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The Evolution of a Commercial Landscape: A Case Study of the Motels Along U.S. Highway 31-W

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The Evolution of a Commercial Landscape:
A Case Study of the Motels Along U.S. Highway 31-W

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The cultural landscape is shaped by human imprints on the natural environment. Many decisions are made that have rippling effects over time. One type of development that changes the landscape is transportation innovation. As improved transportation links are introduced, people change their movement to include the quicker, more efficient route. As movement changes due to increased accessibility, roads that were once traveled by all now have fewer travelers. The rippling effects of the decision to add new infrastructure start at the opening of the innovation. New businesses will spring up at crossroads and common stopping areas. The long established businesses located on the old highways experience a change in business trends (transactions). The less use of the road by travelers, the less use of their businesses. This study attempts to show the effect of the transportation innovation of the Interstate System on the cultural landscape of a U.S. highway.

The study area is U.S. Highway 31-W, also known as the Dixie Highway, which runs parallel and interweaves with Interstate 65, from Elizabethtown south to Bowling Green, Kentucky. The different spatial locations of motels on 31-W and the different uses of the structures over time will be examined to determine
patterns of use in relation to the nearest I-65 interchange.

The study uses nearest neighbor analysis to find patterns among the existing motel structures, and contingency/chi-square analysis to find relationships between motel locations and distances to the nearest interstate interchange and downtown center. Results show that the NNA yielded three years in which there were significant levels to reject the null hypothesis (the point pattern is random) in favor of the alternate hypothesis one (the point pattern is more clustered than random). Neither of the results of the two contingency/chi-square analyses, use of motel structure in relation to distance from the interstate and use of motel structure in relation to distance from the nearest town center, show significant evidence to favor the alternate hypothesis over the null in any of the years used.
Chapter I

Introduction

Human's built environment has been changing for as long as it has existed. Old buildings are razed and new buildings are constructed. In as little as one generation, urban renewal projects can change a neighborhood dramatically. Some changes are so complete that a previous resident could lose recognition of familiar landmarks and become lost. With increased urban sprawl, the countryside is becoming suburban and old suburbia is becoming urban. Cultural landscape is the human imprint on the earth's surface, and the built environment is an element of that landscape. The cultural landscape changes as a consequence of new technology. This change is confirmed by the evidence of new buildings and roads replacing the old and obsolete. One important step in planning and decision-making is to learn the history of an area and recognize patterns of development. This background information helps in the decision-making processes of both private industry and government by supplying information about what policies have and have not worked in the past.

U.S. Highway 31W is a north-south road that spans the continental United States from the Great Lakes to the Gulf of Mexico. Some sections of 31W are called the Louisville-Nashville Road (L & N) as seen by the addresses posted on mailboxes. Prior to the highway, local towns were connected by the L & N Turnpike and segments of the old road were used for 31W. The L & N Turnpike, built in the 1840s, was laid out to give access to as many residents as feasible. The road usually demarcated a boundary between two properties so that each owner had access to the road. In some locations, the
road turned 90 degrees in order to avoid cutting through a farm. The state highway department began numbering the roads in 1932, and the Old L & N Turnpike was issued the number 31W. Four years later, the new 31W, a much straighter road, was constructed and took the number. Parts of the Old L& N Turnpike can be seen from the new 31W (U.S. 31W Bus Tour 1999).

The proximity of 31W to many caves and other tourist attractions in the study area made it a great route on which to build motels prior to the construction of Interstate 65 (I-65). Mammoth Cave National Park (MCNP) is accessible from the towns of Horse Cave, Cave City, and Park City, all located on 31W and near I-65. At over 350 miles long, Mammoth Cave is ranked the longest cave in the world and has a history as a tourist attraction. The cave was utilized as a private commercial tourist attraction when tours began in 1816. Mammoth Cave was designated a National Park in 1941, 125 years after the tours began. Since its National Park designation, Mammoth Cave has also been designated a World Heritage Site in 1981 and an International Biosphere Reserve in 1990 (National Park Service, Department of the Interior 1999). Each year, between 500,000 and 700,000 visitors take cave tours and approximately 2,000,000 people visit the park (Kreitzer 1999).

There have been various studies performed on the economic effect of transportation innovations on an area. This case looks at the change in the commercial landscape along U.S. Highway 31W before and after the construction of I-65. The change in land use is a sign of the economic impact that a new transportation development has on an area. This study does not measure change in dollars and cents;
instead, it studies the changes in the built environment of the cultural (commercial) landscape. What is the land used for? What has the land been used for? What physical changes have the buildings or properties gone through? These are a few of the questions addressed. The case study analyzes the locations of motels and the uses of the buildings over time on the section of 31W between Elizabethtown and Bowling Green, Kentucky.

The specific topically-defined subdivisions of geography in which the research is conducted are cultural geography, transportation planning, and land-use planning. The features in the study are elements of the landscape that were constructed by humans; therefore, this study is categorized as cultural rather than as physical geography. The study is performed to find relationships between transportation change and use of building structures on the commercial landscape. Thus, the study contributes to the literature in the fields of transportation and land use planning by applying general methodologies to a specific case study.

1.1 The changing commercial landscape

Many of the studies that show the impact of transportation infrastructure improvements concentrate on the economic impact. This research looks at the change in aesthetics of the landscape by concentrating on how each motel structure has been used over time. The survey concentrates on how long the buildings exist, what different types of businesses were in the buildings, and how long each type of business stayed at the building.
This study addresses the impact of transportation infrastructure improvements, and looks at the ways in which automobile-related businesses have changed use over time. It also examines the development of the automobile-accommodating landscape through the decline of the railroad era into the era of the automobile.

1.2 Research question and hypotheses

Transportation innovations change the dynamics of accessibility and mobility in a city, its hinterland, and the region around it. Historically, the flow of people and goods is redirected to use the improvement. The railroad encouraged downtown city growth because people could come from the rural areas to patronize the downtown stores. The distance traveled from home to the new shopping area increased, but time was not sacrificed. In the stagecoach era it took three days to travel from Louisville to Nashville. The stagecoach stopped every ten miles, prolonging the trip (U.S. 31W Bus Tour 1999). At present it takes three to four hours by car to travel the same distance. The cultural landscape changed with growing use of new transportation infrastructure introduced to the built environment. Another change occurred when the use of the automobile for recreation became popular in the early part of the twentieth century. New roads were constructed, many paved, and the U.S. highway system was introduced. The maintenance of roads became important to help keep the traffic flowing. This empirical research focuses on U.S. 31W, a two-lane road that is part of the U.S. highway system, and the effect that Interstate 65, a limited access, divided highway, had on the system. The research question addresses the change in the cultural landscape:
How has the commercial landscape of motels evolved along 31W and what impact did the development of I-65 have on the process?

This question is addressed using a descriptive, historical account, and by using formal statistical analysis. First, a descriptive, historical account of the motels along 31W includes verbal descriptions, stories from owners, and photographs of the special features of the motels. The statistical analysis includes nearest neighbor analysis and contingency/chi-square analysis.

Nearest neighbor distance mean (NND mean) is used to determine a point pattern of motels along 31W from Elizabethtown to Bowling Green, Kentucky. A randomization test is then used to determine the significance of the NND mean for ten-year intervals from 1920 to 1980, as no new motels were constructed after 1977. This test determines if there is adequate evidence of any given point pattern. The following hypotheses are tested:

$H_0$: The process shaping the pattern of motel locations does not have a spatial component (it is random and no spatial autocorrelation exists).

$H_{A1}$: The process shaping the pattern of motel locations exhibits a clustering Influence (spatial autocorrelation exists).

$H_{A2}$: The process shaping the pattern of motel locations exhibits a dispersed Influence (spatial autocorrelation exists).

After a point pattern has been determined for the motels along 31W, use of the motel structures over time in relation to distance from Interstate 65 interchanges is studied. The change in the cultural landscape is shown by the change in use of the motel
structures along 31W in five-year intervals between 1975 and 1995. Motel structures are/were used as apartments, for storage, or left vacant. The study uses contingency tables and chi-square analysis to examine the different uses of the motel structures over time, and to determine whether or not this use is dependent on the distance from the nearest interstate interchange or the distance from the nearest town center.

The contingency analysis hypotheses, as they apply to distance from the interstate, are as follows:

\[ H_0: \text{Use of motel structure is independent of distance from the interstate.} \]

\[ H_A: \text{Use of motel structure is dependent on distance from the interstate.} \]

The contingency analysis hypotheses, as they apply to distance from the nearest town center, are as follows:

\[ H_0: \text{Use of motel structure is independent of distance from the nearest town center.} \]

\[ H_A: \text{Use of motel structure is dependent on distance from the nearest town center.} \]

The contingency/chi-square analysis is performed to evaluate evidence of processes that influence the motel to close and the function of the building to change. Such influences include the building's proximity to an interstate interchange or the nearest town center.
Chapter II

Review of Literature

The literature review is divided into three parts: the concept and processes of cultural landscapes, the development of roads, and the history of motels. Each section provides historical background to develop a context for the research.

2.1 Cultural Landscapes

The cultural landscape is both a concept and a process. People see the landscape as the place where they live and work. They experience sounds and smells throughout the area, become familiar with their surroundings, and develop a feeling for the region. The cultural landscape is a process because it continually changes over time. Era after era, old buildings are removed and new infrastructure is added.

A simple definition designates landscape as neither natural nor human made, but what is seen when looking at an area. Over time, the American attitude towards landscape has evolved to have a meaning of natural scenery. J. B. Jackson (1997,305) suggests a new definition of landscape as “a composition of man-made or man-modified space to serve as infrastructure or background for our collective coexistence.” Here Jackson is referring to the cultural landscape, or the organization of space by the community and for the community to live in. Most communities share similar elements but are organized differently. Each neighborhood has boundaries for property ownership and usually has roads and sidewalks on which to travel. There are places for play, such as parks, and places for public assembly. In many small towns, a school auditorium or a
fire hall serves this purpose. Each neighborhood or community organizes generally the same elements in its layout. Each element serves a purpose, and is used by the public to define the world they live in every day (Jackson 1997).

Cultural landscape as a concept includes ideas such as sense of place, topophilia, value of place, and how the material landscape, or built environment, is symbolic to humans. A sense of place is a feeling for a person’s surroundings, be they familiar or not. Relph (1976, 63) describes sense of place as “the ability to recognize different places and different identities of a place.” Some people may be comforted when they come around the corner into the neighborhood of their childhood; others may feel a sense of dread. Memories of the bully they recall from school might linger in their mind. Experiences in a physical setting shapes peoples sense of place in the cultural landscape of that area (Tuan 1977).

Tuan’s (1974) work, *Topophilia*, addresses human ties with the material environment. Whether it is due to the aesthetic beauty of a place or the area’s connection to a person’s past, topophilia is the joy or comfort associated with a particular place. One way people assess the value of a place is how well it fulfills the biological needs of food and shelter. Value of place is also gained through “the relations of space and place, and the range of experience or knowledge” (Tuan 1977, 6). Space becomes place as it becomes more familiar, and the value of place increases. Some experiences are direct and a person has contact with the event first hand. Others are indirect, and are seen or heard from a distance, or from someone else.
Knowledge also influences people's feeling for place. Is the place man-made, natural, or a combination of both? What is the size of the place? (Tuan 1977). A person gets to know a place based on its function (Relph 1976). The laundromat, for example, is used by people without a washer and/or dryer. It serves a weekly or monthly function for many people. Once a washer and dryer are obtained in the home, the laundromat is no longer necessary. As a result, the value of the function decreases. Place is experienced. People exist in it. By naming a space, humans claim it, and begin the change from space to place. Name is a form of identification, and humans identify with a space that has a name (Relph 1976).

Egocentrism is present in many cultures. Spatial evidence of this is expressed by Yi-Fu Tuan (1977, 34): “People everywhere tend to regard their own homeland as the ‘middle place,’ or the center of the world.” Other places are experienced after leaving home and before coming home. There is the lure of comfort and familiarity at home (Tuan 1977). At home, a person is inside a place both literally (under the roof) and metaphorically (familiar surroundings) (Relph 1976). Knowledge of and experience in an area transform space into place. The unfamiliar is space. The new destination on the first day of vacation is space. Surroundings are unfamiliar and directions or a map are needed to make every turn. After two days in the new destination, you are answering questions from other tourists and giving them suggestions of places to visit.

There are three basic elements used in the identity of places: the physical setting, the activities, and the meanings of the activities. The natural setting does not change. Cultural objects may be built on the natural landscape, but the place will always be at the
same elevation and at the same latitudinal and longitudinal points, barring a worldwide catastrophic event. The activities of the people vary from place to place, as do the influences the activities have on the surroundings. Although each place may have similar functional elements in the organization of the place, these three elements identify the place and make it unique (Relph 1976).

