ECONOMIC ANALYSIS

OF

SCENIC BYWAYS

IN

IOWA, KANSAS, MISSOURI, AND NEBRASKA

November 1991
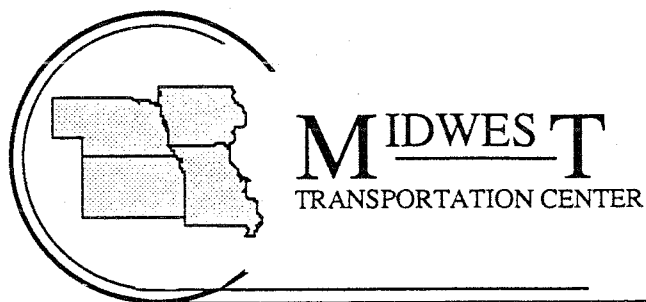
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TRANSPORTATION CENTER

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*Scenic Byways: Their Economic Benefits/Selection/
Designation/Protection and Safety*
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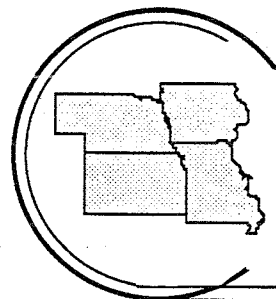
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PREFACE

This report is the product of a 1989-1990 research project in the University Transportation Centers Program. The Program was created by Congress in 1987 to "contribute to the solution of important regional and national transportation problems." A university-based center was established in each of ten federal regions following a national competition in 1988. Each center has a unique theme and research purpose, although all are interdisciplinary and also have educational missions.

The Midwest Transportation Center (Center) is one of the ten centers; it is a consortium that includes Iowa State University (lead institution) and The University of Iowa. The Center serves Federal Region VII which includes Iowa, Kansas, Missouri, and Nebraska. Its theme is "transportation actions and strategies in a region undergoing major social and economic transition." Research projects conducted through the Center bring together the collective talents of faculty, staff, and students within the region to address issues related to this important theme.

The Principal Investigator was Professor Michael W. Babcock, Economics. Co-investigator was Professor Edwin G. Olson, Economics.

ACKNOWLEDGMENTS

TABLE OF CONTENTS

CHAPTER ONE
ECONOMIC IMPACTS

CHAPTER TWO

RECREATIONAL BENEFITS AND COSTS

CHAPTER THREE
SUMMARY AND RECOMMENDATIONS

REFERENCES

LIST OF TABLES

LIST OF FIGURES

ECONOMIC ANALYSIS OF SCENIC BYWAYS IN IOWA, KANSAS, MISSOURI, AND NEBRASKA

EXECUTIVE SUMMARY

INTRODUCTION

One of the primary objectives of this study is to develop models capable of measuring the direct economic impacts of a scenic byways program in the four-state Federal Region VII of Iowa, Kansas, Nebraska, and Missouri. In this study, economic impacts are restricted to the direct expenditures of the additional motorists who use a scenic road solely as a result of designation and advertising promotion. These direct expenditures are likely to be in the following categories:

- Gasoline and Oil
- Hotels and Motels
- Camping and Recreational Vehicle Parks
- Automotive Repair
- Eating and Drinking Places
- Grocery Stores
- Admissions to Attractions
- Hunting and Fishing Permits

The economic impacts of the scenic byways program are obtained by multiplying the change in the number of byway users [caused by designation and promotion] by the expenditures of those users, both in total and by the expenditure categories listed above.

THE PROBLEM ADDRESSED

No consensus model has been developed to specifically measure the economic impacts of scenic byways. Thus this report recommends several alternative models, employing both primary and secondary data.

This report recommends several models designed to measure the increment in road demand as a result of designation and advertising promotion as a scenic byway. One of these is the following time series regression model.

Dependent Variable:
  Scenic Road Traffic Count

Explanatory Variables:
  Personal Income
  Population
  Employment
  Vehicle Registrations
  Gasoline Prices
  Road Quality
  Dummy Variable to Measure Change in Road
   Use Due to Scenic Roads Program

Times series models may also be used to measure changes in road use due to designation and promotion as a scenic byway. The model would employ weekly, monthly, or quarterly traffic count data which would be separated into the following components.

- Trend
- Cycle
- Seasonal
- Irregular

Changes in the Irregular Component of the traffic count data series would measure the change in road demand due to the scenic roads program.

The above statistical models should be combined with primary data surveys. Business firms in the vicinity of the scenic byways could be surveyed to determine if the scenic roads program had any impact on their sales and employment. Representatives of tourism agencies and trade associations are other good sources of information.

The most essential approach is an on-site personal survey of scenic road users both before and after designation and advertising promotion. These surveys would reveal how many people are using the scenic roads for recreational driving, demographic characteristics, and expenditures for various goods and services.

To develop appropriate economic impact models for a scenic roads program it is necessary to obtain an economic-demographic-recreational profile of the four-state study area. Some of this data is needed to gain perspective on the relationship of a scenic roads

program to the four-state economy. Other data are needed to estimate specific impacts. For example, to measure potential road demand, location of major population centers relative to the location of scenic byways needs to be known. Employment and income levels are also helpful in estimating scenic road demand equations. Since scenic roads may be used in conjunction with other recreational facilities, it is important to know the names, locations, attendance levels and growth rates of parks, recreation areas, wildlife refuges, historical sites, and other attractions in the four-state area.

Chapter One contains an economic-demographic-recreational profile of the four-state region containing the following categories.
- Population
- Employment
- Personal Income
- Passenger Car Registrations
- Recreation Facilities and Attractions

Chapter Two indicates how to measure the recreational benefits of scenic byways. These benefits are economic in the sense that they are derived from demand functions, but the benefits do not accrue to a local or state economy via increased sales or increased employment as do the economic impacts discussed above. Rather, the benefits represent the value that recreational drivers place on enhanced or additional scenic byways. Benefits measured here are those which the government utilizes for benefit-cost studies that justify expenditures from tax revenue on parks and recreational services.

Costs of scenic byways are also included in Chapter Two so they can be compared with the dollar value of benefits. Specific cost figures will be obtained from state governments after the byways are selected. Costs for scenic byways are expected to fall into categories of safety, amenities and promotion. Examples include road signs, historical markers, turnouts, caution signs, information packets and maps.

Because the program will be financed out of taxes, it will need to be considered whether the tax base has been increased sufficiently to generate revenue to finance the cost of a scenic byways program. For instance, what changes could be expected in the sales tax, income tax, and gasoline excise tax that could provide funding for the program? Results of the private sector analysis will be used to estimate the impact of scenic byways on tax revenues.

RECOMMENDATIONS

The following recommendations are a result of this research project.

- Measure economic impacts, benefits and costs of scenic byways for the four-state region with the statistical-economic models developed in this report.

- Conduct surveys of scenic byways users both before and after designation and advertising promotion in order to measure accurately the impacts of the scenic roads program.

- Refine a survey instrument for scenic byway users so that it measures accurately trip purposes and expenditures with a minimum amount of time for each interview.

- Repeat surveys of scenic byway users and state agencies at regular intervals after designation to measure the time path of economic impacts, benefits and costs.

- Disseminate the models and data developed in this report to interested parties such as state departments of transportation and commerce, the U.S. Department of Transportation, auto clubs, tourism associations, and university researchers.

ECONOMIC IMPACTS OF SCENIC BYWAYS
IN IOWA, KANSAS, MISSOURI, AND NEBRASKA

CHAPTER ONE
ECONOMIC IMPACTS

I. INTRODUCTION

Recreation and tourism, one of the fastest growing industries in the economy, is fueled by increasing disposable income, leisure time, and the number of elderly, affluent Americans. In 1987 U.S. and foreign tourists spent $291 billion in America, generating 5.3 million jobs paying over $64 billion in wages and salaries.

As a component of the recreation boom there is substantial support for scenic road programs at local, state, and federal levels. States and localities in the Midwest are interested in developing scenic byways as an addition to tourism industries and as a means to diversify the local economy and reduce dependence on agriculture and energy producing industries.

At the federal level there is substantial support for including scenic byways in the 1991 highway bill that will set new directions for federal highway initiatives now that the interstate highway system is complete. The 1991 highway bill may contain federal aid for the designation of a national system of scenic roads or for state assistance to develop regional scenic byways programs.

In November, 1989 Congress authorized a national scenic byways study to be completed in late 1990 to include: (a) updated national inventory of scenic byways; (b) proposed guidelines for a national scenic byways program; (c) case studies showing economic impact of scenic byways; and (d) analysis of potential safety consequences and environmental impacts of scenic byways. Preliminary results of the national study include the following:

- There are about 55,000 miles of road either designated as scenic byways or considered eligible for designation.

- 75% of the scenic byways have been designated by the states, 10% by localities, and 15% by federal agencies.

- 75% of the designated scenic byways are on the primary or secondary federal-aid system.

- Almost all scenic byways are two-lane roads.

- 30% of the scenic byways pass through corridors with local land use controls.

- State designation criteria are extremely varied.

The national transportation research community is actively involved in the scenic byways movement. Both the Transportation Research Board (TRB) and the American Association of State Highway Transportation Officials (AASHTO) have formed Scenic Byways Task Forces to develop a consensus on the functions of a national scenic byways program.

Before proceeding it is necessary to make a few comments regarding the organization of this report. The models discussed in Chapter One are intended to measure the direct economic impacts of scenic roads. These include expenditures by scenic byway users for a wide variety of goods and services such as gasoline, food, and hotels-motels. The models in Chapter Two are intended to estimate recreational benefits of scenic byway users. Measurement of economic impacts and recreational benefits are both important for assessing the value of a scenic roads program. However, since the two types of models measure distinct, separable aspects of scenic road development, clarity is served by separating the discussion into two chapters. Chapter Three contains the summary and recommendations.

II. MODELING THE ECONOMIC
IMPACTS OF SCENIC BYWAYS

One of the primary objectives of this study is to develop models capable of measuring the economic impacts of scenic roads. A search of the professional literature indicates there are many models that are somewhat related to the objectives of this project. For example, many models have been devised to measure roadway demand. These include passenger modal split models, stochastic trip distribution models, network models and gravity models. The types of expenditures and industries usually impacted by tourism have been identified by the U.S. Travel Data Center in its annual national travel surveys. However no consensus has emerged in the professional literature regarding methods to specifically measure the economic impacts of scenic byways, though such a consensus may emerge from the national scenic byways study recently completed.

In this environment, model development is likely to be an ongoing process. Given the absence of studies and methods relating specifically to scenic byways, the greatest contribution this project can make is to point the way to useful impact measurement models which can be adapted by researchers in other regions. Thus, a useful strategy is to pursue several alternative techniques.

MODELING CHANGES IN SCENIC ROAD DEMAND

During the 1973 Watergate hearings, Senator Howard Baker became famous by repeatedly asking two questions of the witnesses: What did the President know? When did he know it? The objective of this research is to ask the following two questions: If a road is designated and promoted as a scenic byway, how many additional people will use it for recreational driving? How much money will these additional motorists spend on goods and services as a result of their recreational trips?

Models are required to measure increments in the use of roads as a result of designation and advertising promotion as a scenic byway. Thus the model must measure how many additional motorists will use the scenic byway after the program goes into effect. Since there is no way to do this before the fact, we need to estimate a model of road use before designation that can be extended into the post-designation period.

3

REGRESSION ANALYSIS USING HISTORICAL DATA

The dependent variable road demand can be measured from historical traffic counts conducted by the Departments of Transportation (DOT) of Kansas, Iowa, Nebraska, and Missouri. A number of explanatory variables can be used in the model, including the following:

Explanatory Variable	Data Source
Personal Income	*City and County Data Book*
	Survey of Current Business
	Local Area Personal Income
Population	*Local Population Estimates*
Employment	*County Business Patterns*
Vehicle Registrations	State DOTs
Gasoline Prices	*CPI Detailed Report*
Road Quality	State DOTs

Personal income, population, and employment are all directly related to road demand. As each of these three variables increases in a region, the demand for normal goods, including recreational driving, will also increase. It is unlikely that all three of these explanatory variables can be used in the same equation. They are undoubtedly highly correlated with each other, making it impossible to statistically measure their separate effects. If this is the case, population will be used as the main explanatory variable since the U.S. Census Bureau frequently issues local population forecasts.

An increase in the price of gasoline raises the cost of recreational driving and may cause some people to engage in alternative forms of recreation. Thus, other things equal, the price of gasoline is inversely related to scenic road use.

Road quality could also influence the demand for individual scenic roads. Regardless of the scenic beauty of the area, few motorists want to drive on hazardous, slow, poorly maintained roads. Thus the quality of the scenic byway is directly related to its use.

The above model would be estimated for roads that are expected to be part of the scenic roads program and would likely be estimated with annual data. If the model yields good statistical results, it can be extended into the post-designation period by adding a dummy variable to the equation. The dummy variable measures the increase in road use directly attributable to

4

the scenic roads program alone. Other explanatory variables in the equation measure changes in road use due to other factors.

An alternative to the dummy variable approach is a "control" road method. In this case, each scenic byway is paired with a control road that has similar demand but is not designated as scenic. This can be accomplished by estimating the above regression model for each scenic byway and its control road. The control road is acceptable if its statistical results are similar to those of the scenic byway. After the scenic roads program goes into effect, any demand differences between the scenic byways and their respective control roads would be attributable to the scenic byways program. The main problem with this approach is identifying control roads for scenic byways which, by their very nature, are unique.

TIME SERIES MODELS

Weekly, monthly, and quarterly traffic count data from state DOTs can be used to construct time series models for each scenic byway. Any data series, including road use, can be separated into the following four components:

(T) Trend = underlying movement of the data series over a long period of time; for example, the trend in road use is up as population and auto ownership increase;

(C) Cycle = movement of the data series due to cyclical changes in the national and regional economy;

(S) Seasonal = movements in the data series due to recurring, predictable seasonal patterns; for example, road use increases in the summer and declines in winter; and

(I) Irregular = changes in the data series that cannot be attributed to the other three factors.

Thus the time series model for scenic road use would be:

Scenic Road Use = T · C · S · I

The X-11 time series program developed by the U.S. Bureau of the Census separates the traffic count data into each of the four components of the time series model. Changes in the Irregular Component would measure the incremental increase directly due to the scenic roads

program (i.e., designation and advertising promotion).

SURVEYS OF BUSINESS FIRMS

At semi-annual intervals after designation and promotion of scenic byways, personal interviews could be conducted with businesses in the vicinity of scenic byways. These firms could be asked whether scenic byways have affected their sales and employment and, if so, by how much. Firms in the following industries could be interviewed: Gasoline Service Stations (554); Amusement and Recreation Services (79); Eating and Drinking Places (58); Grocery Stores (54); Hotels-Motels (701); Camping and Trailer Parks (703); and Automotive Repair Shops (753). (Numbers in parentheses are Standard Industrial Code (SIC) numbers.)

In addition to private business firms, other sources of scenic road impact on business activity include Chambers of Commerce, Departments of Tourism, and Hotel-Motel Associations.

SURVEYS OF SCENIC BYWAY USERS

Though regression and time series models may be useful, there is no substitute for on-site surveys designed to discover the trip purpose of individual drivers and their planned spending by expenditure category. In order to obtain the increase in recreational driving due to the scenic roads program, a survey would have to be conducted on the proposed scenic roads both before and after designation. These surveys would not only reveal the number of recreational drivers using the scenic roads, they could also indicate the effectiveness of scenic road marketing programs. If the four states in the study area employ different marketing strategies, the surveys could reveal something about the relative effectiveness of each.

Surveys conducted prior to designation could include the following questions:
1. Origin? Destination?
2. Why are you using this road? (If the answer is for recreation, a series of observations and questions would follow).
3. Age and race (as observed by the interviewer).
4. Education level and occupation (proxies for income).
5. Number of people in the travel party.
6. How much do you plan to spend on this trip for the following: (a) gasoline; (b) motels; (c) eating and drinking places; (d) grocery stores;

(e) admissions to attractions;   (f) hunting and fishing permits; and   (g) other.

Surveys conducted after designation would be the same as above and include a few additional questions such as:
1.   Are you aware this is a designated scenic byway?
2.   If yes, how did you find out about it?
3.   Have you used this road for recreational driving before it was designated as a scenic byway? How often?
4.   Do you recall the average dollar amount spent on previous trips?

The economic impact questions on both the pre- and post-designation surveys would be integrated with other questions designed to measure the benefits of scenic byways for the users.

The ideal result of the survey is to obtain expenditures that are exclusively due to scenic road use. However this may be difficult to achieve since scenic road use may be jointly consumed with other recreational activities such as hiking, camping, fishing, or hunting. Thus, it would be difficult for the survey respondent to isolate the expenditures that are exclusively associated with scenic road use. However, this may be partially circumvented by asking the motorist for the primary purpose of the trip and what other recreational activities are associated with the trip. A bibliography of survey methodology can be found in the Reference section.

MEASURING THE ECONOMIC IMPACT

Reduced to the bare essentials, the economic impacts of the scenic byways program are obtained by multiplying the change in the number of byway users caused by designation and promotion by the expenditures of those users, both in total and by expenditure category.

III. STUDY AREA PROFILE, ECONOMIC-DEMOGRAPHIC-RECREATIONAL

To develop appropriate economic impact models for a scenic roads program it is necessary to obtain a wide variety of demographic and economic data for the four-state region. Some of this information is required to formulate correct models while other data will be needed to estimate specific impacts. For example we need to know the location of major population

centers relative to the location of scenic byways as well as the population of counties adjacent to the byways. This information yields potential demand. Also employment and income levels and growth rates are helpful in estimating road demand equations. Since scenic roads may be used in conjunction with other recreational facilities, it is important to know names, locations, attendance levels and growth rates of parks, recreation areas, wildlife refuges, historical sites, and other attractions in the four-state area.

The following section of an economic-demographic-recreational profile of the four-state region contains the following categories:
- Population
- Employment
- Personal Income
- Passenger Car Registrations
- Recreation Facilities and Attractions

POPULATION

State Population. Table 1 displays the population for each of the four states in the study area. Based on U.S. census population projections for 1990, Missouri had the most population growth (20.2%) between 1960 and 1990. During the same interval, Kansas and Nebraska posted population gains of 14.4% and 12.5% respectively. Iowa population in 1990 is expected to be virtually the same as 1960.

The four states accounted for 5.5% of the U.S. population in 1970. The U.S. Census Bureau forecasts a decline to 4.5% by the year 2000. Thus, the four-state region is expected to continue to grow more slowly than the rest of the nation.

MSA Population. Table 2 contains MSA (Metropolitan Statistical Area) population for each of the four states in the study area. In 1987 the largest MSA in the region was St. Louis (2.5 million) with Kansas City (1.5 million) and Omaha (0.6 million) in second and third place. Between 1970 and 1980, the fastest growing MSAs in the region were Springfield, Missouri (35.8%); Des Moines, Iowa (28.5%); Columbia, Missouri (24.1%); and Waterloo-Cedar Falls, Iowa (22.5%). Sioux City, Iowa and Topeka, Kansas were the only MSAs in the four states that actually lost population in the 1970-1980 period. In the 1980-1987 time frame, the MSAs with

8

Table 1. State Population, 1960-2010

(Thousands)

Year	Kansas	Nebraska	Missouri	Iowa	Percent of U.S. Total, All 4 States
1960	2179	1412	4320	2758	5.4%
1970	2249	1485	4678	2825	5.5
1980	2364	1570	4917	2914	5.2
1988	2477	1593	5132	2803	4.9
1990	2492	1588	5192	2750	4.8
1995	2515	1574	5304	2652	4.6
2000	2529	1556	5383	2549	4.5
2010	2564	1529	5521	2382	4.3

Source: (1960-1980) U.S. Department of Commerce, Bureau of the Census, Statistical Abstract of the United States, 1989.

(1988-2010) U.S. Bureau of the Census, Current Population Reports, Projections of the Populations of States, by Age, Sex and Race: 1988 to 2010, Series P-25, No. 1017.

Table 2. MSA Population - Four States, 1970-1987

Iowa

	1970	1980	1987*
Des Moines	286,101	367,561	385,100
Cedar Rapids	162,213	169,775	169,100
Davenport-Rock Island, Moline, IL	362,638	384,749	366,600
Waterloo, Cedar Falls	132,916	162,781	149,300
Sioux City	116,189	109,435	123,700
Dubuque	90,609	93,745	90,700
Iowa City	72,127	81,717	85,800

Kansas

	1970	1980	1987*
Wichita	389,352	442,401	474,700
Topeka	155,322	154,916	162,400
Lawrence	57,932	67,640	75,100

Missouri

	1970	1980	1987*
St. Louis	2,363,017	2,376,968	2,458,100
Kansas City, MO, KS	1,253,916	1,433,464	1,546,400
Springfield	152,929	207,704	229,000
Columbia	80,911	100,376	107,500
St. Joseph	86,915	87,888	85,300

Nebraska

	1970	1980	1987*
Omaha	540,142	585,122	616,400
Lincoln	167,972	192,884	207,700

*estimate

Source: (1980 and 1987) U.S. Bureau of the Census, Current Population Reports, Patterns of Metropolitan Area and County Population Growth: 1980 to 1987, Series P-25, No. 1039.

(1970) U.S. Bureau of the Census, 1970 Census of Population, Characteristics of the Population, Part 17, Iowa.

(1970) U.S. Bureau of the Census, 1970 Census of Population, Characteristics of the Population, Part 18, Kansas.

(1970) U.S. Bureau of the Census, 1970 Census of Population, Characteristics of the Population, Part 27, Missouri.

(1970) U.S. Bureau of the Census, 1970 Census of Population, Characteristics of the Population, Part 29, Nebraska.

the largest population growth were Sioux City, Iowa (13.1%); Lawrence, Kansas (11.1%); and Springfield, Missouri (10.3%). Many of the Iowa MSAs lost population in the 1980-1987 period, including Cedar Rapids (-0.4%), Davenport-Rock Island-Moline (-4.7%), Waterloo-Cedar Falls (-8.3%), and Dubuque (-3.2%).

County Population. Since the end of World War II, the larger U.S. metropolitan areas have experienced more population growth than rural and non-metropolitan areas. The result has been a concentration of population in fewer, larger places. This is evident from an examination of Table 3 which displays the 1988 populations of the ten largest counties in each of the four states. In Nebraska, the ten largest counties accounted for 61.4% of 1988 state population. The corresponding figures for Iowa, Kansas and Missouri are 44.6%, 58.3%, and 53.4% respectively.

