Final Report - June 2001

North Central Florida
Regional Planning Council

ALACHUA COUNTYWIDE BICYCLE MASTER PLAN

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Acknowledgments

The *Alachua Countywide Bicycle Master Plan* has been prepared under the direction of the Alachua County Metropolitan Transportation Planning Organization (MTPO), in cooperation with:

- Alachua County
- Bicycle/Pedestrian Advisory Board
- City of Gainesville
- Florida Department of Transportation (FDOT)
- North Central Florida Regional Planning Council (NCFRPC)

This *Master Plan* is the result of a 12-month planning effort that was completed in June 2001. The *Bicycle Master Plan* is a comprehensive plan that will enable Alachua County to effectively, efficiently, and proactively plan bicycle facilities construction throughout the County. The *Plan* incorporates public participation in the establishment of the bicycle facilities needs priorities. This priority ranking will guide funding allocation to specific bicycle facility projects throughout the County and identify opportunities to construct bicycle facilities in conjunction with other roadway or development projects. It is Alachua County's vision to implement a *Bicycle Master Plan* that has broad community support and best addresses the needs of residents and visitors.

Bicycle Master Plan Photos Courtesy of:
Dekova Batey, City of Gainesville
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Executive Summary

The *Alachua Countywide Bicycle Master Plan* provides a blueprint for the expanded development of a countywide system of on-road and off-road bicycle facilities and programs that will serve the transportation and recreational needs of residents and visitors to Alachua County well into the 21st Century. The *Alachua Countywide Bicycle Master Plan* is the result of a project completed in June 2001 for the Gainesville Urbanized Area Metropolitan Transportation Planning Organization (MTPO). This study was conducted as part of the MTPO's *2020 Long Range Transportation Plan*. The focus of the *Plan* is fourfold:

- Expand the **on-road network** of bicycle facilities,
- Expand the **off-road network** of trails,
- **Improve safety** conditions for bicyclists through various safety education programs and by improving existing bicycling conditions, and
- Effect a **mode shift** to bicycling through the implementation of innovative policies and the provision of bicycle facilities and amenities

Central to the achievement of each of these four Goals is the development of a countywide bicycle network. Alachua County and the City of Gainesville have a long history of accommodating bicyclists in their transportation networks. The *Alachua Countywide Bicycle Master Plan* builds upon that history with a call to action that includes: innovative retrofitting of roadways with bicycle facilities; the continued inclusion of bicycle facilities with all new construction and reconstruction of roadways; the continuation and expansion of safety and mode shift incentive initiatives; and the institution of several new and innovative

policies for local, regional, and state government and agencies. This recommended course of action will help create a balanced transportation system that will improve the quality of life for the residents and visitors of Alachua County and continue to make it a desirable place to live.

Why is Bicycling Important to Alachua County?

Why should we accommodate bicycling? Beyond the fact that bicycles are legally considered to be vehicles with the right to use the roadway system, there are some other very good reasons:

Bicycling preserves the character and quality of life for the residents of and visitors to Alachua County.

- Bicycling is an important activity for Alachua County residents, many of whom already enjoy riding for both recreation and transportation.

- Bicycling contributes to Alachua County's image as a friendly, welcoming community.

- Bicycling, along with walking and transit, provides residents and visitors with multiple transportation choices that increase their mobility and reduces traffic congestion.

Bicycling is a necessary part of Alachua County's transportation system.

- Bicycle facilities are needed to form important connections

among the City of Gainesville, the University of Florida, and adjacent jurisdictions.

Bicycling preserves the character and quality of life in Alachua County.

• Bicycling is an affordable option when compared to the expense of owning and operating an automobile ($120/year for bicycles compared to over $5,000/year for autos). This is an important factor in Alachua County where there are over 50,000 community college and university students.

• Many trips made each day in Alachua County, and in particular the City of Gainesville, are short enough to be made by bicycle.

• Residents of Alachua County will be more likely to use the bicycle for transportation if there are safe places to ride: a 1990 Harris Poll found that 40% of U.S. adults say they would commute by bike if bike lanes and pathways were available.

Alachua County is home to the University of Florida, which generates a high volume of concentrated bicycle usage.

- The University of Florida, with over 40,000 students, is a major economic engine in Alachua County. A 1993 Board of Regents study revealed that about 12% of UF students, faculty, and staff bicycle to campus each day (a number that is substantially higher than all other Universities in the State University System combined). This amounts to several thousand commuters a day riding to campus.