In the introduction to the book The Iconography of Landscape: Essays on the Symbolic Representation, Design and Use of Past Environments Denis Cosgrove and Stephen Daniels (1988) discuss landscape as image and symbol. Their essay is iconographic, which means “the theoretical and historical study of symbolic imagery” (Cosgrove and Daniels 1988, 1). They discuss the different approaches to studying the landscape and how it is applied to both painted forms and the built environment, for example, Panofsky’s idea of reading what we see, and John Ruskin’s idea of “landscape at the center of social, political and environmental morality” (Cosgrove and Daniels 1998, 3). Ruskin claims that everything reflects everything else, more or less. The post-modern attitude views landscape as a sense of duplicity. It is both attractive and comprehensive, yet delusional and distorted. In conclusion, they declare that the post-modern view of landscape converts signs and symbols in landscape to mean different contexts. As a post-modern society, we interpret what we want to from the landscape, and we twist things around for different meanings that are more useful (Cosgrove and Daniels 1998).

Using the ideas of the concept of cultural landscape leads into the discussion of the cultural landscape as a process. Nassauer’s (1995) article “Culture and Changing
Landscape Structure” discusses landscape ecology. Her main point is that landscape structure is an effect of culture and also changes culture. This concept is best described as a feedback loop, in which one feeds the other and vice versa. This idea means that we perceive or see the landscape, organize it, and place value on it. Cultural customs affect what is noticed by people, what is preferred, and what is interesting. Landscapes are cultural artifacts because there are pieces of time throughout history showing in them (Nassauer 1995).

Different cultures make decisions about their occupied surface of the earth. William Norton (1989) discusses the landscape and presents a framework for understanding it. Landscapes are both material and symbolic. Landscapes are made up of settlements, lone houses or barns, or natural areas. These elements are material; you can touch them, they are there for a purpose, and they are a function of the past and/or the present. Landscapes are symbolic because they have meanings for humans. The central theme of Norton’s work is the emergence of landscape and these variables that are responsible for change in the landscape. An evolving natural landscape is “a consequence of both previous landscapes and of the ongoing processes prompting change” (Norton 1989, 3). Technology, language, and religion are major components of culture in both space and time. The present landscape is a result of the changing relations between humans and land over time. The claimers of initial occupancy of the first effective settlement leave marks that stay in the cultural landscape of an area (Norton 1989). Examples of these marks can be seen all over the world from Easter Island to Stonehenge, from Greece to Jerusalem, and from Peru to Ohio in the Americas.
An ongoing theme among authors of landscape subjects is the idea that the cultural landscape is made up of bits and pieces of different landscapes of the past, as well as the elements and architecture of the present. The idea of the cultural landscape as a palimpsest is put into context through the dictionary meaning of palimpsest: “a written document, typically on vellum or parchment, that has been written upon several times, often with remnants of earlier, imperfectly erased writing still visible” (Berube 1982, 894). The human imprint on the earth’s surface changes over time. Land ownership changes and, at times, use of the land changes. A farm becomes a suburb, and a historic building that Jesse James used as a hide out is torn down because it is an eyesore (U.S. 31W Bus Tour 1999). Like the vellum or parchment of the written document, traces of previous cultural landscapes are still visible in the present landscape. There are elements of the landscape that will take a long time to wear off due to the elements of the earth. The mounds of the Native Americans of North America, the Great Wall of China, and the pyramids of Egypt are a few grand examples.

J.B. Jackson, in his 1984 book Discovering the Vernacular Landscape, discusses stability and mobility in the cultural landscape. Stability is the part of the landscape with longer life. There are stable, more permanent structures in the landscape, such as the pyramids of Egypt, cathedrals in Europe, and even some buildings that serve government functions, such as courthouses. There are also moveable nonpermanent structures, such as hot-dog stands, mobile homes, and temporary construction buildings. Jackson points out that there is a need to plan for both stability and mobility in the cultural landscape. Automobile-related businesses are another type of temporary structure. When new
transportation infrastructure is utilized, the older transportation is not used as much and eventually establishments go out of business. As a society, we should plan for the decline of areas (Jackson 1984).

There are many writings on specific changes in landscape structure. Examples in this paper will be limited to three types: the new landscape, the machine landscape, and decline of the cultural landscape. Robert Riley (1980) describes the new landscape as pluralistic. Instead of the farm image, or the New England small town image, he claims that specialized interests in recreation and merchandising have been dominant in the shaping of the new landscape. The landscape serves several functions. His pluralistic description is supported by the onset of increased mobility due to the automobile and the influence of mass media (Riley 1980). The character of place changes over time due to both physical change and change in attitude. Attitude can be greatly affected by the media. Media can dictate what is cool, or in vogue, and what is not cool. Media can weaken a sense of place by encouraging placelessness. Placelessness occurs when the identity is sapped from a place. Mass communications such as roads, railways, and airports are imposed on the landscape and interrupt the landscape (Relph 1976). Often a beautiful view of a cityscape and sunset is interrupted by telephone wires in the sky. The landscape is one of the last elements of our society to be influenced by the media. The landscape is slow to change. The interior of homes and offices can be modernized at any time, whenever the owner makes the decision. The cultural landscape takes longer to change due to governmental restrictions designed for the public interest. Planning and zoning are implemented for the good of the general public. Developers build whole areas
into packages. Housing is available, as well as convenient stores and strip malls. The new landscape has been developed to meet the needs of all the different activities available to humans at present (Riley 1980).

The machine landscape, another name for modern landscape described by Edward Relph (1981), is the outcome of people having become dependent on machines. In his book, *Rational Landscapes and Humanistic Geography*, Relph describes two separate machine ages and the effects the machines have had on the landscape. The First Machine Age was manifested on the landscape by the late 1920s, when electrical and gasoline technologies began to be used by the middle class. At this time, utility poles and automobile-related businesses began to show on the landscape. Some electric and gasoline technology appeared on the landscape prior to the 1920s, but these were isolated, localized events, such as skyscrapers and the first few parkways. The Second Machine Age was based on products of synthetic chemistry and mass production of domestic electronics. This machine age is much more subtle, marked by the development of antibiotics, computers, plastics, and televisions. The change in the landscape due to the Second Machine Age is not as easily perceived as the First Machine Age. The changes consist of effects of DDT, microwaves, and nuclear wastes. Relph’s (1981) point is that the two machine ages show on the landscape as large-scale modifications of technology.

Technology is a cause of visual blight, according to Peirce Lewis et al. (1973). When technological innovations such as mechanical, chemical, electronic, and nuclear advancements take place, visual blight spreads over wider areas. Increased mobility has
increased traveling options, but it has spread visual blight from a few concentrated spaces to a wider area (Lewis et al. 1973).

As urban areas change with technology, so do rural areas. Farm consolidation and urban flight are threats to rural populations. As people move to the cities, the small towns lose their tax base. As the population decreases, entrepreneurs go out of business. Eventually a ripple effect occurs and only a couple of stores are left open. People have to travel to other towns to get their supplies. As the tax base decreases, local governments fold. Small towns are enveloped by large, regional governments. Another negative influence on rural change is the Interstate Highway System. During the 1960s, 70s and 80s, interstate highway construction consumed the nation's fiscal and technological resources for road building. At the same time, rural roads began to deteriorate due to neglect. Some roads are even turning into gravel due to overgrowth. This deterioration limits the accessibility and mobility of rural residents. Interstates often bypass the downtown areas of small communities. New business development occurs on the strip that reaches out from downtown toward the interstate. Businesses along the U.S. highways in downtown areas begin to shown signs of decline in revenue (Jakle and Wilson 1992).

The concept and process of cultural landscape are two different things, yet they overlap. The concept reminds people how they feel about their surroundings, and whether they are comfortable or not. Cultural landscapes are continuously changing. They do not stop and start; they change all the time. Cultural landscapes are the outcome of humans changing relationship with the environment.
2.2 Development of Roads

Over the past hundred years, humans have developed technology that has quickened the pace of everyday life. The car is a prime example of a technological advance that has infiltrated most people's neighborhoods and lives. One hundred years ago, a car was considered one of the finest possessions a person could own. Many people wished for one, but never thought they would ever own a car.

In 1895, there were about 300 imported motor vehicles in the U.S. Four years later, in 1899, there were about 2,000 cars. By this time, there were 300 factories producing cars in the U.S. Less than ten years later, in 1908, there were ten times as many. The shops that produced the cars were small, with a low output per year. The early automobiles made in this fashion were very expensive (Jakle 1990).

In the first decade of the 20th century, assembly lines began to be used to mass-produce automobiles. The production of automobiles increased and, by 1914, there were more automobiles produced than carriages, an earlier mode of transportation. Henry Ford and other manufacturers increased the output of automobiles. By 1916, there were two million automobiles on the road (Jakle 1990). Table 1 shows the increase of car registrations in Kentucky and the United States. States passed legislation requiring registration at different times, but many laws were developed around 1920. The biggest increase in car registrations occurred between 1970 and 1980. Other than the 1970 to 1980 interval, the increases stay generally the same, with an average increase of 399,474 per decade registrations for Kentucky, and an average increase of 25,631,866 per decade for the entire United States. The boom from '70 to '80 could be due to families who
needed a double income. More opportunities for extracurricular activities (clubs and sports) for school children also promoted the two-car family. Varying family member schedules increase the need for two vehicles.

At first, cars were simple. Repairs could be performed by the car owner. As improvements, such as electric lights and four-wheel brakes, were introduced to the production of automobiles, they became less easily serviced. Instead of fixing it at home, the owner would have to take it to the shop. The trade off for the cost of repairs was that the newer cars were much more comfortable and easier to drive. Two great improvements to the automobile were the electric self-start and the closed sedan (Jakle 1990). The electric self-start was introduced by Cadillac in 1912. This invention eliminated the need for the hand crank, which required a lot of effort and was unsafe, as many careless operators gained fractured thumbs and fingers. The electric starter improved accessibility to the automobile for a larger portion of the population by making it easier for weaker individuals to drive a car. At about the same time, the closed car was introduced to the market. The enclosed automobile eliminated the need for heavy attire.
The open cars were more like carriages in that road dirt and grit accumulated within the car, on both the upholstery and clothes. This exposure made it necessary to wear heavy clothes, goggles, and hats during a drive to prevent grit from getting on one’s clothes. The closed sedan kept the road dirt out of the car. Although the closed sedan was introduced around 1912, it did not take the majority of sales in the United States until around 1923. In that year, less roadsters were sold than the closed sedans (The Encyclopedia Americana International Edition 1995).

Transportation was the main purpose of the car, but it was also seen as a status symbol. Cars were considered modern. The automobile was a symbol of progress. It gave a person the chance to expand the horizons of his or her world and, in turn, enjoy an increase in opportunities, both socially and economically (Jakle 1990).

At the dawn of the automobile age, driver’s licenses were not required, since there were not many automobiles in the early twentieth century. State governments realized that more cars were being added to the road annually. Driver’s licenses were first required in Kentucky in 1934. The cost of the license was fifty cents (Kentucky Department of Transportation 1934).

In the first third of the 20th century, road conditions were poor, to say the least. A person in the city could get around, although the streets were narrow and crowded. Between city travel was the toughest. A trip from Irvine to Booneville, Kentucky, a mere forty miles, could take up to five days by automobile in a new Model T, not due to mechanical car failure, but due to the poor quality of the roads. The roads were dusty in the summer, and when it rained, the roads became mud-holes. Tires would get stuck in
the deep mud. As the mud started to dry, if a car could make it through, deep tracks would be left. Later, vehicles would get stuck in the ruts left behind. In the winter, the roads were similar to little frozen ponds. After rain, the roads would turn to mud and tires would get stuck (Harrison and Klotter 1997).

Other than the number of driver’s licenses and car registrations issued, evidence of changes in the landscape due to the automobile can be seen by the miles of road added to the infrastructure each year. More evidence can be seen by the increase in the involvement of government in road development and improvement for the public good.

Around 1910, the first major effort was put forth to show the need (desire) for improved roads. The Lincoln Highway Association was formed, and a route was marked from New York City to San Francisco. A few automobile makers financed “demonstration miles,” which they engineered to show how improved roads could increase speed. The long distance road was also designed to have wide curves to ease long distance travel. In 1911, the Long Island Motor Parkway was completed. This road was the first one in the United States to be constructed specifically for automobiles (Jakle 1990).

A state highway commission was formed in Kentucky in 1912, four years before the federal government required the establishment of highway departments (Kleber 1992). State highway departments were to be established with the passing of the Federal Highway Act of 1916, also called the Post Roads Act. Once the state departments were established, the state could obtain federal subsidies for highway construction, up to a matching basis. The federal government did not encourage a network of routes
connecting cities at the time of the Highway Act of 1916. This requirement came about a year later. The railroads did not have the capacity to move the nation’s troops and materials for the war effort. In 1917, Roy Chapin was appointed head of the Highway Transport Committee by the Council for National Defense. Trucks were used to move the large amounts of materiel and troops from the west and mid-west to the east coast ports. The weight of the trucks damaged many of the early roads. Maryland responded by licensing motor vehicles, as well as placing weight restrictions on the roads. Money from the licenses was used for road repairs (Jakle 1990).

The Great War (1914-1918) encouraged the federal government to pass the 1921 Highway Act. Seven percent of roads in each state were to be designated as primary. These were the only roads to receive federal aid on a 50-50 matching basis. All in all, the highway network would cover approximately 200,000 miles and connect cities with a population of over 50,000. A federal gas tax was also established to fund the program (Jakle 1990).

