COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
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August 9, 1971

H-2-62

Memorandum to: J. R. Harbison
State Highway Engineer
Chairman, Research Committee

Subject: Planning Research Report, "Influence of Recreational Areas on the Functional Service of Highways"; HPR - 1 (6), Part I, Vol. 4, Chapter 9

The report enclosed herewith issued from mutual interests of the Divisions of Planning and Research in regard to traffic forecasting and predictive equations or models.

The objective of this study was to obtain sufficient data and therefrom derive a mathematical model specifically for traffic generated by recreational facilities. The data comprises records – from which inferences may be drawn concerning attributes of a facility in relationship to visitation. The subset is considered a pure element which has been uniquely isolated as a constituent part of the statewide traffic model now being developed by the Division of Planning.

Respectfully submitted,

Jas. H. Havens
Director of Research

Attachment
cc's: Research Committee
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JHH:sg

Research Report
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INFLUENCE OF RECREATIONAL AREAS ON THE FUNCTIONAL SERVICE OF HIGHWAYS

by

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in cooperation with the
FEDERAL HIGHWAY ADMINISTRATION
U.S. Department of Transportation

August 1971

ACKNOWLEDGMENTS

An expression of sincere appreciation is extended to those individuals and agencies without whose contributions the comprehensive coverage from the O-D survey could not have been attained. Among those contributing were Mr. Ron Moubray of the Kentucky Department of Parks, Mr. Howard Lawson of the Kentucky Program Development Office, Mr. Robert Howes of the TVA Land Between the Lakes, Mr. J. Porter Taylor of the TVA Knoxville District, Major Nathaniel Fox of the Corps of Engineers' Huntington District, Mr. Leon Cambre of the Daniel Boone National Forest, and Mr. Robert Bendt of the Mammoth Cave National Park. The contributions and cooperation from Spindletop Research are also greatly appreciated.

INTRODUCTION

Purpose and Scope

Development of outdoor recreational facilities in Kentucky has generally been in predominately rural areas. Access to these areas from the primary highway network is often provided by existing low-standard local roads. The recreational travel demand often exceeds the design volumes of these local roads or the volumes that can be accommodated at reasonable levels of service. Such travel demand also constitutes a significant portion of the total demand on the rural primary network, particularly during the peak weekend periods.

Many large reservoirs in Kentucky have generated extensive developments of recreational facilities in the surrounding areas. Highways which have been displaced by reservoir developments are usually relocated and built to the same standards as the original facilities. Such practices and policies, which are followed by many city, state, and federal agencies, neglect the certain increase in demand for recreational activity and ignore the impact of recreational areas on the functional services to be provided.

The purpose of this study was to investigate the nature of travel demand to outdoor recreational facilities in Kentucky and to develop a model for predicting this demand for use in plannng and design of recreational and other routes and in evaluating the traffic-service impacts of proposed new recreational facilities.

The Nature of Travel Demand and Its Impact on Highway Facilities

Since outdoor recreation is presently a significant part of the American way of life, it appears unlikely that the future will bring drastic changes which might decrease the demand for this form of leisure. Most will agree that in the near future there will be more people, more income, more leisure, more travel, and more of everything which generally increases the demand for additional outdoor recreational facilities and the travel to existing facilities. Of prime importance among the factors affecting outdoor recreation are population trends. The continued growth in population will create serious demand problems in recreation as well as other service-type activities. But continued growth is not the only kind of population change that has an impact on the recreational situation. People are becoming better educated and healthier. Shifts are taking place in the age distribution of the population and in the location of their places of residence. The trend in movement from rural to urban areas is now significantly influencing planning and design of outdoor recreational areas; and, as the spatial separation between the location of residence and the location of recreational activities increases, the nature and characteristics of travel demand will change. The desire of the city-dweller to get away from the urban environment is certainly a factor contributing to the increased demand for the outdoor recreational experience.

Another important change is the increase in leisure time. The average workweek has decreased from about 70 hours in 1850 to about 40 hours today, with expectations of a 32 hour workweek by 2000 *(1)*. There are also indications that the four-day workweek is now becoming attractive to more and more companies and employers. Annual vacations are now the rule for workers in nearly all occupations, and the average length of such vacations is increasing. Retirement years are also increasing due to the more liberal retirement programs and the increasing life expectancy. Much of the increased leisure time will be devoted to recreation; at least one-fifth of all leisure time is now spent in some form of outdoor recreation, and at least this much should be expected in the future *(1)*.

Incomes are also increasing. With a projected annual growth rate in the gross national product of 3.5 percent, disposable consumer income is expected to rise from $354 billion in 1960 to $1,437 billion by 2000 *(1)*. With this new affluence, many more Americans will be able to afford the kinds of activities which they would like very much to engage in, but which their limited incomes will not permit. It has been suggested *(1)* that *"As the economic base widens, many of the present differences between groups and the kinds of recreation they seek will lessen. There will be a shift in the occupational composition of the population, with more people in the professional, technical, and white collar categories."* This is likely to bring about an increase in outdoor activity because of the nature of these occupations and the feeling of confinement which begins to prevail in that type of work.

The population is also becoming more mobile. With the present predominate mode of outdoor recreational travel being the passenger car, usually 90 percent or more according to Clawson and Knetsch *(2)*, it appears that a projected increase of 80 percent in the number of registered vehicles from 1959 to 1976 will bring about a proportional increase in outdoor recreational travel *(1)*. Highway departments are probably not prepared to cope with the overall problem and almost certainly not the oftentimes neglected area of outdoor recreational travel. It is unlikely that new modes of transportation will significantly affect the recreational travel burden that is now being imposed on our highways. Therefore, future planning and design of rural highways should consider the influence of outdoor recreational areas and incorporate modifications as necessary to accommodate the recreationists.

It is clearly evident that increases in population, income, leisure time, and travel will bring about a demand for more outdoor recreational travel. Changes in these factors as predicted by the Outdoor Recreation Resources Review Committee are summarized in Figure 1 *(3)*.

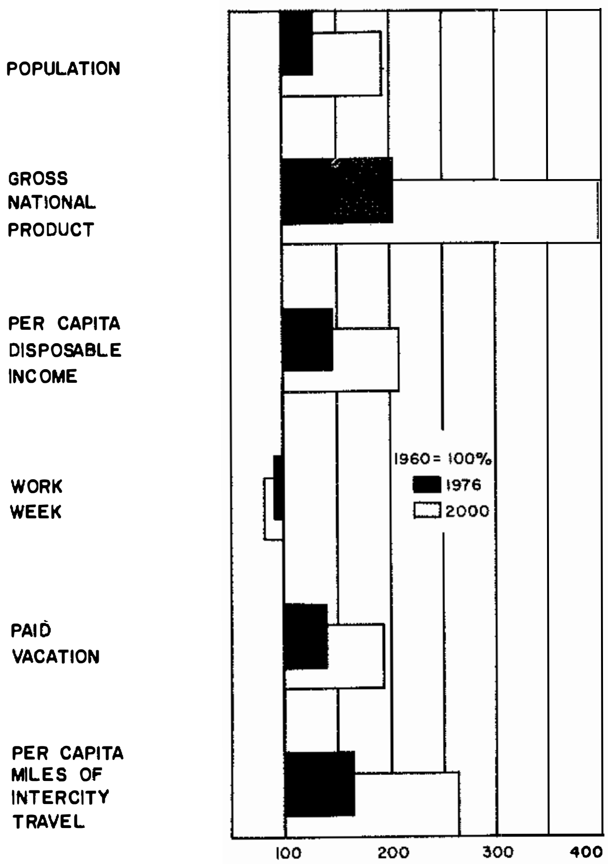

Figure 1. Estimated Changes in Population, Income, Leisure, and Travel for the Years 1976 and 2000. (Ref. 7)

Highways and Recreation

Historically, an improvement in transportation has led to an increase in recreational activity, while an increase in recreational demand has often put a major strain on the transportation system. Clawson and Knetsch *(2)* discuss three general situations in which the effect of outdoor recreational demand upon highway facilities is felt. First, the existence of an attractive outdoor recreational area requires the provision of local access roads. The required number and nature of such roads vary greatly from one recreational area to another depending upon such factors as the availability of construction funds, estimates of potential travel demand, and environmental aspects. Certainly the structural and geometric designs must recognize the nature of the types of vehicles that are peculiar to recreational travel. Another of the special problems in designing and constructing an access road to a recreational area is the preservation of natural scenic beauties which constitute in part the attraction of the area.

Second, recreational travel of all types constitutes an important part of the total traffic volumes on the major highways of a state. In many instances, the volume of recreational traffic may be so large as to require highways of improved design and capacity. Peak volumes for most rural routes now occur on the weekend, with a large percentage of this travel for recreational purposes. Present weekly distributions of traffic volumes on two rural routes in Kentucky are shown in Figure 2. Often the recreational traveler's impression of an area or state, and his desire to return, is greatly affected by the type and condition of the route to and from the recreational area. Recreation as a demand factor is a definite consideration, and for particular roads the major consideration, in planning state highway improvements.

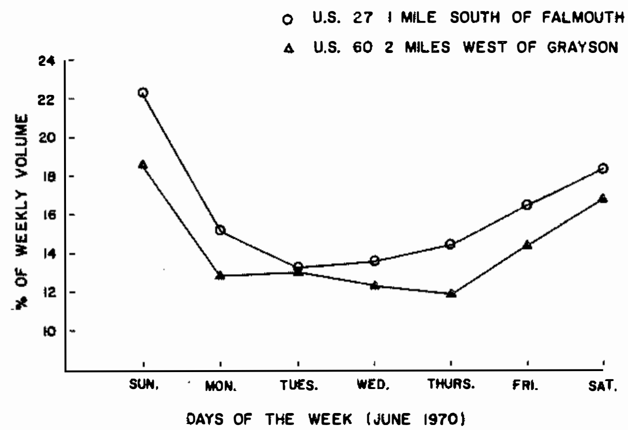

Figure 2. Weekly Distribution of Traffic Volume on Rural Routes in Kentucky

Third, recreational travel has a great effect on traffic flow on arterials leading out of and back into major urban centers. In many urban areas, the desire to seek weekend outdoor recreational experience brings about a Friday afternoon, Saturday, and Sunday rush to leave the city, and a late Sunday and early Monday rush to get back into the city.

According to Clawson and Knetsch *(2)*, travel to and from the recreational area make up two of the five major phases of the outdoor recreational experience. The other three are anticipation of the experience, on-site activities, and recollection of the experience. Since a great deal of the outdoor recreational experience is spent in travel to and from the recreational area and in actual recreational sight-seeing, it would appear that highway planning agencies might properly take advantage of the relationship between transportation and recreation to improve both.

Review of the Literature

Since the primary purpose of this study was to model recreational travel demand, the literature review concentrated on this aspect of the problem. One of the first tasks to be undertaken was to identify the factors which are thought to influence the demand for outdoor recreational travel. The results of this effort are summarized in Table 1. Here the influential factors are classified into five main categories: 1) participant or origin area characteristics (socio-economic characteristics of populace); 2) recreational area characteristics; 3) price of recreational experience (including monetary and non-monetary travel costs and usage fees); 4) time characteristics (primarily seasonal and holiday effects); and 5) miscellaneous characteristics. This list is rather encompassing and it is obvious that any single modeling effort can possibly consider only a limited number of these factors.

TABLE I

FACTORS INFLUENCING THE DEMAND FOR OUTDOOR RECREATIONAL TRAVEL

A. Participant or Origin Area Characteristics
  1. Participant
    a. Family Characteristics
      (1) Income of head of family
      (2) Level of education of head of family
      (3) Occupation of head of family
      (4) Length of paid vacation of head of family
      (5) Race
      (6) National origin
      (7) Number of automobiles owned
    b. Individual Characteristics
      (1) Total leisure time
      (2) Age
      (3) Marital status
  2. Origin Area
    a. Population
    b. Degree of urbanization (proportion urban, rural, and rural non-farm)
    c. Median family income
    d. Median educational level
    e. Percent of blue or white-collar workers
    f. Automobile ownership (per capita ownership, total registration, or percentages of families with 0, 1, 2, and 3 or more automobiles)
    g. Median property value
    h. Median age
    i. Proportion of private, government, and/or self employment
    j. Nativity ratio (proportion of population foreign-born or native of foreign or mixed parentage)
    k. Race ratio (proportion of population non-white)
    l. Residential density.

B. Recreation Area Characteristics
  1. Water-oriented facilities
    a. Lake
      (1) Total acres
      (2) Water level
      (3) Acres for fishing
      (4) Acres for water skiing
      (5) Acres for sail boating
      (6) Length and/or acres of beach
      (7) Swimming areas
      (8) Number of boat launching ramps
      (9) Number of rental boats
      (10) Water quality (pollution)
      (11) Number of open slips
      (12) Number of closed slips
      (13) Seasonal variation in surface area and level
    b. Swimming Pools
      (1) Size
      (2) Availability of bathhouse
  2. Intensive-use Facilities
    a. Number of golf holes
    b. Area available for field sports
    c. Number of tennis courts
    d. Number and types of play grounds
    e. Availability of shooting range
    f. Availability of sky lift
    g. Availability of amusement park
    h. Availability of skating rink
    i. Availability of riding stables
  3. Acreage
    a. Total undeveloped
    b. Total developed
    c. Total water
  4. Non-Intensive-Use Facilities
    a. Trails and paths
      (1) Miles of bicycling paths
      (2) Miles of hiking and walking paths
      (3) Miles of horseback-riding paths
    b. Area available for hunting
  5. Eating Facilities
    a. Restaurant (number of seats)
    b. Concessions
    c. Picnicking
      (1) Number of tables or area available
      (2) Number or area of shelters
      (3) Availability of drinking water
    d. Distance to nearest inn or store
  6. Overnight Accommodations
    a. Camping
      (1) Number of sites and/or acres
      (2) Availability of bathhouse
      (3) Availability of flush toilets
      (4) Availability of electricity
      (5) Availability of laundry facilities
      (6) Availability of firewood
      (7) Availability of drinking water
    b. Other
      (1) Number of cottages
      (2) Number of lodge rooms
      (3) Number of motel rooms
  7. Scenic, Historic, and/or Cultural Attractions
  8. Available Activities
    a. Wildlife exhibits
    b. Naturalist service
    c. Number of drama or concert seats
  9. Other
    a. Availability of airport
    b. Mean temperatures
    c. Average precipitation
    d. Capitol investment in recreation facilities

C. Price of Recreation Experience (monetary and non-monetary)
  1. Spatial Separation Characteristics
    a. Travel route quality
    b. Travel time
    c. Out-of-pocket travel costs
    d. Distance
      (1) Air line
      (2) Road
      (3) Other
  2. Charges for Use of Recreational Facilities

D. Time Characteristics
  1. Holidays
  2. Cyclic conditions
    a. Season
    b. Month
    c. Day of Week
    d. Time of Day

E. Miscellaneous Characteristics
  1. Location within the United States (regional preferences)
  2. Competition from other forms of recreation or other recreational areas
  3. Competition from other origin areas for the use of limited facilities.

Various modeling techniques that have been used for predicting travel demand include multiple regression models, gravity models, opportunity models, and systems theory models. One of the most recent studies, by Pankey and Johnston *(4)*, generalizes the "Clawson-Hotelling" model for the estimation of demand at selected reservoirs in California. This model defines concentric origin zones around the recreational facility for which demand is to be estimated and assumes that the travel costs from within a zone represent the price of the recreational experience for users from that zone. The concentric zones are so constructed that the travel costs to the recreational area from any point within the zone are approximately equal. Alternative models using county of origin zones rather than concentric zones were also developed. Following an analysis of the two techniques, it was concluded that neither was superior in predictive ability but that county zones were easier to work with. Socio-economic variables relating to income, age, education, urbanization, and population of the zones were evaluated in the regression models along with factors defining the quality and quantity of facilities available at the reservoir. All of these variables were introduced into multiple linear regression models in an attempt to predict recreational usage from origin zones to reservoirs.

Another study, by Matthias and Grecco *(5)*, simplifies the procedure for estimating recreational travel to multi-purpose reservoirs. Their non-linear regression model uses only road distance, county population, and the influence of other similar facilities as the parameters affecting attendance. Three Indiana state parks were used to develop one model to predict trips from Indiana counties to the closest park and a second model to predict trips where there was an intervening park between the origin area and the park in question.

A study by Tussey *(6)* at Rough River and Jenny Wiley State Parks in Kentucky suggested that factors other than population and distance were of minor significance for the purpose of visitation predictions. This conclusion was reached after an attempt was made to incorporate a set of socio-economic variables and a factor explaining the effect of competing recreational areas into the multiple linear regression prediction equation.

Schulman *(7)* conducted an extensive survey of Indiana state parks for the purpose of developing prediction and distribution models. Data from 20 state parks were used in a multiple linear regression model to predict total trips to a park. This model relied on the assumption that the total number of trips attracted to a recreational area was some function of its size, facilities, activities, and adjacent population. Forty-eight variables were evaluated and 19 were finally used in the regression equation. The gravity model was used to distribute the predicted number of attracted recreational trips from the park to their counties of origin.

Ungar *(8)* used Schulman's *(7)* data to develop linear and non-linear regression equations to estimate total visitation from all origins and derived three different forms of the gravity model to reproduce the distribution of trips from each of the origin areas. Smith and Landman *(9)*, in a study of visitation to nine federal reservoirs in Kansas and Nebraska, used procedures somewhat similar to those of Schulman *(7)*. Linear regression equations based upon socio-economic variables describing the origin zone and characteristics of the reservoir recreational area were developed to predict the production of county trip-ends and reservoir trip-ends. The gravity model and opportunity model were used to reproduce trip-distribution from counties to reservoirs.

Other studies by Crevo *(10)* and Thompson *(11)* have employed various forms of the gravity model for distribution of trips from origin zone to recreational area. Crevo used multiple linear regression, based on travel time factors, car occupancy, car ownership, and population density, to predict total trips to five state parks in Connecticut. The gravity model was then used to distribute trips from counties of origin to state parks. Thompson, in a study of Ontario parks, attempted to fit data to a model which incorporated as its variables the population of the origin city, park capacity, and park to city distance in miles. This model predicted the number of camping trips from cities in Ontario to parks having camping facilities.

Evaluation of models analyzing patterns of recreational traffic have been reported by Thompson *(11)* and Ellis and Van Doren *(12)*. The latter attempted to duplicate the flow of traffic in the Michigan park system by testing the gravity model and the systems theory model. Ellis and Van Doren concluded that the lesser sophistication of the gravity model makes it more practical for general use but that the systems theory model gave somewhat better results for their data. Thompson also concluded that the systems theory model has some advantages over both the gravity and opportunity models. Despite indications of increasing confidence in the systems theory model, it appears that much reliance is still being placed on regression, gravity, and opportunity models.

The modeling efforts summarized herein indicate that four general types (regression, gravity, opportunity, and systems theory models) have been used effectively. There appears to be no definitive preference for any model type, and any can yield satisfactory results if applied correctly. In this regard, it is necessary to note a particular difficulty that may be encountered with the application of regression models. Regression analyses incorporating large numbers of independent variables do not always yield logical results, and there is sometimes a tendency to overemphasize the importance of variables of less consequence. This was evidenced in the study by Ungar *(8)* when a non-linear regression analysis indicated that the number of picnic tables was the single best predictor of the number of visits to state parks in Indiana.

In reviewing the heterogeneity of the many factors considered relevant, it is apparent that careful choices must be made in identifying suitable independent variables. Rational selection must recognize the possible causative effects of the variables and must give preference to those which are quantifiable and predictable. It is likely that the significance of any particular independent variable will vary from one recreational area to another.

Finally, it must be recognized that most prior studies have been severely constrained in one or more ways -- including a limited data base, a limited number of recreational areas, or a limited number of activity types. Most have attempted to predict annual visitation, a quantity which has meaning for the economic analysis of recreational facilities but which by itself is not particularly useful for evaluating the influence of such travel on the planning and design of highway systems.

SURVEY PROCEDURES

Data Collection

In order to predict travel demand, it is necessary to have a rather comprehensive data base which includes primarily the flows from each origin area to each recreational area. An examination of existing data bases for recreational travel in Kentucky revealed that there was no existing data base that was complete, accurate, consistent, and readily available. It was necessary, therefore, to include as a part of this study an extensive data collection program. A license-plate, origin-destination (O-D) survey was selected. This was supplemented with continuous automatic traffic recorders at 10 sites thought to be representative of Kentucky outdoor recreational areas. Before the surveys could be conducted, it was necessary to select the recreational areas and sites and to delineate the origin

Selection of Recreational Areas

The 42 recreational areas selected are thought to represent the major part of outdoor recreational activity in Kentucky. Specific areas were chosen to represent: 1) a variety of facility types from small fishing lakes to major national scenic attractions, 2) a wide geographic distribution from the western tip of the state to its easternmost section, and 3) a wide variety of operating agencies including private operations, Department of Parks, Department of Natural Resources, Forest Service, National Park Service, TVA, and the Corps of Engineers. Figure 3 shows the geographic distribution of the 42 areas; they are identified by name in Table 2 together with the numbers of the specific survey sites included in each area.

For the most part, each recreational area consists of a continuous land and often water area and is readily identifiable by the name which is attached thereto. This was felt to be extremely important since the recreational attractiveness and reputation of an area is usually a function of the totality of the facilities available there rather than any individual single attraction. An example is the Kentucky Lake-Barkley Lake complex, which has several remarkable individual facilities. Yet these single facilities would lose much of their appeal if it were not for the atmosphere and overall attractiveness created by the entire recreational complex.

TABLE 2

IDENTIFICATION OF RECREATIONAL AREAS AND SURVEY SITES WITHIN EACH AREA

AREA NUMBER	RECREATIONAL AREA	SITES WITHIN AREA
1	Columbus Belmunt State Park	124
2	Kentucky Lake - Barkley Lake[a]	28-47, 54-75, 155, 164-167, 170, 171
3	Lake Beshear - Pennyrile Forest	110, 134
4	Audubon State Park	117
5	Lake Malone State Park	128, 129, 160
6	Rough River Reservoir	86-89
7	Doe Valley Lake	143
8	Otter Creek Park	142
9	Nolin Reservuir	90-94
10	Mammoth Cave National Park	146
11	Shanty Hollow Lake	144
12	Barren River Reservoir	81-85
13	My Old Kentucky Home State Park	132, 168
14	Green River Reservoir	95-99
15	Dale Hollow Reservoir	23, 24, 26, 27
16	Lake Cumberland	1-12, 14-19, 21, 22, 159, 162, 905
17	Natural Arch and Rockcastle Areas	25, 145
18	Cumberland Falls State Park	112, 113, 172-174
19	Wilgreen Lake	141
20	Herrington Lake	147, 149-151, 153, 154
21	Old Fort Harrod State Park	133
22	Beaver Lake	140
23	Guist Creek Lake	135
24	General Butler State Park	118-119
25	Elmer Davis Lake	139
26	Lake Boltz	137
27	Big Bone Lick State Park	120-121
28	Williamstown Lake	136
29	Blue Licks Battlefield State Park	122
30	Fort Bounesboro State Park	123
31	Levi Jackson State Park	130-131
32	Pine Mountain State Park	114-115
33	Cumberland Gap National Park	175-176
34	Natural Bridge State Park	107-109
35	Sky Bridge and Koomer Ridge	13, 20
36	Carter Caves State Park[b]	163
37	Greenbo Lake State Park	126
38	Grayson Reservoir	158, 103-104
39	Buckhorn Lake	76-79, 976
40	Jenny Wiley State Park	100, 156
41	Kingdom Come State Park	127
42	Fishtrap Reservoir	105

[a]Sites 48-53, 80, 157, and 169 were duplicate survey sites at Kenlake State Park
[b]Sites 116 and 152 were duplicate survey sites at Carter Caves State Park

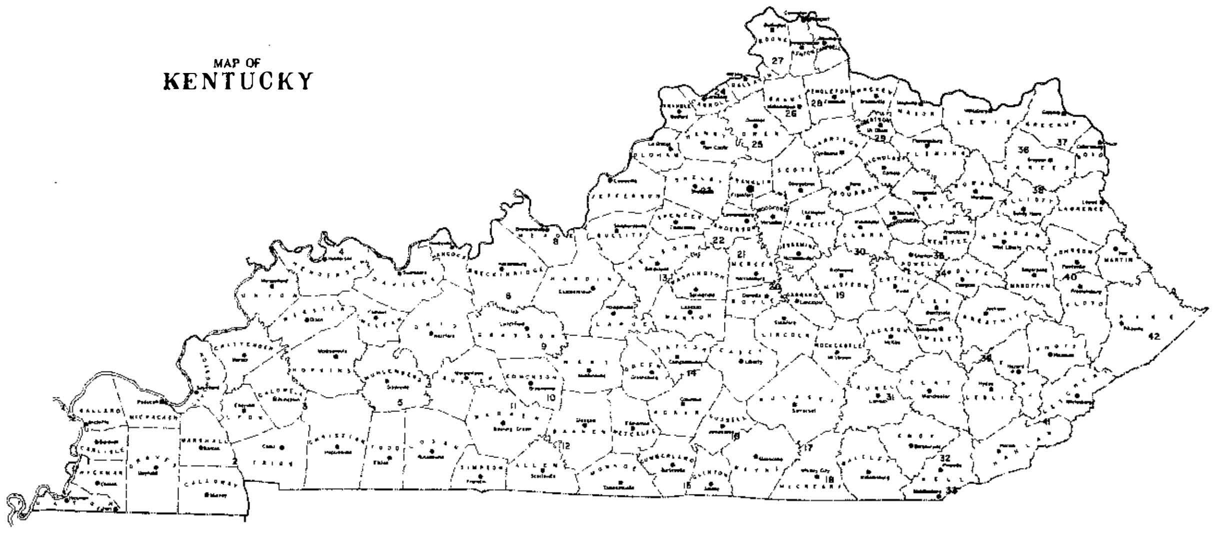

Figure 3. Location of the 42 Recreational Areas

Selection of Survey Sites

Specific survey sites were identified within each of the recreational areas. A total of 170 sites were chosen as the largest and most highly developed areas which contributed most significantly to the overall recreational travel attraction. There were 65 state park sites selected as major recreational attractors along with 64 sites on TVA-administered Kentucky Lake and Land Between the Lakes, three sites at national parks, four sites in the Daniel Boone National Forest, and 16 other miscellaneous recreational facilities. When recreational areas had more than one entrance or exit, such as most of the state parks, then the survey was scheduled so that all entering and exiting points were monitored on the same day. Sites were selected such that all traffic arriving or departing from the recreational area would be recorded.

All participating or administering agencies were asked to suggest appropriate locations at each of the sites under their jurisdiction where the maximum volume of traffic could be recorded. Manpower availability had to be considered and therefore only those sites meeting feasibility requirements were surveyed. With few exceptions, all major recreational areas in Kentucky were included. APPENDIX A included name, location, and date surveyed for each of the 170 sites. Two recreational areas not included were Kincaid Lake State Park where the survey data was lost and Lincoln Homestead State Park which had so many entry points that the personnel required could not be justified.

Recreational areas range from those including only one survey site, such as Carter Caves State Park, to the Kentucky-Barkley Lake complex which includes a total of 58 survey sites.

Delineation of Origin Zones

Since the O-D survey was of the license-plate type, a prime consideration in selecting the origin zones was the type of information readily available from the license plates. This included state and, in some cases, county of origin data. County of origin data was desired for those states contributing most to the total recreational visitation in Kentucky. These states were selected from estimates of the number of overnight visitors to Kentucky state parks *(13)*. They included Illinois, Indiana, Kentucky, Michigan, Missouri, Ohio, Tennessee, and West Virginia. Unfortunately, Illinois, Missouri, and West Virginia had to be ommitted from this list since these states do not have a license numbering scheme such that observed license numbers could be matched with appropriate counties.

The 190 origin zones that were finally selected consist of the 120 Kentucky counties, 10 zones in Ohio, 8 zones in Indiana, 6 zones in Tennessee, 3 zones in Michigan, and one zone for each of the remaining 43 continental states. Kentucky zones are shown in Figure 4 and out-of-state zones in Figure 5. Because of the expected high percentage of traffic from within Kentucky, it was felt that all 120 counties should be designated as origin zones. Criteria for the division of Ohio, Tennessee, Indiana, and Michigan into zones were based largely on geographical location with some consideration of the distribution of population. Zones of these four states were designated such that the size of the zone increased with increasing distance from Kentucky. Exceptions were considered necessary when large population centers such as Columbus, Ohio, and Indianapolis, Indiana, were encountered.

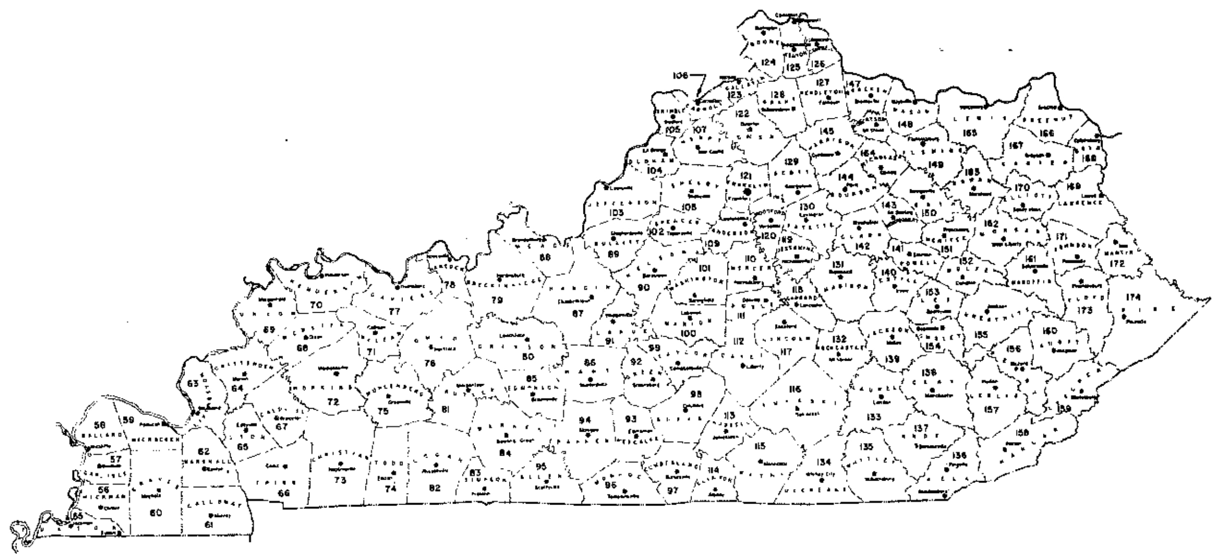

Figure 4. Location of Kentucky Origin Zones

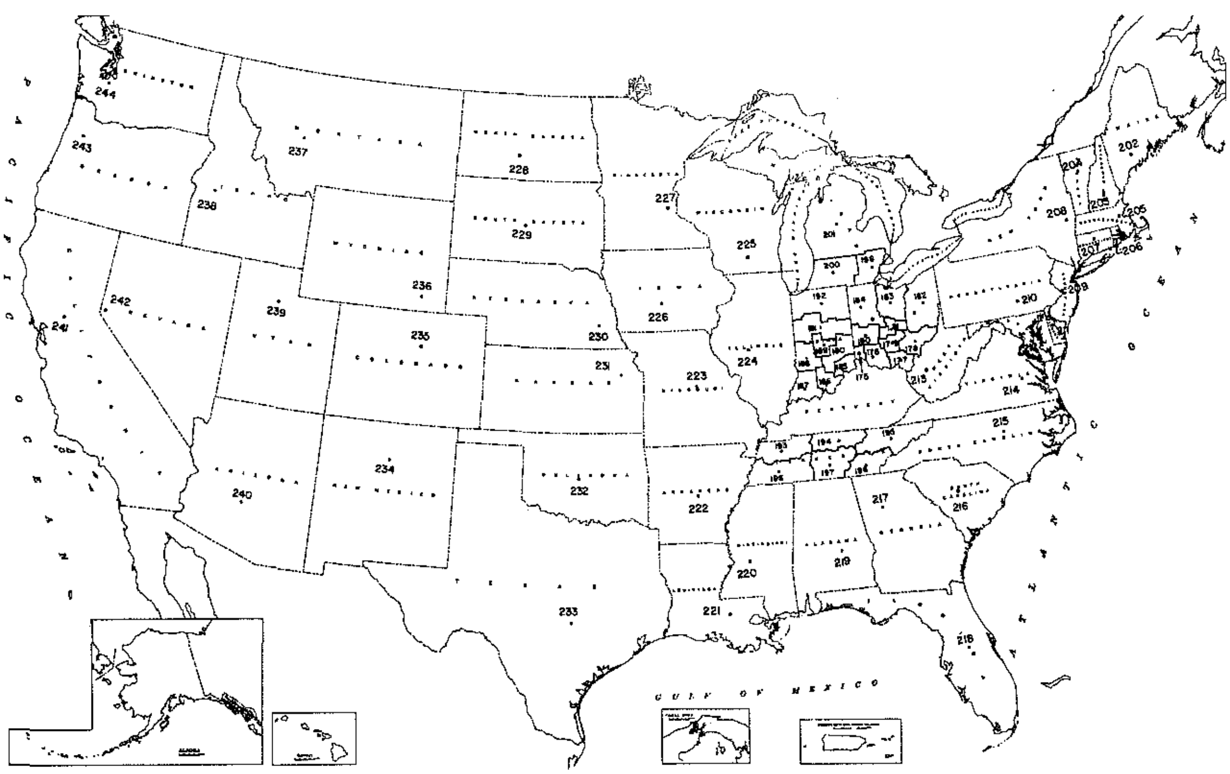

Figure 5. Location of Out-of-State Origin Zones

Origin-Destination Survey

Careful consideration was given to the type of O-D survey that could best satisfy the needs of the study. An interview-type survey always supplies the most accurate and most extensive data on origins, destinations, purposes of travel and so forth. Such surveys require, however, extensive manpower and it was soon obvious that the desired coverage of all major recreational areas in the state would not permit an interview survey. Post-card surveys were also considered but were discarded due to the necessity for stopping vehicles and anticipated difficulties in low-percentage returns, particularly for out-of-state visitors. A license-plate survey was finally selected as meeting the requirements of the study within the manpower constraints.

Survey schedules were planned in such a way as to cover as many recreational areas as possible through the utilization of all available personnel. Observations were made from strategic points where vehicles had to slow down because of some physical feature or roadway design. Some problems were encountered in attempting to conduct this type of license-plate O-D survey. Being unable to determine which vehicles made multiple trips into and out of the recreation area caused double counting in some situations. This was impossible to correct because the surveyors had been instructed to record only the number of vehicles when volumes became so high as to make it impossible to record license numbers and because allowances for short breaks at the end of each hour created lapses during which no data were recorded. Another problem was created by the fact that many vehicles have a location of registration different from the point of origin. Military bases and college campuses usually have a very large number of vehicles in this category which are nearly impossible to account for when the drivers are not interviewed. Regardless of these problems, results from this type of survey indicate that, considering the limited number of personnel available, this means of conducting origin-destination surveys produces excellent data on fairly low volume routes such as those leading to recreational areas. This was verified by the data from automatic traffic counters at 10 of the survey sites and the fact that the survey crews were able to record, with few exceptions, all necessary data on all vehicles

The origin-destination survey was conducted at recreational areas throughout Kentucky during the summer of 1970. The survey was made possible through coordinated efforts of the Kentucky Department of Highways, Kentucky Department of Parks, Tennessee Valley Authority, U.S. Army Corps of Engineers, U.S. Forest Service, Kentucky Department of Natural Resources, and the National Park Service. Personnel provided by these agencies made up the work force which conducted surveys at 170 sites on 11 Sundays between June 7 and August 23, excluding July 5. Only one survey was conducted at each of the sites, with the exception of Kenlake and Carter Caves State Parks, at which surveys were conducted during each of the three survey months.

The peak travel to most outdoor recreational facilities in Kentucky occurs on Sunday, excluding from consideration those periods influenced by holidays. It was decided, therefore, to conduct all surveys on Sundays and to concentrate modeling efforts on average, summer, sunny Sunday flows. It would have been desirable to include weekdays and Saturdays in the survey period, but this was prohibited by manpower limitations.