The concentration of population into fewer, larger places is evident from an examination of county population for each of the four states. Table 4 contains Iowa population for the 1970-1988 period. Between 1970 and 1980, 56 Iowa counties gained population while 43 counties lost people. In the 1980-1988 interval, the U.S. Census Bureau estimates that 87 of the 99 Iowa counties lost population.

Between 1970 and 1980, 54 Kansas counties gained population with 51 losing people (see Table 5). According to U.S. Census Bureau estimates, only 30 Kansas counties gained population in the 1980-1988 period; the other 75 counties are forecast to lose population.

In the 1970-1980 interval, 93 Missouri counties gained population with only 22 suffering decreases (see Table 6). However, between 1980 and 1988 only 70 counties are forecast to gain population while 45 are expected to decline.

An examination of Table 7 reveals that 44 Nebraska counties gained population between 1970 and 1980, with 49 counties suffering losses. In the 1980-1988 period, the U.S. Census Bureau forecasts that 74 Nebraska counties will lose population with only 19 counties posting gains.

Table 3. Population of Ten Largest Counties in Iowa, Kansas, Missouri, and Nebraska, 1988

Iowa

County	Population
Polk	324,700
Linn	171,500
Scott	155,400
Black Hawk	124,500
Woodbury	98,500
Dubuque	90,900
Pottawatomie	88,000
Johnson	86,700
Story	71,900
Clinton	52,900

Percent of State Population
in Ten Largest Counties   44.6%

Kansas

County	Population
Sedgwick	402,100
Johnson	345,700
Wyandotte	172,800
Shawnee	164,800
Douglas	76,500
Leavenworth	66,500
Reno	64,700
Riley	62,700
Butler	50,200
Saline	50,000

Percent of State Population
in Ten Largest Counties   58.3%

Table 3. Population of Ten Largest Counties in Iowa, Kansas, Missouri, and Nebraska, 1988 (Continued)

<u>Missouri</u>

<u>County</u>	<u>Population</u>
St. Louis	1,008,800
Jackson	644,700
St. Charles	204,400
Greene	203,900
Jefferson	172,400
Clay	150,500
Boone	105,800
Jasper	92,100
Buchanan	85,400
Franklin	78,700

Percent of State Population
in Ten Largest Counties   53.4%

<u>Nebraska</u>

<u>County</u>	<u>Population</u>
Douglas	419,400
Lancaster	211,600
Sarpy	98,200
Hall	48,600
Scotts Bluff	37,100
Buffalo	37,000
Dodge	35,400
Lincoln	33,700
Madison	32,300
Adams	30,400

Percent of State Population
in Ten Largest Counties   61.4%

Source: U.S. Department of Commerce, Bureau of the Census, Current Population
Reports, <u>Local Population Estimates</u>, Series P-26, 88-WNC-SC.

Table 4. Iowa Population by County, 1970-1988

County	1970	1980	1988
Adair	9,487	9,509	8,500
Adams	6,322	5,731	5,300
Allamakee	14,968	15,108	14,900
Appanoose	15,007	15,511	14,300
Audubon	9,595	8,559	7,600
Benton	22,885	23,649	22,700
Black Hawk	132,916	137,961	124,500
Boone	26,470	26,184	25,400
Bremer	22,737	24,820	23,300
Buchanan	21,762	22,900	21,800
Buena Vista	20,693	20,774	20,100
Butler	16,953	17,668	16,300
Calhoun	14,292	13,542	12,100
Carroll	22,912	22,951	22,400
Cass	17,007	16,932	15,500
Cedar	17,655	18,635	18,100
Cerro Gordo	49,223	48,458	48,100
Cherokee	17,269	16,238	14,700
Chickasaw	14,969	15,437	14,300
Clarke	7,581	8,612	9,000
Clay	18,464	19,576	17,600
Clayton	20,606	21,098	20,200
Clinton	56,749	57,122	52,900
Crawford	19,116	18,935	18,400
Dallas	26,085	29,513	30,400
Davis	8,207	9,104	8,700
Decatur	9,737	9,794	8,600
Delaware	18,770	18,933	18,600
Des Moines	46,982	46,203	44,300
Dickinson	12,565	15,629	15,300
Dubuque	90,609	93,745	90,900
Emmet	14,009	13,336	11,600
Fayette	26,898	25,488	22,600
Floyd	19,860	19,597	18,100
Franklin	13,255	13,036	11,800
Fremont	9,282	9,401	8,800
Greene	12,716	12,119	10,700
Grundy	14,119	14,366	12,700
Guthrie	12,243	11,983	11,000
Hamilton	18,383	17,862	16,900
Hancock	13,506	13,833	13,300
Hardin	22,248	21,776	19,800
Harrison	16,240	16,348	15,900
Henry	18,114	18,890	18,800
Howard	11,442	11,114	10,500
Humboldt	12,519	12,246	11,300
Ida	9,283	8,908	8,600
Iowa	15,419	15,429	14,700
Jackson	20,839	22,503	21,700

Table 4. Iowa Population by County, 1970-1988 (Continued)

County	1970	1980	1988
Jasper	35,425	36,425	36,200
Jefferson	15,774	16,316	16,700
Johnson	72,127	81,717	86,700
Jones	19,868	20,401	19,800
Keokuk	13,943	12,921	12,000
Kossuth	22,937	21,891	19,700
Lee	42,996	43,106	40,400
Linn	163,213	169,775	171,500
Louisa	10,682	12,055	12,000
Lucas	10,163	10,313	9,500
Lyon	13,340	12,896	12,200
Madison	11,558	12,597	12,600
Mahaska	22,177	22,867	22,400
Marion	26,352	29,669	30,200
Marshall	41,076	41,562	39,400
Mills	11,832	13,406	13,400
Mitchell	13,108	12,329	11,500
Monona	12,069	11,692	10,400
Monroe	9,357	9,209	8,400
Montgomery	12,781	13,413	12,200
Muscatine	37,181	40,436	41,100
O'Brien	17,522	16,972	15,600
Osceola	8,555	8,371	7,600
Page	18,537	19,063	17,100
Palo Alto	13,289	12,721	11,100
Plymouth	24,322	24,743	24,100
Pocahontas	12,793	11,369	10,300
Polk	286,130	303,170	324,700
Pottawattamie	86,991	86,561	88,000
Poweshiek	18,803	19,306	18,900
Ringgold	6,373	6,112	5,400
Sac	15,573	14,118	12,600
Scott	142,687	160,022	155,400
Shelby	15,528	15,043	14,100
Sioux	27,996	30,813	30,200
Story	62,783	72,326	71,900
Tama	20,147	19,533	18,400
Taylor	8,790	8,353	7,500
Union	13,557	13,858	12,900
Van Buren	8,643	8,626	8,200
Wapello	42,149	40,241	36,600
Warren	27,432	34,878	36,700
Washington	18,967	20,141	20,100
Wayne	8,405	8,199	7,100
Webster	48,391	45,953	41,700
Winnebago	12,990	13,010	12,400
Winneshiek	21,758	21,876	21,900
Woodbury	103,052	100,884	98,500
Worth	8,984	9,075	8,600
Wright	17,294	16,319	14,700
State Total (in Thousands)	2,825.0	2,913.8	2,834.0

Source: (1970 and 1980):Iowa Department of Economic Development,
1987-88 Statistical Profile of Iowa, pp. 72-73.

(1988) U.S. Department of Commerce, Bureau of the Census,
Current Population Reports, Local Population Estimates, Series
P-26, No. 88-WNC-SC.

Table 5. Kansas Population by County, 1970-1988

County	1970	1980	1988
Allen	15,043	15,654	15,000
Anderson	8,501	8,749	8,200
Atchison	19,165	18,397	17,800
Barber	7,016	6,548	6,300
Barton	30,663	31,343	30,300
Bourbon	15,215	15,969	15,200
Brown	11,685	11,955	11,400
Butler	38,658	44,782	50,200
Chase	3,408	3,309	3,100
Chautauqua	4,642	5,016	4,500
Cherokee	21,549	22,304	22,100
Cheyenne	4,256	3,678	3,400
Clark	2,896	2,599	2,500
Clay	9,890	9,802	9,100
Cloud	13,466	12,494	11,400
Coffey	7,397	9,370	8,800
Comanche	2,702	2,554	2,400
Cowley	35,012	36,824	37,300
Crawford	37,850	37,916	37,100
Decatur	4,988	4,509	4,100
Dickinson	19,993	20,175	20,100
Doniphan	9,107	9,268	9,000
Douglas	57,932	67,640	76,500
Edwards	4,581	4,271	3,900
Elk	3,858	3,918	3,500
Ellis	24,730	26,098	26,500
Ellsworth	6,146	6,640	6,200
Finney	19,029	23,825	30,900
Ford	22,587	24,315	25,900
Franklin	20,007	22,062	22,500
Geary	28,111	29,852	29,200
Gove	3,940	3,726	3,400
Graham	4,751	3,995	3,600
Grant	5,961	6,977	6,900
Gray	4,516	5,138	5,500
Greeley	1,819	1,845	1,700
Greenwood	9,141	8,764	7,900
Hamilton	2,747	2,514	2,300
Harper	7,871	7,778	7,300
Harvey	27,236	30,531	30,800
Haskell	3,672	3,814	3,900
Hodgeman	2,662	2,269	2,200
Jackson	10,342	11,644	11,800
Jefferson	11,945	15,207	16,900
Jewell	6,099	5,241	4,400
Johnson	220,073	270,069	345,700
Kearny	3,047	3,435	4,000
Kingman	8,886	8,960	8,800
Kiowa	4,088	4,046	3,600
Labette	25,775	25,682	25,200
Lane	2,707	2,472	2,400
Leavenworth	53,340	54,809	66,500
Lincoln	4,582	4,145	3,500
Linn	7,770	8,234	8,300
Logan	3,814	3,478	3,100
Lyon	32,071	35,108	34,800
Marion	13,935	13,522	12,800
Marshall	13,139	12,787	12,300
McPherson	24,778	26,855	27,100
Meade	4,912	4,788	4,400
Miami	19,254	21,618	23,900

Table 5. Kansas Population by County, 1970-1988 (Continued)

County	1970	1980	1988
Mitchell	8,010	8,117	7,400
Montgomery	39,949	42,281	40,900
Morris	6,432	6,419	6,500
Morton	3,576	3,454	3,500
Nemaha	11,825	11,211	10,800
Neosho	18,812	18,967	18,100
Ness	4,791	4,498	4,200
Norton	7,279	6,689	6,200
Osage	13,352	15,319	16,100
Osborne	6,416	5,959	5,200
Ottawa	6,183	5,971	5,800
Pawnee	8,484	8,065	7,500
Phillips	7,888	7,406	6,900
Pottawatomie	11,755	14,782	16,300
Pratt	10,056	10,275	10,200
Rawlins	4,393	4,105	3,700
Reno	60,765	64,983	64,700
Republic	8,498	7,569	6,900
Rice	12,320	11,900	10,900
Riley	56,788	63,505	62,700
Rooks	7,628	7,006	6,200
Rush	5,117	4,516	3,800
Russell	9,428	8,868	7,900
Saline	46,592	48,905	50,000
Scott	5,606	5,782	5,400
Sedgwick	350,694	367,088	402,100
Seward	15,744	17,071	18,500
Shawnee	155,322	154,916	164,800
Sheridan	3,859	3,544	3,200
Sherman	7,792	7,759	6,800
Smith	6,757	5,947	5,300
Stafford	5,943	5,694	5,300
Stanton	2,287	2,339	2,400
Stevens	4,198	4,736	4,900
Sumner	23,553	24,928	25,600
Thomas	7,501	8,451	8,400
Trego	4,436	4,165	3,900
Wabaunsee	6,397	6,867	6,700
Wallace	2,215	2,045	2,000
Washington	9,249	8,543	7,500
Wichita	3,274	3,041	2,900
Wilson	11,317	12,128	11,200
Woodson	4,789	4,600	4,000
Wyandotte	186,845	172,335	172,800
State Total (in Thousands)	2,249.1	2,364.2	2,496.0

Source: (1970 and 1980) The University of Kansas,
Institute for Public Policy and Business Research,
Kansas Statistical Abstract, 1987-88, pp. 4-6.

(1988) U.S. Department of Commerce, Bureau of the
Census, Current Population Reports, Local
Population Estimates, Series P-26, No. 88-WNC-SC.

Table 6. Missouri Population by County, 1970-1988

County	1970	1980	1988
Adair	22,472	24,870	23,400
Andrew	11,913	13,980	15,200
Atchison	9,240	8,605	7,800
Audrain	25,362	26,458	25,300
Barry	19,597	24,408	27,800
Barton	10,431	11,292	11,500
Bates	15,468	15,873	15,900
Benton	9,695	12,183	13,300
Bollinger	8,820	10,301	11,100
Boone	80,911	100,376	105,800
Buchanan	86,915	87,888	85,400
Butler	33,529	37,693	38,700
Caldwell	8,351	8,660	8,300
Callaway	25,850	32,252	33,000
Camden	13,315	20,017	25,800
Cape Girardeau	49,350	58,837	62,200
Carroll	12,565	12,131	11,100
Carter	3,878	5,428	5,900
Cass	39,448	51,029	61,400
Cedar	9,424	11,894	12,400
Chariton	11,084	10,489	9,800
Christian	15,124	22,402	30,400
Clark	8,260	8,493	8,000
Clay	123,322	136,488	150,500
Clinton	12,462	15,916	16,900
Cole	46,228	56,663	61,600
Cooper	14,732	14,643	14,600
Crawford	14,828	18,300	20,000
Dade	6,850	7,383	7,600
Dallas	10,054	12,096	13,400
Daviess	8,420	8,905	8,500
De Kalb	7,305	8,222	8,100
Dent	11,457	14,517	15,400
Douglas	9,268	11,594	12,600
Dunklin	33,742	36,324	34,500
Franklin	55,116	71,233	78,700
Gasconade	11,878	13,181	13,900
Gentry	8,060	7,887	7,100
Greene	152,929	185,302	203,900
Grundy	11,819	11,959	10,900
Harrison	10,257	9,890	9,000
Henry	18,451	19,672	20,000
Hickory	4,481	6,367	7,400
Holt	6,654	6,882	6,300
Howard	10,561	10,008	9,500
Howell	23,521	28,807	31,000
Iron	9,529	11,084	11,200
Jackson	654,554	629,266	644,700
Jasper	79,852	86,958	92,100
Jefferson	105,248	146,183	172,400
Johnson	34,172	39,059	39,000
Knox	5,692	5,508	4,800
Laclede	19,944	24,323	26,400
Lafayette	26,626	29,925	31,300
Lawrence	24,585	28,973	30,900
Lewis	10,993	10,901	10,200
Lincoln	18,041	22,193	28,300
Linn	15,125	15,495	14,400
Livingston	15,368	15,739	15,300
McDonald	12,357	14,917	16,400
Macon	15,432	16,313	16,300

Table 6. Missouri Population by County, 1970-1988 (Continued)

County	1970	1980	1988
Madison	8,641	10,725	11,500
Maries	6,851	7,551	7,900
Marion	28,121	28,638	28,500
Mercer	4,910	4,685	4,000
Miller	15,026	18,532	19,900
Mississippi	16,647	15,726	15,500
Moniteau	10,742	12,068	12,200
Monroe	9,542	9,716	9,400
Montgomery	11,000	11,537	11,600
Morgan	10,068	13,807	15,300
New Madrid	23,420	22,945	21,700
Newton	32,901	40,555	43,800
Nodaway	22,467	21,996	20,800
Oregon	9,180	10,238	9,800
Osage	10,994	12,014	11,800
Ozark	6,226	7,961	9,000
Pemiscot	26,373	24,987	23,700
Perry	14,393	16,784	17,100
Pettis	34,137	36,378	36,600
Phelps	29,481	33,633	34,800
Pike	16,928	17,568	16,900
Platte	32,081	46,341	56,200
Polk	15,415	18,822	21,200
Pulaski	53,781	42,011	40,700
Putnam	5,916	6,092	5,400
Ralls	7,764	8,911	8,900
Randolph	22,434	25,460	26,000
Ray	17,599	21,378	22,600
Reynolds	6,106	7,230	6,700
Ripley	9,803	12,458	13,100
St. Charles	92,954	144,107	204,400
St. Clair	7,667	8,622	8,400
St. Francois	36,818	42,600	47,500
St. Louis	951,353	973,896	1,008,800
St. Louis City	622,234	453,085	403,700
Ste. Genevieve	12,867	15,180	16,400
Saline	24,633	24,919	24,400
Schuyler	4,665	4,979	4,400
Scotland	5,499	5,415	5,000
Scott	33,250	39,647	40,800
Shannon	7,196	7,885	8,000
Shelby	7,906	7,826	7,200
Stoddard	25,771	29,009	28,700
Stone	9,921	15,587	19,200
Sullivan	7,572	7,434	6,700
Taney	13,023	20,467	25,400
Texas	18,320	21,070	21,700
Vernon	19,065	19,806	19,700
Warren	9,699	14,900	19,600
Washington	15,086	17,983	19,500
Wayne	8,546	11,277	12,400
Webster	15,562	20,414	23,800
Worth	3,359	3,008	2,600
Wright	13,667	16,188	17,000
State Total (in Thousands)	4,678.0	4,916.8	5,141.0

Source: (1970 and 1980) University of Missouri-Columbia, College of Business and Public Administration, Statistical Abstract for Missouri, 1987, p. 5.

(1988) U.S. Department of Commerce, Bureau of the Census, Current Population Reports, Local Population Estimates, Series P-26, No. 88-WNC-SC.

Table 7. Nebraska Population by County, 1970-1988

County	1970	1980	1988
Adams	30,553	30,656	30,400
Antelope	9,047	8,675	8,400
Arthur	606	513	500
Banner	1,034	918	1,000
Blaine	847	867	700
Boone	8,190	7,391	7,000
Box Butte	10,094	13,696	14,000
Boyd	3,752	3,331	3,100
Brown	4,021	4,377	3,900
Buffalo	31,222	34,797	37,000
Burt	9,247	8,813	8,300
Butler	9,461	9,330	9,100
Cass	18,076	20,297	22,100
Cedar	12,192	11,375	10,700
Chase	4,129	4,758	4,600
Cherry	6,846	6,758	6,500
Cheyenne	10,778	10,057	10,000
Clay	8,266	8,106	7,600
Colfax	9,498	9,890	9,200
Cuming	12,034	11,664	11,000
Custer	14,092	13,877	12,800
Dakota	13,137	16,573	17,200
Dawes	9,761	9,609	9,200
Dawson	19,771	22,304	20,700
Deuel	2,717	2,462	2,300
Dixon	7,453	7,137	6,600
Dodge	34,782	35,847	35,400
Douglas	389,455	397,038	419,400
Dundy	2,926	2,861	2,700
Fillmore	8,137	7,920	7,400
Franklin	4,566	4,377	4,000
Frontier	3,982	3,647	3,400
Furnas	6,897	6,486	5,900
Gage	25,719	24,456	23,200
Garden	2,929	2,802	2,700
Garfield	2,411	2,363	2,100
Gosper	2,178	2,140	2,100
Grant	1,019	877	800
Greeley	4,000	3,462	3,200
Hall	42,851	47,690	48,600
Hamilton	8,867	9,301	9,100
Harlan	4,357	4,292	4,000
Hayes	1,530	1,356	1,200
Hitchcock	4,051	4,079	3,900
Holt	12,933	13,552	13,100
Hooker	939	990	1,000
Howard	6,807	6,773	6,400
Jefferson	10,436	9,817	9,100
Johnson	5,743	5,285	4,800
Kearney	6,707	7,053	6,700
Keith	8,487	9,364	8,700
Keya Paha	1,340	1,301	1,100
Kimball	6,009	4,882	4,500
Knox	11,723	11,457	10,600
Lancaster	167,972	192,884	211,600
Lincoln	29,538	36,455	33,700
Logan	991	983	1,000
Loup	854	859	800
McPherson	623	593	600
Madison	27,402	31,382	32,300
Merrick	8,751	8,945	8,500
Morrill	5,813	6,085	5,700

Table 7. Nebraska Population by County, 1970-1988 (Continued)

County	1970	1980	1988
Nance	5,142	4,740	4,400
Nemaha	8,976	8,367	8,300
Nuckolls	7,404	6,726	6,200
Otoe	15,576	15,183	14,500
Pawnee	4,473	3,937	3,500
Perkins	3,423	3,637	3,600
Phelps	9,553	9,769	9,800
Pierce	8,493	8,481	8,400
Platte	26,544	28,852	30,400
Polk	6,468	6,320	5,900
Red Willow	12,191	12,615	12,600
Richardson	12,277	11,315	10,200
Rock	2,231	2,383	2,200
Saline	12,809	13,131	12,900
Sarpy	66,200	86,015	98,200
Saunders	17,018	18,716	18,700
Scotts Bluff	36,432	38,344	37,100
Seward	14,460	15,789	15,900
Sheridan	7,285	7,544	7,300
Sherman	4,725	4,226	3,900
Sioux	2,034	1,845	1,600
Stanton	5,758	6,549	6,600
Thayer	7,779	7,582	7,000
Thomas	954	973	900
Thurston	6,942	7,186	7,100
Valley	5,783	5,633	5,600
Washington	13,310	15,508	16,000
Wayne	10,400	9,858	9,800
Webster	5,396	4,858	4,500
Wheeler	1,051	1,060	1,000
York	13,685	14,798	14,900
State Total (in Thousands)	1,483.8	1,569.8	1,602.0

Source: (1970 and 1980) Nebraska Department of Economic Development, 1988-1989 Statistical Handbook.

(1988) U.S. Department of Commerce, Bureau of the Census, Current Population Reports, Local Population Estimates, Series P-26, No. 88-WNC-SC.

Population by Age. The aging of the American population is evident from an examination of Table 8. In 1970, nearly 53% of the U.S. population was under the age of thirty; 37.3% were in the age 30-64 category, and 9.8% were age 65 or over. According to forecasts by the U.S. Bureau of the Census, in the year 2010, only 38.7% of the U.S. population will be less than thirty years of age; 47.5% will be in the 30-64 age group, and nearly 14% will be age 65 or over. There is no significant difference in either the 1970 or the forecast 2010 age distribution of the four states and the U.S. as a whole. The only exception is a slightly higher percentage of people over age 65 in the four-state region, both in 1970 and 2010 (see Table 9).

Population by Sex and Race. Table 10 displays the four-state region population by sex and race for the 1970-2010 time span. In 1970, 93.6% of the region's population was white, 5.9% black, and 0.5% other races. The U.S. Census Bureau forecasts that the 2010 region population will be 90.1% white, 7.8% black, and 2.2% other races. In 1990, the four-state region population is expected to be 51.4% female, 48.6% male.

