

A stylized map of Madison County, Kentucky, with a green path winding through it. The map is black with a white outline, and the path is a gradient of green. The title text is overlaid on the map.

# Madison County Bikeways and Greenways Plan

**Eastern Kentucky University**  
**Department of Geography**  
GEO 325: Environmental Land Use Planning  
*Service Learning Project*  
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EKU “Land Use and Environmental Planning” Service Learning Project

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## Table of Contents

Executive Summary .....	1
Background.....	2
Madison County .....	2
Historic Features .....	2
Purpose and Need .....	4
Environmental Need .....	4
Human Need.....	4
Mission and Vision Statement.....	5
Identification of Issues and Concerns .....	6
Background Research .....	6
Walking Assessment.....	6
Rails to Trails.....	7
Muddy Creek Watershed .....	9
Lexington-Fayette Urban County Government .....	10
Other Trail and Greenway Plans.....	11
Benefits of Trails .....	12
Maps and GIS .....	13
Roadway Assessment.....	14
Public Involvement.....	16
Community Survey Development .....	16
Stakeholder Identification.....	16
Stakeholder and Public Meetings .....	16
Recommendations .....	20
Next Steps and Further Study .....	22
Individual Student Research .....	23
Impact of Bike/Pedestrian Trails on Global Warming.....	23
Estill County Bike and Greenway Plan.....	24
American vs. European Model of Bike/Pedestrian Trails.....	25
Richmond Zoo Feasibility Study .....	25
Groundtruthing the National Land Cover Database .....	25
Incorporation of a “Share the Road” Program in Madison County.....	26
Repurposing Richmond for Sustainability.....	27
Requirements for a Road Race in Madison County.....	27
ADA Accessibility in Richmond.....	28
Madison County Greenway and T&E Study .....	28
Multi-Partner Agency Organization Plan .....	29
History of Sprawl and Advantages of Walkable Communities .....	30
Creating Wildlife Friendly Trails.....	31
History of Rails to Trails.....	31
Appendix A-Sample Road Assessment Results.....	33
Sample Road Assessment Results Table .....	34
Appendix B-Proposed Trail Maps.....	35
Madison County Bikeway/Greenway Plan.....	36
Richmond Bikeway/Greenway Plan .....	37
Berea Bikeway/Greenway Plan .....	38

# Madison County Bikeways and Greenways Plan

EKU “Land Use and Environmental Planning” Service Learning Project

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## Executive Summary

The Madison County Bikeways and Greenways plan is the product of a five month long planning project completed by Eastern Kentucky University’s *GEO 325: Environmental Land Use Planning* class during the Spring semester 2007. We worked closely with the Madison County Greenways and Trails Association, and gained valuable support and input from Richmond Office of the Mayor, the Madison County Planning, and from Berea’s City Council.

**Needs Assessment.** The process began with an assessment of need developed by conducting several trips through Madison County. This field work consisted of a trip along the old Riney-B Railway to learn about rails-to-trails opportunities, a trip to Muddy Creek watershed to better understand greenway protection, and an assessment of the “bikeability” and “walkability” of nearly every public roadway in the county. With the data collected, we were able to begin getting ideas of where the best routes for bikeways would be.

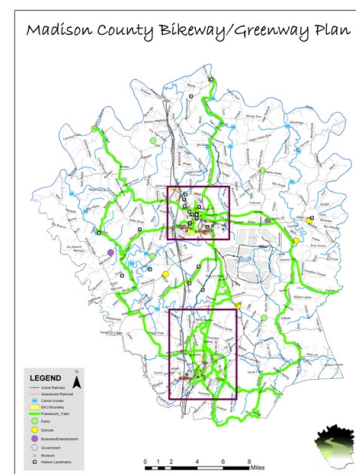
**Community Research.** The process also included researching other community bikeway and greenway plans around the country. We paid special attention to Kentucky communities that have undertaken bikeway projects with the assumption that their goals, geographic setting, and public and political context would be similar to our own. We had a meeting with two Lexington-Fayette Urban County Government officials who went through their process and plans in order to give us an idea of how to format our own project.

**Geographic Information System.** We developed an extensive GIS to catalog and map our field data, and to analyze possible bikeway route scenarios. We produced four working maps of the county: an overall Madison County map, a Berea city map, a Richmond city map, and an EKU campus map. Our GIS team continually worked to update and fine tune these maps as we received more input from stakeholders and community members who attended our community meetings.

**Community and Public Input.** Through the month of April, we held three open community meetings to present our

preliminary plan, and to listen to concerns and invite people review our maps and make recommendations. More than 60 people attended one of the meetings held in Richmond, Berea, and EKU’s campus. Public support was overwhelmingly positive, with very active participation and discussion about possible trail routes. Among the concerns people expressed were issues of safety and liability that could arise from incompatible or conflicting trail users (e.g., bikes, walkers, skateboarders, ATV riders), and both funding and authority for construction and maintenance of a trails system.

**Recommendations.** Our proposed trail plan features a “loop and cross” network anchored by a North/South “Wilderness Road” artery, and an East/West “Riney-B Railroad” artery. The “Big Loop” links areas of historic, scenic, cultural, environmental, and recreational value along existing roadways.



A secondary network of community-or destination-specific trails that link back to this arterial network.

Among our priorities were:

- Access to commercial and retail areas
- Access to frequent—use areas such as schools, post offices, government services, and daily-use businesses such as grocery stores, banks, and discount retailers;
- Access to leisure and amenity points of interest including parks and recreation areas, theaters, and specialty shopping;
- Access to natural and scenic areas, including rivers and streams
- Connectivity with other trails—or likely trails-- both within the county and in the region.

## **Background**

### **Madison County**

Madison County is a very diverse area within the heart of the Commonwealth of Kentucky. Overall population for the county was approximately 70,872 in 2000, jumping to 72,450 by 2005, making Madison County one of the fastest growing areas in the State. With 160 people per square mile, just less than fifty percent of the county’s population lives in the unincorporated areas outside of the cities of Berea and Richmond.

Although the 440 square mile area is comprised of mainly agricultural land, Madison County is also home to just over 1500 non-farm establishments employing roughly 22,725 people (Census Bureau, 2004).

The city of Richmond began as a small trade center for surrounding agricultural area but has since greatly developed its nonagricultural sector. The Bluegrass Army Depot established to the south of Richmond, plays an important role in the storage of military munitions.

Berea prides itself having a small town atmosphere with rich cultural and historical roots. Berea’s reputation as an Appalachian heritage craft center is known internationally.

### **Historic Features**

The two distinct municipalities in the county, Richmond and Berea, are home to places that are of historical and cultural significance. This area has more than 100 buildings on the National Register of Historic Places and three National Register Historic Districts. These places give Madison County several attractive features that may serve as a draw for tourism.

- Daniel Boone first explored this area in 1769 following creeks that flowed northward to the Kentucky River. Later in 1775 he and other pioneers returned to the area through the Cumberland Gap. They followed the route that became known as Boone’s Trace to the south bank of the Kentucky River where they established Fort Boonesborough, which became the first town in what was then Kentucky County to be chartered by the State of Virginia. Today it is part of the Kentucky State Park system. Employees dressed in period garb demonstrate the crafts and skills that were necessary for the survival of the early settlers.
- Madison County was named for Virginia Statesman James Madison who became the Fourth President of the United States. The county seat was moved to land owned by Col. John Miller, one of the county’s first state representatives, in 1798. It was named for Miller’s birthplace of Richmond, Virginia.
- Cassius Marcellus Clay, was an advocate for the abolishment of slavery, a newspaper publisher, a friend of Abraham Lincoln, and an ambassador to Russia during the Civil War. Today, his forty-four room Italianate mansion, White Hall, is a State Historic Site, located in northern Richmond. It was built in 1799 and remodeled in the 1860’s and has features that were unique to the period, including indoor running water and central heating. It is open for guided tours.
- Richmond is also the birthplace of the western pioneer Kit Carson. The area near Goggins Lane and Tate’s Creek Road is where he was believed to have

# Madison County Bikeways and Greenways Plan

EKU “Land Use and Environmental Planning” Service Learning Project

Dr. Alice Jones, Faculty Supervisor

## Background

been born. It has been suggested as a possible location for a trailhead for the proposed Rails to Trails section of the bikeways and greenways plan.

- Col. Richard Callaway obtained the first ferry rights in Kentucky in 1779. He was a Boonesborough settler that offered transportation across the Kentucky River. This along with other ferries at various locations along the Kentucky River operated until the 1950's as they were gradually replaced by bridges. The historic Valley View Ferry is the only one remaining and it will be the final destination in Madison County for the proposed Rails to Trails section.
- In 1850, the City of Berea was known as the Glade. It was a small community that consisted of a few scattered farms and a racetrack. In 1853 Cassius Marcellus Clay gave a free tract of land in the Glade to the Rev. John Gregg Fee. With the help of local supporters and other abolitionist missionaries from the American Missionary Association, Fee established a small village, a church (Union Church), and Berea School (which would become Berea College in 1858). Berea College was the only integrated college in the south for nearly forty years. During the Civil War, Rev. Fee preached to and taught thousands of slave men who had volunteered for service in the Union Army. In 1859, proponents of slavery attacked the abolitionists in Berea, forcing the college to close and its leaders to flee Kentucky until after the Civil War.
- During the 1890's there was a growing national interest in the culture and traditions of Appalachia fostered in part by writers, missionaries, and teachers

who were intrigued by the culture but dismayed by the isolation and poverty of the region. This was the root of the artisan culture that Berea embraced and continues to support and promote today. The recently opened Kentucky Artisan Center displays a wide variety of works by Kentucky artisans.

- The Battle of Richmond Battlefield site was donated to the county and is being developed as a County park. It hosts an annual reenactment of a Confederate victory, which was one of their last during the Civil War. This event each year brings an influx of tourism and offers a boost to the local economy.

Other sites in the county that are appealing historical attractions are Bybee Pottery, The Glyndon Hotel, The Bennett House Bed and Breakfast, Eastern Kentucky University, and hundreds of homes that are on the National Historic Register. Many of these historic sites have been identified as potential destinations that could be linked together or made accessible by the proposed bikeways.

In addition, many recreational features abound with several golf courses, hiking trails, bike paths, rock climbing, and boating on the Kentucky River just begin the list. Eastern Kentucky University and Berea College host many cultural, educational and athletic events. Berea has developed into a center for the arts and crafts with historic Bybee pottery and the Berea Artisan Center being specific attractions. Each year the Special Olympics is hosted in Richmond at EKU where athletes and their friends and families descend upon the city of Richmond from all across the state..

# Madison County Bikeways and Greenways Plan

EKU “Land Use and Environmental Planning” Service Learning Project

Dr. Alice Jones, Faculty Supervisor

## *Purpose and Need*

Greenways are not merely a luxury, but a necessity for the future of Madison County. They offer human and environmental (wildlife, air, and water) health benefits that will maintain and improve the quality of life for all residents. Greenways have also been shown to increase the economic value of property of adjacent land. (Source)

### **Environmental Need**

There are a number of streams in Madison County and this area of the country experiences a significant amount of rainfall. Some urban areas, including Eastern Kentucky University, already experience flooding or storm drain water problems caused by urban run-off associated with an increase in impermeable land surface and a decrease in natural vegetation (caused by development). Source greenways play a crucial role in mitigating water runoff problems by acting as a storage zone, as well a filtering area that can remove pollutants that accumulate with storm water runoff. Greenways mitigate air pollution caused by industry and automobile use through evapotranspiration of carbon dioxide by natural vegetation. They also serve as habitats and mating/migration corridors for wildlife, whose territories are being encroached upon as development of rural areas increases. Greenspaces also serve as islands of natural tranquility. A healthy ecosystem is necessary for supporting a healthy human population.

