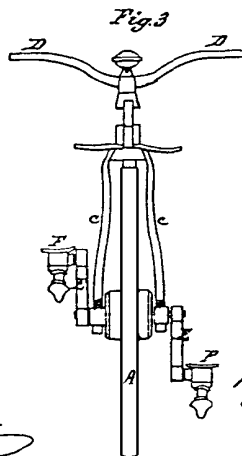
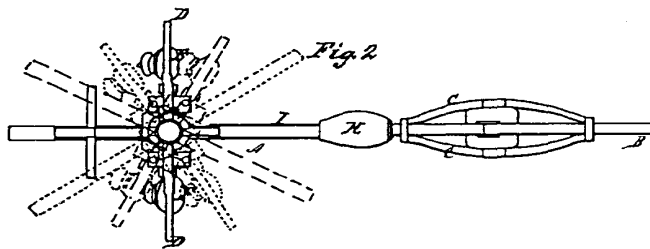
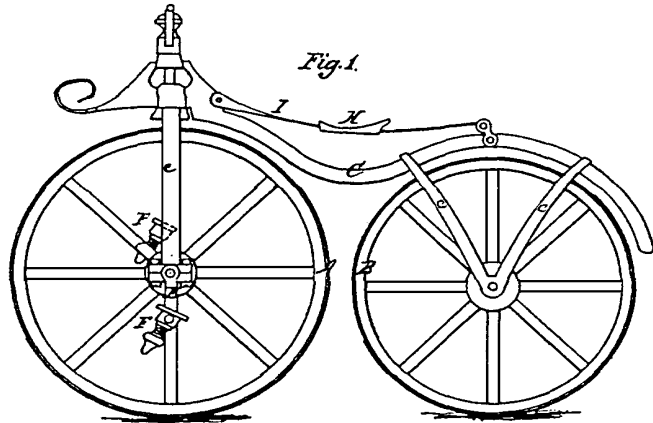


Orange County, North Carolina

P. LALLEMENT.
VELOCIPEDE.

No. 59,915.

Patented Nov. 20, 1866.



Witnesses
Attest J. Little
John H. Shumway

Inventor.
Piere Lallement
John E. Case

A Bicycle Transportation Plan

Adopted by the Orange County Board of Commissioners April 6, 1999
Project Staff

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Foreword

Bicycle Transportation Plan Development Process

The following **Bicycle Plan Component Task Force Members:** Keith Burwell, Jennie Capparella, Kelly Evenson, Barry Freeman, Adrienne Jimenez, Adera Schienker, Mark Schulz, Chuck Tharp, and Chris van Hasselt are citizens of Orange County that were appointed by the Orange County Board of Commissioners on November 19, 1997 with the following specific charge: *To prepare a Bicycle Plan Component to the Transportation Element of the Orange County Comprehensive Plan, including recommendations for implementation, for all of Orange County outside of the municipal extra-territorial planning jurisdictions and the transition areas of the Joint Planning Land Use Plan. To perform research for presentation to the Orange County Board of Commissioners on innovative bicycle and pedestrian connections between subdivisions and other developments. The Bicycle Plan Component should be based on the recommendations in the DCHC Regional Bicycle Plan and the results of the 1995 Orange County Bicycle Suitability Study. Appointment to the Task Force will expire with the Board of Commissioners decision on whether or not to adopt the recommended Bicycle Plan Component.*

In addition to the appointed citizens Orange County Planning Board Member James Selkirk volunteered to assist in the development of the plan. Project Staff included: North Carolina Department of Transportation Maintenance Engineer for Orange County, Chuck Edwards, Orange County Deputy Sheriff, Major Don Truelove and Orange County Planning Staff consisting of Slade McCalip, Carmen Borg, and Lauren Tedder.

The Bicycle Plan Component Task Force created the Bicycle Plan over a 6-month period. The Task Force provided their input as to what the Goals of this plan should be and also which cycling routes are the most important to the cyclists of Orange County. Staff was then directed to develop a plan with recommendations for implementing the goals and making improvements to the priority routes. The Task Force endorsed the draft plan contained herein at their June meeting.

The Task Force consists of members with the following cycling experience: environmental non-profit organization leadership, life-long cycling advocate that does not own a car, epidemiology experts that want to increase opportunities for physical activity, average citizens that cycle, a former bike shop owner, a cyclist involved with real estate development, a cross county cycle commuter, an Effective Cycling proponent cyclist, and a cycle commuter interested in more safety improvements.