Population Summary. The forecast population growth rates for the four states in the study area during the 1960-1990 period are 20.2% (Missouri), 14.4% (Kansas), 12.5% (Nebraska), and zero (Iowa). The population growth rates of the four states have been less than the national growth rates and this trend is expected to continue. The four states account for slightly less than 5% of the U.S. population.

The largest MSAs in the region are St. Louis, Kansas City, and Omaha. In the 1970-1980 period, the fastest growing MSAs were in Missouri and Iowa. However, between 1980 and 1987 many of the Iowa MSAs lost population.

Most of the population of the four states is concentrated in a few counties. In Nebraska, 61.4% of the 1988 population was located in the ten largest counties. The corresponding percentages for Kansas, Missouri, and Iowa are 58.3%, 53.4%, and 44.6%.

In the 1970-1980 time frame, each of the four states (except Nebraska) had more county population gains than losses. However in the 1980-1988 interval, every state (except Missouri) had more county population losses than gains.

The age distribution of the region's population reflects the aging of the U.S. population. The racial composition of the region's population is over 90% white.

Table 8. United States Population by Age, 1970-2010

(Thousands)

	1970	Percent	1980	Percent	1990	Percent	2000	Percent	2010	Percent
Under 5	17,166	8.4	16,454	7.2	18,408	7.4	16,898	6.3	16,899	6.0
5-9	19,919	9.7	16,601	7.3	18,378	7.3	18,126	6.8	16,940	6.0
10-14	20,853	10.2	18,241	8.0	17,284	6.9	19,208	7.2	17,670	6.3
15-19	19,333	9.4	21,157	9.3	17,418	7.0	19,112	7.1	18,839	6.7
20-24	17,202	8.4	21,579	9.5	18,689	7.5	17,600	6.6	19,453	6.9
25-29	13,736	6.7	19,796	8.7	21,511	8.6	17,736	6.6	19,310	6.8
30-34	11,587	5.7	17,815	7.8	22,414	9.0	19,413	7.2	18,262	6.5
35-39	11,155	5.4	14,124	6.2	20,220	8.1	21,820	8.1	18,041	6.4
40-44	11,995	5.8	11,753	5.2	17,677	7.1	22,091	8.2	19,161	6.8
45-49	12,151	5.9	11,050	4.9	13,947	5.6	19,885	7.4	21,482	7.6
50-54	11,166	5.4	11,699	5.1	11,540	4.6	17,338	6.5	21,725	7.7
55-59	10,006	4.9	11,617	5.1	10,623	4.2	13,459	5.0	19,259	6.8
60-64	8,676	4.2	10,144	4.5	10,741	4.3	10,699	4.0	16,171	5.7
65-69	7,026	3.4	8,814	3.9	10,251	4.1	9,491	3.5	12,163	4.3
70-74	5,467	2.7	6,841	3.0	8,122	3.2	8,752	3.3	8,876	3.1
Over 75	7,613	3.7	10,054	4.4	13,187	5.3	16,639	6.2	18,323	6.5
Total	205,052		227,738		250,410		268,266		282,575	

Source: (1970) U.S. Department of Commerce, Bureau of the Census, Current Population Reports, Preliminary Estimates of the Population of the United States by Age, Sex and Race: 1970 to 1981, Series P-25, No. 917.

(1980) U.S. Department of Commerce, Bureau of the Census, Current Population Reports, Estimates of the Population of the United States by Age, Sex, and Race: 1980 to 1984, Series P-25, No. 965.

(1990-2010): U.S. Department of Commerce, Bureau of the Census, Current Population Reports, Projections of the Population of the United States by Age, Sex, and Race: 1988-2080, Series P-25, No. 1018.

Table 9. Four State Region Population by Age, 1970-2010

(Thousands)

Age	1970	Percent	1980	Percent	1990	Percent	2000	Percent	2010	Percent
Under 5	899	8.0%	880	7.5%	901	7.5%	762	6.3%	738	6.2%
5-9	1090	9.7	853	7.3	888	7.4	823	6.8	731	6.1
10-14	1144	10.2	910	7.7	855	7.1	879	7.3	756	6.3
15-19	1063	9.5	1104	9.4	825	6.9	871	7.2	815	6.8
20-24	862	7.7	1099	9.3	837	7.0	779	6.5	816	6.8
25-29	694	6.2	979	8.3	989	8.2	729	6.1	779	6.5
30-34	595	5.3	846	7.2	1044	8.7	784	6.5	733	6.1
35-39	585	5.2	676	5.7	934	7.8	929	7.7	704	5.9
40-44	625	5.6	579	4.9	804	6.7	971	8.1	746	6.2
45-49	636	5.7	566	4.8	645	5.4	882	7.3	886	7.4
50-54	597	5.3	596	5.1	552	4.6	766	6.4	931	7.8
55-59	563	5.0	596	5.1	521	4.3	603	5.0	832	6.9
60-64	518	4.6	532	4.5	527	4.4	493	4.1	696	5.8
65-69	436	3.9	481	4.1	504	4.2	448	3.7	528	4.4
70-74	361	3.2	402	3.4	421	3.5	418	3.5	400	3.3
Over 75	563	5.0	664	5.6	788	6.5	880	7.3	905	7.5
Total	11231	100.0	11763	100.0	12035	100.0	12017	100.0	11996	100.0

Source: (1980-2010) U.S. Bureau of the Census, Current Population Reports, Projections of States, by Age, Sex, and Race: 1988-2010, Series P-25, No. 1017.

(1970) U.S. Bureau of the Census, 1970 Census of Population, Characteristics of the Population, Part 17, Iowa.

(1970) U.S. Bureau of the Census, 1970 Census of Population, Characteristics of the Population, Part 18, Kansas.

(1970) U.S. Bureau of the Census, 1970 Census of Population, Characteristics of the Population, Part 27, Missouri.

(1970) U.S. Bureau of the Census, 1970 Census of Population, Characteristics of the Population, Part 29, Nebraska.

Table 10. Four State Region Population by Sex and Race, 1970-2010

(Thousands)

Year	Sex		Race		
	Male	Female	White	Black	Other
1970	5455	5777	10,514	660	58
1980	5704	6060	10,874	731	159
1990	5849	6182	11,050	810	171
2000	5861	6156	10,929	874	214
2010	5868	6128	10,805	933	258

Source: (1980-2010) U.S. Bureau of the Census, Current Population Reports, Projections of the Population of States by Age, Sex, and Race: 1988 to 2010, Series P-25, No. 1017.

(1970) U.S. Bureau of the Census, 1970 Census of Population, Characteristics of the Population, Part 29, Nebraska.

(1970) U.S. Bureau of the Census, 1970 Census of Population, Characteristics of the Population, Part 27, Missouri.

(1970) U.S. Bureau of the Census, 1970 Census of Population, Characteristics of the Population, Part 18, Kansas.

(1970) U.S. Bureau of the Census, 1970 Census of Population, Characteristics of the Population, Part 17, Iowa.

It is difficult to determine the impact that these population trends will have on the use of scenic byways. This can only be determined empirically. Slow population growth cannot be construed as a positive factor for a leisure activity such as recreational driving. However, the aging of the population may increase the demand for scenic byways since older households have more leisure time and discretionary income than younger households. Racial composition of the population may affect the demand for scenic byways through racial differences in income. In 1988, median family income for white families was $33,915 as opposed to only $19,329 and $21,789 for black and hispanic families. Since the four state region is over 90% white, the racial composition of the population should not negatively affect the use of scenic byways.

The impact of the concentration of population into a few urbanized counties depends on the location of scenic byways relative to the large urban areas. If the roads are within an hour or so drive from urbanized counties they will likely be used more than if they are located in remote areas. For example, western Kansas and western Nebraska are located several hours from the western most population centers of the four-state region.

EMPLOYMENT

State Employment. Total non-agricultural employment for each of the four states in the study region and the U.S. total are displayed in Table 11. Between 1970 and 1988, Kansas had the greatest employment growth (52.2%) while Iowa posted the least growth (31.8%). Of the four states, only Kansas experienced larger employment growth than the U.S. (49.2%). Between 1980 and 1988, none of the four states matched the U.S. employment increment of 16.8%. During the same time period, Missouri posted the greatest employment growth (13.5%), while Iowa had the least, only 4.1%.

MSA Employment. Total non-agricultural MSA employment for each of the four states is revealed in Table 12. The largest MSA in the region is St. Louis with 1988 employment of 1.1 million. Second place goes to Kansas City (755.2 thousand) with Omaha in third position (308.7 thousand). MSAs with the most growth during the 1970-1988 period are Springfield, Missouri (87.5%); Wichita, Kansas (67.6%); and Lincoln, Nebraska (63.0%). St. Joseph, Missouri had the least growth, only 6.9%. In the 1980-1988 interval, Springfield and Kansas City, Missouri had the largest growth increments, 31.4% and 20.3% respectively. During the same period, non-agricultural employment actually declined in Dubuque and Waterloo-Cedar Falls, Iowa.

Table 11. Total State and U.S. Non-Agricultural Employment, 1970-1988

(Thousands)

Year	Kansas	Iowa	Missouri	Nebraska	United States*
1970	678.8	876.9	1668.0	484.3	70.8
1971	677.8	882.7	1660.8	490.8	71.2
1972	717.5	912.3	1700.1	517.0	73.7
1973	763.3	961.3	1770.6	541.3	76.8
1974	790.0	999.0	1789.5	562.1	78.3
1975	801.2	998.7	1740.6	557.8	76.9
1976	834.8	1036.9	1797.8	572.1	79.4
1977	871.0	1079.2	1861.8	593.7	82.5
1978	912.5	1119.2	1953.1	609.9	86.7
1979	946.8	1131.7	2011.1	631.2	89.8
1980	944.7	1109.9	1969.8	627.6	90.4
1981	949.7	1088.6	1956.3	623.2	91.2
1982	921.4	1041.9	1922.4	609.8	89.6
1983	921.6	1040.4	1937.0	610.8	90.1
1984	960.8	1074.7	2032.7	635.4	94.5
1985	967.9	1074.2	2094.7	650.5	97.5
1986	984.8	1073.8	2142.6	652.5	99.5
1987	1005.1	1109.2	2197.8	667.4	102.2
1988	1033.2	1155.9	2236.6	688.2	105.6

Percent Change
| 1970-88 | 52.2% | 31.8% | 34.1% | 42.1% | 49.2% |

*measured in millions

Source: (States, 1972-87) U.S. Bureau of Labor Statistics, Employment,
           Hours, and Earnings, States and Areas, 1972-87.

           (States, 1970-71) U. S. Bureau of Labor Statistics, Employment
           and Earnings, States and Areas, 1939-78.

           (States, 1988) U. S. Bureau of Labor Statistics, Employment
           and Earnings, May 1989.

           (U.S.) U. S. Bureau of Labor Statistics, Emplolyment, Hours,
           and Earnings, 1909-84 and Supplement to Employment and
           Earnings, August, 1989.

Table 12. Total Non-Agricultural MSA Employment, 1970-1988

(Thousands)

	Kansas		Missouri				Nebraska	
	Topeka	Wichita	Kansas City	St. Joseph	St. Louis	Springfield	Lincoln	Omaha
1970	66.6	140.0	517.3	33.4	907.5	59.8	71.9	209.4
1971	68.0	134.4	516.4	33.1	896.7	62.0	73.8	212.8
1972	70.7	143.9	529.3	34.0	899.1	66.2	79.5	221.8
1973	73.5	156.4	553.1	34.4	924.3	70.9	83.4	232.8
1974	75.0	166.1	557.3	34.6	930.4	72.2	86.6	238.0
1975	75.9	170.1	550.0	34.8	907.4	70.8	87.8	237.7
1976	77.7	175.2	570.8	36.0	927.0	74.9	89.5	242.8
1977	81.3	179.8	595.5	36.3	958.5	78.8	94.6	248.5
1978	85.2	191.6	623.5	37.2	1001.1	82.8	97.7	258.5
1979	86.5	202.8	640.8	37.4	1026.6	85.7	100.6	270.1
1980	86.3	205.3	627.6	37.4	1003.7	85.3	100.5	266.9
1981	85.9	206.7	622.0	37.0	1002.2	86.7	99.2	265.9
1982	83.4	193.3	609.8	36.8	986.6	87.3	96.4	262.8
1983	78.6	189.9	635.9	35.1	998.7	89.6	96.2	267.0
1984	82.4	200.6	676.2	35.8	1046.7	95.7	101.0	280.7
1985	83.5	202.2	703.0	36.1	1068.9	99.2	106.4	289.6
1986	83.9	217.5	723.8	35.9	1102.5	104.3	107.7	293.1
1987	86.4	226.9	740.3	35.7	1121.9	107.9	111.8	301.7
1988	89.3	234.7	755.2	-	1139.5	112.1	117.2	308.7
Percent Change 1970-88	34.1%	67.6%	46.0%	6.9%	25.6%	87.5%	63.0%	44.1%

28

Table 12. Total Non-Agricultural MSA Employment, 1970-1988 (Continued)

(Thousands)

Iowa

	Cedar Rapids	Des Moines	Dubuque	Sioux City	Waterloo-Cedar Falls
1970	64.7	137.0	33.4	42.3	50.5
1971	63.2	138.7	34.2	41.5	50.0
1972	65.7	144.4	36.4	44.6	53.3
1973	70.6	152.2	39.0	47.7	57.0
1974	73.6	156.3	41.2	50.2	59.6
1975	74.6	161.0	40.5	49.9	58.9
1976	77.0	166.1	40.8	49.7	59.1
1977	79.7	173.5	43.1	49.8	64.0
1978	82.7	181.0	44.6	51.6	66.0
1979	87.4	183.9	45.0	50.2	67.2
1980	85.2	181.2	43.7	49.1	66.3
1981	81.9	177.2	41.9	49.2	64.7
1982	77.1	172.9	37.6	46.3	59.4
1983	76.3	182.0	37.7	47.3	64.5
1984	78.4	189.5	39.7	48.3	63.4
1985	80.8	193.3	40.2	48.4	60.4
1986	82.6	196.5	39.6	48.4	57.7
1987	85.6	205.9	41.5	49.6	60.4
1988	88.8	214.1	41.7	51.5	63.4
Percent Change 1970-88	37.2%	56.3%	24.9%	21.7%	25.5%

Source: (1972-87) U.S. Bureau of Labor Statistics, Employment, Hours, and Earnings, States and Areas, 1972-87.

(1970-71) U.S. Bureau of Labor Statistics, Employment and Earnings, States and Areas, 1939-78.

(1988) U.S. Bureau of Labor Statistics, Employment and Earnings, May, 1989.

County Employment. According to County Business Patterns (U.S. Bureau of the Census), 69 of Iowa's 99 counties lost employment between 1980 and 1987. The employment loss for the state was 31,685. As of 1987, the top ten Iowa counties as ranked by employment are:

Iowa County	Employment - 1987
Polk	171,945
Linn	76,662
Scott	57,854
Black Hawk	40,117
Dubuque	36,620
Woodbury	34,692
Johnson	24,398
Pottawattamie	20,629
Story	18,386
Des Moines	17,327

Although total Kansas employment increased by 47,674 between 1980 and 1987 (according to County Business Patterns), 73 of the state's 105 counties lost employment. The top ten Kansas counties in 1987, ranked by employment are as follows:

Kansas County	Employment - 1987
Sedgwick	193,684
Johnson	152,397
Shawnee	63,325
Wyandotte	60,593
Reno	20,751
Douglas	20,451
Saline	19,685
Riley	12,995
Montgomery	12,227
Lyon	11,846

In the 1980-1987 period, 76 of Missouri's 115 counties posted employment gains. The employment increase for the state was 194,531. According to County Business Patterns, the top ten Missouri counties, ranked by 1987 employment are:

Missouri County	Employment - 1987
St. Louis	465,813
Jackson	327,001
Greene	89,234
Clay	54,619
St. Charles	53,426
Jasper	37,393
Boone	36,908
Buchanan	30,149
Cape Girardeau	27,193
Jefferson	24,008

Employment in Nebraska increased 21,276 between 1980 and 1987. Douglas and Lancaster counties posted employment gains of 18,202 and 10,261 during the same period. The gains in these counties were partially offset by employment decreases in 61 of Nebraska's 93 counties. The top ten Nebraska counties in terms of 1987 employment are:

Nebraska County	Employment - 1987
Douglas	213,396
Lancaster	81,788
Hall	19,429
Sarpy	14,018
Madison	12,354
Buffalo	11,666
Scotts Bluff	10,653
Adams	10,639
Dodge	10,362
Platte	10,063

Employment by Industry. Table 13 contains United States non-agricultural employment by major industry division. Between 1970 and 1987, the percent of total U.S. employment in the manufacturing sector fell from 27.4% to 18.5%. Other U.S. sectors experiencing declines in percent of total employment include mining, construction, transportation and public utilities, and government.

Table 13. United States Employment by Major Industry Division, 1970-1987

(millions)

	1970	Percent	1975	Percent	1980	Percent	1987	Percent
Total Non-Agricultural	70.8		76.9		90.3		102.5	
Mining	0.6	0.8	0.8	1.0	1.0	1.1	0.7	0.7
Construction	3.6	5.1	3.5	4.6	4.3	4.8	5.0	4.9
Manufacturing	19.4	27.4	18.3	23.8	20.3	22.5	19.0	18.5
Durable Goods	11.2	15.4	10.7	13.9	12.2	13.5	11.2	10.9
Non-Durable Goods	8.2	11.6	7.6	9.9	8.1	9.0	7.8	7.6
Transportation & Public Utilities	4.5	6.4	4.5	5.9	5.1	5.6	5.4	5.3
Wholesale Trade	4.0	5.6	4.4	5.7	5.3	5.9	5.8	5.7
Retail Trade	11.0	15.5	12.6	16.4	15.0	16.6	18.5	18.0
Finance, Insurance, & Real Estate	3.6	5.1	4.2	5.5	5.2	5.8	6.5	6.3
Services	11.5	16.2	13.9	18.1	17.9	19.8	24.2	23.6
Government	12.6	17.8	14.7	19.1	16.2	17.9	17.4	17.0

Source: (1970, 1975, 1980) U.S. Bureau of Labor Statistics, Employment, Hours, and Earnings United States, 1909-84.

(1987) U.S. Bureau of Labor Statistics, Supplement to Employment and Earnings, August, 1989.

Sectors posting relative employment increases are Wholesale Trade; Retail Trade; Finance, Insurance, & Real Estate; and Services.

In general, the U.S. has shifted from a goods producing to a service producing economy.

The same relative shifts in employment among industry sectors occurred in the four-state study area with a few exceptions (see Table 14). Wholesale Trade in Missouri and Nebraska fell slightly as a percent of total employment. The construction industry in Missouri experienced a relative gain (see Tables 17 and 18).

Table 15 displays Iowa non-agricultural employment by two digit SIC number. Industry specialization in Iowa reflects the shift to a service producing economy. The largest private industry employers in Iowa (with their SIC code in parentheses) are:

Iowa Industry	Percent of 1987 Iowa Employment
Medical and Other Health Services (80)	7.7%
Eating and Drinking Places (58)	6.2%
Non-Electrical Machinery (35)	3.7%
Food and Kindred Products (20)	3.6%
Food Stores (54)	3.3%
Miscellaneous Business Services (73)	3.1%

The employment composition of the Kansas economy is listed in Table 16. An inspection of the table reveals that the principal private industry employers in Kansas are similar to those in Iowa are as follows:

Kansas Industry	Percent of 1987 Kansas Employment
Medical and Other Health Services (80)	7.0%
Eating and Drinking Places (58)	6.0%
Transportation Equipment (37)	5.2%
Miscellaneous Business Services (73)	3.2%
Food and Kindred Products (20)	2.5%

Table 14. Four State Region Employment by Major Industry Division, 1970-1987

(Thousands)

	1970	Percent	1975	Percent	1980	Percent	1987	Percent
Total Non-Agricultural	3708.3		4098.5		4651.9		4951.6	
Mining	24.4	0.7	23.7	0.6	27.8	0.6	20.9	0.4
Construction	170.0	4.6	186.2	4.5	208.6	4.5	202.9	4.1
Manufacturing	887.1	23.9	885.3	21.6	968.7	20.8	897.1	18.1
Durable Goods	493.0*	13.3	509.4	12.4	567.8	12.2	507.5	10.2
Non-Durable Goods	394.1*	10.6	375.9	9.2	400.9	8.6	389.6	7.9
Transportation & Public Utilities	266.3	7.2	270.8	6.6	306.8	6.6	299.7	6.1
Wholesale Trade	251.4	6.8	278.2	6.8	327.6	7.0	323.4	6.5
Retail Trade	616.8	16.6	722.0	17.6	805.0	17.3	917.9	18.5
Finance, Insurance & Real Estate	190.4	5.1	215.3	5.3	255.6	5.5	303.3	6.1
Services	583.8	15.7	715.6	17.5	887.0	19.1	1099.8	22.2
Government	718.1	19.4	801.4	19.6	864.8	18.6	886.6	17.9