- Providing adequate and safe bicycle connections from the surrounding community to the University can increase the number of bicyclists that ride to the campus and safely accommodate the thousands of bicyclists riding to campus today. In turn this can help relieve traffic congestion on the major corridors into campus and support the University's parking policies.

- The areas surrounding the campus feature high residential densities and a mixture of land uses that makes travel by bicycling a viable transportation mode.

How this Master Plan was Developed

This project was conducted by consultant Sprinkle Consulting, Inc. (SCI) under the direction of the Gainesville Urbanized Area Metropolitan Transportation Planning Organization and a Project Steering Committee comprised of planners, engineers, and representatives of various stakeholder groups and implementing agencies. In addition to the individuals on the Steering Committee (listed on page 3), numerous other individuals and organizations actively participated in Steering Committee meetings and work groups including representatives of the following:

- North Central Florida Regional Planning Council
- Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area
- The City of Gainesville
- Alachua County

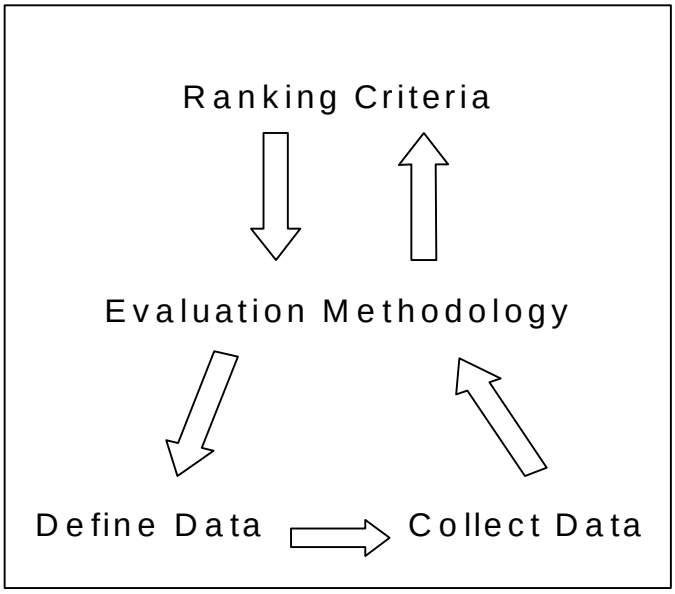
- Florida Department of Transportation
- The University of Florida
- The Regional Transit System
- The Bicycle & Pedestrian Advisory Board
- The Citizens Advisory Committee
- The Technical Advisory Committee
- Paynes Prairie State Park
- San Felasco State Park
- Suwannee River Water Management District
- St. Johns River Water Management District
- Gainesville Regional Utilities
- Gainesville Police Department
- City of High Springs
- FDOT District Two Rail Office
- Sustainable Alachua County

Draft plan materials and Steering Committee meeting notifications were also submitted to mayors of each incorporated town in Alachua County.

Two of the *Plan's* primary goals are to expand both the on-road bicycle network and the off-road (trail) network. In order to achieve this within a context of limited financial resources, the study network segments have been prioritized for bicycle facility construction. The ranking process is a five-step process (see Figure 1). The first step is to define and establish the **ranking criteria**. The second step is to determine the **evaluation methodology** that is used for each of the study segments according to the established criteria. The third step is to **define the data needs** for the evaluations. The fourth step, **data collection**, was undertaken to support the other steps of the process. Finally, the fifth step involves **evaluation of the study**

segments for bicycle facility retrofit funding **prioritization.**

Figure 1 Ranking Process



The study network for which the ranking was performed includes all of the arterial and collector roads in the County, including several local roads within the University of Florida Campus, and numerous potential off-road trail corridors. There is a total of 1,185 miles of roadways and trails in the study network, of which the on-road network comprises 823 miles. Approximately 229 miles of the on-road network have paved shoulders or bike lanes. The 362 miles of trails in the study network includes 58 miles of existing trails. Thus, 287 miles (or 24%) of the entire study network presently have bicycle facilities (bike lane, trail, or paved shoulder).