The Task Force made the following recommendations to the Planning Board and Commissioners regarding plan implementation; a) that a permanent and formal Bicycle Advisory Committee be established, b) that a Bicycle Coordinator staff position be established to support the BAC, c) that the 1974 NC Bikeways Act be updated, and d) that the current Bicycle Task Force remain together until after the Orange County Bicycle Map is completed. The Planning Board at its August 5, 1998 meeting endorsed the plan and the

recommendations of the Task Force with the following exception; the Planning Board would only support providing “part time” staff support to a Bicycle Advisory Committee and not a “full time” position.



Introduction

TRANSPORTATION PLAN

The purpose of this plan is to provide a Bicycle Transportation Component to the Transportation Element of the Orange County Comprehensive Plan. What exactly does this mean? It means that this is a plan intended to develop transportation facilities and programs for bicyclists. “A successful bicycle program would be one that made cycling safer, faster, and more convenient” (John Forester, Bicycle Transportation - A Handbook for Cycling Transportation Engineers, MIT Press, Cambridge, Massachusetts, 1994). The transportation need that this plan seeks to address is that of providing bicycle transportation facilities between the urban areas within and adjacent to Orange County that currently have adopted bicycle plans (this includes the Towns of Hillsborough, Carrboro, Chapel Hill and the City of Durham). This plan also seeks to provide rural areas with secondary bicycle transportation routes to provide access to the urban areas within and adjacent to Orange County.

ORANGE COUNTY BICYCLE TRANSPORTATION PLAN SUPPLEMENT

This is a companion document to the Orange County Bicycle Plan and is intended for use as an appendix, bibliography, and reference. The supplement is available upon request. For a complete listing of the contents of the supplement see the Table of Contents for this plan.

1993 DURHAM-CHAPEL HILL-CARRBORO (DCHC) REGIONAL BICYCLE PLAN

This was the first bicycle plan developed specifically for Orange County. The Orange County Board of Commissioners did not adopt the plan, but did direct that it be used as a planning guideline for the development of this bicycle transportation plan. The North Carolina Department of Transportation (DOT) had significant concerns about the plan. The Orange County Bicycle Transportation Plan seeks to address most, if not all, of those concerns.

NORTH CAROLINA DOT COMMENTS ON THE 1993 DCHC REGIONAL BICYCLE PLAN

The greatest concerns expressed by the reviewing agencies of the DOT were that the DCHC Bicycle Plan mixed transportation cycling with recreational cycling. Of particular concern to DOT was the fact that the DCHC Plan did not emphasize the different skills needed by the plan’s design cyclists for their use of roads for transportation cycling. DOT’s greatest concern is that the DCHC Plan would encourage cyclists without the proper traffic cycling skills to use roads during congested times and thereby increase the risk of accident to novice and child cyclists. The DOT’s comments are included in their entirety in Section A. of the Bicycle Transportation Plan Supplement.

BICYCLES AS VEHICLES

In order to develop bicyclist transportation facilities and programs, bicycles must be considered as transportation vehicles with rights equal to that of motor vehicles. In the words of John Forester, renowned Cycling Transportation Engineer, “cyclists fare best when they act and are treated as drivers of

vehicles.” Bicycles as vehicles is the foundation of this of this plan and also the law in the state of North Carolina, North Carolina General Statute (NCGS) 20-4.01 (49).

Does this mean that recreational bicyclists can't use the routes developed herein? On the contrary, it means that recreational bicyclists will no longer have to drive their cars to remote locations to recreational cycling, if this plan is implemented. The facilities described in this plan are intended to enable: bicycle commuters to use their bikes to ride to work, people at home and at work the option of riding their bike to shop and run errands, and also to enable recreational bicyclists to ride to their preferred recreational routes. This plan is not intended to enable children or adults without the proper bicycle handling skills and traffic navigation abilities to ride on roads. This plan does provide for the adequate education of children and adult bicyclists to enable them to learn bicycle handling and traffic skills.

NOT A TYPICAL NORTH CAROLINA COUNTY BICYCLE PLAN

Most, if not all, of the counties in North Carolina that are performing bicycle planning adopt a map of local bicycling routes without a schedule of improvements or performance measures to determine the progress of the plan's implementation. This is because state law (NCGS 136-51) vests the exclusive control, management and responsibility for all public roads outside of municipalities with the North Carolina Department of Transportation.