* estimated

Table 15. Iowa Employment by Industry, 1970-1987

	1970	Percent	1975	Percent	1980	Percent	1987	Percent
Total Non-Agricultural Employment	861714		974047		1121773		1090448	
Agricultural Services, Forestry, Fisheries	3449	0.4	2094	0.3	3697	0.3	4868	0.4
Mining	2717	0.3	2756	0.3	2496	0.2	2254	0.2
Oil & Gas Extraction (13)	408	0.0	400	0.0	52	0.0	50	0.0
Non-Metallic Minerals (14)	2302	0.3	1897	0.2	2084	0.2	1697	0.2
Contract Construction	33452	3.9	37057	3.8	46060	4.1	33405	3.1
General Building Contractors (15)	11098	1.3	11990	1.2	15515	1.4	9400	0.9
Heavy Construction Contractors (16)	5243	0.6	5138	0.5	5981	0.5	4514	0.4
Special Trade Contractors (17)	16797	1.9	19929	2.0	24564	2.2	19491	1.8
Manufacturing	214029	24.8	233355	24.0	257944	23.0	204099	18.7
Food & Kindred Products (20)	49949	5.8	45639	4.7	46035	4.1	39257	3.6
Apparel & Textile Products (22-23)	4296	0.5	3800	0.4	5678	0.5	4721	0.4
Lumber & Wood Products (24)	3678	0.4	4910	0.5	5034	0.4	5449	0.5
Furniture & Fixtures (25)	3901	0.5	3281	0.3	3977	0.4	3609	0.3
Paper & Allied Products (26)	4159	0.5	4236	0.4	5100	0.5	5043	0.5
Printing & Publishing (27)	13836	1.6	15314	1.6	18080	1.6	19715	1.8
Chemicals & Allied Products (28)	5961	0.7	5082	0.5	6171	0.6	4680	0.4
Petroleum & Coal Products (29)	206	0.0	203	0.0	175	0.0	162	0.0
Rubber & Plastics (30)	7245	0.8	9735	1.0	11763	1.0	10082	0.9
Leather & Leather Products (31)	623	0.1	693	0.1	750	0.1	753	0.1
Stone, Clay, & Glass Products (32)	5880	0.7	6081	0.6	5981	0.5	4471	0.4
Primary Metal Products (33)	8420	1.0	8194	0.8	9448	0.8	6815	0.6
Fabricated Metal Products (34)	13258	1.5	19508	2.0	21142	1.9	17457	1.6
Machinery, Except Electrical (35)	46960	5.4	62348	6.4	72902	6.5	40264	3.7
Electrical Equipment (36)	21894	2.5	23706	2.4	26803	2.4	22559	2.1
Transportation Equipment (37)	6943	0.8	7548	0.8	6568	0.6	8694	0.8
Instruments (38)	2721	0.3	2136	0.2	2866	0.3	1789	0.2
Miscellaneous Manufacturing (39)	5618	0.7	6482	0.7	6240	0.6	5172	0.5
Transportation & Public Utilities	50632	5.9	56462	5.8	56334	5.0	50804	4.7
Railroad Transportation (40)	11327	1.3	9000	0.9	8000	0.7	4500	0.4
Local & Interurban Passenger Transit (41)	2310	0.3	1817	0.2	1577	0.1	2394	0.2
Trucking & Warehousing (42)	14416	1.7	17041	1.7	19470	1.7	19202	1.8
Transportation by Air (45)	671	0.1	689	0.1	906	0.1	792	0.1
Pipeline Transportation (46)	167	0.0	156	0.0	170	0.0	159	0.0
Transportation Services (47)	625	0.1	633	0.1	1108	0.1	1475	0.1
Communication (48)	11932	1.4	13396	1.4	14051	1.3	10200	0.9
Electric, Gas, & Sanitary Services (49)	8690	1.0	8542	0.9	9472	0.8	10074	0.9
Wholesale Trade	49656	5.8	69317	7.1	77382	6.9	69058	6.3

35

Table 15. Iowa Employment by Industry, 1970-1987 (Continued)

	1970	Percent	1975	Percent	1980	Percent	1987	Percent
Retail Trade	161832	18.8	174749	17.9	204607	18.2	206285	18.9
Building Materials & Farm Equipment (52)	13705	1.6	8432	0.9	10408	0.9	7954	0.7
General Merchandise (53)	25571	3.0	27345	2.8	26237	2.3	23442	2.1
Food Stores (54)	23446	2.7	25676	2.6	30482	2.7	35943	3.3
Automotive Dealers & Service Stations (55)	26045	3.0	27656	2.8	27534	2.5	24920	2.3
Apparel & Accessory Stores (56)	8893	1.0	10337	1.1	12496	1.1	11399	1.0
Furniture Stores (57)	6045	0.7	6743	0.7	7711	0.7	6763	0.6
Eating & Drinking Places (58)	34650	4.0	46829	4.8	63679	5.7	67988	6.2
Miscellaneous Retail Stores (59)	19752	2.3	18440	1.9	21839	1.9	22727	2.1
Finance, Insurance, & Real Estate	43194	5.0	49491	5.1	62791	5.6	69646	6.4
Banking (60)	12946	1.5	15758	1.6	18245	1.6	18586	1.7
Credit Agencies (61)	4360	0.5	5233	0.5	7207	0.6	8790	0.8
Security & Commodity Brokers (62)	1183	0.1	1110	0.1	1188	0.1	1891	0.2
Insurance Carriers (63)	12802	1.5	15542	1.6	19485	1.7	22490	2.1
Insurance Agents, Brokers & Service (64)	3206	0.4	4417	0.5	5329	0.5	7313	0.7
Real Estate (65)	5455	0.6	6038	0.6	8325	0.7	7254	0.7
Combined Real Estate, Insurance, Etc. (66)	718	0.1	662	0.1	807	0.1	542	0.0
Holding & Other Investment Offices (67)	318	0.0	155	0.0	1392	0.1	1883	0.2
Services	121861	14.1	150168	15.4	196529	17.5	237235	21.8
Hotels & Other Lodging Places (70)	9759	1.1	10047	1.0	11476	1.0	10395	1.0
Personal Services (72)	11134	1.3	10302	1.1	10962	1.0	12654	1.2
Miscellaneous Business Services (73)	11598	1.3	14089	1.4	19702	1.8	33642	3.1
Auto Repair, Services & Garages (75)	4290	0.5	4567	0.5	6280	0.6	7221	0.7
Miscellaneous Repair Services (76)	1872	0.2	2265	0.2	2868	0.3	2814	0.3
Motion Pictures (78)	2139	0.2	2094	0.2	1998	0.2	1525	0.1
Amusement & Recreation Services (79)	4501	0.5	6046	0.6	7460	0.7	8288	0.8
Medical & Other Health Services (80)	43461	5.0	57947	5.9	77509	6.9	83955	7.7
Legal Services (81)	2749	0.3	3615	0.4	5049	0.5	6325	0.6
Education Services (82)	10584	1.2	11073	1.1	13636	1.2	19630	1.8
Social Services (83)	-	-	7824	0.8	14665	1.3	20097	1.8
Museums, Botanical, Zoological Gardens (84)	-	-	91	0.0	222	0.0	143	0.0
Non Profit Organizations (86)	15343	1.8	14809	1.5	17176	1.5	21059	1.9
Miscellaneous Services (89)	4135	0.5	5035	0.5	6813	0.6	8039	0.7
Local Government	113000	13.1	124900	12.8	133200	11.9	131000	12.0
State Government	41300	4.8	47200	4.8	52800	4.1	59100	5.4
Federal Government	21200	2.5	19800	2.0	21400	1.9	21200	1.9
Unclassified	5394	0.6	6098	0.6	6533	0.6	1534	0.1

Numbers in parentheses are SIC codes.

Source: All data other than Railroad Transportation (40) and Government obtained from U. S. Department of Commerce, County Business Patterns.

Railroad Transportation and Government obtained from Bureau of Labor Statistics. Employment, Hours, and Earnings, States and Areas, 1977-87.

Table 16. Kansas Employment by Industry, 1970-1987

	1970	Percent	1975	Percent	1980	Percent	1987	Percent
Total Non-Agricultural Employment	682283		778763		964126		1018000	
Agricultural Services, Forestry, Fisheries	2546	0.4	1470	0.2	2210	0.2	3805	0.4
Mining	10206	1.5	11690	1.5	17443	1.8	12651	1.2
Oil and Gas Extraction (13)	8422	1.2	9115	1.2	13359	1.4	9517	1.0
Non Metallic Minerals (14)	1277	1.9	1472*	0.2	1668	0.2	1184	0.1
Contract Construction	31792	4.7	34397	4.4	48191	5.0	43778	4.3
General Building Contractors(15)	10334	1.5	9985	1.3	13461	1.4	10614	1.0
Heavy Construction Contractors (16)	7457	1.1	7692	1.0	11587	1.2	7654	0.8
Special Trade Contractors (17)	13850	2.0	16720	2.1	23086	2.4	25426	2.5
Manufacturing	142029	20.8	163672	21.0	207202	21.5	185590	18.5
Food and Kindred Products (20)	18024	2.6	21656	2.8	22773	2.4	25101	2.5
Apparel and Textile Products (22-23)	4090	0.6	4331	0.6	4553	0.5	3699	0.4
Lumber and Wood Products (24)	1368	0.2	2692	0.3	3704	0.4	2924	0.3
Furniture and Fixtures (25)	1772	0.3	1966	0.3	2421	0.3	2163	0.2
Paper and Allied Products (26)	3239	0.5	3156	0.4	4462	0.5	4950	0.5
Printing and Publishing (27)	12307	1.8	14511	1.9	16889	1.8	19040	1.9
Chemicals and Allied Products (28)	8902	1.3	5925	0.8	8408	0.9	8347	0.8
Petroleum and Coal Products (29)	3571	0.5	3537	0.5	4181	0.4	2785	0.3
Rubber and Plastics (30)	5656	0.8	6921	0.9	8655	0.9	8229	0.8
Leather and Leather Products (31)	191	0.0	150	0.0	200	0.0	175	0.0
Stone, Clay, and Glass Products (32)	6728	1.0	6328	0.8	7583	0.8	6079	0.6
Primary Metal Products (33)	3335	0.5	4202	0.5	4426	0.5	2390	0.2
Fabricated Metal Products (34)	8048	1.2	9178	1.2	10704	1.1	8190	0.8
Machinery, Except Electrical (35)	15955	2.3	26604	3.4	32190	3.3	22218	2.2
Electrical Equipment (36)	3490	0.5	5619	0.7	10277	1.1	9783	1.0
Transportation Equipment (37)	35513	5.2	38253	4.9	54425	5.6	52889	5.2
Instruments (38)	1151	0.2	2717	0.3	3261	0.3	2336	0.2
Miscellaneous Manufacturing (39)	1313	0.2	1683	0.2	1931	0.2	1560	0.2
Transportation and Public Utilities	51518	7.6	49983	6.4	64959	6.7	63599	6.2
Railroad Transportation (40)	16348	2.4	14800	1.9	13400	1.4	9200	0.9
Local and Interurban Passenger Transit (41)	1913	0.3	1610	0.2	2273	0.2	2753	0.3
Trucking and Warehousing (42)	10993	1.6	12206	1.6	19174	2.0	18527	1.8
Transportation by Air (45)	1143	0.2	1003	0.1	1998	0.2	3605	0.4
Pipeline Transportation (46)	892	0.1	652	0.1	830	0.1	805	0.1
Transportation Services (47)	479	0.1	719	0.1	1451	0.2	2138	0.2
Communication (48)	9523	1.4	10726	1.4	15392	1.6	13823	1.4
Electric, Gas, and Sanitary Services (49)	9080	1.3	7154	0.9	8738	0.9	10619	1.0
Wholesale Trade	39770	5.8	51671	6.6	60059	6.2	61081	6.0

Table 16. Kansas Employment by Industry, 1970-1987 (Continued)

	1970	Percent	1975	Percent	1980	Percent	1987	Percent
Retail Trade	122215	17.9	135561	17.4	164479	17.1	182430	17.9
Building Materials and Farm Equipment (52)	8035	1.2	5764	0.7	6911	0.7	7229	0.7
General Merchandise (53)	18205	2.7	19815	2.5	19851	2.1	18965	1.9
Food Stores (54)	17444	2.6	19139	2.5	21346	2.2	26593	2.6
Automotive Dealers and Service Stations (55)	22724	3.3	21382	2.8	21448	2.2	21075	2.1
Apparel and Accessory Stores (56)	7558	1.1	8833	1.1	10522	1.1	10021	1.0
Furniture Stores (57)	4396	0.6	5334	0.7	6384	0.7	6567	0.6
Eating and Drinking Places (58)	26790	3.9	35266	4.5	50321	5.2	60577	6.0
Miscellaneous Retail Stores (59)	14257	2.1	15737	2.0	20898	2.2	23372	2.3
Finance, Insurance, and Real Estate	30193	4.4	39125	5.0	49606	5.1	60752	6.0
Banking (60)	10080	1.5	12673	1.6	15428	1.6	16205	1.6
Credit Agencies (61)	3925	0.6	4813	0.6	6068	0.6	8736	0.9
Security and Commodity Brokers (62)	731	0.1	539	0.1	763	0.1	1437	0.1
Insurance Carriers (63)	8104	1.2	8969	1.2	11450	1.2	10093	1.0
Insurance Agents, Brokers, and Service (64)	2486	0.4	2886	0.4	4666	0.5	9114	0.9
Real Estate (65)	3844	0.6	6406	0.8	7871	0.8	10763	1.1
Combined Real Estate, Insurance, Etc. (66)	620	0.1	624	0.1	643	0.1	457	0.0
Holding and Other Investment Offices (67)							2570	0.3
Services	93602	13.7	117305	15.1	156245	16.2	201889	19.8
Hotels and Other Lodging Places (70)	9235	1.4	7559	1.0	7871	0.8	9176	1.0
Personal Services (72)	10150	1.5	9062	1.2	9816	1.0	12424	1.2
Miscellaneous Business Services (73)	7106	1.0	11551	1.5	16715	1.7	32480	3.2
Auto Repair, Services & Garages (75)	3147	0.5	4427	0.6	5186	0.5	6767	0.7
Miscellaneous Repair Services (76)	1778	0.3	2162	0.3	2917	0.3	3094	0.3
Motion Pictures (78)	1611	0.2	1505	0.2	1615	0.2	1247	0.1
Amusement and Recreation Services (79)	4097	0.6	4640	0.6	5762	0.6	5944	0.6
Medical & Other Health Services (80)	34158	5.0	46211	5.9	64666	6.7	71608	7.0
Legal Services (81)	2034	0.3	2752	0.4	3985	0.4	5534	0.5
Education Services (82)	5331	0.8	6197	0.8	6969	0.7	9124	0.9
Social Services (83)			6047	0.8	8980	0.9	13675	1.3
Museums, Botanical, Zoological Gardens (84)			64	0.0	74	0.0	258	0.0
Non Profit Organizations (86)	10643	1.6	10676	1.4	13868	1.4	19305	1.9
Miscellaneous Services (89)	4172	0.6	4293	0.6	7116	0.7	9208	0.9
State Government and Local Government	128400	18.8	143000	18.4	160700	16.7	170500	16.7
Federal Government	25900	3.8	25700	3.3	26700	2.8	27300	2.7
Unclassified	4112	0.6	5189	0.7	6332	0.7	1625	0.2

*interpolated
Numbers in parentheses are SIC codes.
Source: All data other than Railroad Transportation (40) and Government obtained from U.S. Department of Commerce, County Business Patterns.
Railroad Transportation and Government obtained from Bureau of Labor Statistics. Employment, Hours, and Earnings, States and Areas, 1972-87.

Table 17. Missouri Employment by Industry, 1970-1987

	1970	Percent	1975	Percent	1980	Percent	1987	Percent
Total Non-Agricultural Employment	1697301		1725357		2000010		2214941	
Agricultural Services, Forestry, Fisheries	3589	0.2	3142	0.2	4944	0.2	7359	0.3
Mining	10033	0.6	9626	0.6	8338	0.4	5639	0.3
Metal Mining (10)	4252	0.3	3135	0.2	2402	0.1	828	0.0
Bituminous Coal Mining (12)	511	0.0	750	0.0	1204	0.0	1240	0.1
Oil and Gas Extraction (13)	1237	0.1	375	0.0	157	0.0	190	0.0
Non-Metallic Minerals (14)	3831	0.2	3067	0.2	3090	0.2	2783	0.1
Contract Construction	70767	4.2	64906	3.8	86364	4.3	103358	4.7
General Building Contractors (15)	21017	1.2	18982	1.1	27513	1.4	30079	1.4
Heavy Construction Contractors (16)	11575	0.7	10438	0.6	10106	0.5	9115	0.4
Special Trade Contractors (17)	37359	2.2	35486	2.1	48745	2.4	64164	2.9
Manufacturing	458606	27.0	401685	23.3	458360	22.9	417269	18.8
Food and Kindred Products (20)	44920	2.6	40825	2.4	39940	2.0	36142	1.6
Textile Products (22)	2222	0.1	750	0.0	370	0.0	700	0.0
Apparel Products (23)	32699	1.9	28015	1.6	28747	1.4	21053	1.0
Lumber and Wood Products (24)	7907	0.5	8532	0.5	10486	0.5	9770	0.4
Furniture and Fixtures (25)	6161	0.4	6007	0.3	8818	0.4	9354	0.4
Paper and Allied Products (26)	12445	0.7	11502	0.7	13374	0.7	12949	0.6
Printing and Publishing (27)	34968	2.1	33607	1.9	36167	1.8	38733	1.7
Chemicals and Allied Products (28)	21418	1.3	23530	1.4	23850	1.2	21038	0.9
Petroleum and Coal Products (29)	1849	0.1	1891	0.1	1920	0.1	1196	0.1
Rubber and Plastics (30)	10028	0.6	9855	0.6	13978	0.7	14463	0.7
Leather and Leather Products (31)	25463	1.5	20561	1.2	21418	1.1	13686	0.6
Stone, Clay, and Glass Products (32)	13228	0.8	11911	0.7	13603	0.7	11594	0.5
Primary Metal Products (33)	14925	0.9	16914	1.0	19397	1.0	12434	0.6
Fabricated Metal Products (34)	30884	1.8	32212	1.9	38526	1.9	37015	1.7
Non-Electrical Machinery (35)	31498	1.9	32455	1.9	36313	1.8	28124	1.3
Electrical Machinery (36)	36949	2.2	30544	1.8	42023	2.1	36846	1.7
Transportation Equipment (37)	75640	4.5	47791	2.8	65102	3.3	68984	3.1
Instruments (38)	5280	0.3	5682	0.3	5237	0.3	6281	0.3
Miscellaneous Manufacturing (39)	8382	0.5	7279	0.4	6586	0.3	6153	0.3
Transportation and Public Utilities	124812	9.0	121766	7.1	138452	7.0	146290	6.6
Railroad Transportation (40)	20350	1.2	17500	1.0	16300	0.8	9900	0.4
Local and Interurban Passenger Transit (41)	7714	0.5	7501	0.4	6270	0.3	8847	0.4
Trucking and Warehousing (42)	33259	2.0	30387	1.8	40653	2.0	41795	1.9
Water Transportation (44)	2119	0.1	3432	0.2	4791	0.2	3189	0.1
Transportation by Air (45)	13232	0.8	14008	0.8	16926	0.8	16793	0.8
Pipeline Transportation (46)	244	0.0	105	0.0	181	0.0	134	0.0
Transportation Services (47)	2645	0.2	2941	0.2	3958	0.2	6609	0.3
Communication (48)	24016	1.4	25044	1.5	29523	1.5	30934	1.4
Electric, Gas, and Sanitary Services (49)	17345	1.0	15908	0.9	16464	0.8	18096	0.8
Wholesale Trade	114408	6.7	118426	6.9	137641	6.9	130787	5.9

Table 17. Missouri Employment by Industry, 1970-1987 (Continued)

	1970	Percent	1975	Percent	1980	Percent	1987	Percent
Retail Trade	275382	16.2	287876	16.8	329517	16.5	391588	17.7
Building Materials and Farm Equipment (52)	13582	0.8	10385	0.6	12682	0.6	15644	0.7
General Merchandise (53)	53179	3.1	48874	2.8	44389	2.2	45283	2.0
Food Stores (54)	36422	2.1	37872	2.2	42610	2.1	54497	2.5
Automotive Dealers and Service Stations (55)	40157	2.4	38454	2.2	40819	2.0	46852	2.1
Apparel and Accessory Stores (56)	19343	1.1	17519	1.0	19781	1.0	20636	0.9
Furniture Stores (57)	9693	0.6	9761	0.6	11663	0.6	13068	0.6
Eating and Drinking Places (58)	57907	3.4	75236	4.4	101767	5.1	132463	6.0
Miscellaneous Retail Stores (59)	31294	1.8	36701	2.1	39970	2.0	44543	2.0
Finance, Insurance, & Real Estate	92426	5.4	96372	5.6	110376	5.5	137355	6.2
Banking (60)	24422	1.4	27446	1.6	33004	1.7	36909	1.7
Credit Agencies (61)	12790	0.8	10486	0.6	11122	0.6	14580	0.7
Security and Commodity Brokers (62)	4713	0.3	4450	0.3	4544	0.2	11896	0.5
Insurance Carriers (63)	24780	1.5	24119	1.4	25777	1.3	27928	1.3
Insurance Agents, Brokers & Service (64)	7162	0.4	9015	0.5	10393	0.5	13844	0.6
Real Estate (65)	15946	0.9	16100	0.9	19481	1.0	22712	1.0
Combined Real Estate, Insurance Etc. (66)	-	-	707	0.0	723	0.0	491	0.0
Holding & Other Investment Companies (67)	1351	0.1	2250	0.1	2718	0.1	5781	0.3
Services	254415	15.0	295391	17.2	396113	19.8	529665	23.9
Hotels & Other Lodging Places (70)	17711	1.0	17826	1.0	21404	1.1	26946	1.2
Personal Services (72)	24625	1.5	21852	1.3	22712	1.1	27987	1.3
Miscellaneous Business Services (73)	36332	2.1	44404	2.6	60889	3.0	90061	4.1
Auto Repair, Services & Garages (75)	9242	0.5	9308	0.5	12557	0.6	17444	0.8
Miscellaneous Repair Services (76)	4656	0.3	4972	0.3	5990	0.3	7067	0.3
Motion Pictures (78)	3932	0.2	3779	0.2	3199	0.2	3186	0.1
Amusement & Recreation Services (79)	8928	0.5	10774	0.6	13642	0.7	15017	0.7
Medical & Other Health Services (80)	74437	4.4	95263	5.5	128255	6.4	173627	7.8
Legal Services (81)	4065	0.2	5503	0.3	8096	0.4	13279	0.6
Education Services (82)	23738	1.4	23471	1.4	32343	1.6	38193	1.7
Social Services (83)	-	-	16399	1.0	29956	1.5	34403	1.6
Museums, Botanical, Zoological Gardens (84)	-	-	274	0.0	557	0.0	743	0.0
Non Profit Organizations (86)	32397	1.9	26167	1.5	32426	1.6	45671	2.1
Miscellaneous Services (89)	13329	0.8	13953	0.8	21160	1.1	28653	1.3
Local Government	150000	8.8	174900	10.2	182400	9.2	202800*	9.2
State Government	63800	3.8	72400	4.2	66500	3.3	67600*	3.1
Federal Government	69400	4.1	68700	4.0	69300	3.5	71600	3.2
Unclassified	9663	0.6	10167	0.6	11705	0.6	3631	0.2

* Estimated

Numbers in parentheses are SIC codes.

Source: All data except Railroad Transportation and Government obtained from U.S. Department of Commerce, County Business Patterns. Railroad Transportation and Government data obtained from U.S. Department of Labor, Bureau of Labor Statistics, Employment, Hours, and Earnings, States and Areas, 1972-1987.