### **Human Need**

Obesity in America is becoming an increasingly large burden on public health systems and personal quality of life. Most of our cities are built in a sprawling layout, requiring the use of an automobile to get to work and other necessary destinations. Many people spend a significant part of their

day engaged in sedentary activities. Outdoor activities can lead to a more active lifestyle. Greenways offer a natural area of beauty and tranquility which all citizens can enjoy. All residents, regardless of income level can enjoy walking along a stream, bird watching in a wooded area, or identifying native wildflowers.

As the United States and the rest of the world faces increasing environmental problems, it is becoming more important that children in K-12 schools have access to natural areas for scientific observation and study; Greenways can serve as local, outdoor educational settings for community children. Getting adults and children outdoors and active plays a vital role in education, decreasing levels of obesity, and improving general health.

Madison County is home to many college students that do not have access to a vehicle. These students have responsibilities such as holding jobs, grocery shopping, and running errands. Providing alternative travel corridors for students-in areas like Eastern Bypass between ECU and Wal-Mart-will provide a safer way for students to carry out their responsibilities.

In addition, the elderly, disabled, and children also need better sidewalks and pathways. Currently these pathways are broken, damaged, obstructed, or lack connectivity. A well maintained bike and pedestrian path would be a safe way to get around Richmond.

## *Mission and Vision Statement*

Every great organization has ideas and goals which are put together to form a mission and vision statement. The mission statement describes, to its members, the organization’s purpose and ideals. The vision statement is a few sentences telling the community at large what the organization hopes will happen when their ideas and goals have been implemented. A series of processes took place to form the Mission and Vision Statements of the Madison County Trails and Greenways Project.

Winning ideas make an organization stand out. In this class each student was given the task of creating four to five winning ideas that would make their community more bike and pedestrian friendly. When creating these winning ideas, students thought about what was important to them personally and to their community as a whole, including positive ways in which their community might change.

Then the class divided into groups. Our ideas were then categorized and separated by subject and main idea (e.g. tourism, health and pedestrian travel). The winning ideas were given measures of success to tell how successful the idea is. These measures included such things as increasing tourism, lowering mortality rate, and construction of paths and trails.

The ideas were also given core values, the main reason for the idea. Some of the values listed were increase in revenue, healthier community and less automobile traffic.

Winning ideas then were combined to create four separate Mission and Vision Statements that represented our ideas for the future of Madison County. The individual statements were then combined to create a master Mission and Vision Statement that would represent the group as a whole and showcase their ideas about the future of Madison County. These master statements are as follows:

### ***Mission Statement***

The EKU greenways and bikeways planning team will be devoted to the health, safety and education of the greater community by developing a comprehensive network of bicycle and pedestrian trails and designated green space areas in Madison County.

### ***Vision Statement***

Madison County will become healthier, safer, and more environmentally friendly as the new trail and green space network fosters a sense of community, social responsibility, and overall well-being. It will provide environmentally friendly transportation alternatives as well as options for healthy, safe recreation. The introduction of trail ways and green spaces will facilitate interconnectedness between communities by increasing ease of travel to local businesses, historical sites, and recreation areas that make Madison County unique and beautiful. The plan will also serve as a model for neighboring communities by promoting and successfully implementing a program for sustainable development and well-planned growth.

## *Identification of Issues and Concerns*

### **Background Research**

#### ***Walking Assessment***

While the majority of people become pedestrians at some points in the day, many do not perform their daily activities and errands as full-time walkers or bicyclists. In order to better understand the needs and obstacles of the everyday pedestrian, the class was assigned to become the person that our project was attempting to help.

We were given instructions to perform at least seven out of the ten errands on the list stated below. These relatively simple tasks represent those same errands that many without access to motor vehicle transportation have to accomplish on a daily basis.

- Renew your driver's license
- Cash a check
- Buy bread
- Mail a letter
- Drop by the public school
- Visit the mayor's office
- Buy a birthday card
- Drop and add a class
- Go to a movie
- Go to a “date spot” for dinner or entertainment
- Find a fishing spot

Eastern Kentucky University's campus was the preferred starting point for the assignment, so the starting location would be more uniform and convenient, and would represent those students that rely on pedestrian travel every day. The trek could be performed by bicycle or foot, with one hour being the minimum time spent by bicycle and two hours being the minimum time spent on foot. We did not actually

have to “perform” the task, such as actually purchase a birthday card or cash a check. Rather, we manually traveled to a destination at which these tasks could be accomplished. Also, it was required that each task be done at a separate location. For example, we could not travel to Wal-Mart and buy both bread and a birthday card at that one location. Instead, we would have to possibly buy bread at Wal-Mart and buy a birthday card at Hallmark, even though both tasks could potentially be performed at the same place.

Following the assignment, we created a log of the time used to run the errands, the path traveled, and the exact points visited. A two to five page reflection of our experience was also included, which contained our personal thoughts on the assignment and we believed the assignment to be particularly relevant to the class bikeways and greenways project as a whole.

Many students in the class found this to be one of the most difficult field work assignments in the class. It set the stage for the level of difficulty of the class project as a whole. Forced to act as pedestrians, members of the class were able to experience the challenges of being a walker or bicyclist in Richmond and Madison County.

One of the most obvious obstacles that we faced were the absence of sidewalks, inadequate sidewalks, or those sidewalks that end abruptly. In some of the more potentially busy pedestrian areas, students were forced to walk alongside the flowing traffic, putting them in constant danger of injury. The condition of the concrete on some of the sidewalks was so desperately in need of repair that bicycle travel in particular was almost impossible. Topographic



# Madison County Bikeways and Greenways Plan

EKU “Land Use and Environmental Planning” Service Learning Project

Dr. Alice Jones, Faculty Supervisor

## Identification of Issues and Concerns

locations of some of the sidewalks were such that, in times of poor weather or ground shift, those locations could be covered with standing water or mud. Some sidewalks, as shown in the picture below, were unusable due to direct, negative human intervention, such as trash buildup or electrical poles in the middle of the walkway. However, the most intriguing to all class participants was that of the sidewalks that mysteriously ended abruptly, forcing students to venture into the street or continue their journey through grass or mud.



Naturally, it was necessary for students to cross the street at some point to continue on to the next task. However, when faced with a sea of on-coming, fast-moving motor vehicles, many students found themselves at an impasse because of an absence of pedestrian crosswalks. Some class bicyclists were required use the vehicle turning lanes along with typical motorists. While bicycles are considered a vehicle and are street-legal, the dangers posed by riding directly with traffic can be quite perilous.

Sidewalks provide an important and needed safety barrier between pedestrians and the motor vehicles on the street. At many locations, the sheer volume and speed of motorists was extremely intimidating. Speed limits throughout cities are deemed safe for the motorists, but when pedestrians are required to use any particular part of the road, those “safe moving” drivers can potentially pose a danger to pedestrians. Even in places throughout town where the speed limit is relatively low and somewhat safer for pedestrians, cars regularly exceed posted speed-limits and increase the chance of injury to themselves, other motorists, and any pedestrians and bicyclists that may also be using that road for travel. This is particularly evident on the EKU bypass, which leads directly to many of Richmond’s businesses, schools, and eateries.

Because drivers do not have to share city roads with pedestrians on a regular basis, many have lost the essential awareness of their surroundings that is so necessary to both driver and pedestrian safety. Students found themselves to be practically invisible when confronted with a typical driver. Even at crosswalks, many drivers failed to obey the pedestrians’ right-of-way, and instead barreled through an intersection or crossing without any discernable recognition of oncoming pedestrians. This can be remedied through driver and pedestrian education, along with consistent growth of pedestrians and bicyclists throughout Madison County.

### ***Rails to Trails***

“Rails to Trails” is a national program that promotes the development of multiuse recreational trails along abandoned railroad lines. The program is championed largely in part by the non profit advocacy group Rails to Trails Conservancy

# Madison County Bikeways and Greenways Plan

EKU “Land Use and Environmental Planning” Service Learning Project

Dr. Alice Jones, Faculty Supervisor

## Identification of Issues and Concerns

(RTC). Since its founding in 1986 RTC has achieved a great amount of success in promoting and gaining favorable legislation and providing useful information, leadership, and technical assistance for the trails and greenways movement.

Presently there is a proposal to convert the abandoned “Riney-B” railroad line in Madison County, following Tate’s Creek Road from Richmond to Valley View, into a bike trail.

The first train ran on December 7th 1891. The main purpose for this railroad was hauling freight, coal, and lumber. The railroad has not been used for rail transport since 1932 when it was abandoned and sold in parcels to individual landowners. Few of the Riney-B’s original structures remain. There is an 850 foot tunnel in Million near Richmond, a few bridgeless trestles, the Rice Station Depot and the Depot at Valley View. The depot at Valley View has since been added onto and converted into a house and the Rice Station Depot has been donated to Madison County and could possibly be developed into a railroad history museum. Also of historical significance along this route is the birthplace of the western pioneer Kit Carson near the corner of Goggin’s Lane and Tate’s Creek Road, which is being proposed as a trailhead and possible location for the railroad history museum.

Our class worked to develop a comprehensive trail plan which includes the Riney-B Rails to Trails project. Also included in this plan are proposed green space areas, the identification of roads that are biker friendly, and the identification of desired origin and destination points.

This undertaking was advocated by the local organization Madison County Greenways and Trails, which is headed by

Eddie and Kristin Farrey. This group not only promotes local cycling activities, but is involved with the statewide events promoted by the Kentucky Rails to Trails Council. We met with Kristin and Eddie to discuss trail sites their group would like to see incorporated into the county-wide network. These included

- Connect Berea and Richmond
- Richmond to Valley View
- EKV campus to Wal-Mart, Richmond Mall, Gibson Bay and Lake Reba
- Richmond to Irvine or at least Waco
- Richmond to Paint Lick
- Berea to Mt. Vernon
- Berea to Paint Lick
- Berea to Red Lick/Irvine
- Berea to Bear Wallow
- White Hall Shrine to Fort Boonesboro
- Richmond to Acres of Land Winery
- Safe passage ways for kids to library, YMCA, parks and schools. (See attached maps)



# Madison County Bikeways and Greenways Plan

EKU “Land Use and Environmental Planning” Service Learning Project

Dr. Alice Jones, Faculty Supervisor

## Identification of Issues and Concerns

Although many people view this as a wonderful amenity that would be added to our county, there are a few concerns which will need to be addressed.

The concerns of opponents to the plan are mostly voiced by the landowners along the proposed route. They worry that there could be safety or liability issues associated with granting an easement across their property. They are also concerned about trespassing and vandalism. As with many proposed plans of this sort, some owners worry about whether or not the trails would become a haven for delinquent activity, and that litter could become a problem. Questions have been raised over lighting and hours of operation, what types of vehicles would be allowed, and if someone were to get hurt would emergency vehicles have accessibility.



Those in favor of the plan believe that American society is becoming more obese and it is necessary to promote a healthy lifestyle in which bicycling could play a large part. In addition, it is necessary for those who wish to ride, jog, walk, or rollerblade need a safe place to do so. Many also feel that

this plan would provide immediate dividends such as an improved quality of life, an increase in tourism, a boost to the local economy through the attraction of new families and businesses, and a reduction in air pollution by providing an alternate means of transportation.

### **Muddy Creek Watershed**

Field research was conducted at the Meadowbrook Farm at Eastern Kentucky University. Muddy Creek was used as a case study for investigating issues in the design of and need for greenway systems. Tom Edwards the Conservation Biologist for the Kentucky Division of Fish and Wildlife served as a consultant for this research.