Changes to old infrastructure to accommodate the increasingly efficient automobile can be seen in every town and city in the U.S. By the 1920s, the traffic had increased enough that streets initially intended for horse and buggy were widened to accommodate the larger, faster automobile. In some downtown areas, the streets were as wide as they could be without displacing buildings. At this time, many downtown streets were made one-way. The one-way streets allowed more vehicles to travel through the downtown area. When that change did not help with the increasing traffic, bypasses were built. The bypasses took the traffic away from the initial road and encouraged businesses
to relocate along the new road. As changes were being made to roads in the cities, improvements on roads connecting cities were also being made. New Jersey began to use road cuts, grade separations, and viaducts, as well as controlled exit and entrance ramps at tunnels and bridges near New York City and Philadelphia (Jakle 1990).

In 1923, Kentucky started a wide-scale effort to connect all the county seats (Kincaid 1955). Kentucky designated 3,700 miles of surfaced roads as part of the U.S. system in 1927. These were US 60, US 68, US 41, and many others including the two Dixie Highways, both US 25 and US 31. Of all the highways designated, the two Dixie Highways, which actually run north and south, are the only ones with 2 routes, an east (US 25E and US31E) and a west (US 25W and US 31W) route (Kleber 1992).

During the 1930s, parkways were built in different areas of the country, but usually near large cities. Parkways were a way for city dwellers to escape the concrete and drive on a tree-lined open road. The American Association of State Highway Officials set standards for road building and set a national speed limit for highways. Once the roads were established, people used these for more than just escaping the city for enjoyment in their cars, they were used for commuting back and forth to work, for freight haulage, and for long distance travel (Jakle 1990).

In 1954, the Bureau of Public Roads was restructured and renamed the Department of Transportation. At this time, Dwight Eisenhower, then president of the United States, asked Lucius Clay to chair the President’s Advisory Committee on a National Highway Program. This committee assessed what transportation needs were necessary around the United States and how to fund those needs (Weingroff 1996).
The 1956 Highway Act planned to create 41,000 miles of two-lane, limited-access highways. Of those 41,000, five thousand miles were to be in cities. The project was to be funded by the Highway Trust Fund. This fund consisted of federal taxes on new buses, tractor-trailers, motor fuels, tires, and a tax on heavy trucks (Jakle 1990). The Interstate Highway System was scheduled for completion in 1972 (Hindley 1972).

The government gave four reasons to justify the building of the new road system using the money gathered from the above taxes: too many roads were congested, the poor roads increased transportation costs for businesses (tire replacement for example), the roads were unsafe and most importantly, the highways that existed then were inadequate to move the people out of the cities in case of a need for evacuation due to a nuclear attack (Jakle 1990).

The modern era of toll roads began shortly before the Interstate System went into construction. The Kentucky Turnpike Authority and the construction of the turnpike from Louisville to Elizabethtown began in the early 1950s (Kleber 1992). The actual opening date was 1956. By the time the Interstate Highway was being implemented, many toll roads already existed. This usage fee occurred between Louisville and Elizabethtown. The toll road was constructed and paid for by a state bond, which was repaid by the people who used the toll road. People paid to use it, thus paying for the maintenance of the road and the construction costs (Harrison and Klotter 1997). The Department of Transportation could then use some of the toll roads already constructed for the interstate system (Kleber 1992). Table 2 shows the increase in total road mileage
over time for Kentucky and the United States. The inconsistency of dates on a ten-year interval in the

Table 2. Miles of road in Kentucky and the United States, 1909-1990

<table>
<thead>
<tr>
<th>YEAR</th>
<th>KENTUCKY</th>
<th>UNITED STATES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1909</td>
<td>53,744</td>
<td>2,199,388</td>
</tr>
<tr>
<td>1919</td>
<td>57,916</td>
<td>2,478,552</td>
</tr>
<tr>
<td>1930</td>
<td>61,261</td>
<td>3,009,006</td>
</tr>
<tr>
<td>1940</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>1950</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>1960</td>
<td>69,514</td>
<td>3,545,693</td>
</tr>
<tr>
<td>1970</td>
<td>69,071</td>
<td>3,730,082</td>
</tr>
<tr>
<td>1980</td>
<td>69,300</td>
<td>3,995,400</td>
</tr>
<tr>
<td>1990</td>
<td>69,668</td>
<td>3,880,151</td>
</tr>
</tbody>
</table>

Source: U.S. Department of Commerce. Bureau of Foreign and Domestic Commerce 1923, 1932

early part of the century is due to the Census Bureau’s collection process. Not all data was collected in the same time frame as the population data. The changes in the landscape can be seen while driving. New roads are constructed everyday, as can be witnessed in downtowns, suburbs, and the countryside.

At times, people would be displaced. New roads had to be put somewhere. The new roads were most often placed where public parks were located and where poor people lived. Low-income areas are often a mix of rental apartments and homeowners. The people of a neighborhood often do not have the economic or political power to fight
government decisions that have to do with transportation infrastructure improvements. Although displacement of people has been a problem with the development of new infrastructure, many demands are placed on the government for greater accessibility and mobility for the freedom of movement on well-maintained, direct-route roads (Jakle 1990).

One monetary impact of an interstate is the increase in neighboring land values. Ayers and Freidberg (N.D.) studied the effects of Interstate 64 on the rural land values of the five Kentucky counties located between the two urban centers of Lexington and Ashland-Huntington. Time series data were used for a ten-year period. The sample consisted of 20 percent of all property transactions for each county. The dependent variable was price per acre. Total county population, per capita income, number of acres in the transaction, distance to Interstate 64, as well as distance to the nearest economic center, were a few of the independent variables. Regression analysis was used to determine that Interstate 64 had a positive impact on land values in all five counties, and the counties near the two large urban areas were affected the strongest. The three counties in the middle of the study area were dependent on distance to the nearest economic center rather than on distance to the nearest interstate interchange. Of all the independent variables used, those affecting land value the most were the existence of a building on the parcel of land. This study of land values is one way the economic effect of an interstate can be measured on the surrounding hinterland (Ayers and Freidberg N.D.).
An advantage of the automobile is that it allows people to travel greater
distances in the same amount of time. This concept is called time-space convergence (de
Blij and Muller 1998). Distance can be described by time convergence with space at
different locations depending on the means of travel. A two-hour trip by plane will take
one much further than a two-hour trip by car. A place that is a day away in a car will take
much longer by bicycle. Transportation improvements allow people to have greater
mobility and accessibility, which widens the options in everyday life.

The limited-access, divided highways have many advantages. The most obvious
is speed, but there is also the nonexistence of traffic lights and stop signs. The curves are
wider, thus the road becomes straighter and it is easier to manipulate the car. The
economic disadvantages for rural areas, which are bypassed by the interstate, can be
devastating. Many of the businesses that were formerly located in the downtown area
move to the access road near the interstate. The two-lane highway has the advantage that
a traveler can stop anywhere along the road, rather than at the interchange on the
highway. The interstate interchange encourages development near the interchange rather
than all along it. Social interaction between travelers and residents is limited to the
interstate interchange. In contrast, on the two-lane highway the traveler can stop at any
business or roadside attraction that he/she perceives to be interesting.

Changes in infrastructure have greatly improved accessibility and mobility for
many people. As we move into the 21st century, new challenges will arise as the United
States integrates other new and improved forms of transportation with the present
infrastructure.
2.3 History of motels

In 1979, James Belasco published a study that followed the evolution of roadside accommodations from auto-camps to motels. Trade journals and touring literature were used to show the change in roadside accommodations over time. In the early twentieth century, people began touring the countryside in automobiles. Families camped along the roadside in tents. Meals were prepared on an open fire in the cans in which they were packaged. Auto-campers often littered an area before leaving. This abuse caused problems for the landowners of the property, and sometimes led to confrontations about trespassing and littering. As more people acquired cars, the problems intensified.

The auto-campers often traveled between rural areas without stopping in the cities they passed through. Merchants in downtown areas began to realize the potential income from these travelers, prompting city governments to allot public land for free municipal campgrounds. The free campgrounds attracted travelers to the town, bringing business to the merchants. It also alleviated some of the problems in the country. The campgrounds became crowded with the rising numbers of cars on the road. Maintenance costs rose and, by 1923, the municipal campgrounds were no longer free. The fees covered maintenance costs and served as a screen to keep the poorest travelers out of town.

Private camps soon opened up, and many new camps proliferated in the rural areas and in towns. Better amenities were provided at the private campgrounds. By 1925, cabins were added to some of the camps (Belasco 1979). Do-it-yourself plans and kits were available to entrepreneurs on a tight budget (Figure 1) (Liebs 1985). Soon after, many of the cabins were stocked with beds and linens, as well as indoor plumbing and
stoves. This change was in response to tourist demands for easier travel and the inconvenience of carrying all the camping gear. This change could also have caused different attitudes toward travel. In the beginning, the tourists would travel to get out of town and view the countryside. Later, tourists had roadside attraction destinations.

Figure 1. "Tourist Cabins that Get the Business"
Source: Liebs (1985), whose source was *Popular Mechanics* July 1935.
During the Depression, many people who could no longer afford to stay in luxurious downtown hotels utilized the cabin industry. Although other businesses were struggling to stay open, business for cabin entrepreneurs remained steady. The owners upgraded the cabins to encourage people to stay at their establishment rather than another. Newly erected accommodations took the form of cottages rather than cabins. Small motels then began to appear along the highway. By 1945, there were many motor courts across the country. At this point, large-scale developers became interested in motel development. In his conclusion, Belasco (1979) notes that the businesses evolved due to the demands of the middle class they served, as well as the roadside entrepreneurs who accommodated the demands.

Some significant dates and events regarding the early development of motels are listed in a timeline in Appendix A. In 1901, the first tourist court was built in the United States and was located in Douglas, Arizona. Askin's Tourist Court was used by copper-smelting workers as temporary housing. A free camp house located in Delevan, Kansas, opened in March 1914. There was no key; it was first come first served, and it was occupied almost every night. Many of the tourist and auto camps had a gas station and a grocery store on the premises. In 1920, there were 1,000 cabin camps in the United States, and this number doubled by 1926 (Margolies 1995).

As different styles of motels developed, different names were used to signify that the establishment was intended for lodging travelers: motor court, tourist court, auto court, cottages, motel court, hotel court, or cottage court (Jakle et al. 1996). The 1950s brought another type of motel to the American automobile landscape, the motor inn,
which consisted of a few two or three story buildings organized around a courtyard focused on an outdoor swimming pool. The boxy form of the highway hotel came about during the 1970s. Round, curvilinear, and cruciform shapes were also used. The public space of a highway hotel is concentrated on the first floor, and the private rooms are located on the upper levels.

While analyzing the changes in roadside accommodations, two elements of the buildings that focus on accommodations are building types and building arrangements. The changes in building type can be seen in Figure 2. The auto-camp and tourist home came first. The tourist home was usually a person's home, with extra rooms converted into space for travelers. The cabin camp either evolved from an auto camp or tourist home, or was constructed without a prior business on the premises. As more and more people began to travel in automobiles, there was a demand for more lodging facilities with better amenities. Thus came the less rustic cottages to replace cabins, and then the motor court to replace cottage courts. Different bathroom facilities were the distinguishing factors between cabin courts and cottage courts. Cabin courts had a centrally located bathroom and people had to leave the cabin to use the facilities, while cottage courts had private bathrooms built in the cottages.

Eventually the two-story motor inn began to show up on the landscape. The highway hotel, built at interstate interchanges, is generally larger than the U.S. highway motels. One reason is that the locations of interchanges are far apart, whereas motels can be built almost anywhere along the highway. At the interchange there is less road
frontage to place hotels; which necessitates the larger size of the few hotels that occupy the space.

Different building arrangements, or spatial organization, of roadside accommodations are shown in Figure 3. The highway motels are laid out over a larger area, along a strip of land next to the highway. Parking spots are right next to the door of the room. Interstate interchange hotels are boxy. Many floors are used to increase capacity.
Along with the motor inns and the highway hotels came the rise of franchises and chains. The motel industry caught on to this phenomenon later than other automobile-related businesses, such as petroleum stations and restaurants. Mom-and-pop motels were dominant in the accommodation industry after World War II. The 1960s witnessed the increase of franchise chains in the motel industry. In 1962, less than two percent of motel establishments were affiliated with lodging chains. By 1987, 64 percent were affiliated with lodging chains. Chains are advantageous to both the traveler and the owner. The traveler will be secure in knowing there is a network of properties. There is
also some quality control over the uncertainties that come with picking an unknown motel. Problems to be avoided are a broken bed, dirty bathroom, and no privacy. By being involved with a chain, the owner knows that the network will help to advertise the location and quality of a motel, thereby ensuring a certain number of travelers to recognize and utilize the facility (Jakle et al. 1996). For example, all Howard Johnson motels are very similar. You can find a Howard Johnson’s because of the orange and turquoise colors used and the similar spatial layout. This uniformity is to make travelers feel more comfortable because of the familiar surroundings (Relph 1976).