Table 18. Nebraska Employment by Industry, 1970-1987

	1970	Percent	1975	Percent	1980	Percent	1987	Percent
Total Non-Agricultural Employment	478516		546672		639310		659486	
Agricultural Services, Forestry, Fisheries	1754	0.4	1314	0.2	1954	0.3	2795	0.4
Mining	1511	0.3	1459	0.3	2021	0.3	1861	0.3
Oil & Gas Extraction (13)	675	0.1	510	0.1	852	0.1	672	0.1
Non-Metallic Minerals (14)	737	0.2	781	0.1	859	0.1	709	0.1
Contract Construction	22899	4.8	24310	4.4	29905	4.7	24644	3.7
General Building Contractors (15)	7685	1.6	6929	1.3	9277	1.5	5548	0.8
Heavy Construction Contractors (16)	3774	0.8	4092	0.7	3643	0.6	2907	0.4
Special Trade Contractors (17)	11440	2.4	13289	2.4	16985	2.7	16189	2.5
Manufacturing	86284	18.0	87074	15.9	100836	15.8	88526	13.4
Food & Kindred Products (20)	24930	5.2	25216	4.6	24768	3.9	22159	3.4
Apparel & Textile Products (22-23)	2007	0.4	1997	0.4	2615	0.4	2752	0.4
Lumber & Wood Products (24)	893	0.2	1989	0.4	2378	0.4	1774	0.3
Furniture & Fixtures (25)	1659	0.3	1529	0.3	2189	0.3	1895	0.3
Paper & Allied Products (26)	1204	0.3	974	0.2	1324	0.2	1208	0.2
Printing & Publishing (27)	5841	1.2	6531	1.2	7544	1.2	9451	1.4
Chemicals & Allied Products (28)	2162	0.5	2375	0.4	2430	0.4	2384	0.4
Petroleum & Coal Products (29)	185	0.0	207	0.0	321	0.1	150	0.0
Rubber and Plastics (30)	2465	0.5	4056	0.7	4462	0.7	4626	0.7
Leather & Leather Products (31)	103	0.0	149	0.0	197	0.0	247	0.0
Stone, Clay, & Glass Products (32)	2178	0.5	2335	0.4	2749	0.4	2114	0.3
Primary Metal Products (33)	2534	0.5	2554	0.5	3227	0.5	1895	0.3
Fabricated Metal Products (34)	6071	1.3	6655	1.2	7444	1.2	6179	0.9
Machinery, Except Electrical (35)	8410	1.8	11757	2.2	15293	2.4	10340	1.6
Electrical Equipment (36)	10084	2.1	8753	1.6	9484	1.5	7265	1.1
Transportation Equipment (37)	4732	1.0	3389	0.6	5055	0.8	4887	0.7
Instruments (38)	3722	0.8	3231	0.6	3990	0.6	3870	0.6
Miscellaneous Manufacturing (39)	1758	0.4	1308	0.2	1781	0.3	1239	0.2
Transportation & Pub. Utilities	34922	7.3	36406	6.7	51061	8.0	40904	6.2
Railroad Transportation (40)	11268	2.4	11700	2.1	16400	2.6	10700	1.6
Local & Interurban Passenger Transit (41)	1654	0.3	1584	0.3	1600	0.3	1209	0.2
Trucking & Warehousing (42)	8161	1.7	8506	1.6	11552	1.8	13254	2.0
Transportation by Air (45)	763	0.2	598	0.1	743	0.1	832	0.1
Pipeline Transportation (46)	127	0.0	100	0.0	90	0.0	70	0.0
Transportation Services (47)	590	0.1	610	0.1	844	0.1	1349	0.2
Communication (48)	8628	1.8	11014	2.0	16132	2.5	10462	1.6
Electric, Gas, & Sanitary Services (49)	3453	0.7	1506	0.3	2117	0.3	1916	0.3
Wholesale Trade	31782	6.6	39602	7.2	47549	7.4	42303	6.4

Table 18. Nebraska Employment by Industry, 1970-1987 (Continued)

	1970	Percent	1975	Percent	1980	Percent	1987	Percent
Retail Trade	91173	19.1	101297	18.5	115765	18.1	122819	18.6
Building Materials & Farm Equipment (52)	7158	1.5	4347	0.8	5088	0.8	4565	0.7
General Merchandise (53)	15368	3.2	16436	3.0	14141	2.2	14550	2.2
Food Stores (54)	11749	2.5	14688	2.6	14670	2.3	18635	2.8
Automotive Dealers & Service Stations (55)	14432	3.0	14995	2.7	15291	2.4	13972	2.1
Apparel & Accessory Stores (56)	6041	1.3	6089	1.1	7319	1.1	6330	1.0
Furniture Stores (57)	3193	0.7	3634	0.7	3802	0.6	4030	0.6
Eating & Drinking Places (58)	21372	4.5	27314	5.0	37761	5.9	42141	6.4
Miscellaneous Retail Stores (59)	10188	2.1	10445	1.9	12438	1.9	14960	2.3
Finance, Insurance, & Real Estate	29046	6.1	33975	6.2	41669	6.5	51837	7.9
Banking (60)	7864	1.6	9184	1.7	10631	1.7	11621	1.8
Credit Agencies (61)	2404	0.5	3042	0.6	4416	0.7	5150	0.8
Security & Commodity Brokers (62)	757	0.2	684	0.1	.928	0.1	1438	0.2
Insurance Carriers (63)	11692	2.4	13812	2.5	15663	2.4	21567	3.3
Insurance Agents, Brokers & Service (64)	2020	0.4	2568	0.5	3604	0.6	4968	0.8
Real Estate (65)	3364	0.7	3596	0.7	4276	0.7	4824	0.7
Combined Real Estate, Insurance, Etc. (66)	506	0.1	472	0.1	572	0.1	298	0.0
Holding & Other Investment Offices (67)	-	-	414	0.1	1050	0.2	1192	0.2
Services	74713	15.6	93382	17.1	113832	17.8	147139	22.3
Hotels & Other Lodging Places (70)	7393	1.5	6181	1.1	6797	1.1	6515	1.0
Personal Services (72)	6524	1.4	6251	1.1	6326	1.0	7377	1.1
Miscellaneous Business Services (73)	9086	1.9	12298	2.2	16191	2.5	29064	4.4
Auto Repair Services & Garages (75)	2645	0.6	2916	0.5	4248	0.7	4991	0.8
Miscellaneous Repair Services (76)	1153	0.2	1463	0.3	2053	0.3	1997	0.3
Motion Pictures (78)	1140	0.2	1109	0.2	1032	0.2	735	0.1
Amusement & Recreation Services (79)	3220	0.7	4203	0.8	4624	0.7	5348	0.8
Medical & Other Health Services (80)	25042	5.2	31800	5.8	41246	6.5	49389	7.5
Legal Services (81)	1387	0.3	2024	0.4	2957	0.5	3753	0.6
Education Services (82)	5437	1.1	5476	1.0	6775	1.1	9059	1.4
Social Services (83)	-	-	6870	1.3	6249	1.0	8354	1.3
Museums, Botanical, Zoological Gardens (84)	120	0.0	90	0.0	125	0.0	157	0.0
Non Profit Organizations (86)	8196	1.7	7927	1.5	9455	1.5	12961	2.0
Miscellaneous Services (89)	3194	0.7	4002	0.7	4992	0.8	6015	0.9
Local Government	63300	13.2	78000	14.3	81500	12.7	83200	12.6
State Government	24015	5.0	29600	5.4	32800	5.1	34300	5.2
Federal Government	13875	2.9	17100	3.1	16600	2.6	18000	2.7
Unclassified	3242	0.7	3153	0.6	3818	0.6	1158	0.2

Numbers in parentheses are SIC codes.

Source: All data other than Railroad Transportation (40) and Government obtained from U. S. Department of Commerce, County Business Patterns.

Railroad Transportation and Government obtained from Bureau of Labor Statistics. Employment, Hours, and Earnings, States and Areas, 1972-87.

42

Table 17 contains Missouri non-agricultural employment by industry. In 1987 the major private industry employers were as follows:

Missouri Industry	Percent of 1987 Missouri Employment
Medical and Other Health Services (80)	7.8%
Eating and Drinking Places (58)	6.0%
Miscellaneous Business Services (73)	4.1%
Transportation Equipment (37)	3.1%

The employment composition of the Nebraska economy is displayed in Table 18. Principal private industry employers in Nebraska are:

Nebraska Industry	Percent of 1987 Nebraska Employment
Medical and Other Health Services (80)	7.5%
Eating and Drinking Places (58)	6.4%
Miscellaneous Business Services (73)	4.4%
Food and Kindred Products (20)	3.4%
Insurance Carriers (63)	3.3%

Table 19 contains 1970-1987 employment in selected tourism industries of the four-state region. During this period, Kansas employment in the Gasoline Service Stations (554) and Hotels and Other Lodging Places (70) industries declined by 18.9% and 0.6% respectively. In contrast, Kansas employment in Eating and Drinking Places (58) and Automotive Repair Shops (753) increased by 126.1% and 109.9% during the same period.

In Iowa, tourism industries suffering employment losses during the 1970-1987 interval include: (1) General Merchandise Stores (53) at -8.3%; and (2) Gasoline Service Stations (554) at -13.9%. During the same period, Iowa employment in Eating and Drinking Places (58) and Automotive Repair Shops (753) leaped by 96.2% and 70% respectively.

The structure of tourism employment change in Missouri was similar to Iowa. Employment declined in General Merchandise Stores (53) and Gasoline Service Stations (554) and soared in Eating and Drinking Places (58) and Automotive Repair Shops (753).

Table 19. Tourism Industries Employment, 1970-1987

Kansas Employment-Tourism Industries

	1970	1975	1980	1987	Percent Change
General Merchandise Stores (53)	18205	19815	19851	18965	4.2
Grocery Stores (541)	15998	17303	19089	24046	50.3
Gasoline Service Stations (554)	9062	8233	7333	7353	-18.9
Eating & Drinking Places (58)	26790	35266	50321	60577	126.1
Hotels & Other Lodging Places (70)	9235	7559	7871	9176	-0.6
Automotive Repair Shops (753)	2324	2702	3763	4878	109.9

Iowa Employment-Tourism Industries

	1970	1975	1980	1987	Percent Change
General Merchandise Stores (53)	25571	27345	26237	23442	-8.3
Grocery Stores (541)	21213	24285*	27318	32161	51.6
Gasoline Service Stations (554)	11554	12324	10840	9947	-13.9
Eating & Drinking Places (58)	34650	46829	63679	67988	96.2
Hotels & Other Lodging Places (70)	9739	10047	11476	10395	6.7
Automotive Repair Shops (753)	2920	3218	4125	4965	70.0

Missouri Employment-Tourism Industries

	1970	1975	1980	1987	Percent Change
General Merchandise Stores (53)	53179	48874	44389	45283	-14.8
Grocery Stores (541)	32152	32973	37030	48702	51.5
Gasoline Service Stations (554)	18352	16885	16154	18099	-1.4
Eating & Drinking Places (58)	57907	75236	101767	132463	128.8
Hotels & Other Lodging Places (70)	17711	17826	21404	26946	52.1
Automotive Repair Shops (753)	5198	6645*	8093	11045	112.5

Nebraska Employment-Tourism Industries

	1970	1975	1980	1987	Percent Change
General Merchandise Stores (53)	15368	16436	14141	14550	-5.3
Grocery Stores (541)	10188	12756**	12721**	16030	57.3
Gasoline Service Stations (554)	6717	6823	6004	5745	-14.5
Eating & Drinking Places (58)	21372	27314	37761	42141	97.2
Hotels & Other Lodging Places (70)	7393	6181	6797	6515	-11.9
Automotive Repair Shops (753)	1840	1973	2952	3532	92.0

*interpolated

**estimated

Source: U. S. Department of Commerce, County Business Patterns.

Nebraska tourism industries with large employment gains include: (1) Eating and Drinking Places (58) at 97.2%; and (2) Automotive Repair Shops (753) at 92.0%. In contrast, employment declined in General Merchandise Stores (53), Gasoline Service Stations (554), and Hotels and Other Lodging Places (70).

Employment Summary. Of the four states in the study area, only Kansas achieved a rate of employment growth above that of the U.S. as a whole. The 1970-1988 employment growth rates for each of the four states and the U.S. are as follows:

United States	49.2%
Kansas	52.2%
Nebraska	42.1%
Missouri	34.1%
Iowa	31.8%

The top and bottom three MSAs as measured by employment growth during the 1970-1988 interval are:

Top Three MSAs

Springfield, Missouri	87.5%
Wichita, Kansas	67.6%
Lincoln, Nebraska	63.0%

Bottom Three MSAs

St. Joseph, Missouri	6.9%
Sioux City, Iowa	21.7%
Dubuque, Iowa	24.9%

Between 1980 and 1987, employment of each of the four states became more concentrated in a small number of counties. This is demonstrated by the following data:

State	Number of Counties that Lost Employment, 1980-1987	Number of Counties that Gained Employment, 1980-1987
Iowa	69	30
Kansas	73	32
Missouri	39	76
Nebraska	61	32

As the data indicate, only Missouri had more county employment gains than losses.

The transition of the U.S. from a goods producing to a service producing economy is reflected in the industry employment statistics of the four states. The share of total employment

attributable to mining and manufacturing has declined while that of the trade and service sectors has increased.

In the manufacturing sector, the four-state region specializes in the following industries: (1) Farm Machinery (3523); (2) Food and Kindred Products (20); (3) Airplane Manufacturing (3721); and (4) Automobile Manufacturing (37111). (The numbers in parentheses are SIC codes.)

In the retail trade and service sectors, the following are large employers in the four-state region: (1) Medical and Other Health Services (80); (2) Eating and Drinking Places (58); (3) Miscellaneous Business Services (73); and (4) Insurance (63).

Employment in selected tourism industries of the four-state region displayed differential employment growth in the 1970-1987 period. Large employment gains occurred in Eating and Drinking Places (58) and Automotive Repair Shops (753). In contrast, employment fell in General Merchandise Stores (53) and Gasoline Service Stations (554).

While employment growth in the study region has been less than the national rate, regional employment gains have been relatively strong. The employment increases should contribute to increased use of scenic byways.

The impact of concentrated employment growth in a few urbanized counties depends on the location of scenic byways relative to these employment centers. The greater the proximity of employment growth to scenic byways, the greater the demand for them. However if a scenic byway is located in an area of low employment density, it doesn't necessarily imply low use. For example, if the counties that are contiguous to the scenic road have large numbers of retirees, demand for the road may be relatively high.

The shift from a goods producing to a service producing economy may affect scenic byway use through shifts in relative wages. For example, the manufacturing industry is characterized by relatively large, high wage firms. In contrast, the retail trade and service sectors are composed mainly of small, low wage firms. However the impact of industry employment shifts is an empirical question.

PERSONAL INCOME

State Personal Income. Table 20 contains personal income in current dollars for the four-state study area and the United States. The table indicates that U.S. personal income rose 391% between 1970 and 1988, reaching $4 trillion in 1988. All of the four states had a lower growth rate of personal income than the U.S. as a whole. This is partly due to somewhat lower per capita income and slower population growth in the four-state region. Of the four states, Kansas had the highest growth rate (362.4%) of personal income, followed by Missouri (346.1%), Nebraska (323.2%), and Iowa (285.2%). Since personal income is heavily influenced by population size, Missouri personal income is about twice as large as that of Iowa and Kansas and more than three times greater than Nebraska. In 1988, the four states accounted for 4.5% of U.S. personal income.

Table 21 displays per capita personal income in current dollars for the four-state region and the U.S. Between 1970 and 1988, U.S. per capita personal income rose 307%, reaching $16,489 in 1988. Kansas was the only one of the four states that posted a higher growth rate (318.0%) than the U.S. The growth rate (305.7%) of Missouri per capita personal income was about the same as the U.S. rate. The growth rates for Nebraska (293.0%) and Iowa (285.4%) were considerably less than the national growth rate.

Per capita personal income in 1988 for each of the four states was:

Kansas	$15,759
Missouri	15,452
Nebraska	14,774
Iowa	14,662

In 1988, per capita income in each of the four states was less than that of the U.S. ($16,489).

When deflated by the Consumer Price Index (CPI) the 1970-1988 growth rates of per capita personal income for each of the four states are:

Kansas	37.1%
Missouri	33.1
Nebraska	28.9
Iowa	26.4

Table 20. State and U.S. Personal Income, 1970-1988

(Billions of Current Dollars)

Year	Iowa	Kansas	Missouri	Nebraska	United States
1970	$ 10.8	$ 8.5	$ .17.8	$ 5.6	$ 825.5
1971	11.3	9.2	19.2	6.1	888.5
1972	12.6	10.3	20.9	6.8	976.2
1973	15.3	11.9	23.5	8.0	1,095.3
1974	15.9	12.8	25.1	8.3	1,204.9
1975	17.6	13.9	27.3	9.4	1,308.5
1976	18.8	15.3	30.1	9.9	1,447.0
1977	20.9	16.8	33.6	10.8	1,602.9
1978	21.2	19.0	37.7	12.4	1,807.0
1979	26.5	21.8	42.1	13.9	2,028.5
1980	27.8	23.5	45.8	14.6	2,254.1
1981	31.5	26.8	50.9	16.8	2,514.2
1982	31.6	28.5	53.7	17.6	2,663.4
1983	31.8	29.5	57.1	18.0	2,834.4
1984	34.8	31.8	62.5	19.8	3,101.2
1985	36.2	33.8	66.7	20.8	3,317.5
1986	37.7	35.6	70.5	21.6	3,519.2
1987	39.6	37.3	74.7	22.5	3,766.1
1988	41.6	39.3	79.4	23.7	4,053.0
Percent Change 1970-1988	285.2%	362.4%	346.1%	323.2%	391.0%

Source: U.S. Department of Commerce, Survey of Current Business, August issues.

Table 21. State and U.S. Per Capita Income, 1970-1988

(Current Dollars)

Year	Iowa	Kansas	Missouri	Nebraska	United States
1970	$ 3,804	$ 3,770	$ 3,809	$ 3,759	$ 4,051
1971	3,951	4,090	4,074	4,073	4,296
1972	4,394	4,565	4,402	4,467	4,665
1973	5,349	5,238	4,915	5,230	5,182
1974	5,540	5,642	5,250	5,405	5,648
1975	6,097	6,095	5,687	6,075	6,073
1976	6,437	6,639	6,247	6,371	6,651
1977	7,188	7,226	6,927	6,954	7,294
1978	8,289	8,163	7,732	7,957	8,136
1979	9,091	9,290	8,615	8,853	9,033
1980	9,538	9,941	9,296	9,272	9,919
1981	10,795	11,207	10,303	10,641	10,949
1982	10,857	11,811	10,868	11,055	11,480
1983	10,965	12,137	11,500	11,267	12,098
1984	12,016	13,022	12,494	12,324	13,114
1985	12,606	13,813	13,250	12,967	13,896
1986	13,288	14,476	13,914	13,509	14,596
1987	14,028	15,089	14,630	14,100	15,472
1988	14,662	15,759	15,452	14,774	16,489
Percent Change 1970-1988	285.4%	318.0%	305.7%	293.0%	307.0%

Source: U.S. Department of Commerce, Survey of Current Business, August issues.

County Personal Income.   Since personal income is determined primarily by population, it follows that the largest counties will also have the greatest personal income. In Iowa the top ten counties in 1987 in terms of personal income are:

Iowa County	Personal Income - 1987 (Millions of Dollars)	Per Capita Personal Income - 1987
Polk	$5314.2	$16,644
Linn	2616.5	15,429
Scott	2407.7	15,424
Black Hawk	1675.8	13,323
Woodbury	1396.5	14,298
Johnson	1351.5	15,747
Dubuque	1176.6	12,966
Pottawattamie	1159.3	13,129
Story	968.0	13,486
Clinton	695.9	13,163

The above ten counties account for 46.5% of 1988 Iowa personal income.

For Kansas the top ten counties as measured by 1987 personal income are:

Kansas County	Personal Income - 1987 (Millions of Dollars)	Per Capita Personal Income - 1987
Johnson	$7058.9	$21,173
Sedgwick	6402.3	16,220
Shawnee	2612.6	16,090
Wyandotte	2106.6	12,138
Douglas	927.5	12,349
Reno	879.9	13,529
Saline	778.9	15,464
Leavenworth	777.0	12,012
Riley	746.9	12,072
Butler	743.0	15,104

These ten counties accounted for 61.4% of 1987 Kansas personal income.

The top ten Missouri counties in terms of 1987 personal income are:

Missouri County	Personal Income - 1987 (Millions of Dollars)	Per Capita Personal Income - 1987
St. Louis	$19840.5	$19,873
Jackson	10057.5	15,765
St. Charles	3174.2	16,439
Greene	2800.8	13,987
Clay	2441.9	16,443
Jefferson	2227.8	13,377
Boone	1516.4	14,106
Buchanan	1138.8	13,353
Jasper	1117.1	12,394
Franklin	1098.9	13,800

The above ten counties accounted for 60.7% of 1987 Missouri personal income.

In Nebraska the top ten counties as measured by 1987 personal income are as follows:

Nebraska County	Personal Income - 1987 (Millions of Dollars)	Per Capita Personal Income - 1987
Douglas	$6578.4	$15,832
Lancaster	2985.5	14,373
Sarpy	1304.1	13,471
Hall	654.7	13,432
Scotts Bluff	495.7	13,216
Dodge	471.2	13,405
Lincoln	457.9	13,764
Buffalo	449.5	12,247
Adams	431.6	14,206
Madison	419.6	13,016

The above listed ten counties accounted for 62.5% of 1987 Nebraska personal income.

Personal Income Summary. Due to population growth below the national average, personal income growth in the four-state region failed to keep pace with national growth during the 1970-1988 period. The personal income growth rates in current dollars for the U.S. and each of the four states follows:

United States	391.0%
Kansas	362.4%
Missouri	346.1%
Nebraska	323.2%
Iowa	285.2%

In 1988, the four states accounted for 4.5% of U.S. personal income. The 1988 personal income (measured in billions of dollars) of each of the four states follows:

Missouri	$79.4
Iowa	41.6
Kansas	39.3
Nebraska	23.7

Kansas was the only one of the four states to achieve a higher growth rate of per capita personal income than the U.S. as a whole. The 1970-1988 growth rates of per capita personal income for the U.S. and each of the four states follows:

	Current Dollars	Constant Dollars
United States	307.0%	33.5%
Kansas	318.0%	37.1%
Missouri	305.7%	33.1%
Nebraska	293.0%	28.9%
Iowa	285.4%	26.4%

Among the four states, Kansas achieved the highest 1988 per capita income, although the differences between the states are not large. The 1988 per capita personal incomes of the U.S. and each of the four states are:

United States	$16,489
Kansas	15,759
Missouri	15,452
Nebraska	14,774
Iowa	14,662

Since personal income is heavily influenced by population, it follows that most of each state's personal income will be generated in counties with the largest population. The percent of 1987 state personal income accounted for by the ten largest counties in each state are:

Nebraska	62.5%
Kansas	61.4%
Missouri	60.7%
Iowa	46.5%

The impact of income growth and income levels on scenic byways depends on whether they are a normal or inferior good. If scenic roads are a normal good, sluggish income growth will have a negative effect on the demand for scenic byways. The opposite is the case if they are an inferior good. Whether scenic byways are a normal or inferior good depends on empirical questions such as the cost of using them relative to other kinds of recreation and how potential users view them.

