

Developing a Bike/Pedestrian Plan Using ArcInfo and Public Participation

Rob Shumowsky, Madison County Council of Governments

Abstract: The Madison County Council of Governments is creating a bike/pedestrian plan for Madison County, Indiana. The focus of this plan is not only to benefit Madison County, but also to develop a regional network that fits into the surrounding counties' existing and future paths.

ArcInfo has been essential in calculating roadway conditions suitable for paths and in recreating maps to display at public meetings. Participants at such meetings mark desired areas on the provided maps, which are then put into the agency's bike plan geodatabase allowing for easy comparison of important areas. CommunityViz software is being used to develop a 3D simulation of a potential bike/pedestrian path on an abandoned railroad corridor to ease the "not in my backyard" building mentality.

This presentation will summarize the importance of public participation, local government relationships, and ArcInfo technology in developing a solid regional bike/pedestrian plan.

AGENCY PROFILE

The Madison County Council of Governments (MCCOG) is a cooperative, county-wide planning organization, funded in part by Alexandria, Anderson, Elwood, Pendleton, and Madison County, Indiana. Located 30 miles northeast of Indianapolis, the MCCOG jurisdiction contains rural, urban, and suburban areas. The Madison County Council of Governments strives to provide policy makers, public and private economic development professionals, public planning officials, and the general public with the knowledge and vision necessary to promote economic development while sustaining and protecting our area's heritage and natural resources. The agency looks towards technological advances to help provide the proper guidance as part of the planning process.

INTRODUCTION

Madison County has long recognized the need to provide pedestrian and bicycle friendly communities. In recent updates to the Madison County Comprehensive Plan, pedestrian and bicycle access was identified as an element to be included in future development. The central element of this plan is the identification of a countywide network of recommended bikeways and walkways to improve non-motorized transportation and access. It is the first step toward achieving the goal of countywide bicycle and pedestrian connections between schools, parks, libraries, community centers, and other important destinations.

PROJECT BEGINNING

Data collection was an integral part of the planning process. In order to get data implemented into the agency's GIS, extensive field work was required. The agency does not have ArcPad, or any other mobile GIS system, so data was collected the old fashioned way by writing information on hard-copy maps and then transferring it into digital data.

The planning team was fortunate enough to have time to spend one day riding with a local biking club, Spoke and Wheel. By riding on the roads throughout the county the team was given a real life feel as to what roads would be best for the bike and pedestrian routes. Getting a feel for what types of surfaces were best, how fast the traffic was moving on a given road and the scenery available were quite valuable. On roads that were not traveled by bike, MCCOG sent interns out in a car to collect data using the following sheet.

Bicycle Inventory Checklist



Surveyor: _____ Date/ Time: _____

Road: _____

From: _____

To: _____

Road Configuration

- 1) One Way or Two Way (circle)
 # of lanes (N or E) _____
 # of lanes (S or W) _____
- 3) Lane width (center to curb) _____
- 4) Lane Markings: yes or no
- 5) Centerline: yes or no
 painted _____ median _____
- 6) Paved Shoulder: yes or no
- 7) Shoulder Width _____
- 8) Parking: yes or no
 angled _____ parallel _____
- 9) Observed Speed _____
- 10) Posted Speed _____
- 11) Traffic Volume (Sample 5 min. Count) _____
- 12) Average Daily Traffic _____
- 13) # of Trucks (Semi & Delivery) _____
- 14) Road Surface
 Asphalt Concrete
 Chip & Seal Other
- 15) Surface Condition (circle rating) 1 2 3 4 5
 1= very poor/ 5= very good
- 16) Points of Interest _____
- 17) Subdivisions _____
- 18) Barriers/ Hazards _____
- 19) R.O.W. _____

Intersections

Please refer to the following types when identifying where impediments exist for cyclists. Please include direction of travel and any diagram or sketches as well.

Type 1: A single wide lane, changing to a two-lane approach at the throat of the intersection, or two through lanes with parking that becomes a three lane approach with the inside lane designated as a forced right turn.

Type 2: Forced right turn, when the curb lane of a two-lane approach forces the cyclist to the right.

Type 3: The throat of the intersection approach is widened for an exclusive right turn and the lane is striped with a solid line.

Type 4: Any other impediment; please clarify through a diagram.