Therefore bicycling facilities outside of municipalities in North Carolina are under the control of the North Carolina Department of Transportation (see section II, Current Conditions, subsection D. Regional/State Policies, Programs and Regulations). Counties can request that bicycle facilities are constructed, but the decision to build the facilities is vested completely with North Carolina Department of Transportation. Currently the North Carolina Department of Transportation will provide for local review and comment on a proposed capacity improvement (road widening) or bridge replacement project. It is at this stage that bicycling accommodations are included in the project if there exists a local, regional, or state bicycle plan depicting that facility as part of an adopted bicycle route. It should also be noted that this plan does not make engineering design recommendations contrary to current North Carolina Department of Transportation's engineering design standards and policies as depicted in the North Carolina Bicycle Facilities Planning and Design Guidelines, (NC DOT Division of Bicycle and Pedestrian Transportation, January, 1994).

BICYCLING IS A SUSTAINABILITY INDICATOR

The number of bicycling trips and the percentage of total road mileage with bicycle facilities are sustainable development indicators (SUSTAINABLE DEVELOPMENT POLICY RECOMMENDATIONS FOR THE TOWN OF CHAPEL HILL, Department of City and Regional Planning, University of North Carolina at Chapel Hill, 1997, page 19). The Shaping Orange County's Future Sustainability Committee states that “*A sustainable community pursues ecological integrity and natural resource conservation as well as the satisfaction of basic human needs for the present and for future generations*” (Committee Report on Sustainable Community for Orange County, Shaping Orange County's Future Sustainability Committee, Orange County Department of Planning, 1998, page 1).

“Bicycling produces virtually no air pollution. Per mile air pollution savings are large because bicycling usually replaces short, cold start trips for which internal combustion engines have their highest emission rates, so each 1% of automobile travel replaced by bicycling decreases motor vehicle air pollution by 2% to 4%.” (see Section B. of the Bicycle Transportation Plan Supplement, Quantifying Bicycling Benefits for Achieving Transportation Demand Management Goals, Todd Litman, Victoria Transport Policy Institute, 1994, page 2).

ADVOCATE OF CHANGE

This plan advocates changes at the state, regional, and local levels to statutes, programs, policies and ordinances in order to accomplish the goals as set forth by the Orange County Bicycle Plan Component Task Force. These changes are especially needed by counties experiencing growth within and between the towns in their jurisdictions. These changes are also needed to enable counties in metropolitan planning areas of poor air quality to provide alternative transportation modes to the single occupant automobile.

In brief, for this plan to be implemented as recommended herein (i.e., inter-urban county bicycling facilities), changes must be made to the amount of funding that is “earmarked” for cycling and in the way that roads, that are also bicycle routes, are planned, programmed, constructed and maintained by the North Carolina Department of Transportation. Cycling funds must become a dedicated source of funding similar

to that of the Highway Trust Fund (see Section C. of the Bicycle Transportation Plan Supplement for an excerpt from the 1998-2004 North Carolina State Transportation Improvement Program), whereby a portion of state transportation funds can only be used to build and improve bicycle routes. Also changes made at the state and regional levels will likely require commensurate changes at the local level to subdivision regulations and zoning ordinances.

CURRENT PLANNING FRAMEWORK

In Orange County the adopted Board of County Commissioners Goals and Objectives directs that bicycle planning be done. The FY 97-98 Goals and Objectives include a provision (Objective 4 - Update the Transportation Element of the Orange County Comprehensive Plan) to develop a Bicycle Component to the Transportation Element of the Orange County Comprehensive Plan. Also being prepared as a result of the Board's Goals and Objectives is the development of a Joint Master Recreation and Parks Plan. It has been recommended that this new plan also contain a Recreational Bicycling Element to address the concerns of county residents about child, novice and off-road cycling opportunities. These two Bicycling Plan initiatives (transportation and recreation) will provide an excellent opportunity at the local level to institutionalize cycling into land use planning and regulatory functions.