As is the case with the population and employment variables, concentration of income in a few, large urbanized counties may reduce the demand for scenic roads if they are located in areas that are distant from these large income centers.

PASSENGER CAR REGISTRATIONS

State Passenger Car Registrations. Table 22 contains passenger car registrations of the U.S. and the four-state study area for the 1970-1988 period. Passenger car registrations are directly related to population and personal income. Since the four-state region has experienced slower population growth than the U.S. as a whole, passenger car registrations have also increased by less than the national growth rate.

Between 1970 and 1988, U.S. passenger car registrations rose by 57.1%, reaching 139.5 million in 1988. Iowa and Missouri had similar growth rates of 42.1% and 41.2% respectively. The Kansas and Nebraska growth rates were 33.3% and 30.4%.

Table 22. Passenger Car Registrations, 1970-1988

(Thousands)

	Iowa	Kansas	Missouri	Nebraska	United States*
1970	1398	1134	1888	680	88.8
1971	1424	1177	1949	729	92.2
1972	1450	1220	2027	778	96.5
1973	1481	1267	2094	785	101.4
1974	1506	1252	2142	807	104.2
1975	1543	1241	2177	824	106.1
1976	1593	1284	2232	910	109.5
1977	1642	1313	2301	840	111.6
1978	1717	1344	2360	846	115.8
1979	1699	1368	2409	861	117.6
1980	1679	1388	2432	836	120.7
1981	1703	1387	2466	804	122.2
1982	1668	1393	2540	805	122.8
1983	1765	1408	2541	815	125.5
1984	1744	1456	2595	830	127.2
1985	1938	1474	2622	836	130.8
1986	1895	1496	2686	853	134.4
1987	1937	1502	2667	867	136.2
1988	1987	1512	2665	887	139.5

| Percent Change 1970-88 | 42.1% | 33.3% | 41.2% | 30.4% | 57.1% |

*Measured in millions

Source: Motor Vehicle Manufacturers Association, Motor Vehicle
         Facts and Figures.

54

County Passenger Car Registrations. Since passenger car registrations are strongly correlated with population, the most populous counties have the largest number of automobiles.

The Iowa motor vehicle registration figures include truck and bus registrations as well as passenger cars. The top ten counties as measured by 1990 motor vehicle registrations are:

Iowa County	Motor Vehicle Registrations - 1990
Polk	319,830
Linn	173,052
Scott	146,623
Black Hawk	122,376
Woodbury	96,166
Pottawattamie	93,458
Dubuque	79,147
Johnson	75,896
Story	61,417
Clinton	53,050

These ten counties account for 41% of 1990 Iowa motor vehicle registrations.

The top ten Kansas counties as measured by 1988 passenger car registrations are as follows:

Kansas County	Passenger Car Registrations - 1988
Sedgwick	249,772
Johnson	248,193
Shawnee	102,714
Wyandotte	91,191
Douglas	41,741
Reno	38,367
Leavenworth	32,842
Saline	32,217
Butler	30,322
Riley	25,369

The above listed counties accounted for 59% of 1988 Kansas passenger car registrations.

The top ten Missouri counties in terms of 1988 passenger car registrations are:

Missouri County	Passenger Car Registrations - 1988
St. Louis	668,398
Jackson	423,438
St. Charles	123,623
Greene	116,497
Clay	94,676
Jefferson	94,632
Boone	60,634
Jasper	53,350
Buchanan	48,296
Franklin	47,093

These ten counties accounted for 62.2% of 1988 Missouri passenger car registrations.

The top ten Nebraska counties as measured by 1987 passenger car registrations are as follows:

Nebraska County	Passenger Car Registrations - 1987
Douglas	225,944
Lancaster	111,305
Sarpy	49,151
Hall	28,167
Buffalo	21,479
Scotts Bluff	20,956
Dodge	20,637
Lincoln	18,768
Madison	18,072
Platte	17,514

These ten counties accounted for 61.1% of 1987 Nebraska car registrations.

Passenger Car Registrations Summary. Passenger car registrations are directly related to population and personal income. Since the four state region lags the U.S. in these variables, passenger car registration growth did not match U.S. growth in the 1970-1988 period. The passenger car registration growth rates for the U.S. and each of the four states were:

U.S.	57.1%
Iowa	42.1%
Missouri	41.2%
Kansas	33.3%
Nebraska	30.4%

Passenger car registrations are heavily concentrated in the most populous counties of the four-state region.

Since scenic road use and motor vehicle registrations are complimentary goods, sluggish motor vehicle registration growth should theoretically have an adverse effect on scenic road demand. This would especially be the case if the cost of automobile driving escalated substantially as a result of the Persian Gulf war. However, it is highly likely that the lower growth rate of passenger car registrations in the four-state region is a result of slow population growth rather than a low demand for automobiles.

RECREATION FACILITIES AND ATTRACTIONS

Iowa. Table 23 contains attendance figures of 59 Iowa state parks for the 1982-1989 interval. Total attendance rose from 13.4 million in 1982 to 13.8 million in 1984. After declining to 12.9 million in 1985, attendance plunged to 9.4 million in 1986. By 1989, attendance had recovered to 12 million. For the entire 1982-1989 era, total attendance fell 10.6%.

Several Iowa state parks experienced large percentage gains in attendance during the 1982-1989 interval. Some of these popular parks are:

Park Name	1982 Attendance (thousands)	1989 Attendance (thousands)	Percent Change 1982-1989
Ledges	139	402	189.2
Mines of Spain/ E.B. Lyons	42	118	181.0
Pleasant Creek	110	264	140.0
Gull Point Complex	479	1008	110.4
Cedar Rock*	7	14	100.0

*attendance figures available only for 1984 and subsequent years.

Other Iowa state parks suffered significant declines in attendance. Examples include the following:

Park Name	1982 Attendance (thousands)	1989 Attendance (thousands)	Percent Change 1982-1989
A.A. Call	223	17	- 92.3
Plum Grove	7	1	- 85.7
Spring Brook	498	151	- 69.7
Union Grove	277	104	- 62.4
Green Valley	251	94	- 62.5
Lake of Three Fires	133	50	- 62.4

Table 23. Iowa State Park Attendance, 1982-1989

(Thousands)

Park	1982	1983	1984	1985
A. A. Call	223	205	45	45
Backbone	480	542	410	396
Beeds Lake	162	109	129	167
Bellevue	204	187	190	194
Big Creek	432	482	689	391
Black Hawk	612	581	560	847
Bobwhite	50	57	63	36
Brushy Creek	82	81	88	85
Cedar Rock	-	-	7	7
Clear Lake	247	309	342	306
Dolliver	251	221	175	244
Elk Rock	84	83	102	94
Fort Defiance	103	68	54	52
Geode	290	302	314	327
George Wyth	401	504	494	506
Green Valley	251	225	207	206
Gull Point Complex	479	494	643	680
Honey Creek	161	144	193	154
Lacey-Keosaqua	224	211	188	182
Lake Ahquabi	292	222	205	231
Lake Anita	156	157	171	178
Lake Darling	292	226	306	298
Lake Keomah	131	88	70	183
Lake Macbride	534	613	596	633
Lake Manawa	1247	1233	2007	1219
Lake of Three Fires	133	151	182	182
Lake Wapello	196	193	172	124
Ledges	139	84	140	222
Lewis and Clark	184	177	169	229
Maquoketa Caves	143	110	120	105
Margo Frankel	35	45	49	70
McIntosh Woods	182	143	166	183
Mines of Spain/E.B. Lyons	42	41	55	71
Nine Eagles	63	47	56	76
Okamanpedan	55	41	42	33
Palisades-Kepler	305	326	268	252
Pammel	19	93	35	66
Pikes Peak	145	172	110	31
Pilot Knob	133	159	138	166
Pine Lake	346	405	352	335
Pleasant Creek	110	173	222	242
Plum Grove	7	7	8	0.1
Prarie Rose	152	173	166	170
Preparation Canyon	14	12	12	18
Red Haw	346	381	312	256
Rock Creek	471	265	224	129
Springbrook	498	495	474	191
Stone Park	447	292	352	325
Twin Lakes	30	41	113	112
Union Grove	277	198	160	171
Viking Lake	149	195	210	233
Volga River	157	172	179	205
Walnut Woods	58	84	89	75
Wanata	13	15	14	14
Wapsipinicon	682	627	575	511
Waubonsie	114	120	112	129
Wildcat Den	204	266	204	271
Wilson Island	131	101	27	71
Yellow River Camping	-	-	6	13
Total	13,432	13,203	13,773	12,942

58

Table 23. Iowa State Park Attendance, 1982-1989 (Continued)

Park	1986	1987	1988	1989	Percent Change 1982-1989
A. A. Call	5	13	15	17	-92.3
Backbone	321	367	355	436	-9.2
Beeds Lake	120	237	188	162	no change
Bellevue	94	125	143	177	-13.2
Big Creek	327	518	565	650	50.4
Black Hawk	707	832	432	425	-30.5
Bobwhite	15	33	35	47	-6.0
Brushy Creek	42	41	77	77	-6.1
Cedar Rock	8	9	10	14	100.0
Clear Lake	215	173	162	157	-36.4
Dolliver	140	122	182	215	-14.3
Elk Rock	100	102	144	139	65.5
Fort Defiance	43	46	133	111	-
Geode	252	251	353	375	29.3
George Wyth	313	401	267	365	-9.0
Green Valley	79	88	95	94	-62.5
Gull Point Complex	588	604	765	1,008	110.4
Honey Creek	158	139	162	159	-1.2
Lacey-Keosaqua	118	104	121	120	-46.4
Lake Ahquabi	143	188	182	230	-21.2
Lake Anita	142	139	139	150	-3.8
Lake Darling	225	174	191	178	-39.0
Lake Keomah	63	75	87	154	17.5
Lake Macbride	466	541	520	455	-14.8
Lake Manawa	596	677	683	941	-24.5
Lake of Three Fires	126	52	62	50	-62.4
Lake Wapello	114	108	119	112	-42.8
Ledges	189	541	339	402	189.2
Lewis and Clark	208	225	200	190	3.3
Maquoketa Caves	82	101	135	141	-1.4
Margo Frankel	See Big Creek		51	60	71.4
McIntosh Woods	174	128	147	127	-30.2
Mines of Spain/E.B. Lyons	74	80	94	118	181.0
Nine Eagles	32	52	40	83	31.7
Okamanpedan	35	See Ft. Defiance			-
Palisades-Kepler	196	147	192	213	-30.2
Pammel	52	59	59	no data	-
Pikes Peak	90	119	148	139	-4.1
Pilot Knob	115	81	73	76	-42.8
Pine Lake	332	359	640	481	39.0
Pleasant Creek	154	202	268	264	140.0
Plum Grove	6	6	9	1	-85.7
Prarie Rose	139	112	159	94	-38.2
Preparation Canyon	11	See Lewis & Clark			-
Red Haw	215	194	217	261	-24.5
Rock Creek	91	125	230	546	15.9
Springbrook	97	130	155	151	-69.7
Stone Park	260	200	168	307	-31.3
Twin Lakes	80	See Black Hawk			-
Union Grove	105	76	71	104	-62.4
Viking Lake	192	213	183	223	49.7
Volga River	177	110	106	113	-28.0
Walnut Woods	38	74	51	56	-3.4
Wanata	14	In Gull Point			-
Wapsipinicon	377	386	394	434	-36.4
Waubonsie	77	80	99	99	-13.1
Wildcat Den	237	249	247	233	14.2
Wilson Island	55	72	79	66	-49.6
Yellow River Camping	-	-	-	-	-
Total	9,421	10,280	10,740	12,003	-10.6

Source: Iowa Department of Natural Resources

59

In 1989, the ten Iowa state parks with the largest attendance were:

Park Name	1989 Attendance (thousands)
Gull Point Complex	1008
Lake Manawa	941
Big Creek	650
Rock Creek	546
Pine Lake	481
Lake Macbride	455
Backbone	436
Wapsipincion	434
Black Hawk	425
Ledges	402

These ten parks accounted for nearly half of the 1989 Iowa state park attendance.

In addition to 83 state parks and recreation areas, Iowa has four federal reservoirs and three national wildlife refuges.

Kansas. Table 24 displays annual attendance for 21 Kansas state parks. Between 1980 and 1988, total attendance rose from 4.4 million to 5.5 million, a gain of 23.4%.

Kansas state parks experiencing the greatest percentage increases in attendance for the 1980-1988 interval include the following:

Park Name	1980 Attendance (thousands)	1988 Attendance (thousands)	Percent Change 1980-1988
El Dorado*	126	848	573.0
Tuttle Creek	388	780	101.0
Meade	91	162	78.0
Perry	342	554	62.0
Glen Elder	235	355	51.1

*attendance data available only for 1983 and subsequent years

Table 24. Kansas State Park Attendance, 1980-1988

(Thousands)

Park	1980	1981	1982	1983	1984
Cedar Bluff	90	108	121	143	143
Cheney	686	1,016	564	576	643
Clinton	323	451	318	267	272
Crawford	162	103	129	103	96
El Dorado	-	-	-	126	376
Elk City	122	84	125	99	96
Fall River	159	90	128	190	137
Glen Elder	235	260	265	268	258
Kanopolis	257	246	292	190	208
Lovewell	233	216	251	137	189
Meade	91	76	85	88	76
Melvern	142	165	170	185	185
Milford	167	176	166	167	131
Perry	342	301	281	336	237
Pomona	185	116	126	122	101
Prairie Dog	101	134	115	118	120
Scott	125	120	88	104	87
Toronto	206	147	157	149	124
Tuttle Creek	388	275	377	339	333
Webster	237	201	238	198	213
Wilson	185	184	211	212	153
Total	4,435	4,468	4,205	4,117	4,177

Park	1985	1986	1987	1988	Percent Change 1980-1988
Cedar Bluff	108	96	115	100	11.1
Cheney	643	481	548	685	no change
Clinton	289	338	354	404	25.1
Crawford	141	104	23	25	-84.6
El Dorado	411	678	797	848	573.0
Elk City	102	113	93	85	-30.3
Fall River	111	121	103	95	-40.3
Glen Elder	266	260	371	355	51.1
Kanopolis	175	223	209	219	-14.8
Lovewell	183	227	185	126	-45.9
Meade	80	62	137	162	78.0
Melvern	105	73	135	51	-63.8
Milford	141	136	169	127	-24.0
Perry	196	205	180	554	62.0
Pomona	97	137	139	114	-38.4
Prairie Dog	137	113	92	102	no change
Scott	67	117	127	168	34.4
Toronto	153	180	175	158	-23.3
Tuttle Creek	359	402	538	780	101.0
Webster	232	94	118	128	-46.0
Wilson	222	203	160	188	1.6
Total	4,219	4,361	4,676	5,474	23.4

Source: Kansas Department of Wildlife and Parks

Other Kansas state parks suffered significant decreases in attendance during the 1980-1988 time frame. Examples include the following:

Park Name	1980 Attendance (thousands)	1988 Attendance (thousands)	Percent Change 1980-1988
Crawford	162	25	-84.6
Melvern	142	51	-63.8
Webster	237	128	-46.0
Lovewell	233	126	-45.9
Fall River	159	95	-40.3

The top five Kansas state parks as measured by 1988 attendance are:

Park Name	1988 Attendance (thousands)
El Dorado	848
Tuttle Creek	780
Cheney	685
Perry	554
Clinton	404

These five parks accounted for nearly 60% of 1988 Kansas state park attendance.

In addition to 24 state parks, Kansas has 40 fishing lakes and wildlife areas. The state also has 24 federal wildlife areas under license to the Kansas Department of Wildlife and Parks.

The state of Kansas has designated eleven historical sites. These include the First Territorial Capital at Fort Riley, Kansas; the John Brown Museum at Osawatomie, Kansas; and the Hollenberg Pony Express Station at Hanover, Kansas.

Nebraska. Table 25 presents 1980-1989 attendance figures for six Nebraska state parks, eight state historical parks, and 34 state recreation areas. Total attendance at these facilities increased from 5.5 million in 1980 to 9 million in 1989, an increase of 62.4%.

Table 25. Nebraska State Park and Recreation Area Attendance, 1980-1989

(Thousands)

State Parks

Name	1980	1981	1982	1983	1984
Indian Cave	145	120	108	119	117
Platte River	-	-	93	196	191
Ponca	215	204	206	189	171
Niobrara	161	148	136	148	148
Chadron	278	228	205	187	194
Fort Robinson	294	377	331	353	343

State Historical Parks

	1980	1981	1982	1983	1984
Arbor Lodge	157	139	141	158	156
Ash Hollow	67	68	70	51	68
Buffalo Bill Ranch	39	43	46	48	45
Champion Mill	3	2	3	3	2
Fort Atkinson	36	37	38	38	41
Fort Hartsuff	31	32	28	26	27
Fort Kearney	83	86	82	73	65
Rock Creek Station	5	9	12	19	42

State Recreation Areas

	1980	1981	1982	1983	1984
Blue Stem	-	-	-	18	19
Box Butte	-	-	-	78	76
Branched Oak	-	-	-	765	785
Bridgeport	-	-	-	74	14
Calamus	-	-	-	-	-
Conestoga	-	-	-	145	165
Dead Timber	76	76	75	81	89
Enders Reservoir	58	59	65	66	67
Fort Kearney	-	-	-	144	136
Fremont	629	632	601	611	646
Johnson Lake	341	415	459	372	332
Lake McConaughy	397	385	354	480	449
Lake Maloney	-	-	-	-	-
Lake Minatare	248	257	265	242	240
Lewis & Clark	378	378	239	203	498
Louisville	205	228	210	247	53
Medicine Creek	123	123	128	146	132
Merritt	-	-	-	135	121
Mormon Island	249	255	272	220	259
Olive Creek	-	-	-	26	32
Oliver Reservoir	-	-	-	-	10
Pawnee	-	-	-	717	725
Red Willow	185	174	176	173	81
Schramm	350	154	82	110	96
Sherman	166	201	220	222	257
Stagecoach	-	-	-	15	22
Summit	-	-	-	-	-
Swanson	55	89	46	49	48
Two Rivers	225	225	256	212	228
Victoria Springs	71	49	47	34	41
Wagon Train	-	-	-	38	50
Wildcat Hills	-	-	-	-	7
Willow Creek	-	-	-	-	18
Windmill	55	59	66	54	43
Total	5,545	5,470	5,271	7,853	7,886

Table 25. Nebraska State Park and Recreation Area Attendance, 1980-1989 (Continued)

State Parks

Name	1985	1986	1987	1988	1989	Percent Change 1980-89
Indian Cave	157	149	163	185	175	20.7
Platte River	272	230	301	330	329	254.0
Ponca	190	149	181	192	196	-8.8
Niobrara	233	239	198	141	153	-5.0
Chadron	191	187	181	172	157	-43.5
Fort Robinson	332	314	304	291	285	-3.1

State Historical Parks

Name	1985	1986	1987	1988	1989	Percent Change 1980-89
Arbor Lodge	157	152	160	157	166	5.7
Ash Hollow	55	38	32	30	18	-73.1
Buffalo Bill Ranch	51	37	36	35	37	-5.1
Champion Mill	5	9	9	12	16	433.0
Fort Atkinson	42	59	54	57	50	38.9
Fort Hartsuff	31	30	33	30	29	-6.4
Fort Kearney	61	60	59	58	58	-30.1
Rock Creek Station	39	39	41	43	43	760.0

State Recreation Areas

Name	1985	1986	1987	1988	1989	Percent Change 1980-89
Bluestem	190	197	198	174	174	867.0
Box Butte	75	75	75	75	76	-2.6
Branched Oak	810	820	825	795	795	3.9
Bridgeport	36	51	46	43	40	-45.9
Calamus	-	4	86	243	227	
Conestoga	170	170	156	135	135	-6.9
Dead Timber	96	104	91	105	104	36.8
Enders Reservoir	68	45	18	41	47	-19.0
Fort Kearney	126	121	117	116	116	-19.4
Fremont	714	720	767	784	813	29.2
Johnson Lake	344	338	354	446	459	34.6
Lake McConaghy	524	635	697	723	698	75.8
Lake Maloney	94	106	106	128	152	61.7
Lake Minatare	244	232	187	212	195	-21.3
Lewis & Clark	204	194	219	191	178	-52.9
Louisville	255	269	271	274	275	34.1
Medicine Creek	141	117	115	43	49	-60.1
Merritt	114	123	115	102	105	-22.2
Mormon Island	260	254	267	298	337	35.3
Olive Creek	35	37	26	32	32	23.1
Oliver Reservoir	42	43	33	19	28	180.0
Pawnee	750	765	770	730	730	1.8
Red Willow	166	115	19	45	56	-69.7
Schramm	93	94	96	98	126	-64.0
Sherman	249	254	239	177	167	No Change
Stagecoach	25	26	25	26	26	73.3
Summit	-	-	-	-	82	-
Swanson	48	30	33	51	64	16.4
Two Rivers	289	190	292	283	350	55.5
Victoria Springs	31	31	33	34	37	-47.9
Wagon Train	54	66	69	65	65	71.1
Wildcat Hills	4	5	12	16	24	242.0
Willow Creek	92	98	104	107	134	644.0
Windmill	43	40	39	38	41	-25.5
Total	8,575	8,413	8,494	8,739	9,004	62.4

Attendance at some of these Nebraska facilities soared in the 1980s. Examples include the following:

Facility Name	1980 Attendance (thousands)	1989 Attendance (thousands)	Percent Change 1980-1989
Bluestem Recreation Area*	18	174	867.0
Rock Creek Station	5	43	760.0
Willow Creek Recreation Area**	18	134	644.0
Champion Mill Park	3	16	433.0
Platte River State Park***	93	329	254.0
Wildcat Hills Recreation Area**	7	24	242.0
Oliver Reservoir**	10	28	180.0

* attendance data available only for 1983 and subsequent years
** attendance data available only for 1984 and subsequent years
*** attendance data available only for 1982 and subsequent years

Other Nebraska facilities experienced sharp declines in attendance during the 1980s including the following:

Facility Name	1980 Attendance (thousands)	1989 Attendance (thousands)	Percent Change 1980-1989
Ash Hollow Park	67	18	- 73.1
Red Willow Recreation Area	185	56	- 69.7
Schramm Recreation Area	350	126	- 64.0
Medicine Creek Recreation Area	123	49	- 60.1
Lewis & Clark Recreation Area	378	178	- 52.9
Victoria Springs Recreation Area	71	37	- 47.9
Bridgeport Recreation Area*	74	40	- 45.9
Chadron State Park	278	157	- 43.5

* attendance data available only for 1983 and subsequent years

In 1989, the ten most heavily attended recreation facilities in Nebraska were the following:

Facility Name	1989 Attendance (thousands)
Fremont Recreation Area	813
Branched Oak Recreation Area	795
Pawnee Recreation Area	730
Lake McConaghy	698
Johnson Lake Recreation Area	459
Two Rivers Recreation Area	350
Mormon Island Recreation Area	337
Platte River State Park	329
Fort Robinson	285
Louisville Recreation Area	275

The above facilities accounted for 56% of 1989 Nebraska recreational facility attendance.