Diagram:

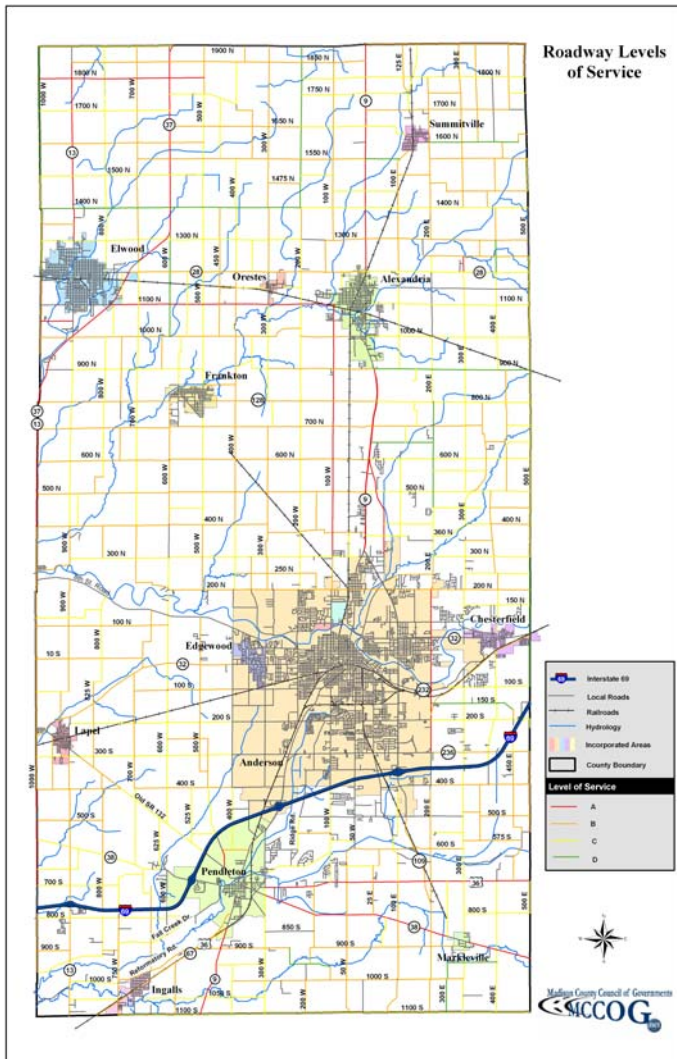
Description: _____

After the data was collected, a feature dataset was created within a geodatabase that was specifically designated for the bike/pedestrian plan data. The county's centerline file was copied and pasted into this dataset. Attributes were created based on the inventory sheet, and attributes from the old centerline file that were not needed were removed. Each line segment of the centerline feature class contained information that allowed for analysis on which segments would be best to implement into the plan.

Once the data was collected, rankings of specific road conditions followed. Surface conditions, lane width, shoulder width and

condition, right-of-way, posted speed, and traffic volumes were all given rankings of one through five (one being the worst and five being the best) within the geodatabase. Ideal

routes were to have a high surface condition rating (smooth pavement), and lane width wide enough for cars and bikes. Paved shoulders were preferred, but rare. A right-of-way of approximately ten feet or more was ideal so that there would be as little land acquisition as possible. Finally, low speed of traffic and low traffic volumes were also considered to be the preferred conditions. All data was then mapped and symbolized based on ranking to show where the best roads were.



In order to gain a better view on road conditions for bike and pedestrian paths, a new field was created called “level of service.” To create this field, a simple equation that added the rankings of data previously mentioned was used. Third party software called CommunityViz made the calculations very simple as the formula was only inputted once, and then all the values in the level of service field were populated. Scores between 18 and 21 received a grade of A, which was the best. Scores between 15 and 17 received a B, 12 through 14 a C, and 9 through 11 a D, which was rated the worst. Roads which were given a D were not considered, and were recommended for improvements. A map was then generated to show the rankings for level of service.

PUBLIC INVOLVEMENT

The MCCOG saw public involvement as being an important key in developing its bike and pedestrian plan. Meetings were scheduled at the beginning of the process in all the communities within Madison County. Attendance was mixed with small numbers being at the less populated communities and bigger numbers in the larger communities. To gain public input various maps were plotted at large sizes, and meeting attendees were divided into groups to discuss what they thought was significant. The groups wrote on the maps noting features around their communities in which were important to possibly

be included on the chosen routes. After about 20 to 30 minutes, group leaders were designated and presented their maps in front of all attendees explaining what their group decided. The maps were then taken back to the office where the information was added into the biking feature dataset.