There are many issues to consider when developing a greenway plan, including: stormwater management, environmental remediation, riparian protection, and water quality protection and pollution. Greenways offer a form of natural stormwater management. Permeable soils and vegetation act as a “holding” area for rainwater, decreasing or mitigating the threat of flooding. Also, vegetation and soils act as a natural filtration system, effectively improving the quality of water in streams adjacent to greenways.

Mr. Edwards has worked extensively with landowners within the Muddy Creek watershed in order to improve the water quality of the creek, and he has done this by creating riparian buffers around streams that mitigate water pollution.

Greenways also increase the natural beauty of an area, which can potentially increase tourism, especially when bikeways/walkways are connected to greenway systems. A greenway can serve as habitat for literally hundreds of

# Madison County Bikeways and Greenways Plan

EKU “Land Use and Environmental Planning” Service Learning Project

Dr. Alice Jones, Faculty Supervisor

## Identification of Issues and Concerns

species of flora and fauna, which can in turn attract a variety of citizens and tourists with a variety of interests. There is also an educational component to greenways. For example, the field research site at Meadowbrook Farm serves as an educational site for classes taught at EKU as well as the Kentucky River Watershed Watch volunteer training site.

### **Lexington-Fayette Urban County Government**

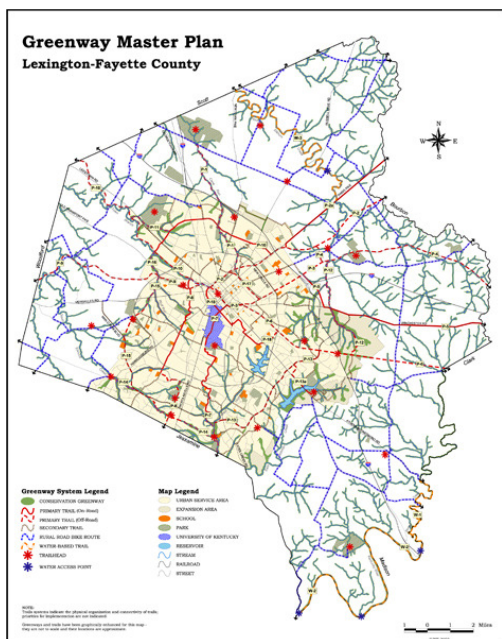
Early in the process, we met with the Lexington-Fayette Urban County Government (LFUCG) to discuss their plans for greenways and bike trails in Fayette County. Their plan has already been put in to effect, but the experience they shared taught us much about the planning process itself and what we can expect in the years to come.

Initially, we realized that the work we were to complete in four months was actually a year and a half process for most professional planning committees, so it was impressed on us the importance of being thorough, yet fast. It also became evident that although their plan had already been accepted,

work had not yet begun. Although the plan was accepted, funding was a huge issue keeping them from moving forward. Our own plans did not address funding, so we began to look for ways for trails to either pay for themselves, or be included in already-scheduled road improvements or other infrastructure updates (such as bike paths being included in widening roads or on the grading over new water lines.) We also learned that we must be realistic in our expectations. Although our plan may be one cohesive piece as we look at it now, it is highly likely that it will be completed piece by piece over extended period of time.

One of the most interesting things we learned from this meeting was the intention of LFUCG to extend their trail lines to the Kentucky River on Tates Creek Road. They also made us aware of the 2010 World Equestrian Games that will be held at the Kentucky Horse Park. This would enable us to connect our trails with Lexington, extending their service, and also give us an opportunity to appeal to the influx of European visitors with the games, who expect to be able to transport themselves via bike (and possibly horse) rather than traditional modes of transportation.

This meeting also gave us the comfort and hope that things in our region are moving towards embracing trails and greenspace as an important part of our Kentucky heritage. It enabled us to move on with a new spirit, knowing that our plans were already desired by the community at large.



# Madison County Bikeways and Greenways Plan

EKU “Land Use and Environmental Planning” Service Learning Project

Dr. Alice Jones, Faculty Supervisor

## Identification of Issues and Concerns

### Other Trail and Greenway Plans

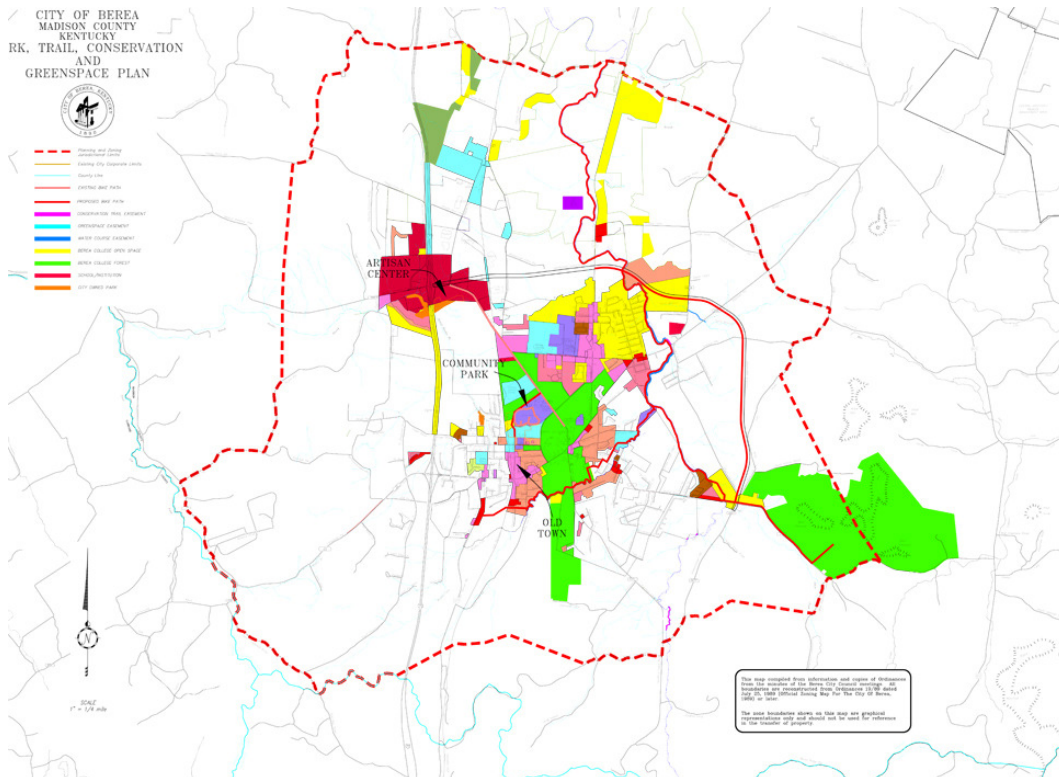
We also researched a number of existing trail plans for cities across the United States. These gave us an extremely broad range of plans, from simple rails-to-trails plans to complete city networks, allowing us to identify what would work in our situation from each one. From all of the plans, we were at least assured that it could be done, even in situations smaller than ours. With that hesitation aside, we were again impressed with the idea that although it could be done, it would be a continual process, not a single installation, that would take time, funding, and support.

These plans also described many of the benefits that trail systems have for communities. Since there are no established trail systems in our vicinity, it was important to be able to approach citizens and decision makers with concrete examples of the positive aspects of trail systems that our

county could adapt. This avoided our ideas being shot down immediately before planning. Seeing examples that are already in place assures everyone that this is not just dreaming, but real, practical application for our county.

One of the most important suggestions from these plans was the idea of making phases or prioritizing trails and spaces that we thought to be most important. This would allow decision makers to concentrate on small areas at a time, to avoid feeling overwhelmed, or spreading their focus too thin and accomplishing a little in a lot of places.

Besides the ideas and lessons learned, the plans also familiarized us with what a formalized plan should actually look like in writing. As none of us have had experience in writing formal planning documents, these examples were invaluable in our process of writing and organizing.



# Madison County Bikeways and Greenways Plan

EKU “Land Use and Environmental Planning” Service Learning Project

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## *Identification of Issues and Concerns*

### **Benefits of Trails**

Walking, hiking and biking trails have proven to be very beneficial to many aspects of a community. The benefits are felt by the citizens, the economy, and the environment in and around the community. These benefits can build and strengthen a community, encouraging its growth and stability.

The most familiar benefit of these trails is the overall public health benefits. Giving people an opportunity to get outside and be active can greatly influence the well-being of a community. Walking, hiking or biking on trails is a great form of exercise and can be as strenuous as needed, people can exercise at their own pace. Exercise can lead to weight loss, a healthier body and reduced stress. These benefits can lead to a longer, healthier, happier life.

Trails and greenspace areas encourage people to come out of their houses and begin interacting with their friends and neighbors. In recent years, relationships have begun to rely heavily on impersonal communication via the internet and cell phones. People no longer interact face-to-face as they have in the past. Trails can change this, and strengthen a community by creating a friendly social atmosphere, where people know and can rely on their neighbors. In addition, trails and greenspaces provide opportunities to meet other citizens from, or visiting, the community. They are great places to hold special events and promote community awareness.

Trails can also strengthen the economy of a community. Having trails can have an immense impact on tourism. Connecting large cities, historical sites, or points of interest by a walking trail or a biking trail will bring tourists. People

are eager to see other communities and learn about their histories. An increase in tourism can directly affect the local economy as tourists pay to stay in hotels, eat at local restaurants, and shop at local businesses. Having trails for tourists to use in a tremendous draw for the community.

Another way the economy can benefit from trails is an increase the house values. Having property adjacent or near a trailhead or trail has been proven to raise the value of a house and property.

Trails and greenspace areas give people access to the beauty of the environment and nature that was once hidden and unable to visit. Allowing people to enjoy the environment will teach them to appreciate what is available and to not destroy the little that is left.



Trails also serve as a means of transportation. An efficient trail network could reduce the number of cars on the road and the amount of pollution in the air. If used regularly, people would save money on gas and would be able to enjoy the beauty of nature that is often overlooked when traveling

## *Identification of Issues and Concerns*

by car. Reducing the amount of traffic on the roads will also increase the safety in a community. In addition, there would be fewer accidents involving multiple vehicles or pedestrians. Having trails could build a safer community.

Trails can give citizens access to many parts of the city or county that were previously unknown or little visited. Many people do not know all of the history of their community and providing them with access to these points of interest could prove enlightening. This will expand the culture and togetherness of a community. Continuing the education of a community is important and having people feel a pride of the knowledge of their history and culture will make the community a great place to live.

These are just some of the benefits that the development of walking, hiking and biking trails can have on a community. The growth and well-being of a community can lead to additional growth and happiness, sending the community on an upward spiral. The benefits can be felt in all corners of the community and live on for decades and decades.

### **Maps and GIS**

For this project, we needed to produce maps that we can work from. We used ArcMap GIS to produce these maps.

First, we had to acquire the data to be used. We found a lot of the data we needed at KyGeoNet. This included the borders, roads, active and abandoned railroads of Madison County. Other data that we needed came from Paul Schraeder, the City of Berea's land surveyor and GIS coordinator. He supplied us with some of the businesses and boundaries of the Berea area, as well as walking/biking trails in Berea, both existing and proposed. The layers of streams

and major bodies of water came from Tiger Data, which is distributed by ESRI.

The rest of the data that was needed had to be digitized by the GIS team. They made their own data layers of historic landmarks, Camp Catalpa, parks, schools, businesses, and government areas. Also, a layer of data was created using information taken from the rest of the class's assessment of Madison County's road system, showing roads with developed trails, or roads that need improvement to sustain a trail.

Some of the data layers were created using different coordinate systems. This prevents the layers from overlapping properly on the map. Tyler Huffman was essential in converting some of these files to a format that we could use.