Surveys were conducted from 10:00 am to 8:00 pm by one to three persons, depending on the level of activity expected at that particular site. This time period was chosen for several reasons: it was felt that the bulk of the Sunday travel would occur during this period, the peak hour would most certainly fall during the period, many departures which had arrived on Friday and Saturday would be recorded, and the 10-hour time period was not considered to be excessive for the endurance of one survey crew. The data collected on each vehicle at each survey site included the direction of movement (arriving or departing), the vehicle type, the number of persons per vehicle, and the license plate identification. An example of the survey form is shown in Figure 6.

KENTUCKY DEPARTMENT OF HIGHWAYS
RECREATIONAL O-D SURVEY

Date: DAY | MO. | YR. [1 2 3 4 5 6]

Location: [7 8 9]

Weather: A/ [10]

Sheet Number: [11 12 13]

Survey Made By:

Hourly Total: [14 15 16 17]

Time: START [18 19 20 21] END [22 23 24 25]

FORM A

LINE NUMBER	ARRIVING 0	DEPARTING 1	VEHICLE CLASS B/	NUMBER OF PERSONS IN VEHICLE	LICENSE NUMBER OR COUNTY	OUT-OF-STATE ABBREVIATION	LINE NUMBER	ARRIVING 0	DEPARTING 1	VEHICLE CLASS B/	NUMBER OF PERSONS IN VEHICLE	LICENSE NUMBER OR COUNTY	OUT-OF-STATE ABBREVIATION	LINE NUMBER	ARRIVING 0	DEPARTING 1	VEHICLE CLASS B/	NUMBER OF PERSONS IN VEHICLE	LICENSE NUMBER OR COUNTY	OUT-OF-STATE ABBREVIATION
1							2							3						
4							5							6						
7							8							9						
10							11							12						
13							14							15						
16							17							18						
19							20							21						
22							23							24						
25							26							27						
28							29							30						
31							32							33						
34							35							36						
37							38							39						
40							41							42						
43							44							45						
46							47							48						
49							50							51						
52							53							54						
55							56							57						
58							59							60						
61							62							63						
64							65							66						
67							68							69						
26						47	26						47	26						47

CODES: A
1. CLEAR & SUNNY
2. CLOUDY & PARTLY SUNNY
3. CLOUDY & NO SUN
4. LIGHT RAIN
5. INTERMITTENT SHOWERS
6. HEAVY THUNDERSHOWERS

B/
1. TWO-AXLE VEHICLE
2. (1) WITH BOAT & TRAILER
3. BOAT ON CARTOP OR PICKUP
4. (1) WITH CAMPER TRAILER OR HOUSE TRAILER
5. CAMPER PICKUP OR SINGLE UNIT CAMPING VEHICLE
6. (5) WITH BOAT & TRAILER
7. MISCELLANEOUS

Figure 6. Recreational Origin-Destination Survey Form

Continuous Traffic Counts

Utilization of automatic traffic counters to gather additional volume data was considered an essential supplement to the O-D survey data. It was felt that continuous volume data would be very helpful in adjusting for visitation reductions brought about by rain and for the purpose of converting from 10-hour survey volumes to peak-hour and 24-hour totals. Another purpose of the continuous traffic counts was to analyze the time distribution of demand throughout the year.

Automatic traffic counters capable of recording hourly volumes were installed on two-lane two-way routes varying greatly in geometric design. Ten sites were selected as being representative of the 170 survey sites. Included as traffic counter locations were routes to a small fishing lake with limited facilities (Beaver Lake), four multiple-use water-oriented sites which were dispersed geographically throughout the state (Lake Cumberland, Rough River, Jenny Wiley, and Lake Barkley State Parks), three sites with heavy day-use and a significant amount of camping (Boonesborough, Audubon, and Levi Jackson State Parks), and two sites of great scenic beauty which are also intensively developed (Carter Caves State Park and Mammoth Cave National Park). Peak-hour volumes ranged from 50 at Beaver Lake to 800 at Mammoth Cave National Park.

DATA PREPARATION AND SUMMARIES

After the field surveys were completed and before the modeling task had begun, considerable time and effort were devoted to data preparation for use by the computer and to the production of relevant data summaries.

Data Processing

The survey form (Figure 6) was designed such that, following a minimum amount of checking and coding by hand in the office, the data could be directly keypunched from the survey form onto cards. The cards for each site were then edited by the computer and all errors were corrected manually. The corrected cards were then loaded onto magnetic tape; a final check was made by a second error edit program. All data manipulations and analyses were performed using the magnetic tape. APPENDIX B details the arrangement and format of the tape data.

Volume Adjustments

Final volumes to be used in the modeling were subjected to several adjustments. First, all counts reflecting only a partial hour of data were linearly projected to full-hour periods. Other more complicated means of projection were attempted but failed to produce results more accurate than the linear projections. Linear projections were also used to adjust for the very few situations in which the surveyor was absent from his post for a full hour. These two adjustments, considering both arriving and departing volumes, accounted for an increase of 12.48 percent from actual counted volumes to volumes adjusted to full-hour periods.

Other volume adjustments were also made for hours and days during which there was rain. It was felt that the general trend in rain-induced visitation reduction could be detected from the automatic-traffic-counter data. Volume data recorded by these counters on "good weather Sundays" was compared with survey data collected on "rainy Sundays' in order to derive a factor to make necessary adjustments. Corresponding to the weather codes on the survey form in Figure 6, the adjustment factors to be applied to the rainy weather volumes were a 10 percent increase for Weather Code 3 (cloudy and no sun), 25 percent for Code 4 (light rain), 75 percent for Code 5 (intermittent showers), and 100 percent for Code 6 (heavy thundershowers).

Sundays in the summer of 1970 were relatively free of rain at the survey sites located throughout Kentucky: rainy-day volume adjustments were necessary for only 9.2 percent of the total hours surveyed. These adjustments, including both arriving and departing volumes, account for an increase of 2.95 percent from volumes adjusted to full-hour periods to volumes adjusted to good weather and full-hour periods. All adjustments for each facility type are summarized in APPENDIX C.

As previously indicated, the use of automatic traffic counters is an asset to a study of this type. Ten-hour survey volumes appear to agree very closely to the 10-hour automatic traffic counter volumes at those sites where this comparison is possible. Plots of volume versus time from automatic traffic counter data also serve to verify Sunday as the peak day of the week. The plot for Carter Caves State Park is shown in Figure 7.

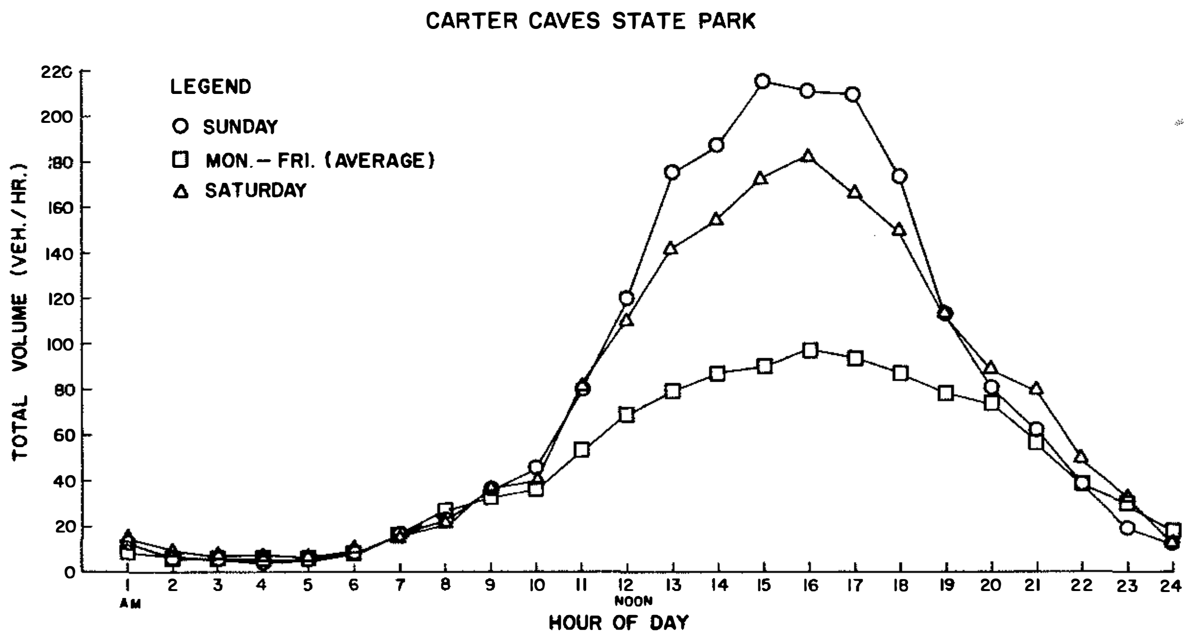

Figure 7. Distribution of Total Volume of Trips by Time of Day at Carter Caves State Park

Data Summaries

After making the necessary checks to assure that the data were correct, various summaries were performed through use of the IBM 360 computer at the University of Kentucky. The first summary, shown in APPENDIX C, included such information as the total number of vehicles, the number of vehicles by direction, vehicle-type classification, and average vehicle occupancy. All of these data were tabulated for each of the 50 states, Canada, and others. Also included are summaries categorized according to each of the administrating agencies, state parks, national parks, Corps of Engineers facilities, TVA (Kentucky Lake), TVA (Land Between the Lakes), Daniel Boone National Forest, and other areas.

Summaries containing much of the same information as the first summary type were also prepared for each site. This second summary differed from the first in that the trip origins were categorized by the eight highest visitation states for all recreational areas in Kentucky rather than including all 50 states. An example of this summary type is shown in APPENDIX D.

Much useful information has been made available through these data summaries. Having made 130,653 observations, which were adjusted for partial-hour counts and rainy weather to a total of 151,298, it was felt that the sample size was sufficiently large to assure an acceptable reliability in the data.

Results from data summaries indicated that 73.02 percent of all vehicles were from Kentucky. This was considerably higher than expected but could be attributed to the large number of local or day-use type facilities. For example, only 36.57 percent of the observed vehicles at the two national parks were from Kentucky, while this number was 85.21 percent at day-use-oriented Corps of Engineers areas.

It was also found that 96.26 percent of the observed trips were from Kentucky and seven nearby states. These seven states in the order of highest to lowest were Ohio, Indiana, Illinois, Tennessee, Michigan, Missouri, and West Virginia. Total vehicle trips to all recreational sites from Kentucky and each of these seven states are, respectively: 93,178; 9,834; 7,127; 4,604; 3,206; 1,751; 1,572; 1,560. The close-proximity-produced visitation is evidenced by the fact that all of these states border Kentucky with the exception of Michigan. High visitation from Michigan can probably be explained by the comparatively convenient accessibility via Interstate 75 and the close relationships maintained by native Kentuckians who have migrated to Michigan for employment.

Another factor was responsible for the high percentage of vehicles from Kentucky. First, the format of the survey was set up so that both arriving and departing vehicles were observed. This procedure, in addition to the 10 am to 8 pm survey time period, tended to bias the results by counting both arrivals and departures of the predominately Kentucky-based day-users. Other visitors, many of which were from outside Kentucky, were counted only once at the beginning or end of an extended visit.

Table 3 summarizes the means and variances of the vehicle occupancy rates (together with the number of vehicles which were classified by occupancy) from the eight highest visitation states. The total number of vehicles shown here is 93.53 percent of the actual number counted from these states because surveyors were unable to observe vehicle occupancies at all times.

In order to determine the significance of the difference in vehicle occupancy rates between Kentucky and each of the other seven primary states and also between facility types, significance tests were performed *(14)*. At the 5-percent significance level, it was determined that the average vehicle occupancy rate for Kentucky vehicles was different from each of the seven other states (for the composite of all facility types).

The second set of significance tests were performed on vehicle occupancy rates at each of the seven facility types. Tests at the 5-percent level of significance confirmed that there was no difference between rates at facilities administered by the Corps of Engineers, TVA (Kentucky Lake), and the other areas. It was also determined that there was no significant difference

TABLE 3

AVERAGE VEHICLE OCCUPANCIES, VARIANCES, AND NUMBER OF VEHICLES USED IN CALCULATION FOR THE PRIMARY STATES

	ORIGIN	STATE PARKS	NATIONAL PARKS	CORPS OF ENGINEERS	TVA KENTUCKY LAKE	TVA LAND BETWEEN THE LAKES	DANIEL BOONE NATIONAL FOREST	OTHER AREAS	TOTAL
Mean	Kentucky	3.02	3.22	2.84	2.70	3.18	3.44	2.82	2.94
	Ohio	3.47	3.37	3.11	3.69	3.61	3.33	3.00	3.37
	Indiana	3.34	3.56	3.08	3.23	3.35	3.63	3.16	3.31
	Illinois	3.68	3.57	3.43	3.39	3.54	---	3.38	3.57
	Tennessee	3.40	3.29	3.13	3.39	3.23	3.43	3.82	3.32
	Michigan	3.50	3.94	3.16	2.97	3.10	4.14	3.31	3.52
	Missouri	3.61	3.44	3.14	3.03	3.32	6.00	2.33	3.40
	West Virginia	3.60	3.40	3.30	2.86	2.00	6.00	2.40	3.61
	All Origins	3.13	3.36	2.88	2.87	3.26	3.41	2.87	3.06
Variance	Kentucky	3.10	2.79	2.35	2.23	2.39	3.46	2.08	2.75
	Ohio	2.52	1.99	2.25	4.57	2.38	2.79	1.76	2.44
	Indiana	2.95	2.15	2.40	2.31	2.47	2.36	1.78	2.75
	Illinois	6.00	1.96	3.19	3.28	11.34	---	2.57	5.02
	Tennessee	2.29	2.28	2.13	2.62	2.89	1.96	2.22	2.49
	Michigan	2.74	2.18	2.00	1.22	1.74	1.84	1.56	2.51
	Missouri	11.51	3.02	2.20	1.58	2.00	1.00	0.44	6.58
	West Virginia	2.71	2.44	2.60	0.98	---	0.00	0.44	2.69
	All Origins	3.28	2.38	2.37	2.50	3.29	3.28	2.04	2.90
Number of Vehicles	Kentucky	41950	1159	23114	4170	2116	525	3695	82608
	Ohio	4577	365	1850	117	143	156	291	8142
	Indiana	3821	363	1008	365	373	30	114	6518
	Illinois	2075	218	366	536	354	0	24	4369
	Tennessee	1132	219	202	147	593	7	28	2887
	Michigan	860	227	104	32	52	7	74	1446
	Missouri	713	18	110	181	73	2	9	1517
	West Virginia	795	30	99	7	1	2	10	1313
	All Origins	58771	3246	27649	5822	3969	773	4504	114887

between occupancy rates at national parks and Daniel Boone National Forest sites. At the other two facility types, state parks and TVA (Land Between the Lakes), a significant difference was noted between these two sets of vehicle occupancy rates.

Somewhat of a trend may be detected from these tests of significance. Average vehicle occupancy rates appear to be related both to distance traveled and facility type. The average vehicle occupancy of 3.06 from all origins to all recreation areas is somewhat smaller than the 3.5 figure now being used by the Kentucky Department of Parks *(13)*. This low value may also be attributed to the large number of Kentucky visitors at day-use type facilities. It would appear reasonable to assume that differences are caused by the fact that many out-of-state vehicles contain entire families on vacation as opposed to local vehicles whose users frequently travel in numbers less than the average family size of three to four people. Another observation of vehicle occupancy rates tends to indicate the possibility of further grouping: the lowest rates of 2.87 2.88 are at predominately water-oriented facilities, intermediate rates of 3.13 - 3.26 are at multiple-use facilities, and the highest rates of 3.36 - 3.41 are at the sight-seeing areas catering to families.

A weighted average vehicle occupancy for the seven primary states outside Kentucky was calculated to be 3.41 persons per vehicle. This is more in line with the presently used rates. A comprehensive recreational origin-destination license-plate survey has never been conducted in Kentucky and the average vehicle occupancy of 2.94 for Kentucky vehicles to all recreational areas was somewhat unexpected. Perhaps this characteristic of in-state recreational travel is not confined to Kentucky since it appears to be a function of the type and location of recreational areas with respect to population centers.

Other somewhat surprising results were obtained from the summary of vehicle classifications shown in Table 4. An overall percentage of passenger cars of 89.95 from all origins to all recreational areas is higher than the value presently being used by most agencies. Kentucky's passenger car percentage of 90.89 was not of major difference from that of the seven next highest visitation states, with values ranging from a high of 90.99 for Tennessee to a low of 85.74 for Michigan. These percentages are dependent upon facility type to some extent, but the apparent lack of difference between states tended to eliminate the day-use aspects as an influencing factor. This is to say that the facilities offered or the lack of facilities affects the car-driving recreationist in the same way regardless of his origin. Again, the nature and scope of the survey must be considered: this survey was unique in that its comprehensiveness permitted coverage of recreational areas heretofore omitted because of concentration on very intensively developed areas.

Percentages of other vehicle classifications indicate some differences by origin which could be investigated through reliance upon detailed socio-economic analysis, facility inventory, and location evaluation.

MODELING TRAFFIC FLOWS

Consideration was given to the use of regression, gravity, opportunity, and systems models for simulating and predicting recreational travel flow. Because of the constraints of this study, the ease of applying regression techniques, and the apparent successes of regression models *(4, 5, 6)*, it was soon decided to concentrate solely on regression techniques in the first phase of the study.

The first phase of the study deals with the development of a traffic simulation model for each of the 42 outdoor recreational areas. Phase II employs a cross-classification technique in addition to regression analyses in order to develop a general traffic prediction model for all major outdoor recreational areas in Kentucky.

TABLE 4

VEHICLE CLASSIFICATIONS FOR THE PRIMARY STATES

ORIGIN	CAR	CAR WITH BOAT AND TRAILER	CAR WITH BOAT ON TOP	CAR WITH CAMPER TRAILER	SINGLE UNIT CAMPER	SINGLE UNIT CAMPER WITH BOAT	OTHER
Kentucky	90.89	5.27	.40	.61	1.08	.37	1.38
Ohio	86.46	5.34	.63	3.35	2.62	.62	.97
Indiana	87.57	4.51	.62	2.38	3.15	.87	.90
Illinois	88.11	3.36	.88	3.20	2.72	.86	.88
Tennessee	90.99	3.44	.32	1.59	1.62	1.05	.99
Michigan	85.74	2.28	.70	6.08	3.33	.94	.94
Missouri	88.67	4.03	.77	2.82	2.63	.51	.58
West Virginia	88.51	2.31	.79	5.61	1.45	.46	.86
All Origins	89.95	4.91	.46	1.36	1.58	.48	1.26

Phase I: Recreational Area Simulation Models

Dependent Variable

As has been noted already, most prior studies of recreational travel have selected annual visitation as the demand variable to be simulated. This is logical since annual visitation is a most useful variable in assessing the economic consequences of a recreational investment. At the same time, annual visitation is in itself of limited utility in assessing the impact of recreational travel patterns on the planning, design, and operation of the supporting highway network. For this purpose, a more relevant demand variable would be the peak-hour, two-directional volumes on an average summer Sunday. This emphasis on the average summer Sunday was instrumental in determining how the O-D survey was to be conducted. It was also recognized that the complete history of the time distribution of traffic flows was of prime significance. For this reason, the automatic traffic recording stations were established with the intention of obtaining hourly volumes for a complete year at the ten representative sites.

The peak-hour, two-directional volume is a satisfactory dependent variable for the regression analysis with one major exception. That is, due to the large number of origin zones and the inclusion of several recreational areas having small visitation, many of the 190 peak-hour volumes at each recreation area are either zero or else very small. A more stable variable would be the volume observed over a longer period of time. It was decided, therefore, to concentrate on a 10-hour volume as the primary dependent variable. Two-directional and one-directional arriving volumes were rejected since they were felt to place excessive emphasis on the day-use visitor. In order to avoid biasing Sunday-arriving day users, 10-hour departing volumes were selected to represent the dependent variable.

Based on the O-D survey data and data from the ten automatic traffic counters, it was possible to obtain both a peak-hour, two-directional volume and a 24-hour, two-directional volume from the actual or predicted 10-hour departing volumes. Factors for converting from 10-hour departing volumes to peak-hour and 24-hour volumes are shown in Table 5. It is anticipated that when the one-year volume counts have been completed, it will be possible to estimate annual visitation based solely on actual and predicted 10-hour departures.

Independent Variables

Most of the factors of Table I that influence the demand for outdoor recreational travel could be considered as possible candidates for the independent variables of a regression equation. However, it is obvious that, in order to be manageable, the number of independent variables must be fewer than the number of factors contained in Table I. Furthermore, the studies

TABLE 5

FACTORS FOR CONVERTING FROM 10-HOUR DEPARTING VOLUME TO PEAK-HOUR AND 24-HOUR VOLUMES

RECREATIONAL AREA	FACTORS TO BE MULTIPLIED BY THE 10-HOUR DEPARTING VOLUMES TO OBTAIN: PEAK-HOUR TOTAL	24-HOUR TOTAL
1	.35	2.90
2	.26	2.42
3	.33	2.29
4	.33	2.29
5	.34	2 48
6	.29	2.42
7	.32	3.28
8	.33	2.54
9	.26	2.42
10	.25	2.90
11	.35	3.28
12	.36	2.52
13	.31	2.34
14	.35	2.52
15	.27	2.52
16	.28	2.52
17	.34	2.54
18	.28	2.38
19	.31	3.28
20	.25	2.48
21	.37	2.34
22	.31	3.28
23	.31	3.28
24	.31	2.38
25	.36	3.28
26	.26	3.28
27	.32	2.34
28	.32	3.28
29	.30	2.54
30	.32	2.34
31	.34	2.54
32	.32	2.38
33	.31	2.90
34	.27	2.38
35	.31	2.90
36	.31	2.38
37	.29	2.52
38	.36	2.48
39	.27	2.48
40	.27	2 48
41	.37	2.29
42	.32	2.52

by Matthias and Grecco *(5)* and Tussey *(6)* concluded that simpler equations may produce better predictions than more complicated equations. All independent variables must be quantifiable and should be simple, easy to predict, and causative in nature.

Based on the literature review and the ease of acquiring data, it was decided to represent the origin-area characteristics by the single variable of population. This is certainly the most important of the origin-area characteristics and one which is easy to acquire and easy to predict for future time periods. Current population data for each of the 190 origin zones were obtained from the 1970 census reports *(15)*.

Selection of the recreational area characteristics was certainly a much more difficult and perhaps more important task. The 170 survey sites (42 recreation areas) include a very wide variety of outdoor recreational facilities ranging from a secluded boat ramp on one of the large reservoirs having an average Sunday visitation of 150 to an intensively developed state park having an average Sunday visitation of nearly 30,000. Inclusion of many sites having few recreational facilities was necessary in order to assure complete coverage of the major recreational attractors. It is conceivable that those sites with limited facilities may serve as backup areas to the overflow from major attractors operating at capacity on Sundays. The variety of recreational facilities among the 42 recreational areas is indicated by the summary of Table 6.

Because of this variety in the nature of facilities at the 42 areas, it was decided to bypass the problem of selecting suitable independent variables to represent the recreational attractiveness of these areas by the development of an independent model for each area. While this certainly facilitated the completion of Phase I of the study and did enable a preliminary examination of recreation travel demand, it must be viewed as an interim measure to be supplemented by a more comprehensive predictive model in Phase II.

The next category of factors is the price of the recreational experience. As is common in analyses such as this, the distance separating the origin zone from the recreation area was chosen to represent in its entirety the price of the recreational experience. In order to determine the required 7,980 distances, a system of nodes was established including the 190 origin zone nodes* and the 42 recreational area centroids. Links were then constructed connecting all adjacent nodes. Airline distances were used for the links interconnecting the 120 Kentucky origin zones, the 42 recreational areas, and the zones of Ohio, Indiana, Tennessee, and Michigan. Over-the-road distances, obtained from a road atlas *(17)*, were used for links outside the five above-named states. The minimum path distance from each origin to each recreation area was then determined using the ICES TRANSET I computer program *(16)*.

It was felt that airline distances between the smaller origin zones would approximate the actual road distance when there was at least one zone between the two nodes for which distances were being measured. This was based on the assumption that jagged lines created by connecting county seats will be close to the actual road distance between nodes.

Average percentage errors between actual and minimum path distances were calculated for three ranges of distance: 0-100 miles, 101-300 miles, and greater than 300 miles. Using a sample of one percent of the total output, the respective average percentage errors were -14.61, -7.63, and -1.48. Indications were that the TRANSET minimum path procedure underestimated actual distances between nodes – the largest percent error being for the 0-100 mile range.

It was felt that these percentage errors were not really significant when the location of origin zone centroid was investigated. Centroids or nodes were certainly not the origin of all trips from within a zone, and the assumption that all trips originated from a single point within a zone introduced an error which cannot be evaluated. Therefore, it has to be assumed that at least a part of these calculated errors in distances are off-set by the error of not knowing the exact origin of the trip.

Finally, factors from the lists in Table 1 termed time characteristics and miscellaneous characteristics were not considered as independent variables in this regression analysis. Additional discussion of the time characteristics has been placed in a preceding section of this report.

Forms of the Expression

Having selected the dependent and independent variables, the form of the expression to be analyzed was $Y = f(D, P)$; where Y is the predicted 10-hour departing volume, D is the distance from the recreational area to the origin zone, and P is the population of the origin zone. Various plots were then made in an attempt to determine the relationship between departing volume, distance, and population. It was found that departing trips per capita versus distance plotted on a full logarithmic graph produced an approximate straight line, indicating an exponential type function should describe

**The node was taken as the county seats of the Kentucky counties, the approximate geographic centroids of the Ohio, Indiana, Tennessee, and Michigan zones, and the capitals of the remaining states.*

TABLE 6

CHARACTERISTICS OF THE RECREATIONAL AREAS

AREA NO.	LAND ACREAGE		WATER ACREAGE	GOLF HOLES	PICNICKING		CAMPING		NUMBER OF OUTDOOR GAMES	NUMBER OF DRAMA SEATS	NUMBER OF COTTAGES	NUMBER OF LODGE ROOMS	BIKING MILEAGE	HIKING MILEAGE
	DEVELOPED	TOTAL			ACRES	TABLES	ACRES	SITES						
1	10	156		36	3	130	5	15						
2	311	114,181	180,000	9	258	1,269	322	607	4		165	124	50	120
3	99	435	55	9	10	196	15	65			15	24		6
4	645	645	18		15	215	5	54	1		5			
5	9	348	788	9	4	250	14	24						
6	97	450	5,100		70	244	30	106	2		15	40		
7	500	2,000	400		10									
8	500	3,000			50	300	75	200			4			12
9		524	5,800			21		2			9	12		
10		51,351			2	50	10	145			70	78		6
11		106	106											
12		2,197	10,000	9	10	379	30	117			12	51		
13	76	235		9	10	196	10	36		1,000				
14		4,553	8,200			20								
15	6	60	4,300			14		2			40	10		1
16	141	3,921	50,250	18	69	859	128	345	2		79	80		15
17	24	83			9	39	8	26			3			20
18		1,720			1	120	12	73			47	60		18
19	20	20	175											
20	26	38	1,860		1		19	390			76			
21					5	36				800				
22		170	170											
23			325											
24	110	809	30	9	10	388	35	154	2		18	33		
25		30	140											
26			135											
27	29	248	7		5	133	15	162	1					
28		2	305											
29		100			3	126	2							
30	21	108			5	104	15	55						
31	28	815				400	20	200	3					
32	68	2,500	35	9	2	138				1,000	15	20		
33	700	21,368			20	200	20	330		500		30		100
34		1,500	60		6	136	10	77			10	35		
35	50	135			10	23	15	44						61
36	26	1,000	36	9	1	331								2
37	26	3,330	225		3	265	20	70				32		
38		65	3,620		5	55								
39		829	1,230		2	132	10	58	1			36		
40	1	1,706	1,100	9	5	245	5	70	1	800		48		2
41	6	1,000	2		5	60	3							
42			1,131			5	10							

AREA NO.	HORSEBACK TRAILS (MILES)	HUNTING ACREAGE	BEACH LINE (FEET)	POOL AREA (SQ FT)	BOATING					FISHING ACREAGE	WATER SKIING ACREAGE	SAILING ACREAGE	BEACH ACREAGE
					RAMPS	SLIPS OPEN	SLIPS CLOSED	ACREAGE	RENTAL BOATS				
1													
2	120	10,000	2,400	2,050	39	283	252	100,000	480	100,000	100,000	100,000	10
3	4		150	1,250	1			55	744	55	55		
4			300							18			
5			350		2	18		788	6	788	788		
6			600	1,250	3	213	18	4,680	39	4,680	4,680		
7			2,500		1	25		400	10	400			150
8	10			2,500	1								
9					2	102			63				
10													
11								106		106			
12			1,200					10,000		10,000			
13													
14					3								
15	3		400		4	43	115		126				1
16	4		600	4,450	14	648	110	50,250	273	50,250	50,250	50,250	9
17									30				
18	3			7,050									
19								175		175			
20				7,500	3	30		1,860		1,860			
21													
22					1			170	25	170	170		
23								325		325			
24	3		250	1,250				30		30			
25			150			13			5				
26								96		96			
27										7			
28					1	25			40				
29				3,200									
30			600		1								
31	3			3,200									
32	4			1,250									
33	100												
34	2			3,200				60		60			
35													
36	3		200	1,250				36	32	36			
37			600		1	65		225		225			
38					1			1,500					
39			300		5	55	20	1,200		1,200	1,200		
40	2			4,000	1	100	10	1,150		1,150	1,150		
41										2			
42		14,000											

the relationship. An equation previously reported by Tussey *(6)* described this relationship and was of the form

$$Y = a\ D^b\ P \qquad 1$$

where Y was the estimated annual visitation, D was the airline distance from the recreational area to the origin zone, P was the population of the origin zone, a was a constant describing the propensity of the individuals in an origin zone to visit a recreational area, and b was a constant describing the relationship between distance and visitation.

Another equation using the relationship between population, distance, and visitation was reported by Matthias and Grecco *(5)* and was of the form

$$Y = a\ e^{bD}\ P \qquad 2$$

where e was the base of natural logarithms and the other variables were essentially the same as in Equation 1. Realizing that some very reliable models had been developed from the selected variables, an analysis was begun to determine what type of model would best fit the data collected in this study.

Evaluating the Equations

There are several linear and nonlinear statistical techniques available for the purpose of finding the best fit for a set of data observations. Selected for use in this study were a linear technique entitled "Step-Wise Multiple Linear Regression Analysis - MULTR" *(18)* and a nonlinear technique entitled "Least Squares Estimation of Non-Linear Parameters - NLIN" *(19)*. MULTR is a computer program for finding the "least squares best fit" of a set of data which uses an F test to determine the most significant independent variable, establishes the correlation and regression coefficients for that one independent variable, and continues to add the remaining variables in order of decreasing significance until the specified minimum F-level is reached. NLIN is a computer program for finding the "least squares best fit" which uses an iterative process known as Marquardt's compromise *(20)*.

Criteria for Determining the Best Equation

Statistical criteria used for determining the best equation were the squared correlation index (R^2) and the standard error of estimate. R^2 is a measure of the total variance of the dependent variable explained by the independent variables in the equation over that which could be explained by the mean of the dependent variable alone. The standard error of estimate is a measure of the dispersion of the observed data points about the least-squares regression line.

Linear versus Nonlinear Regression

After 1) selecting dependent and independent variables, 2) determining the form of the expression and means of evaluating this form, and 3) choosing the criteria for determining the best equation, regression analyses were begun.

First, the basic linear equation

$$Y = a + bD + cP \qquad 3$$

was tested using MULTR to verify the suspected nonlinear relationship. After verifying the nonlinearity of Equation 3, 15 other equations including Equations 1 and 2 were transformed into their logarithmic forms and tested using MULTR. Results from the analysis of these transformed equations indicated that Equation 1 was the best predictor based on R^2 and the standard error of estimate. Since the transformed equation is not the same as the original function, a computer program was written to evaluate the same statistical measures for the original equation using parameters found in the best fit of the transformed equation. Results from these checks proved that all of the transformed equations were very poor statistically and essentially useless as predictors.

Having determined the linear regression technique to be of little value, an investigation of nonlinear regression analysis was the next step. Using Equation 1, which had proved to be the best equation from MULTR results, a nonlinear regression analysis (NLIN) yielded satisfactory results. Other equations were tested using NLIN, but all failed to produce results significantly better than those obtained using Equation 1. Due to the limitations of NLIN, attempts to test some equations resulted in unsuccessful runs.

Some of the problems in the unsuccessful runs were the result of the wide range of the independent variables. Distances ranged from 5 miles up to approximately 3000 miles, and population ranged from 5000 to 20 million. The problem of trying to represent the distance variable with a single continuous function was anticipated and the use of dummy variables was considered to be a possible solution to the problem. Dummy variables were used to stratify distances into the following ranges: 0-100 miles, 101-300 miles, and greater than 300 miles. In an effort to reduce the large range of population figures, the populations were entered into the regression equations in thousands. Dummy variables proved to be of practically no significance in attempting to improve the prediction equations. The use of population in thousands permitted the testing of equations which had previously failed to give results. Equations tested using NLIN included.

$$Y = aD^bP \qquad 1$$
$$Y = aD^{bx_1 + cx_2 + dx_3}P \qquad 4$$
(Dummy Variables)
$$Y = aD^b P^c \qquad 5$$
$$Y = ae^{bD}P \qquad 2$$

All of the equations tested, with the exception of Equation 1, proved to be unreasonable or more complicated without improving the prediction model. Results from this group of tested equations implied that, using the NLIN procedure for finding the "best fit" parameters, Equation 1 is the best predictor when attempting to relate distance and population to volume of trips.

Selecting the Best Equation

Having progressed through a considerable number of potential models, Equation 1 was selected as the model which could best simulate the flow of traffic to recreational areas. Table 7 was prepared to show the comparative results between those equations yielding best results from linear regression and those from nonlinear regression. Standard errors of estimate for each equation are tabulated for each of the first three recreational areas.

Equation 5, which had the smallest standard error for the first recreational area, was not selected as the best equation because placing an exponent on population resulted in problems using NLIN which prevented obtaining results for other recreational areas.

Calibrating and Evaluating the Model

Calibration of the model consisted of using NLIN to find the "best fit" equation for each of the 42 recreational areas. In an attempt to present a more detailed analysis of the results, a computer program was prepared to evaluate the models. These model evaluation results are summarized in APPENDIX E. Measures used to verify the statistical validity and reasonableness as computed for actual and predicted values were total trips, mean and standard deviation of trips per origin, mean and standard deviation of trip length, and trip-length distribution. Also included for each of the 42 recreational areas were the parameters of the final prediction equation, the standard error of estimate, and the squared correlation index (R^2). Wide ranges were found to exist for all of these measures, probably because of the wide range of departing trips from the recreational areas. The 10-hour departing trips varied from 46 at Shanty Hollow Lake to 18,216 at the Kentucky Lake-Barkley Lake complex. Percentage differences between actual total trips and predicted total trips for each recreational area ranged from 1.0 for Audubon State Park to 143.0 for Guist Creek Lake. Actual and predicted mean trip lengths had an even greater range of percentage differences; from 2.0 at Columbus Belmont State Park to 372.0 at Wilgreen Lake. And finally, the much used squared correlation index (R^2) was also very non-uniform; 0.02 for the Lake Cumberland complex to 1.00 (this perfect R^2 resulted from rounding to two places) for Audubon State Park and Fishtrap Reservoir.