While Gainesville and Alachua County may lead Florida and perhaps the Nation in providing good bicycle accommodations, the majority

(58%) of the study network mileage does not currently provide good bicycling conditions. Based on a scientific grading scale that reports bicycling conditions on an "A" through "F" academic styled scale (with "A" being the best and "F" the worst), the current bicycling conditions for the study network are a "C". Furthermore, according to the recently adopted *Gainesville Metropolitan Area 2020 Transportation Plan,* the network's bicycling conditions for the study network will fall to a "D" unless action is taken beyond what is currently being done. Thus, there is a pressing need for Alachua County and its jurisdictions to improve those roadways that do not presently accommodate bicyclists. This must be done to build upon and enhance the existing bicycle network and to ensure that bicycling remains a viable, safe, and popular mode of transportation.

The provision of roads with good bicycling conditions plays an important role in the Master Plan's prioritization process.

The primary ranking criteria used to prioritize the study network segments include: an evaluation of **bicycling conditions**, an analysis of the potential **bicycle travel demand**, quantification of **public desire** for facility location, recommended **facility** and facility (unit) **construction cost**. The evaluation methodologies associated with each of these criteria are briefly described below.

Bicycle Quality of Service (QOS)

The bicycling conditions ranking criteria was evaluated using the *Bicycle Level of Service (LOS) Model*. The *Model* is the statistically reliable method of evaluating the bicycling conditions of a shared

roadway environment. It uses the same measurable traffic and roadway factors that transportation planners and engineer's use for other travel modes. With statistical precision, the *Model* clearly reflects the effect on bicycling suitability or "compatibility" due to factors such as roadway width, bike lane widths and striping combinations, traffic volume, pavement surface conditions, motor vehicles' speed and type, and on-street parking.

The *Bicycle Level of Service Model* is based on the proven research documented in *Transportation Research Record 1578* [3], published by the Transportation Research Board of the National Academy of Sciences. It has been applied to over 100,000 miles of evaluated urban, suburban, and rural roads and streets across North America. It is established by the Florida Department of Transportation as the recommended standard methodology for determining existing and anticipated bicycling conditions throughout Florida.

Latent Demand Method

The bicycle travel demand analysis was performed using the *Latent Demand Method*. This analysis is an essential component of the prioritization process. The *Latent Demand Method* determines *potential* bicycle trip activity within a corridor quantifying the potential trip interchange between trip origins and destinations. This method is used in lieu of bicycle counts as a determinant of bicycle demand. The reason bicycle counts were not used is that they only indicate *revealed* demand. Revealed demand fails to account for the bicycle trips that do not occur due to impediments in the bicycle transportation network. Thus a surrogate measure of demand must be used to account for these *latent* bicycle trips.

[3] Landis, Bruce W. "Real-Time Human Perceptions: Toward a Bicycle Level of Service" *Transportation Research Record 1578*, Transportation Research Board, Washington DC 1997

The *Latent Demand Method* quantifies the potential latent bicycle trips for each study segment corridor by assuming that the impediments to bicycle travel are eliminated throughout the study network. It is a probabilistic gravity model that uses readily available demographic data and employs simplified GIS geocoding and data input for spreadsheet-based gravity model computations. The *Latent Demand Method* estimates the relative probability of bicycle travel on an individual corridor segment; it is based upon the proximity, frequency, and magnitude of adjacent trip generators and/or attractors. It quantifies latent bicycle travel demand by excluding the effect of all travel impedances except that of distance. The datasets of the adopted *Gainesville Metropolitan Area 2020 Transportation Plan* Preferred Alternative were used in the *Latent Demand Method* analysis.

Public Input

Public input is an important criterion in the formation of this *Plan*, specifically in the identification of the potential off-road trail network and in helping to further prioritize the analytically ranked network segments for bicycle facility retrofit funding. Pubic input in the development of the *Alachua Countywide Bicycle Master Plan* was achieved through two rounds of public workshops.

The 1st round of public workshops was held principally to identify the locations of potential trail corridors throughout Alachua County. In addition to identifying potential trail corridors, workshop participants also ranked the draft Goals for the *Alachua Countywide Bicycle Master Plan.* Each attendee was given a questionnaire that allowed them to rank, in order of importance, the four Goal categories that had been established by the *Plan's* Steering Committee. The participants ranked the continued development of an on-road bicycle network as

the top goal, with the development of an off-road network of trails ranking a close second. The goals and objectives are further discussed in Section 1 of this *Plan*.