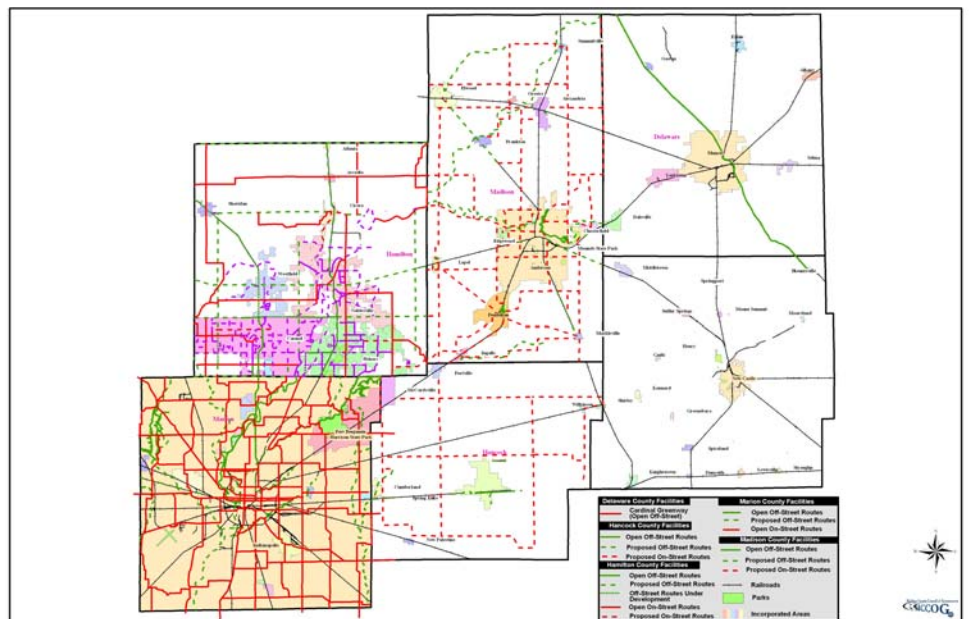
In addition to the meetings open to the public, the MCCOG also established a steering committee made of community and business leaders, elected officials, and bike enthusiasts. This committee met throughout the development period to provide information on what they saw as being important. While the public was more focused on the enjoyment of having bike and pedestrian paths, the steering committee focused more on the benefits to the communities and how having a plan could provide for economic development, population growth, and an increased quality of life.

The final form of public input came from the local biking club Spoke and Wheel. This group rode throughout the county weekly on rides ranging from 15 to 100 miles. Their experience and knowledge was extremely important in developing the plan. They were able to provide information and ideas that could not be found in the public meetings or the steering committee. For instance, the group explained the most scenic areas, where the best locations for stops existed, and even which houses had dogs that were not chained and would chase bikers.

REGIONAL THINKING

In the beginning of the process, the MCCOG saw the importance of creating its bike/pedestrian plan with a regional focus. In planning, it is important to remember that county lines are nothing more than jurisdictional boundaries, and that life continues past these borders. Madison County shares its boundaries with six different counties, and is about five miles away from another (Marion County), so regional planning was especially important for this area.

The staff contacted the surrounding counties to determine their available data regarding bike and pedestrian plans. The contacts supplied the MCCOG with spoken information, maps, and shapefiles which were later incorporated into MCCOG's biking geodatabase.



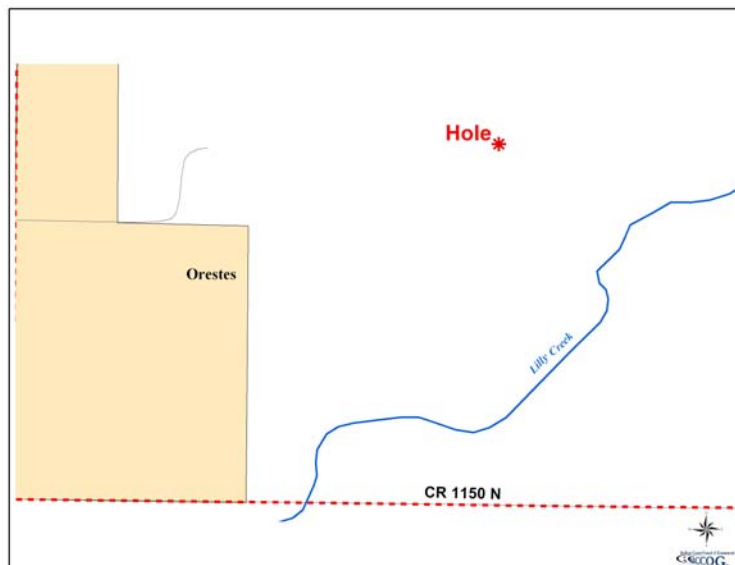
The levels of development in each county varied. To the east, Delaware County is home to the longest multi-use path in the Indiana, the Cardinal Greenway. This was one of the first rails-to-trails projects in Indiana, and stretches some 27 miles, with more to be developed. The MCCOG focused its plan to link to the Cardinal Greenway so it would be easily accessible for Madison County residents, along with providing a path for those outside the county who want to visit.