There was certainly no obvious trend in these evaluation results. For this reason, two of the recreational areas were chosen for more detailed discussion. The two recreational areas were numbers 4 and 34; Audubon State Park with a 10-hour departing volume of 1934 and Natural Bridge State Park with a volume of 1930. The equation for Recreational Area 4, with extremely close actual and predicted values in almost every category, appears to be a much better predictor than does the equation for Area 34. Plots of observed versus predicted 10-hour departing volumes for Areas 4 and 34 are shown in Figures 8 and 9 respectively. The greater predictive ability of the equation for Area 4 was not very obvious from these plots since there was a considerable dispersion of points. It was obvious that Area 34 drew from a much wider range of origins than did Area 4. One evaluation which perhaps showed more in this particular situation than any other was that of trip-length distribution. Plots of trip-length distribution for Areas 4 and 34 are shown in Figures 10 and 11. It can be seen from these plots that more people drive greater distances to visit Natural Bridge State Park than to visit Audubon State Park.

TABLE 7

COMPARISON OF LINEAR AND NONLINEAR REGRESSION RESULTS

NO.	EQUATIONS	STANDARD ERRORS OF ESTIMATE RECREATIONAL AREA 1	RECREATIONAL AREA 2	RECREATIONAL AREA 3
1	$Y = a D^b P$	14.17	306.65	12.59
2	$Y = a e^{bD} P$	39.79	382.60	30.71
3[a]	$Y = a + bD + cP$	24.10	352.24	16.10
4	$Y = a D^{bx_1 + cx_2 + dx_3} P$	33.56	289.18	33.86
5	$Y = a D^b P^c$	22.62	277.75	15.65
	Nonlinear			
1	$Y = a D^b P$	12.04	216.71	10.37
2	$Y = a e^{bD} P$	13.04	241.17	10.33
4	$Y = a D^{bx_1 + cx_2 + dx_3} P$	12.05	216.28	10.26
5[b]	$Y = a D^b P^c$	5.37		

[a]Equation 3 was tested using only linear regression since nonlinear regression would have yielded the same results.
[b]Due to limitations of NLIN, results were obtained only for Recreational Area 1 using Equation 5.

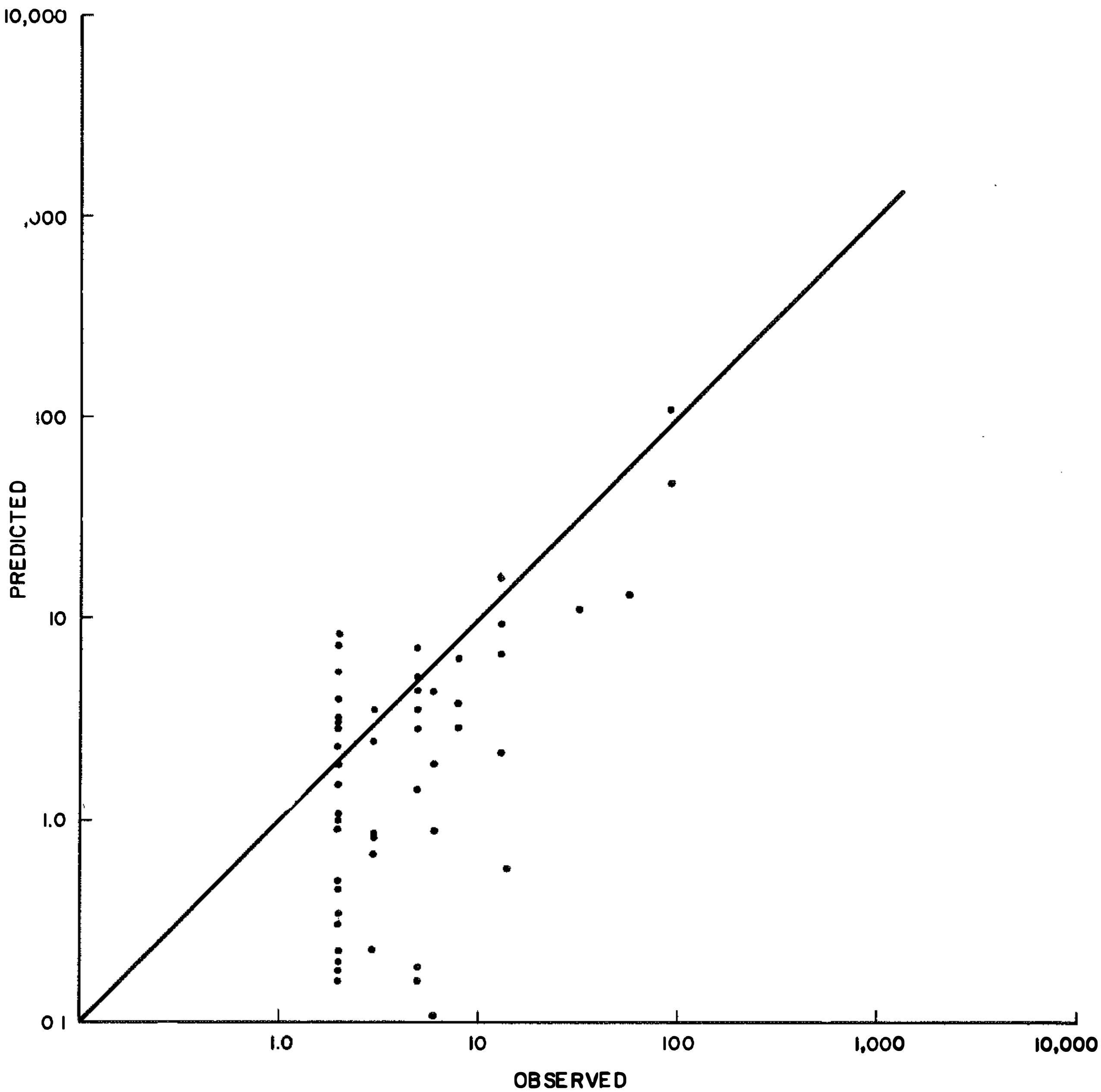

Figure 8. Observed Versus Predicted 10-Hour Departing Volumes: Audubon State Park

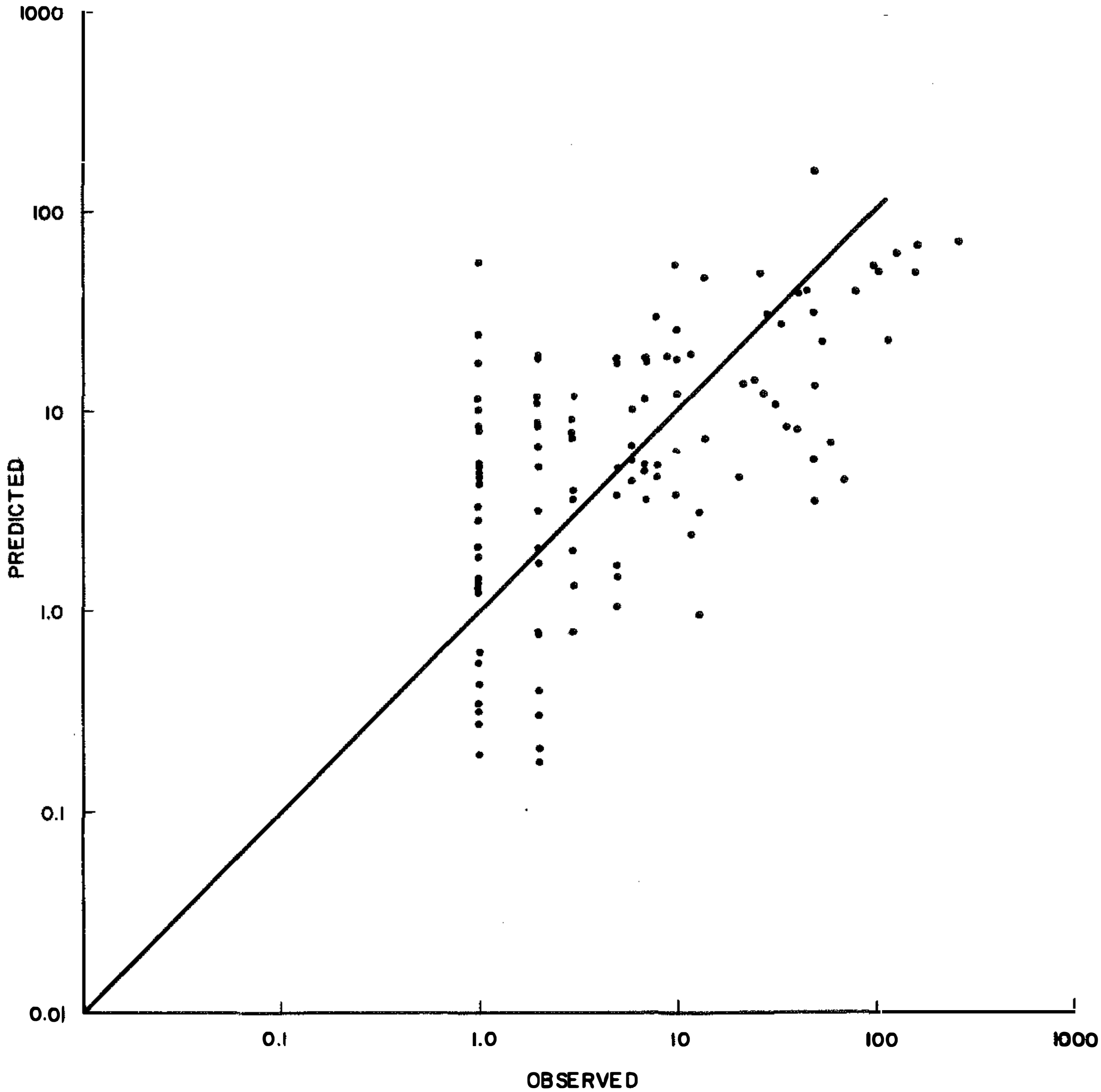

Figure 9. Observed Versus Predicted 10-Hour Departing Volumes: Natural Bridge State Park

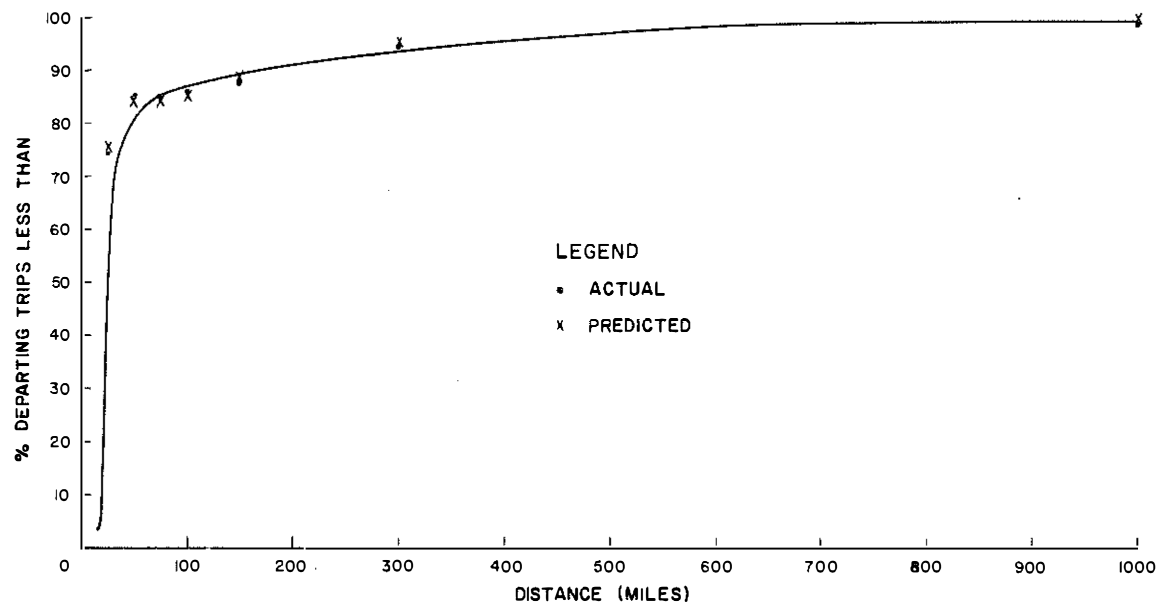

Figure 10. Relationship between Distance from Audubon State Park and Cumulative Percentage of Trips

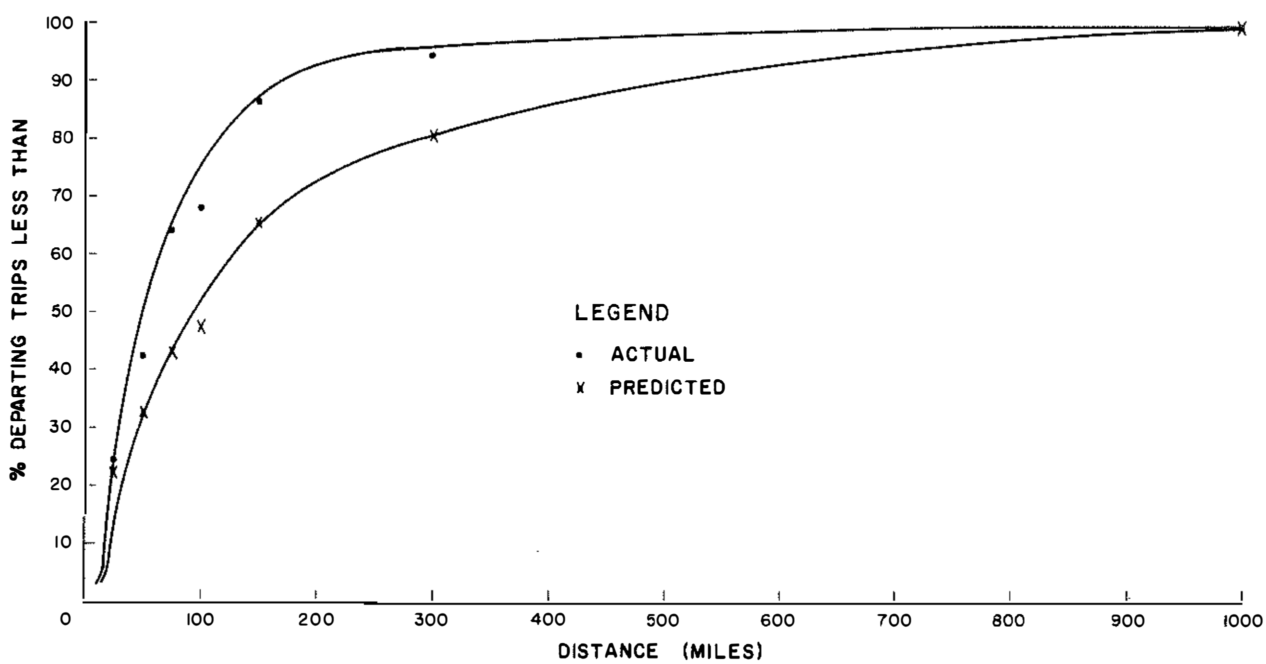

Figure 11. Relationship between Distance from Natural Bridge State Park and Cumulative Percentage of Trips

Application of Results

Results from Phase I of the study indicate that models can be developed which very effectively simulate the flow of traffic on routes leading to outdoor recreational areas in Kentucky. Each of these 42 models is directly applicable as a prediction model for the recreational area for which it was developed.

Assuming that most planned outdoor recreational facilities in Kentucky would be similar to at least one of the existing 42 outdoor recreational areas, demand could be predicted for facilities falling into this category. Table 8 was prepared to facilitate the use of these models for the purpose of predicting traffic volumes on routes to recreational areas in Kentucky. Recreational areas were arranged according to availability and size of lake, availability of day-use facilities (number of picnic tables and availability of golf courses), and the availability of overnight facilities (cottages, lodge rooms, and camping sites). Other information listed in this table is the recreational area name and number, 10-hour departing volumes, parameters of each equation, and those characteristics best describing the recreational areas.

A prediction model for all outdoor recreational areas dissimilar from those 42 included in the survey will be developed in Phase II of this report.

To aid in planning and design, reference should be made to Table 5 for those factors necessary to convert from 10-hour departures to peak-hour and 24-hour total volumes.

As an additional aid in the application of results, Table 9 was prepared for the purpose of qualitatively expressing the confidence placed on each of the 42 models. This qualitative expression was arrived at by ranking the recreational areas from best to worst according to results from three statistical measures. These measures were the percentage difference between actual and predicted total trips, the percentage difference between actual and predicted mean trip lengths, and the squared correlation index (R^2).

Phase II: General Prediction Model

Having developed models for each of the individual recreational areas, it was felt that a general model was essential as a comprehensive predictor of visitation. This model differs from the specific models in that an attractiveness index factor represents the overall attractiveness of the recreational area and permits incorporating the independent variable into the perdiction model rather than using a table as in the Phase I modeling effort.

Selection of Recreational Area Characteristics

Characteristics of the 42 recreational areas as presented in Table 6 were evaluated and nine were chosen to be entered into linear regression analyses (MULTR) to determine their relative significance. Ten-hour departing volumes were also used as the dependent variable in this regression analysis. Camp sites, cottages, and lodge rooms were grouped under a single heading of overnight accommodations to simplify testing. After several computer runs of MULTR, it was decided that the regression equation should be forced through the origin in order to eliminate the negative coefficients which were being produced because of the very large constant values. With the equation forced through the origin, the coefficients of the recreational area characteristics as determined by MULTR were all positive. The characteristics and coefficients are presented in Table 10. The attractiveness index factor, A, can be calculated for each of the 42 recreational areas by means of the following relationship:

A = 9.569 (Number of golf holes) + 3.314 (Number of picnic tables) + 0.309 (Number of overnight accommodations) + 0.069 (Number of drama seats) + 2.377 (Miles of hiking trails) + 8.113 (Miles of horseback trails) + 0.294 (Lineal feet of beach) + 0.228 (Square feet of swimming pool) + 0.098 (Water acreage).

With an attractiveness index factor as an independent variable representing the recreational attractiveness of each area, the next step was to find the best fit regression equation using this new factor in addition to population of the origin zone and distance from origin zone to recreational area. The trial and error testing during the first phase of modeling was very beneficial in that much was learned about the data set and many of the problems associated with using NLIN were encountered. For these reasons, in addition to the fact that visitation patterns vary greatly for short and long distances, it was decided that the data should be broken down into those distances less than or equal to 100 miles and those greater than 100 miles. Non-linear regression analysis (NLIN) was used for those vehicles having origins less than or equal to 100 miles and a cross-classification technique was used for those vehicles having origins greater than 100 miles.

TABLE 8

SUMMARY TO AID IN THE APPLICATION OF MODEL RESULTS

LAKE[a]	DAY USE FACILITIES[b]	OVERNIGHT FACILITIES[c]	REC. AREA NO.	RECREATIONAL AREA NAME	10-HOUR DEPARTING VOLUME	PARAMETERS A	PARAMETERS B	WATER ACRES	NO. OF PICNIC TABLES	NO. OF OVERNIGHT FACILITIES	REMARKS[d]
Large	L	L	2	Kentucky Lake-Barkley Lake	18,218	30,609	-2.22	180,000	1269	898	G, OD, SP, SB
			16	Lake Cumberland	6,917	1,154	-1.88	50,250	859	504	G, SP, SB
			40	Jenny Wiley S.P.	2,874	441	-1.84	1,100	245	136	G, OD, SP
			6	Rough River Reservoir	2,552	2,138	-2.01	5,100	246	161	G, SP, SB
			12	Barren River Reservoir	1,644	40,462	-3.20	10,000	379	180	G, SB
		M	5	Lake Malone S.P.	1,250	6,701	-2.58	788	250	24	SB
		S		None							
	M	L	39	Buckhorn Lake	1,217	13,412	-2.63	1,230	132	94	SB
		M	9	Nolin Reservoir	1,602	3,943	-2.18	5,800	21	23	
			15	Dale Hollow Reservoir	604	567	-2.28	4,300	14	52	SB
		S	14	Green River Reservoir	2,424	18,170	-2.67	8,200	20	0	
			42	Fishtrap	1,267	141,232	-3.50	1,131	5	0	
			39	Grayson Reservoir	1,151	2,935	-2.34	3,620	56	0	
	S	L	20	Harrington Lake	1,201	1,445	-2.22	1,860	0	466	
		M		None							
		S		None							
Small	L	L	37	Greenbo Lake S.P.	945	524	-2.09	225	266	106	SB
			3	Lake Beshear - Pennyrile	558	4,069	-.257	35	196	104	G, SP, SB
			24	General Butler S.P.	461	759	-1.98	30	368	205	G, SP, SB
		M	4	Audubon S.P.	1,925	1,507	-2.30	18	215	69	G, SB
			32	Pine Mountain S.P.	492	21	-1.76	36	138	36	G, OD, SP
		S	36	Carter Caves S.P.	610	1,025	-2.15	26	331	0	G, SB
	M	L	34	Natural Bridge S.P.	1,944	1,865	-2.18	60	136	122	SP
			27	Big Bone Lick S.P.	674	602	-2.54	7	133	162	
		M		None							
		S	41	Kingdom Come S.P.	194	365	-2.27	2	60	0	
	S	L		None							
		M		None							
		S	22	Beaver Lake	140	94	-2.12	170	0	0	
			23	Guist Creek Lake	131	36	-1.76	325	0	0	
			28	Williamstown Lake	130	20	-1.74	305	0	0	
			7	Doe Valley Lake	110	399	-2.39	400	0	0	SB
			19	Wilgreen Lake	68	18	-2.01	176	0	0	
			25	Elmer Davis Lake	63	72	-2.30	140	0	0	
			20	Lake Boltz	62	31	-1.87	135	0	0	
			11	Shanty Hollow Lake	46	276	-2.81	108	0	0	
None	L	L	31	Levi Jackson S.P.	3,434	5,034	-2.47	0	400	200	SP
			8	Otter Creek Park	783	260	-1.63	0	300	206	SP
			36	Cumberland Gap N.P.	660	482	-2.19	0	200	360	OD
		M	13	My Old Kentucky Home S.P.	1,130	251	-1.85	0	196	36	G, OD
		S		None							
	M	L	18	Cumberland Falls S.P.	3,537	1,114	-2.01	0	120	180	SP
			10	Mammoth Cave N.P.	1,547	297	-1.75	0	50	293	
		M	30	Fort Boonesboro S.P.	2,315	455	-1.63	0	104	56	SB
			1	Columbus - Belmont S.P.	706	5,297	-2.68	0	130	15	
			35	Sky Bridge - Koomar Ridge	304	228	-2.11	0	23	44	
			17	Natural Arch - Rockcastle	283	751	-2.38	0	39	28	
		S	29	Blue Licks Battlefield S.P.	683	14,226	-3.01	0	126	0	SP
			21	Old Fort Harrod S.P.	321	5	-1.39	0	36	0	OD
	S	L		None							
		M		None							
		S		None							

[a] Large ≥ 500 acres

[b] L = 150 picnic tables or availability of golf course; M = 1-150 picnic tables and no golf course;
S = No picnic tables and no golf course

[c] L ≥ 90 units (cottages + lodge rooms + camping sites); M < 90 and ≥ 15 units; S < 15 units

[d] G = Golf; OD = Outdoor drama; SP = Swimming pool; SB = Swimming beach

TABLE 9

QUALITATIVE EXPRESSION OF CONFIDENCE IN EACH MODEL

RECREATIONAL AREA	EXPRESSION OF CONFIDENCE IN MODEL
1	High
2	Medium
3	High
4	High
5	High
6	Low
7	Medium
8	Medium
9	Low
10	High
11	High
12	High
13	High
14	High
15	Low
16	Low
17	Medium
18	Low
19	Medium
20	Medium
21	Medium
22	Medium
23	Low
24	Medium
25	High
26	Medium
27	Medium
28	Medium
29	High
30	Low
31	High
32	High
33	Medium
34	Medium
35	Medium
36	Medium
37	High
38	Low
39	Medium
40	Medium
41	Low
42	High

TABLE 10

RECREATIONAL AREA CHARACTERISTICS AND COEFFICIENTS

CHARACTERISTICS	COEFFICIENTS
Number of golf holes	9.569
Number of picnic tables	3.314
Number of overnight accommodations	0.309
Number of drama seats	0.069
Miles of hiking trails	2.377
Miles of horseback trails	8.113
Lineal feet of beach	0.294
Square feet of swimming pool	0.228
Water acreage	0.098

Nonlinear Regression for Origin Distances Less Than or Equal to 100 Miles

The first step in attempting to develop a model for the prediction of visitation from origins less than or equal to 100 miles was to incorporate the attractiveness index factor into Equation 1 for the purpose of running nonlinear regression analyses. Using the equation of the form

$$Y = a\ D^b\ P\ A^d \qquad 6$$

where A was the attractiveness index factor, d was a constant describing the relationship between the attractiveness of the recreational area and visitation, and the other variables were the same as in Equation 1, a successful run of NLIN was made. Realizing that placing an exponent on P (population) in Equation 5 had resulted in a great improvement in the standard error of estimate of the first recreational area, an attempt was made to exponentiate P in Equation 6. Equation 5 was not chosen as the best equation in the first phase of the study because problems encountered with NLIN would not permit the complete analysis of the equation. It was felt that the addition of the attractiveness index factor would sufficiently change the nature of Equation 5 so that the equation of the form

$$Y = a\ D^b\ P^c\ A^d \qquad 7$$

could be fitted to the data. All variables and constants in Equation 7 have previously been defined. Equation 7 was successfully fitted to the data using NLIN, and the statistical results were much improved compared to those for Equation 6.

Cross-Classification for Origin Distances Greater than 100 Miles

After deciding that trips from origins less than and greater than 100 miles should be treated differently, the next step was selecting a means of analyzing those trips from origins greater than 100 miles. Since there were so many zero volumes from origins greater than 100 miles, a cross-classification technique was selected as the most satisfactory means of analysis.

This cross-classification technique consisted of classifying the distances into six groups, the populations into five groups, and the attractiveness index factor into six groups so that all trip interchanges greater than 100 miles could be categorized. Each trip interchange was entered into the classification as a departing volume per thousand population and the mean of all interchanges within each category was recorded as the representative value.

Evaluation of Model

After analyzing and classifying the data by groups of less than and greater than 100 miles, results from each analysis technique were combined in order to present and evaluate the general prediction model. Using an evaluation procedure similar to that employed in the first phase of the study, the evaluation results from the combined nonlinear regression-cross-classification analyses are presented in APPENDIX F. Results from these techniques were not as accurate as the results from the first phase of the study. While Phase I of the study was primarily the development of an individual simulation model for each recreational area, Phase II concentrated on the development of a general prediction model which could be applied to any outdoor recreational area in Kentucky.

The prediction model representing distances less than 100 miles is

$$Y = 1.107\ D^{-1.083}\ P^{.441}\ A^{.868} \qquad 8$$

where Y is the 10-hour departing volume of vehicles, D is the distance from origin zone to recreational area, P is the population of the origin zone in thousands, and A is the attractiveness index factor representing the characteristics of the recreational area.

After obtaining somewhat disappointing results from the evaluation of the combined nonlinear regression - cross-classification analyses, it was decided to attempt development of a cross-classification model for the entire data set. Using an expanded version of the previously discussed cross-classification technique, the distances were categorized into eleven groups, population into five groups, and the attractiveness index factors into eight groups. As before, each trip interchange was entered into the classification as a 10-hour departing volume per thousand population and the mean of all interchanges within each category was recorded as the representative value.

Results from the cross-classification model were tabulated and evaluated in a manner similar to that employed for the two previous models. These results, which are presented in APPENDIX G, indicate a significant improvement when compared to the combined nonlinear regression - cross-classification model. Because of improved predictive ability, the cross-classification model was chosen as the final general prediction model and is presented in Table 11.

Application of Model

The simplicity and generality of the final prediction model makes it readily applicable to almost any recreational area. One needs to know only the characteristics of the recreational area as listed in Table 10, the population of the origin zone from which visitation is to be predicted, and the distance from the origin zone to the recreational area. Many recreational areas do not have all the facilities listed in Table 10, but most have at least one of the facilities from which the attractiveness index factor can be calculated.

By inputing distance in miles from origin zone to recreational area, population of origin zone in thousands, and the attractiveness index factor expressing the characteristics of the recreational area, one can obtain a prediction of the 10-hour departing volume from recreational area to origin zone. The classifications presented in Table 11 make the predictive methodology a very simple and straightforward procedure. For the purpose of recreational highway planning and design, the 10-hour departing volume can be converted to peak-hour and 24-hour volumes. This can be accomplished by using Tables 5 and 8. Table 8 permits the classification of recreational areas such that any planned or proposed new outdoor recreational area in Kentucky will be similar to at least one of the existing areas. After selecting the recreational area most similar to the planned or proposed area, the calculated 10-hour departing volume can be compared to the 10-hour departing volume listed in Table 8. This permits selecting the recreational area with similar visitation patterns in addition to similar attractiveness characteristics. Then referring to Table 5, the peak-hour and 24-hour

TABLE 9

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4	High
5	High
6	Low
7	Medium
8	Medium
9	Low
10	High
11	High
12	High
13	High
14	High
15	Low
16	Low
17	Medium
18	Low
19	Medium
20	Medium
21	Medium
22	Medium
23	Low
24	Medium
25	High
26	Medium
27	Medium
28	Medium
29	High
30	Low
31	High
32	High
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$$Y = a\ D^b\ P\ A^d \qquad 6$$

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$$Y = a\ D^b\ P^c\ A^d \qquad 7$$

could be fitted to the data. All variables and constants in Equation 7 have previously been defined. Equation 7 was successfully fitted to the data using NLIN, and the statistical results were much improved compared to those for Equation 6.

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This cross-classification technique consisted of classifying the distances into six groups, the populations into five groups, and the attractiveness index factor into six groups so that all trip interchanges greater than 100 miles could be categorized. Each trip interchange was entered into the classification as a departing volume per thousand population and the mean of all interchanges within each category was recorded as the representative value.

Evaluation of Model

After analyzing and classifying the data by groups of less than and greater than 100 miles, results from each analysis technique were combined in order to present and evaluate the general prediction model. Using an evaluation procedure similar to that employed in the first phase of the study, the evaluation results from the combined nonlinear regression-cross-classification analyses are presented in APPENDIX F. Results from these techniques were not as accurate as the results from the first phase of the study. While Phase I of the study was primarily the development of an individual simulation model for each recreational area, Phase II concentrated on the development of a general prediction model which could be applied to any outdoor recreational area in Kentucky.

The prediction model representing distances less than 100 miles is

$$Y = 1.107\ D^{-1.083}\ P^{.441}\ A^{.868} \qquad 8$$

where Y is the 10-hour departing volume of vehicles, D is the distance from origin zone to recreational area, P is the population of the origin zone in thousands, and A is the attractiveness index factor representing the characteristics of the recreational area.

After obtaining somewhat disappointing results from the evaluation of the combined nonlinear regression - cross-classification analyses, it was decided to attempt development of a cross-classification model for the entire data set. Using an expanded version of the previously discussed cross-classification technique, the distances were categorized into eleven groups, population into five groups, and the attractiveness index factors into eight groups. As before, each trip interchange was entered into the classification as a 10-hour departing volume per thousand population and the mean of all interchanges within each category was recorded as the representative value.

Results from the cross-classification model were tabulated and evaluated in a manner similar to that employed for the two previous models. These results, which are presented in APPENDIX G, indicate a significant improvement when compared to the combined nonlinear regression - cross-classification model. Because of improved predictive ability, the cross-classification model was chosen as the final general prediction model and is presented in Table 11.

Application of Model

The simplicity and generality of the final prediction model makes it readily applicable to almost any recreational area. One needs to know only the characteristics of the recreational area as listed in Table 10, the population of the origin zone from which visitation is to be predicted, and the distance from the origin zone to the recreational area. Many recreational areas do not have all the facilities listed in Table 10, but most have at least one of the facilities from which the attractiveness index factor can be calculated.

By inputing distance in miles from origin zone to recreational area, population of origin zone in thousands, and the attractiveness index factor expressing the characteristics of the recreational area, one can obtain a prediction of the 10-hour departing volume from recreational area to origin zone. The classifications presented in Table 11 make the predictive methodology a very simple and straightforward procedure. For the purpose of recreational highway planning and design, the 10-hour departing volume can be converted to peak-hour and 24-hour volumes. This can be accomplished by using Tables 5 and 8. Table 8 permits the classification of recreational areas such that any planned or proposed new outdoor recreational area in Kentucky will be similar to at least one of the existing areas. After selecting the recreational area most similar to the planned or proposed area, the calculated 10-hour departing volume can be compared to the 10-hour departing volume listed in Table 8. This permits selecting the recreational area with similar visitation patterns in addition to similar attractiveness characteristics. Then referring to Table 5, the peak-hour and 24-hour

TABLE 9

QUALITATIVE EXPRESSION OF CONFIDENCE IN EACH MODEL

RECREATIONAL AREA	EXPRESSION OF CONFIDENCE IN MODEL
1	High
2	Medium
3	High
4	High
5	High
6	Low
7	Medium
8	Medium
9	Low
10	High
11	High
12	High
13	High
14	High
15	Low
16	Low
17	Medium
18	Low
19	Medium
20	Medium
21	Medium
22	Medium
23	Low
24	Medium
25	High
26	Medium
27	Medium
28	Medium
29	High
30	Low
31	High
32	High
33	Medium
34	Medium
35	Medium
36	Medium
37	High
38	Low
39	Medium
40	Medium
41	Low
42	High

TABLE 10

RECREATIONAL AREA CHARACTERISTICS AND COEFFICIENTS

CHARACTERISTICS	COEFFICIENTS
Number of golf holes	9.569
Number of picnic tables	3.314
Number of overnight accommodations	0.309
Number of drama seats	0.069
Miles of hiking trails	2.377
Miles of horseback trails	8.113
Lineal feet of beach	0.294
Square feet of swinuning pool	0.228
Water acreage	0.098

Nonlinear Regression for Origin Distances Less Than or Equal to 100 Miles

The first step in attempting to develop a model for the prediction of visitation from origins less than or equal to 100 miles was to incorporate the attractiveness index factor into Equation 1 for the purpose of running nonlinear regression analyses. Using the equation of the form

$$Y = a\, D^{b}\, P\, A^{d} \qquad 6$$

where A was the attractiveness index factor, d was a constant describing the relationship between the attractiveness of the recreational area and visitation, and the other variables were the same as in Equation 1, a successful run of NLIN was made. Realizing that placing an exponent on P (population) in Equation 5 had resulted in a great improvement in the standard error of estimate of the first recreational area, an attempt was made to exponentiate P in Equation 6. Equation 5 was not chosen as the best equation in the first phase of the study because problems encountered with NLIN would not permit the complete analysis of the equation. It was felt that the addition of the attractiveness index factor would sufficiently change the nature of Equation 5 so that the equation of the form

$$Y = a\, D^{b}\, P^{c}\, A^{d} \qquad 7$$

could be fitted to the data. All variables and constants in Equation 7 have previously been defined. Equation 7 was successfully fitted to the data using NLIN, and the statistical results were much improved compared to those for Equation 6.

Cross-Classification for Origin Distances Greater than 100 Miles

After deciding that trips from origins less than and greater than 100 miles should be treated differently, the next step was selecting a means of analyzing those trips from origins greater than 100 miles. Since there were so many zero volumes from origins greater than 100 miles, a cross-classification technique was selected as the most satisfactory means of analysis.

This cross-classification technique consisted of classifying the distances into six groups, the populations into five groups, and the attractiveness index factor into six groups so that all trip interchanges greater than 100 miles could be categorized. Each trip interchange was entered into the classification as a departing volume per thousand population and the mean of all interchanges within each category was recorded as the representative value.

Evaluation of Model

After analyzing and classifying the data by groups of less than and greater than 100 miles, results from each analysis technique were combined in order to present and evaluate the general prediction model. Using an evaluation procedure similar to that employed in the first phase of the study, the evaluation results from the combined nonlinear regression-cross-classification analyses are presented in APPENDIX F. Results from these techniques were not as accurate as the results from the first phase of the study. While Phase I of the study was primarily the development of an individual simulation model for each recreational area, Phase II concentrated on the development of a general prediction model which could be applied to any outdoor recreational area in Kentucky.

The prediction model representing distances less than 100 miles is

$$Y = 1.107\ D^{-1.083}\ P^{.441}\ A^{.868} \qquad 8$$

where Y is the 10-hour departing volume of vehicles, D is the distance from origin zone to recreational area, P is the population of the origin zone in thousands, and A is the attractiveness index factor representing the characteristics of the recreational area.