The Durham-Chapel Hill-Carrboro (DCHC) Metropolitan Planning Organization (regional transportation planning body) is currently developing a 2025 Comprehensive Transportation Plan. At this time there is little documentation on what, if any, changes will be made to the adopted 1993 DCHC Regional Bicycle Plan. However, some of the more critical comments raised by citizens (concerning the draft Goals and Objectives for the new plan) are that there are no performance measures or facility construction goals for bicycle transportation in the plan (see Section D. of the Bicycle Transportation Plan Supplement for the Transportation Advisory Committee meeting minutes for the May 13, 1998 Public Hearing on the 2025 Transportation Plan: Draft Goals & Objectives). It should also be mentioned that since the adoption of the 1993 DCHC Regional Bicycle Plan that the local governments of the Towns of Hillsborough and Chapel Hill, the City of Durham and Orange County have all adopted or are currently developing new bicycle plans for their respective jurisdictions.

At the state level, from 1987 to 1997 only 28 miles of paved shoulders have been constructed by NORTH CAROLINA DEPARTMENT OF TRANSPORTATION out of the 78,000 miles of roadway maintained by NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (*Bicycling & Walking in North Carolina - A Long-Range Transportation Plan*, Division of Bicycle and Pedestrian Transportation, North Carolina Department of Transportation, November 1996, page 28). It should be noted *that if NC DOT were to provide the lane widths and paved shoulders as called for in their own Roadway Design Manual and Bicycle Facilities Design Guidelines (see Section E. of the Bicycle Transportation Plan Supplement), then almost every (except for one) bicycle route depicted in this plan would have its travel lanes widened and seven of the routes would have been provided with paved shoulders.*

At the federal level President Clinton has signed the Transportation Equity Act for the 21st Century (TEA 21) into law. TEA 21 provides the same type of bicycle transportation facility funding opportunities with even more consideration and eligibility for funding bicycle transportation under the various transportation funding programs (see Section F. of the Bicycle Transportation Plan Supplement for a TEA 21 Summary). Once again, as in 1991, there is an opportunity to provide an increased amount of cycling transportation facilities. It should be noted that TEA 21, like its predecessor ISTEA, is more of an "enabling" legislation that will allow states to fund bicycle transportation facilities, *if the Governor and the Secretary of the NORTH CAROLINA Board of Transportation so choose to do so* under the enhancement and other provisions of the legislation.



I. GOALS & PRIORITY BICYCLE TRANSPORTATION ROUTES

A. Goals and Objectives – The Goals for this plan were developed by the Bicycle Task Force at their third meeting. Subsequent meetings were used for the discussion and development of how to implement the goals (i.e., objectives to be accomplished to progress toward accomplishment of the goals). The progress of the implementation of this plan can be gauged through an assessment of the number and type of pro-bike indicators.

GOAL #1.

CONSTRUCT BICYCLE FACILITIES IN ORANGE COUNTY THAT WILL MAKE CYCLING FOR TRANSPORTATION PURPOSES SAFER, MORE CONVENIENT, AND MORE EFFICIENT.

GOAL #1 OBJECTIVES. (or things that would make goal #1 happen if they were to happen)

WIDEN all Primary Priority Bicycle Transportation highway travel lanes to 12 feet and provide 4 feet of paved shoulder before signing them as a Bicycle Route (see Orange County Proposed Priority Bicycle Transportation Routes Map, July, 1998 on page 5a of this plan).

IDENTIFY staff and elected officials responsible for bicycling improvements.

INCLUDE bicycling improvements as a staff assigned responsibility with an elected official identified as being bicycling supportive.

ESTABLISH a Bicycle Advisory Committee at the local and regional levels.

CREATE and *FORMALIZE* a Bicycle Transportation Program in Orange County to include; commitment of resources, developing the primary and secondary routes, developing and implementing the education, enforcement, and encouragement programs to change cycling and motorist behavior to make cycling safer.

CHANGE state and regional bicycle transportation policies and programs to include dedicated funding for bicycle improvements to include funding “triggers” (i.e., in areas of poor air quality, more cycling facilities should be funded) based upon regional air quality.

CHANGE maintenance programs to include better surfacing and 4 foot paved shoulders on primary priority bicycle transportation routes.

PROVIDE intersection improvements and treatments to provide for better turning and through movements for cyclists to include bicycle pavement markings and “bicycle sensitive” traffic signal actuators.

GOAL #2.

INCREASE SAFETY ON ORANGE COUNTY BICYCLE TRANSPORTATION ROUTES.

GOAL #2 OBJECTIVES. (or things that would make goal #2 happen if they were to happen)

INCREASE child and adult cyclist traffic procedure education and bicycling skills.