Figure 4 shows the number of properties each corporation held in the United States in 1974. Each corporation was mainly involved with one lodging chain. The exception is Red Carpet and Master Hosts, which were two chains owned by one corporation. The largest chain is the Holiday Inn with 1,703 properties in 1974, followed by Best Western with 1300. Rodeway Inns had only 155 properties in 1974, which places them last in the top ten. In Figure 5, using 1992 data, many corporations were involved with more than one motel chain. The corporations that are involved with more than one chain are distinguished from the others by the use of three tiers. The top tier is the chain with the most properties, the middle tier is the chain with the second most properties, and the bottom tier is the remaining properties. Hospitality Franchise System (2,291 properties in all) is affiliated with Days Inn (1,217), Ramada Inns (575), and Howard Johnson’s (499). Days Inn has more hotels without the rest of its affiliates than the three ranked lowest on the chart (Jakle et al. 1996).
**Figure 4.** Largest lodging chains in the US, 1974
Source: Jakle et al. 1996.

**Figure 5.** Largest motel franchises in the US, 1992.
Source: Jakle et al. 1996.
The accommodation industry has changed over time. It has generally followed changes in transportation. As new roads are located, the auto-related businesses open along the new route. Some of the businesses are brand new; others are old businesses relocated to the area with a heavier traffic flow.
Chapter III

Data

The size and dimensions of the study area are discussed as both absolute and relative locations. Descriptive data regarding the motels within the study area are also presented.

3.1 Study area

Highway 31W is a north-south road that runs from Michigan to the Gulf of Mexico (Map 1). It passes through Louisville, Elizabethtown and Bowling Green, Kentucky, then Nashville, Tennessee.

Interstate 65 (I-65) was opened through the study area in segments during the 1960s. The study area of 31W is 68 miles long and is located between the interchange of I-65 and 31W in Elizabethtown (exit 91) and the interchange of Duncan Hines Highway and 31W in Bowling Green (Map 2). The railroad tracks, I-65 and 31W all follow a similar path between Louisville and Nashville and intersect each other in several places along the route. Due to karst topography, sunken dents in the land known as sinkholes, made surveying for the railroad a long and difficult process. Due to the difficulties overcome by the railroad crew, at later dates, 31W and I-65 took similar paths to the railroad.

The 68 miles of 31W goes through six counties; from north to south, the counties are Hardin, Larue, Hart, Barren, Edmonson and Warren. The highway provides a border for the two counties of Hardin and Larue. Larue is on the east side and Hardin is on the
Map 1. Dixie Highway: 31W prior to Interstate 65
Source: H.M. Gousha, Co. no date.
Map 2. 31W Study area.
Source: Robinson 2002.
west side. There are nine towns in the study area: Elizabethtown, Glendale Junction, Upton, Bonnieville, Munfordville, Horse Cave, Cave City, Park City and Bowling Green

Prior to U.S. Highway 31W, the towns were connected by the Louisville and Nashville Turnpike, built in the 1840s. The L & N Turnpike was laid out to give access to as many residences as feasible. Therefore it usually was used as property boundaries and would turn 90 degrees in order to avoid going directly through a farmer’s field (U.S. 31W Bus Tour 1999). The L & N Turnpike had extensive use during the Civil War by the armies on both sides (Trapasso 2002). The road was improved from 1915 to 1916 and renamed the Dixie Highway. The road was named for one of its main uses of travelers, people from the north going south, into Dixieland, with a Florida destination (Kentucky Echoes no date).

The highway department began numbering the roads in 1932. The Old L & N Turnpike was issued the number 31W. Four years later, the new 31W was constructed and took the number. Parts of the Old L & N Turnpike can be seen from the new 31W. (U.S. 31W Bus Tour 1999).

Caves and other tourist attractions in the area made 31W a great route to build road oriented businesses on prior to the construction of Interstate 65. Motels and other roadside attractions, such as, miniature golf, mini amusement parks, gift shops, restaurants and gas stations began to pop up along the route. At over 350 miles long, Mammoth Cave is ranked the longest cave in the world, and has a long history as a tourist attraction. This cave had attracted people for over one hundred years before it was designated a National Park. Since achieving national park designation in 1941,
Mammoth Cave has been designated as a World Heritage Site in 1981 and as an International Biosphere Reserve in 1990 (National Park Service, Department of the Interior 1999).

Mammoth Cave had a monumental affect on the development of the surrounding area prior to National Park designation. In 1886, Mammoth Cave Railroad opened. The 8.7 mile long rail track was laid between Park City (prior names being Three Forks and Glasgow Junction) and Mammoth Cave. Use of the railroad was discontinued around 1931 due to monetary losses (Goode 1986).

There are many other tourist attractions located in and around the study region. Several commercial caves are in operation, such as Crystal Onyx Cave Park, Onyx Cave and Hidden River Cave, as well as antique shops, for example Magaline’s Antique Mall located in Cave City near the junction of 31W and 70. Civil War battlefields and other historic sites associated with the Civil War are located along and around the study area. Kentucky Down Under, Guntown Mountain Amusement Park, Jesse James Riding Stables, Mammoth Cave Wax Museum, Mammoth Cave Wildlife Museum, Horse Cave Theatre, and the American Cave Museum and Hidden River Cave are many of the attractions around the Mammoth Cave area.

It should be noted that not all attractions with Mammoth Cave as part of their name are associated with Mammoth Cave National Park. This name association could be evidence of the early commercial cave wars. Before Mammoth Cave became a national park, it was privately owned and utilized as a commercial cave. In the late 19th and early 20th centuries, there were several cave attractions in the area. Some of the privately
owned caves would later be discovered to be another entrance to Mammoth Cave. Due to the number of commercial caves in the area, the owners had to make theirs stand out from the others. Some of the owners used dishonest signs, located along the road to Mammoth Cave, diverting tourists from Mammoth Cave and toward their cave. So many tourists were diverted that the managers of Mammoth Cave had to advertise in the newspapers in order to warn tourists of the dishonest diversions from the path. The movement for Mammoth Cave to be made a national park was strengthened by the problems among the commercial cave owners (Goode 1986).

Part of 31W in Warren and Edmonson counties has been designated as Duncan Hines Scenic Byway. The Kentucky Transportation Cabinet has designated Duncan Hines Scenic Byway as a Kentucky Scenic Byway. Not just any road can be designated; it must be considered scenic. The application for the designation requires visual documentation of the entire route, mile by mile (Kentucky Transportation Cabinet 1994). An 80-mile scenic tour, the Duncan Hines Scenic Byway begins at Hines home and office at 3089 Louisville Road, Bowling Green, Kentucky (presently Hardy and Son Funeral Home). The scenic drive passes through parts of Warren and Edmonson Counties, but the drive is actually made of segments of several different roads. The byway also passes through Mammoth Cave National Park (Bowling Green-Warren County Tourist and Convention Commission, n.d.).

The segment of 31W between Louisville and Nashville has recently been designated as a heritage corridor. The U.S. Highway 31W Heritage Corridor initiative has the following goals in the establishment of the corridor: (1) inventory of natural and
scenic sites, (2) safety issues regarding transportation and access to sites, (3) the promotion of heritage tourism, (4) analyze the conditions of the existing infrastructure and (5) marketing the project to the public, both residents and travelers. This initiative is beginning to take shape. A robust inventory has been compiled and sites will continue to be added in the future. In order to add a sense of theme to the inventory, the resources are placed in one of the following five categories: the Civil War; African American and underground railroad; churches, cemeteries and genealogy; hotels, stage-stops and hospitals; and transportation. The heritage corridor project will improve economic conditions along 31W by attracting a few of the many travelers away from I-65 and onto 31W with nostalgia tourism. Nostalgia tourism is a combination of historic resources and tourist attractions and physical features that promotes travel in a certain area with a feeling of stepping back in time. With increasing working hours for double income families, many of these families choose to take shorter vacations closer to home. Thus, there may be an increase in tourism along the heritage corridor. The corridor will have a visitor center at the south and north ends of the route within the state. Each visitor center will have maps available that show the various tourist attractions and historic sites along 31W and the Old L & N Turnpike (U.S. 31W Bus Tour 1999).

South Carolina’s Heritage Corridor Initiative, begun around 1996, is an approach to rural economic development. Frequently travelers head directly for the beaches and the tourism development often bypasses small towns because people travel on the interstates. The agricultural, natural and cultural resources of the area provide themes for a 240-mile interactive museum without walls. Small towns and rural areas often do not
have the monetary means to invest in tourism development. This initiative brings together 14 counties. The South Carolina Corridor study shows that 700,000 people a year will visit the heritage corridor. Visitor expenses are expected to reach $83 million a year. Permanent tourism jobs, as well as temporary development jobs will be created within the 14 counties. By banding together, the areas with small tax bases can pool their resources to improve tourism development in the region (B & E Review 1996).

Like the South Carolina Heritage Corridor, the 31W Heritage Corridor could attract tourists from the interstate to the U.S. highway. This designation may increase traffic, which may in turn increase the demands for services. There might be economic development and a reduction in unemployment.

3.2 Motel data

A bar chart in Figure 6 shows the dates of construction for the motels in the study area. The dates of construction range from 1912 to 1977. The Mammoth Cave Hotel, built in 1912, is in Horse Cave and is located right to the railroad tracks. The motel built in 1977 is Star Motel located in Cave City. It is one of two motels that were built in the study area after the opening of I-65 ca.1965. Star Motel is also located near, but not right next to, an I-65 interchange, as is the other motel that was built after the interstate was completed. The mean date of construction is 1947. Map 3 displays the locations of 41 motels along 31W. A list of motels in the study area is available in Appendix B.
Sometimes the fieldwork would not supply the date of construction or confirm the dates of change of use for the motel. Two of the possible motel locations were eliminated from the study due to inadequate information: one because it was unconfirmed as a motel, and the other the date of construction could not be estimated.

Many of the motels in Park City, Cave City, and Horse Cave served railroad travelers before the popularization of the automobile. There are three railroad inns that should be included in the discussion, even though they are located just outside the study area. Bell’s Tavern, in Park City, Kentucky is not fully intact. It is now a shell of a building serving as a historical park and an archaeological site on the Old L & N Turnpike. A few doors to the north is an old inn called the Mentz Hotel, which was utilized by railroad travelers going to cave attractions in the area. This hotel is presently being restored (U.S. 31W Bus Tour 1999). The Old Munford Inn, Munfordville,
Map 3. Motels located on 31W in study area.
Source: Robinson 2002.
Kentucky was built by Thomas Munford in 1801 or 1810. It became a stopping point for travelers along the Old L & N Turnpike (Hart County Chamber of Commerce N.D.).

Descriptions of the motels included in the study are located in the descriptive analysis section of the paper. Elements of the motels discussed include: architectural style, historical significance, unusual features, and trends in builders and ownership.
Chapter IV

Research design

The research design is divided into three sections. First, the collection of data is described in the field work section. The descriptive analysis is second and includes photographs and architectural descriptions. The third section describes the two point pattern analyses, nearest neighbor, and contingency/chi-square.

4.1 Field work

The collection of the primary data took many steps. First, an automobile journey was required to search the study area for motels, hotels, and cottage rentals or, in some cases, evidence of a motel that is no longer there. The focus of the study is motels, hotels, and cottage rentals. A survey of the motels was performed by distributing a questionnaire to a contact person at each motel. The questionnaire was used to be certain that the same information was collected from all the establishments. The questionnaire is three pages long and is available in Appendix C. The first page is information regarding the attribute data of the establishment, for example, date of construction, architectural style, swimming pool on premises and history of the building. The second page is locational data. The most important piece of information obtained is the location on a USGS topographic map, which was later used to determine the latitude and longitude coordinates. The street address is used to search records at the Property Value Assessors office (PVA).
The PVA office in each county was visited, as the second step, to acquire the date of construction, dates of renovations, names and addresses of the owners, and previous owners. The deed book and page numbers were also recorded in case a deed search was necessary to find the date of construction, which was the third step. The fourth step was to contact the current owner if they had not yet been spoken with, and ask them for information regarding the motel. The fifth step was to contact the previous owner, and so on, until the information was obtained or the original owner or builder was reached.

The PVA records are not complete. Many dates of construction are missing. Also, sometimes it is hard to estimate the date of construction by researching a deed. In addition, many of the original owners are deceased. This problem with the data collection process shows why time is an important factor in current historic research. It is important to record the information from the people who know it before there is no one left who knows it.

4.2 Descriptive analysis

The motels within the study area are significant architectural examples of automobile oriented businesses in the commercial landscape of the twentieth century. Examples can be seen in the older, elaborate signs with flashing neon bulbs (Photograph 1), and in the architecture of the buildings themselves (Photograph 2). The layouts of the different buildings exemplify the many stages of the evolution of roadside
accommodations. The survey includes railroad hotels, cottage courts, and motels. Each motel has a different history regarding the effects of the interstate on the U.S. highway.

This section examines the history, dates of construction, demolition or conversion to other use, railroad access, location, architecture, structures listed on the National Register, and ownership, for example, Mammoth Cave National Park has an influence on its surrounding area. The cave tourists have a positive impact on the economy in the cave area. Many of the motels in this area have continued to serve as motels. One community that may be an exception to this pattern is Park City. There is only one remaining motel in business in this town. The others have changed use to apartments with weekly and monthly rates, or have been razed. Both are reactions to the economic influence the interstate has had on the area.