After obtaining somewhat disappointing results from the evaluation of the combined nonlinear regression - cross-classification analyses, it was decided to attempt development of a cross-classification model for the entire data set. Using an expanded version of the previously discussed cross-classification technique, the distances were categorized into eleven groups, population into five groups, and the attractiveness index factors into eight groups. As before, each trip interchange was entered into the classification as a 10-hour departing volume per thousand population and the mean of all interchanges within each category was recorded as the representative value.

Results from the cross-classification model were tabulated and evaluated in a manner similar to that employed for the two previous models. These results, which are presented in APPENDIX G, indicate a significant improvement when compared to the combined nonlinear regression - cross-classification model. Because of improved predictive ability, the cross-classification model was chosen as the final general prediction model and is presented in Table 11.

Application of Model

The simplicity and generality of the final prediction model makes it readily applicable to almost any recreational area. One needs to know only the characteristics of the recreational area as listed in Table 10, the population of the origin zone from which visitation is to be predicted, and the distance from the origin zone to the recreational area. Many recreational areas do not have all the facilities listed in Table 10, but most have at least one of the facilities from which the attractiveness index factor can be calculated.

By inputing distance in miles from origin zone to recreational area, population of origin zone in thousands, and the attractiveness index factor expressing the characteristics of the recreational area, one can obtain a prediction of the 10-hour departing volume from recreational area to origin zone. The classifications presented in Table 11 make the predictive methodology a very simple and straightforward procedure. For the purpose of recreational highway planning and design, the 10-hour departing volume can be converted to peak-hour and 24-hour volumes. This can be accomplished by using Tables 5 and 8. Table 8 permits the classification of recreational areas such that any planned or proposed new outdoor recreational area in Kentucky will be similar to at least one of the existing areas. After selecting the recreational area most similar to the planned or proposed area, the calculated 10-hour departing volume can be compared to the 10-hour departing volume listed in Table 8. This permits selecting the recreational area with similar visitation patterns in addition to similar attractiveness characteristics. Then referring to Table 5, the peak-hour and 24-hour

TABLE II

CROSS-CLASSIFICATION PREDICTION MODEL

CROSS-CLASSIFICATION MODEL TABULATION

ATTRACTIVENESS INDEX FACTOR GROUP	DISTANCES (MILES)	POPULATION (THOUSANDS) 0-10	10-100	100-1000	1000-10000	10000-100000
	0- 20	0.95898163	0.37657559	0.16223729	0.0	0.0
	20- 40	0.07621366	0.04382936	0.09810883	0.0	0.0
	40- 60	0.03046736	0.00665962	0.01014474	0.02425961	0.0
	60- 80	0.00447205	0.00213163	0.00075684	0.00793951	0.0
	80- 100	0.00501749	0.00134144	0.00087748	0.00135821	0.0
0- 100	100- 150	0.0	0.00209034	0.00086263	0.00042550	0.0
	150- 250	0.00236395	0.00113672	0.0	0.00008044	0.0
	250- 400	0.0	0.00194506	0.0	0.0	0.0
	400- 700	0.0	0.0	0.0	0.00001943	0.0
	700-1300	0.0	0.0	0.0	0.00002829	0.00000457
	1300-3000	0.0	0.0	0.0	0.00001465	0.00000711
	0- 20	1.13544655	5.72978306	0.0	0.0	0.0
	20- 40	0.50813001	0.64762914	0.16062135	0.0	0.0
	40- 60	0.09077013	0.07542700	0.19504023	0.0	0.0
	60- 80	0.00946701	0.04417120	0.03474323	0.0	0.0
	80- 100	0.00978377	0.02821740	0.01148133	0.0	0.0
100- 250	100- 150	0.01283454	0.01465168	0.00521773	0.01120973	0.0
	150- 250	0.0	0.01779335	0.00267404	0.00496950	0.0
	250- 400	0.00974108	0.01038040	0.00106779	0.00049610	0.00026823
	400- 700	0.0	0.0	0.0	0.00023177	0.00013441
	700-1300	0.0	0.0	0.0	0.00014438	0.00004732
	1300-3000	0.0	0.0	0.0	0.00001783	0.00003980
	0- 20	13.60512066	2.15327835	1.69190311	0.0	0.0
	20- 40	0.45618343	0.84385180	0.0	0.05734091	0.0
	40- 60	0.07118195	0.20437711	0.05361288	0.0	0.0
	60- 80	0.08550048	0.09662765	0.02636402	0.0	0.0
	80- 100	0.08958763	0.07254964	0.11188710	0.00930038	0.0
250- 500	100- 150	0.12461966	0.03304999	0.04490374	0.00147254	0.0
	150- 250	0.06225098	0.03363845	0.01334620	0.01168360	0.00223527
	250- 400	0.00599639	0.00172808	0.00508884	0.00435554	0.00706346
	400- 700	0.0	0.0	0.00032421	0.00202752	0.00088352
	700-1300	0.0	0.0	0.00074924	0.00085544	0.00085450
	1300-3000	0.0	0.0	0.00032310	0.00038885	0.00028194
	0- 20	17.07408142	14.42647648	4.35972214	0.0	0.0
	20- 40	1.23048592	0.98168427	0.06762052	0.0	0.0
	40- 60	0.34941846	0.26402664	0.11306220	0.0	0.0
	60- 80	0.08732462	0.07660019	0.69479340	0.0	0.0
	80- 100	0.04565455	0.04019441	0.06184201	0.04536866	0.0
500- 1000	100- 150	0.02295336	0.03790832	0.01202674	0.01365991	0.0
	150- 250	0.02795955	0.02301007	0.00477299	0.00526530	0.0
	250- 400	0.01548490	0.00816158	0.00185738	0.00121748	0.00260782
	400- 700	0.0	0.0	0.0	0.00050416	0.00029665
	700-1300	0.0	0.0	0.00008404	0.00026949	0.00026645
	1300-3000	0.0	0.0	0.0	0.00010759	0.00011941
	0- 20	19.37731934	5.39795580	0.0	0.0	0.0
	20- 40	1.09620857	1.13166714	0.49376857	0.0	0.0
	40- 60	0.22912484	0.44439262	0.34142214	0.0	0.0
	60- 80	0.05523006	0.12133151	0.40397137	0.08435732	0.0
	80- 100	0.06004418	0.04569305	0.04844257	0.09810972	0.0
1000- 2000	100- 150	0.02523594	0.04007056	0.01873372	0.01772470	0.0
	150- 250	0.03705391	0.01600631	0.00513345	0.00448848	0.0
	250- 400	0.01967793	0.00619185	0.00224304	0.00144763	0.00132626
	400- 700	0.0	0.0	0.00062903	0.00060745	0.00077247
	700-1300	0.0	0.0	0.00013438	0.00035780	0.00025655
	1300-3000	0.0	0.0	0.00027983	0.00028034	0.00013434
	0- 20	9.30527592	16.86503601	0.0	0.0	0.0
	20- 40	1.61003971	2.61544514	1.88730049	0.0	0.0
	40- 60	0.24922538	0.68204987	0.00874927	0.0	0.0
	60- 80	0.23705786	0.32020891	0.04441848	0.0	0.0
	80- 100	0.10578489	0.10133439	0.09276676	0.0	0.0
2000- 4000	100- 150	0.18476230	0.10318834	0.05605559	0.05523141	0.0
	150- 250	0.07273781	0.08328956	0.02152548	0.03683314	0.0
	250- 400	0.15019166	0.04602881	0.01176453	0.00443741	0.00067058
	400- 700	0.0	0.0	0.00090592	0.00138012	0.00214037
	700-1300	0.0	0.0	0.00047370	0.00087972	0.00033799
	1300-3000	0.0	0.0	0.00041116	0.00012996	0.00023882
	0- 20	4.85889149	21.91233826	0.0	0.0	0.0
	20- 40	0.24458832	27.33007813	0.0	0.0	0.0
	40- 60	0.0	2.28969002	0.0	0.0	0.0
	60- 80	0.93365526	1.73152637	0.00729106	0.0	0.0
	80- 100	0.55362606	0.55689758	1.63489532	0.0	0.0
4000-10000	100- 150	0.29150647	0.23062080	0.19563627	0.0	0.0
	150- 250	0.31635976	0.20414138	0.07663280	0.16524690	0.0
	250- 400	0.0	0.0	0.04418130	0.00874706	0.00447054
	400- 700	0.0	0.0	0.00181183	0.00149137	0.00092559
	700-1300	0.0	0.0	0.0	0.00086951	0.00094638
	1300-3000	0.0	0.0	0.00088904	0.00042389	0.00044779
	0- 20	107.88320923	111.47634888	0.0	0.0	0.0
	20- 40	41.39472961	21.06471252	0.0	0.0	0.0
	40- 60	6.88586330	20.13973999	0.66606885	0.0	0.0
	60- 80	5.98302994	6.34304714	0.0	0.0	0.0
	80- 100	1.85128021	2.99995136	0.0	0.0	0.0
10000-20000	100- 150	0.99966675	0.72808444	0.64073777	0.08552021	0.0
	150- 250	0.49463910	0.54417735	0.32898664	0.06843203	0.0
	250- 400	0.25180978	0.30700815	0.06867200	0.05273020	0.19035572
	400- 700	0.0	0.0	0.02297622	0.01006312	0.0
	700-1300	0.0	0.0	0.00599426	0.00490166	0.00383404
	1300-3000	0.0	0.0	0.00365747	0.00344839	0.00119410

conversion factors corresponding to the appropriate recreational area can be determined.

The preceding discussion was based on the assumption that the prediction was for the purpose of aiding in the planning and design of highways leading to outdoor recreational areas. One could use the same procedure if the desired prediction was visitation to a planned or proposed outdoor recreational area.

SUGGESTED ADDITIONAL RESEARCH

As observed from the review of the literature, recreational travel forecasting models have not been refined to any great extent. Having selected a very simple model for the first phase of this study, it appears that further investigations should be made to determine if detailed socio-economic and recreational area characteristics would produce better prediction models. While the model developed in the second phase of the study did include the characteristics of the recreational area, the model could possibly be refined by the inclusion of other factors from Table I. Other models such as the gravity, opportunity, and systems theory should also be tested and calibrated using the data from this study since it appears that the comprehensiveness of the survey coverage was unique.

When the full year of volume data from the automatic traffic counters is accumulated, an extremely useful set of information will become available for further research. This information should reveal a great deal about the characteristics and trends of recreational travel, thus permitting the incorporation of a new approach in the planning and design of recreation-oriented routes.

Results from these studies also indicate that much needs to be accomplished in order to explain the effects which recreational areas have on local and regional highway systems. Increases in population, income, leisure time, and travel will certainly only complicate the existing problem of excess demand for recreational areas. With these factors in mind, it appears that research on a regional basis is necessary from the standpoint of both transportation and recreational needs and use.

CONCLUSIONS

Through the use of a license-plate origin-destination survey, data were summarized and analyzed for the purpose of modeling traffic flows on routes to outdoor recreational areas in Kentucky. Significant findings and results from modeling are:

1. With the expected increases in population, income, leisure, and travel in the near future, a great effort will be required to provide and preserve sufficient outdoor recreational facilities. Adequate highways to and from these outdoor recreational facilities are destined to be an integral part of the total recreational experience.

2. Peak volumes for most rural routes now occur on weekends with a large percentage of the travel for recreational purposes.

3. Overall results indicate that the license-plate origin-destination survey of the type used in this study was very successful. Limitations of the survey were due to the problem of double-counting some vehicles and the inability to distinguish those vehicles having origins different from that indicated on their license plates.

4. Of all the vehicles surveyed, 73 percent were from Kentucky. This was considerably higher than expected, but could be attributed to the large number of local or day-use type recreational facilities which were surveyed.

5. Vehicle occupancy rates for Kentucky vehicles were significantly less than those for each of the next seven highest visitation states. Day-use visitation patterns are also the probable cause of these differences.

6. Automatic traffic counters are a necessity for an O-D survey of this type.

7. Modeling efforts were divided into two phases. Phase I dealt with the development of a simulation model for each of the 42 recreational areas. The models determined to best fit the data of this study were of the form $Y = aD^bP$, where Y was the 10-hour departing volume of vehicles, D was the distance in miles from origin zone to recreational area, P was the population in thousands of the origin zone, a was a constant describing the propensity of individuals in an origin zone to visit a recreational area, and b was the exponent describing the relationship between distance and visitation.

8. Phase II dealt with the development of a general prediction model applicable to any of the outdoor recreational areas included in the survey. The prediction model from the combined nonlinear regression - cross-classification analyses in its final form was:

$$Y = 1.107\ D^{-1.083}\ P^{.441}\ A^{.868}$$

where Y was the 10-hour departing volume of vehicles, D was the distance in miles from origin zone to recreational area, P was the population in thousands of the origin zone, and A was the attractiveness index factor representing the characteristics of the recreational area.

The cross-classification model, which was chosen as the best general prediction model, is presented in Table 11.

9. The models developed in Phase I proved to be excellent simulators of traffic volumes to some recreational areas and poor for others. The cross-classification model developed in Phase II was an adequate predictor of traffic volumes for most outdoor recreational areas.

10. Nonlinear regression analysis was far superior to linear regression for the purpose of finding the best fit equation to simulate and predict traffic on recreational routes.

11. The cross-classification technique used in Phase II of the study appeared to be significantly better than regression analyses as a prediction model for the entire data set.

12. Models developed in Phase I should be applied as demand predictors for planned or proposed outdoor recreational areas very similar to one of the existing 42 areas.

13. For proposed outdoor recreational areas dissimilar from any of the existing 42 areas, the Phase II cross-classification model should be applicable as a predictor of demand.

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APPENDIX A

SURVEY SITE NUMBERS, DATES, AND DESCRIPTIONS

33	July 19	Kentucky Dam Village State Park - North entrance to beach area just off US 641.
34	July 19	Kentucky Dam Village State Park - South entrance to beach area and bathhouse just off US 641.
35	July 19	Kentucky Dam Village State Park - South entrance to cottages just off US 641.
36	July 19	Kentucky Dam Village State Park - Entrance to picnic area and executive cottages just off US 641.
37	July 19	Kentucky Dam Village State Park - North entrance to camping and picnic area just off KY 282.
38	June 7	Kentucky Lake - On KY 1519 off US 641 on Sleed Creek Road.
39	June 7	Kentucky Lake - Intersection of Bizzel Road and KY 1422 off US 641.
40	June 14	Kentucky Lake - Intersection of KY 963 and KY 1052, 2.3 miles off US 68.
41	June 14	Kentucky Lake - On KY 58 off US 68 at access roads to camps and resorts.
42	June 21	Kentucky Lake - On KY 962, 1.5 miles off US 68 northeast of Fairdealing just north of trailer park.
43	August 9	Kentucky Lake - Entrance to Grand Rivers Dock and Municipal Park just off KY 453 near Lake City.
44	June 21	Kentucky Lake - Entrance to Gordons Dock and camping area off US 68 north of Jonathan Creek.
45	July 12	Kentucky Lake - Entrance to Harry Lee Waterfield Roadside Park off US 68 south of Jonathan Creek.
46	July 12	Kentucky Lake - Entrance to Sportsman Dock and Motel off US 68 south of Jonathan Creek.
47	August 9	Barkley Lake - Grand Rivers Public Use Area just off KY 453, near Lake City.
48	June 28	Kentucky Lake - Entrance to camping area in Kenlake State Park just west of intersection of KY 94 and US 68 - KY 80.
49	June 28	Kentucky Lake - Entrance to recreational area in Kenlake State Park at the intersection of KY 94 and US 68 - KY 80.

50	June 28	Kentucky Lake - Entrance to hotel and cottages in Kenlake State Park just off KY 94.
51	August 23	Kentucky Lake - Entrance to hotel and cottages in Kenlake State Park just off KY 94.
52	August 23	Kentucky Lake - Entrance to recreational area beach and amphitheater in Kenlake State Park at the intersection of KY 94 and US 68.
53	August 23	Kentucky Lake - Entrance to camping area in Kenlake State Park just west of intersection of KY 94 and US 68.
54	August 16	Kentucky Lake - Intersection of KY 497 and Highland Road off KY 94 south of Kenlake State Park.
55	June 7	Land Between The Lakes - On KY 453 just south of canal between Kentucky and Barkley Lakes.
56	June 14	Land Between The Lakes - On KY 453 just north of intersection with US 68.
57	July 26	Land Between The Lakes - On KY 453 just south of intersection with US 68.
58	August 2	Land Between The Lakes - On TENN 49 just north of intersection with US 79.
59	August 16	Land Between The Lakes - On Ft. Henry Road just north of intersection with US 79.
60	June 7	Barkley Lake - Barkley Dam Navigational Lock Area on KY 917 just south of intersection with US 62 and 641.
61	June 14	Barkley Lake - Access road to Barkley Dam and Power house off US 62 and 641.
62	June 7	Barkley Lake - Intersection of KY 1271 and KY 810, 0.7 mile south of US 62 and 641.
63	June 14	Barkley Lake - On KY 295 southeast of Kuttawa, 0.6 mile south of US 62 and 641.
64	June 21	Barkley Lake - Access road to Popular Creek Dock on KY 295 at Eddyville.
65	June 21	Barkley Lake - On KY 730 off KY 93 south of Eddyville.
66	June 28	Barkley Lake - Entrance to Eddy Creek Recreational Area just off KY 93 crossing Eddy Creek.

67	July 12	Barkley Lake - Entrance to Drydens Creek Dock just off KY 274 south of Confederate.
68	July 12	Barkley Lake - Entrance to Cannon Spring Recreational Area off KY 274 south of Confederate.
69	June 7	Barkley Lake - Entrance to Hurricane Creek Recreational Area just off KY 274.
70	July 19	Barkley Lake - Port Prizer Point Recreational Area on KY 276 near intersection with KY 274.
71	July 26	Barkley Lake - Entrance to Lake Barkley State Park on KY 1489 off US 68.
72	July 26	Barkley Lake - Access road to Devils Elbow Recreational Area just off US 68 and KY 80 at Canton.
73	August 9	Barkley Lake - Calhoun Hill Recreational Area on KY 1062 just off KY 164.
74	August 16	Barkley Lake - Donaldson Creek Recreational Area at intersection of KY 164 and KY 807.
75	August 23	Barkley Lake - Entrance to Linton Recreational Area just off KY 164 near Linton.
76	June 7	Buckhorn Reservoir - Access road to Buckhorn State Park lodge and dock on KY 1833.
77	June 14	Buckhorn Reservoir - Access road to Buckhorn dam and picnic area just off KY 28 near Buckhorn.
78	July 12	Buckhorn Reservoir - Access road to Trace Branch Dock off KY 451 southeast of Krypton.
79	August 23	Buckhorn Reservoir - Access road to Confluence Dock just off KY 257, 11 miles north of Hyden.
80	August 23	Kentucky Lake - Entrance to the cottage annex area at Kenlake State Park.
81	June 7	Barren River Reservoir - Entrance to Peninsula Boat Ramp on KY 2065 off KY 252.
82	June 14	Barren River Reservoir - Entrance to Beaver Creek Boat Ramp on KY 1342 just off KY 252.
83	July 12	Barren River Reservoir - Intersection of Tobacco Road and Crows Road on KY 1318 west of Lucas.

84	July 19	Barren River Reservoir - Entrance to Barren River Reservoir State Park on KY 87 just west of US 31E.
85	August 16	Barren River Reservoir - Entrance to Austin Boat Ramp on KY 1347, 2.7 miles south of KY 87.
86	June 7	Rough River Reservoir - North entrance to Rough River Dam State Park just off KY 79.
87	June 7	Rough River Reservoir - South entrance to Rough River Dam State Park just off KY 79.
88	June 14	Rough River Reservoir - Boat Ramp off KY 737, 6 miles northwest of Leitchfield.
89	August 2	Rough River Reservoir - Access road to lake just off KY 105 near Axtel.
90	June 7	Nolin Reservoir - Dog Creek Ramp off KY 88, 4.5 miles west of Cub Run.
91	August 2	Nolin Reservoir - Entrance to Wax Ramp just off KY 88 on north side of lake.
92	July 12	Nolin Reservoir - Intersection of KY 889 and Whispering Pines Road, 1.5 miles south of KY 88.
93	August 2	Nolin Reservoir - Montadier Ramp on KY 2067, 1.5 miles south of KY 459.
94	August 16	Nolin Reservoir - Entrance to Brier Creek Ramp on KY 1827.
95	June 7	Green River Reservoir - Boat ramp at dam just off KY 55.
96	June 14	Green River Reservoir - Access road to Lone Valley Ramp off KY 1601 off KY 55.
97	July 26	Green River Reservoir - Access road to Taylor County Dock off KY 372 south of Atchison.
98	August 16	Green River Reservoir - Access road to Pikes Ridge Ramp on new road off KY 76 west of Yuma.
99	August 23	Green River Reservoir - Access road to Holmes Bend Ramp off KY 682 north of Holmes.
100	June 21	Dewey Lake - Entrance to Jenny Wiley State Resort Park on KY 304 just north of US 23 and US 460 at Brandy Keg.

103	June 21	Grayson Reservoir - Northernmost part of lake on KY 1496 just off KY 7 south of Leon.
104	August 26	Grayson Reservoir - Bruin Recreational and Camping Area on KY 7 north of Bruin.
105	June 21	Fishtrap Reservoir - Entrance road to dam off KY 1789 near Millard.
107	June 21	Natural Bridge State Park - Main entrance to to park just off KY 11 leading to Hemlock Lodge.
108	June 21	Natural Bridge State Park - North entrance just off KY 11 leading to picnic and camping areas.
109	June 21	Natural Bridge State Park - South entrance just off KY 11 leading to picnic and camping areas.
110	June 21	Pennyrile Forest State Park - Entrance to lodge and all other facilities of park just off KY 398 off KY 109.
112	August 2	Cumberland Falls State Park - South entrance to falls parking lot and entrance to picnic area just off KY 90.
113	August 2	Cumberland Falls State Park - Entrance to cabins, amphitheater, and camping area just off KY 90.
114	August 16	Pine Mountain State Park - Park entrance to amphitheater just off US 25E.
115	August 16	Pine Mountain State Park - Park entrance to recreational areas off KY 190.
116	June 21	Carter Caves State Park - Entrance to park just off KY 182 off US 60 northeast of Olive Hill.
117	June 28	Audubon Memorial State Park - Park entrance road just off US 641 north of Henderson.
118	June 28	General Butler State Park - Park entrance road off KY 320 south of Carrollton.
119	June 28	General Butler State Park - Park entrance road off US 227 southeast of Carrollton.
120	June 28	Big Bone Lick State Park - Park entrance to picnic facilities just off KY 338.
121	June 28	Big Bone Lick State Park - Park entrance to recreational facilities just off KY 338.

122	July 26	Blue Licks Battlefield State Park - Park entrance road off US 68 southeast of Mt. Olivet.
123	June 28	Fort Boonesborough State Park - Park entrance road off KY 338 just off US 227 north of Boonesborough.
124	June 28	Columbus - Belmont Battlefield State Park - Park entrance road just off KY 123 off KY 58 at Columbus.
126	July 12	Greenbo Lake State Park - On KY 1711 at park entrance off KY 1.
127	July 12	Kingdom Come State Park - On KY 1926 at park entrance off KY 119.
128	July 12	Lake Malone State Park - On KY 1785 at lake access point off KY 107.
129	July 26	Lake Malone State Park - Park access road off KY 973 west of Dunmore.
130	July 26	Levi Jackson Wilderness Road State Park - entrance road to park just off KY 229 southeast of London.
131	July 26	Levi Jackson Wilderness Road State Park - entrance road to park just off US 25 south of London.
132	July 26	My Old Kentucky Home State Park - Entrance road to park just off US 150 east of Bardstown.
133	July 26	Old Fort Harrod State Park - Park entrance road just off US 68 in Harrodsburg.
134	July 26	Lake Beshear - On access road to lake just off KY 109.
135	August 2	Guist Creek Lake - Lake access road leading to boat dock off KY 1779 east of Shelbyville.
136	August 16	Williamstown Lake - Access road to boat dock off KY 467 near Williamstown.
137	August 2	Lake Boltz - Lake access road to boat dock off Dry Ridge Road off KY 467.
139	August 9	Elmer Davis Lake - On 1670 leading to boat dock off KY 22 south of Owenton.
140	August 9	Beaver Lake - On KY 749 off US 62 at access point to boat dock.

141	August 9	Wilgreen Lake - On Old Town Bridge Road to. boat dock off KY 876 southwest of Richmond.
142	June 28	Otter Creek Park - Main entrance road to park off KY 1238 near Muldraugh.
143	July 26	Doe Valley Lake - On access road to boat dock off KY 933 east of Brandenburg.
144	August 9	Shanty Hollow Lake - On KY 1592 to boat dock south of Glenmore.
145	August 9	Daniel Boone National Forest - Entrance to Natural Arch Scenic Area on KY 927 just off US 27.
146	August 23	Mammoth Cave National Park - Entrance road to park off KY 70.
147	June 21	Herrington Lake - Access road off KY 33 to Gwinn Island north of Danville.
149	July 19	Herrington Lake - Entrance to Safari Camp on KY 152 on west side of lake.
150	August 2	Herrington Lake - Entrance to Paradise and Hughes Camps on Hugley Lane off KY 33.
151	August 2	Herrington Lake - Entrance to Kennedy's Boat Dock on KY 152 on east side of lake.
152	August 23	Carter Caves State Park - Entrance to park just off KY 182 northeast of Olive Hill.
153	August 16	Herrington Lake - Entrance to Bryants Camp just off KY 34 on east side of lake.
154	August 23	Herrington Lake - On Curdsville Road off KY 33 leading to Dix Dam.
155	June 21	Kentucky Lake - Reed Road near Fairdealing off US 641.
156	June 21	Dewey Lake - Entrance to Jenny Wiley State Park just off KY 304 near Paintsville.
157	June 28	Kentucky Lake - Entrance to the cottage annex area at Kenlake State Park.
158	August 16	Grayson Reservoir - Rosedale Recreational area - Grayson Reservoir State Park - Just off KY 7 north of Bruin Recreational Area.
159	July 12	Lake Cumberland - Access road to Fishing Creek Recreational Area just off KY 80 on the east side of Fishing Creek.

160	July 12	Lake Malone State Park - Entrance to main park building just off KY 973.
162	July 19	Lake Cumberland - On KY 1277 on access road to Laurel Boat Dock and Sayer Campsite west of Corbin.
163	July 19	Carter Caves State Park - Entrance to park just off KY 182 northeast of Olive Hill.
164	August 2	Kentucky Lake - Entrance to hotel and cottages in Kenlake State Park just off KY 94.
165	August 2	Kentucky Lake - Entrance to recreational area beach and amphitheater in Kenlake State Park at the intersection of KY 94 and US 68.
166	August 2	Kentucky Lake - Entrance to camping area in Kenlake State Park just west of intersection of KY 94 and US 68.
167	August 2	Kentucky Lake - Entrance to cottage annex area at Kenlake State Park.
168	July 26	My Old Kentucky Home State Park - Entrance road to the camping grounds at the park just off US 150 east of Bardstown.
169	July 26	Kentucky Lake - Entrance to hotel and cottages in Kenlake State Park just off KY 94.
170	August 2	Kentucky Lake - East entrance to the Kentucky Dam Lock and Navigational Area just off US 641.
171	August 2	Kentucky Lake - West entrance to the Kentucky Dam Lock and Navigational Area just off US 641.
172	August 2	Cumberland Falls State Park - North entrance to falls parking lot just off KY 90.
173	August 2	Cumberland Falls State Park - Entrance to Dupont Lodge just off KY 90.
174	August 2	Cumberland Falls State Park - Entrance to the public pool just off KY 90.
175	August 23	Cumberland Gap National Historic Park - Entrance to visitors center and scenic area off US 25E.
176	August 23	Cumberland Gap National Historic Park - Entrance to camping and picnic area off US 58 in Virginia.
905	June 7	Lake Cumberland - North entrance to Burnside dock in Burnside just off US 27.
976	June 7	Buckhorn Reservoir - Entrance to Gays Creek Dock and camping area on KY 2072.

APPENDIX B

TAPE DATA ARRANGEMENT AND FORMAT

TAPE DATA ARRANGEMENT[a]

Data for First Site

- 25 Verbal Description Records
- Site Location Record
- Hour Identification Record (1st Hour)
- Data Records (one for each vehicle)
- •
- •
- •
- Hour Identification Record (10th Hour)
- Data Records (one for each vehicle)

•
•
•

Data for 170th Site

- 25 Verbal Description Records
- Site Location Record
- Hour Identification Record (1st Hour)
- Data Records (one for each vehicle)
- •
- •
- •
- Hour Identification Record (10th Hour)
- Data Record (one for each vehicle)

[a]Arrangement of sites on tape is not related to site number.

TAPE RECORD FORMAT

RECORD POSITIONS	FORMAT	VERBAL DESCRIPTION RECORD[a]	SITE IDENTIFICATION RECORD	HOUR IDENTIFICATION RECORD	DATA RECORD
1-4	I4		Site Number	Hourly Volume[b]	Vehicle Number[d]
5-8	I4		Day	Starting Time	Direction Code[e]
9-12	I4	Month		Ending Time	Vehicle Classification[c]
13-14	I2		Year (last 2 Digits)	Weather[c]	Occupancy
15-17	I3		Blank	Blank	County[f]
18-19	I2		Blank	Blank	State[g]
20	I1	1	2	3	4
21-25	I5	Site Number	Site Number	Site Number	Site Number

[a]First 19 positions of 25 consecutive records contain verbal description of site location (alphameric).
[b]Volume recorded is 9999 if no count taken during hour.
[c]See Figure 5 for codes.
[d]Vehicles numbered consecutively beginning with one for each hour.
[e]0 is arriving and 1 is departing.
[f]Counties numbered consecutively according to alphabetical listing within any state.
[g]States numbered consecutively according to alphabetical listing of the 50 states. Canada is 51 and other locations are 52.

APPENDIX C

SUMMARY OF TRAVEL CHARACTERISTICS

1970 KENTUCKY RECREATIONAL TRAVEL STUDY
KENTUCKY DEPARTMENT OF HIGHWAYS

TYPE OF SURVEY: VEHICLE LICENSE PLATE ORIGIN AND DESTINATION SURVEY

DATE OF SURVEY: SUMMER 1970 (SUNDAYS OF JUNE 7 THROUGH AUGUST 23, JULY 5 EXCLUDED)

NUMBER OF SITES:

STATE PARKS	65
NATIONAL PARKS	3
CORPS OF ENGINEERS FACILITIES	64
TVA (KENTUCKY LAKE)	13
TVA (LAND BETWEEN THE LAKES)	5
DANIEL BOONE NATIONAL FOREST	4
OTHER AREAS	16
ALL RECREATIONAL AREAS	170

DURATION OF SURVEY: 10:00 AM TO 8:00 PM ON A SUNDAY AT EACH SITE

* * SUMMARY OF VOLUMES * *

	ACTUAL COUNTED VOLUMES			VOLUMES ADJUSTED TO FULL-HOUR PERIODS			VOLUMES ADJUSTED TO GOOD WEATHER AND FULL-HOUR PERIODS		
	ARRIVING	DEPARTING	TOTAL	ARRIVING	DEPARTING	TOTAL	ARRIVING	DEPARTING	TOTAL
STATE PARKS	41055.	39578.	80633.	46199.	44676.	90882.	47154.	46916.	93969.
NATIONAL PARKS	1774.	1925.	3699.	2279.	2469.	4750.	2315.	2507.	4824.
CORPS OF ENGINEERS FACILITIES	15108.	15610.	30718.	16420.	17008.	33414.	16680.	17268.	33948.
TVA (KENTUCKY LAKE)	2931.	3057.	5988.	3166.	3308.	6477.	3212.	3353.	6569.
TVA (LAND BETWEEN THE LAKES)	2023.	2003.	4026.	2634.	2682.	5315.	2634.	2682.	5315.
DANIEL BOONE NATIONAL FOREST	372.	405.	777.	403.	442.	850.	537.	587.	1123.
OTHER AREAS	2439.	2373.	4812.	2659.	2611.	5270.	2794.	2756.	5550.
ALL RECREATIONAL AREAS	65702.	64951.	130653.	73760.	73196.	146958.	75326.	76069.	151298.