The GIS team then made several different maps. They started with a map of Madison County, putting in the roads, railroads, water bodies and city boundaries. From there, they did close up maps of the Richmond and Berea areas, adding in such things as businesses, parks, schools and other destinations.

These maps were taken to several stakeholder meetings, so that citizens could write their own ideas of where trails should be, or where they could best connect to existing trails. This information was taken, and after each meeting, the GIS team digitized that data in a new layer called “proposed stakeholder trails.”

# Madison County Bikeways and Greenways Plan

EKU “Land Use and Environmental Planning” Service Learning Project

Dr. Alice Jones, Faculty Supervisor

## Identification of Issues and Concerns

### **Roadway Assessment**

A road assessment of Madison County, Kentucky was conducted with the following mission and goal in mind: To determine walkability and bikeability in Madison County, with first-hand interaction to ensure the quality of information given in the final report. These interactions included the actual walking and biking of the observed roads.

To achieve this, a draft assessment was produced. What the assessment focused on was determined by traits deemed desirable for safe and effective bicycle and pedestrian use. General information about the road itself was observed, such as whether or not the road had sidewalks and/or designated bike lanes or biking areas.

The draft assessment included possible criteria to rate on a predetermined numerical scale from 0-5 - with 0 indicating that the criteria observed was not there, 1 indicating the worst conditions, and 3 indicating the best and most optimal conditions. The draft was given everyone in the class with the task of assessing three roads of their choice. By doing this, all students became familiar with the assessment and the goals of the survey, and then in turn gave proper input to maximize the efficiency and quality of information that could be taken from the survey.

To have a clear, precise, and effective method of evaluating these roads, Madison county was divided into 5 quadrants- southwest, east, west, northeast, and southeast-and 2 cities-





## *Identification of Issues and Concerns*

Richmond and Berea. Using GIS, detailed maps were made to cover each quadrant effectively which included selected project roads, streams, and abandoned rail ways. These quadrants were then assigned to the class with the task of evaluating every road on the map.

The final road assessment survey evaluated three categories on a numerical scale of 0-3 – with 0 remaining as the score for missing observed criteria, 1 being the worst, 2 being fair and usable, and 3 being optimal and the most desirable conditions. The assessment included a field for the map ID to identify which map the road came from, a road ID to number the roads with the corresponding map, and lastly a field for the road name was included. The categories were finalized as follows:

- General Information. This included surface condition, road width, topography, visibility to traffic, distance between stops, road shoulder width, traffic volume, number of lanes, and speed limit.
- Sidewalk. This evaluated the walkability of the sidewalk if the road had a sidewalk. Criteria evaluated included surface condition, lighting, signage, obstructions, curb cuts, if the sidewalk was interrupted by an adjoining street or other reasons, and whether or not the use of the sidewalk was weather dependent.
- Designated Biking Line. This evaluated whether or not the road had a designated area for bikers and cyclists. All the same criteria were evaluated as listed above with the sidewalk assessment criteria.

Once the roads were evaluated, the information was digitized using a spreadsheet program. The individual assessments were then compiled into a comprehensive database.

By using certain values obtained from the assessment, it was possible to isolate values from the observed criteria in order to rank roads based on their specific conditions. This was done by choosing all the values that are desired and adding them together to give an overall score. By having a predetermined scale of 0-3, this data could be quantitatively combined to have a maximum and minimum score. The minimum score is inevitably 0, and the maximum score can be obtained by the following equation:

- $\text{max} = \text{Vmax}(n)$  - The equation states that the maximum score equals the maximum scale value (  $\text{Vmax}$  ) times the number of criteria values used (  $n$  ). For example, in this case our maximum scale value is 3, and if we observed 9 different criteria, the maximum score would equal 27 (as seen in the example below):  **$\text{max} = 3(9) \rightarrow \text{max} = 27$**   
Now that the minimum and maximum scores have been obtained, the roads can then be ranked in order of lowest to highest, highest to lowest, or any other method desired.

Conducting the road assessment resulted in a better understanding of areas in need of the most improvement and, more importantly, the hands-on interactions allowed for a better understanding of the project and overall roadway conditions in Madison County. A sample of the road assessment form used is presented **Appendix A**. The complete data is available upon request..

## *Identification of Issues and Concerns*

### **Public Involvement**

An important part of developing any community project is to involve the community. Their input and opinions are instrumental in planning a successful project. We needed to collect input such as elements that should be included in the trails, where people would like to see bike trails, ideas for funding the proposed trails, and any concerns that may need to be addressed.

### **Community Survey Development**

Our class performed several planning activities to aide the planning for Madison County Bikeways and Greenways Plan. One task was the creation of a community survey. In order to attain a representative opinion on the variety of aspects that our project addresses we decided to do a SWOT analysis. A SWOT analysis is a method that focuses on the strengths, weaknesses, opportunities, and threats of a particular subject. In order to get these opinions we constructed a questionnaire that contained questions related to each of these topics.

The class was then separated into groups to choose the questions that would work the best for our project. After deciding on the appropriate set of questions, we compiled a survey in which the class answered the questions. After a few minor alterations, the survey was ready to be used in our first public meeting with the project stakeholders.

### **Stakeholder Identification**

At the beginning of the semester the class worked on generating a list of informed stakeholders, regardless of whether or not they were a resident of Madison County. This

After the individuals were identified they were divided up between the class members and contacted. We created an excel spreadsheet to organize the status of the phone calls or emails and any information we received. We used the collected information to assist us in the next steps of our project, namely, developing a community survey based on what we already knew and what we needed to know.

### **Stakeholder and Public Meetings**

Once we had our stakeholders identified we contacted them by phone or e-mail to inform them that we would be having a meeting and that we requested their attendance or at least the attendance of someone from their office. After the initial phone calls we had a list of individuals who said they would attend. This list gave us an idea of the number of individuals to expect. About a week before the meeting we sent out letters to every stakeholder that was contacted no matter what response they gave. This letter reminded them of the location, date, and time of the meeting.

Out of the individuals invited, the following people attended:

- Ruth Davis Carroll (Health Department)
- Lloyd Jordisom (Health Department)
- Mike Reister (attended on John Wernergreen’s behalf)
- Connie Lawson (Mayer of Richmond)
- Matt (Greenways and Trails/Historic Railroad Expert)
- Kristin Farrey (Rails to Trails)
- Rita Smart (Richmond Main Street Coordinator)

## *Identification of Issues and Concerns*

Some of those who were invited but not able to make the meeting were:

- Tom Edwards (Biologist)
- Tom Moreland (GIS Coordinator)
- Kevin Hup (Assistant Superintendent and Assistant Principal of Madison High School)
- Mike Roberts (City of Richmond)
- Duane Curry (Madison County Planning)
- Andy McDonald (Berea)
- Rita Smart (Bennett House)
- Laura Littleton (Bluegrass ADD)
- Tiffany Jackson (Kentucky Department of Transportation)
- Byron Bond (Chamber of Commerce).

At the meeting Dr. Jones welcomed everyone, gave an overview of the course, and outlined the meeting agenda. Next a student discussed our mission and vision statements and conducted our power-point presentation, which addressed our progress and what still needed to be done. Then we broke the meeting attendees into small student led groups to fill out the community survey and discuss the answers we received with the whole group.

Students then led group discussions of the responses and then all the groups reconvened to go over the key points that they felt were the most important. These points were then combined and posted around the room under their respective categories.

Following the survey discussion the stakeholders were then guided to the maps we created in GIS. There was a map showing Madison County as a whole, as well as enlarged maps of the cities of Richmond and Berea. The stakeholders

were given the opportunity to draw where they felt paths were needed or where trails already existed directly onto the maps where they felt paths were needed or where trails already exist. This portion of the meetings was the most anticipated and most successful because people felt more involved and could give us their input one-on-one. We then wrapped up the meetings by thanking all involved and letting them know that we would continue to keep them updated on any more developments.

The meeting as a whole was very beneficial, allowing the class to identify the strengths and weaknesses of our assessment and plan. It also gave us a better understanding of the planning process.

After the stakeholder meeting we conducted three more meetings that were open to all interested community members. The first was held in Berea, the second in Richmond, and the third was part of EKU's Earth Days activities and was held on the campus. These meetings were very successful in gaining input from the public and from professional planners. The format established in the stakeholder meeting was used at all three public forums.

We received a variety of responses from the different individuals at the meetings who took part in our questionnaire. Since in each category there were a number of the same responses, we have compiled four pie charts in order to represent those opinions.

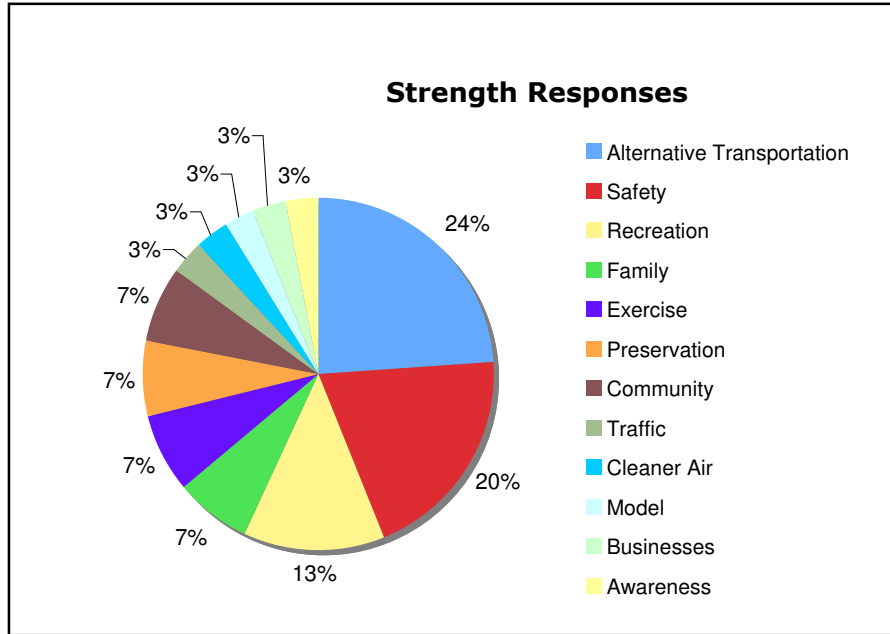
# Madison County Bikeways and Greenways Plan

EKU “Land Use and Environmental Planning” Service Learning Project

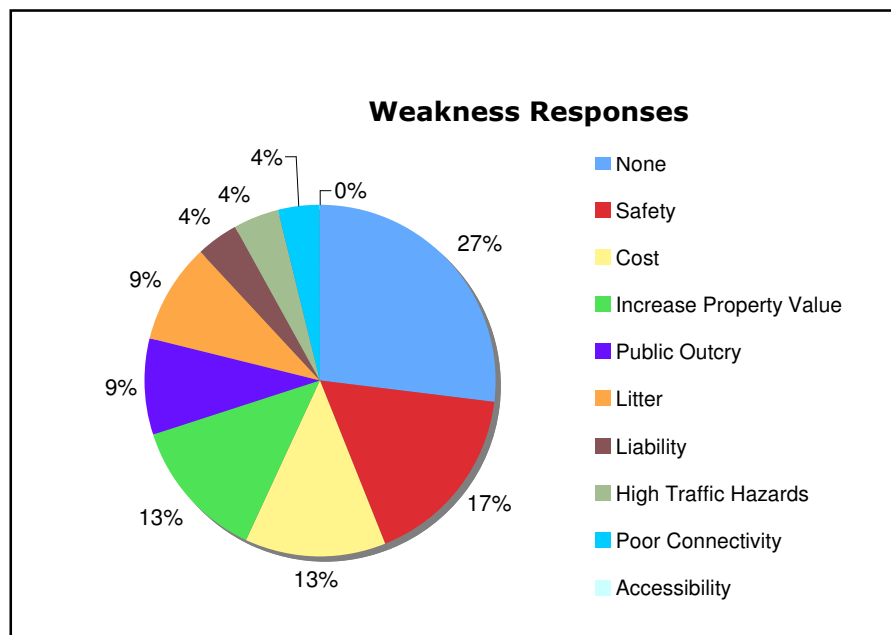
Dr. Alice Jones, Faculty Supervisor

## Identification of Issues and Concerns

To assess our project’s strengths we used the community survey to ask people to imagine Madison County had an extensive network of bike and pedestrian trails, and greenway trails that connected businesses, campus, residential areas, and points of interest; and that also preserved wildlife and greenspace corridors. We then asked them to describe what would be the best thing about this for them personally.