Photograph 1. Star Motel
Source: Photograph by the author
As described in the study area section of the paper, there are 41 motels in the survey. All motels were constructed between 1912 and 1977. Over half of the motels were built between 1941 and 1960. The opening of Interstate 65, built parallel to 31W, in segments from Louisville to Nashville in the late ‘50s and early ‘60s slowed development along the U.S. highway in favor of development at the interstate interchanges. Between 1961 and 1970, only four motels were built along 31W. The interstate was built parallel to 31W. Near Mammoth Cave, the Interstate was built between U.S. Highway 31W and the cave. Therefore, interstate traffic could completely miss the small towns.

Development had shifted to the road that links the town to the interstate, as well as along the road that links the national park to the interstate. At the northern end of the study area, some of the motels were built during and after the interstate construction. The Commonwealth Lodge (Photograph 3) was built at the northern end of the study area in
1963. The location is in Elizabethtown at I-65 interchange 91. The date of construction, 1963, is after the interstate was completed in the area. Of the eight motels at the interchange, four were built after the interstate was completed in 1959.

Photograph 3. Commonwealth Lodge
Source: Photograph by the author

Of the 41 motels in the survey, three have been completely torn down since spring of 1998, the beginning of the data collection process. Two that have been razed are Gray’s Motel (Photograph 4) located north of Horse Cave and McBroom Motel (Photograph 5) located in Warren County, north of Bowling Green. Gray’s Motel has been displaced by a tire business in a metal fabricated building. The lot on which McBroom Motel stood is now vacant. The possible location of the regional airpark in the Oakland area could determine the outcome of the McBroom corner lot. The third one that was demolished was the Pink Motel in Park City (Photograph 6). This motel was almost completely torn down at the beginning of the study. One part, toward the back of the motel, was left standing and was being used for what appeared to be storage space.
Since spring of 1998, the remains of the building have been torn down and removed. A new building has been erected toward the back of the lot. There is a garden toward the front of the lot. The Pink Motel is one of the locations along 31W with legendary stories of Elvis performing at or visiting the lounge (stories vary).

Photograph 4. Grays Motel
Source: Photograph by the author

Photograph 5. McBroom Motel
Source: Photograph by the author
Several other motels have gone through modifications. The Dutch Motel, south of Elizabethtown, was the only motel in the area with a carport attached to the front of the building (Photograph 7). At some point in 1999, the carport was detached from the building. It is a possibility that the carport was burned on the premises. This suspicion developed due to a large pile of burnt rubble toward the south end of the lot. At one time the Dutch Girl Motel had a public shower room and spaces for trailers to park. Campers would stay on the premises and use the showers. A previous owner said that at times the public showers and the trailer spaces were used by gypsies. The Hardin County fairgrounds are just south of this motel. It was probably frequented by people who set up or attended the fairgrounds.
The Mammoth Cave Hotel, located near the railroad right of way in Horse Cave, is the oldest accommodation structure in the survey (Photograph 8). Straight-line winds associated with a severe storm, which moved through the town in spring of 1998, tore part of the front porch roof away from the building. This structure is a town controversy, most of which can be blamed on the decline of the building. There has been no one living in it for quite sometime. Many people who love old architecture would like to see the building renovated and used for local government offices or even turned back into a hotel, apartments, or assisted living for adults. The large rooms and spacious hallways of the railroad hotels could make any of the options feasible. There are several people, however, who would like to see the place demolished and replaced by a park or any other structure, as long as it is not dilapidated (31W Bus Tour 1999).

Other modifications to buildings include basic remodeling such as new carpet and new paint. The owner of the Scottish Inns Motel (Photograph 9), Rita Kapur, spoke of other motels that she had owned and renovated, specifically, the Horse Cave Motel. At
the time of the interview, remodeling of the Scottish Inn Motel in Cave City was being completed and the building was to be reopened soon. She also spoke of plans to remove the dated sign and put up a modern one (Photograph 10).

One significant change is the absence of swimming pools on many of the properties (Photograph 11). Owners informed me that the insurance rates for the pools were too high for the amount of use the pools had. One owner informed me that the pool at his motel was filled in shortly after a car drove off the highway, through the pool gate, and into the pool. Fortunately, this mishap occurred at night and no one was injured. The owner implied that the driver may have been intoxicated, but he couldn’t confirm that with any hard evidence. That was when he informed me that he did not own the motel at that time.
Photograph 9. Scottish Inn Motel
Source: Photography by the author

Photograph 10. The dated sign of the Scottish Inns Motel.
Source: Photograph by the author
Cave City Budget Inn (Photograph 12), along with still having a pool on the premises, has the first tennis court, not only for Cave City but for all of Barren County as well.

The motels in the survey represent architectural styles of automobile-oriented businesses from the dawn of the automobile age. At that time, not very many people owned autos. Autos were first used recreationally by the elite who could afford cars. As automobile manufacturers began to increase production, the middle class began to purchase automobiles. As more automobiles were registered, and as roads improved for automobile travel, the owners of the motels that existed and the newly developed motels
competed for travelers. The sign in front of Cave Land Motel shows the many
amenities this motel offers (Photograph 13). At the time of the most current ownership
change, the new owners decided to stay with the 1950s motif when redecorating and
renovating the interior and the exterior of the motel. The owners are reaching out to the
nostalgia tourists.

The motels along U.S. Highway 31W are directed toward use by the travelers
along the road, rather than residents. Structures built for use by nonresidents are known
as other-directed architecture. The motels A landscape problem that occurs in many
areas of natural beauty is the development of what Edward Relph calls other-directed
places. The beauty of a place diminishes due to the impact of tourism on the place
(Relph 1976). The tourists flock to the attraction destination and use the area for awhile. The more visitors, the more facilities necessary to serve the visitors. Development occurs, and the beauty of a place, manmade or natural, is scrunched in from all sides until there is visual change in landscape between the attraction and the facilities for the tourists. This development pattern occurs outside many national parks. Instead of serving the needs of the citizens of the community, other-directed architecture serves the needs of the passers-by, the outside spectators, and the consumers (Relph 1976 p. 93, Relph’s source: Jackson 1970 pp.64-65). The I-65 interchange 53 is an example of other-directed architecture near the study area (Photograph 14 & 15).

![Photograph 14. Interstate 65 interchange #53. Source: Photograph by the author](image)

The most important aspect for a motel in determining whether a traveler stays at the accommodation is location. The motel must be located conveniently for the travelers to use on their trips. A motel that is out of the way and not well advertised will not get
many customers, even if the rates are lower than many others. Also, some people choose to pay more to be closer to the attraction. Motel owners can charge for the convenience of their location. Star Motel has a good location, as can be seen in Photograph 16.
If a person is looking for accommodations for a night without planning ahead, then appearance is very important to a traveler. A tourist may not stop at a motel that has chipped paint, algae in the swimming pool and broken glass in the parking lot. There are other significant factors that deter tourists. If there are no lights in the lot, or on the sign, and specifically if there is not a vacancy sign at all, then a person may be lead to believe that the motel has been turned into apartments that are rented by the week or by the month. A clean appearance is important in attracting the traveler that has not planned ahead to stop and stay. Horse Cave Motel advertises “super clean rooms” (Photograph 17).
Two of the three motels in the study area that are on the National Register of Historic Places are still standing, Wigwam Village #2 in Cave City and Horse Shoe Court in Warren County. The third one, McBroom Motel in Warren County, was demolished in 1999. Wigwam Village #2 (Photograph 2 & 18) was built in 1937. This establishment, which has individual rooms in wigwams and is situated in a half circle around a grassy area, still maintains business as a motel. The restaurant has closed, but a gift shop remains in the large wigwam at the front of the semicircle arrangement. The village is a Kentucky Landmark in addition to being on the National Register.
Horse Shoe Court (Photograph 19), north of Bowling Green in Warren County, was built between the years 1930 and 1935. The motor court is gothic revival architecture and started out as a 20th century motor court with four small cottages and a beer tavern. The front tavern/office has served many purposes, such as a filling station and a packaged liquor store. In 1957, the liquor store was converted to a gift shop when liquor sales were prohibited in Warren County. The motor court was shut down in 1982. Since then rooms have been rented as apartments (Johnston 1997).

McBroom Motel (Photograph 5), torn down in 1999, was part of a national register nomination called *Historic Resources along US 31W in Warren County, 1920-1965*, by Janet L. Johnston. The nomination lists automobile oriented businesses located along 31W. Other than motels, restaurants and filling stations are included on the list.
(Johnston 1997). It was from this overall inventory that Johnston found and promoted the individual listing of Horse Shoe Camp.

As for owners, throughout the study area similar owners names are associated with two or more motels. During the '40s and '50s, the motel building boom accelerated. At this time it was common for a construction company or realtor to buy property, build a business on it, then sell it as a new business. While researching PVA records and deeds, it was noticed that Earnest Gray built two motels. One was located on the north side of Horse Cave, Grays Motel (Photograph 4), and had been razed at some point since 1997. The other is located on the southern side of Horse Cave and was also called Grays Motel. It has been used as apartments since 1983 and is currently known as Shannon’s Apartments (Photograph 20).

All of the motels in the study area except one have changed ownership, some several times. The H-S Motel located in the northern half of the study area in the town of Bonnieville, Hart County, is still occupied by one of the original owners (Photograph 21).

Photograph 20. Shannon’s Apartments, formerly known as Gray’s Motel, was built by Earnest Gray. Source: Photograph by the author

Esther and Paul Srygler built the motel in 1951 and ran the business. Mr. Srygler willed the motel to his wife and daughter in 1967. The motel stayed in business until
1978, when it was changed to apartments. This motel is the only one in the study area in which all information was collected from the original owner.

Rita Kipur, present owner of the Scottish Inns Motel in Cave City, also owned the Horse Cave Motel in Horse Cave for three years. Her normal pattern of operation is as follows: she buys a motel, then renovates and rejuvenates the building and its atmosphere. The business is then reopened and established. After success, she sells the motel. The Horse Cave Motel was chosen to show trends in ownership.

Elements discussed in the descriptive analysis were architectural style, historical significance, unusual features, and trend in builders and ownership. Rather than discuss each element of every motel, the best examples were selected to represent each element.
4.3 Point Pattern Analysis

The point pattern analysis addresses the following questions: What was the point pattern of the motels along 31W prior to the construction of I-65? Once I-65 opened, did each of the motels along 31W remain open or close? Did the distance of the motel from the nearest interstate interchange or the nearest town center have any influence on whether or not the motel remained open or closed? Knowing what questions the study addresses, this section discusses some point pattern analyses used in similar roadside and business situations.

The cultural landscape of Toronto has large urban hotels concentrated in two areas, one is near the airport and the other is in the downtown area. A 1985 study, performed by Wall et al. used quadrat analysis, nearest neighbor analysis, and standard deviational ellipse to determine if the accommodations in Toronto were clustered, dispersed, or random. The categories used in the analyses were total accommodations, hotels, and motels. In 1965, 42.4% of all establishments were motels. By 1979, the number had decreased to 37%. One of the reasons stated for the decrease was the inability of the small motels to compete with the many amenities of the new, large hotels (Wall et al. 1985).

In 1983, Stephen Smith, from the University of Waterloo in Canada, performed point pattern analysis on restaurants in Canada “to investigate some of the possible factors influencing spatial variations in the number and location of restaurants and in the tendency of people to dine out.” On the macro-scale, he investigated national patterns of restaurant development using multiple regression. On the micro-scale, he
identified patterns of local site selection using nearest neighbor analysis. The micro-

scale study was performed in Kitchener and Waterloo, Ontario. The restaurants were
divided into categories: ice cream parlors, doughnut shops, pizza parlors, fast food
restaurants, restaurants located in hotels or motels, banquet facility restaurants,
neighborhood kitchens (also known as the local “greasy spoon”), and regular restaurants.

He performed nearest neighbor analysis on each different group of restaurants. The
threshold level was set at 1.0. A level less than one shows evidence of clustering, a level
equal to one shows it is random, and greater than one shows evidence of dispersion. All
but one group had a pattern that proved significantly lower than 1.0, which indicated a
clustered pattern. The category of restaurants with banquet facilities was the exception,
having shown evidence of a random pattern. In conclusion, Smith (1983) found that
location was an important factor for restaurant success. Other factors that have relative
importance to success are management, effective marketing, cost control, and menu
planning.

A 1975 article by Pinder and Witherick describes a nearest neighbor modification
for use in linear study regions. Patterns along a line are uni-dimensional and therefore
cannot use methods for a two-dimensional area. The formula for normal nearest neighbor
analysis was modified to find the average distance of a random distribution on a linear
study region. The modification had an outcome of random average by figuring “half the
mean distance that would separate the points if they were distributed with perfect
regularity throughout the entire line length” (Pinder and Witherick 1975, 17).
4.3.1 Nearest Neighbor Analysis

Nearest neighbor analysis is a way of determining spatial patterns in a study region. It is designed to find evidence of clustering, randomness, or dispersion patterns within an area. The point pattern of the motels located on 31W is analyzed by calculating nearest neighbor distance means (NND mean) for each year of the study: 1920, 1930, 1940, 1950, 1960, 1970 and 1980. The objective of nearest neighbor analysis is to determine if the point pattern is consistent with a random process or whether evidence of clustering or dispersion is present. Also called a Poisson process, a random process will have an outcome with points distributed randomly in the study area. Clustering and dispersion are two other outcomes of the point pattern.