1970 KENTUCKY RECREATIONAL TRAVEL STUDY
KENTUCKY DEPARTMENT OF HIGHWAYS
SUMMARY FOR 65 LOCATIONS - STATE PARKS

ORIGIN	COUNTED VOLUMES BY DIRECTION ARRIVING	DEPARTING	TOTAL	COUNTED VOLUMES BY VEHICLE TYPE CAR	CAR W/ BOAT AND TLR	CAR W/ BOAT ON TOP	CAR W/ CAMPER TLR	S.UNIT CAMPER	S.UNIT CAMPER W/ BOAT	OTHER	UNCLASS	TOTAL	AVERAGE VEHICLE OCCUPANCY
ALABAMA	71.	64.	135.	118.	4.	0.	7.	2.	0.	2.	2.	135.	3.1654
ALASKA	4.	3.	7.	4.	0.	0.	1.	2.	0.	0.	0.	7.	4.6667
ARIZONA	11.	7.	18.	17.	0.	0.	1.	0.	0.	0.	0.	18.	3.0588
ARKANSAS	32.	24.	56.	44.	1.	1.	5.	3.	0.	0.	2.	56.	3.5400
CALIFORNIA	66.	67.	133.	119.	1.	1.	4.	3.	3.	1.	1.	133.	3.5763
COLORADO	21.	13.	34.	24.	0.	2.	2.	6.	0.	0.	0.	34.	3.4333
CONNECTICUT	20.	7.	27.	20.	3.	0.	4.	0.	0.	0.	0.	27.	3.0000
DELAWARE	8.	4.	12.	8.	2.	0.	1.	0.	0.	0.	1.	12.	3.1818
FLORIDA	215.	192.	407.	335.	6.	1.	31.	21.	3.	0.	10.	407.	3.1404
GEORGIA	95.	80.	175.	147.	4.	2.	11.	3.	5.	0.	3.	175.	3.4013
HAWAII	6.	1.	7.	5.	0.	0.	0.	0.	1.	1.	0.	7.	2.5714
IDAHO	4.	4.	8.	6.	2.	0.	0.	0.	0.	0.	0.	8.	3.0000
ILLINOIS	1582.	1464.	3046.	2712.	64.	31.	104.	69.	13.	23.	30.	3046.	3.6294
INDIANA	2398.	2330.	4728.	4222.	110.	26.	95.	111.	16.	38.	110.	4728.	3.3510
IOWA	41.	29.	70.	56.	0.	4.	3.	3.	0.	2.	2.	70.	3.7015
KANSAS	20.	17.	37.	26.	0.	0.	1.	3.	6.	0.	1.	37.	3.4857
KENTUCKY	28217.	27386.	55603.	49860.	1407.	210.	316.	402.	81.	721.	2606.	55603.	3.0038
LOUISIANA	22.	25.	47.	37.	3.	1.	3.	1.	0.	2.	0.	47.	3.4545
MAINE	7.	4.	11.	11.	0.	0.	0.	0.	0.	0.	0.	11.	2.4545
MARYLAND	53.	49.	102.	94.	0.	1.	6.	0.	0.	0.	1.	102.	3.1935
MASS.	19.	13.	32.	28.	0.	0.	1.	2.	0.	0.	1.	32.	3.2692
MICHIGAN	626.	566.	1192.	987.	30.	7.	77.	34.	7.	15.	35.	1192.	3.5063
MINNESOTA	18.	14.	32.	24.	0.	0.	6.	1.	0.	0.	1.	32.	3.0400
MISSOURI	615.	553.	1168.	1048.	44.	4.	35.	20.	3.	6.	8.	1168.	3.4991
MISSISSIPPI	15.	10.	25.	21.	0.	1.	0.	2.	0.	0.	1.	25.	3.2609
MONTANA	6.	3.	9.	9.	0.	0.	0.	0.	0.	0.	0.	9.	2.6250
NEBRASKA	24.	14.	38.	31.	1.	0.	2.	3.	0.	0.	1.	38.	3.1176
NEVADA	2.	3.	5.	4.	0.	0.	0.	1.	0.	0.	0.	5.	3.6000
N. HAMPSHIRE	3.	5.	8.	7.	0.	0.	0.	0.	0.	0.	1.	8.	2.7143
NEW JERSEY	57.	45.	102.	90.	0.	1.	6.	3.	1.	0.	1.	102.	3.2688
NEW MEXICO	6.	10.	16.	14.	0.	0.	1.	1.	0.	0.	0.	16.	3.0909
NEW YORK	99.	85.	184.	162.	7.	1.	7.	5.	0.	0.	2.	184.	3.4720
N. CAROLINA	48.	36.	84.	74.	1.	0.	1.	1.	0.	0.	7.	84.	3.4085
NORTH DAKOTA	6.	9.	15.	14.	1.	0.	0.	0.	0.	0.	0.	15.	3.8182
OKLAHOMA	21.	20.	41.	39.	0.	0.	0.	1.	0.	0.	1.	41.	3.0541
OHIO	3454.	3254.	6708.	5845.	132.	34.	251.	136.	12.	58.	240.	6708.	3.4649
OREGON	22.	14.	36.	30.	1.	0.	1.	4.	0.	0.	0.	36.	3.4167
PENNSYLVANIA	115.	96.	211.	178.	4.	0.	13.	7.	1.	3.	5.	211.	3.2416
RHODE ISLAND	1.	5.	6.	5.	0.	0.	1.	0.	0.	0.	0.	6.	3.6667
S. CAROLINA	27.	35.	62.	55.	1.	0.	2.	3.	0.	0.	1.	62.	3.7321
SOUTH DAKOTA	5.	6.	11.	8.	0.	0.	2.	1.	0.	0.	0.	11.	3.2222
TENNESSEE	997.	963.	1960.	1805.	47.	5.	21.	20.	13.	3.	46.	1960.	3.3690
TEXAS	134.	124.	258.	235.	5.	0.	4.	9.	1.	0.	4.	258.	3.1048
UTAH	6.	5.	11.	11.	0.	0.	0.	0.	0.	0.	0.	11.	3.3000
VERMONT	2.	3.	5.	5.	0.	0.	0.	0.	0.	0.	0.	5.	4.0000
VIRGINIA	99.	100.	199.	171.	3.	0.	9.	11.	0.	0.	5.	199.	3.2289
WASHINGTON	18.	19.	37.	35.	0.	0.	1.	1.	0.	0.	0.	37.	2.8788
W. VIRGINIA	681.	720.	1401.	1208.	24.	10.	80.	18.	5.	11.	45.	1401.	3.6572
WISCONSIN	46.	38.	84.	71.	2.	0.	9.	0.	0.	0.	2.	84.	3.5325
WYOMING	2.	1.	3.	3.	0.	0.	0.	0.	0.	0.	0.	3.	4.6667
CANADA	54.	26.	80.	58.	0.	0.	13.	6.	0.	0.	3.	80.	3.3239
OTHERS	5.	4.	9.	9.	0.	0.	0.	0.	0.	0.	0.	9.	2.5000
UNCLASSIFIED	929.	1009.	1938.	1706.	57.	10.	19.	34.	2.	34.	76.	1938.	2.7819
TOTAL	41055.	39578.	80633.	71855.	1967.	353.	1157.	953.	173.	920.	3255.	80633.	3.1278

1970 KENTUCKY RECREATIONAL TRAVEL STUDY
KENTUCKY DEPARTMENT OF HIGHWAYS
SUMMARY FOR 3 LOCATIONS - NATIONAL PARKS

ORIGIN	COUNTED VOLUMES BY DIRECTION			COUNTED VOLUMES BY VEHICLE TYPE									AVERAGE VEHICLE OCCUPANCY
	ARRIVING	DEPARTING	TOTAL	CAR	CAR W/ BOAT AND TLR	CAR W/ BOAT ON TOP	CAR W/ CAMPER TLR	S.UNIT CAMPER	S.UNIT CAMPER W/ BOAT	OTHER	UNCLASS	TOTAL	
ALABAMA	20.	20.	40.	34.	0.	0.	0.	4.	0.	0.	2.	40.	3.2821
ALASKA	1.	0.	1.	1.	0.	0.	0.	0.	0.	0.	0.	1.	5.0000
ARIZONA	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
ARKANSAS	5.	5.	10.	10.	0.	0.	0.	0.	0.	0.	0.	10.	3.7143
CALIFORNIA	6.	12.	18.	12.	0.	0.	1.	5.	0.	0.	0.	18.	2.5000
COLORADO	1.	0.	1.	1.	0.	0.	0.	0.	0.	0.	0.	1.	0.0
CONNECTICUT	4.	7.	11.	8.	0.	0.	0.	3.	0.	0.	0.	11.	4.1000
DELAWARE	1.	1.	2.	2.	0.	0.	0.	0.	0.	0.	0.	2.	3.5000
FLORIDA	24.	26.	50.	43.	0.	0.	3.	1.	0.	1.	2.	50.	3.4583
GEORGIA	18.	31.	49.	47.	0.	1.	1.	0.	0.	0.	0.	49.	3.8500
HAWAII	0.	1.	1.	1.	0.	0.	0.	0.	0.	0.	0.	1.	1.0000
IDAHO	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
ILLINOIS	117.	119.	236.	216.	0.	0.	7.	8.	0.	0.	5.	236.	3.5734
INDIANA	188.	233.	421.	373.	2.	0.	15.	19.	0.	7.	5.	421.	3.5592
IOWA	10.	11.	21.	17.	0.	0.	2.	2.	0.	0.	0.	21.	3.3529
KANSAS	5.	1.	6.	6.	0.	0.	0.	0.	0.	0.	0.	6.	3.5000
KENTUCKY	654.	680.	1334.	1235.	4.	1.	18.	20.	2.	16.	38.	1334.	3.2192
LOUISIANA	5.	12.	17.	15.	0.	0.	0.	0.	0.	0.	2.	17.	3.0000
MAINE	0.	1.	1.	0.	0.	0.	0.	0.	0.	0.	1.	1.	2.0000
MARYLAND	14.	7.	21.	14.	2.	0.	2.	3.	0.	0.	0.	21.	4.1000
MASS.	5.	3.	8.	8.	0.	0.	0.	0.	0.	0.	0.	8.	3.5000
MICHIGAN	129.	137.	266.	228.	1.	0.	19.	15.	0.	0.	3.	266.	3.9427
MINNESOTA	7.	6.	13.	11.	0.	0.	2.	0.	0.	0.	0.	13.	3.4615
MISSOURI	7.	12.	19.	18.	0.	0.	1.	0.	0.	0.	0.	19.	3.4444
MISSISSIPPI	4.	10.	14.	13.	0.	0.	0.	0.	0.	0.	1.	14.	3.2727
MONTANA	0.	1.	1.	1.	0.	0.	0.	0.	0.	0.	0.	1.	0.0
NEBRASKA	1.	2.	3.	3.	0.	0.	0.	0.	0.	0.	0.	3.	3.0000
NEVADA	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
N. HAMPSHIRE	1.	1.	2.	2.	0.	0.	0.	0.	0.	0.	0.	2.	4.0000
NEW JERSEY	17.	15.	32.	26.	0.	0.	3.	1.	0.	0.	2.	32.	3.0714
NEW MEXICO	1.	0.	1.	1.	0.	0.	0.	0.	0.	0.	0.	1.	3.0000
NEW YORK	37.	42.	79.	65.	0.	0.	2.	10.	0.	0.	2.	79.	3.0462
N. CAROLINA	12.	17.	29.	27.	0.	0.	0.	1.	0.	0.	1.	29.	3.5600
NORTH DAKOTA	0.	1.	1.	1.	0.	0.	0.	0.	0.	0.	0.	1.	4.0000
OKLAHOMA	3.	1.	4.	4.	0.	0.	0.	0.	0.	0.	0.	4.	4.0000
OHIO	186.	228.	414.	356.	2.	1.	21.	16.	2.	7.	9.	414.	3.3726
OREGON	2.	2.	4.	2.	0.	0.	0.	2.	0.	0.	0.	4.	3.0000
PENNSYLVANIA	23.	14.	37.	35.	0.	0.	1.	0.	0.	0.	1.	37.	3.5000
RHODE ISLAND	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
S. CAROLINA	16.	3.	19.	18.	0.	1.	0.	0.	0.	0.	0.	19.	2.6471
SOUTH DAKOTA	0.	1.	1.	0.	0.	0.	1.	0.	0.	0.	0.	1.	5.0000
TENNESSEE	115.	128.	243.	229.	0.	0.	4.	3.	0.	0.	7.	243.	3.2877
TEXAS	16.	15.	31.	28.	0.	0.	0.	1.	0.	1.	1.	31.	3.1034
UTAH	2.	2.	4.	4.	0.	0.	0.	0.	0.	0.	0.	4.	2.3333
VERMONT	0.	1.	1.	1.	0.	0.	0.	0.	0.	0.	0.	1.	1.0000
VIRGINIA	38.	41.	79.	74.	0.	0.	2.	0.	1.	0.	2.	79.	3.1447
WASHINGTON	1.	3.	4.	4.	0.	0.	0.	0.	0.	0.	0.	4.	2.0000
W. VIRGINIA	16.	18.	34.	31.	0.	0.	1.	1.	0.	0.	1.	34.	3.4000
WISCONSIN	17.	25.	42.	38.	0.	0.	1.	1.	0.	1.	1.	42.	3.2432
WYOMING	2.	0.	2.	2.	0.	0.	0.	0.	0.	0.	0.	2.	2.5000
CANADA	13.	6.	19.	16.	0.	0.	1.	0.	0.	0.	2.	19.	3.1176
OTHERS	0.	2.	2.	1.	0.	0.	0.	1.	0.	0.	0.	2.	2.0000
UNCLASSIFIED	30.	21.	51.	45.	0.	0.	0.	4.	1.	0.	1.	51.	2.9737
TOTAL	1774.	1925.	3699.	3327.	11.	4.	108.	121.	6.	33.	89.	3699.	3.3651

1970 KENTUCKY RECREATIONAL TRAVEL STUDY
KENTUCKY DEPARTMENT OF HIGHWAYS
SUMMARY FOR 64 LOCATIONS - CORPS OF ENGINEERS FACILITIES

ORIGIN	COUNTED VOLUMES BY DIRECTION			COUNTED VOLUMES BY VEHICLE TYPE									AVERAGE VEHICLE OCCUPANCY
	ARRIVING	DEPARTING	TOTAL	CAR	CAR W/ BOAT AND TLR	CAR W/ BOAT ON TOP	CAR W/ CAMPER TLR	S.UNIT CAMPER	S.UNIT CAMPER W/ BOAT	OTHER	UNCLASS	TOTAL	
ALABAMA	11.	9.	20.	15.	2.	2.	0.	1.	0.	0.	0.	20.	3.3529
ALASKA	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
ARIZONA	3.	4.	7.	6.	0.	0.	0.	1.	0.	0.	0.	7.	4.5000
ARKANSAS	5.	4.	9.	9.	0.	0.	0.	0.	0.	0.	0.	9.	2.8889
CALIFORNIA	8.	12.	20.	14.	0.	0.	0.	4.	0.	0.	2.	20.	3.3333
COLORADO	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
CONNECTICUT	2.	1.	3.	3.	0.	0.	0.	0.	0.	0.	0.	3.	2.0000
DELAWARE	1.	1.	2.	2.	0.	0.	0.	0.	0.	0.	0.	2.	3.0000
FLORIDA	38.	35.	73.	64.	4.	0.	1.	2.	1.	0.	1.	73.	3.2344
GEORGIA	7.	8.	15.	14.	0.	0.	0.	0.	1.	0.	0.	15.	3.1538
HAWAII	1.	0.	1.	1.	0.	0.	0.	0.	0.	0.	0.	1.	5.0000
IDAHO	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
ILLINOIS	194.	184.	378.	326.	19.	1.	6.	11.	6.	4.	5.	378.	3.4290
INDIANA	514.	547.	1061.	799.	137.	7.	12.	45.	23.	10.	28.	1061.	3.0823
IOWA	4.	4.	8.	8.	0.	0.	0.	0.	0.	0.	0.	8.	2.7500
KANSAS	1.	3.	4.	4.	0.	0.	0.	0.	0.	0.	0.	4.	2.7500
KENTUCKY	12589.	12851.	25440.	20896.	2632.	95.	122.	356.	194.	395.	750.	25440.	2.8394
LOUISIANA	11.	4.	15.	10.	1.	0.	0.	4.	0.	0.	0.	15.	2.7333
MAINE	1.	3.	4.	4.	0.	0.	0.	0.	0.	0.	0.	4.	3.0000
MARYLAND	1.	5.	6.	4.	0.	1.	1.	0.	0.	0.	0.	6.	2.6000
MASS.	3.	7.	10.	9.	1.	0.	0.	0.	0.	0.	0.	10.	4.2500
MICHIGAN	66.	56.	122.	107.	5.	1.	0.	4.	4.	0.	1.	122.	3.1635
MINNESOTA	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
MISSOURI	58.	52.	110.	90.	9.	2.	2.	6.	1.	0.	0.	110.	3.1455
MISSISSIPPI	3.	6.	9.	7.	0.	0.	0.	2.	0.	0.	0.	9.	2.8333
MONTANA	1.	0.	1.	0.	0.	0.	0.	1.	0.	0.	0.	1.	4.0000
NEBRASKA	2.	2.	4.	4.	0.	0.	0.	0.	0.	0.	0.	4.	3.5000
NEVADA	1.	0.	1.	1.	0.	0.	0.	0.	0.	0.	0.	1.	3.0000
N. HAMPSHIRE	1.	3.	4.	3.	0.	0.	0.	0.	0.	0.	1.	4.	3.3333
NEW JERSEY	8.	6.	14.	11.	0.	0.	1.	0.	0.	2.	0.	14.	2.6923
NEW MEXICO	1.	1.	2.	2.	0.	0.	0.	0.	0.	0.	0.	2.	2.0000
NEW YORK	6.	12.	18.	16.	2.	0.	0.	0.	0.	0.	0.	18.	3.3889
N. CAROLINA	10.	10.	20.	16.	2.	0.	0.	0.	0.	0.	2.	20.	3.5000
NORTH DAKOTA	1.	0.	1.	0.	1.	0.	0.	0.	0.	0.	0.	1.	2.0000
OKLAHOMA	3.	2.	5.	2.	1.	0.	0.	2.	0.	0.	0.	5.	3.0000
OHIO	918.	1055.	1973.	1400.	330.	18.	15.	66.	31.	23.	90.	1973.	3.1119
OREGON	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
PENNSYLVANIA	10.	9.	19.	15.	2.	0.	0.	1.	0.	0.	1.	19.	3.0000
RHODE ISLAND	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
S. CAROLINA	8.	5.	13.	11.	1.	0.	0.	1.	0.	0.	0.	13.	2.7500
SOUTH DAKOTA	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
TENNESSEE	108.	107.	215.	189.	12.	1.	0.	2.	0.	3.	8.	215.	3.1337
TEXAS	25.	22.	47.	40.	2.	0.	0.	4.	0.	0.	1.	47.	3.0870
UTAH	1.	2.	3.	2.	0.	0.	0.	1.	0.	0.	0.	3.	5.0000
VERMONT	1.	0.	1.	1.	0.	0.	0.	0.	0.	0.	0.	1.	4.0000
VIRGINIA	33.	25.	58.	55.	1.	0.	0.	1.	0.	0.	1.	58.	2.9184
WASHINGTON	1.	1.	2.	2.	0.	0.	0.	0.	0.	0.	0.	2.	2.0000
W. VIRGINIA	51.	53.	104.	85.	7.	2.	3.	3.	2.	2.	0.	104.	3.3030
WISCONSIN	4.	5.	9.	7.	0.	0.	1.	0.	1.	0.	0.	9.	2.8750
WYOMING	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
CANADA	0.	3.	3.	3.	0.	0.	0.	0.	0.	0.	0.	3.	3.0000
OTHERS	11.	10.	21.	19.	0.	0.	0.	0.	0.	2.	0.	21.	1.1429
UNCLASSIFIED	382.	481.	863.	597.	76.	3.	6.	14.	13.	22.	132.	863.	2.8953
TOTAL	15108.	15610.	30718.	24873.	3247.	133.	170.	532.	277.	463.	1023.	30718.	2.8855

1970 KENTUCKY RECREATIONAL TRAVEL STUDY
KENTUCKY DEPARTMENT OF HIGHWAYS
SUMMARY FOR 13 LOCATIONS - TVA (KENTUCKY LAKE)

ORIGIN	COUNTED VOLUMES BY DIRECTION			COUNTED VOLUMES BY VEHICLE TYPE									AVERAGE
	ARRIVING	DEPARTING	TOTAL	CAR	CAR W/ BOAT AND TLR	CAR W/ BOAT ON TOP	CAR W/ CAMPER TLR	S.UNIT CAMPER	S.UNIT CAMPER W/ BOAT	OTHER	UNCLASS	TOTAL	VEHICLE OCCUPANCY
ALABAMA	5.	6.	11.	11.	0.	0.	0.	0.	0.	0.	0.	11.	3.2000
ALASKA	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
ARIZONA	1.	2.	3.	3.	0.	0.	0.	0.	0.	0.	0.	3.	3.3333
ARKANSAS	3.	2.	5.	5.	0.	0.	0.	0.	0.	0.	0.	5.	5.4000
CALIFORNIA	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
COLORADO	1.	1.	2.	2.	0.	0.	0.	0.	0.	0.	0.	2.	2.0000
CONNECTICUT	1.	1.	2.	2.	0.	0.	0.	0.	0.	0.	0.	2.	5.5000
DELAWARE	0.	1.	1.	1.	0.	0.	0.	0.	0.	0.	0.	1.	6.0000
FLORIDA	20.	18.	38.	37.	0.	0.	0.	0.	1.	0.	0.	38.	3.3158
GEORGIA	7.	7.	14.	14.	0.	0.	0.	0.	0.	0.	0.	14.	3.0714
HAWAII	1.	0.	1.	1.	0.	0.	0.	0.	0.	0.	0.	1.	4.0000
IDAHO	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
ILLINOIS	252.	305.	557.	492.	31.	2.	13.	12.	3.	1.	3.	557.	3.3899
INDIANA	187.	196.	383.	327.	21.	5.	12.	14.	3.	1.	0.	383.	3.2274
IOWA	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
KANSAS	3.	4.	7.	6.	0.	0.	0.	1.	0.	0.	0.	7.	3.5714
KENTUCKY	2099.	2158.	4257.	3840.	235.	10.	20.	85.	10.	43.	14.	4257.	2.6952
LOUISIANA	2.	2.	4.	3.	1.	0.	0.	0.	0.	0.	0.	4.	2.6667
MAINE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
MARYLAND	3.	2.	5.	5.	0.	0.	0.	0.	0.	0.	0.	5.	4.0000
MASS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
MICHIGAN	17.	15.	32.	28.	0.	4.	0.	0.	0.	0.	0.	32.	2.9688
MINNESOTA	1.	2.	3.	3.	0.	0.	0.	0.	0.	0.	0.	3.	2.0000
MISSOURI	91.	97.	188.	159.	6.	5.	3.	11.	1.	1.	2.	188.	3.0276
MISSISSIPPI	11.	15.	26.	20.	3.	0.	0.	2.	1.	0.	0.	26.	3.2308
MONTANA	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
NEBRASKA	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
NEVADA	0.	1.	1.	1.	0.	0.	0.	0.	0.	0.	0.	1.	7.0000
N. HAMPSHIRE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
NEW JERSEY	4.	5.	9.	9.	0.	0.	0.	0.	0.	0.	0.	9.	2.5556
NEW MEXICO	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
NEW YORK	2.	3.	5.	5.	0.	0.	0.	0.	0.	0.	0.	5.	4.0000
N. CAROLINA	2.	2.	4.	2.	0.	0.	0.	2.	0.	0.	0.	4.	2.5000
NORTH DAKOTA	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
OKLAHOMA	1.	3.	4.	4.	0.	0.	0.	0.	0.	0.	0.	4.	5.0000
OHIO	66.	56.	122.	101.	2.	0.	7.	9.	0.	2.	1.	122.	3.6923
OREGON	0.	1.	1.	1.	0.	0.	0.	0.	0.	0.	0.	1.	4.0000
PENNSYLVANIA	10.	7.	17.	13.	2.	1.	1.	0.	0.	0.	0.	17.	3.4375
RHODE ISLAND	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
S. CAROLINA	5.	3.	8.	6.	1.	0.	1.	0.	0.	0.	0.	8.	3.6250
SOUTH DAKOTA	1.	0.	1.	0.	1.	0.	0.	0.	0.	0.	0.	1.	4.0000
TENNESSEE	71.	81.	152.	145.	3.	0.	1.	2.	0.	0.	1.	152.	3.3946
TEXAS	11.	13.	24.	23.	0.	0.	0.	1.	0.	0.	0.	24.	3.6667
UTAH	0.	2.	2.	1.	0.	0.	0.	1.	0.	0.	0.	2.	3.5000
VERMONT	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
VIRGINIA	2.	0.	2.	2.	0.	0.	0.	0.	0.	0.	0.	2.	2.5000
WASHINGTON	1.	1.	2.	2.	0.	0.	0.	0.	0.	0.	0.	2.	4.0000
W. VIRGINIA	4.	3.	7.	2.	4.	0.	1.	0.	0.	0.	0.	7.	2.8571
WISCONSIN	4.	1.	5.	4.	0.	0.	0.	1.	0.	0.	0.	5.	2.7500
WYOMING	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
CANADA	1.	0.	1.	1.	0.	0.	0.	0.	0.	0.	0.	1.	6.0000
OTHERS	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
UNCLASSIFIED	41.	41.	82.	55.	9.	0.	0.	7.	1.	4.	6.	82.	2.5397
TOTAL	2931.	3057.	5988.	5336.	319.	27.	59.	148.	20.	52.	27.	5988.	2.8669

1970 KENTUCKY RECREATIONAL TRAVEL STUDY
KENTUCKY DEPARTMENT OF HIGHWAYS
SUMMARY FOR 5 LOCATIONS - TVA (LAND BETWEEN THE LAKES)

ORIGIN	COUNTED VOLUMES BY DIRECTION ARRIVING	DEPARTING	TOTAL	COUNTED VOLUMES BY VEHICLE TYPE CAR	CAR W/ BOAT AND TLR	CAR W/ BOAT ON TOP	CAR W/ CAMPER TLR	S.UNIT CAMPER	S.UNIT CAMPER W/ BOAT	OTHER	UNCLASS	TOTAL	AVERAGE VEHICLE OCCUPANCY
ALABAMA	8.	14.	22.	10.	0.	1.	5.	3.	2.	0.	1.	22.	3.6818
ALASKA	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
ARIZONA	0.	2.	2.	1.	0.	0.	1.	0.	0.	0.	0.	2.	2.5000
ARKANSAS	3.	0.	3.	2.	0.	0.	0.	0.	0.	1.	0.	3.	2.6667
CALIFORNIA	3.	1.	4.	2.	0.	0.	1.	0.	1.	0.	0.	4.	2.7500
COLORADO	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
CONNECTICUT	0.	1.	1.	0.	0.	0.	0.	1.	0.	0.	0.	1.	0.0
DELAWARE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
FLORIDA	15.	5.	20.	14.	1.	0.	1.	1.	0.	3.	0.	20.	3.0500
GEORGIA	4.	4.	8.	4.	2.	0.	2.	0.	0.	0.	0.	8.	2.7500
HAWAII	0.	1.	1.	0.	0.	0.	1.	0.	0.	0.	0.	1.	2.0000
IDAHO	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
ILLINOIS	187.	173.	360.	248.	37.	6.	15.	24.	17.	9.	4.	360.	3.5367
INDIANA	197.	181.	378.	270.	36.	5.	22.	20.	17.	7.	1.	378.	3.3512
IOWA	9.	2.	11.	7.	0.	0.	4.	0.	0.	0.	0.	11.	2.7273
KANSAS	8.	2.	10.	8.	0.	0.	1.	1.	0.	0.	0.	10.	3.3000
KENTUCKY	1071.	1070.	2141.	1759.	172.	21.	49.	64.	39.	28.	9.	2141.	3.1857
LOUISIANA	5.	4.	9.	6.	0.	1.	2.	0.	0.	0.	0.	9.	4.2222
MAINE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
MARYLAND	1.	7.	8.	8.	0.	0.	0.	0.	0.	0.	0.	8.	4.2500
MASS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
MICHIGAN	26.	27.	53.	37.	3.	0.	5.	4.	2.	1.	1.	53.	3.0962
MINNESOTA	2.	0.	2.	1.	0.	0.	0.	1.	0.	0.	0.	2.	2.5000
MISSOURI	42.	31.	73.	59.	3.	0.	3.	4.	2.	2.	0.	73.	3.3151
MISSISSIPPI	0.	2.	2.	2.	0.	0.	0.	0.	0.	0.	0.	2.	4.0000
MONTANA	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
NEBRASKA	3.	2.	5.	1.	2.	0.	1.	1.	0.	0.	0.	5.	3.4000
NEVADA	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
N. HAMPSHIRE	1.	0.	1.	1.	0.	0.	0.	0.	0.	0.	0.	1.	3.0000
NEW JERSEY	3.	4.	7.	4.	0.	0.	1.	1.	1.	0.	0.	7.	3.2857
NEW MEXICO	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
NEW YORK	8.	3.	11.	7.	1.	1.	1.	1.	0.	0.	0.	11.	2.9091
N. CAROLINA	3.	4.	7.	2.	1.	0.	1.	2.	0.	0.	1.	7.	3.5714
NORTH DAKOTA	1.	0.	1.	0.	0.	0.	1.	0.	0.	0.	0.	1.	3.0000
OKLAHOMA	0.	1.	1.	0.	0.	0.	0.	1.	0.	0.	0.	1.	3.0000
OHIO	79.	64.	143.	95.	12.	2.	15.	8.	8.	2.	1.	143.	3.6154
OREGON	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
PENNSYLVANIA	4.	2.	6.	4.	0.	0.	2.	0.	0.	0.	0.	6.	3.3333
RHODE ISLAND	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
S. CAROLINA	3.	1.	4.	4.	0.	0.	0.	0.	0.	0.	0.	4.	3.0000
SOUTH DAKOTA	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
TENNESSEE	254.	345.	599.	454.	46.	4.	23.	24.	20.	25.	3.	599.	3.2344
TEXAS	33.	12.	45.	38.	0.	0.	2.	4.	1.	0.	0.	45.	3.0227
UTAH	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
VERMONT	1.	0.	1.	1.	0.	0.	0.	0.	0.	0.	0.	1.	6.0000
VIRGINIA	3.	4.	7.	3.	3.	0.	0.	1.	0.	0.	0.	7.	2.5714
WASHINGTON	1.	2.	3.	0.	1.	0.	0.	0.	1.	1.	0.	3.	2.3333
W. VIRGINIA	0.	1.	1.	1.	0.	0.	0.	0.	0.	0.	0.	1.	2.0000
WISCONSIN	7.	3.	10.	6.	1.	0.	2.	1.	0.	0.	0.	10.	4.1429
WYOMING	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
CANADA	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
OTHERS	1.	0.	1.	1.	0.	0.	0.	0.	0.	0.	0.	1.	1.0000
UNCLASSIFIED	37.	28.	65.	41.	5.	1.	5.	4.	2.	4.	3.	65.	3.2143
TOTAL	2023.	2003.	4026.	3101.	326.	42.	166.	171.	113.	83.	24.	4026.	3.2585

1970 KENTUCKY RECREATIONAL TRAVEL STUDY
KENTUCKY DEPARTMENT OF HIGHWAYS
SUMMARY FOR 4 LOCATIONS - DANIEL BOONE NATIONAL FOREST

ORIGIN	COUNTED VOLUMES BY DIRECTION ARRIVING	DEPARTING	TOTAL	COUNTED VOLUMES BY VEHICLE TYPE CAR	CAR W/ BOAT AND TLR	CAR W/ BOAT ON TOP	CAR W/ CAMPER TLR	S.UNIT CAMPER	S.UNIT CAMPER W/ BOAT	OTHER	UNCLASS	TOTAL	AVERAGE VEHICLE OCCUPANCY
ALABAMA	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
ALASKA	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
ARIZONA	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
ARKANSAS	0.	1.	1.	1.	0.	0.	0.	0.	0.	0.	0.	1.	5.0000
CALIFORNIA	1.	0.	1.	0.	0.	0.	0.	1.	0.	0.	0.	1.	2.0000
COLORADO	1.	1.	2.	2.	0.	0.	0.	0.	0.	0.	0.	2.	2.0000
CONNECTICUT	1.	1.	2.	2.	0.	0.	0.	0.	0.	0.	0.	2.	4.0000
DELAWARE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
FLORIDA	2.	2.	4.	4.	0.	0.	0.	0.	0.	0.	0.	4.	2.2500
GEORGIA	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
HAWAII	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
IDAHO	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
ILLINOIS	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
INDIANA	16.	14.	30.	28.	2.	0.	0.	0.	0.	0.	0.	30.	3.6333
IOWA	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
KANSAS	1.	1.	2.	2.	0.	0.	0.	0.	0.	0.	0.	2.	2.0000
KENTUCKY	253.	275.	528.	479.	10.	3.	6.	5.	0.	17.	8.	528.	3.4381
LOUISIANA	1.	1.	2.	2.	0.	0.	0.	0.	0.	0.	0.	2.	4.5000
MAINE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
MARYLAND	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
MASS.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
MICHIGAN	4.	3.	7.	7.	0.	0.	0.	0.	0.	0.	0.	7.	4.1429
MINNESOTA	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
MISSOURI	1.	1.	2.	2.	0.	0.	0.	0.	0.	0.	0.	2.	6.0000
MISSISSIPPI	1.	0.	1.	1.	0.	0.	0.	0.	0.	0.	0.	1.	7.0000
MONTANA	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
NEBRASKA	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
NEVADA	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
N. HAMPSHIRE	1.	0.	1.	1.	0.	0.	0.	0.	0.	0.	0.	1.	4.0000
NEW JERSEY	1.	1.	2.	2.	0.	0.	0.	0.	0.	0.	0.	2.	3.0000
NEW MEXICO	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
NEW YORK	1.	1.	2.	2.	0.	0.	0.	0.	0.	0.	0.	2.	6.0000
N. CAROLINA	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
NORTH DAKOTA	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
OKLAHOMA	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
OHIO	70.	86.	156.	135.	8.	2.	5.	6.	0.	0.	0.	156.	3.3333
OREGON	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
PENNSYLVANIA	1.	1.	2.	2.	0.	0.	0.	0.	0.	0.	0.	2.	2.0000
RHODE ISLAND	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
S. CAROLINA	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
SOUTH DAKOTA	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
TENNESSEE	4.	4.	8.	7.	0.	0.	0.	0.	0.	0.	1.	8.	3.4286
TEXAS	1.	1.	2.	2.	0.	0.	0.	0.	0.	0.	0.	2.	3.0000
UTAH	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
VERMONT	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
VIRGINIA	2.	2.	4.	4.	0.	0.	0.	0.	0.	0.	0.	4.	3.0000
WASHINGTON	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
W. VIRGINIA	1.	1.	2.	2.	0.	0.	0.	0.	0.	0.	0.	2.	6.0000
WISCONSIN	1.	1.	2.	2.	0.	0.	0.	0.	0.	0.	0.	2.	6.0000
WYOMING	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
CANADA	1.	1.	2.	2.	0.	0.	0.	0.	0.	0.	0.	2.	4.0000
OTHERS	6.	6.	12.	12.	0.	0.	0.	0.	0.	0.	0.	12.	1.0000
UNCLASSIFIED	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
TOTAL	372.	405.	777.	703.	20.	5.	11.	12.	0.	17.	9.	777.	3.4088

1970 KENTUCKY RECREATIONAL TRAVEL STUDY
KENTUCKY DEPARTMENT OF HIGHWAYS
SUMMARY FOR 16 LOCATIONS - OTHER AREAS

ORIGIN	COUNTED VOLUMES BY DIRECTION			COUNTED VOLUMES BY VEHICLE TYPE									AVERAGE VEHICLE OCCUPANCY
	ARRIVING	DEPARTING	TOTAL	CAR	CAR W/ BOAT AND TLR	CAR W/ BOAT ON TOP	CAR W/ CAMPER TLR	S.UNIT CAMPER	S.UNIT CAMPER W/ BOAT	OTHER	UNCLASS	TOTAL	
ALABAMA	11.	8.	19.	19.	0.	0.	0.	0.	0.	0.	0.	19.	2.6111
ALASKA	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
ARIZONA	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
ARKANSAS	1.	1.	2.	2.	0.	0.	0.	0.	0.	0.	0.	2.	2.0000
CALIFORNIA	8.	8.	16.	16.	0.	0.	0.	0.	0.	0.	0.	16.	2.3750
COLORADO	3.	3.	6.	6.	0.	0.	0.	0.	0.	0.	0.	6.	2.8000
CONNECTICUT	6.	5.	11.	10.	0.	0.	1.	0.	0.	0.	0.	11.	3.0000
DELAWARE	1.	1.	2.	2.	0.	0.	0.	0.	0.	0.	0.	2.	3.5000
FLORIDA	18.	8.	26.	23.	1.	0.	1.	1.	0.	0.	0.	26.	2.6800
GEORGIA	7.	7.	14.	12.	0.	0.	2.	0.	0.	0.	0.	14.	2.9000
HAWAII	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
IDAHO	0.	2.	2.	2.	0.	0.	0.	0.	0.	0.	0.	2.	4.0000
ILLINOIS	14.	13.	27.	21.	2.	0.	1.	0.	0.	3.	0.	27.	3.3750
INDIANA	64.	62.	126.	96.	7.	0.	10.	11.	2.	0.	0.	126.	3.1579
IOWA	5.	7.	12.	11.	0.	0.	1.	0.	0.	0.	0.	12.	3.3000
KANSAS	3.	2.	5.	5.	0.	0.	0.	0.	0.	0.	0.	5.	3.4000
KENTUCKY	1985.	1890.	3875.	3504.	269.	17.	13.	37.	9.	19.	7.	3875.	2.8192
LOUISIANA	1.	1.	2.	2.	0.	0.	0.	0.	0.	0.	0.	2.	3.0000
MAINE	1.	0.	1.	1.	0.	0.	0.	0.	0.	0.	0.	1.	3.0000
MARYLAND	4.	2.	6.	6.	0.	0.	0.	0.	0.	0.	0.	6.	2.6000
MASS.	3.	2.	5.	5.	0.	0.	0.	0.	0.	0.	0.	5.	3.6000
MICHIGAN	36.	43.	79.	73.	0.	0.	3.	0.	3.	0.	0.	79.	3.3108
MINNESOTA	2.	1.	3.	3.	0.	0.	0.	0.	0.	0.	0.	3.	2.5000
MISSOURI	6.	6.	12.	9.	1.	1.	0.	0.	1.	0.	0.	12.	2.3333
MISSISSIPPI	2.	1.	3.	3.	0.	0.	0.	0.	0.	0.	0.	3.	3.6667
MONTANA	2.	0.	2.	2.	0.	0.	0.	0.	0.	0.	0.	2.	0.0
NEBRASKA	3.	4.	7.	7.	0.	0.	0.	0.	0.	0.	0.	7.	2.2857
NEVADA	0.	2.	2.	2.	0.	0.	0.	0.	0.	0.	0.	2.	2.5000
N. HAMPSHIRE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
NEW JERSEY	5.	5.	10.	10.	0.	0.	0.	0.	0.	0.	0.	10.	4.1667
NEW MEXICO	1.	1.	2.	2.	0.	0.	0.	0.	0.	0.	0.	2.	2.0000
NEW YORK	8.	12.	20.	20.	0.	0.	0.	0.	0.	0.	0.	20.	3.7222
N. CAROLINA	9.	6.	15.	15.	0.	0.	0.	0.	0.	0.	0.	15.	3.4000
NORTH DAKOTA	0.	1.	1.	1.	0.	0.	0.	0.	0.	0.	0.	1.	1.0000
OKLAHOMA	1.	2.	3.	3.	0.	0.	0.	0.	0.	0.	0.	3.	4.0000
OHIO	141.	177.	318.	276.	21.	3.	4.	8.	6.	0.	0.	318.	3.0034
OREGON	3.	1.	4.	4.	0.	0.	0.	0.	0.	0.	0.	4.	1.5000
PENNSYLVANIA	12.	11.	23.	19.	0.	0.	3.	1.	0.	0.	0.	23.	3.3000
RHODE ISLAND	1.	0.	1.	1.	0.	0.	0.	0.	0.	0.	0.	1.	4.0000
S. CAROLINA	6.	3.	9.	7.	0.	0.	2.	0.	0.	0.	0.	9.	2.0000
SOUTH DAKOTA	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
TENNESSEE	12.	17.	29.	28.	0.	0.	1.	0.	0.	0.	0.	29.	3.8214
TEXAS	6.	7.	13.	12.	0.	0.	0.	1.	0.	0.	0.	13.	4.2000
UTAH	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
VERMONT	1.	1.	2.	2.	0.	0.	0.	0.	0.	0.	0.	2.	2.0000
VIRGINIA	9.	11.	20.	19.	0.	0.	0.	1.	0.	0.	0.	20.	3.2941
WASHINGTON	3.	0.	3.	3.	0.	0.	0.	0.	0.	0.	0.	3.	2.5000
W. VIRGINIA	6.	5.	11.	11.	0.	0.	0.	0.	0.	0.	0.	11.	2.4000
WISCONSIN	2.	3.	5.	5.	0.	0.	0.	0.	0.	0.	0.	5.	2.5000
WYOMING	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
CANADA	2.	2.	4.	4.	0.	0.	0.	0.	0.	0.	0.	4.	2.0000
OTHERS	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.0
UNCLASSIFIED	25.	29.	54.	47.	0.	0.	1.	0.	0.	1.	5.	54.	3.0714
TOTAL	2439.	2373.	4812.	4331.	301.	21.	43.	60.	21.	23.	12.	4812.	2.8670