INCREASE driver education and awareness of cyclist rights and traffic maneuvers.

INCREASE helmet and headlight usage.

PROVIDE cycling mapping and route signing on those routes improved for cycling.

PROVIDE law enforcement that targets illegal cyclist and motorist behavior in regard to the cycling rights in North Carolina law.

REVISE and *PROVIDE* for more accurate cycling accident reporting by cyclists, police, EMS, and emergency rooms.

PROVIDE “end of trip” and “inter-modal” cycling accommodations through local and regional land use and transportation planning.

B. Performance Measures

ASSESS the implementation progress of the plan. It is critically important to have an accounting of indicators as to whether or not the plan is progressing. The key performance measures for this plan are the annual number of miles of road lanes widened to 12 feet and number of miles of 4 foot shoulders constructed and also the number of persons attending the cyclist skills and traffic education courses.



II. CURRENT CONDITIONS

A. Use Data and Safety Problems

COMMUTER PROFILE or DESIGN CYCLIST

In the May/June 1997 issue of *Bicycle USA* (magazine of the League of American Bicyclists) an article was published that profiled what they estimated to be typical bicycle commuters (see Section G. of the Bicycle Transportation Plan Supplement for the complete article). The Task Force reviewed this article. A local survey would be preferable, but the funds and work program to perform such a survey were not included in the project design for the development of this plan. As reported in the article;

“What ‘Average’ Bike Commuters Revealed

Note that 20% of the respondents were female. In the results that follow female responses appear in “[]”.

The survey results indicate that the ‘average’ bike commuters are 40 [37] year-old professionals (59%[53]) with a household income in excess of \$45,000 per year who bike commute 10.6 [10.2] months per year. The average annual bicycle commuting distance was 1,921 [1,581] miles while these same cyclists rode an average of 3,387 [2,854] miles for all trip purposes. Just under 10% reported having an accident in the previous 12 months.

Our man [and woman]-in-the-saddle has bike commuted an average of 8.7 [6.4] years and make 8.2 [7.9] one-way commute trips per week. They reported their average bike commute each-way as 7.4 [6.4] miles and taking 30.9 [30.0] minutes. There were two hardy souls who claimed 42 [and 41] years of bike commuting.

For 71% [67%] bicycling was their primary commuting mode. For the rest, weather (39%[37%]) and needing a car at work (8%[7%]) were the two major reasons they didn’t bike commute more often.”

ESTIMATED ORANGE COUNTY BICYCLE COMMUTERS

There is no valid estimate of the *total* number of cyclists that commute to work by bicycle at this time for Orange County. There are however two reasonable travel behavior surveys that have been performed in Orange County by a local major employer and by the regional (three county) transit authority that indicate the potential bicycle commuter base in Orange County. As demonstrated below, these travel surveys indicate that the current amount of bicycle commuters in Orange County is in excess of 3,396. Since 1995 only these two surveys have been performed to determine travel behavior in Orange County.

- The major employer survey (University Commuting Study for the University of North Carolina at Chapel Hill, performed by the University of North Carolina Department of Public Safety) was performed to determine the commuting preferences of the students and employees of UNC. This survey indicated that there are approximately 3,396 persons commuting by bicycle per day during the academic year (514 employees or 3.7% of total employees and 2,882 students or 16.5% of total students). Any questions about the survey should be directed to Raymond Magyar, UNC Transportation Planner, at 962-5028.
- The regional travel behavior survey (the 1994/1995 Triangle Travel Behavior Survey, performed by the Triangle Transit Authority or TTA) was performed to determine the commuting and other travel preference of persons living in the Triangle Region of North Carolina (Wake, Durham and Orange Counties). This survey indicated that, in 1995, 1.4% of all trips made across the Triangle are made

using a bicycle. Any questions about the survey should be directed to Joe Huegy, TTA Senior Transportation Planner, at 406-1710.

