the municipal and tribal government perspectives. Only 6 percent and 9 percent of municipal and tribal governments respectively provided transportation services in their areas (Table 10). No follow up question was asked concerning the kinds of transportation services they provided.

Table 10. Organization Provides Transportation in the Area

Answer	Municipal Government		Tribal Government		Total	
	Number	Percent	Number	Percent	Number	Percent
No Answer	9	7.08	2	7.41	10	7.14
Yes	13	6.19	5	18.52	12	8.57
No	98	86.73	20	74.07	118	84.29
Total	**113**	**100.00**	**27**	**100.00**	**140**	**100.00**

More municipal government respondents (42 percent) than tribal government respondents (19 percent) indicated that they knew of other transportation agencies that provided transportation services in the area. Almost half of the respondents did not know of any other transportation entities in the area that offered their services (Table 11).

Table 11. Presence of Other Organizations in the Area that Provides Transportation

Answer	Municipal Government		Tribal Government		Total	
	Number	**Percent**	**Number**	**Percent**	**Number**	**Percent**
No Answer	13	11.50	4	14.81	17	12.14
Yes	47	41.59	5	18.52	52	37.14
No	53	46.90	18	66.67	71	50.71
Total	**113**	**100.00**	**27**	**100.00**	**140**	**100.00**

With respect to the main transportation issues in the area, both municipal and tribal governments indicated that a lack of public transportation was a big problem, partly because of the cost or funding associated with establishing and maintaining public transportation. A few differences existed in their respective answers. For example, only municipal governments stated that they did not see any problem (11 percent) and that rural areas (location and volume of use) dictated whether or not public transportation could be provided (Table 12).

Table 12. Main Transportation Problem in the Area

Answer	Municipal Government		Tribal Government		Total	
	Number	Percent	Number	Percent	Number	Percent
No Answer	15	13.27	0	0	15	10.71
Roads	6	5.31	5	18.52	11	7.86
Cost/Funding	36	31.85	9	33.33	45	32.14
No Public Transportation	21	18.58	8	29.63	29	20.71
Location	14	12.39	0	0.00	14	10.00
No Problem	12	10.62	0	0.00	12	8.57
Personal Vehicle	1	0.88	2	7.41	3	2.14
Lack of Use	2	1.77	1	3.70	3	2.14
Other	6	5.31	2	7.41	8	5.71
Total	**113**	**100.00**	**27**	**100.00**	**140**	**100.00**

Asked whether municipal or tribal governments would consider providing public transportation, the majority of the respondents indicated that they would not: 74 percent and 67 percent respectively. Only 17 percent of the municipal governments and 30 percent of tribal governments said they would consider providing public transportation (Table 13).

Table 13. Would Consider Offering Public Transportation

Answer	Municipal Government		Tribal Government		Total	
	Number	Percent	Number	Percent	Number	Percent
No Answer	11	9.73	1	3.70	12	8.57
Yes	19	16.81	8	29.63	27	19.29
No	83	73.45	18	66.67	101	72.14
Total	**113**	**100.00**	**27**	**100.00**	**140**	**100.00**

Although about a quarter of the respondents did not answer the question, Table 13 shows things that municipal and tribal governments felt should be done in order to improve public transportation in their respective areas, including providing the service (12%) and making

it accessible to users (6 percent). They also indicated that making reliable transportation services available to the elderly was important. They stated that in order to establish an effective system, service providers should not rely on volunteers, bus schedules should be dependable, transportation services regular, sidewalks and streets should be improved, and fuel costs should be controlled. “Other” includes providing taxi services, reliable drivers, and taking care of the needs of residents on the lower rung of the socioeconomic ladder.