We also wanted to know if there were any reasons that you wouldn’t want bike, pedestrian, and greenway trails in Madison County. Responses would inform us of any weaknesses in our project.



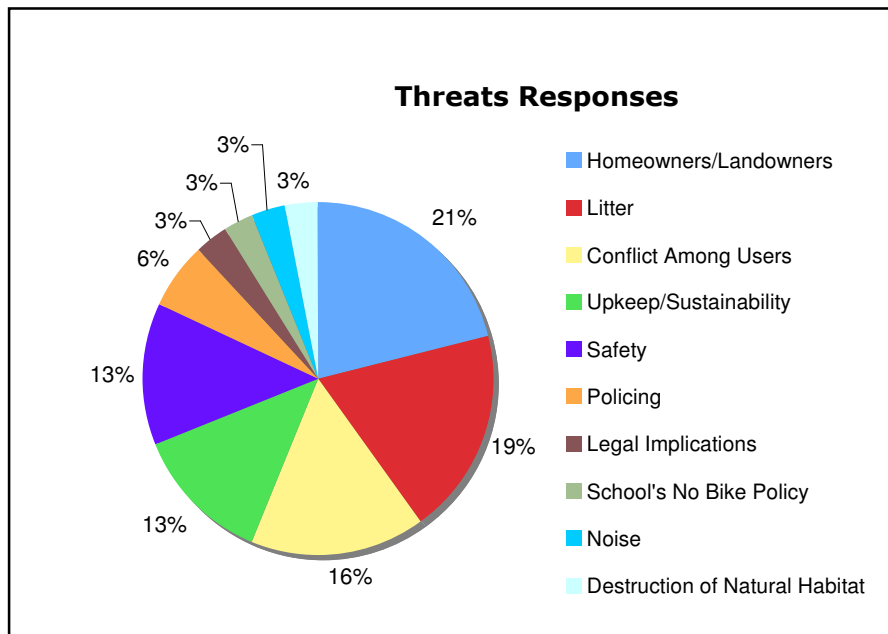
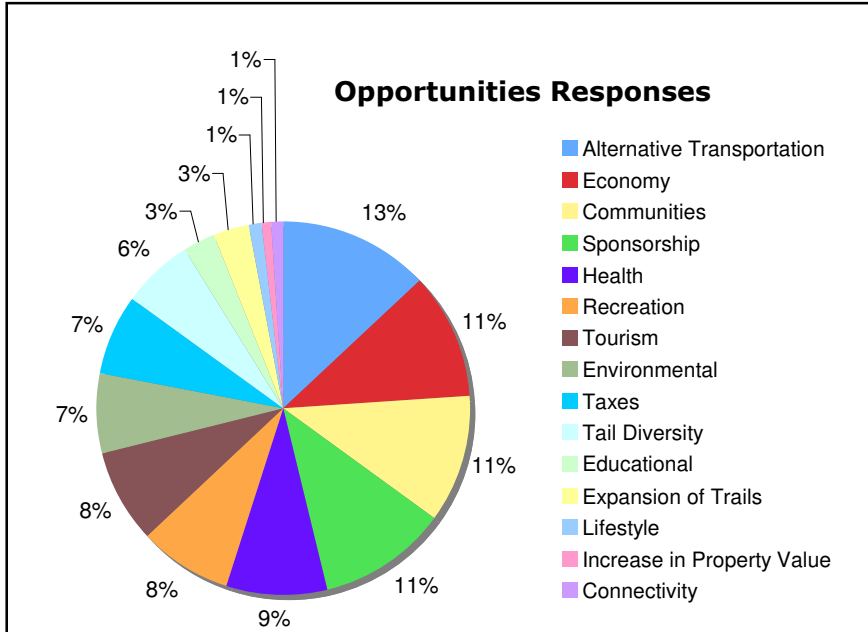
# Madison County Bikeways and Greenways Plan

EKU "Land Use and Environmental Planning" Service Learning Project

Dr. Alice Jones, Faculty Supervisor

## Identification of Issues and Concerns

In addition, we wanted find out what opportunities bike, pedestrian, and greenway trails might provide for the community and what threats they might pose if they were adjacent to a community member's property.



# Madison County Bikeways and Greenways Plan

EKU “Land Use and Environmental Planning” Service Learning Project

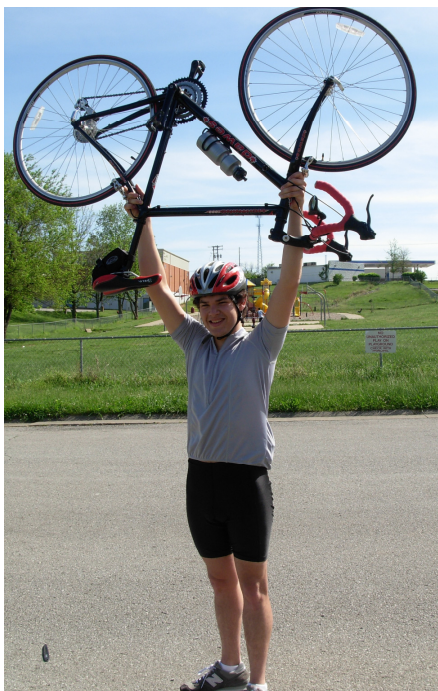
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## Recommendations

Our maps consist of four different priorities. Those priorities are as follows: high use areas, businesses, water access/recreational use, and links to other bike plans. We arrived at these priorities by brainstorming as a class and focusing on the key features that we need to address within our maps.

High use areas are areas that many Madison County citizens frequent over a short period of time. These are areas like schools and other non-commercial points of interest. Some non-commercial points of interest that we have on our maps are Lake Reba, Berea Forest, Camp Catalpa, and so on.

Businesses are also something that we considered to be a priority. We classified businesses as places people go to in order to buy goods and receive services. These types of places include grocery stores, restaurants, banks, theaters, shopping and so on.



Another identified priority are areas that provide water access for recreational use. These areas allow people an entrance to sites that are suitable for canoeing and kayaking. These allow further nature opportunities off trail from biking or walking. Fishing capabilities will also be possible.

The last priority that was identified are trails that will provide links to other counties trails. Making sure that these trails get implemented provide a complete connectivity for our county trails that will hopefully extend statewide.

The class selected these as our top priorities because they either provide a safer form of alternative transportation for the citizens in Madison County or ways for the citizens to access water recreation sites. Many of the paths to high use areas and businesses are currently not safe for pedestrians and bikers, which is a huge concern since they are used often. With the implementation of trails in these areas safety concerns will no longer be such a big issue. It is also important to provide connectivity to other counties that way people will not have to resort back to cars or unsafe paths.

Our comprehensive plan of bike trails encompasses the entire area of Madison country. To accommodate citizens from all bikable areas, trails were placed in a cross and circle formation, with secondary trails serving individual needs.

The north-south traffic is covered by a trail reaching from Boonesborough State Park on the Kentucky River, down the Old Wilderness Trail, continuing down US 25 to Berea. West-east, a trail will run from Clay's Ferry, down Tates Creek Road following the old Riney B trail bed, to Irvine at the Estill County line.

## Recommendations

Our circular trail is formed by the Robert Martin Bypass and the proposed Berea Bypass with connections to the west and east through scenic areas and passing by areas of interest such as Bybee Pottery and Acres of Land Winery.

In the city areas of Richmond, trails were chosen by their importance of need. Our first priority trails were those that posed safety hazards for pedestrians or that would service area schools, businesses, and residents the most. With the recent fatalities on the Robert Martin Bypass, it was seen as one of the roads of greatest importance, since it is already highly trafficked by pedestrians, and the fact that it is obviously dangerous. School children, who are prohibited from riding bikes to school because of the danger, were also seen to have the greatest priority for safety. Trails linking businesses and residential areas were also given high priority, as they are useful for fulfilling the needs of daily life.

The city area trails of Berea have already been proposed and adopted by the City of Berea. We drew our information from their plan, and from strategic planning meetings with stakeholders and residents.

Those trails given the lowest priority were those that are purely for recreational use, or those that might require extensive reworkings of roads and existing structures. One such trail is the proposed trail through the Battle Field Park. No roads exist there, and significant changes would have to be made. The trail along the Riney B railroad bed is also one that would require extensive work, as many houses and other structures have been built on the flat land of the rail bed.

All of the trails support the integration of communities across the county that have long since been isolated by any means except cars and other motorized vehicles. Residents, businesses, government, and interest groups alike all agree that the necessity for more accessible routes through the county, by bike or by foot, are in great need and demand. Our plan incorporates the needs of all these parties in to one plan.

A complete set of maps for Madison County, Richmond and Berea are provided in [Appendix B](#).

## *Next Steps and Further Study*

Having completed this project is just the first step in a chain of events that will help to ensure a bright future for Madison County residents. We hope this report will serve as a framework for the upcoming steps required to realize the full potential of the Madison County Bikeways and Greenways plan.

The data that we collected from the Road Assessment Survey was given to the Madison County GIS department, who are compiling and formatting the data, and it will be released to the public in the summer of 2007. We have established a group of students, from those involved in the preparation of this plan, to act as liaisons and follow up with community questions and concerns into the fall of 2007. Their main focus will be to present this information to various interested parties, continue to drum up public support, and ensure that progress is made with the plans that have been laid out. We have created a website which will help keep the community updated on plans and progress, as well as allowing the public to contact us with any concerns or comments.

In the long term, it will be necessary to meet with developers to speak with them about incorporating sidewalks and bikeways into new projects. The city could help encourage this by providing incentives for developers who include bikeways into their plans. Also, with the building of Colonel Walk linking campus and downtown, there should be a project developed to improve other downtown sidewalks to provide a safer and more reliable system for pedestrians. Hopefully, Colonel Walk will act as a springboard from which we can move forward with the other development projects that this report has identified.

This project has completed in just a few short months what usually takes a year to eighteen months. Because of this, there is a great deal of room for further research in areas that we were simply not able to dive into very deeply. We feel that an analysis of traffic flows and volumes would compliment our Road Assessment and would help to provide further insight into locations that would make the best routes for bikeways. A study that looks at the usage patterns, as well as safety and maintenance issues of the existing bike trails in Madison County would be helpful as well. Furthermore, a more in depth survey of the community would help to both understand their desire and concerns but also bring more attention to the need for this project. Finally, funding strategies could be looked into in order to help pay for the building of Madison County bike trails. There are numerous grants available from state and national governments and organizations but we were unable to fully research these opportunities.