Nebraska has many historical sites and other attractions. These include the Sod House Museum and Pony Express Station at Gothenburg, Nebraska; the State Capitol in Lincoln, Nebraska; the Strategic Air Command Museum in Bellevue, Nebraska; and Boys Town in Omaha.

Nebraska is the only state in the four-state study area that has national monuments and national forests. Nebraska also has three national wildlife refuges.

Missouri. The state of Missouri has 47 state parks and 23 historical sites. These include the First Missouri State Capitol in St. Charles County, the General John J. Pershing Boyhood Home in Linn County, the Harry S. Truman Birthplace in Barton County, and the Mark Twain Birthplace in Monroe County.

Recreation Facilities and Attractions Summary. It is highly likely that scenic road use and outdoor recreational activities are jointly consumed. For the most part, attendance at state parks and recreation areas increased in the four-state region during the 1980s. If this trend continues, it would have a positive effect on scenic road use. This would particularly be the case if scenic roads passed in or near the most heavily attended facilities. However, if the scenic roads and recreational areas are distant from major population centers, the demand for both would be reduced.

CHAPTER TWO
RECREATIONAL BENEFITS AND COSTS

I. INTRODUCTION

Chapter Two indicates how to measure the recreational benefits of scenic byways. These benefits are economic in the sense that they are derived from demand functions, but the benefits do not accrue to a local or state economy via increased sales or increased employment, as do the benefits discussed in Chapter One. Rather, the benefits represent the value that recreational drivers place on enhanced or additional scenic byways. Benefits measured here are those which the government utilizes for benefit/cost studies that justify expenditures from tax revenue on parks and recreational services. Examples of the valuation techniques suggested in this study can be found in "National Economic Development Benefit Evaluation Procedures: Recreation." (U.S. Water Resources Council 1983, p. 67 ff.)

Costs of scenic byways are also included in an analysis so they can be compared with the dollar value of benefits. Specific cost figures will be obtained from state governments after the byways are selected. Costs for scenic byways are expected to fall into categories of safety, amenities and promotion. For example, road signs, historical markers, turnouts, caution signs, information packets and maps could be included.

Because the program will be financed out of taxes, one must estimate the increase in revenue generated by economic activity of new users of scenic byways. For instance, what changes could be expected in the sales tax, income tax, and gasoline excise tax that could provide funding for the program? Will this revenue be sufficient to finance the cost of a scenic byways and their promotion? The inquiry into the tax base requires an analysis of economic development within the private sector, which requires estimates of changes in sales and employment, derived from techniques discussed in Chapter One. Results of the private sector analysis when completed in a second stage of this project will be used to estimate the impact of scenic byways on tax revenues.

In summary, this chapter is a public sector analysis that considers recreational benefits for the general public, government expenditures to provide the program, and the taxes that finance the program.

II. ECONOMIC MODELS TO MEASURE BENEFITS

Although one concept of an item's value is the total amount which consumers pay for it, that guideline breaks down for public goods, of which a scenic byway is an example.[1] Because no market exists for a public good, we cannot observe directly the public's willingness to pay. In general, public goods are those that are provided by the government. More specifically, a public good has the properties of being nonrival and nonexcludable. Nonrival refers to a good which many people can enjoy without diminishing the amount available to others (e.g., general benefits of an educated citizenry in contrast to a rival good such as a hamburger which is consumed by the purchaser). Nonexcludability denotes goods to which people have equal and free access such as national defense whether or not they have paid taxes or fees, and goods for which it is not feasible to charge a fee on each occasion of use (for example, roads and streets within a community).

A public good has a cost paid by taxation even though it does not have a market price. To determine whether or not the value of a specific public good exceeds its costs, one must establish a value for it in the absence of a market. There are a number of techniques for estimating value or benefit. The extensive bibliography at the end of this report is a thorough list of books and articles that discuss these techniques. Almost all of the estimating techniques utilize consumer surplus as a measure of benefits.

CONSUMER SURPLUS

Consider, as a means of illustrating consumer surplus, the commodity water. The cost is low but its value is immense. The demand for water is illustrated in Figure 1. The total amount paid for water is its price, P_0 times the quantity Q_0, $0P_0aQ_0$ in the figure. The total amount that people would be willing to pay, rather than do without Q_0 water, is the area underneath the demand curve, $0baQ_0$. Consumer surplus is the difference between what people pay and the total amount that they would be willing to pay rather than do without the commodity, i.e., the shaded area P_0ba.[2] Water is an extreme example with a large difference between price

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[1] Indeed, the guideline is not even correct for private market transactions; for instance, the total benefits of water exceed the total dollars paid for it.

[2] The concept of consumer surplus is far from simple. See for instance the discussion in Chapter 2, "Theoretical Basis of the Contingent Valuation Method," in R. Mitchell and R. Carson, Using Surveys to Value Public Goods:
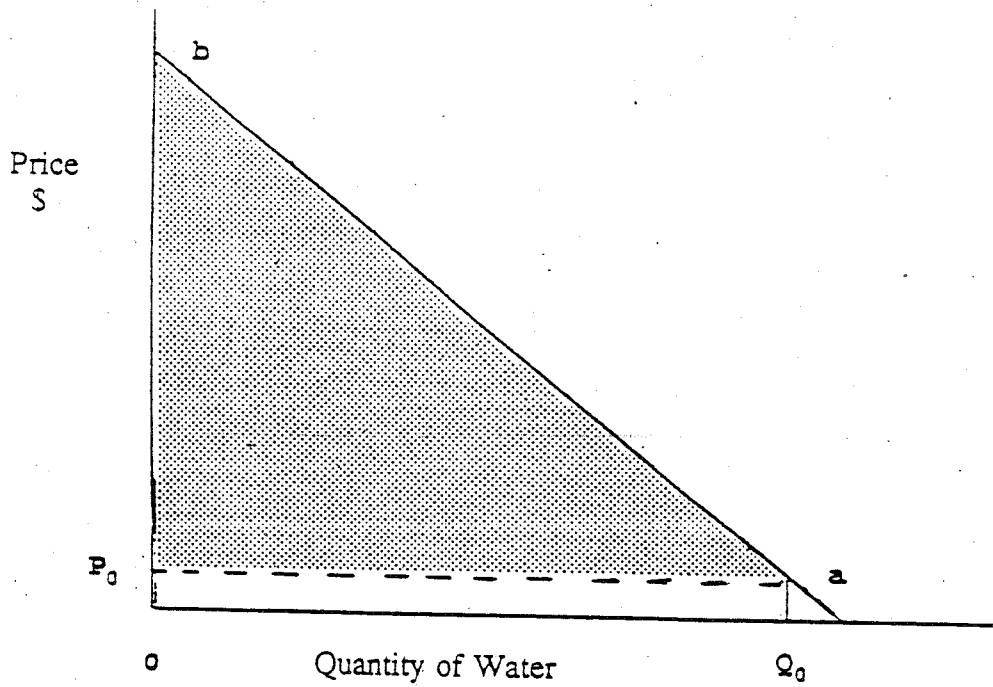
Figure 1
Consumer Surplus: Water
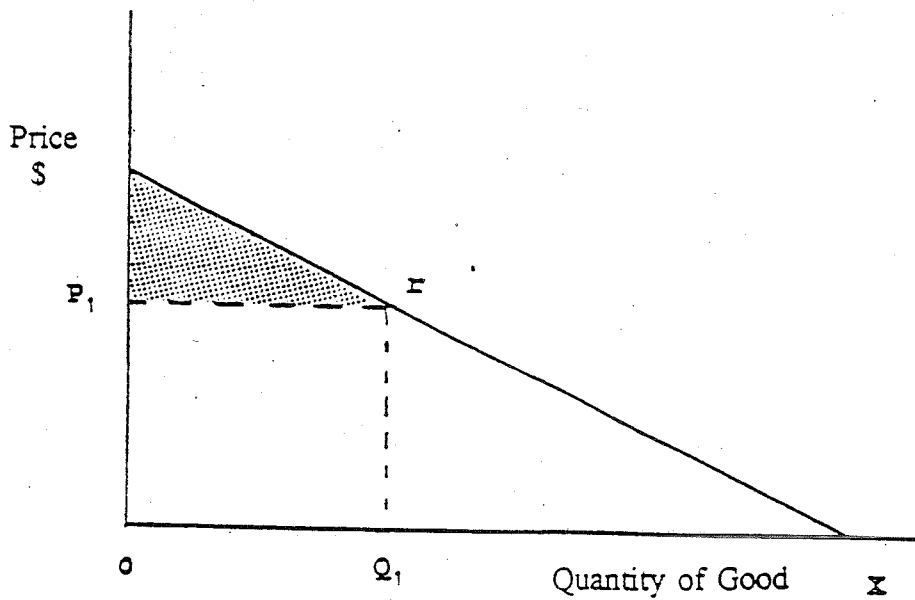
Figure 2
Minimal Consumer Surplus

and total value, and consequently a large consumer surplus. On the other hand, consumer surplus could be less than total expenditures $0P_1rQ_1$, as in Figure 2.

Because the concept of consumer surplus is generally unfamiliar outside of economics, we would like to explain why we must use consumer surplus for evaluation. The example is a national park which is a quasi-public good because one can exclude users and charge a fee. We consider differing revenues that might be obtained with alternative fees. Suppose that a weekly fee of $15 results in 100,000 users during a year; total fees are $1.5 million. Next, suppose a fee of $45 with 70,000 users and total fees of $3.15 million. Third, consider no fee with 150,000 users and zero revenue.

Expenditure does not provide a measure of value for the park. Its value does not fall to zero when there are no fees, nor does its value increase when fewer people use it and pay $45 fees. In all cases the total area under the demand curve remains constant. However, consumer surplus increases as the admission price declines because: (1) consumer surplus increases as the number of users increase in response to lower prices, and (2) out-of-pocket costs that are subtracted from total area under the demand curve become less so that consumer surplus, accordingly, increases. (Note: valuation of the recreational experience may be modified by congestion.)

For any good, public or private, its total value is the total of the amount paid plus the consumer surplus. In the case of recreation away from home, the user does have some personal costs, namely transportation and time. If that was the total value of the recreational experience, one could not justify additional expenditure for government to provide a recreational facility such as a national park. The benefits to which government costs will be compared are those benefits over and above personal expenditures, namely, consumer surplus.

Scenic Byways and Consumer Surplus. Scenic byways are already in place, and they may be travelled for recreation by people presently familiar with the roads. The line, ad, in Figure 3 indicates existing demand for scenic byways that will be measured by an initial survey after the scenic byways are identified but before they are marked and publicized. The consumer surplus that we wish to measure is not the amount under the demand curve ad. Rather, it is the additional or incremental amount that arises after the byways are identified and publicized. Following the marking and publicizing of the byways we will survey drivers a second time. We
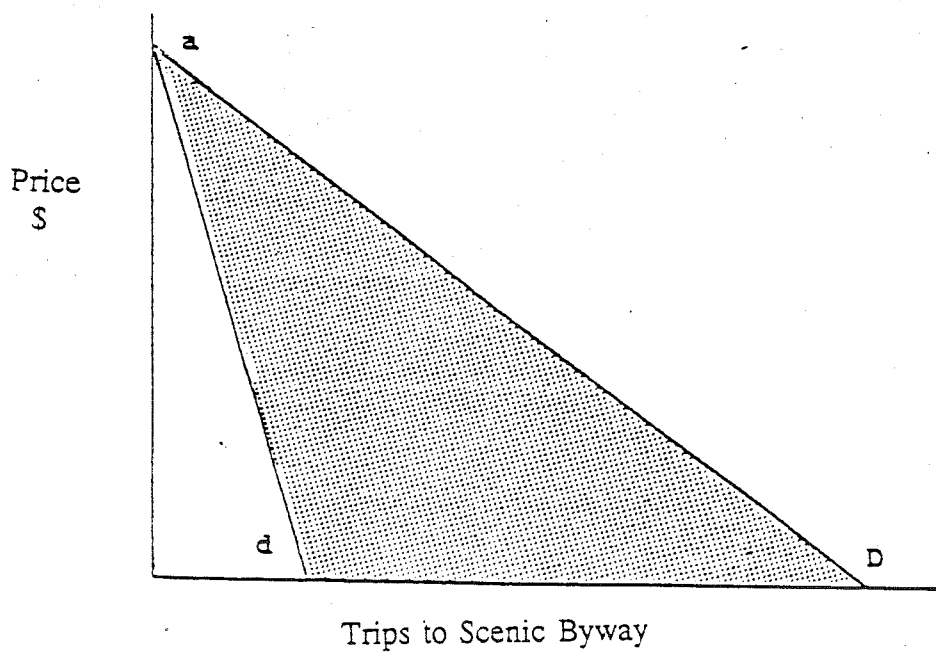
Figure 3

Increment of Consumer Surplus

expect demand to shift progressively outward as more individuals learn of the byways.[3] We presume that eventual demand of all users is represented by the demand curve aD in Figure 3. The net benefits of the scenic byway is the increment of consumer surplus between the two demand curves in Figure 3, the shaded area adD. All private costs, such as transportation, have been netted out of Figure 3. From this increase in benefits the decline in value that other sites would experience must be subtracted if users shift to the newly designated scenic byway.

CATALOG OF MODELS

There are two principal techniques for measuring benefits of recreational services: (1) travel cost mehtod and (2) contingent valuation. Two other methods are valuation and the household production function.

The travel cost technique is certainly the oldest (Hotelling 1947; Clawson 1959, 1966) and probably the most refined. A series of articles has modified and improved the original model. In brief, the travel cost method can estimate a demand curve for driving a scenic byway with a sample survey of drivers who provide brief demographic data and information on differing distances travelled. These data together with the variable costs of travel and time yield a demand function from a schedule of prices that declines with proximity to the scenic drive.

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[3] The demand for public goods is generally added vertically. For scenic byways, output could be measured as number of scenic roads. For any one road, which could be used by many drivers, the demand could be summed vertically to measure total willingness to pay. In this study, we follow the convention of the travel cost method and use "trips" as the unit of output and add individual demand curves horizontally.

Among techniques of estimating benefits, the travel cost technique is perhaps the simplest,[4] and it is the technique which is appropriate for estimating benefits of specific scenic byways.

The contingent valuation method also has a vast literature and more than twenty years of development. As does travel cost, contingent valuation methodology depends on survey data, but a much more complex and lengthy survey than for travel cost. The method is aimed at eliciting an individual's willingness to pay for a public (non-market) good or service. The interviewer describes a good, a hypothetical market, and attempts to elicit the willingness to pay (price) from the respondent in a manner that does not allow the respondent to use strategy to bias downward the value he places on a good.

The name of the contingent technique comes from the procedure that the willingness to pay is contingent on the respondent's estimate of the value of the good, given the circumstances of the market. A number of entries in the Reference section discuss contingent valuation. A thorough discussion is in a 1989 book by Mitchell and Carson, Using Surveys to Value Public Goods: the Contingent Valuation Method (1989).

Contingent valuation can provide information beyond that available from the travel cost procedure. For instance, contingent valuation can measure an option demand to preserve a site for the respondent's (potential) future use or use of other persons, or simply to preserve a recreational area--whether or not one actually plans to visit the site. The travel cost method measures demand only for persons who actually visit a recreational area. This latter is the

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[4] The simplest technique of all is probably the gross expenditure technique that values a recreational site or experience by what a person spends on recreation.

Recreational expenditures have been measured a number of ways of which the following is the most general (R. Mack and 5. Myers 1965): the analyst determines from surveys (1) the total dollar amount spent by all families in a region on recreation and leisure (sports equipment, TV, admission fees to spectator sports, share of vehicle costs that can be apportioned to recreation, etc.), (2) total time spent on leisure and recreation, and then (3) calculate dollar amount per hour. This hourly value is then multiplied by the number of hours spent on a specific recreational activity, such as driving a scenic byway.

The drawback to this technique is that personal expenditures, especially average expenditure, do not indicate either total benefits or consumer surplus generated from a particular recreational site. What we wish to discover is benefits of a recreational experience in excess of private expenditures. The appropriateness of governmental expenditures is weighed against these net benefits (consumer surplus).

demand we are seeking to estimate benefits for scenic byways. Though contingent valuation is a fruitful technique, it requires a lengthy interview and a cadre of skilled interviewers. The surveys used for the travel cost method are much shorter and quicker to administer.

Before providing details of the travel cost method, two additional concepts for site valuation are briefly described. These techniques also provide information beyond that which can be obtained from the travel cost method, but their complexity is not required for this study.

Whereas the travel cost method focuses on a single site and its composite bundle of characteristics, the hedonic measurement of value, a third estimation technique, seeks to identify specific components of the bundle and focus on the attributes or characteristics of a recreational experience and how a person responds to them. The hedonic method seeks to price the individual characteristics of a recreational experience (e.g., type or quality of scenery, solitude and restfulness, likelihood of obtaining fish or game, photogenic vistas, etc.) The sum of characteristic values and location values of a site provide the total value on its benefits. (See Brown and Mendelssohn 1984; Atkinson and Halvorson 1984.)

Hedonic valuation has applications outside of recreation. For instance, the hedonic method can focus on the characteristic of clean air in a large city or noise abatement near an airport and measure the value of these characteristics through differentials in property values.

In an approach similar to the hedonic valuation, Greig stresses characteristics of a site in "Recreation Evaluation Using a Characteristics Theory of Consumer Behavior" (Greig 1983). Greig utilizes Lancaster's analysis of the characteristics of a good and indicates how one might place a value on a modification of the characteristics of a site (e.g., adding a camping area to a state forest.)

Finally, we consider a fourth technique of valuing non-market goods, the household production function. An analyst can utilize a household production function for which output is the quantity of value of a recreational activity and the inputs are attributes of the household and the site itself, which are jointly utilized in the production of recreation. Household inputs could be such items as fishing gear, specialized recreational vehicle, food, clothing, amount of time available for leisure (retired or mid-career), knowledge of the environment, etc. The value of a site is measured by isolating its contribution among all inputs to total output. (See Deyek

and Smith 1978; Bockstael and McConnell 1981.) The analysis of inputs and outputs is more complex than we require to value scenic byways.

TRAVEL COST TECHNIQUE

Using the travel cost model developed by Clawson and modified significantly, we will determine the demand curve for recreational driving along the proposed scenic byways with an on-site survey. The benefits to individuals from recreational driving is distinct and separate from the impact on private sector business, which is measured by models outlined in Chapter One.

The model we will use for recreational demand is succinctly explained in a paper by Jack L. Knetsch, "Displaced Facilities and Benefit Calculations" (Land Economics, vol. 53, no. 1, 1977, pp. 123-24.)

> We can suppose an otherwise isolated region of five towns--A, B, C, D and E--each with a stable population of a hundred souls with similar distributions of incomes and tastes among them. The five settlements are situated with varying proximity to the only park in the region in such a way that the money cost of visiting the park varies by dollar increments from $1 for people in A to $5 for people in E. We can also assume that the park is sufficiently ample in size to rule out congestion worries, to have no variable cost of operation and no entrance fees. Further, we can assume that the only determinant of visit rates from the five towns is the money cost of making the trip and that the reaction to these costs is given by a linear function indicating zero visits with $5 costs and visits per capita at zero costs, as shown in Figure 4. This cost-visit relationship is not a demand curve for the park, although one can be derived from it.