Table 14. Things that Can Be Done to Improve Public Transportation

What Can be Done	Municipal Governments		Tribal Government		Total	
	Number	Percent	Number	Percent	Number	Percent
No Answer	32	28.32	1	3.70	33	23.57
Service for the Elderly	9	7.96	2	7.41	11	7.86
Less Dependence on Volunteers	3	2.65	0	0	3	2.14
Better Sidewalks/ Streets	6	5.31	6	22.22	12	8.57
Lower fuel prices	3	2.65	1	3.70	4	2.86
Provide Public Transportation	12	10.62	5	18.52	17	12.14
Dependable Schedules	4	3.54	3	11.11	7	5.00
Regular Bus Service	7	6.19	0	0	7	5.00
More Access	6	5.31	2	7.40	8	5.71
Nothing	9	7.96	0	0	9	6.43
Other	21	19.47	7	25.93	29	20.71
Total	**113**	**100.00**	**27**	**100.00**	**140**	**100.00**

Discussion

The 2010 Census data indicated that the counties with the largest cities, namely: Oklahoma, Tulsa, and Comanche, had the highest concentrations of minority populations. The population grew by 8.7 percent between 2000 and 2010. The counties that had the largest increases were Rogers and Wagoner in the northeast, and Canadian, Cleveland, and Logan in Central Oklahoma, and Marshall in the South Central Oklahoma (Figure 9). The counties surrounding Comanche County either lost population or grew very slowly.