The equation for nearest neighbor distance mean is displayed in Figure 7.

\[
\bar{NND} = \frac{\sum NND}{n}
\]

where: 
- \(n\) = number of points
- \(NND\) = nearest neighbor distance
- \(\sum\) = sum of

Figure 7. Nearest neighbor equation

Nearest neighbor analysis is traditionally performed to find point patterns in an areal study region, for example, part of a city, a whole town, or a county. In this case, the study area is a linear study region, in other words, a line with points arranged along either side of it. The absence of an area makes it difficult to determine the density. The value of the density of points is needed for the equations used to calculate the standard error for
perfectly random and for perfectly dispersed. Due to the inability to calculate the
standard errors, a simulation of a random process test is used to determine significance of
each measured nearest neighbor distance mean of the motels for each ten year period.

The simulation of a random process test is devised to accommodate the problem
of absence of density with the existence of a linear point pattern is performed using S-
Plus software. Significance of the nearest neighbor statistics was calculated by
simulating outcomes of a random point process along a line. A separate simulation was
carried out for each time period and associated number of motel points. In each case, the
actual nearest neighbor statistic was compared with 999 nearest neighbor statistics
generated under the null hypothesis that the locations of motels were random throughout
the linear study region. P-values are then found from the rank order of the actual nearest
neighbor statistic in the set of 1000 values. The actual nearest neighbor distance is then
inserted in its place among the 999 random numbers. The place where the actual nearest
neighbor distance mean fits into the ascending order is the p-value of that particular year.
If the actual value is in the smallest five percent of values, then the hypothesis of
randomness is rejected in favor of clustering. Likewise, if the actual value is in the
largest five percent of values, then the hypothesis is rejected in favor of dispersion. It
needs to be pointed out that the p-value in this case is used to show how strongly the
pattern is clustered or dispersed, or if the pattern is random, a point best illustrated by an
example. In Figure 8, the nearest neighbor distance mean for 1960 is 0.62 miles. That
number fell into the ascending order in the 7th place, and the p-value is 0.007. The null
hypothesis is rejected in favor of alternate hypothesis one. Given the alpha value is set at
0.050. The alpha value is used at both ends of the 999 numbers. Since the p-value fell within the first fifty numbers on the list (the low value end), then alternate hypothesis one (clustered) was accepted. If the p-value had fallen within the last fifty numbers on the list (the high value end), then alternate hypothesis two (dispersed) would have been accepted. If the number had fallen within the middle 900 numbers, then the null hypothesis (random) would have been accepted.

**SIMULATION TEST EXAMPLE**

1960

NND Mean=0.62 Miles

Generated numbers:

0.49  
0.55  
0.57  
0.58  
0.59  
0.60  
**0.62**  
0.63  
0.65  
0.66  
0.68  
0.69  
0.70  
0.72  

P-Value of .62 = 0.007

Figure 8. Simulation test example, 1960.  
Source: Author’s data
4.3.2 Contingency/chi-square analysis

After using NNA to establish point patterns over time, the patterns can be analyzed to determine the possible processes that created the patterns.

The next step in the methodology is to find out how the interstate affected the cultural landscape along 31W. Use of the motel establishments over time as regards distance from the nearest interstate interchange and the nearest town center will be studied. The two statistical tests will determine if there is any impact on the use of the structure as regards distances. Questions posed are: Are the establishments that are no longer functioning as a motel located in town or in a rural area? Does the interchange of the interstate influence the type of reuse, or non-use of the motel structure?

The first step is to determine the use of the motel structures over time. The temporal increments are 1975, 1980, 1985, 1990 and 1995. The interstate was constructed during the 1960s through the study area. The study divides the motel structures into motels and other uses. This division establishes the number of motel structures that are still used as motels and those that have a different use.

The other use category includes apartments, vacant structures, and retail shops. The criteria for the categories are based on the function of the building. A structure serving as a motel has an office with an attendant and rents rooms for the night. Some of these also rent by the week, but as long as a room can be rented for a night, then it is a motel. A structure serving as apartments usually has no person in the office; instead, there is a sign displayed in a window with a number to call. The category of vacant structures includes: dilapidated buildings; buildings that are not being used at all, but are
still intact for use; and buildings that no longer exist. A structure that the owner uses to produce an income in a way other than a motel or apartments falls into the retail shops category.

Measurements from the motel structure to the nearest interstate interchange and the nearest town center were taken (rounded to the nearest tenth) to determine the relationship between the use of the motel structure and the distances from a specific geographic location. The most direct route is used in the study. The distance of the motels from the interstate interchanges are divided into increments that represent the number of motels within each category. The two spatial increments are less than or equal to 1.5 and greater than or equal to 1.6 (Table 3). The increments for the distance to nearest town center are divided into less than or equal to 1.0 and greater than or equal to 1.1 (Table 4).

**CONTINGENCY TABLE: DISTANCE FROM INTERSTATE INTERCHANGE**
**MOTEL VS. OTHER USES**

<table>
<thead>
<tr>
<th>DISTANCE</th>
<th>MOTELS</th>
<th>OTHER USES</th>
<th>TOTALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1.5</td>
<td>14</td>
<td>7</td>
<td>21</td>
</tr>
<tr>
<td>≥1.6</td>
<td>12</td>
<td>7</td>
<td>19</td>
</tr>
<tr>
<td>TOTALS</td>
<td>26</td>
<td>14</td>
<td>40</td>
</tr>
</tbody>
</table>

Table 3. Distance from interstate interchange, 1980.
Source: Compiled by author.

**CONTINGENCY TABLE: DISTANCE FROM NEAREST TOWN CENTER**
**MOTEL VS. OTHER USES**

<table>
<thead>
<tr>
<th>DISTANCE</th>
<th>MOTELS</th>
<th>OTHER USES</th>
<th>TOTALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤1.0</td>
<td>14</td>
<td>9</td>
<td>23</td>
</tr>
<tr>
<td>≥1.1</td>
<td>13</td>
<td>4</td>
<td>17</td>
</tr>
<tr>
<td>TOTALS</td>
<td>27</td>
<td>13</td>
<td>40</td>
</tr>
</tbody>
</table>

Table 4. Distance from nearest town center, 1980.
Source: Compiled by author.
The contingency table is divided differently for each study due to the minimum requirement of frequency counts in each category. "No more than one-fifth of the expected frequencies should be less than five and none less than two" (McGrew & Monroe 1993, 203). The distance to nearest interstate interchange did not have a high enough count in one of the categories. The distance was lengthened to increase the frequency count to an acceptable level.

Chi-square analysis will be applied to the data in the contingency tables. The chi-square equation uses actual frequencies and expected frequencies to determine if there is a dependent relationship between the variables (Figure 9).

The alpha value is set at 0.05. A statistical table of percentage points of the chi-square distribution is used to measure the chi-square values for each year. Using the chi-square table with an alpha value of 0.05, the chi-square value needs to be greater than or equal to 3.84 to be significant (Mendenhall et al., 1990).

\[ X^2 = \sum_{i=1}^{r} \sum_{j=1}^{k} \frac{(O_{ij} - E_{ij})^2}{E_{ij}} \]

where: \( O_{ij} = \) observed frequency count in the \( i^{th} \) row and \( j^{th} \) column
\( E_{ij} = \) expected frequency count in the \( i^{th} \) row and \( j^{th} \) column
\( r = \) number of rows in the contingency table
\( k = \) number of columns in the contingency table

Figure 9. Chi-square equation
Source: McGrew & Monroe 1993
Chapter V

Results

The results of the analyses will begin with the nearest neighbor analysis. The hypotheses will be restated followed by the results in Table 5. The two contingency/chi-square analyses will be presented in the same order.

5.1 Nearest neighbor analysis

Nearest Neighbor Analysis

\( \text{H}_0 \): The point pattern is random.

\( \text{H}_{A1} \): The point pattern is more clustered than random.

\( \text{H}_{A2} \): The point pattern is more dispersed than random.

Table 5. Results of nearest neighbor analysis

<table>
<thead>
<tr>
<th>YEAR</th>
<th>NND MEAN</th>
<th>P-VALUE CLUSTERING</th>
<th>P-VALUE DISPERSED</th>
<th>HYPOTHESIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1920</td>
<td>3.72</td>
<td>.046</td>
<td>.954</td>
<td>( \text{H}_{A1} )</td>
</tr>
<tr>
<td>1930</td>
<td>3.27</td>
<td>.124</td>
<td>.876</td>
<td>( \text{H}_0 )</td>
</tr>
<tr>
<td>1940</td>
<td>2.32</td>
<td>.187</td>
<td>.813</td>
<td>( \text{H}_0 )</td>
</tr>
<tr>
<td>1950</td>
<td>.91</td>
<td>.010</td>
<td>.990</td>
<td>( \text{H}_{A1} )</td>
</tr>
<tr>
<td>1960</td>
<td>.62</td>
<td>.007</td>
<td>.993</td>
<td>( \text{H}_{A1} )</td>
</tr>
<tr>
<td>1970</td>
<td>.72</td>
<td>.095</td>
<td>.905</td>
<td>( \text{H}_0 )</td>
</tr>
<tr>
<td>1980</td>
<td>.68</td>
<td>.075</td>
<td>.925</td>
<td>( \text{H}_0 )</td>
</tr>
</tbody>
</table>

Dispersed p-value set at the tenth number in descending order.
Clustering p-value set at the tenth number in ascending order.
Source: Compiled by author from collected data

Of the seven years in the study, the NNA yielded three years in which the results were at significant levels to reject the null hypothesis in favor of alternate hypothesis one. The other four years accepted the null hypothesis.
5.2 Contingency/chi-square

The contingency/chi-square analysis was performed twice: once as it applied to
distance from the nearest interstate interchange, then as it applied to distance from the
nearest town center. The results are shown in Tables 6 & 7.

\( H_0: \) Use of motel structure is independent of distance from the
interstate.

\( H_A: \) Use of motel structure is dependent on distance from the interstate.

<table>
<thead>
<tr>
<th>Year</th>
<th>Chi-Square Value</th>
<th>Chi Table Value ( \chi^2 = 0.05 )</th>
<th>Hypothesis Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975</td>
<td>.0836</td>
<td>3.84146</td>
<td>Fail to reject ( H_0 )</td>
</tr>
<tr>
<td>1980</td>
<td>.0540</td>
<td>3.84146</td>
<td>Fail to reject ( H_0 )</td>
</tr>
<tr>
<td>1985</td>
<td>.0820</td>
<td>3.84146</td>
<td>Fail to reject ( H_0 )</td>
</tr>
<tr>
<td>1990</td>
<td>.3819</td>
<td>3.84146</td>
<td>Fail to reject ( H_0 )</td>
</tr>
<tr>
<td>1995</td>
<td>.15605</td>
<td>3.84146</td>
<td>Fail to reject ( H_0 )</td>
</tr>
</tbody>
</table>

Source: Compiled by author from collected data.

Contingency analysis hypotheses, as they apply to distance from the nearest town
center:

\( H_0: \) Use of motel structure is independent of distance from the nearest
town center.

\( H_A: \) Use of motel structure is dependent on distance from the nearest
town center.

Neither of the studies found significant evidence to favor the alternate hypothesis
over the null in any of the years used.
Table 7. Results of contingency/chi-square analysis: distance to nearest town center.

<table>
<thead>
<tr>
<th>Year</th>
<th>Chi-Square Value</th>
<th>Chi Table Value $\chi^2=0.05$</th>
<th>Hypothesis Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975</td>
<td>0.0038</td>
<td>3.84146</td>
<td>Fail to reject $H_0$</td>
</tr>
<tr>
<td>1980</td>
<td>1.0842</td>
<td>3.84146</td>
<td>Fail to reject $H_0$</td>
</tr>
<tr>
<td>1985</td>
<td>0.0506</td>
<td>3.84146</td>
<td>Fail to reject $H_0$</td>
</tr>
<tr>
<td>1990</td>
<td>0.0022</td>
<td>3.84146</td>
<td>Fail to reject $H_0$</td>
</tr>
<tr>
<td>1995</td>
<td>0.017</td>
<td>3.84146</td>
<td>Fail to reject $H_0$</td>
</tr>
</tbody>
</table>

Source: Compiled by author from collected data.
6 Discussion

The nearest neighbor and the contingency/chi-square analysis will be presented first. The information gathered from the beginning of this section will be used to address the research question.

Research Question: How has the commercial landscape evolved along 31W and what impact did the development of I-65 have on the process?

6.1 Nearest Neighbor Analysis

Nearest Neighbor Analysis

\( H_0: \) The point pattern is random.

\( H_{A1}: \) The point pattern is more clustered than random.

\( H_{A2}: \) The point pattern is more dispersed than random.

The NNA was performed with ten year intervals starting with 1920 and ending in 1980. The null hypothesis, which states that the point pattern is random, was accepted in the study years 1930, 1940, 1970 and 1980. The years 1920, 1950 and 1960 had significant evidence to reject the null hypothesis in favor of alternate hypothesis one (\( H_{A1} \)), in which the point pattern is more clustered than random. Of the three in favor of alternate hypothesis one, two were grouped together, 1950 and 1960. Both years showed very strong indications of clustering. The latter, the example used earlier, 1960, had the strongest clustering value, 0.007. The former, 1950, had a value of 0.010, which is also strong evidence of a clustering pattern. The significance level was set at 0.05. The year 1920 had a clustering value of 0.046; this value is just within the significance level.
There are gradations when setting the significance level. Remember, the values show how strongly the pattern is clustered with more precision than significance tables. The precision is due to using the data from this study to determine significance, rather than a significance table made with numbers from outside the study.