1970 KENTUCKY RECREATIONAL TRAVEL STUDY
KENTUCKY DEPARTMENT OF HIGHWAYS
SUMMARY FOR170 LOCATIONS - ALL RECREATIONAL AREAS

ORIGIN	COUNTED VOLUMES BY DIRECTION ARRIVING	DEPARTING	TOTAL	COUNTED VOLUMES BY VEHICLE TYPE CAR	CAR W/ BOAT AND TLR	CAR W/ BOAT ON TOP	CAR W/ CAMPER TLR	S.UNIT CAMPER	S.UNIT CAMPER W/ BOAT	OTHER	UNCLASS	TOTAL	AVERAGE VEHICLE OCCUPANCY
ALABAMA	126.	121.	247.	207.	6.	3.	12.	10.	2.	2.	5.	247.	3.2060
ALASKA	5.	3.	8.	5.	0.	0.	1.	2.	0.	0.	0.	8.	4.7143
ARIZONA	15.	15.	30.	27.	0.	0.	2.	1.	0.	0.	0.	30.	3.3571
ARKANSAS	49.	37.	86.	73.	1.	1.	5.	3.	0.	1.	2.	86.	3.5455
CALIFORNIA	92.	100.	192.	163.	1.	1.	6.	13.	4.	1.	3.	192.	3.3029
COLORADO	27.	18.	45.	35.	0.	2.	2.	6.	0.	0.	0.	45.	3.2051
CONNECTICUT	34.	23.	57.	45.	3.	0.	5.	4.	0.	0.	0.	57.	3.2727
DELAWARE	11.	8.	19.	15.	2.	0.	1.	0.	0.	0.	1.	19.	3.3889
FLORIDA	332.	286.	618.	520.	12.	1.	37.	26.	5.	4.	13.	618.	3.1606
GEORGIA	138.	137.	275.	238.	6.	3.	16.	3.	6.	0.	3.	275.	3.4008
HAWAII	8.	3.	11.	8.	0.	0.	1.	0.	1.	1.	0.	11.	2.7273
IDAHO	4.	6.	10.	8.	2.	0.	0.	0.	0.	0.	0.	10.	3.2500
ILLINOIS	2346.	2258.	4604.	4015.	153.	40.	146.	124.	39.	40.	47.	4604.	3.5715
INDIANA	3564.	3563.	7127.	6115.	315.	43.	166.	220.	61.	63.	144.	7127.	3.3121
IOWA	69.	53.	122.	99.	0.	4.	10.	5.	0.	2.	2.	122.	3.4513
KANSAS	41.	30.	71.	57.	0.	0.	2.	5.	6.	0.	1.	71.	3.3768
KENTUCKY	46368.	46310.	93178.	81573.	4729.	357.	544.	969.	335.	1239.	3432.	93178.	2.9444
LOUISIANA	47.	49.	96.	75.	5.	2.	5.	5.	0.	2.	2.	96.	3.3222
MAINE	9.	8.	17.	16.	0.	0.	0.	0.	0.	0.	1.	17.	2.5882
MARYLAND	76.	72.	148.	131.	2.	2.	9.	3.	0.	0.	1.	148.	3.3750
MASS.	30.	25.	55.	50.	1.	0.	1.	2.	0.	0.	1.	55.	3.5106
MICHIGAN	904.	847.	1751.	1467.	39.	12.	104.	57.	16.	16.	40.	1751.	3.5166
MINNESOTA	30.	23.	53.	42.	0.	0.	8.	2.	0.	0.	1.	53.	3.0444
MISSOURI	820.	752.	1572.	1385.	63.	12.	44.	41.	8.	9.	10.	1572.	3.4041
MISSISSIPPI	36.	44.	80.	67.	3.	1.	0.	6.	1.	0.	2.	80.	3.3056
MONTANA	9.	4.	13.	12.	0.	0.	0.	1.	0.	0.	0.	13.	2.7778
NEBRASKA	33.	24.	57.	46.	3.	0.	3.	4.	0.	0.	1.	57.	3.0566
NEVADA	3.	6.	9.	8.	0.	0.	0.	1.	0.	0.	0.	9.	3.6667
N. HAMPSHIRE	7.	9.	16.	14.	0.	0.	0.	0.	0.	0.	2.	16.	3.1429
NEW JERSEY	95.	81.	176.	152.	0.	1.	11.	5.	2.	2.	3.	176.	3.1772
NEW MEXICO	9.	12.	21.	19.	0.	0.	1.	1.	0.	0.	0.	21.	2.8667
NEW YORK	161.	158.	319.	277.	10.	2.	10.	16.	0.	0.	4.	319.	3.3893
N. CAROLINA	84.	75.	159.	136.	4.	0.	2.	6.	0.	0.	11.	159.	3.4296
NORTH DAKOTA	8.	11.	19.	16.	2.	0.	1.	0.	0.	0.	0.	19.	3.4667
OKLAHOMA	29.	29.	58.	52.	1.	0.	0.	4.	0.	0.	1.	58.	3.3148
OHIO	4914.	4920.	9834.	8208.	507.	60.	318.	249.	59.	92.	341.	9834.	3.3675
OREGON	27.	18.	45.	37.	1.	0.	1.	6.	0.	0.	0.	45.	3.2273
PENNSYLVANIA	175.	140.	315.	266.	8.	1.	20.	9.	1.	3.	7.	315.	3.3971
RHODE ISLAND	2.	5.	7.	6.	0.	0.	1.	0.	0.	0.	0.	7.	3.7143
S. CAROLINA	65.	50.	115.	101.	3.	1.	5.	4.	0.	0.	1.	115.	3.3137
SOUTH DAKOTA	6.	7.	13.	8.	1.	0.	3.	1.	0.	0.	0.	13.	3.4545
TENNESSEE	1561.	1645.	3206.	2857.	108.	10.	50.	51.	33.	31.	66.	3206.	3.3246
TEXAS	226.	194.	420.	378.	7.	0.	6.	20.	2.	1.	6.	420.	3.1563
UTAH	9.	11.	20.	18.	0.	0.	0.	2.	0.	0.	0.	20.	3.4444
VERMONT	5.	5.	10.	10.	0.	0.	0.	0.	0.	0.	0.	10.	3.6667
VIRGINIA	186.	183.	369.	328.	7.	0.	11.	14.	1.	0.	8.	369.	3.1433
WASHINGTON	25.	26.	51.	46.	1.	0.	1.	1.	1.	1.	0.	51.	2.7778
W. VIRGINIA	759.	801.	1560.	1340.	35.	12.	85.	22.	7.	13.	46.	1560.	3.6131
WISCONSIN	81.	76.	157.	133.	3.	0.	13.	3.	1.	1.	3.	157.	3.4317
WYOMING	4.	1.	5.	5.	0.	0.	0.	0.	0.	0.	0.	5.	3.8000
CANADA	71.	38.	109.	84.	0.	0.	14.	6.	0.	0.	5.	109.	3.2653
OTHERS	23.	22.	45.	42.	0.	0.	0.	1.	0.	2.	0.	45.	1.3864
UNCLASSIFIED	1444.	1609.	3053.	2491.	147.	14.	31.	63.	19.	65.	223.	3053.	2.8170
TOTAL	65702.	64951.	130653.	113526.	6191.	585.	1714.	1997.	610.	1591.	4439.	130653.	3.0591

1970 KENTUCKY RECREATIONAL TRAVEL STUDY
KENTUCKY DEPARTMENT OF HIGHWAYS
SUMMARY FOR 65 LOCATIONS - STATE PARKS

ORIGIN	PERCENTAGES BY DIRECTION			PERCENTAGES BY VEHICLE TYPE							
	ARRIVING	DEPARTING	TOTAL	CAR	CAR W/ BOAT AND TLR	CAR W/ BOAT ON TOP	CAR W/ CAMPER TLR	S.UNIT CAMPER	S.UNIT CAMPER W/BOAT	OTHER	TOTAL
ALABAMA	0.18	0.17	0.17	88.722	3.008	0.0	5.263	1.504	0.0	1.504	133.
ALASKA	0.01	0.01	0.01	57.143	0.0	0.0	14.286	28.571	0.0	0.0	7.
ARIZONA	0.03	0.02	0.02	94.444	0.0	0.0	5.556	0.0	0.0	0.0	18.
ARKANSAS	0.08	0.06	0.07	81.481	1.852	1.852	9.259	5.556	0.0	0.0	54.
CALIFORNIA	0.16	0.17	0.17	90.152	0.758	0.758	3.030	2.273	2.273	0.758	132.
COLORADO	0.05	0.03	0.04	70.588	0.0	5.882	5.882	17.647	0.0	0.0	34.
CONNECTICUT	0.05	0.02	0.03	74.074	11.111	0.0	14.815	0.0	0.0	0.0	27.
DELAWARE	0.02	0.01	0.02	72.727	18.182	0.0	9.091	0.0	0.0	0.0	11.
FLORIDA	0.54	0.50	0.52	84.383	1.511	0.252	7.809	5.290	0.756	0.0	397.
GEORGIA	0.24	0.21	0.22	85.465	2.326	1.163	6.395	1.744	2.907	0.0	172.
HAWAII	0.01	0.00	0.01	71.429	0.0	0.0	0.0	0.0	14.286	14.286	7.
IDAHO	0.01	0.01	0.01	75.000	25.000	0.0	0.0	0.0	0.0	0.0	8.
ILLINOIS	3.94	3.80	3.87	89.920	2.122	1.028	3.448	2.288	0.431	0.763	3016.
INDIANA	5.98	6.04	6.01	91.425	2.382	0.563	2.057	2.404	0.346	0.823	4618.
IOWA	0.10	0.08	0.09	82.353	0.0	5.882	4.412	4.412	0.0	2.941	68.
KANSAS	0.05	0.04	0.05	72.222	0.0	0.0	2.778	8.333	16.667	0.0	36.
KENTUCKY	70.32	71.01	70.66	94.081	2.655	0.396	0.596	0.759	0.153	1.360	52997.
LOUISIANA	0.05	0.06	0.06	78.723	6.383	2.128	6.383	2.128	0.0	4.255	47.
MAINE	0.02	0.01	0.01	100.000	0.0	0.0	0.0	0.0	0.0	0.0	11.
MARYLAND	0.13	0.13	0.13	93.069	0.0	0.990	5.941	0.0	0.0	0.0	101.
MASS.	0.05	0.03	0.04	90.323	0.0	0.0	3.226	6.452	0.0	0.0	31.
MICHIGAN	1.56	1.47	1.51	85.307	2.593	0.605	6.655	2.939	0.605	1.296	1157.
MINNESOTA	0.04	0.04	0.04	77.419	0.0	0.0	19.355	3.226	0.0	0.0	31.
MISSOURI	1.53	1.43	1.48	90.345	3.793	0.345	3.017	1.724	0.259	0.517	1160.
MISSISSIPPI	0.04	0.03	0.03	87.500	0.0	4.167	0.0	8.333	0.0	0.0	24.
MONTANA	0.01	0.01	0.01	100.000	0.0	0.0	0.0	0.0	0.0	0.0	9.
NEBRASKA	0.06	0.04	0.05	83.784	2.703	0.0	5.405	8.108	0.0	0.0	37.
NEVADA	0.00	0.01	0.01	80.000	0.0	0.0	0.0	20.000	0.0	0.0	5.
N. HAMPSHIRE	0.01	0.01	0.01	100.000	0.0	0.0	0.0	0.0	0.0	0.0	7.
NEW JERSEY	0.14	0.12	0.13	89.109	0.0	0.990	5.941	2.970	0.990	0.0	101.
NEW MEXICO	0.01	0.03	0.02	87.500	0.0	0.0	6.250	6.250	0.0	0.0	16.
NEW YORK	0.25	0.22	0.23	89.011	3.346	0.549	3.846	2.747	0.0	0.0	182.
N. CAROLINA	0.12	0.09	0.11	96.104	1.299	0.0	1.299	1.299	0.0	0.0	77.
NORTH DAKOTA	0.01	0.02	0.02	93.333	6.667	0.0	0.0	0.0	0.0	0.0	15.
OKLAHOMA	0.05	0.05	0.05	97.500	0.0	0.0	0.0	2.500	0.0	0.0	40.
OHIO	8.61	8.44	8.52	90.368	2.041	0.526	3.881	2.103	0.186	0.897	6468.
OREGON	0.05	0.04	0.05	83.333	2.778	0.0	2.778	11.111	0.0	0.0	36.
PENNSYLVANIA	0.29	0.25	0.27	86.408	1.942	0.0	6.311	3.398	0.485	1.456	206.
RHODE ISLAND	0.00	0.01	0.01	83.333	0.0	0.0	16.667	0.0	0.0	0.0	6.
S. CAROLINA	0.07	0.09	0.08	90.164	1.639	0.0	3.279	4.918	0.0	0.0	61.
SOUTH DAKOTA	0.01	0.02	0.01	72.727	0.0	0.0	18.182	9.091	0.0	0.0	11.
TENNESSEE	2.48	2.50	2.49	94.305	2.456	0.261	1.097	1.045	0.679	0.157	1914.
TEXAS	0.33	0.32	0.33	92.520	1.969	0.0	1.575	3.543	0.394	0.0	254.
UTAH	0.01	0.01	0.01	100.000	0.0	0.0	0.0	0.0	0.0	0.0	11.
VERMONT	0.00	0.01	0.01	100.000	0.0	0.0	0.0	0.0	0.0	0.0	5.
VIRGINIA	0.25	0.26	0.25	88.144	1.546	0.0	4.639	5.670	0.0	0.0	194.
WASHINGTON	0.04	0.05	0.05	94.595	0.0	0.0	2.703	2.703	0.0	0.0	37.
W. VIRGINIA	1.70	1.87	1.78	89.086	1.770	0.737	5.900	1.327	0.369	0.811	1356.
WISCONSIN	0.11	0.10	0.11	86.585	2.439	0.0	10.976	0.0	0.0	0.0	82.
WYOMING	0.00	0.00	0.00	100.000	0.0	0.0	0.0	0.0	0.0	0.0	3.
CANADA	0.13	0.07	0.10	75.325	0.0	0.0	16.883	7.792	0.0	0.0	77.
OTHERS	0.01	0.01	0.01	100.000	0.0	0.0	0.0	0.0	0.0	0.0	9.
TOTAL	40126.	38569.	78695.	92.862	2.542	0.456	1.495	1.232	0.224	1.189	77378.

1970 KENTUCKY RECREATIONAL TRAVEL STUDY
KENTUCKY DEPARTMENT OF HIGHWAYS
SUMMARY FOR 3 LOCATIONS - NATIONAL PARKS

ORIGIN	PERCENTAGES BY DIRECTION			PERCENTAGES BY VEHICLE TYPE							
	ARRIVING	DEPARTING	TOTAL	CAR	CAR W/ BOAT AND TLR	CAR W/ BOAT ON TOP	CAR W/ CAMPER TLR	S.UNIT CAMPER	S.UNIT CAMPER W/BOAT	OTHER	TOTAL
ALABAMA	1.15	1.05	1.10	89.474	0.0	0.0	0.0	10.526	0.0	0.0	38.
ALASKA	0.06	0.0	0.03	100.000	0.0	0.0	0.0	0.0	0.0	0.0	1.
ARIZONA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
ARKANSAS	0.29	0.26	0.27	100.000	0.0	0.0	0.0	0.0	0.0	0.0	10.
CALIFORNIA	0.34	0.63	0.49	66.667	0.0	0.0	5.556	27.778	0.0	0.0	18.
COLORADO	0.06	0.0	0.03	100.000	0.0	0.0	0.0	0.0	0.0	0.0	1.
CONNECTICUT	0.23	0.37	0.30	72.727	0.0	0.0	0.0	27.273	0.0	0.0	11.
DELAWARE	0.06	0.05	0.05	100.000	0.0	0.0	0.0	0.0	0.0	0.0	2.
FLORIDA	1.38	1.37	1.37	89.583	0.0	0.0	6.250	2.083	0.0	2.083	48.
GEORGIA	1.03	1.63	1.34	95.918	0.0	2.041	2.041	0.0	0.0	0.0	49.
HAWAII	0.0	0.05	0.03	100.000	0.0	0.0	0.0	0.0	0.0	0.0	1.
IDAHO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
ILLINOIS	6.71	6.25	6.47	93.506	0.0	0.0	3.030	3.463	0.0	0.0	231.
INDIANA	10.78	12.24	11.54	89.663	0.481	0.0	3.606	4.567	0.0	1.683	416.
IOWA	0.57	0.58	0.58	80.952	0.0	0.0	9.524	9.524	0.0	0.0	21.
KANSAS	0.29	0.05	0.16	100.000	0.0	0.0	0.0	0.0	0.0	0.0	6.
KENTUCKY	37.50	35.71	36.57	95.293	0.309	0.077	1.389	1.543	0.154	1.235	1296.
LOUISIANA	0.29	0.63	0.47	100.000	0.0	0.0	0.0	0.0	0.0	0.0	15.
MAINE	0.0	0.05	0.03	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
MARYLAND	0.80	0.37	0.58	66.667	9.524	0.0	9.524	14.286	0.0	0.0	21.
MASS.	0.29	0.16	0.22	100.000	0.0	0.0	0.0	0.0	0.0	0.0	8.
MICHIGAN	7.40	7.20	7.29	86.692	0.380	0.0	7.224	5.703	0.0	0.0	263.
MINNESOTA	0.40	0.32	0.36	84.615	0.0	0.0	15.385	0.0	0.0	0.0	13.
MISSOURI	0.40	0.63	0.52	94.737	0.0	0.0	5.263	0.0	0.0	0.0	19.
MISSISSIPPI	0.23	0.53	0.38	100.000	0.0	0.0	0.0	0.0	0.0	0.0	13.
MONTANA	0.0	0.05	0.03	100.000	0.0	0.0	0.0	0.0	0.0	0.0	1.
NEBRASKA	0.06	0.11	0.08	100.000	0.0	0.0	0.0	0.0	0.0	0.0	3.
NEVADA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
N. HAMPSHIRE	0.06	0.05	0.05	100.000	0.0	0.0	0.0	0.0	0.0	0.0	2.
NEW JERSEY	0.97	0.79	0.88	86.667	0.0	0.0	10.000	3.333	0.0	0.0	30.
NEW MEXICO	0.06	0.0	0.03	100.000	0.0	0.0	0.0	0.0	0.0	0.0	1.
NEW YORK	2.12	2.21	2.17	84.416	0.0	0.0	2.597	12.987	0.0	0.0	77.
N. CAROLINA	0.69	0.89	0.79	96.429	0.0	0.0	0.0	3.571	0.0	0.0	28.
NORTH DAKOTA	0.0	0.05	0.03	100.000	0.0	0.0	0.0	0.0	0.0	0.0	1.
OKLAHOMA	0.17	0.05	0.11	100.000	0.0	0.0	0.0	0.0	0.0	0.0	4.
OHIO	10.67	11.97	11.35	87.901	0.494	0.247	5.185	3.951	0.494	1.728	405.
OREGON	0.11	0.11	0.11	50.000	0.0	0.0	0.0	50.000	0.0	0.0	4.
PENNSYLVANIA	1.32	0.74	1.01	97.222	0.0	0.0	2.778	0.0	0.0	0.0	36.
RHODE ISLAND	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
S. CAROLINA	0.92	0.16	0.52	94.737	0.0	5.263	0.0	0.0	0.0	0.0	19.
SOUTH DAKOTA	0.0	0.05	0.03	0.0	0.0	0.0	100.000	0.0	0.0	0.0	1.
TENNESSEE	6.59	6.72	6.66	97.034	0.0	0.0	1.695	1.271	0.0	0.0	236.
TEXAS	0.92	0.79	0.85	93.333	0.0	0.0	0.0	3.333	0.0	3.333	30.
UTAH	0.11	0.11	0.11	100.000	0.0	0.0	0.0	0.0	0.0	0.0	4.
VERMONT	0.0	0.05	0.03	100.000	0.0	0.0	0.0	0.0	0.0	0.0	1.
VIRGINIA	2.18	2.15	2.17	96.104	0.0	0.0	2.597	0.0	1.299	0.0	77.
WASHINGTON	0.06	0.16	0.11	100.000	0.0	0.0	0.0	0.0	0.0	0.0	4.
W. VIRGINIA	0.92	0.95	0.93	93.939	0.0	0.0	3.030	3.030	0.0	0.0	33.
WISCONSIN	0.97	1.31	1.15	92.683	0.0	0.0	2.439	2.439	0.0	2.439	41.
WYOMING	0.11	0.0	0.05	100.000	0.0	0.0	0.0	0.0	0.0	0.0	2.
CANADA	0.75	0.32	0.52	94.118	0.0	0.0	5.882	0.0	0.0	0.0	17.
OTHERS	0.0	0.11	0.05	50.000	0.0	0.0	0.0	50.000	0.0	0.0	2.
TOTAL	1744.	1904.	3648.	92.161	0.305	0.111	2.992	3.352	0.166	0.914	3610.

1970 KENTUCKY RECREATIONAL TRAVEL STUDY

KENTUCKY DEPARTMENT OF HIGHWAYS

SUMMARY FOR 64 LOCATIONS - CORPS OF ENGINEERS FACILITIES

ORIGIN	PERCENTAGES BY DIRECTION			PERCENTAGES BY VEHICLE TYPE							
	ARRIVING	DEPARTING	TOTAL	CAR	CAR W/ BOAT AND TLR	CAR W/ BOAT ON TOP	CAR W/ CAMPER TLR	S.UNIT CAMPER	S.UNIT CAMPER W/BOAT	OTHER	TOTAL
ALABAMA	0.07	0.06	0.07	75.000	10.000	10.000	0.0	5.000	0.0	0.0	20.
ALASKA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
ARIZONA	0.02	0.03	0.02	85.714	0.0	0.0	0.0	14.286	0.0	0.0	7.
ARKANSAS	0.03	0.03	0.03	100.000	0.0	0.0	0.0	0.0	0.0	0.0	9.
CALIFORNIA	0.05	0.08	0.07	77.778	0.0	0.0	0.0	22.222	0.0	0.0	18.
COLORADO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
CONNECTICUT	0.01	0.01	0.01	100.000	0.0	0.0	0.0	0.0	0.0	0.0	3.
DELAWARE	0.01	0.01	0.01	100.000	0.0	0.0	0.0	0.0	0.0	0.0	2.
FLORIDA	0.26	0.23	0.24	88.889	5.556	0.0	1.389	2.778	1.389	0.0	72.
GEORGIA	0.05	0.05	0.05	93.333	0.0	0.0	0.0	0.0	6.667	0.0	15.
HAWAII	0.01	0.0	0.00	100.000	0.0	0.0	0.0	0.0	0.0	0.0	1.
IDAHO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
ILLINOIS	1.32	1.22	1.27	87.399	5.094	0.268	1.609	2.949	1.609	1.072	373.
INDIANA	3.49	3.62	3.55	77.348	13.262	0.678	1.162	4.356	2.227	0.968	1033.
IOWA	0.03	0.03	0.03	100.000	0.0	0.0	0.0	0.0	0.0	0.0	8.
KANSAS	0.01	0.02	0.01	100.000	0.0	0.0	0.0	0.0	0.0	0.0	4.
KENTUCKY	85.49	84.94	85.21	84.633	10.660	0.385	0.494	1.442	0.786	1.600	24690.
LOUISIANA	0.07	0.03	0.05	66.667	6.667	0.0	0.0	26.667	0.0	0.0	15.
MAINE	0.01	0.02	0.01	100.000	0.0	0.0	0.0	0.0	0.0	0.0	4.
MARYLAND	0.01	0.03	0.02	66.667	0.0	16.667	16.667	0.0	0.0	0.0	6.
MASS.	0.02	0.05	0.03	90.000	10.000	0.0	0.0	0.0	0.0	0.0	10.
MICHIGAN	0.45	0.37	0.41	88.430	4.132	0.826	0.0	3.306	3.306	0.0	121.
MINNESOTA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
MISSOURI	0.39	0.34	0.37	81.818	8.182	1.818	1.818	5.455	0.909	0.0	110.
MISSISSIPPI	0.02	0.04	0.03	77.778	0.0	0.0	0.0	22.222	0.0	0.0	9.
MONTANA	0.01	0.0	0.00	0.0	0.0	0.0	0.0	100.000	0.0	0.0	1.
NEBRASKA	0.01	0.01	0.01	100.000	0.0	0.0	0.0	0.0	0.0	0.0	4.
NEVADA	0.01	0.0	0.00	100.000	0.0	0.0	0.0	0.0	0.0	0.0	1.
N. HAMPSHIRE	0.01	0.02	0.01	100.000	0.0	0.0	0.0	0.0	0.0	0.0	3.
NEW JERSEY	0.05	0.04	0.05	78.571	0.0	0.0	7.143	0.0	0.0	14.286	14.
NEW MEXICO	0.01	0.01	0.01	100.000	0.0	0.0	0.0	0.0	0.0	0.0	2.
NEW YORK	0.04	0.08	0.06	88.889	11.111	0.0	0.0	0.0	0.0	0.0	18.
N. CAROLINA	0.07	0.07	0.07	88.889	11.111	0.0	0.0	0.0	0.0	0.0	18.
NORTH DAKOTA	0.01	0.0	0.00	0.0	100.000	0.0	0.0	0.0	0.0	0.0	1.
OKLAHOMA	0.02	0.01	0.02	40.000	20.000	0.0	0.0	40.000	0.0	0.0	5.
OHIO	6.23	6.97	6.61	74.349	17.525	0.956	0.797	3.505	1.646	1.221	1883.
OREGON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
PENNSYLVANIA	0.07	0.06	0.06	83.333	11.111	0.0	0.0	5.556	0.0	0.0	18.
RHODE ISLAND	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
S. CAROLINA	0.05	0.03	0.04	84.615	7.692	0.0	0.0	7.692	0.0	0.0	13.
SOUTH DAKOTA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
TENNESSEE	0.73	0.71	0.72	91.304	5.797	0.483	0.0	0.966	0.0	1.449	207.
TEXAS	0.17	0.15	0.16	86.957	4.348	0.0	0.0	8.696	0.0	0.0	46.
UTAH	0.01	0.01	0.01	66.667	0.0	0.0	0.0	33.333	0.0	0.0	3.
VERMONT	0.01	0.0	0.00	100.000	0.0	0.0	0.0	0.0	0.0	0.0	1.
VIRGINIA	0.22	0.17	0.19	96.491	1.754	0.0	0.0	1.754	0.0	0.0	57.
WASHINGTON	0.01	0.01	0.01	100.000	0.0	0.0	0.0	0.0	0.0	0.0	2.
W. VIRGINIA	0.35	0.35	0.35	81.731	6.731	1.923	2.885	2.885	1.923	1.923	104.
WISCONSIN	0.03	0.03	0.03	77.778	0.0	0.0	11.111	0.0	11.111	0.0	9.
WYOMING	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
CANADA	0.0	0.02	0.01	100.000	0.0	0.0	0.0	0.0	0.0	0.0	3.
OTHERS	0.07	0.07	0.07	90.476	0.0	0.0	0.0	0.0	0.0	9.524	21.
TOTAL	14726.	15129.	29855.	83.762	10.934	0.448	0.572	1.792	0.933	1.559	29695.

1970 KENTUCKY RECREATIONAL TRAVEL STUDY
KENTUCKY DEPARTMENT OF HIGHWAYS
SUMMARY FOR 13 LOCATIONS - TVA (KENTUCKY LAKE)

ORIGIN	PERCENTAGES BY DIRECTION			PERCENTAGES BY VEHICLE TYPE							
	ARRIVING	DEPARTING	TOTAL	CAR	CAR W/ BOAT AND TLR	CAR W/ BOAT ON TOP	CAR W/ CAMPER TLR	S.UNIT CAMPER	S.UNIT CAMPER W/BOAT	OTHER	TOTAL
ALABAMA	0.17	0.20	0.19	100.000	0.0	0.0	0.0	0.0	0.0	0.0	11.
ALASKA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
ARIZONA	0.03	0.07	0.05	100.000	0.0	0.0	0.0	0.0	0.0	0.0	3.
ARKANSAS	0.10	0.07	0.08	100.000	0.0	0.0	0.0	0.0	0.0	0.0	5.
CALIFORNIA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
COLORADO	0.03	0.03	0.03	100.000	0.0	0.0	0.0	0.0	0.0	0.0	2.
CONNECTICUT	0.03	0.03	0.03	100.000	0.0	0.0	0.0	0.0	0.0	0.0	2.
DELAWARE	0.0	0.03	0.02	100.000	0.0	0.0	0.0	0.0	0.0	0.0	1.
FLORIDA	0.69	0.60	0.64	97.368	0.0	0.0	0.0	0.0	2.632	0.0	38.
GEORGIA	0.24	0.23	0.24	100.000	0.0	0.0	0.0	0.0	0.0	0.0	14.
HAWAII	0.03	0.0	0.02	100.000	0.0	0.0	0.0	0.0	0.0	0.0	1.
IDAHO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
ILLINOIS	8.72	10.11	9.43	88.809	5.596	0.361	2.347	2.166	0.542	0.181	554.
INDIANA	6.47	6.50	6.48	85.379	5.483	1.305	3.133	3.655	0.783	0.261	383.
IOWA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
KANSAS	0.10	0.13	0.12	85.714	0.0	0.0	0.0	14.286	0.0	0.0	7.
KENTUCKY	72.63	71.55	72.08	90.502	5.539	0.236	0.471	2.003	0.236	1.013	4243.
LOUISIANA	0.07	0.07	0.07	75.000	25.000	0.0	0.0	0.0	0.0	0.0	4.
MAINE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
MARYLAND	0.10	0.07	0.08	100.000	0.0	0.0	0.0	0.0	0.0	0.0	5.
MASS.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
MICHIGAN	0.59	0.50	0.54	87.500	0.0	12.500	0.0	0.0	0.0	0.0	32.
MINNESOTA	0.03	0.07	0.05	100.000	0.0	0.0	0.0	0.0	0.0	0.0	3.
MISSOURI	3.15	3.22	3.18	85.484	3.226	2.688	1.613	5.914	0.538	0.538	186.
MISSISSIPPI	0.38	0.50	0.44	76.923	11.538	0.0	0.0	7.692	3.846	0.0	26.
MONTANA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
NEBRASKA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
NEVADA	0.0	0.03	0.02	100.000	0.0	0.0	0.0	0.0	0.0	0.0	1.
N. HAMPSHIRE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
NEW JERSEY	0.14	0.17	0.15	100.000	0.0	0.0	0.0	0.0	0.0	0.0	9.
NEW MEXICO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
NEW YORK	0.07	0.10	0.08	100.000	0.0	0.0	0.0	0.0	0.0	0.0	5.
N. CAROLINA	0.07	0.07	0.07	50.000	0.0	0.0	0.0	50.000	0.0	0.0	4.
NORTH DAKOTA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
OKLAHOMA	0.03	0.10	0.07	100.000	0.0	0.0	0.0	0.0	0.0	0.0	4.
OHIO	2.28	1.86	2.07	83.471	1.653	0.0	5.785	7.438	0.0	1.653	121.
OREGON	0.0	0.03	0.02	100.000	0.0	0.0	0.0	0.0	0.0	0.0	1.
PENNSYLVANIA	0.35	0.23	0.29	76.471	11.765	5.882	5.882	0.0	0.0	0.0	17.
RHODE ISLAND	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
S. CAROLINA	0.17	0.10	0.14	75.000	12.500	0.0	12.500	0.0	0.0	0.0	8.
SOUTH DAKOTA	0.03	0.0	0.02	0.0	100.000	0.0	0.0	0.0	0.0	0.0	1.
TENNESSEE	2.46	2.69	2.57	96.026	1.987	0.0	0.662	1.325	0.0	0.0	151.
TEXAS	0.38	0.43	0.41	95.833	0.0	0.0	0.0	4.167	0.0	0.0	24.
UTAH	0.0	0.07	0.03	50.000	0.0	0.0	0.0	50.000	0.0	0.0	2.
VERMONT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
VIRGINIA	0.07	0.0	0.03	100.000	0.0	0.0	0.0	0.0	0.0	0.0	2.
WASHINGTON	0.03	0.03	0.03	100.000	0.0	0.0	0.0	0.0	0.0	0.0	2.
W. VIRGINIA	0.14	0.10	0.12	28.571	57.143	0.0	14.286	0.0	0.0	0.0	7.
WISCONSIN	0.14	0.03	0.08	80.000	0.0	0.0	0.0	20.000	0.0	0.0	5.
WYOMING	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
CANADA	0.03	0.0	0.02	100.000	0.0	0.0	0.0	0.0	0.0	0.0	1.
OTHERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
TOTAL	2890.	3016.	5906.	89.515	5.351	0.453	0.990	2.483	0.336	0.872	5961.