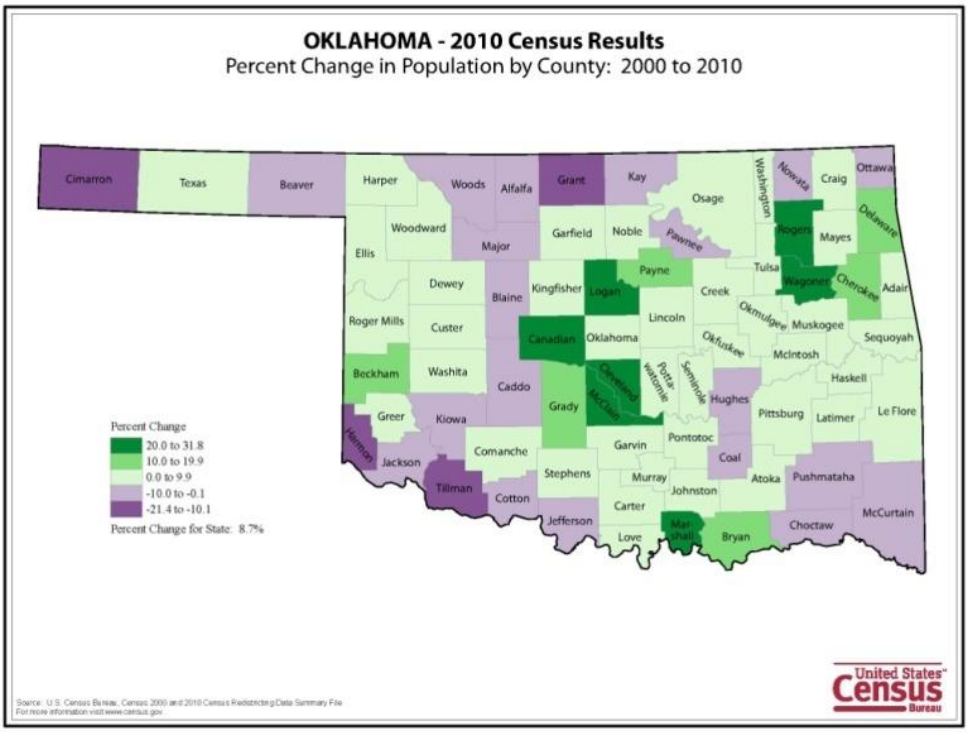

Figure 12. Oklahoma Population Percent Change, 2000-2010

The results from the self-administered questionnaires indicated that the majority of the respondents owned at least one vehicle. Only 15 percent did not own any automobiles. This is 12 percentage points from the mean U.S. population. Mobility for those who did not own any vehicle was limited. These were mainly the elderly who could not drive because of age or medical conditions. They depended on others to take them around, although few missed their appointments for lack of assistance. Their mobility needs to be addressed because as Oklahoma grays, more and more elderly will be forced to drive themselves because their needs may increase—needs such as getting to a health center, pharmacy, or shopping center. Hence, those respondents who owned vehicles were more mobile than those who did not. Nonetheless those who did not own a vehicle relied on others, mainly family members to take them to places of service including medical facilities and shopping centers. Others used public transportation where it was available. This was an important finding because most of the respondents lived more than 10 miles away from either a shopping center or a medical facility.

Accessibility, or the ability to reach needed services and facilities, is a big issue in rural areas because the car still dominates the transportation scene in rural Oklahoma. The question on how students went to school needed to be explored more because most of the useable answers indicated that most students drove themselves to school while a few used the school bus. How do those young people who are not eligible to drive get to school?

Public transportation could play, and to some extent does play, a major role in rural Oklahoma. As municipal and tribal governments indicated in their answers, there were other entities in their respective areas that provided public transportation, which apparently some respondents did not know about. Several public transportation (passenger) services are available through most of Oklahoma. For example, Little Dixie Transit operates in southeastern Oklahoma, Pelivan Transit in northeastern Oklahoma, KiBois Area Transit System in eastern Oklahoma, Washita Valley Transit around Chickasha, First Capitol Trolley in the Oklahoma City-Guthrie-Langston-and-Stillwater area, and the Southern Oklahoma Rural transit in south central Oklahoma. However, the rider has to know when the services are rendered because some routes are not run on a daily basis.

Much of that public transportation is conducted under the auspices of various councils of governments within their jurisdiction. As the answers from municipal and tribal governments have indicated, it takes a lot of money to establish and run transportation services. Because of low ridership in dispersed rural areas, providing a service can be burdensome on the provider. On their own, municipal and tribal governments are not in position to offer public transportation mainly because of costs and lack of volume to sustain a service. Therefore, respondents who did not have means of transportation were limited to shorter distances and relied on family and relatives to take them to places of interest or need.

Nonetheless, not every person is affected equally. Some households have more than one reliable vehicle and do not see any major transportation problem. Most of these would not consider using public transportation if it were available. Consistent with this finding is the opposite response by those who did not have vehicles. They would use public transportation when and if available.

This study did not verify the role of socioeconomic status on mobility. There were some respondents who could not drive or did not have a car or access to a car to drive. These were mainly the elderly, who could be assumed to have had low or limited income. More information or research is necessary to find out their particular needs. If they could choose where to live, they probably may want to live close to available services and facilities.

Like other studies before, this study concluded that travel demand patterns in rural areas are usually small and diffuse, creating a need for private rather than public transportation. And that even where public transportation may be available many people may not know about it or use it. It would be difficult to provide a bus service in that kind of environment because providing such a service is costly and needs high ridership to be sustained. Large subsidies are therefore imperative. Indeed, "The longer distances make it more expensive and harder to provide the same level of provision as in urban areas, and this problem is magnified by the lower levels of demand in rural areas" [15, p. 461].

Conclusion and Recommendations

This study shows that individuals in rural Oklahoma depend more on personal vehicles than public transportation for mobility, and most are unaware of the availability of public transit systems. One of the major drawbacks of the study was that neither the county commissioners nor councils on governments were included in the study. Their perspective on the rural transportation needs would have yielded new insights in the issues involved. That is then a subject of further research.

Accessibility is critical to social justice. Lack of income, suitable public transportation, private transportation, physical location, and other factors affect the mobility of rural residents. These topics need to be studied in detail to fully understand the dynamics of rural needs. One can only surmise that future rural transportation will be innovative as it will embrace new technology that may already have been adopted in urban areas. Conventional rail and bus services will continue to be limited to urban areas (centers or corridors of higher demand) as well as locations of higher transportation demand.