# Madison County Bikeways and Greenways Plan

EKU "Land Use and Environmental Planning" Service Learning Project

Dr. Alice Jones, Faculty Supervisor

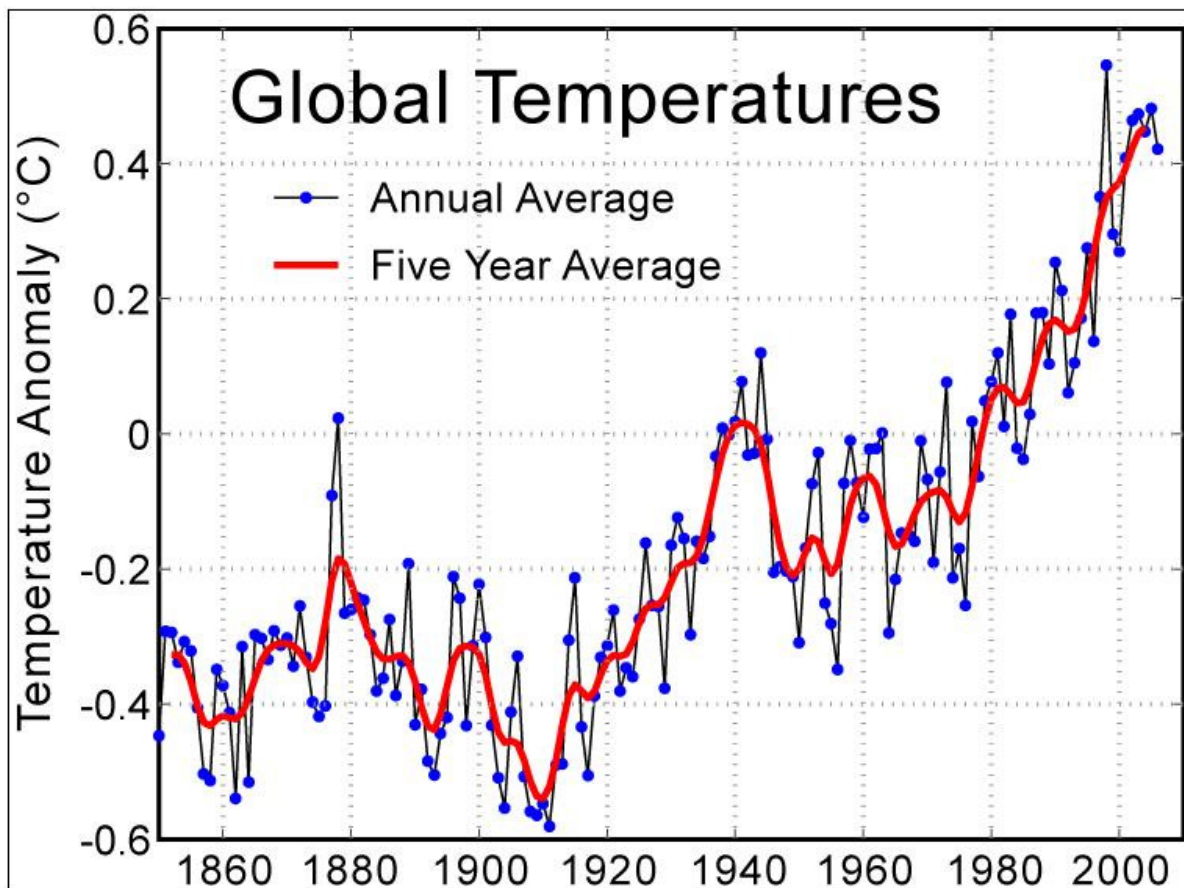
## Individual Student Research

**Brian Bentley's** individual project identified the meaning of global warming, the causes and effects, what one can do to help reduce carbon dioxide and other greenhouse gases in the atmosphere, and the advantages of pedestrian/bicycle trails and its impact on global warming. Several model bikeway plans in cities such as Portland, Seattle, and Toronto, were researched and analyzed for possible positive effects on global warming brought about by the construction of those plans.

Brian was able to identify seemingly small things that every community, including the Madison County, Kentucky area, can do to help reduce the harmful greenhouse gases that are

contributing to global warming. One of the actions being taken is the establishment of pedestrian and bicycle trails to help encourage less vehicle use. It is hoped that by adopting these plans, people will commute to work or run errands using their bikes instead of their cars.

The diagram below shows the average world temperature between the years of 1850 and 2006 and how it has steadily increased. One can see how much increase there has been throughout time, and how it has been steadily increasing since the late 1970s. This trend will, of course, continue, as human activities contribute to the greenhouse gases in the atmosphere.



<http://www.globalwarmingart.com> - Robert A. Rohde

# Madison County Bikeways and Greenways Plan

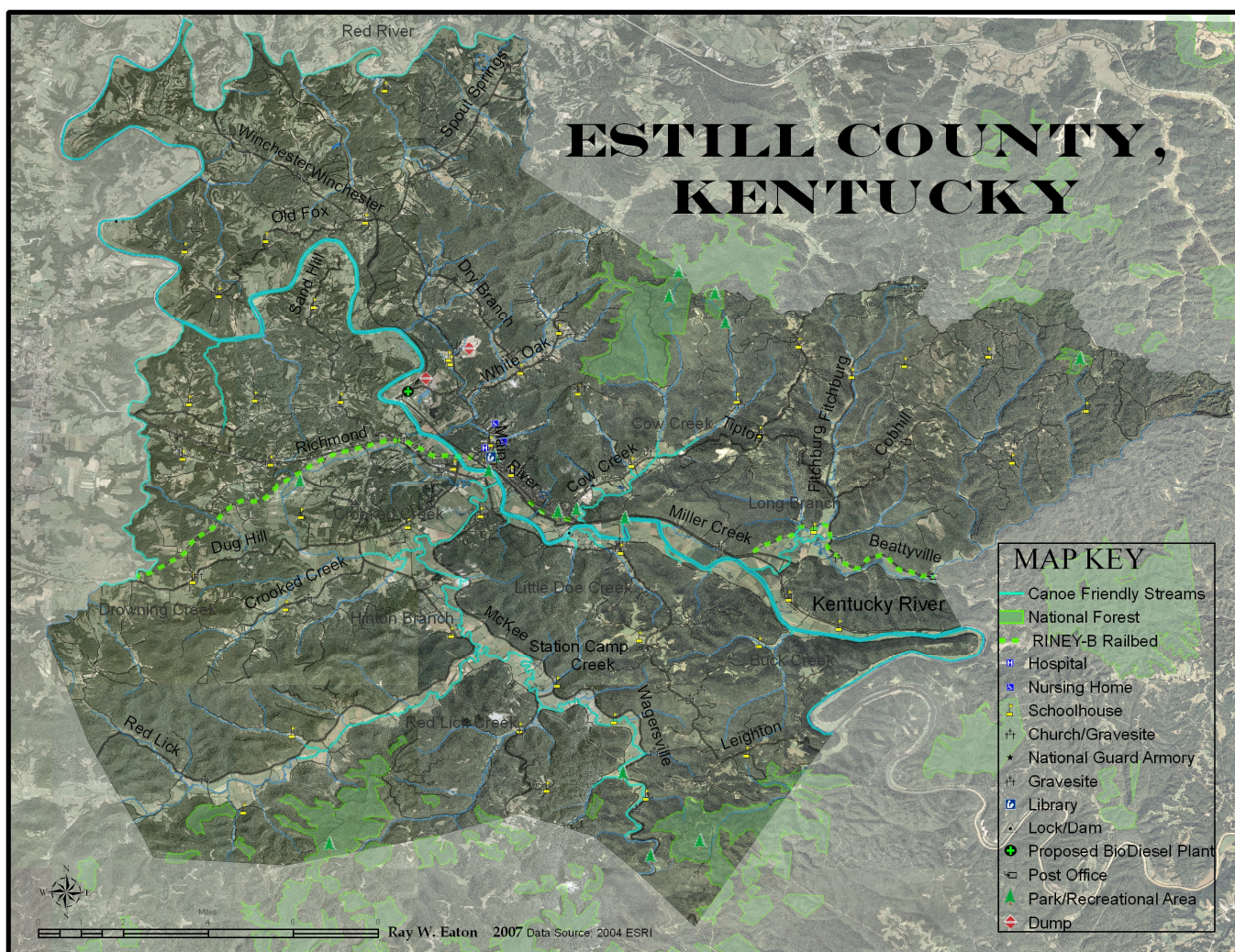
EKU “Land Use and Environmental Planning” Service Learning Project

Dr. Alice Jones, Faculty Supervisor

## Individual Student Research

Using his GIS skills and the information gained from the class, **Ray Eaton** has created a bikeways/greenways trail map similar to that of those for Madison County. A condensed version of the map is visible below.

This map could serve as an essential puzzle piece in the future connected network of bikeways and greenways in Kentucky counties. If the Estill County bikeways/greenways plan, along with the plan of Madison County, were to be constructed, the connection route could provide Kentuckians with a method of long-distance alternative transportation.



## Individual Student Research

**Misty Bonnette** was able to compare and contrast American and European bikeways and walkways for her individual project. Researched information included data concerning the numbers of bikeways in both the United States and European countries, as well as the population that uses the bikeways and walkways. In her report, she was able to answer questions about the difference in the number of people who use bikeways, pedestrian walkways, and trails in the United States and Europe. Specific items that were addressed included the cost of fuel, cost of drivers' licenses, taxes, and urban congestion.

Identification of the effects of bicycle and pedestrian trails in Europe were also used as possible resources for American trails. This will be shown through statistics as well as pictures. The collection of statistics will include categories such as, environment, crowding and congestion in cities, changed attitudes, and the health of the population.

However, when researching the European bikeways and trailways as models, Misty was also able to identify some important community responsibilities consisting of traffic safety, environmental problems, and driver awareness. These current European models may hopefully shed light on issues that have arisen concerning Madison County's proposed trails.

**James Conner** researched the possibility of building a zoo in Richmond. He found that the progressively growing city of Richmond is quickly developing and using up its precious farm land. Many think the land should be used for anything other than residential and commercial development. According to the current future land use map of Richmond,

located on the city's website, most of the newly opened farm land for development, along the by-pass, has been zoned for residential and commercial building. Richmond city officials are, or were, looking into possible tourist attractions. A zoological society would greatly benefit Richmond economically, ecologically, and educationally. While Richmond can not yet support a major zoo, as in the San Diego Zoo, Richmond could facilitate a small zoo, as in the Atlanta Zoo.

He also found that Richmond's steadily growing population has a mounting need for added employment and schools. Building a zoo in Richmond would help to raise the employment status and bring in outside revenue. Not only would a zoo improve the economy, but it would also increase the ecology and educational standings of Richmond and possibly Madison County. Although the zoo would be a non-profit organization, with private financial support and the increase in tourism to Richmond the zoo would create the income necessary to sustain its self and help Richmond collect the funds desired for other projects. On average a small wildlife park/ zoo profits around \$10 million about 20% comes from tourist and another 22% is generated from donations. Mostly all of its profit is given back to the zoo and the community.

**Jill Hunter's** project consisted of checking the accuracy of the National Land Cover Data for Madison County, which will then ensure proper planning and construction of county bikeways and greenways. The true term used for this kind of research is called ground-truthing. From past research, she had found that when the NLCD had been used for smaller

## Individual Student Research

projects instead of state level projects, inaccurate land cover classifications could later be detected.

The main corridor for land cover assessment was chosen by looking at the maps that were created in class and finding a proposed trail that would touch the many land cover classifications in Madison County. The class and members of previous meetings contributed to the decision of certain trails that were included in the initial mapping process. The Geographic Information Systems team created linear features to correspond with the suggestions.