1970 KENTUCKY RECREATIONAL TRAVEL STUDY
KENTUCKY DEPARTMENT OF HIGHWAYS
SUMMARY FOR 5 LOCATIONS - TVA (LAND BETWEEN THE LAKES)

ORIGIN	PERCENTAGES BY DIRECTION ARRIVING	DEPARTING	TOTAL	PERCENTAGES BY VEHICLE TYPE CAR	CAR W/ BOAT AND TLR	CAR W/ BOAT ON TOP	CAR W/ CAMPER TLR	S.UNIT CAMPER	S.UNIT CAMPER W/BOAT	OTHER	TOTAL
ALABAMA	0.40	0.71	0.56	47.619	0.0	4.762	23.810	14.286	9.524	0.0	21.
ALASKA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
ARIZONA	0.0	0.10	0.05	50.000	0.0	0.0	50.000	0.0	0.0	0.0	2.
ARKANSAS	0.15	0.0	0.08	66.667	0.0	0.0	0.0	0.0	0.0	33.333	3.
CALIFORNIA	0.15	0.05	0.10	50.000	0.0	0.0	25.000	0.0	25.000	0.0	4.
COLORADO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
CONNECTICUT	0.0	0.05	0.03	0.0	0.0	0.0	0.0	100.000	0.0	0.0	1.
DELAWARE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
FLORIDA	0.76	0.25	0.50	70.000	5.000	0.0	5.000	5.000	0.0	15.000	20.
GEORGIA	0.20	0.20	0.20	50.000	25.000	0.0	25.000	0.0	0.0	0.0	8.
HAWAII	0.0	0.05	0.03	0.0	0.0	0.0	100.000	0.0	0.0	0.0	1.
IDAHO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
ILLINOIS	9.42	8.76	9.09	69.663	10.393	1.685	4.213	6.742	4.775	2.528	356.
INDIANA	9.92	9.16	9.54	71.618	9.549	1.326	5.836	5.305	4.509	1.857	377.
IOWA	0.45	0.10	0.28	63.636	0.0	0.0	36.364	0.0	0.0	0.0	11.
KANSAS	0.40	0.10	0.25	80.000	0.0	0.0	10.000	10.000	0.0	0.0	10.
KENTUCKY	53.93	54.18	54.05	82.505	8.068	0.985	2.298	3.002	1.829	1.313	2132.
LOUISIANA	0.25	0.20	0.23	66.667	0.0	11.111	22.222	0.0	0.0	0.0	9.
MAINE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
MARYLAND	0.05	0.35	0.20	100.000	0.0	0.0	0.0	0.0	0.0	0.0	8.
MASS.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
MICHIGAN	1.31	1.37	1.34	71.154	5.769	0.0	9.615	7.692	3.846	1.923	52.
MINNESOTA	0.10	0.0	0.05	50.000	0.0	0.0	0.0	50.000	0.0	0.0	2.
MISSOURI	2.11	1.57	1.84	80.822	4.110	0.0	4.110	5.479	2.740	2.740	73.
MISSISSIPPI	0.0	0.10	0.05	100.000	0.0	0.0	0.0	0.0	0.0	0.0	2.
MONTANA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
NEBRASKA	0.15	0.10	0.13	20.000	40.000	0.0	20.000	20.000	0.0	0.0	5.
NEVADA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
N. HAMPSHIRE	0.05	0.0	0.03	100.000	0.0	0.0	0.0	0.0	0.0	0.0	1.
NEW JERSEY	0.15	0.20	0.18	57.143	0.0	0.0	14.286	14.286	14.286	0.0	7.
NEW MEXICO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
NEW YORK	0.40	0.15	0.28	63.636	9.091	9.091	9.091	9.091	0.0	0.0	11.
N. CAROLINA	0.15	0.20	0.18	33.333	16.667	0.0	16.667	33.333	0.0	0.0	6.
NORTH DAKOTA	0.05	0.0	0.03	0.0	0.0	0.0	100.000	0.0	0.0	0.0	1.
OKLAHOMA	0.0	0.05	0.03	0.0	0.0	0.0	0.0	100.000	0.0	0.0	1.
OHIO	3.98	3.24	3.61	66.901	8.451	1.408	10.563	5.634	5.634	1.408	142.
OREGON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
PENNSYLVANIA	0.20	0.10	0.15	66.667	0.0	0.0	33.333	0.0	0.0	0.0	6.
RHODE ISLAND	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
S. CAROLINA	0.15	0.05	0.10	100.000	0.0	0.0	0.0	0.0	0.0	0.0	4.
SOUTH DAKOTA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
TENNESSEE	12.79	17.47	15.12	76.174	7.718	0.671	3.859	4.027	3.356	4.195	596.
TEXAS	1.66	0.61	1.14	84.444	0.0	0.0	4.444	8.889	2.222	0.0	45.
UTAH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
VERMONT	0.05	0.0	0.03	100.000	0.0	0.0	0.0	0.0	0.0	0.0	1.
VIRGINIA	0.15	0.20	0.18	42.857	42.857	0.0	0.0	14.286	0.0	0.0	7.
WASHINGTON	0.05	0.10	0.08	0.0	33.333	0.0	0.0	0.0	33.333	33.333	3.
W. VIRGINIA	0.0	0.05	0.03	100.000	0.0	0.0	0.0	0.0	0.0	0.0	1.
WISCONSIN	0.35	0.15	0.25	60.000	10.000	0.0	20.000	10.000	0.0	0.0	10.
WYOMING	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
CANADA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
OTHERS	0.05	0.0	0.03	100.000	0.0	0.0	0.0	0.0	0.0	0.0	1.
TOTAL	1986.	1975.	3961.	77.486	8.146	1.049	4.148	4.273	2.824	2.074	4002.

1970 KENTUCKY RECREATIONAL TRAVEL STUDY
KENTUCKY DEPARTMENT OF HIGHWAYS
SUMMARY FOR 4 LOCATIONS - DANIEL BOONE NATIONAL FOREST

ORIGIN	PERCENTAGES BY DIRECTION ARRIVING	DEPARTING	TOTAL	PERCENTAGES BY VEHICLE TYPE CAR	CAR W/ BOAT AND TLR	CAR W/ BOAT ON TOP	CAR W/ CAMPER TLR	S.UNIT CAMPER	S.UNIT CAMPER W/BOAT	OTHER	TOTAL
ALABAMA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
ALASKA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
ARIZONA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
ARKANSAS	0.0	0.25	0.13	100.000	0.0	0.0	0.0	0.0	0.0	0.0	1.
CALIFORNIA	0.27	0.0	0.13	0.0	0.0	0.0	0.0	100.000	0.0	0.0	1.
COLORADO	0.27	0.25	0.26	100.000	0.0	0.0	0.0	0.0	0.0	0.0	2.
CONNECTICUT	0.27	0.25	0.26	100.000	0.0	0.0	0.0	0.0	0.0	0.0	2.
DELAWARE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
FLORIDA	0.54	0.49	0.51	100.000	0.0	0.0	0.0	0.0	0.0	0.0	4.
GEORGIA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
HAWAII	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
IDAHO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
ILLINOIS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
INDIANA	4.30	3.46	3.86	93.333	6.667	0.0	0.0	0.0	0.0	0.0	30.
IOWA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
KANSAS	0.27	0.25	0.26	100.000	0.0	0.0	0.0	0.0	0.0	0.0	2.
KENTUCKY	68.01	67.90	67.95	92.115	1.923	0.577	1.154	0.962	0.0	3.269	520.
LOUISIANA	0.27	0.25	0.26	100.000	0.0	0.0	0.0	0.0	0.0	0.0	2.
MAINE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
MARYLAND	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
MASS.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
MICHIGAN	1.08	0.74	0.90	100.000	0.0	0.0	0.0	0.0	0.0	0.0	7.
MINNESOTA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
MISSOURI	0.27	0.25	0.26	100.000	0.0	0.0	0.0	0.0	0.0	0.0	2.
MISSISSIPPI	0.27	0.0	0.13	100.000	0.0	0.0	0.0	0.0	0.0	0.0	1.
MONTANA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
NEBRASKA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
NEVADA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
N. HAMPSHIRE	0.27	0.0	0.13	100.000	0.0	0.0	0.0	0.0	0.0	0.0	1.
NEW JERSEY	0.27	0.25	0.26	100.000	0.0	0.0	0.0	0.0	0.0	0.0	2.
NEW MEXICO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
NEW YORK	0.27	0.25	0.26	100.000	0.0	0.0	0.0	0.0	0.0	0.0	2.
N. CAROLINA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
NORTH DAKOTA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
OKLAHOMA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
OHIO	18.82	21.23	20.08	86.538	5.128	1.282	3.205	3.846	0.0	0.0	156.
OREGON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
PENNSYLVANIA	0.27	0.25	0.26	100.000	0.0	0.0	0.0	0.0	0.0	0.0	2.
RHODE ISLAND	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
S. CAROLINA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
SOUTH DAKOTA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
TENNESSEE	1.08	0.99	1.03	100.000	0.0	0.0	0.0	0.0	0.0	0.0	7.
TEXAS	0.27	0.25	0.26	100.000	0.0	0.0	0.0	0.0	0.0	0.0	2.
UTAH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
VERMONT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
VIRGINIA	0.54	0.49	0.51	100.000	0.0	0.0	0.0	0.0	0.0	0.0	4.
WASHINGTON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
W. VIRGINIA	0.27	0.25	0.26	100.000	0.0	0.0	0.0	0.0	0.0	0.0	2.
WISCONSIN	0.27	0.25	0.26	100.000	0.0	0.0	0.0	0.0	0.0	0.0	2.
WYOMING	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
CANADA	0.27	0.25	0.26	100.000	0.0	0.0	0.0	0.0	0.0	0.0	2.
OTHERS	1.61	1.48	1.54	100.000	0.0	0.0	0.0	0.0	0.0	0.0	12.
TOTAL	372.	405.	777.	91.536	2.604	0.651	1.432	1.563	0.0	2.214	768.

1970 KENTUCKY RECREATIONAL TRAVEL STUDY
KENTUCKY DEPARTMENT OF HIGHWAYS
SUMMARY FOR 16 LOCATIONS - OTHER AREAS

ORIGIN	PERCENTAGES BY DIRECTION ARRIVING	DEPARTING	TOTAL	PERCENTAGES BY VEHICLE TYPE CAR	CAR W/ BOAT AND TLR	CAR W/ BOAT ON TOP	CAR W/ CAMPER TLR	S.UNIT CAMPER	S.UNIT CAMPER W/BOAT	OTHER	TOTAL
ALABAMA	0.46	0.34	0.40	100.000	0.0	0.0	0.0	0.0	0.0	0.0	19.
ALASKA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
ARIZONA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
ARKANSAS	0.04	0.04	0.04	100.000	0.0	0.0	0.0	0.0	0.0	0.0	2.
CALIFORNIA	0.33	0.34	0.34	100.000	0.0	0.0	0.0	0.0	0.0	0.0	16.
COLORADO	0.12	0.13	0.13	100.000	0.0	0.0	0.0	0.0	0.0	0.0	6.
CONNECTICUT	0.25	0.21	0.23	90.909	0.0	0.0	9.091	0.0	0.0	0.0	11.
DELAWARE	0.04	0.04	0.04	100.000	0.0	0.0	0.0	0.0	0.0	0.0	2.
FLORIDA	0.75	0.34	0.55	88.462	3.846	0.0	3.846	3.846	0.0	0.0	26.
GEORGIA	0.29	0.30	0.29	85.714	0.0	0.0	14.286	0.0	0.0	0.0	14.
HAWAII	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
IDAHO	0.0	0.09	0.04	100.000	0.0	0.0	0.0	0.0	0.0	0.0	2.
ILLINOIS	0.58	0.55	0.57	77.778	7.407	0.0	3.704	0.0	0.0	11.111	27.
INDIANA	2.65	2.65	2.65	76.190	5.556	0.0	7.937	8.730	1.587	0.0	126.
IOWA	0.21	0.30	0.25	91.667	0.0	0.0	8.333	0.0	0.0	0.0	12.
KANSAS	0.12	0.09	0.11	100.000	0.0	0.0	0.0	0.0	0.0	0.0	5.
KENTUCKY	82.23	80.63	81.44	90.589	6.954	0.440	0.336	0.957	0.233	0.491	3868.
LOUISIANA	0.04	0.04	0.04	100.000	0.0	0.0	0.0	0.0	0.0	0.0	2.
MAINE	0.04	0.0	0.02	100.000	0.0	0.0	0.0	0.0	0.0	0.0	1.
MARYLAND	0.17	0.09	0.13	100.000	0.0	0.0	0.0	0.0	0.0	0.0	6.
MASS.	0.12	0.09	0.11	100.000	0.0	0.0	0.0	0.0	0.0	0.0	5.
MICHIGAN	1.49	1.83	1.66	92.405	0.0	0.0	3.797	0.0	3.797	0.0	79.
MINNESOTA	0.08	0.04	0.06	100.000	0.0	0.0	0.0	0.0	0.0	0.0	3.
MISSOURI	0.25	0.26	0.25	75.000	8.333	8.333	0.0	0.0	8.333	0.0	12.
MISSISSIPPI	0.08	0.04	0.06	100.000	0.0	0.0	0.0	0.0	0.0	0.0	3.
MONTANA	0.08	0.0	0.04	100.000	0.0	0.0	0.0	0.0	0.0	0.0	2.
NEBRASKA	0.12	0.17	0.15	100.000	0.0	0.0	0.0	0.0	0.0	0.0	7.
NEVADA	0.0	0.09	0.04	100.000	0.0	0.0	0.0	0.0	0.0	0.0	2.
N. HAMPSHIRE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
NEW JERSEY	0.21	0.21	0.21	100.000	0.0	0.0	0.0	0.0	0.0	0.0	10.
NEW MEXICO	0.04	0.04	0.04	100.000	0.0	0.0	0.0	0.0	0.0	0.0	2.
NEW YORK	0.33	0.51	0.42	100.000	0.0	0.0	0.0	0.0	0.0	0.0	20.
N. CAROLINA	0.37	0.26	0.32	100.000	0.0	0.0	0.0	0.0	0.0	0.0	15.
NORTH DAKOTA	0.0	0.04	0.02	100.000	0.0	0.0	0.0	0.0	0.0	0.0	1.
OKLAHOMA	0.04	0.09	0.06	100.000	0.0	0.0	0.0	0.0	0.0	0.0	3.
OHIO	5.84	7.55	6.68	86.792	6.604	0.943	1.258	2.516	1.887	0.0	318.
OREGON	0.12	0.04	0.08	100.000	0.0	0.0	0.0	0.0	0.0	0.0	4.
PENNSYLVANIA	0.50	0.47	0.48	82.609	0.0	0.0	13.043	4.348	0.0	0.0	23.
RHODE ISLAND	0.04	0.0	0.02	100.000	0.0	0.0	0.0	0.0	0.0	0.0	1.
S. CAROLINA	0.25	0.13	0.19	77.778	0.0	0.0	22.222	0.0	0.0	0.0	9.
SOUTH DAKOTA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
TENNESSEE	0.50	0.73	0.61	96.552	0.0	0.0	3.448	0.0	0.0	0.0	29.
TEXAS	0.25	0.30	0.27	92.308	0.0	0.0	0.0	7.692	0.0	0.0	13.
UTAH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
VERMONT	0.04	0.04	0.04	100.000	0.0	0.0	0.0	0.0	0.0	0.0	2.
VIRGINIA	0.37	0.47	0.42	95.000	0.0	0.0	0.0	5.000	0.0	0.0	20.
WASHINGTON	0.12	0.0	0.06	100.000	0.0	0.0	0.0	0.0	0.0	0.0	3.
W. VIRGINIA	0.25	0.21	0.23	100.000	0.0	0.0	0.0	0.0	0.0	0.0	11.
WISCONSIN	0.08	0.13	0.11	100.000	0.0	0.0	0.0	0.0	0.0	0.0	5.
WYOMING	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
CANADA	0.08	0.09	0.08	100.000	0.0	0.0	0.0	0.0	0.0	0.0	4.
OTHERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
TOTAL	2414.	2344.	4758.	90.229	6.271	0.437	0.896	1.250	0.437	0.479	4800.

1970 KENTUCKY RECREATIONAL TRAVEL STUDY
KENTUCKY DEPARTMENT OF HIGHWAYS
SUMMARY FOR170 LOCATIONS - ALL RECREATIONAL AREAS

ORIGIN	PERCENTAGES BY DIRECTION			PERCENTAGES BY VEHICLE TYPE							
	ARRIVING	DEPARTING	TOTAL	CAR	CAR W/ BOAT AND TLR	CAR W/ BOAT ON TOP	CAR W/ CAMPER TLR	S.UNIT CAMPER	S.UNIT CAMPER W/BOAT	OTHER	TOTAL
ALABAMA	0.20	0.19	0.19	85.537	2.479	1.240	4.959	4.132	0.826	0.826	242.
ALASKA	0.01	0.00	0.01	62.500	0.0	0.0	12.500	25.000	0.0	0.0	8.
ARIZONA	0.02	0.02	0.02	90.000	0.0	0.0	6.667	3.333	0.0	0.0	30.
ARKANSAS	0.08	0.06	0.07	86.905	1.190	1.190	5.952	3.571	0.0	1.190	84.
CALIFORNIA	0.14	0.16	0.15	86.243	0.529	0.529	3.175	6.878	2.116	0.529	189.
COLORADO	0.04	0.03	0.04	77.778	0.0	4.444	4.444	13.333	0.0	0.0	45.
CONNECTICUT	0.05	0.04	0.04	78.947	5.263	0.0	8.772	7.018	0.0	0.0	57.
DELAWARE	0.02	0.01	0.01	83.333	11.111	0.0	5.556	0.0	0.0	0.0	18.
FLORIDA	0.52	0.45	0.48	85.950	1.983	0.165	6.116	4.298	0.826	0.661	605.
GEORGIA	0.21	0.22	0.22	87.500	2.206	1.103	5.882	1.103	2.206	0.0	272.
HAWAII	0.01	0.00	0.01	72.727	0.0	0.0	9.091	0.0	9.091	9.091	11.
IDAHO	0.01	0.01	0.01	80.000	20.000	0.0	0.0	0.0	0.0	0.0	10.
ILLINOIS	3.65	3.56	3.61	88.106	3.357	0.878	3.204	2.721	0.856	0.878	4557.
INDIANA	5.55	5.63	5.59	87.570	4.511	0.616	2.377	3.151	0.874	0.902	6983.
IOWA	0.11	0.08	0.10	82.500	0.0	3.333	8.333	4.167	0.0	1.667	120.
KANSAS	0.06	0.05	0.06	81.429	0.0	0.0	2.857	7.143	8.571	0.0	70.
KENTUCKY	72.94	73.11	73.02	90.893	5.269	0.398	0.606	1.080	0.373	1.381	89746.
LOUISIANA	0.07	0.08	0.08	79.787	5.319	2.128	5.319	5.319	0.0	2.128	94.
MAINE	0.01	0.01	0.01	100.000	0.0	0.0	0.0	0.0	0.0	0.0	16.
MARYLAND	0.12	0.11	0.12	89.116	1.361	1.361	6.122	2.041	0.0	0.0	147.
MASS.	0.05	0.04	0.04	92.593	1.852	0.0	1.852	3.704	0.0	0.0	54.
MICHIGAN	1.41	1.34	1.37	85.739	2.279	0.701	6.078	3.331	0.935	0.935	1711.
MINNESOTA	0.05	0.04	0.04	80.769	0.0	0.0	15.385	3.846	0.0	0.0	52.
MISSOURI	1.28	1.19	1.23	88.668	4.033	0.768	2.817	2.625	0.512	0.576	1562.
MISSISSIPPI	0.06	0.07	0.06	85.897	3.846	1.282	0.0	7.692	1.282	0.0	78.
MONTANA	0.01	0.01	0.01	92.308	0.0	0.0	0.0	7.692	0.0	0.0	13.
NEBRASKA	0.05	0.04	0.04	82.143	5.357	0.0	5.357	7.143	0.0	0.0	56.
NEVADA	0.00	0.01	0.01	88.889	0.0	0.0	0.0	11.111	0.0	0.0	9.
N. HAMPSHIRE	0.01	0.01	0.01	100.000	0.0	0.0	0.0	0.0	0.0	0.0	14.
NEW JERSEY	0.15	0.13	0.14	87.861	0.0	0.578	6.358	2.890	1.156	1.156	173.
NEW MEXICO	0.01	0.02	0.02	90.476	0.0	0.0	4.762	4.762	0.0	0.0	21.
NEW YORK	0.25	0.25	0.25	87.936	3.175	0.635	3.175	5.079	0.0	0.0	315.
N. CAROLINA	0.13	0.12	0.12	91.892	2.703	0.0	1.351	4.054	0.0	0.0	148.
NORTH DAKOTA	0.01	0.02	0.01	84.211	10.526	0.0	5.263	0.0	0.0	0.0	19.
OKLAHOMA	0.05	0.05	0.05	91.228	1.754	0.0	0.0	7.018	0.0	0.0	57.
OHIO	7.65	7.77	7.71	86.464	5.341	0.632	3.350	2.623	0.622	0.969	9493.
OREGON	0.04	0.03	0.04	82.222	2.222	0.0	2.222	13.333	0.0	0.0	45.
PENNSYLVANIA	0.27	0.22	0.25	86.364	2.597	0.325	6.494	2.922	0.325	0.974	308.
RHODE ISLAND	0.00	0.01	0.01	85.714	0.0	0.0	14.286	0.0	0.0	0.0	7.
S. CAROLINA	0.10	0.08	0.09	88.596	2.632	0.877	4.386	3.509	0.0	0.0	114.
SOUTH DAKOTA	0.01	0.01	0.01	61.538	7.692	0.0	23.077	7.692	0.0	0.0	13.
TENNESSEE	2.43	2.60	2.51	90.987	3.439	0.318	1.592	1.624	1.051	0.987	3140.
TEXAS	0.35	0.31	0.33	91.304	1.691	0.0	1.449	4.831	0.483	0.242	414.
UTAH	0.01	0.02	0.02	90.000	0.0	0.0	0.0	10.000	0.0	0.0	20.
VERMONT	0.01	0.01	0.01	100.000	0.0	0.0	0.0	0.0	0.0	0.0	10.
VIRGINIA	0.29	0.29	0.29	90.859	1.939	0.0	3.047	3.878	0.277	0.0	361.
WASHINGTON	0.04	0.04	0.04	90.196	1.961	0.0	1.961	1.961	1.961	1.961	51.
W. VIRGINIA	1.18	1.26	1.22	88.507	2.312	0.793	5.614	1.453	0.462	0.859	1514.
WISCONSIN	0.13	0.12	0.12	86.364	1.948	0.0	8.442	1.948	0.649	0.649	154.
WYOMING	0.01	0.00	0.00	100.000	0.0	0.0	0.0	0.0	0.0	0.0	5.
CANADA	0.11	0.06	0.09	80.769	0.0	0.0	13.462	5.769	0.0	0.0	104.
OTHERS	0.04	0.03	0.04	93.333	0.0	0.0	0.0	2.222	0.0	4.444	45.
TOTAL	64258.	63342.	127600.	89.947	4.905	0.463	1.358	1.582	0.483	1.261	126214.

APPENDIX D

SAMPLE OF TRAVEL CHARACTERISTICS FOR A SURVEY SITE

1970 KENTUCKY RECREATIONAL TRAVEL STUDY
KENTUCKY DEPARTMENT OF HIGHWAYS

SITE NUMBER 71

SITE DESCRIPTION BARKLEY LAKE - ENTRANCE TO LAKE BARKLEY S. P. ON KY 1489 OFF US 68. SURVEY TAKEN ON JULY 26.

DATE DAY 26, MONTH 7, YEAR 1970

PERIOD OF SURVEY 10 A.M. THROUGH 8 P.M.

WEATHER

CONDITION	NUMBER OF HOURS
CLEAR & SUNNY	10
CLEAR & PARTLY SUNNY	0
CLOUDY & NO SUN	0
LIGHT RAIN	0
INTERMITTENT SHOWERS	0
HEAVY THUNDERSTORMS	0

ESTIMATED NUMBER OF VEHICLES

HOUR	ARRIVALS	DEPARTURES	TOTAL
10-11AM	32.	33.	65.
11-12AM	78.	45.	123.
12-1PM	92.	56.	148.
1-2PM	137.	98.	235.
2-3PM	136.	125.	261.
3-4PM	119.	163.	282.
4-5PM	95.	127.	222.
5-6PM	74.	103.	177.
6-7PM	51.	77.	128.
7-8PM	32.	71.	103.
ALL DAY	846.	898.	1744.

SITE NUMBER 71

	VEHICLES ARRIVING			VEHICLES DEPARTING			ARRIVALS AND DEPARTURES		
	NUMBER COUNTED	NUMBER EST.	PERCENT	NUMBER COUNTED	NUMBER EST.	PERCENT	NUMBER COUNTED	NUMBER EST.	PERCENT
ORIGIN									
CLASSIFIED									
ILLINOIS	34.	34.	4.04	32.	32.	3.62	66.	67.	3.82
INDIANA	62.	62.	7.36	75.	76.	8.47	137.	138.	7.93
KENTUCKY	614.	617.	72.92	655.	665.	74.01	1269.	1281.	73.48
MICHIGAN	9.	9.	1.07	10.	10.	1.13	19.	19.	1.10
MISSOURI	13.	13.	1.54	15.	15.	1.69	28.	28.	1.62
OHIO	21.	21.	2.49	15.	15.	1.69	36.	36.	2.08
TENNESSEE	54.	54.	6.41	53.	54.	5.99	107.	108.	6.20
W. VIRGINIA	0.	0.	0.0	0.	0.	0.0	0.	0.	0.0
OTHER STATES	35.	35.	4.16	30.	30.	3.39	65.	66.	3.76
UNCLASSIFIED	4.			13.			17.		
TOTAL	846.	846.		898.	898.		1744.	1744.	
VEHICLE TYPE									
CLASSIFIED									
CAR	776.	777.	91.83	810.	814.	90.60	1586.	1591.	91.20
CAR WITH BOAT AND TLR	35.	35.	4.14	46.	46.	5.15	81.	81.	4.66
CAR WITH BOAT ON TOP	1.	1.	0.12	2.	2.	0.22	3.	3.	0.17
CAR WITH CAMPER TLR	6.	6.	0.71	9.	9.	1.01	15.	15.	0.86
SINGLE UNIT CAMPER	11.	11.	1.30	11.	11.	1.23	22.	22.	1.27
SINGLE UNIT CAMPER WITH BOAT	0.	0.	0.0	4.	4.	0.45	4.	4.	0.23
OTHER	16.	16.	1.89	12.	12.	1.34	28.	28.	1.61
UNCLASSIFIED	1.			4.			5.		
TOTAL	846.	846.		898.	898.		1744.	1744.	
AVERAGE PERSONS PER VEHICLE		2.959			3.036			2.999	

APPENDIX E

PHASE I PREDICTION MODEL EVALUATION

1970 KENTUCKY RECREATIONAL TRAVEL STUDY
KENTUCKY DEPARTMENT OF HIGHWAYS
MODEL EVALUATION

10-HOUR DEPARTING VOLUME = A0*(DISTANCE**A1)*(POPULATION/1000)

REC. ZONE		TOTAL TRIPS	MEAN TRIPS PER ORIGIN	STD. DEV. TRIPS PER ORIGIN	A0	A1	STD. ERROR	SQ. CORR. INDEX	MEAN TRIP LENGTH	STD. DEV. TRIP LENGTH	PERCENTAGE OF TRIPS HAVING LENGTHS LESS THAN OR EQUAL TO 25	50	75	100	150	300	1000	3000
1	ACTUAL	703.	3.70	24.42					63.4	196.8	70.1	82.2	86.6	86.9	87.6	93.6	99.4	100.0
	PREDICTED	606.	3.19	21.34					62.0	137.6	69.2	77.9	83.3	83.7	87.1	94.1	99.8	100.0
					5297.5	-2.676	12.04	0.76										
2	ACTUAL	18220.	95.89	297.95					140.5	200.0	25.1	53.1	59.0	62.3	67.6	88.5	99.2	100.0
	PREDICTED	15489.	81.52	211.24					193.5	236.9	20.7	34.5	46.5	48.5	60.2	77.4	98.5	100.0
					30608.7	-2.223	216.71	0.47										
3	ACTUAL	552.	2.91	16.26					92.5	166.5	59.6	64.9	69.2	79.9	84.1	92.2	98.9	100.0
	PREDICTED	571.	3.01	12.52					100.3	163.7	53.0	62.5	68.0	74.3	81.5	90.3	99.5	100.0
					4069.2	-2.571	10.37	0.59										
4	ACTUAL	1934.	10.18	98.64					78.9	266.1	74.5	85.0	85.2	86.1	87.5	94.6	99.0	100.0
	PREDICTED	1913.	10.07	98.48					55.9	142.8	75.3	84.4	84.8	85.6	88.7	94.9	99.8	100.0
					1507.5	-2.295	5.96	1.00										
5	ACTUAL	1245.	6.55	41.46					48.4	121.2	69.8	82.6	88.5	90.0	94.2	96.1	99.8	100.0
	PREDICTED	1155.	6.08	36.28					81.7	148.3	51.9	67.6	71.9	78.5	84.6	91.3	99.8	100.0
					6700.8	-2.580	20.27	0.76										
6	ACTUAL	2542.	13.38	79.79					104.0	235.5	21.9	43.0	86.4	88.5	90.1	94.4	98.9	100.0
	PREDICTED	3679.	19.36	49.21					210.0	251.2	17.9	26.9	43.9	47.6	54.7	77.8	99.1	100.0
					2138.0	-2.014	61.39	0.41										
7	ACTUAL	107.	0.56	4.15					68.9	142.4	43.0	86.9	86.9	86.9	92.5	94.4	100.0	100.0
	PREDICTED	167.	0.88	3.94					106.9	167.0	34.2	60.9	68.0	72.9	79.9	88.6	99.8	100.0
					398.9	-2.391	1.11	0.93										
8	ACTUAL	752.	3.96	27.52					193.1	337.0	15.2	64.6	68.2	69.1	71.1	76.3	97.9	100.0
	PREDICTED	1399.	7.36	22.22					213.5	269.9	19.1	37.4	43.7	48.4	57.1	71.1	98.9	100.0
					260.2	-1.825	15.02	0.70										
9	ACTUAL	1593.	8.38	63.67					61.5	89.0	24.8	37.2	91.5	94.0	95.4	98.5	99.9	100.0
	PREDICTED	3183.	16.75	39.72					171.6	219.8	16.8	34.0	47.8	57.3	62.2	80.3	99.4	100.0
					3943.5	-2.181	47.71	0.44										
10	ACTUAL	1967.	10.35	22.60					299.7	334.1	14.2	17.9	21.1	31.5	39.7	60.3	98.2	100.0
	PREDICTED	1844.	9.70	18.40					289.8	302.3	12.8	17.5	27.0	33.7	40.9	61.6	98.3	100.0
					296.8	-1.745	13.65	0.64										
11	ACTUAL	45.	0.24	1.90					40.0	80.3	75.6	80.0	82.2	88.9	95.6	97.8	100.0	100.0
	PREDICTED	41.	0.22	1.86					34.5	84.0	78.2	85.3	91.2	93.1	94.8	97.5	100.0	100.0
					275.6	-2.807	0.38	0.96										
12	ACTUAL	1636.	8.61	61.10					39.3	78.0	55.3	85.0	88.0	88.8	95.9	98.0	100.0	100.0
	PREDICTED	1168.	6.15	54.22					28.3	58.1	75.1	92.4	94.1	95.0	97.3	98.9	100.0	100.0
					40462.0	-3.200	28.87	0.78										
13	ACTUAL	1133.	5.96	28.32					140.9	213.6	36.1	60.3	64.7	66.0	72.2	78.8	99.6	100.0
	PREDICTED	1462.	7.69	26.62					177.3	252.1	30.4	46.5	52.9	55.2	66.0	76.6	99.1	100.0
					251.3	-1.847	8.35	0.91										
14	ACTUAL	2416.	12.72	92.33					41.0	103.3	74.5	79.1	82.5	94.7	95.9	98.0	99.8	100.0
	PREDICTED	2713.	14.28	89.59					62.5	122.6	64.2	71.5	75.6	85.7	88.7	95.3	99.9	100.0
					18169.7	-2.673	21.41	0.95										

1970 KENTUCKY RECREATIONAL TRAVEL STUDY
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MODEL EVALUATION

10-HOUR DEPARTING VOLUME = A0*(DISTANCE**A1)*(POPULATION/1000)

REC. ZONE		TOTAL TRIPS	MEAN TRIPS PER ORIGIN	STD. DEV. TRIPS PER ORIGIN	A0	A1	STD. ERROR	SQ. CORR. INDEX	MEAN TRIP LENGTH	STD. DEV. TRIP LENGTH	PERCENTAGE OF TRIPS HAVING LENGTHS LESS THAN OR EQUAL TO 25	50	75	100	150	300	1000	3000
15	ACTUAL	601.	3.16	16.35					90.7	149.4	49.9	56.7	60.2	62.7	83.7	94.5	99.8	100.0
	PREDICTED	366.	1.92	10.53					131.4	205.7	42.8	48.2	61.4	64.5	74.0	85.8	99.6	100.0
					666.9	-2.281	12.79	0.39										
16	ACTUAL	6904.	36.34	190.43					105.4	153.6	12.7	50.8	58.8	66.8	75.6	94.4	99.8	100.0
	PREDICTED	3489.	18.36	42.73					253.4	281.4	16.8	21.0	33.2	37.0	48.7	68.1	98.7	100.0
					1154.2	-1.884	188.71	0.02										
17	ACTUAL	285.	1.50	6.78					124.6	143.7	37.9	49.5	50.9	55.8	58.6	91.6	100.0	100.0
	PREDICTED	190.	1.00	3.12					157.1	205.3	32.7	40.7	45.1	58.0	68.2	80.7	99.8	100.0
					751.0	-2.384	6.14	0.18										
18	ACTUAL	3548.	18.67	42.81					182.0	211.0	16.4	28.2	35.7	39.1	54.3	81.5	99.6	100.0
	PREDICTED	1864.	9.81	30.86					212.4	261.5	24.2	30.5	46.0	48.1	56.8	70.8	99.4	100.0
					1113.7	-2.010	33.76	0.38										
19	ACTUAL	66.	0.35	3.49					18.7	30.5	74.2	90.9	90.9	92.4	100.0	100.0	100.0	100.0
	PREDICTED	80.	0.42	3.43					88.3	186.9	63.8	71.6	73.2	76.7	82.7	90.1	99.6	100.0
					17.9	-2.008	0.61	0.97										
20	ACTUAL	1185.	6.24	31.71					60.6	175.2	71.6	78.9	82.0	88.3	92.8	96.0	99.6	100.0
	PREDICTED	1636.	8.61	28.63					106.7	180.9	52.3	60.5	64.1	70.8	79.5	87.8	99.6	100.0
					1445.3	-2.217	12.29	0.85										
21	ACTUAL	321.	1.69	5.23					140.8	264.5	14.3	30.5	55.1	64.8	78.8	89.1	99.1	100.0
	PREDICTED	243.	1.28	2.82					318.3	352.5	15.6	22.4	27.9	31.3	40.5	55.2	98.2	100.0
					4.7	-1.393	4.56	0.24										
22	ACTUAL	139.	0.73	4.50					60.7	156.0	41.7	89.9	89.9	91.4	92.8	95.7	100.0	100.0
	PREDICTED	186.	0.98	3.92					109.8	187.4	38.8	62.8	67.6	72.7	78.7	86.9	99.8	100.0
					93.7	-2.120	2.13	0.78										
23	ACTUAL	130.	0.68	6.43					53.2	133.1	21.5	94.6	96.2	96.2	96.9	96.9	100.0	100.0
	PREDICTED	316.	1.66	4.80					198.7	266.3	18.6	40.0	46.3	53.3	61.8	73.0	99.3	100.0
					36.2	-1.762	4.01	0.61										
24	ACTUAL	2451.	12.90	63.99					62.3	150.3	38.6	72.2	87.6	89.6	93.2	97.1	99.7	100.0
	PREDICTED	2859.	15.05	59.87					135.0	211.0	30.9	47.5	62.7	65.2	74.1	86.3	99.3	100.0
					759.3	-1.976	21.27	0.89										
25	ACTUAL	60.	0.32	1.86					34.8	36.1	51.7	73.3	93.3	93.3	98.3	100.0	100.0	100.0
	PREDICTED	67.	0.35	1.73					88.5	154.3	39.8	54.1	73.4	77.8	83.3	93.0	99.7	100.0
					72.2	-2.301	0.68	0.87										
26	ACTUAL	60.	0.32	1.89					45.5	74.3	56.7	83.3	86.7	88.3	95.0	98.3	100.0	100.0
	PREDICTED	75.	0.39	1.45					141.7	224.0	30.6	53.6	57.8	67.0	72.2	85.6	99.2	100.0
					11.1	-1.870	1.19	0.60										
27	ACTUAL	670.	3.53	21.24					54.6	174.5	70.7	82.2	84.5	89.9	93.4	96.6	99.6	100.0
	PREDICTED	466.	2.45	18.88					33.5	77.9	69.6	88.8	90.4	94.3	95.7	98.4	100.0	100.0
					501.7	-2.543	10.09	0.77										
28	ACTUAL	126.	0.66	3.92					90.7	315.6	29.4	87.3	88.1	93.7	96.0	96.8	98.4	100.0
	PREDICTED	206.	1.08	3.20					191.3	263.5	21.9	42.7	46.9	56.7	62.6	79.2	98.7	100.0
					20.1	-1.744	2.10	0.71										