Higher private car ownership in rural areas will continue to play a major role in both mobility and accessibility. However, public policy concerning transportation needs for an aging or graying population must be addressed because the elderly need to travel for social services and health care needs [23].

This study is a survey of rural needs. Further research is needed to hone on mobility patterns and needs in greater detail than this study has done. A study to address issues of socioeconomic status, employment, and short-distance and long-distance travel is needed.

To the best of our knowledge this is the first study in Oklahoma to study rural transportation needs. More studies are needed. That would include responses for all the members of the households. This study was limited to the respondents alone. Additionally, if this study could be conducted again, it would be helpful to reduce the number of no responses. One way of doing so would require face-to-face interviews or telephone interviews that would allow for follow-up or probing questions.

What will the future of transportation look like for rural areas? Nobody knows for sure, but given the importance of place and the dwindling agricultural base, rural transportation will be transformed, embracing the impact of technology on mobility. For example, employees in rural areas may have to commute long distances to work in urban areas and retire in rural residents at the end of the day. The role of public policy cannot be underestimated in addressing both rural and transportation needs.

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Appendices

Appendix 1: Langston University Institutional Review Board Approval

LANGSTON UNIVERSITY

Institutional Review Board

Dr. Yvonne Montgomery, Chairperson

May 25, 2010

The Institutional Review Board (IRB) has reviewed and approved your project and permission has been granted for you to begin. Approval is valid for one (1) year from the approved date. If research is not complete by this date, you will need approval to continue.

The approval form is enclosed. Any questions should be directed to Dr. Yvonne Montgomery, Chairperson, Institutional Review Board. I look forward to working with you.

Sincerely,

Yvonne Montgomery

Yvonne Montgomery, Ed. D.
IRB Chair

P.O. Box 1500 Langston, Oklahoma 73050 Phone: (405) 466-3242

Langston University

Institutional Review Board

Human Subjects Review

Date: May 25, 2010 IRB Proposal #119

Title: "Human Transportation Needs in Rural Oklahoma."

Principal Investigator (s) Dr. D. Chongo Mundende

Reviewed and Processed: May 5, 2010

IRB Decision Rendered: _____ Approved

(approval or disapproval)

All approvals must be subject to review by a full Institutional Review Board at the next meeting as well as subject to the monitoring process of the Board at any time during the approval period.

Approval status period valid for data collection is one calendar year. A request for continuation of a research project beyond the one-year time must be submitted to the Board in writing prior to the one-year expiration date.

Any changes or modifications to the approved project must also be submitted for approval.

Comments:

Modifications or Terms and Conditions for Approval:

Reasons for Disapproval:

Signature Yvonne Montgomery Date 5-25-10
IRB Chair

Transportation Center of Excellence

September 8, 2010

Dear Sir/Madam:

The Transportation Center at Langston University is conducting a study on the needs of transportation in Oklahoma. As you aware, moving from place to place is extremely important. The purpose of this study is to understand the issues people face in regard to mobility and those which planners have in regard to providing the needed services.

We are requesting that you help us by answering the questions on the question paper enclosed in this letter. But before you answer the questions, please read the consent form. Two copies of the consent form have been enclosed. You sign both of them and return one of them in the self-addressed stamped envelope. You keep the other for your records. The survey will take between 10 and 15 minutes.

As stated in the consent form, the answers of the survey will be treated with utmost confidentiality. Please do not sign your name, your tribe's name, or include your address or other information that may identify you or the tribe on the answer sheet. No individual responses will be recorded. Only aggregate statistical measures will be reported.

We thank you for your kind assistance.

If you have questions concerning this letter, please call me toll-free at 1-866-466-2231.

Sincerely,

Darlington C. Mundende
Principal Investigator and
Director, Center for Outreach Programs

Appendix 2: Self-Administered Questionnaire – Individuals

Human Transportation Needs in Rural Oklahoma

Instructions: Please select one of the given answers by filling in the circle that represents your information.