Results from the NNA show patterns of businesses related to transportation and how change in transportation affects the cultural landscape. At the beginning of the century, the motels were clustered. There were only three motels in the study region in 1920, one in Horse Cave and two in Park City; therefore, the pattern was clustered. All three were located near the railroad and were used by rail travelers in the early part of the twentieth century. Later, they were used by automobile drivers on the new U.S. Highway 31W, constructed in 1936.

In the year 1930, four of the seven motels had a NND of 0.2 or 0.1. There was also one NND of 15.1 miles. The 15.1 miles was high enough to overcome the battle for the null hypothesis. Six of the seven motels were located in the southern half of the study area between Horse Cave and Park City. This clustering is evidence of the influence that Mammoth Cave National Park creates on the study area. By 1940 there were twelve motels that were distributed in a random pattern. Half of the motels had a NND of less than 0.05 miles; the other six were 2.8 miles or higher. The highest NND in this year was 7.2 miles.

The years 1950 and 1960 both favor alternate hypothesis one. There were 21 motels in 1950, and 11 of them had a NND of 0.05 or less. The highest NND was 6.3 miles. The point pattern for 1950 is strongly clustered. Fifteen motels were added to the
cultural landscape of the study region between the years 1950 and 1960. The strongest clustered point pattern, 1960, had 36 motel points. Twenty-five of the points had a NND value of 0.5 miles or less. The p-value clustering for 1960 is 0.007; this year showed the strongest evidence of clustering in the nearest neighbor analysis. The most construction of the whole study period was performed in this time frame. The decade before, there was an increase of nine motels. The building boom between 1940 and 1960 may account for the clustering pattern during those years.

The last two years of the study, 1970 and 1980, both accepted the null hypothesis. There were 40 motels in 1970. In 1980, there was an increase of only one. There is not enough evidence during these years to support either of the alternate hypotheses. The slowing of development and building on the U.S. Highway in favor of building by the new interstate interchanges is one reason for the low increase in the number of motels added to the study area.

Mammoth Cave and other underground attractions in the area influenced the development of motels in Horse Cave, Cave City and Park City. The first motels in Horse Cave and Park City served railroad travelers. Each motel was positioned close to the station, but en route to Mammoth Cave. Mammoth Cave was rediscovered in 1791 and organized tours have been given since the 1820s or earlier (Glennon 1999).

Many motels were located across the street from each other, next door to each other, or on the same intersection. This spatial crowding is likely due to the increase in motels in the forties and fifties. Property that was large enough to accommodate a motel was available at the edge of town. Motel buildings take more space than a restaurant or a
gas station. Therefore, the builders took the available larger lots located closest to
downtown or closest to intersections. Transportation and infrastructure development has
changed the dynamics of the towns. The motel structures are no longer located on the
outskirts. Business buildings have been constructed in other areas.

By finding point patterns, this study shows how transportation infrastructure
improvements change the cultural landscape. Roadside accommodations along 31W are
clustered in areas for each year in the study, but there are other motels separated by far
distances, which sometimes make the outcome appear random. Learning the effects of
transportation on the cultural landscape will help to better plan new transportation
infrastructure in the future. Determining the clustering and random patterns of an
automobile-related type of business on the U.S. Highway can aid decisions in the future.
Looking at different types of businesses along transportation routes over time will
determine general patterns of use of land throughout the landscape. If it is learned that
certain structures built for different uses are not used for prolonged periods of time, then
new uses for the land can be planned accordingly. If the average length of life of a
certain type of structure that dominates an area is known, then as the area declines, a new
use for the area can be planned. If possible future outcomes are considered more readily
at present, then this foresight could decrease the amount of pollution, paperwork,
controversy, and decision making in future planning. Studying and finding patterns of
auto-related businesses that rely on traffic from a transportation route will better enable
planning of future infrastructure development. In general, traffic patterns follow new
transportation infrastructure. The opening of a new, wider, and easily accessible route
will attract travelers. As people use the new route, business declines on the older route. Many businesses opt to move to a location on the new road. Learning the effects of this pattern on the cultural landscape will help in making decisions in the future regarding: planning of new transportation, people displacement, historic preservation and building and zoning codes. Decisions will be made in the future about the buildings we live and work in today. Developing zoning codes, planning transportation and land use are all decision processes that will benefit from having learned the patterns that have occurred over the past hundred years, since the beginning of the automobile era.

6.2 Contingency/Chi-Square Analysis

The chi-square statistic tests the contingency table as a whole entity. The resulting statistic lets us know if the variables are dependent on each other or independent of each other. The resulting chi-square statistic will be a relatively small number if the null hypothesis is true. The hypotheses for the two studies are:

Contingency analysis hypotheses, as they apply to distance from the interstate:

\[ H_0: \] Use of motel structure is independent of distance from the interstate.

\[ H_A: \] Use of motel structure is dependent on distance from the interstate.

Contingency analysis hypotheses, as they apply to distance from the nearest town center:

\[ H_0: \] Use of motel structure is independent of distance from the nearest town center.
\( H_A: \) Use of motel structure is dependent on distance from the nearest town center.

Location of the motel in this study is the distance from the nearest town center or distance from the nearest interstate interchange. The first statistical test was meant to determine whether the distance from the nearest interstate interchange influenced the use of the motel structure. As new hotels were built at the interstate interchanges, people would stay in them as opposed to driving farther to the old motels located along the U.S. highways. The distance to nearest town center was also studied to see if the towns had any influence on the surrounding areas.

The studies were performed to determine if there is a pattern to the demise of the automobile oriented commercial landscape along the U.S. highway in the study area. Old storefronts have changed use or are not being used at all. The buildings that stand empty are often left to rot and fall apart on their own. Complaints begin to flow in to the local government and eventually condemnation is sought. If the commercial landscape was to show a pattern (over time) as to which areas were to decline, then communities could plan ahead for reuse of areas with historic significance. Or in some cases, communities could plan for demolition and redevelopment of areas.

The results of the contingency/chi-square analysis regarding motel use within distance of the nearest interstate interchange had outcomes of chi-square values that were less than the value on the chi table (3.84), thus favoring the null hypothesis; the probability of a motel changing function is independent of its location.
The results of the contingency/chi-square analysis did not show significant evidence to accept the alternate hypothesis over the null for any of the years in either study. The research showed that use of the motel structure was dependent on neither distance to the nearest interstate interchange nor distance to the nearest town center. The results could be influenced by the location of Mammoth Cave National Park. The close proximity of the park to three towns in the study area could have influenced motels in the area to stay open.

Some of the questions posed previously in the paper are: Are the establishments that are no longer functioning as a motel located in town or in a rural area? Does the interchange of the interstate influence the type of reuse, or nonuse of the motel structure? Studying the use of the motel structure with regard to distance from the nearest town center indicated whether or not the motels in the rural areas were changing use to apartments or nonuse as opposed to the motel structures closer to the town center. While collecting data for the NNA, one significant factor that influenced how the study was set up was that the date of the last motel constructed in the study region was in the 1980s. Even though the contingency chi-square analysis did not show significant results regarding the changing use of the structures along 31W with relation to distance from the interstate, the fact that no new motels have been built along the route in the past twenty years does show that the interstate has influenced the traffic patterns to some degree.
6.3 **Addressing the research question**

The results of the nearest neighbor analysis and the contingency/chi-square analysis are used to address the following research question:

How has the commercial landscape of motels evolved along 31W and what impact did the development of I-65 have on the process?

The nearest neighbor analysis was performed to find the pattern of motels along the U.S. highway before, during and after the interstate was constructed. There is evidence of clustering three out of the seven study years. The four other years did not have significant enough evidence to favor either of the alternate hypotheses.

The results of the contingency/chi-square analysis had no significant evidence to support the alternate hypotheses of dependency. The chi-square results showed no significant correlation of use of motel structures in relation to distance from the interstate interchange. To many observers, the correlation seems to be evident as they drive down the U.S. highways and see the commercial landscape of the motels. Their eyes may focus on the downtrodden buildings, rather than the viable businesses that are housed in other buildings.

The second chi-square study, distance from nearest town center, did not result in significant evidence to accept the alternate hypothesis of dependency. The results do not indicate that motels located in the country tend to change uses, whereas the motels in the town centers tend to stay in business as motels. This finding could mean that either motels in both urban and rural area changed their uses, or that motels in both areas continued to be used as motels.
This study is based on the idea that the change in use of structure (no longer used as a motel) would indicate that the spatial effect of the traffic flow had changed the landscape. Mammoth Cave National Park, a major international tourist attraction, being close to a section of the study region, could have influenced motels in the area to stay in business as motels to meet the needs of the tourist industry in the Horse Cave and Cave City area.

Throughout the rest of the study area, the changes in building use were visually apparent, as well as evident in the data collection process. Many of the motels on 31W did change use. After the interstate was constructed, businesses began to congregate at the interchanges. At most of the interchanges, motels and hotels have been added to the landscape, as well as restaurants and filling stations. There are some interchanges that do not have any businesses, and there are some interchanges that have only one or two businesses. There are many that have multiple businesses. The multiple businesses cater to both the travelers along the interstate and the residents of the town located at the interchange. The types of businesses that cater to both are restaurants and gas stations and convenience stores. The motels built near the interstate cater to travelers and occasionally to the local residents. Some of the connecting roads between 31W towns and the interstate are built up with new development as well. Interstate interchange number 91 is an example of this type of movement as can be seen in Map 4.
If patterns in the change of the landscape are found, then they will help motivate people to plan for the long term rather than just their own lifetime. Planners need to realize that the human race is on the move, and that the roads and businesses that are being used are going to change. Something to consider is not only what can go where, but the reuse or demolition of unused roads and buildings. An empty building will be subjected to the following question. How badly damaged or in disrepair does it need to be before the local government condemns it? This idea treads on the property owners rights. An empty building that has regular upkeep and repair is deemed okay by most people. An empty building that is left to decay will eventually earn a reputation as an
eyesore. If the eyesore has character, it may even become a point of argument over whether it should stay up or be torn down, as in the case of the Mammoth Cave Hotel in Horse Cave.

While this study focused on the I-65/U.S. 31W conflict, this situation is one that is not uncommon across the United States. The two lane U.S. Highway versus the four lane Interstate is not isolated to this one study. Many of the interstates in the United States were developed alongside the routes of the U.S. Highways. An example of this same situation is I-40 and U.S. Hwy 70 in Tennessee. Interstate 40 crosses over U.S. 70 several times across the state. Another example is in the state of Florida. U.S. Highway 19 and Interstate 75 run nearly parallel north/south along the gulf side of Florida. In this case, U.S. Hwy 19 is much more developed than U.S. 31W in Kentucky. U.S. 19 is much closer to the shoreline than is I-75. It would be interesting to do a similar study in this area using a contingency/chi-square analysis with the categories: distance from the interstate, distance from the nearest town center, and distance from the gulf shore.

There are two areas in the study that have few or no motels. One is from the south side of Elizabethtown to Bonnieville, a distance of about 20 miles. Between these two towns, there were only two motels, spaced relatively far apart. There are only two motels in Bonnieville, both of which no longer function as motels. The H-S Motel is now rental units, and the declining Jaggers Motel is vacant. Traveling south from Bonnieville, there are progressively more and more motels until they peak in Cave City. From there, the numbers decline until just south of Park City, the beginning of the other area with few or no motels.
There is only one motel in Edmonson County, The Park Mammoth located just south of Park City. From there traveling south there are no motels until the northern part of 31W in Warren County, where there are three motels. This distance is about 31 miles. These two areas have nearest neighbor distance which are longer than in other parts of the study region. These areas could be considered the non-clustering areas of the study region.

The high number of motels in Elizabethtown and the amenities provided by the larger cities located at the ends of the study area drew tourists to the cities. People began to rely on city areas for places to stay, gas and restaurants. The amenities of the country motels could not compete with the choices available for tourists in the cities. Tourists began to travel to destinations, rather than just to get away from it all. This change occurred along with the increase in motel franchises. The reliability of motel chains to be located in towns along the U.S. highways increased the number of people frequenting those motels.

To the other extreme are the clustered areas of the study. One area that specifically stands out is the Mammoth Cave area. Mammoth Cave National Park could have created enough noise in the study area to affect the outcome of both the nearest neighbor distance study and the contingency/chi-square analysis. The cave, being an international tourist attraction, has many visitors every year. These visitors support the motels in the Cave City and Horse Cave area. Each year Mammoth Cave National Park has a large number of visitors who need a place to stay while they are visiting the cave. The motels around the Mammoth Cave area receive enough tourists as guests to keep the
motels open for business. Mammoth Cave is an example of a destination attraction; people travel specifically to visit the cave. Because the cave is an even 56 degrees Fahrenheit in every season, people visit the cave in the winter as well as in the summer, although summer is the busier time for the cave.