The park can be presumed to have a value given by the capitalized flow of the willingness-to-pay for the services of the park on the part of the users. Under the given assumptions, the annual value can be measured by the area under the curve EZ of Figure 4, but above the actual costs for each town, each multiplied by its population: that is, the sum of consumer surplus enjoyed by all of the visits. For example, the 100 people of town D face costs of $4 but each would be willing to pay an amount represented by OED1 and therefore would be willing to pay 4ED over what they actually spend. Their joint willingness-to-pay for use of the park is then $50 [$1 x 100 x .5]. For town E it is zero, for C $200 [$2 x 200 x.5], for B $450 and for A $800, for a total annual value of $1,500. Given this annual flow of values,

75
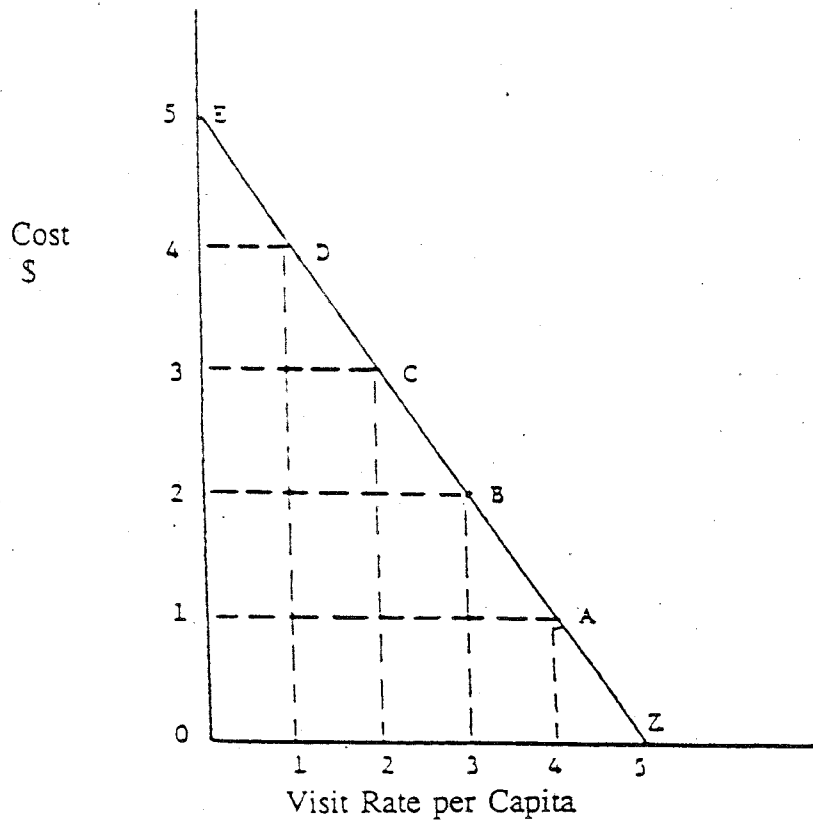
Figure 4
Visit-Cost Relationship
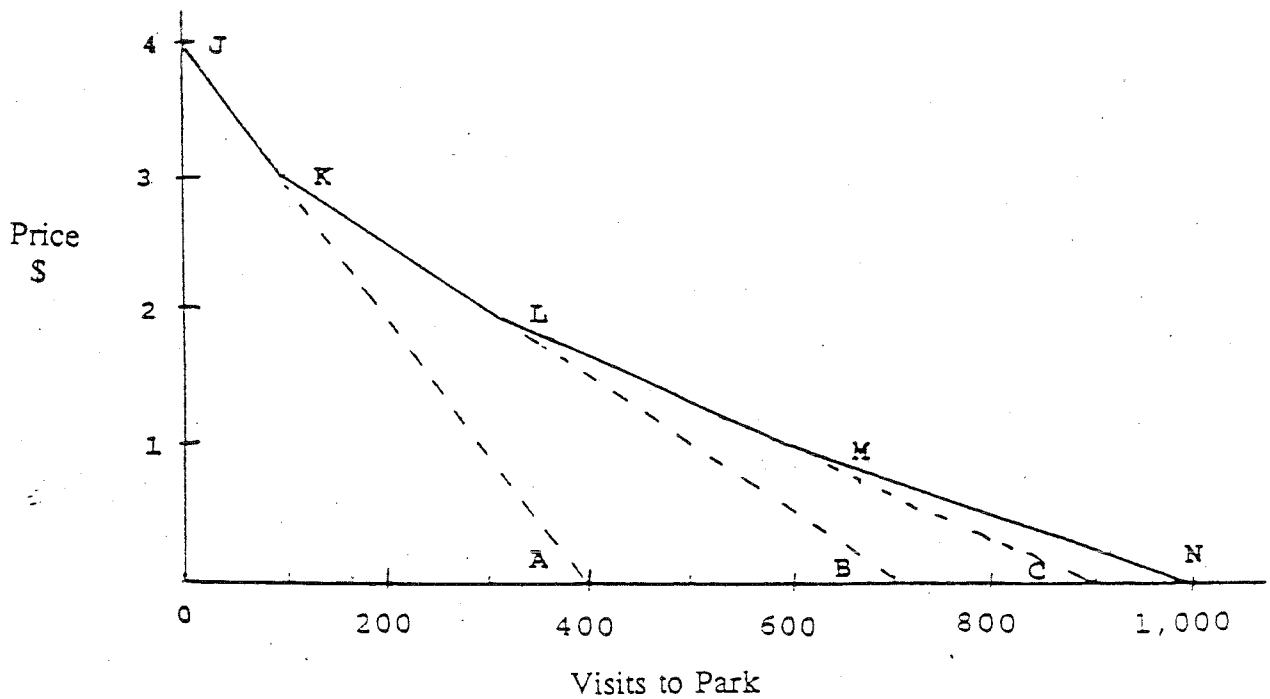
Figure 5

Demand and Consumer Surplus for Visits to Park

the capital worth of the park might be put at $15,000 using a discount rate of ten percent.

Figure 5 illustrates the above analysis as a conventional demand curve with a conventional measure of consumer surplus. The total area under the demand curve is precisely equal to the $1,500 derived by Knetsch in his per capita analysis. Table 1 converts the information in Figure 4 into a demand curve format from which Figure 5 is derived. To find the consumer surplus for the park after all costs have been incurred by the visitors for A, consider the demand for the park net of their $1.00 travel and time cost. When the park has zero admission, residents of A wish to visit four times per year. Travel costs for B residents are $2.00, and at zero admission price, demand is three visits per year. This procedure is repeated for each community. Note that each community has 100 persons so that when per capita demand is four in Community A, total demand in Table 1 and Figure 5 is 400. If the product of per capita visits and each community's total population is obtained, we derive the total visits indicated in row one ($0.00 price) of Table 1 are derived.

Table 1

Price of Park	Trips Originating in Town					Total Trips	Consumer Surplus
	A	B	C	D	E		
$0.00	400	300	200	100	0	1,000	$1,500
1.00	300	200	100	0	0	600	700
2.00	200	100	0	0	0	300	250
3.00	100	0	0	0	0	100	50
4.00	0	0	0	0	0	0	0

If an admission price were charged or the costs of travel exceeded $1.00, data from the travel cost survey could be used to modify the estimate of consumer surplus. Rows two through five in Table 1 accommodate increases in price. If the park charged $1.00 admission or travel costs increased by $1.00, row two would provide the basis for calculating consumer surplus. If the price of visiting the park were $4.00 or travel costs increased by $4.00, the number of visitors and consumer surplus would fall to zero.

The demand curve, JKLMN, in Figure 5 can be obtained by entering the "Price of Park" and "Total Trips" from Table 1. One can also convert Figure 4 to the total demand curve in Figure 5 via graphical summation of demand curves of individual towns. The triangle AEl (multiplied by 100 on the quantity axis) in Figure 4 corresponds to AJO in Figure 5. BE2 in

Figure 4 corresponds to BKA in Figure 5, and finally DE4 in Figure 4 corresponds to CNM in Figure 5.

Consumer surplus in Figure 5 is the area under the demand curve and above the price. For instance if price is zero, the area under the demand curve from O to 100 trips is $350 (100 x $3.00 + 100 x $1.00 x .5). If one sums consumer surplus from O to 1,000, the total is $1,500. Consumer surplus is compared to costs of providing or enhancing a recreational experience.

The articles listed in the References section "Valuation of Non-Market Goods and Services" expand upon the simple model indicated above. For instance, cost estimates of transportation require a complex set of assumptions and data. It is assumed in the travel cost technique that recreation users do not allocate the fixed costs of vehicles and equipment to a specific trip. To do so would overstate utility. The preferable measurement of explicit costs is variable costs which may only be vehicle-operating costs for short trips. An implicit cost is travel time for vehicle occupants. This cost has generally been a crude measure and sometimes presumed the same for all travelers. The byway study will seek demographic information on age and occupation of all automobile occupants in order to refine the opportunity cost of travelers. This refinement of the model should eliminate some of the problems of multicollinearity of time costs and vehicle-operating costs experienced in prior studies.

We must also determine whether use of the byways replaces at-home activities or is an excursion that substitutes for a drive to an alternative site. If others roads are used less for recreational driving as a consequence of newly publicized byways, the alternatives will lose value that must be subtracted from the value calculated for scenic byways.

The econometrics of demand estimation creates a number of issues. The set of questions asked of travelers is an aspect of model specification. In addition to questions, one must incorporate variables to recognize the impact on travel of items such as the season and daily weather conditions. The selection of the mathematical format is not straightforward. Indeed coefficients of determination (R^2) may provide a weak basis for choosing the format that yields defensible estimates of consumer surplus.

ON-SITE SURVEY

Chapter One describes the on-site survey. Noted briefly, here are some of the specific uses of survey responses for developing recreational demand. It must be known whether the drive along the byway is part of a longer, multi-day trip or the principal destination of a one-day trip. It would not be justified to attribute all costs of a multi-day trip to the byway. It must be known what alternative activities were foregone to drive the scenic byway. These responses are useful to estimate opportunity cost and losses in value to alternate sites because these losses are offset against the benefits of the scenic byway under study.

III. COSTS OF SCENIC BYWAYS

Each specific cost of scenic byways must be identified in terms of: (1) program, and (2) duration/time sequence such as illustrated in Matrix 1 on the following page.

To know the purpose and nature of the expenditure will place it within the overall program of furnishing scenic byway services to the public. If there are specific expenditures designed primarily for private sector development, these costs will be listed separately in Chapter One and do not here enter into benefit/cost analysis.

The specific costs have not at this point been determined. They depend upon plans of each state within the four-state region. In general, expenditures will probably fall into the following categories: (1) selection and marking of byways; (2) safety and amenities of byways; and (3) information and promotion.

Selection utilizes the work done by Bob L. Smith, Kansas State University, in conjunction with groups in each state that nominate scenic byways. Smith has documented scenic features of many of these roads. The states must then select the roads to be designated and marked as scenic byways. Costs of the latter, especially marking and signs, will be included in costs of subsequent economic analyses. A second category of costs will be expenditures by states to rectify roadway safety hazards which were identified by Smith. Also, states may choose to add historical signs, turnouts and other amenities for the convenience of recreational drivers. These costs will be included in subsequent analyses. Finally, the states will wish to provide information and promotion of newly designated byways. This may be as simple as

adding information to subsequent printing of existing brochures. On the other hand, a state may target scenic byways for an intensive promotional campaign. Costs for these expenditures have not yet been determined, but are expected to vary among the four states.

Not only must the nature and purpose of expenditures be known but their time sequence. There must be a way of comparing the sequence of costs with the sequence of benefits. One would expect substantial costs to occur in initial years (i.e., signs, road improvements, and publicity) and benefits to start small and increase over time with greater awareness of byways. If the time sequence of costs and benefits is known, then they can be compared at one time with present value analysis or annuitize costs to compare annual costs to annual benefits. The expected lifetime of capital investment such as road signs and physical improvements of the roads must be known along with the annual maintenance of these durable items. And estimates of increased maintenance costs that arise because of traffic attributable to additional recreational driving must be known.

The following matrix presents a simple outline of how costs will be arranged for benefit/cost estimates. For each of the categories noted below, there will be a number of subcategories with costs. Also there will be estimates of costs over a longer time span than indicated in the matrix.

MATRIX 1

Expenditures and Their Time Sequence

Categories of Expenditures	Time Sequence					
	Year 0	1	2	3	4	5
Selection and Marking						
Safety and Amenities of Byways						
Information and Promotion						

IV. COMPARISON OF BENEFITS AND COSTS

We will use two approaches to comparing benefits and costs: (1) present value of all future benefits and costs, and (2) comparison of annual benefits and costs which will require annuitization of long-lived investments. The analysis will generally use standard techniques of project analysis, except it will explicitly treat inflation which is sometimes ignored in benefit/cost studies. A list of references of benefit/cost analysis is included in the Reference section. Most of the references are standard texts on benefit/cost, though some focus on specific applications whose benefits are estimated similarly to the recreation benefits of byways.

V. REVENUES TO FINANCE SCENIC BYWAYS

Completion of a tax and revenue analysis must await an estimate of the impact of scenic byways on economic activity of the private sector. To the extent that scenic byways create a net increase in income taxes, sales taxes, and excise taxes--the program will generate its own funding. Justification for scenic byways does not depend on new revenues. If the program generates recreational benefits in excess of costs, the benefit/cost ratio may exceed that of existing programs and thereby justify reallocation of federal/state/local funds to the scenic byways program.

Edwin G. Olson, Kansas State University, has worked with state revenue departments on tax forecasting and will confer with state agency personnel and legislators regarding alternative programs to finance scenic byways. In future work on the scenic byways program, the section on financing will be expanded on the basis of consultation with state governments as well as estimates of private sector economic activity provided by Michael W. Babcock, Kansas State University.

CHAPTER THREE
SUMMARY AND RECOMMENDATIONS

No consensus has emerged in the professional literature regarding models designed to measure the economic impacts of scenic byways. This report suggests several alternative methodologies which:

(1) measure the direct economic impacts of a scenic byways program in the four-state region (e.g. enhanced sales of firms that provide goods and services to users); and

(2) measure the recreational benefits for users of the scenic byways.

The first section of this summary considers direct impacts. The impacts measured by the models are restricted to the direct expenditures of the additional motorists who use the scenic roads solely as a result of designation and advertising promotion. The economic impacts of the scenic roads program can be obtained by multiplying the change in the number of byways users by the expenditures of those users. Thus, suggested models are intended to answer the following two questions:

1. If a road is designated and promoted as a scenic byway, how many additional people will use it for recreational driving?

2. How much money will these additional motorists spend on goods and services as a result of their recreational driving?

I. ECONOMIC IMPACT MODELS

One model to address the first question is a time series regression model with the dependent variable measured as passenger car traffic counts linked to several explanatory variables such as population, personal income, and the price of gasoline. The model is initially estimated for the pre-designation period and extended into the post-designation period by adding a dummy variable to the equation. The dummy variable measures the increase in scenic road use directly attributable to the scenic roads program alone.

Another model to measure the increment in road use due to byway designation is the statistical time series approach, illustrated by the following equation:

$$\text{Scenic Road Use (SRU)} = T \bullet C \bullet S \bullet I$$

where	SRU	=	weekly, monthly, or quarterly passenger count on the scenic byway
	T	=	movement of the traffic counts over a long period
	C	=	movement of the traffic counts due to cyclical changes in the economy
	S	=	movement in the traffic counts due to predictable seasonal patterns
	I	=	movement in traffic counts that can not be attributed to the other three factors

Changes in the Irregular Component would measure the increase in scenic road use due to designation and promotion.

The increment in recreational driving due to a scenic roads program can also be measured by on-site surveys conducted both before and after designation. Surveys conducted before designation would include questions designed to discover the trip purpose of each travel party. In this way the amount of recreational driving can be separated from trips for other purposes. Surveys conducted after designation would contain questions designed to discover the number of people using the road for recreational driving solely as a result of designation and promotion.

The on-site survey approach can also be used to answer the second question posed above. That is, how much did each scenic byway user spend as a result of the recreational trip both in total and by expenditure category?

The on-site surveys could be supplemented by personal interviews of companies in the vicinity of scenic byways. These firms could be asked if scenic byways have affected their sales and employment and, if so, by how much.

II. ECONOMIC-DEMOGRAPHIC-RECREATIONAL PROFILE

In order to formulate and empirically measure models of scenic road demand, an economic-demographic-recreational profile was established for the study area. The profile contains the following categories:

- Population
- Employment
- Personal Income
- Passenger Car Registrations
- Recreational Facilities and Attractions

The principal findings of the profile are as follows.

POPULATION

- In the 1960-90 period, the population growth rates of the four states were less than the U.S. as a whole.
- The largest population centers in the region are St. Louis, Kansas City, and Omaha.
- Most of the population of the four states is concentrated in a few urbanized counties.
- In the 1980s, every state except Missouri in the study region had more county population losses than gains.
- The age distribution of the region's population reflects the aging of the U.S. population.
- The racial composition of the region's population is over 90% white.

The effect of these population trends on scenic road use can only be determined empirically. Slow population growth would likely result in less recreational driving. However the aging of the population would appear to be a positive factor since older people have more leisure time and discretionary income. The racial composition of the region's population may raise the demand for scenic roads since white family income is higher than non-white family income. The impact of the concentration of population depends on the location of scenic byways relative to these large urban areas.

EMPLOYMENT

- Of the four states in the study area, only Kansas achieved a rate of employment growth above that of the U.S. as a whole.

84

- In the 1970-88 period, the regional MSAs with the greatest employment growth were Springfield, Missouri; Wichita, Kansas; and Lincoln, Nebraska. The three MSAs with the least employment growth were St. Joseph, Missouri; Sioux City, Iowa; and Dubuque, Iowa.
- Employment in each of the four states has become concentrated in a small number of counties.
- In the 1980s, each state in the region except Missouri had more county employment losses than gains.
- The region has shifted from a goods producing to a service producing economy.
- Principal employers in the region's manufacturing sector are farm machinery, food products, airplane manufacturing, and automobile manufacturing.
- Major employers in the region's retail trade and service sectors are medical services, eating and drinking places, business services, and insurance.

While employment growth in the study region has been less than the national rate, regional employment gains have been relatively good. Thus it is unlikely that slower employment growth will curtail the use of scenic byways. The shift to a service producing economy may affect scenic road use through changes in relative wages. This is because the service industry is dominated by small, low wage firms as opposed to manufacturing which is mostly composed of larger, high wage firms.

PERSONAL INCOME
- In the 1970-88 period, personal income growth in the four-state region failed to keep pace with national growth.
- In 1988, per capita income of each of the four states was less than U.S. per capita income.
- Between 1970 and 1980, Kansas was the only one of the four states to achieve a higher growth rate of per capita personal income than the U.S. as a whole.
- Among the four states, Kansas had the highest 1988 per capita income. However the differences between states are not large.
- Because Missouri has the largest population of the four states, it also has the largest personal income.
- Personal income is concentrated in a few large urbanized counties.

If scenic roads are a normal good, sluggish income growth will have a negative effect on the use of scenic byways. The concentration of income may reduce the demand for scenic roads if they are located in areas that are remote form the large income centers. On the other hand, scenic drives are alternatives to costly vacations, and may increase if income should fall.

PASSENGER CAR REGISTRATIONS

- In the 1970-88 period, passenger car registration growth in the region did not match U.S. growth, probably due to lagging income growth.
- Passenger car registrations are heavily concentrated in the most populous counties of the four-state region.

The low growth rate of passenger car registrations is likely a result of slow population growth rather than a low demand for automobiles relative to the rest of the U.S.

RECREATIONAL FACILITIES AND ATTRACTIONS

- Attendance at Iowa state parks fell 10% between 1982 and 1989, but attendance growth varied widely among Iowa state parks.
- Iowa has four federal reservoirs and three national wildlife refuges.
- Attendance at the 21 Kansas state parks rose 23% in the 1980-1988 interval. Attendance growth varied greatly among Kansas state parks.
- Kansas has 40 fishing lakes and wildlife areas, 24 federal wildlife areas, and 11 state historical sites.
- Total attendance at six Nebraska state parks, eight state historical parks, and 34 state recreation areas leaped 62% in the 1980-89 period. Attendance growth varied widely among these Nebraska facilities.
- Nebraska is the only state in the region that has national monuments and national forests. The state also has three national wildlife refuges and many other attractions.
- Missouri has 47 state parks and 23 state historical sites.

In the 1980s, attendance at state parks and recreation areas increased in the four-state region. If this trend continues, it would have a positive effect on scenic road use, especially if the scenic roads passed near the most heavily attended and popular facilities.

III. RECREATIONAL BENEFITS

Economic impact models and the economic-demographic-recreational profile sections of this summary focused on techniques and data to measure the direct impacts of a scenic byways program on private sector expenditures and employment--the contents of Chapter One. The following comments summarize material in Chapter Two, valuation of recreational benefits.

Chapter Two indicates how to measure the recreational benefits of scenic byways. These benefits are economic in the sense that they are derived from demand functions, but the benefits do not accrue to a local or state economy via increased sales or increased employment, as do the economic impacts discussed in Chapter One. Rather, the benefits represent the value that recreational drivers place on enhanced or additional scenic byways. Benefits measured here are those which the government utilizes for benefit/cost studies that justify expenditures from tax revenue on parks and recreational services.

Costs of scenic byways are also included in this analysis so they can be compared with the dollar value of benefits. Specific cost figures will be obtained from state governments after the byways are selected. Costs for scenic byways are expected to fall into categories of safety, amenities and promotion (for example, road signs, historical markers, turnouts, caution signs, information packets and maps).

Because the program will be financed out of taxes, the increase in revenue generated by economic activity of new users of scenic byways will need to be estimated. For instance, what changes could be expected in the sales tax, income tax, and gasoline excise tax that could provide funding for the program? Will this revenue be sufficient to finance the cost of scenic byways and their promotion? Inquiry into the tax base requires an analysis of economic development within the private sector, which in turn requires estimates of changes in sales and employment derived from techniques discussed in Chapter One. Results of the private sector analysis can be used to estimate the impact of scenic byways on tax revenues.

In summary, Chapter Two is a public sector analysis that considers: (1) recreational benefits for the general public, (2) government expenditures to provide the program, and (3) the taxes that finance the program. However, the chapter does not provide specific data or conclusions for the scenic byway programs in the four-state region of Iowa, Kansas, Missouri

and Nebraska as specific byways have not yet been selected. Therefore, the chapter explains how to determine recreational value and cost once the byways have been identified by the states.

Chapter Two also discusses four alternative models, which are referenced in an extended bibliography at the end of the Reference section. The model that has tentatively been identified as appropriate for estimating the recreational value of byways is the travel cost model. Data requirements for that model overlap the data utilized to measure direct economic impacts of the byways program. Moreover, the data requirements correspond well with data collected by transportation agencies on origin/destination surveys. Demographic data required for the travel cost model can be largely determined by observations from those who conduct on-site surveys, and if necessary supplemented by mail questionnaires sent to drivers whose auto licenses are noted by the survey team.

The travel cost method essentially estimates the value of recreation by comparing the costs and numbers of visitors from locations at varying distances from the site of the scenic byway. Those who reside near the scenic byway are presumed to receive recreational value equivalent to those who travel long distances (spending more time and auto operating costs). Thus, they receive a surplus value over and above what they spend to make the short trip to the location of the scenic byway. All visitors except those at the maximum distance from which people travel to the scenic byway (a distance determined after origin/destination data are collected) will receive value from recreation in excess of personal cost of the drive. The sum of these excess or surplus values is the recreational benefit of the scenic byway.

In addition to valuation of benefits, Chapter Two indicates how data on the cost of developing the byways are obtained--principally from state governments--and compared to recreational benefits. Finally, the report addresses financing of byway projects with tax revenues. Specific results of these financial analyses must await selection of scenic roadways by the four states. Collection of data will occur only after such selection.

IV. RECOMMENDATIONS

■ Measure economic impacts, benefits and costs of scenic byways for the four-state region with the statistical-economic models developed in this report.

■ Conduct surveys of scenic byways users both before and after designation and advertising promotion in order to measure accurately the impacts of the scenic roads program.

■ Refine a survey instrument for scenic byway users so that it measures accurately trip purposes and expenditures with a minimum amount of time for each interview.

■ Repeat surveys of scenic byway users and state agencies at regular intervals after designation to measure the time path of economic impacts, benefits and costs.

■ Disseminate the models and data developed in this report to interested parties such as state departments of transportation and commerce, the U.S. Department of Transportation, auto clubs, tourism associations, and university researchers.

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113

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116

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