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KENTUCKY DEPARTMENT OF HIGHWAYS
MODEL EVALUATION

10-HOUR DEPARTING VOLUME = A0*(DISTANCE**A1)*(POPULATION/1000)

REC. ZONE		TOTAL TRIPS	MEAN TRIPS PER ORIGIN	STD. DEV. TRIPS PER ORIGIN	A0	A1	STD. ERROR	SQ. CORR. INDEX	MEAN TRIP LENGTH	STD. DEV. TRIP LENGTH	PERCENTAGE OF TRIPS HAVING LENGTHS LESS THAN OR EQUAL TO 25	50	75	100	150	300	1000	3000
29	ACTUAL	679.	3.57	14.83					40.9	164.8	68.8	87.0	92.5	94.3	97.9	99.1	99.6	100.0
	PREDICTED	684.	3.60	13.86					45.7	78.8	60.5	77.2	81.4	88.3	95.0	98.4	100.0	100.0
					14226.3	-3.012	5.27	0.87										
30	ACTUAL	2306.	12.14	63.15					70.9	167.7	64.4	77.6	80.5	85.6	89.8	95.1	99.2	100.0
	PREDICTED	2811.	14.80	49.24					184.3	259.0	38.4	43.9	46.2	52.4	62.3	77.8	98.9	100.0
					454.8	-1.828	38.72	0.62										
31	ACTUAL	3412.	17.96	122.35					91.1	208.4	55.6	69.1	72.4	76.3	80.8	91.6	99.2	100.0
	PREDICTED	2596.	13.66	120.63					53.0	128.2	74.2	79.5	81.8	87.3	89.9	94.5	99.9	100.0
					5034.2	-2.469	23.60	0.96										
32	ACTUAL	486.	2.56	14.24					144.9	231.4	52.7	55.3	57.0	58.4	63.6	82.1	99.0	100.0
	PREDICTED	298.	1.57	13.84					109.8	236.2	66.8	75.2	75.9	76.6	78.4	84.8	99.2	100.0
					20.7	-1.763	3.94	0.92										
33	ACTUAL	545.	2.87	10.19					257.3	310.1	23.3	25.3	35.8	36.7	41.5	64.4	98.5	100.0
	PREDICTED	358.	1.88	8.99					161.6	232.2	33.0	39.2	61.7	63.5	66.0	79.1	99.3	100.0
					481.6	-2.187	5.27	0.73										
34	ACTUAL	1930.	10.16	29.13					101.1	181.8	24.8	42.8	64.1	68.1	86.5	94.1	99.2	100.0
	PREDICTED	1789.	9.42	18.06					177.8	224.3	22.4	32.8	43.3	47.6	65.3	80.6	99.3	100.0
					1865.4	-2.146	23.24	0.36										
35	ACTUAL	286.	1.51	4.18					109.2	149.3	19.2	35.7	54.2	60.1	85.3	95.1	99.3	100.0
	PREDICTED	256.	1.35	2.80					184.2	229.7	21.4	31.9	41.8	47.4	66.0	79.6	99.2	100.0
					227.6	-2.113	3.19	0.42										
36	ACTUAL	800.	4.21	17.19					104.8	162.0	26.9	44.9	48.4	74.6	85.1	94.3	99.4	100.0
	PREDICTED	1025.	5.39	15.37					168.4	215.0	23.0	34.7	37.4	55.4	67.5	81.8	99.4	100.0
					1024.5	-2.154	6.93	0.84										
37	ACTUAL	941.	4.95	30.43					66.0	204.7	60.5	66.5	86.7	88.7	92.7	96.6	99.3	100.0
	PREDICTED	1194.	6.28	29.37					109.6	193.2	49.4	57.5	69.2	72.9	79.6	88.2	99.6	100.0
					524.2	-2.091	6.98	0.95										
38	ACTUAL	1146.	6.03	36.26					47.1	116.5	58.9	81.6	84.0	92.1	94.5	98.3	99.7	100.0
	PREDICTED	1302.	6.85	23.78					129.2	186.7	35.3	45.3	51.9	65.9	74.2	87.4	99.6	100.0
					2935.1	-2.339	27.24	0.44										
39	ACTUAL	1224.	6.44	49.10					71.0	199.7	71.2	77.9	80.6	81.9	86.1	96.2	99.4	100.0
	PREDICTED	1527.	8.03	28.60					95.8	153.3	48.3	59.8	66.0	75.9	79.1	90.6	99.8	100.0
					13412.1	-2.626	39.73	0.35										
40	ACTUAL	2857.	15.04	97.94					57.3	173.4	75.7	79.3	81.1	82.3	89.6	95.3	99.6	100.0
	PREDICTED	2794.	14.71	90.93					158.7	258.3	53.9	55.8	57.2	59.0	68.6	80.1	99.1	100.0
					440.6	-1.840	36.60	0.86										
41	ACTUAL	189.	0.99	8.86					95.5	223.4	75.1	75.1	76.7	76.7	79.4	92.1	99.5	100.0
	PREDICTED	159.	0.84	3.20					167.6	226.3	35.7	42.9	58.4	59.7	62.6	78.7	99.4	100.0
					365.4	-2.271	8.30	0.12										
42	ACTUAL	1260.	6.63	78.55					48.6	122.8	86.0	88.7	89.2	89.9	91.9	95.2	100.0	100.0
	PREDICTED	1179.	6.21	78.56					20.7	42.7	91.8	95.8	96.5	96.9	98.6	99.5	100.0	100.0
					141232.6	-3.502	2.15	1.00										

APPENDIX F

PHASE II PREDICTION MODEL EVALUATION
(COMBINED NONLINEAR REGRESSION - CROSS-CLASSIFICATION MODEL)

1970 KENTUCKY RECREATIONAL TRAVEL STUDY
KENTUCKY DEPARTMENT OF HIGHWAYS
MODEL EVALUATION

COMPOSITE MODEL EVALUATION

REC. ZONE		TOTAL TRIPS	MEAN TRIPS PER ORIGIN	STD. DEV. TRIPS PER ORIGIN	STD. ERROR	SQ. CORR. INDEX	MEAN TRIP LENGTH	STD. DEV. TRIP LENGTH	PERCENTAGE OF TRIPS HAVING LENGTHS LESS THAN OR EQUAL TO 25	50	75	100	150	300	1000	3000
1	ACTUAL	703.	3.70	24.42			63.4	196.8	70.1	82.2	86.6	86.9	87.6	93.6	99.4	100.0
	PREDICTED	684.	3.60	8.14			295.6	373.9	24.7	36.5	43.7	46.6	48.5	61.7	94.4	100.0
					19.22	0.38										
2	ACTUAL	18220.	95.89	297.95			140.5	200.0	25.1	53.1	59.0	62.3	67.6	88.5	99.2	100.0
	PREDICTED	14139.	74.42	173.79			126.5	188.8	21.5	43.3	62.2	70.2	74.1	90.0	99.0	100.0
					190.88	0.59										
3	ACTUAL	552.	2.91	16.26			92.5	166.5	59.6	64.9	69.2	79.9	84.1	92.2	98.9	100.0
	PREDICTED	1346.	7.09	17.06			99.4	200.4	30.5	51.5	67.6	84.6	88.7	93.0	98.9	100.0
					13.77	0.28										
4	ACTUAL	1934.	10.18	98.64			78.9	266.1	74.5	85.0	85.2	86.1	87.5	94.6	99.0	100.0
	PREDICTED	1163.	6.12	27.54			89.5	190.1	37.9	64.6	71.9	83.2	86.8	94.3	99.4	100.0
					73.71	0.44										
5	ACTUAL	1245.	6.55	41.46			48.4	121.2	69.8	82.6	88.5	90.0	94.2	96.1	99.8	100.0
	PREDICTED	1294.	6.81	16.91			99.7	203.6	24.6	48.7	67.2	84 5	88.4	92.7	99.2	100.0
					30.31	0.47										
6	ACTUAL	2542.	13.38	79.79			104.0	235.5	21.9	43.0	86.4	88.5	90.1	94.4	98.9	100.0
	PREDICTED	2324.	12.23	29.72			82.2	155.8	20.4	40.4	72.8	91.1	93.1	96.4	99.6	100.0
					65.54	0.33										
7	ACTUAL	107.	0.56	4.15			68.9	142.4	43.0	86.9	86.9	86.9	92.5	94.4	100.0	100.0
	PREDICTED	1214.	6.39	14.85			103.0	180.3	23.0	40.5	60.6	82.5	87.3	92.1	99.5	100.0
					13.21	-9.15										
8	ACTUAL	752.	3.96	27.52			193.1	337.0	15.2	64.6	68.2	69.1	71.1	76.3	97.9	100.0
	PREDICTED	2468.	12.99	35.63			78.2	152.2	28.4	46.7	70.3	90.7	93.7	95.9	99.6	100.0
					30.46	-0.23										
9	ACTUAL	1593.	8.38	63.67			61.5	89.0	24.8	37.2	91.5	94.0	95.4	98.5	99.9	100.0
	PREDICTED	1261.	6.64	12.65			99.9	178.5	17.1	41.5	64.2	85.0	87.0	92.8	99.5	100.0
					58.01	0.17										
10	ACTUAL	1967.	10.35	22.60			299.7	334.1	14.2	17.9	21.1	31.5	39.7	60.3	98.2	100.0
	PREDICTED	958.	5.04	8.04			256.9	317.4	12.5	21.9	33.5	41.3	50.6	67.5	97.9	100.0
					18.01	0.37										
11	ACTUAL	45.	0.24	1.90			40.0	80.3	75.6	80.0	82.2	88.9	95.6	97.8	100.0	100.0
	PREDICTED	64.	0.34	0.47			224.7	294.5	11.5	22.6	33.9	39.1	50.5	78.6	98.0	100.0
					1.63	0.26										
12	ACTUAL	1636.	8.61	61.10			39.3	78.0	55.3	85.0	88.0	88.8	95.9	98.0	100.0	100.0
	PREDICTED	3448.	18.14	42.25			100.1	172.0	22.8	47.0	63.3	79.7	85.5	93.7	99.5	100.0
					42.67	0.51										
13	ACTUAL	1133.	5.96	28.32			140.9	213.6	36.1	60.5	64.7	66.0	72.2	78.8	99.6	100.0
	PREDICTED	1816.	9.56	23.69			77.9	151.4	32.9	54.9	74.0	87.4	91.8	94.8	99.7	100.0
					15.62	0.70										
14	ACTUAL	2416.	12.72	92.33			41.0	103.3	74.5	79.1	82.5	94.7	95.9	98.0	99.8	100.0
	PREDICTED	1568.	8.25	15.91			91.9	164.3	24.1	43.9	61.7	87.0	89.8	94.1	99.6	100.0
					81.20	0.23										

COMPOSITE MODEL EVALUATION

REC. ZONE		TOTAL TRIPS	MEAN TRIPS PER ORIGIN	STD. DEV. TRIPS PER ORIGIN	STD. ERROR INDEX	SQ. CORR.	MEAN TRIP LENGTH	STD. DEV. TRIP LENGTH	25	50	75	100	150	300	1000	3000
									PERCENTAGE OF TRIPS HAVING LENGTHS LESS THAN OR EQUAL TO							
15	ACTUAL	601.	3.16	16.35			90.7	149.4	49.9	56.7	60.2	62.7	83.7	94.5	99.8	100.0
	PREDICTED	858.	4.51	11.78	12.38	0.43	113.0	213.9	23.5	39.8	59.8	79.2	85.6	92.2	99.3	100.0
16	ACTUAL	6904.	36.34	190.43			105.4	153.6	12.7	50.8	58.8	66.8	75.6	94.4	99.8	100.0
	PREDICTED	13178.	69.36	143.13	208.17	-0.19	146.1	198.4	19.8	30.7	48.8	62.4	70.2	84.3	99.4	100.0
17	ACTUAL	285.	1.50	6.78			124.6	143.7	37.9	49.5	50.9	55.8	58.6	91.6	100.0	100.0
	PREDICTED	278.	1.46	3.06	5.96	0.23	97.9	162.2	20.4	38.5	58.6	84.6	87.9	94.7	99.8	100.0
18	ACTUAL	3548.	18.67	42.81			182.0	211.0	16.4	28.2	35.7	39.1	54.3	81.5	99.6	100.0
	PREDICTED	2760.	14.53	33.01	31.15	0.47	119.4	189.0	21.6	37.6	58.3	72.5	78.8	91.3	99.7	100.0
19	ACTUAL	66.	0.35	3.49			18.7	30.5	74.2	90.9	90.9	92.4	100.0	100.0	100.0	100.0
	PREDICTED	112.	0.59	1.25	2.49	0.49	150.0	238.2	22.5	37.3	46.8	57.5	72.1	88.7	99.2	100.0
20	ACTUAL	1185.	6.24	31.71			60.6	175.2	71.6	78.9	82.0	88.3	92.8	96.0	99.6	100.0
	PREDICTED	4426.	23.3[illegible]	42.18	30.50	0.07	87.6	150.8	29.5	47.4	64.5	81.5	87.8	95.2	99.7	100.0
21	ACTUAL	321.	1.69	5.23			140.8	264.5	14.3	30.5	55.1	64.8	78.8	89.1	99.1	100.0
	PREDICTED	596.	3.14	11.87	10.97	-3.40	57.0	116.6	41.8	61.9	77.9	92.2	94.9	97.7	99.9	100.0
22	ACTUAL	139.	0.73	4.50			60.7	156.0	41.7	89.9	89.9	91.4	92.8	95.7	100.0	100.0
	PREDICTED	108.	0.57	0.94	3.99	0.22	159.5	241.3	16.9	35.7	45.9	54.3	71.2	87.5	99.2	100.0
23	ACTUAL	130.	0.68	6.43			53.2	133.1	21.5	94.6	96.2	96.2	96.9	96.9	100.0	100.0
	PREDICTED	150.	0.79	1.48	5.77	0.19	127.9	211.0	19.0	40.2	54.6	66.5	79.2	91.0	99.5	100.0
24	ACTUAL	2451.	12.90	63.99			62.3	150.3	38.6	72.2	87.6	89.6	93.2	97.1	99.7	100.0
	PREDICTED	3351.	17.63	52.05	27.19	0.82	64.0	131.1	31.7	56.0	80.5	92.5	95.3	97.5	99.7	100.0
25	ACTUAL	60.	0.32	1.86			34.8	36.1	51.7	73.3	93.3	93.3	98.3	100.0	100.0	100.0
	PREDICTED	94.	0.50	0.81	1.53	0.33	173.7	252.3	11.8	27.3	40.1	48.1	65.0	88.3	98.9	100.0
26	ACTUAL	60.	0.32	1.89			45.5	74.3	56.7	83.3	86.7	88.3	95.0	98.3	100.0	100.0
	PREDICTED	102.	0.54	1.05	1.58	0.30	173.8	247.3	17.3	32.1	39.6	48.5	61.4	88.8	99.0	100.0
27	ACTUAL	670.	3.53	21.24			54.6	174.5	70.7	82.2	84.5	89.9	93.4	96.6	99.6	100.0
	PREDICTED	1646.	8.66	20.26	13.33	0.61	163.0	261.4	25.0	41.3	51.5	64.7	70.1	83.4	98.6	100.0
28	ACTUAL	126.	0.66	3.92			90.7	315.6	29.4	87.3	88.1	93.7	96.0	96.8	98.4	100.0
	PREDICTED	142.	0.75	1.62	3.06	0.39	127.9	217.8	23.3	45.1	55.5	68.0	77.2	92.0	99.3	100.0

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MODEL EVALUATION

COMPOSITE MODEL EVALUATION

REC. ZONE		TOTAL TRIPS	MEAN TRIPS PER ORIGIN	STD. DEV. TRIPS PER ORIGIN	STD. ERROR INDEX	SQ. CORR. INDEX	MEAN TRIP LENGTH	STD. DEV. TRIP LENGTH	25	50	75	100	150	300	1000	3000
									PERCENTAGE OF TRIPS HAVING LENGTHS LESS THAN OR EQUAL TO							
29	ACTUAL	679.	3.57	14.83			40.9	164.8	68.8	87.0	92.5	94.3	97.9	99.1	99.6	100.0
	PREDICTED	2241.	11.80	20.29			82.0	159.7	26.2	50.0	67.6	87.3	92.7	96.3	99.6	100.0
					16.07	-0.17										
30	ACTUAL	2306.	12.14	63.15			70.9	167.7	64.4	77.6	80.5	85.6	89.8	95.1	99.2	100.0
	PREDICTED	1373.	7.23	15.76			91.2	174.5	30.7	51.9	64.9	84.3	88.6	93.5	99.5	100.0
					51.99	0.32										
31	ACTUAL	3412.	17.96	122.35			91.1	208.4	55.6	69.1	72.4	76.3	80.8	91.6	99.2	100.0
	PREDICTED	3548.	18.68	45.92			101.7	169.6	25.0	43.2	59.8	78.5	83.3	92.8	99.6	100.0
					85.93	0.51										
32	ACTUAL	486.	2.56	14.24			144.9	231.4	52.7	55.3	57.0	58.4	63.6	82.1	99.0	100.0
	PREDICTED	1850.	9.74	67.00			57.4	156.9	60.8	74.1	81.7	90.8	92.5	96.0	99.6	100.0
					54.01	-13.38										
33	ACTUAL	545.	2.87	10.19			257.3	310.1	23.3	25.3	35.8	36.7	41.5	64.4	98.5	100.0
	PREDICTED	1576.	8.30	29.16			93.9	196.4	26.5	46.9	73.2	88.0	89.5	93.5	99.3	100.0
					23.28	-4.22										
34	ACTUAL	1930.	10.16	29.13			101.1	181.8	24.8	42.8	64.1	68.1	86.5	94.1	99.2	100.0
	PREDICTED	2178.	11.46	18.78			81.4	163.7	24.3	46.7	73.5	87.9	93.1	95.8	99.5	100.0
					22.92	0.38										
35	ACTUAL	286.	1.51	4.18			109.2	149.3	19.2	35.7	54.2	60.1	85.3	95.1	99.3	100.0
	PREDICTED	517.	2.72	4.59			73.6	123.1	22.3	47.3	73.3	88.9	94.3	97.3	99.8	100.0
					4.21	-0.01										
36	ACTUAL	800.	4.21	17.19			104.8	162.0	26.9	44.9	48.4	74.6	85.1	94.3	99.4	100.0
	PREDICTED	2083.	10.96	25.51			87.8	166.6	23.3	44.7	61.5	88.3	92.3	95.7	99.5	100.0
					16.78	0.05										
37	ACTUAL	941.	4.95	30.43			66.0	204.7	60.5	66.5	86.7	88.7	92.7	96.6	99.3	100.0
	PREDICTED	1740.	9.16	30.92			84.8	185.1	36.9	51.8	68.9	85.9	90.8	94.7	99.4	100.0
					13.28	0.81										
38	ACTUAL	1146.	6.03	36.26			47.1	116.5	58.9	81.6	84.0	92.1	94.5	98.3	99.7	100.0
	PREDICTED	941.	4.95	10.03			110.4	203.5	23.1	42.8	59.0	79.1	84.8	93.3	99.3	100.0
					30.50	0.29										
39	ACTUAL	1224.	6.44	49.10			71.0	199.7	71.2	77.9	80.6	81.9	86.1	96.2	99.4	100.0
	PREDICTED	1080.	5.68	10.46			101.2	192.9	25.1	44.4	64.8	84.2	87.1	93.1	99.3	100.0
					45.10	0.16										
40	ACTUAL	2857.	15.04	97.94			57.3	173.4	75.7	79.3	81.1	82.3	89.6	95.3	99.6	100.0
	PREDICTED	3321.	17.48	69.42			92.3	178.6	45.1	56.3	66.1	77.2	84.7	93.0	99.6	100.0
					35.01	0.87										
41	ACTUAL	189.	0.99	8.86			95.5	223.4	75.1	75.1	76.7	76.7	79.4	92.1	99.5	100.0
	PREDICTED	249.	1.31	3.62			99.8	177.9	27.2	44.0	71.4	83.6	85.1	93.0	99.6	100.0
					8.01	0.18										
42	ACTUAL	1260.	6.63	78.55			48.6	122.8	86.0	88.7	89.2	89.9	91.9	95.2	100.0	100.0
	PREDICTED	145.	0.77	2.37			141.5	226.1	19.5	37.2	51.7	66.2	76.8	88.3	99.4	100.0
					76.95	0.04										

STATISTICAL ACCURACY OF TOTAL PREDICTION

STANDARD ERROR	STANDARD DEVIATION	SQUARED CORRELATION INDEX
55.875	72.316	0.403

APPENDIX G

PHASE II PREDICTION MODEL EVALUATION
(CROSS - CLASSIFICATION MODEL)

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MODEL EVALUATION

COMPOSITE MODEL EVALUATION

REC. ZONE		TOTAL TRIPS	MEAN TRIPS PER ORIGIN	STD. DEV. TRIPS PER ORIGIN	STD. ERROR	SQ. CORR. INDEX	MEAN TRIP LENGTH	STD. DEV. TRIP LENGTH	25	50	75	100	150	300	1000	3000
1	ACTUAL	703.	3.70	24.42			63.4	196.8	70.1	82.2	86.6	86.9	87.6	93.6	99.4	100.0
	PREDICTED	768.	4.04	12.51			261.8	365.4	38.1	49.2	51.7	52.5	54.2	65.9	95.1	100.0
					17.81	0.47										
2	ACTUAL	18220.	95.89	297.95			140.5	200.0	25.1	53.1	59.0	62.3	67.6	88.5	99.2	100.0
	PREDICTED	18220.	95.89	280.02			144.2	207.9	24.1	50.0	58.5	62.3	67.6	87.9	98.8	100.0
					103.48	0.88										
3	ACTUAL	552.	2.91	16.26			92.5	166.5	59.6	64.9	69.2	79.9	84.1	92.2	98.9	100.0
	PREDICTED	1219.	6.41	29.62			90.8	213.2	61.9	70.8	79.2	83.0	87.6	92.3	98.7	100.0
					20.89	-0.65										
4	ACTUAL	1934.	10.18	98.64			78.9	266.1	74.5	85.0	85.2	86.1	87.5	94.6	99.0	100.0
	PREDICTED	927.	4.88	38.21			88.0	214.3	64.5	76.4	77.3	78.9	83.4	92.8	99.2	100.0
					61.12	0.62										
5	ACTUAL	1245.	6.55	41.46			48.4	121.2	69.8	82.6	88.5	90.0	94.2	96.1	99.8	100.0
	PREDICTED	1089.	5.73	25.17			109.5	220.6	30.8	47.9	54.0	81.6	86.1	91.4	99.0	100.0
					34.10	0.32										
6	ACTUAL	2542.	13.38	79.79			104.0	235.5	21.9	43.0	86.4	88.5	90.1	94.4	98.9	100.0
	PREDICTED	1123.	5.91	25.78			116.0	217.0	15.7	32.2	79.0	81.5	85.6	92.6	99.1	100.0
					59.07	0.45										
7	ACTUAL	107.	0.56	4.15			68.9	142.4	43.0	86.9	86.9	86.9	92.5	94.4	100.0	100.0
	PREDICTED	801.	4.22	20.95			112.7	222.3	48.5	59.6	66.8	73.5	80.8	88.1	99.2	100.0
					18.92	-19.82										
8	ACTUAL	752.	3.96	27.52			193.1	337.0	15.2	64.6	68.2	69.1	71.1	76.3	97.9	100.0
	PREDICTED	1496.	7.87	41.47			83.6	194.3	45.6	71.8	81.2	84.6	89.6	93.3	99.4	100.0
					28.63	-0.08										
9	ACTUAL	1593.	8.38	63.67			61.5	89.0	24.8	37.2	91.5	94.0	95.4	98.5	99.9	100.0
	PREDICTED	1745.	9.18	44.61			79.5	155.6	34.3	46.6	76.6	89.2	90.6	94.8	99.6	100.0
					30.52	0.77										
10	ACTUAL	1967.	10.35	22.60			299.7	334.1	14.2	17.9	21.1	31.5	39.7	60.3	98.2	100.0
	PREDICTED	1047.	5.51	13.32			234.7	312.2	24.8	31.9	36.6	46.3	54.8	70.3	98.0	100.0
					15.12	0.55										
11	ACTUAL	45.	0.24	1.90			40.0	80.3	75.6	80.0	82.2	88.9	95.6	97.8	100.0	100.0
	PREDICTED	54.	0.29	1.81			65.8	214.5	72.5	84.6	87.4	89.1	93.1	95.6	99.0	100.0
					0.64	0.89										
12	ACTUAL	1636.	8.61	61.10			39.3	78.0	55.3	85.0	88.0	88.8	95.9	98.0	100.0	100.0
	PREDICTED	2065.	10.87	42.12			121.6	219.3	43.9	58.1	63.2	66.1	75.7	89.5	99.2	100.0
					30.63	0.75										
13	ACTUAL	1133.	5.96	28.32			140.9	213.6	36.1	60.3	64.7	66.0	72.2	78.8	99.6	100.0
	PREDICTED	1486.	7.82	33.89			71.4	169.0	57.5	69.9	82.7	84.6	90.0	93.7	99.6	100.0
					24.37	0.26										
14	ACTUAL	2416.	12.72	92.33			41.0	103.3	74.5	79.1	82.5	94.7	95.9	98.0	99.8	100.0
	PREDICTED	1417.	7.46	29.64			79.7	176.3	55.6	65.0	68.9	85.6	88.7	93.5	99.6	100.0
					73.69	0.36										

PERCENTAGE OF TRIPS HAVING LENGTHS LESS THAN OR EQUAL TO (columns 25 through 3000)

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COMPOSITE MODEL EVALUATION

REC. ZONE		TOTAL TRIPS	MEAN TRIPS PER ORIGIN	STD. DEV. TRIPS PER ORIGIN	STD. ERROR INDEX	SQ. CORR.	MEAN TRIP LENGTH	STD. DEV. TRIP LENGTH	PERCENTAGE OF TRIPS HAVING LENGTHS LESS THAN OR EQUAL TO 25	50	75	100	150	300	1000	3000
15	ACTUAL	601.	3.16	16.35			90.7	149.4	49.9	56.7	60.2	62.7	83.7	94.5	99.8	100.0
	PREDICTED	635.	3.34	14.29			122.2	248.5	42.6	52.8	68.4	71.9	80.6	89.5	99.0	100.0
					8.31	0.74										
16	ACTUAL	6904.	36.34	190.43			105.4	153.6	12.7	50.8	58.8	66.8	75.6	94.4	99.8	100.0
	PREDICTED	6904.	36.34	100.90			110.3	161.3	15.2	50.2	58.4	66.8	75.6	94.9	99.7	100.0
					130.73	0.53										
17	ACTUAL	285.	1.50	6.78			124.6	143.7	37.9	49.5	50.9	55.8	58.6	91.6	100.0	100.0
	PREDICTED	452.	2.38	15.58			85.3	180.3	64.5	71.5	74.0	78.8	82.9	93.5	99.7	100.0
					15.21	-4.04										
18	ACTUAL	3548.	18.67	42.81			182.0	211.0	16.4	28.2	35.7	39.1	54.3	81.5	99.6	100.0
	PREDICTED	1838.	9.67	34.86			142.4	228.3	37.6	50.2	56.7	58.7	68.2	86.9	99.5	100.0
					30.58	0.49										
19	ACTUAL	66.	0.35	3.49			18.7	30.5	74.2	90.9	90.9	92.4	100.0	100.0	100.0	100.0
	PREDICTED	73.	0.38	1.90			57.7	184.1	53.2	86.2	88.0	90.4	95.5	97.0	99.5	100.0
					2.48	0.50										
20	ACTUAL	1185.	6.24	31.71			60.6	175.2	71.6	78.9	82.0	88.3	92.8	96.0	99.6	100.0
	PREDICTED	3169.	16.68	50.62			91.0	178.3	51.0	65.0	69.6	74.1	83.0	93.3	99.5	100.0
					33.06	-0.09										
21	ACTUAL	321.	1.69	5.23			140.8	264.5	14.3	30.5	55.1	64.8	78.8	89.1	99.1	100.0
	PREDICTED	733.	3.86	15.11			61.6	144.3	58.6	77.0	82.9	85.2	89.9	95.9	99.8	100.0
					14.38	-6.56										
22	ACTUAL	139.	0.73	4.50			60.7	156.0	41.7	89.9	89.9	91.4	92.8	95.7	100.0	100.0
	PREDICTED	82.	0.43	1.89			55.8	173.8	49.5	87.2	89.6	92.3	96.2	97.2	99.5	100.0
					3.22	0.49										
23	ACTUAL	130.	0.68	6.43			53.2	133.1	21.5	94.6	96.2	96.2	96.9	96.9	100.0	100.0
	PREDICTED	135.	0.71	5.21			51.4	135.3	22.4	90.6	93.1	95.0	97.6	98.3	99.7	100.0
					2.08	0.90										
24	ACTUAL	2451.	12.90	63.99			62.3	150.3	38.6	72.2	87.6	89.6	93.2	97.1	99.7	100.0
	PREDICTED	1752.	9.22	29.32			81.9	176.9	32.5	57.7	83.8	85.7	90.9	95.2	99.4	100.0
					45.81	0.49										
25	ACTUAL	60.	0.32	1.86			34.8	36.1	51.7	73.3	93.3	93.3	98.3	100.0	100.0	100.0
	PREDICTED	88.	0.46	2.04			64.4	167.2	28.9	70.9	91.7	93.1	95.9	97.4	99.5	100.0
					1.86	-0.00										
26	ACTUAL	60.	0.32	1.89			45.5	74.3	56.7	83.3	86.7	88.3	95.0	98.3	100.0	100.0
	PREDICTED	105.	0.55	2.75			54.1	154.8	50.1	86.2	90.4	93.2	96.0	97.8	99.6	100.0
					1.61	0.27										
27	ACTUAL	670.	3.53	21.24			54.6	174.5	70.7	82.2	84.5	89.9	93.4	96.6	99.6	100.0
	PREDICTED	1525.	8.03	25.35			164.5	273.0	44.1	50.8	53.3	61.9	67.7	82.0	98.5	100.0
					18.68	0.23										
28	ACTUAL	126.	0.66	3.92			90.7	315.6	29.4	87.3	88.1	93.7	96.0	96.8	98.4	100.0
	PREDICTED	89.	0.47	2.45			61.1	167.4	44.6	87.2	89.2	92.4	95.7	97.4	99.5	100.0
					2.01	0.74										

1970 KENTUCKY RECREATIONAL TRAVEL STUDY
KENTUCKY DEPARTMENT OF HIGHWAYS
MODEL EVALUATION

COMPOSITE MODEL EVALUATION

REC. ZONE		TOTAL TRIPS	MEAN TRIPS PER ORIGIN	STD. DEV. TRIPS PER ORIGIN	STD. ERROR	SQ. CORR. INDEX	MEAN TRIP LENGTH	STD. DEV. TRIP LENGTH	PERCENTAGE OF TRIPS HAVING LENGTHS LESS THAN OR EQUAL TO 25	50	75	100	150	300	1000	3000
29	ACTUAL	679.	3.57	14.83			40.9	164.8	68.8	87.0	92.5	94.3	97.9	99.1	99.6	100.0
	PREDICTED	1436.	7.56	20.21			91.8	198.1	39.7	62.3	70.6	80.2	88.7	94.2	99.3	100.0
					15.60	-0.11										
30	ACTUAL	2306.	12.14	63.15			70.9	167.7	64.4	77.6	80.5	85.6	89.8	95.1	99.2	100.0
	PREDICTED	2281.	12.00	74.81			50.2	141.5	77.6	85.2	87.0	90.6	93.1	96.1	99.7	100.0
					22.41	0.87										
31	ACTUAL	3412.	17.96	122.35			91.1	208.4	55.6	69.1	72.4	76.3	80.8	91.6	99.2	100.0
	PREDICTED	2542.	13.38	50.37			109.3	200.3	46.1	60.8	66.4	70.1	76.6	90.0	99.5	100.0
					92.57	0.43										
32	ACTUAL	486.	2.56	14.24			144.9	231.4	52.7	55.3	57.0	58.4	63.6	82.1	99.0	100.0
	PREDICTED	1215.	6.40	41.48			67.4	190.7	70.0	83.0	85.1	86.0	88.5	93.9	99.4	100.0
					31.30	-3.83										
33	ACTUAL	545.	2.87	10.19			257.3	310.1	23.3	25.3	35.8	36.7	41.5	64.4	98.5	100.0
	PREDICTED	851.	4.48	26.53			129.5	260.5	24.7	34.7	76.1	77.8	80.6	87.9	98.8	100.0
					20.93	-3.22										
34	ACTUAL	1930.	10.16	29.13			101.1	181.8	24.8	42.8	64.1	68.1	86.5	94.1	99.2	100.0
	PREDICTED	1207.	6.35	18.56			95.8	218.4	46.0	62.0	75.1	78.2	87.5	92.4	99.2	100.0
					21.77	0.44										
35	ACTUAL	286.	1.51	4.18			109.2	149.3	19.2	35.7	54.2	60.1	85.3	95.1	99.3	100.0
	PREDICTED	315.	1.66	3.65			132.7	202.1	14.2	36.0	54.2	59.7	78.9	91.2	99.5	100.0
					2.97	0.50										
36	ACTUAL	800.	4.21	17.19			104.8	162.0	26.9	44.9	48.4	74.6	85.1	94.3	99.4	100.0
	PREDICTED	1011.	5.32	18.77			125.2	231.6	22.8	40.2	44.1	75.8	84.2	91.0	99.0	100.0
					9.39	0.70										
37	ACTUAL	941.	4.95	30.43			66.0	204.7	60.5	66.5	86.7	88.7	92.7	96.6	99.3	100.0
	PREDICTED	1255.	6.60	28.81			95.4	216.3	45.4	56.9	71.3	80.4	87.2	92.7	99.2	100.0
					12.42	0.83										
38	ACTUAL	1146.	6.03	36.26			47.1	116.5	58.9	81.6	84.0	92.1	94.5	98.3	99.7	100.0
	PREDICTED	1064.	5.60	25.26			88.5	196.7	52.6	65.8	70.4	81.5	86.6	94.1	99.3	100.0
					16.69	0.79										
39	ACTUAL	1224.	6.44	49.10			71.0	199.7	71.2	77.9	80.6	81.9	86.1	96.2	99.4	100.0
	PREDICTED	1376.	7.24	35.82			69.7	176.8	66.4	77.2	81.7	87.6	89.9	94.6	99.5	100.0
					31.06	0.60										
40	ACTUAL	2857.	15.04	97.94			57.3	173.4	75.7	79.3	81.1	82.3	89.6	95.3	99.6	100.0
	PREDICTED	3024.	15.91	88.90			87.9	188.3	65.3	70.1	73.1	75.0	83.2	92.3	99.6	100.0
					65.59	0.55										
41	ACTUAL	189.	0.99	8.86			95.5	223.4	75.1	75.1	76.7	76.7	79.4	92.1	99.5	100.0
	PREDICTED	335.	1.76	10.12			110.7	210.4	51.8	59.3	72.0	73.3	75.7	89.9	99.5	100.0
					11.40	-0.66										
42	ACTUAL	1260.	6.63	78.55			48.6	122.8	86.0	88.7	89.2	89.9	91.9	95.2	100.0	100.0
	PREDICTED	506.	2.66	25.45			77.0	179.3	69.1	77.3	78.5	79.6	86.1	93.7	99.7	100.0
					53.52	0.54										

STATISTICAL ACCURACY OF TOTAL PREDICTION

STANDARD ERROR	STANDARD DEVIATION	SQUARED CORRELATION INDEX
40.968	72.316	0.679

MEAN TRIPS PER INTERCHANGE 8.703