The linear feature of the trail chosen for ground-truthing travels directly through the center of the county. It begins at the northern county boundary on Fort Boonesboro State Park Road, turning right onto Boonesboro Road, turning into Red house Road after crossing a waterway. The trail turns left on the Robert Martin Bypass turning into the Eastern Bypass at the Irvine Rd intersection. At the Berea Road intersection, Jill chose to take that trail to have an area in Berea ground-truthed as well. The trail follows Berea Road even at the fork in the road with Kingston Highway. Berea Road turns into Richmond Road North after leaving the Berea city limits, continuing on this road until it intersects with Estill Street ending the trail. Using this feature will incorporate many land cover classifications and in turn will prove the accuracy of which pixel or land cover classification is most likely misclassified or best classified.

Maps were created using the National Agriculture Imagery Project images as a base map to better identify driving locations and land cover in the field. The NLCD was overlain the NAIP, and the trail liner feature was then added along

with the state and local roads for use when driving along the corridor. The maps were segmented by zooming in enough to easily see the NLCD pixels and printed.

Polygons were drawn on the field maps by Jill's personal observances. Each polygon was labeled according to the 1992 NLCD land cover data classification scheme. Inaccuracies were noted as the polygons were drawn.

The polygons from the field maps were added through digitization in ArcMap, GIS software. The digitized polygons were then rasterized to 30-meter pixels to match the rasters of the NLCD. The pixels went through a series of statistic analysis to determine the NLCD inaccuracies.

The data from the Jill's procedure will allow the future planners of the bikeway/ greenway projects of Madison County to better make placement of the trails according to land cover that is correctly classified.

**Erin Jolly and Benjamin Gonzalez** have proposed the research and incorporation of the “Share the Road” program in Madison County. This community program encourages the education and responsibility of the motorists, pedestrians, and bicyclists that frequent the same roads for transportation. This plan has been utilized by many communities already and has proven quite beneficial in those both with and without a bikeways/greenways plan.

“Share the Road” is an education-based program that utilizes this motorist/pedestrian education, along with signage and awareness as simple tools to help road users be more aware of their surroundings. Somewhat in-depth examination of

# Madison County Bikeways and Greenways Plan

EKU “Land Use and Environmental Planning” Service Learning Project

Dr. Alice Jones, Faculty Supervisor

## Individual Student Research

other communities’ programs is essential to incorporating the program into the bikeways and greenways project because past successes can be mimicked to create success within our own program. Two particular “Share the Road” program communities that will be observed include those of the Delaware Valley, PA and the State of Minnesota.

Using the information collected from researching other programs, it can then be possible to create a blueprint for “Share the Road” in Madison County. A system of education will have to be set up, including a way to publicly inform the community members of their rights as road users (perhaps in the form of a website). Benjamin Gonzales, then used the background information, basic premise of the “Share the Road” program, and the quantified data from the class’ roadway assessments to assist in picking specific points throughout Madison County to place the essential “Share the Road” signage.

A combination of a “Share the Road” program and a bikeways and greenways trail system will make it safer for Madison County residents to utilize their non-motor vehicle traveling potential both today and in the future.

**Rebecca Jones’** project consisted of reexamining the building systems of Richmond and providing a plan for communities that are sustainable and more environmentally friendly than under present conditions.

The model communities will be at two sites: Site A by Madison Central High School and Daniel Boone Elementary School located at the current the Madison County Country Club and golf course and Site B by the new elementary

school on the new Richmond By-Pass. This plan will include a new city park and a new middle school at Site A and a new high school/middle combination by Site B. Each of these communities will be equipped with a grocer, a druggist, a hard ware store, a clothing store, and a day care center. All of these businesses will be locally owned and run by someone in the community. All are centrally located near schools as well.

The sight plans were designed for both of these communities and provide detail the reasoning for the designs. Also included are past and current examples of comparable sustainable communities. Lastly, a reorganization of the entire city of Richmond was provided, utilizing the existing infrastructure while allowing for growth within the city, and not expansion itself, in a sustainable fashion. Use of the information concerning sustainable communities, the environmentally-friendly nature of the bikeways and greenways plan can be encouraged to Madison County.

**Michael Phelps’** individual project built upon the road assessments that were done in class for the overall bikeways and greenways project. He continued to look at the sidewalk conditions through out the county and spoke with several runners in the community to determine what issues they deal with daily. There are many problems that the runners face that could easily be resolved. Proper crosswalks should be installed, sidewalk improvements made, and signs cautioning drivers about pedestrian walks are three things that could easily be done to improve the conditions in Madison County.

The second half of this individual project includes a description of the organization and resources that are

## ***Individual Student Research***

needed to put together a road race (such as a 10K or half marathon). Michael looked at how to obtain sponsors and funding as well as choosing the proper course and recruiting volunteers. He then took this information and applied it to the situation in Madison County in order to propose that such a race could, and ultimately should, be adopted by the area. There is plenty of opportunity and need that exists within the county concerning this issue, and it is necessary to bring attention to the recommended adoption of many of the before mentioned improvements.

***Vicki Pyle*** researched the accessibility of Richmond Kentucky for individuals in wheelchairs and with physical disabilities. Research was conducted in the community to see if Richmond is currently in compliance with the national Americans with Disabilities Act regulations. Included in her full report is a copy of ADA regulations to make sure that the potential trails and greenways in Madison County are built in compliance.

In order to gain a first-hand opinion on the subject, local Richmond citizens with physical disabilities were interviewed concerning their personal views of Richmond's accessibility. Questions asked included where they frequently travel and where they would like to travel that is currently inaccessible due to their use of wheelchairs and motorized scooters. A survey was given asking how the disabled get around Richmond, whether they have their own vehicle that is modified, public transportation, or their own mobility.

After the interviews, Vicki personally inspected one of the locations that the interviewees said they could not travel to because of accessibility issues was observed and surveyed

to see if it currently passes ADA regulations. A blank form for future reference with other trail and walkway maintenance and construction will be included in the report, along with recommendations of changes that need to be made to make the Madison County trail way plan ADA acceptable.

Pictures of the current conditions and conditions that do meet ADA regulations are included in her full research document, along with the interviews of the citizens of Richmond, her personally completed ADA form, and a blank ADA form.

***Merin Roseman and Brandon Jacobs*** provided a preliminary study and inventory of green spaces and selection of a proposed greenway system based on threatened/endangered species in Madison County, Kentucky. This greenway system is a recommendation to those who may feel it necessary to modify the original system later in its development process. Lands were selected for the greenway visually by inspecting aerial photography and by buffering streams, lakes, reservoirs, and existing green spaces.

Madison County growth is rapid and undeveloped lands are being utilized for residential and commercial purposes more each year. With the county growth, it is important to ensure that the county maintains and commits to a green infrastructure. Undeveloped spaces offer habitat for flora and fauna, as well as environmental remediation. There are thirty species listed in Madison County by Kentucky State Nature Preserves Commission whose populations are described as "Of Concern" to "Endangered". With increasing growth and development expected for Madison County, it is highly likely that these species' habitat will be further

## Individual Student Research

encroached upon. Therefore it is important that Madison County maintain and commit to a greenway system to enhance the land's natural ability to handle manmade pollutants and to maintain a habitat for endangered/threatened species as listed in the "Madison County Report of Endangered, Threatened, and Special Concern Plants, Animals, and Natural Communities of Kentucky".

Merin and Brandon set out to create a system of greenway hubs and corridors ensure the health of genes/populations. To create this system, the following research and tasks were accomplished:

- Inventory of existing public land/green spaces
- Buffer major streams (the 4 watersheds) of Madison County
- Buffer of minor streams
- Division of Madison County into 4 quadrants, in consideration of people in the county to have access to the greenways regardless of mobility
- Survey of land cover for the 4 quads- tried to connect or enlarge existing undeveloped lands and connect greenspaces to corridors and other hubs.
- Overlay of proposed trails for Madison County on our greenway system

The team found at least one very large swatch of land considered "greenspace". They incorporated this area into the project map because it serves as a safe habitat for deer and the threatened/endangered Running Buffalo Clover, and the area has greatly improved the water quality of Muddy Creek which runs through it.

This greenway site selection was created based on land cover, existing green spaces, buffers of lakes, reservoirs,

and streams in Madison County, and the Geography 325: Environmental Land Use Planning class trails proposal. Issues not considered in the site selection process of new greenways were landowners and property lines. It is expected that this site selection would be more effective if the greenway sites crossed as few property lines as possible.

**Nick Walendziak** researched the necessity of developing strong partnerships between the many organizations involved in moving forward in the Madison County trails project. His goal in researching this subject was to better understand the role of the newly formed non-profit organization, Madison County Greenways and Trails Association, Inc., in the class' plan. The purpose of his project included uncovering issues and making suggestions to the Madison County Greenways and Trails Association, Inc. to promote an efficient partnership.

Before development begins, the ideas of a partnership are often unclear. Agencies are generally in favor of the bikeways and greenways proposal, but individual responsibilities for those agencies have not been designated concerning the overall plan. However, this beginning stage is an important period for partners to come together quickly and delegate specific responsibilities addressed in the proposal.

To gain a better understanding of what partnerships "look like," Nick focused on case examples of other greenway / bikeway plans in Kentucky in the hope of making direct comparisons between those plans and the plan for Madison County. I will also use "tools" to help all partners better

## Individual Student Research

understand their role in this partnership including a survey, organizational chart, and maps.

A survey was created with more than ten questions in regards to partnership responsibilities. Questions varied from issues about responsibilities, timeline for the plan, and legal issues, among others. This survey was mailed to stakeholders such as mayors and city commissioners, the Madison County Greenways and Trails organization, the Madison County School Board, and ECU Facilities operators.

An organizational chart can be a helpful visual tool that multi-partner groups can use to understand one's role in all phases of a greenway/bikeway plan. This project's chart offers a chain of command for all partners involved and will help prevent confusion about responsibilities, along with promoting clear and concise communication.

Maps were created to show land owner right-of-ways and other properties, including maps of waterlines, sewer lines, gas lines, and road ownership. These maps should help give a sense of the number and location of different land owners that might need to partner to see this plan through.

This project will help set in motion a transition from ideas to action. The sooner strong partnerships can be forged, the sooner we can all begin to enjoy the benefits of our proposed greenway / bikeway plan.

**Hanna Watts** researched the history and circumstances that created sprawl in America and the advantages of walkable communities. She looked at how the introduction of

the automobile affected community development, encouraging the expansion of cities.

In her research she found that as access to private modes of transportation made individuals and industry more mobile, infrastructure was built to support a new geography based largely around the automobile. These advances in infrastructure and technology allowed industries to move away from city centers, creating new jobs in outlying suburban areas, and draining wealth out of older industrial cities. In turn, rent prices in cities dropped drastically and factories, often those producing the most hazardous pollution, were likely to locate in these abandoned urban areas.

Hanna also found that transportation infrastructure and systems focused on the private automobile leaves inner city populations, children, and the elderly with very few options for personal mobility. Wide roads with high traffic volumes, high speeds, and non-existent sidewalks or bicycle paths are not safe options for traveling on foot and inadequate public transportation keeps these groups sequestered in their neighborhoods.

Research shows that as people and industries move to the outskirts of cities, traditional commercial districts (“Main Streets”) succumb to neglect and fall into disrepair. The development of livable communities, that emphasize planning to accommodate pedestrians, not only encourages healthy physical habits, it also promotes the revitalization of traditional commercial centers. She found that reusing existing structures and retrofitting them with energy saving



## Individual Student Research

technology can be more environmentally friendly than tearing down old buildings and constructing new ones in their place.

Hanna believes that Historic Preservation and planning for Livable communities could be especially beneficial in an area like Madison County, which has more than 100 buildings and homes in the National Register of Historic Places and two colleges.