Hamilton County, directly toward the west, and Marion County (Indianapolis) to the southwest have the most developed bike and pedestrian pathways in Indiana. Hamilton County is home to hundreds of miles of trails with a combination of on-road, off-road multi-use, and off road trail paths. Both Marion and Hamilton Counties are home to the most popular trial in Indiana, the Monon Trail, which has over 300,000 visitors a year. The MCCOG focused on linking Madison County’s plan with the existing and proposed paths in both Hamilton and Marion Counties.

All of these counties had their systems in their GIS, and shared the data with the MCCOG. This made the regional planning much easier, as the agency did not have to recreate any data. It also helped to provide a good “role model” as to how the new system should be.

DATA AND MAPS

After the data and research had been gathered, GIS became an even more important part of the plan. Data creation, data entry, analysis, and map making were constants during the process. For example, a feature dataset called “Public Sites” was created to show feedback from the public meetings. Sites that participants marked on their maps as being important to their communities were included. Much of this data was normal and included features such as libraries, scenic areas, and interesting restaurants. There were a few oddities included such as a hole (see map below). One community noted that when the landfill near their boundary was built a hole was produced after the infill was taken away. People in the community felt that this hole could be used in some way for recreation. The MCCOG also added features from its dataset to the public sites including schools, parks, water bodies, etc.



In determining the best areas for the routes, additional maps and data were used. One important data type used was volume counts. As an MPO, the MCCOG collects volume counts on roads throughout its jurisdiction. These counts were overlaid onto the bike plan data in order to determine which roads

had the highest automobile levels. Keeping away from roads that were too busy was important so that bikers and pedestrians would both feel and be safe when enjoying the routes.

The agency also looked at the current public transportation routes within the county. Anderson is the only city that has a full time bus system, which is called CATS (City of Anderson Transit Systems). The CATS routes, as well as the bus stops and transportation centers, were already in the MCCOG's GIS, so it was easy to look at existing conditions. When developing a preferred route in Anderson, it was important to link the bike routes to the CATS routes in order promote bike travel as not only recreational enjoyment, but also of being an alternative of getting across town. For those people who do not want, or are unable to ride for long distances, linking bike routes with the CATS routes was important in promoting an alternative transportation mode.

Later into the process, different paths were chosen as potential routes for further evaluation. One map showing the potential routes was created from the public meetings. The steering committee also created one, as did Spoke and Wheel. The three maps created from each group were quite similar in some ways. All three focused on multi-use paths that followed creeks and rivers. There was also a connection focusing on schools, parks, and other recreational sites. Each group understood the focus on regional planning, and designed routes that would link all the communities together, as well as reach communities in the surrounding counties.

The various maps and data created were used extensively in narrowing down the selections to determine the best routes. Using the combination of public input as well as GIS driven data, the MCCOG developed a plan consistent with what was desired in the county. It provided biker friendly routes, and provided connectivity both locally and regionally. The plan included shared-road routes, off-road routes, and areas where multi-use paths along the roads would be best.

Upon selection of the routes, individual maps were created for each segment to place into the plan, thus allowing a better understanding of location and distance. Written descriptions about the segment were also included. These descriptions included recommendations about how the segment should be used based on the data collected.

The use of GIS was also significant after the finalization of the plan. The shared-road routes signs are to be placed at two mile intervals, or at turns in the road. The GIS provided an easy way of determining the number of signs to be used, and gave an approximate location for each sign. This data was added to the geodatabase. The proposed routes were also put onto the agency's ArcIMS website to allow the public easy viewing access of the future trails.