The establishment of a minimum Bicycle Quality of Service (QOS) standard (or standards) is an essential component of this *Plan.* The attendees were provided with a questionnaire that asked them to vote for a minimum standard. The questionnaire described the existing average countywide bicycle quality of service ("C"). They were also provided with a general time frame and cost of achieving the different target standards. The Steering Committee used the public input from the 1st workshop to establish a target Bicycle QOS of "B" for non-state roads and "C" for state roads.

The purpose of the 2nd round of public workshops was to present the draft prioritization results and latent demand results. A significant feature of this round of workshops was the ability of participants to review draft work products and recommendations, and to vote for where they wanted bicycle facilities built, for either on-road facilities or trails. A detailed account of public input and participation is provided in Section 3.3 of this *Plan.* Appendix "A" contains copies of the questionnaires used in the workshops as well as completed attendance sheets.

Facility Recommendation and Cost

Selecting the appropriate bicycle facility to construct is an important function of the prioritization process. The selection process for the general type of improvement needed for individual roadway segments, along with the associated estimated per mile construction cost, is illustrated in Figure 7, the *Bicycle Facility Selection & Cost Decision Tree,* in Section 4.3.

Since cost is always a determining factor in infrastructure investment decisions, per mile construction costs based on each segment's construction level of difficulty have been integrated into the prioritization process. These general costs are associated with typical roadway cross-sectional conditions and the resultant necessary general improvements. The per mile cost of right-of-way acquisition is also used in determining the (total) facilities construction cost.

Benefit-Cost Ratio

Each of the primary ranking criteria is combined into a benefit-cost ratio (or specifically an Index) to prioritize roadways and trails for construction. Benefit-Cost ratios are tools classically used in infrastructure investment planning and programming. They provide an indication of the relative value of improving a transportation facility with respect to other (candidate) transportation facilities. The individual terms of the Benefit-Cost factor are the ranking criteria evaluation methods. Those in the numerator (ΔBicycle QOS, Demand, and Public Input) are the "benefits"; the denominator is the "cost (per mile)". The "ΔBicycle QOS" term is the numeric difference between the existing bicycle level of service and the target bicycle level of service recommended in this *Plan.*

The results of the benefit-cost ratio are used to develop a prioritization list (needs ranking) for roadway and trail segments. The resulting prioritization list (needs ranking) is included in Appendix A & B. This prioritization list represents the final *needs* ranking, but not necessarily the construction order/schedule that bicycle facilities or trails will be programmed for construction. This final needs ranking provides an objective basis for County, MTPO, and local jurisdiction staff to select and schedule roadway and trail segment projects for bicycle retrofit improvements. Other deciding factors in construction orders/

schedule include opportunities to implement these bicycle projects in conjunction with roadway construction or special funding opportunities such as grants or partnerships.

Summary of Recommendations

The focus of the *Alachua Countywide Bicycle Master Plan* is the development of a countywide bicycle transportation network of on-road and off-road bicycle facilities as well as the expansion of programs to support bicyclist safety and effect a mode shift. These facilities and programs will serve both the transportation and recreational needs of the community. A crucial element of this *Bicycle Master Plan's* Action Plan is the establishment of target Bicycle quality of service standards for roadways. Based on input from the first public workshop, the Steering Committee's recommendation is that all new and retrofit construction on County and City roads and streets should achieve a Bicycle Quality of Service standard of "B", whereas state roads should achieve a "C" (on a scale of "A" through "F", with "A" being the highest quality bicycling environment, and "F" being the worst).

Using these Bicycle QOS standards, the percentage of the (on-road) network with bike lanes and paved shoulders would increase from 28 percent to 71 percent (an additional 353 miles of bikeways) if all of the recommended facilities were constructed. As the remainder of the report demonstrates, much of this expansion of the on-road bicycle network will be achieved through minimal cost approaches using techniques such as re-striping during repaving projects or constructing paved bike shoulders on roads with buildable shoulders.

The existing bicycle network is identified on Maps 4A & 4B at the end of this *Plan*. The maps also depict the identified and prioritized study segments that currently fall below the County's target Bicycle Quality

of Service standards. The aforementioned evaluation criteria ***(Bicycle Quality of Service*, *Latent Demand*, Public Input**, and per mile construction **costs)**, provide a rational and objective basis for the prioritization and retrofit construction of roadway and trail corridor improvements recommended in this *Plan*.