**Litany Webster and Kimberly Allen** created a PowerPoint presentation for those responsible for implementing the bikeway and greenway plan. The presentation addresses key points that need to be considered when creating a bike path in areas where wildlife can be found. Dr. Robert Frederick, a professor in the Department of Biological Sciences at Eastern Kentucky University, was able to offer information about the key points concerning Madison County wildlife.

Dr. Frederick offered information concerning major wildlife areas around Madison County and some of the types of wildlife that can be found in those areas. He also proposed ways to modify the bike paths that will prevent the hindering of wildlife that may come into contact with them.

Since some mammals respond negatively to obstacles such as roads or pathways, one aspect that Dr. Frederick suggested to be included with the bike paths were overpasses. Overpasses, in this sense, are areas in which the bike path passes over an area that is frequented by small mammals and other wildlife. These areas can be very small and the size of such overpasses will vary according to the size of wildlife that Dr. Frederick recognized as having a

need to cross a particular area that the bike path intercepts. He also pointed out that the surface type of the bike path can also play a role in whether or not wildlife will cross.

If these bike path modifications are not implemented, it can potentially cause a negative impact on the genetic diversity of a species because of potential mates being limited to only those that can be found on the side of the bike path on which they reside. Eventually, the repetition of mating partners could cause a lack in genetic diversity.

A pamphlet was created for the public that includes areas of interest that bikers will encounter as they are using the proposed bike path. In the pamphlet, photographs of some of these areas were included, as well as recreational activities and brief descriptions about the kinds of wildlife of the area. Maps of these areas were also put in the pamphlet in order to inform bikers of where they are and in what direction they are heading at all times.

**Anthony Young** researched the “Rails to Trails” program so as to possibly incorporate the program in to the class’ overall bikeways and greenways project. “Rails to Trails” is a national program that promotes the development of multiuse recreational trails along abandoned railroad lines. The program is championed largely in part by the non-profit advocacy, Rails to Trails Conservancy. Since it’s founding in 1986, RTC has achieved a great amount of success in promoting and gaining favorable legislation, providing useful information, leadership, and technical assistance to the bikeways and greenways movement. Nationwide the RTC has assisted hundreds of communities and “Rails to Trails” advocates to build over 13,000 miles of trails thus far.

# Madison County Bikeways and Greenways Plan

EKU “Land Use and Environmental Planning” Service Learning Project

Dr. Alice Jones, Faculty Supervisor

## *Individual Student Research*

Currently, a comprehensive plan for bikeways and greenways is being proposed for Madison County part of which includes a “Rails to Trails” segment. This is being developed for the local advocate, Madison County Greenways and Trails, which is an affiliate of the Kentucky Rails to Trails Council and the Rails to Trails Conservancy. Presently Kentucky ranks forty-fifth among the states in miles of developed Rails to Trails. However, the proposal to develop one in Richmond, Kentucky along the abandoned Richmond, Nicholasville, Irvine, & Beattyville Railroad line and a 109 mile trail from Lexington to Ashland Kentucky along the abandoned Big Sandy Railroad line, would have a significant impact on Kentucky’s standing if they are developed.

“Rails to Trails” programs have traditionally provided multi-use trails that provide a means for people to experience an enjoyable form of recreation; whether it is biking, jogging, walking, hiking, rollerblading, or horseback riding along some trails. They can also serve the dual purpose of providing a crucial educational link to history for current and future generations. They also promote awareness about the railroads which had once been there. Many of these trails incorporate the romanticism and nostalgia associated with railroads by using the former tunnels, bridges, trestles, and, the buildings that remain whenever possible. As a national model, the KATY trail in Missouri is a prime example of this historic link, not only does it offer the components of a former railroad, but a segment of this trail follows part of the route of the Lewis and Clark Expedition.

Programs such as this undertaking not only offer the aesthetic beauty of nature but provide health, environmental,

economic and interesting educational facets. The benefits associated with this program for the community far outweigh the negative aspects. The hope is that if the “Rails to Trails” program was constructed within Madison County, it will provide an economic boon to the county as the railroad once had.

## *Appendix A*

# *Sample Road Assessment Results*



## *Appendix B*

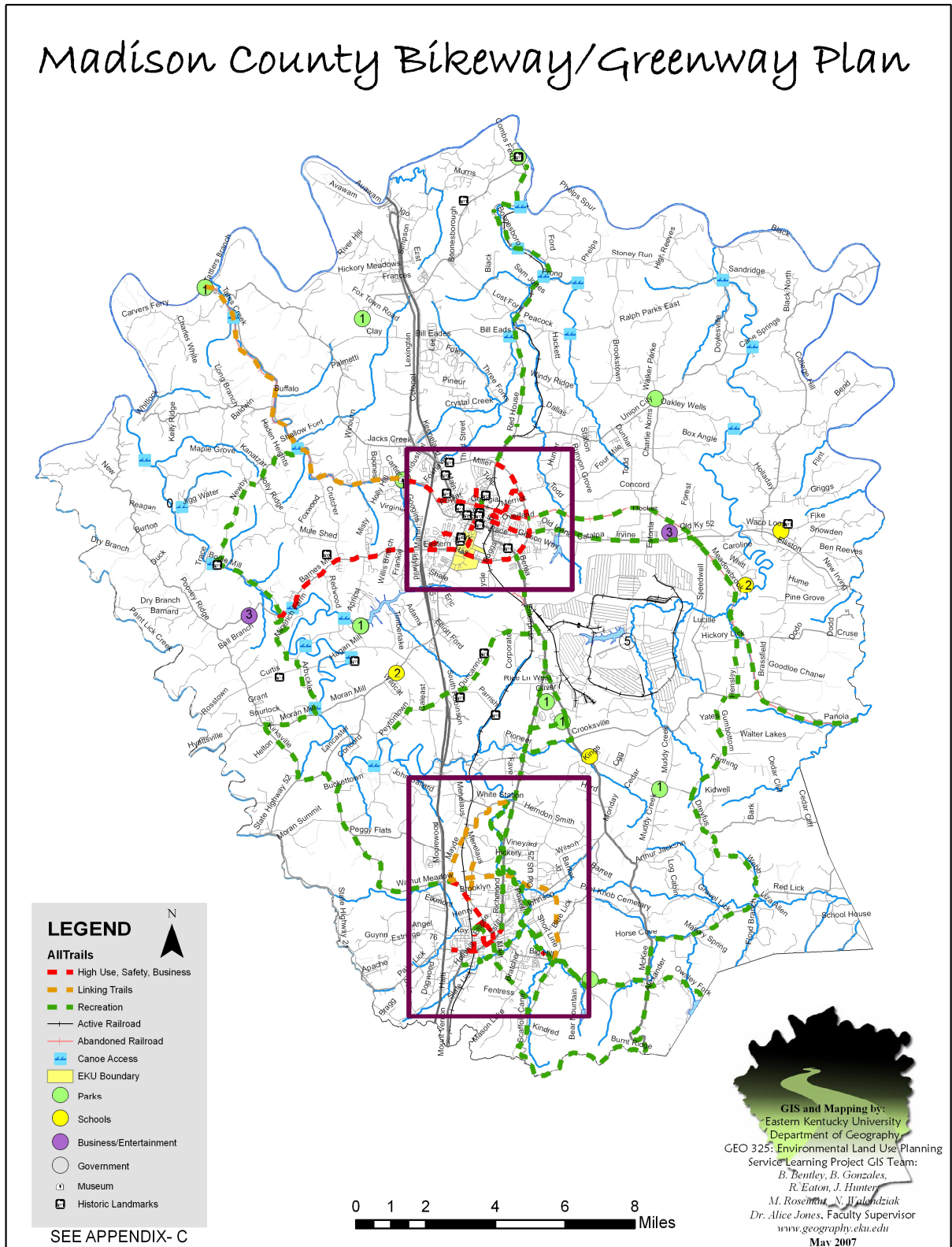
# *Proposed Trail Maps*

# Madison County Bikeways and Greenways Plan

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## Appendix B—Proposed Trail Maps

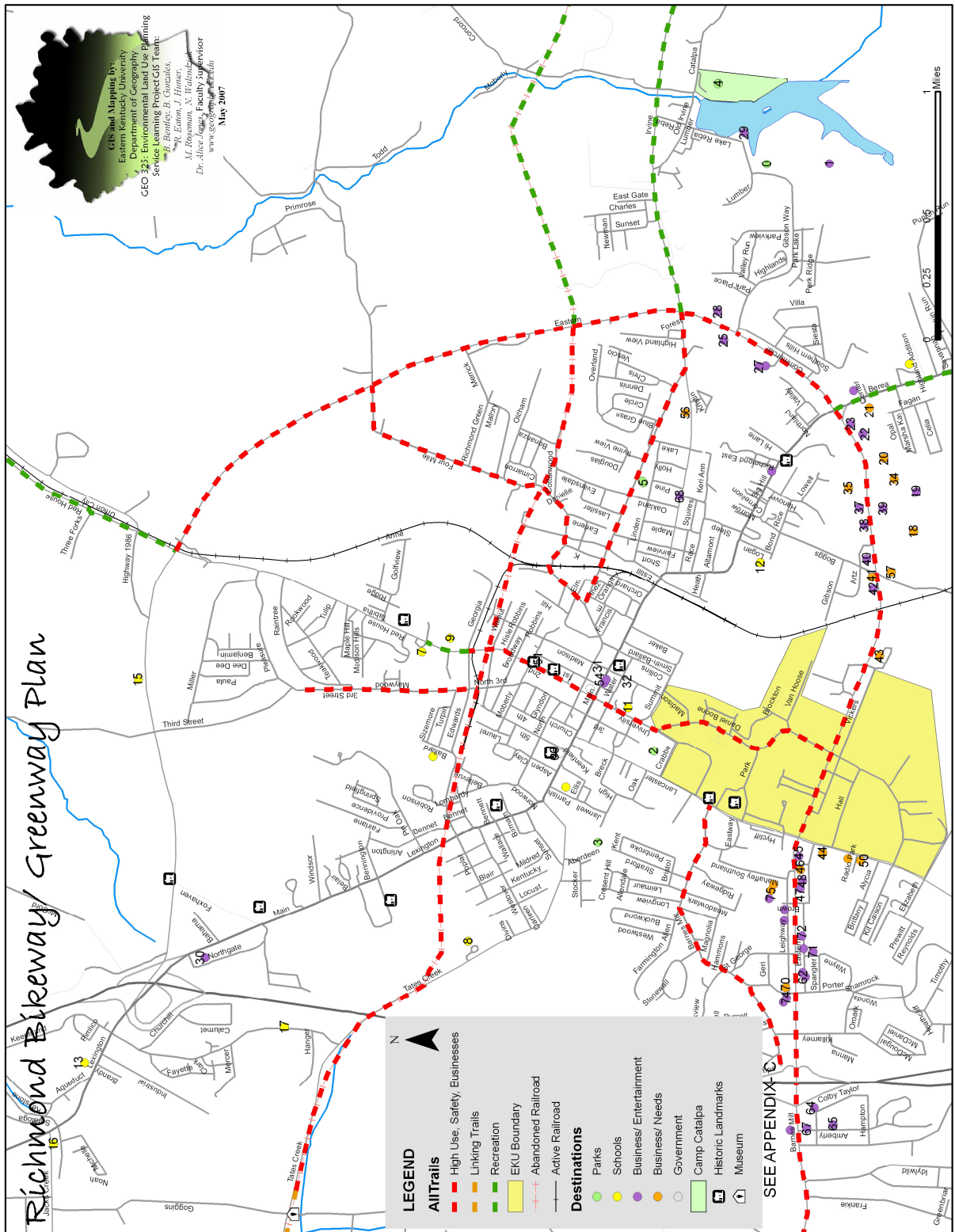


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## Appendix B—Proposed Trail Maps



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