CURRENT STATUS

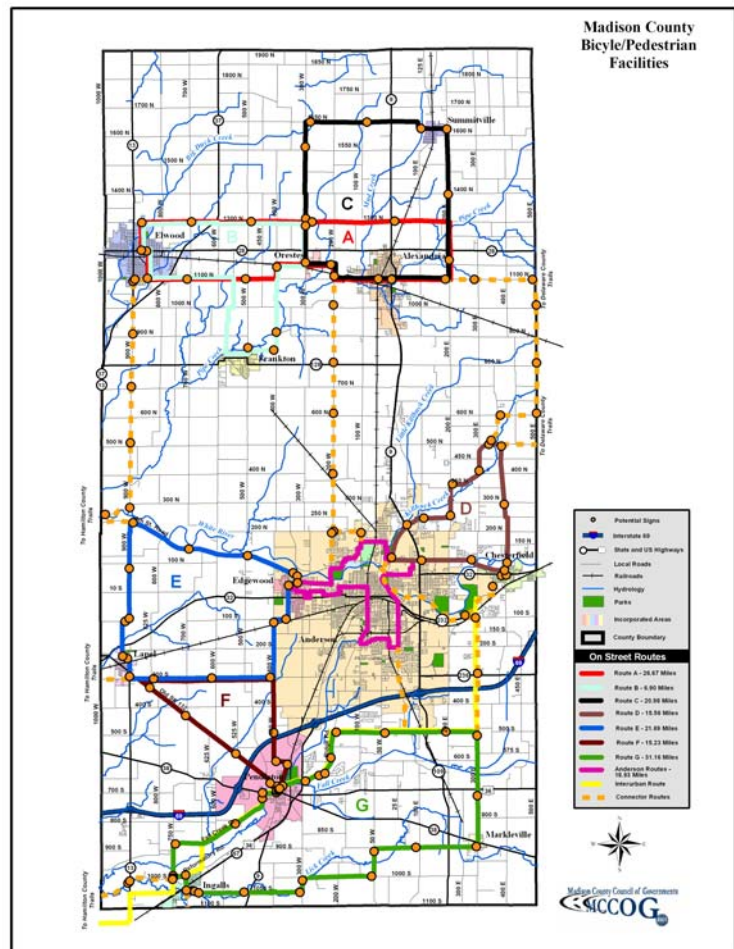
Following the completion of the written plan, the approval on on-road routes throughout the county was done by elected officials. Designated loops were generated from the final

selected routes to provide the best connectivity possible. On-road routes are presently the only ones being implemented at this time as these would be the easiest to get the project started in the right direction. These routes require the least amount of effort and funding by the county. Once these become successful, the generation of off-road paths along the rivers and creeks, as well as the creation of off-road multi-use routes along roads can be implemented.

Three of the final selected off-road routes followed abandon railroad corridors. Turning these areas into biking paths has been both popular and successful in many parts of the United States. However, the process can be extremely difficult with land acquisition and gaining the acceptance of property owners being time consuming and costly. To help aid in this process, the MCCOG has created a 3D GIS model of one corridor within the county. The focus is to show current conditions of the abandoned corridor and how adding a bike trail can help the aesthetics of the area. The agency will also use success stories such as the Monon Trail and the Cardinal Greenway to explain how these rail-to-trail projects have increased quality of life, spurred economic development, and given their respective communities much praise. The same story could eventually come true in Madison County with the proper steps.

CONCLUSION

The MCCOG, as well as the County and the communities within it, recognized the importance of developing bike/pedestrian paths in the area to increase the living standards of the citizens. Using public meetings and GIS were an integral part of the process. By staging a number of public meetings with biking groups, community leaders, and public citizens, MCCOG was able to receive a diverse amount of information to help aid with the process. ArcInfo was important in data creation and maintenance, enabling a regional perspective, map developing, and analysis of the potential routes. It easily allowed for information to be made available to the public. The finished plan will now allow the routes to develop and will be an added asset to the people of Indiana.



ACKNOWLEDGEMENTS

The author would like to thank Allan Henderson who was the project manager and person most involved in the MCCOG's bike/pedestrian plan. His tireless work and effort made this paper and presentation possible. The author would also like to thank Amanda Jacobs for assisting in the writing and editing of this paper.

AUTHOR INFORMATION

Robert Shumowsky
GIS Specialist
Madison County Council of Governments
16 E. 9th St., Room 100
Anderson, IN 46016
Phone: (765) 641-9482
Fax: (765) 641-9486
rjshum@mccog.net