Although the busiest, Mammoth Cave is only one of the attractions in the southern part of the study area. There are other commercial caves in the area, including Hidden River in Horse Cave, Crystal Onyx Cave, and Lost River Cave in Bowling Green. Other interesting sites include the Corvette Museum, Kentucky Down Under, and Horse Cave Theater. The large number of attractions in the southern end of the study area could create enough noise to change the motel patterns.

There are several different views of historic preservation. Some believe that all historic buildings should be saved. Others believe that some significant structures should be saved, but not all of them. It is not practical to save every building, for several reasons. For one, not all buildings lend themselves to practical reuse. For example, a building that was made to be a motel with a separate outside entrance for each room would not be practical for reuse as an office building with several people sharing the same secretary. In the winter, the secretary would have to put on his/her coat every time he/she was called to a different office. There are some practical reuses of motels, such as apartments, farmers markets, or specialty boutiques, but do we need to save all of them?

Another reason for not saving every building is that there are times when a new need, such as a justice center, makes it necessary to demolish several buildings for space for the new need. A need may arise, such as a fine arts facility, which may have a
positive economic impact on a declining area, but location can become an issue if a declining area is targeted for demolition. In a case like this, the reasonable thought to keep in mind is that to sacrifice a few will bring good to those remaining. For example, if a whole block of buildings are demolished for a fine arts facility, then the surrounding area may see improvement due to investments in the area for uses that support the fine arts facility. The first floors of houses and buildings in the surrounding area may be turned into shops, restaurants, boutiques and art galleries, and the upper floors could become apartments.

Finally, new technology improves our standard of living. Steel frames, for example, may withstand severe weather over a longer period of time as opposed to stick frames. Also, faulty wiring and eroded pipes may cause severe structural damage to older buildings.

Communities can plan for the decline of areas by looking for patterns in the commercial landscape. In the planning, the community can decide which buildings are worth saving, how many of the same types of buildings to save, and which ones render demolition. In the planning of saving historic buildings it is important to consider the impact of natural disasters such as fire, tornadoes, earthquakes and such. It is prudent to save several of each type of architecture and/or building function due to unexpected losses.

Another advantage of knowing the patterns of decline has to do with transportation planning. As new transportation is added to the infrastructure, the route is then used. A blatant example of this usage is the interstate system. After the interstate
was constructed, towns grew toward the interstates. Knowing of this possibility, planning for decline of areas and transportation planning can go hand in hand. If an area is declining, it may be useful to build a new road or implement a public transportation system in the area. People would be encouraged to move to or utilize shopping in these areas, which would have a positive economic impact on the area.

If the decline of commercial areas in the cultural landscape was known before it actually happened, then the communities could tackle the problem ahead of time, rather than after the fact. Planning could become proactive rather than reactive. Not all historic preservationists work for the government. Many people consider themselves to be preservationists because they appreciate old buildings and historic sites. Reactive preservationists often see a declining historic building on their way to work. They may say to themselves, “I wish someone would do something with that building, it’s a shame that it is falling apart.” After several weeks, months or years go by, the preservationist drives by and the building is no longer there. Well, someone finally did do something with that building. It is at this point that the preservationists react by calling the local government and issuing complaints about the demolition of one of their favorite old buildings. A proactive preservationist would call the local government at the first sign of decline and issue a complaint. Then code enforcement could intervene and possibly prevent the further decline of the building. Another approach would be to think of a good reuse for the building then act on it.

The landscape is more than motels; it includes the restaurants, gas stations, homes, stores, vehicles, roads, and everything in between. The natural environment is an
important factor of the landscape. It is the base for which all other parts of the landscape is built upon. When driving down the road and looking at the landscape, think about all of the previous uses of the buildings along the side of the road. Take note of any abandoned buildings. Do they look shabby? Do you think they are eyesores?

6.4 Future Research Recommendations

There are several issues that could be changed for the better if the study were performed over again. Some of these have been mentioned earlier in the text. The first item that comes to my mind is using a random sample of a larger study area. Using the entire length of a U.S. highway could change the outcome, possibly 31W from the Great Lakes all the way to the Gulf Coast of Florida. An area double in size of the original study would also be good. It would be interesting to see how major cities the size of Louisville and Nashville would affect the study area, as well as Indianapolis. It is likely that evidence of clustering would be strong because of the cities. The loss of many of the motels in the larger cities due to redevelopment would make it difficult to locate the motels that no longer exist. The use of city directories would be invaluable in those situations. The advantage of city areas is the use of city directories, which show the land use of lots within the city for different years. Rural directories would have been very helpful in the study. Alas, these do not exist for the area used in the present study.

Interstate 75 and U.S. Highway 19 in Florida would be an excellent area to do a similar study, as was mentioned earlier in the paper. Items to be measured would be
motel structure: distance to the gulf coast, distance to the nearest interstate interchange, and distance to nearest motel located at an interstate interchange.

Another interesting study that could be performed in South Central Kentucky’s cave and karst area is the use of the caves or cave attractions. Similar to the study of land use of motel structures, distance from the cave attractions could be measured to: nearest interstate interchange, nearest motel, nearest U.S. highway and nearest town center. The major point of interest here is that the cave attractions are not mobile. They have to stay with the cave. Another issue to consider in this study is whether to look at present conditions or changes over time.

A use of the data gathered for the study could be to make an interactive web page using GIS. The web page could include the data describing each motel, such as, the date of construction, the different uses of the building over time, the different names of the motels and businesses lodged in the motel structure, the type of architecture, major changes to the building over time, the number of rooms in the motel, as well as the distance from the nearest town center or distance from the nearest interstate interchange. Telephone numbers could also be included for the structures that are still functioning as motels.

With the increased attention being put on 31W and 31E due to the heritage corridor movement, a website of this type could be expanded to include other significant sites. Also, other websites could be attached for further education about specific sites in the study area. Education regarding planning and decision-making processes could also be included.
References


Gousha H. M., Co. n.d. Map of Dixie Highway (prior to the interstate).


Kentucky Department of Transportation. 1934. *Kentucky Department of Transportation Clerical Book*. Frankfort, KY: KDT.


U.S. 31W Bus Tour. 1999. Louisville to Franklin, KY. Debby Spencer, West Kentucky Corporation, Coordinator,. June 23 & 24


http://www.tfhrc.gov/pubrds/summer96/p96su10.htm
Appendix A

Time Line

1790  Mammoth Cave rediscovered by a European descendant.
c. 1801  Old Munford Inn built in Munfordville, KY.
1816  Mammoth Cave utilized as a private commercial tourist attraction.
1840s  L & N Turnpike was built.
1861-1865  American Civil War dominates usage of L & N Turnpike.
1886  Mammoth Cave Railroad opened. The 8.7 mile long track was laid
between Park City and Mammoth Cave.
1895  About 300 imported motor vehicles in the US.
1899  About 2,000 cars in the U.S., domestic and imports.
1901  First tourist court built in U.S. called Askin's Tourist Court located in
Douglas, AZ.
1908  About 20,000 cars in the U.S., domestic and imports.
1910  The Lincoln Highway Association was formed.
1911  The first road in the U.S. to be constructed specifically for automobiles,
the Long Island Motor Parkway, is completed.
1912  State highway commission is formed in Kentucky.
1912  Electric self-start was introduced by Cadillac.
1912  Mammoth Cave Hotel, Horse Cave, KY, the oldest roadside
accommodation in the study, is built.
c.1912  Closed car introduced to the market.
1914  More automobiles produced than carriages.
1914  A free camp house opened in Delevan, KS.
1916  2,000,000 automobiles in the U.S.
1916  State highway departments were to be established with the passing of the
      Federal Highway Act of 1916 (also called the Post Roads Act).
1916  L & N Turnpike is improved and renamed the Dixie Hwy.
1917  Roy Chapin appointed head of Highway Transport Committee by the
      Council of National Defense. Trucks were used to move military
      materials.
1920  State legislation requiring automobile registration.
1920  Street widening and one-way streets replaced carriage avenues to
      accommodate the larger automobile.
1920  Free municipal campgrounds are established in some downtown areas.
1920  1,000 cabin camps in the U.S.
1921  1921 Highway Act passed: federal aid to states for road improvements
      and developments.
1922  First year the closed car (closed sedan) took the majority of sales over the
      open roadster.
1923  KY started a wide-scale effort to connect all the county seats.
1923  Free municipal campgrounds begin to charge fees to cover costs.
1925  Cabins begin to be added to more camps.
1926  2,000 cabin camps in the U.S.
1927  KY designated 3,700 miles of surfaced roads as part of the U.S. system,
      including the Dixie Highway.
c. 1930s Parkways were built in different areas of the country, usually near large cities.

1931 Mammoth Cave Railroad closed due to discontinued use and monetary losses.

1932 The highway department began numbering roads.

\[
\text{Dixie Hwy \& Old L \& N Turnpike} = \text{US Hwy 31W}
\]

1934 Drivers licenses were first required in Kentucky.

1936 Newly constructed U.S. Hwy 31-W is completed and is still used at present.

c. 1940s Many motor courts begin to appear on the landscape.

1941 Mammoth Cave designated a national park.

1947 Mean date of construction of motels in study area.

1949 Bureau of Public Roads reorganized under the name Department of Transportation.

c. 1950s The Kentucky Turnpike Authority was formed and the construction of the turnpike from Louisville to Elizabethtown began.

c. 1950s Motor inns begin to show up on the landscape.

1956 Opening date of the Kentucky Turnpike between Louisville and Elizabethtown.

1956 1956 Highway Act: a federal plan to create a two lane, limited-access highway system which included around 41,000 miles of road known as the Interstate Highway System.

c. 1960s Increase in franchise chains in the motel industry.
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<td>c. 1960s</td>
<td>Interstate 65 is being constructed in Kentucky.</td>
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<td>1962</td>
<td>Less than two percent of motel establishments affiliated with lodging chains.</td>
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<td>c. 1970s</td>
<td>Highway hotels begin to show up on landscape.</td>
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<td>1972</td>
<td>Scheduled completion of the Interstate Highway System.</td>
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<td>1977</td>
<td>Star Motel, Cave City, KY, the newest motel in the study area is built.</td>
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<td>1981</td>
<td>Mammoth Cave National Park designated as a World Heritage Site.</td>
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<td>1987</td>
<td>Sixty-four percent of motels established are affiliated with lodging chains.</td>
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<td>1990</td>
<td>Mammoth Cave National Park designated as an International Biosphere Reserve.</td>
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<td>1996</td>
<td>South Carolina's Heritage Corridor is initiated.</td>
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Appendix B
Appendix B

Motels in Study Area by County with Dates of Construction

**Hardin County**

Best Western Cardinal Inn 1955
Roadside Inn 1950
Bluegrass Inn  c. 1959
Commonwealth Lodge 1963
Budget Holiday Motel 1959
Heritage Inn 1951
Shady Grove  c. 1947
Dutch Girl 1950

**Larue County**

Sullivan's Motel  c. 1962

**Hart County**

H-S Motel 1951
OK Court  c. 1957
Jaggers Motor Court c. 1930
Supreme Truck Stop c. 1954
Village Inn 1968
Hart Motel 1947
Hotel-Cann Apartments 1933
Grays Motel c. 1956
Mammoth Cave Inn 1912
Horse Cave Motel c. 1957
Blue Grass Motel c. 1948
Shannons Apartments c. 1950

**Barren County**

Twin City Motel c. 1950
Wigwam Village #2 1937
Cave Land Motel 1951
Scottish Inns Motel 1957
Hunt’s Storage Units c. 1928
Cave City Budget Inn c. 1947
Village Inn Apartments c. 1930
Holiday Motel c. 1946
No name – flea market 1959
Star Motel 1977
Valley Camp Motel 1928
Arrowhead Apartments c. 1940
The Pink Motel c. 1946
Red Shutters c. 1915
Parkland Motel 1958
Park City Manor Cottages c. 1919
Edmonson County

Park Mammoth Resort 1964

Warren County

Horse Shoe Court 1935
McBroom Motel 1948
KY Derby Tourist Court c. 1938
Appendix C
Motel/Hotel Questionnaire
I-65/US 31W/RR

1. Name of establishment
2. Address of establishment
3. Business Telephone
4. Date of Construction
5. Original function of the building
6. History of the building:
   Year of remodeling
   Additions
   Renovations
7. Names of former businesses that occupied the building
8. Is there or has there ever been a restaurant on the premises? Or right next door? Include the names and years occupied.
9. Is there or has there ever been a bar on the premises?
10. Present use of the building
11. Acreage of the property
12. Number of rooms
13. Square footage of building
14. Number of parking places
15. Public space
16. Does this property have any historical recognition, for example Kentucky Landmark, local landmark, or listed on the National Register of Historic Places? Include date recognition gained.
Motel/Hotel Questionnaire
Owner Information

17. Present owner’s name

18. Owner’s address

19. Owner’s telephone number

20. Owner’s e-mail address

21. PVA map number

22. Deed book/page number

23. Name and address of previous owner(s)

24. Name of contact, address, and telephone number (if other than owner)
Motel/Hotel Questionnaire
Location Information

25. Quad map used

26. Latitude

27. Longitude

28. County

Extra Information

29. Architectural style

30. Special features

31. Photographs

32. Dates of research
Appendix D
### Table F  \( p \)-values for \( \chi^2 \)

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