1. How many people live in your home?
   a. I live alone
   b. 2-4
   c. 5 or more

2. Do you own personal vehicles (cars, trucks, vans, SUVs)?
   a. Yes
   b. No (Go to Question 4)

3. How many vehicles (cars, trucks, vans, SUVs) do you have in this household? (**After answering this Question, go to Question 5.**)
   a. 0 (zero)
   b. 1-2
   c. 2-3
   d. 4 or more

4. What are two most important reasons that you use your vehicle?
   a. Work
   b. Shopping
   c. Visit friends/relatives
   d. Leisure, such as parks and recreation sites
   e. Other, please specify:_____

4. How do you get to places of interest or need, such as grocery stores, health or medical centers, church?
   a. Family members take me there
   b. I use public transportation
   c. I use emergency vehicles
   d. I walk
   e. Other, please specify:_____

5. In your opinion, what is the biggest problem in regard to transportation in your area?
   (Please fill in the blank) _____

6. If you do not drive, why is it that you don't drive?
   a. I have no car to drive
   b. My license has expired
   c. Because of medical conditions
   d. Other, please specify: _____

7. How far is the nearest shopping center from your home?
   a. Less than 1 mile
   b. 1-5 miles
   c. 6-10 miles
   d. More than 10 miles

8. How far is your medical center or clinic from your home?
   a. Less than 1 mile
   b. 1-5 miles
   c. 6-10 miles
   d. More than 10 miles

9. If you have school-going children at home, how do they get to and from school?
   a. They go by school bus.
   b. They drive themselves to school.
   c. A friend or family member takes them to school
   d. They walk to school.
   e. A friend or family member takes them to school
   f. Other, please specify: _____.

10. In the last 12 months, did you or someone in your household miss a health or medical appointment because you could not drive or get someone to drive you to the health or medical center?
   a. Yes
   b. No

11. If public transportation was available, would you use it?
   a. Yes
   b. No

12. If you could change one thing in regard to transportation in your area, what would you change?
(Please fill in the blank) _____

13. Do you own or rent the place where you are currently living?
a. Own
b. Rent

14. Please identify your gender.
a. Male
b. Female

15. What is your primary or main occupation? **(Please fill in the blank)** _____

16. What is your age group?
a. Less than 20 years
b. 20 – 29 years
c. 30 - 39years
d. 40 - 49years
e. 50 - 59years
f. 60 - 69years
g. 70 years and above

17. What is your total annual household income?
a. Less than $10,000
b. $10,000 - $29,999
c. $30,000 - $49,999
d. $50,000 - $69,999
e. $70,000 or more

Thank you so much for your participation in this survey.

Appendix 3: Self-Administered Questionnaire – Municipal and Tribal Governments

Human Transportation Needs in Rural Oklahoma

Instructions: Please select one of the given answers by filling in the circle that represents your information.

1. The representative completing this survey works for a
   a. Municipal Government
   b. _____ County
   c. _____ Tribe or Nation
   d. Other Local Government Entity (**Please specify.**)_____

2. Does your organization provide "public" transportation in your area?
   a. Yes **(Go to Question 4)**
   b. No

3. Is there another entity that provides "public" transportation in your area?
   a. Yes
   b. No

4. In your opinion, what is the biggest problem in regard to transportation in your area?
   (Please fill in the blank) _____

5. Would your organization consider providing "public" transportation?
   a. Yes **(Go to Question 7)**
   b. No

6. What would it take for your organization to provide "public" transportation?
   a. Yes
   b. No

7. What, in your opinion, is the most needed transportation need in your area?
   (Please fill in the blank) _____

8. If you could change one thing in regard to transportation in your area, what would you change?
   (Please fill in the blank) _____

Thank you so much for your participation in this survey.