Some calculations or inferences have been made using the above surveys to demonstrate the local nature of bicycle trip making propensity and are provided below:

- ✓ In 1995 there were 37,397 persons employed within Orange County. It is assumed that each of these persons made a trip to work and a trip from work for a total of 74,794 work trips from an employment site located in Orange County. This number does not include person trips for persons that live in Orange County but commute to jobs outside of the county (which could possibly be an additional 37,206 work trips as estimated by the Triangle Regional Modeling Team for the year 1995 using an unvalidated computer simulation model).
- ⇒ If the local major employer (UNC) factor of 3.7% is applied to total “in-county” employment trips of 74,794, then there would be approximately 2,767 bike commute trips for the whole county plus those bikers who commute to jobs out of the county by bicycle. Add the 2,767 possible bike employee commuters to the already existing UNC student commuter trips ($2,882 * 2 = 5,764$) and the estimated total possible county bike transportation trips per day is 8,531.
- ⇒ If the triangle-wide (TTA) average of 1.4% (i.e., the bicycling portion of all trips) is applied to the total possible number of employee commute trips (74,794) there would only be a possible 1,047 bicycle trips for county employees. Add the UNC student commuters (5,764) to 1,047 and you have an estimated total possible county bike transportation trips per day of 6,811.
- ⇒ And finally, if the national average of 0.7% (i.e., the bicycling portion of all trips) is applied to the total possible number of employee commute trips (74,794) there would only be a possible 523 bicycle trips for county employees. Add the UNC student commuters (5,764) to 523 and you have an estimated total possible county bike transportation trips per day of 6,287.

As demonstrated above, the current methods of inferring cycling trips from major employer and regional surveys is not as accurate as counting motor vehicle trips with a rubber hose across the road! Additional survey work is needed to provide numbers of cyclists by route and also to identify potential major employers that would have cyclists. In addition to a lack of travel survey data for estimating current bicycle usage, there is currently no valid method for predicting future bicycle commuting numbers.

However, according to the Bicycle News Agency, in their February 8th, 1998 webpage posting: “US Cycling Doubles - While Britain seemingly struggles to double cycle usage by 2002, the USA is celebrating news that the number of cycle commuters is up from 3.3 million in 1990 to 7.9 million now. A Bicycling Magazine survey is said to have found that if conditions improve, 29.9 million would bike-commute.” This would constitute a 359% increase in bicycle commuters.

At this time there is nothing to indicate that bicycle commuting will increase by 359% in Orange County in the near future. Nor is there anything at this time that indicates that all those persons who say that they will cycle commute in the future if better facilities are provided will live up to that promise. What is indicated in the future for Orange County automobile commuters is more frequent and longer periods of congestion on the arterial (or main transportation) highways of the county. There is research being performed at this time at the national and Triangle Regional levels to develop methods to forecast bicycle commute trips. This plan should be updated periodically to determine the validity of its recommendations based upon future bicycle commuter forecasts.

CYCLIST BEHAVIOR OBSERVATION

The Orange County Sheriff’s Department made the following observations about cyclist behavior in Orange County. As you will notice, both observations are about recreational cyclists and their programs.

- ⇒ Most of the cycling violations observed by the Sheriff’s Department are cyclists riding two or more abreast on rural roads.
- ⇒ Most of the cycling complaints received by the Sheriff’s Department are due to “unannounced” Bicycle Races and Tours. One race organizer placed flyers announcing their race in the mailboxes along the race route and there were no complaints received about that particular cycling event.

CURRENT CRASH DATA

Orange County cyclist crash data is hard to retrieve and must be done by hand. Each and every accident record must be reviewed individually to determine if cycling was involved or mentioned in the accident or emergency room reports. Currently, neither the police nor hospital emergency rooms maintain cyclist crash data as a separate category. State-wide data from “1990 to 1994 there were 6,400 bicycle/motor vehicle crashes reported to the Division of Motor Vehicles, or about 1,280 per year” (Bicycling & Walking in North Carolina - A Long-Range Transportation Plan, Division of Bicycle and Pedestrian Transportation, North Carolina Department of Transportation, November 1996, page 41).

Reprinted with the permission of John Forester is the following table from page 62 of his book Bicycle Transportation – A Handbook for Cycling Transportation Engineers:

**Table 5-16 Factors Responsible
For Cycling Injuries & Deaths**

	Percent
Cyclist error	50
Road-surface defect	20
Motorist error	8
Bicycle equipment failure	6
Pedestrians	4
Dogs	2
Insufficient signal clearance	1
Road-design defect	< 0.5
Road-capacity overload	< 0.5
Undetermined	8

This table clearly shows that increasing cyclist safety cannot be “engineered” alone. As cyclists cause one-half of all the their own injuries and deaths, an effective bicycle program would have to include trying to influence cyclist behavior through education, awareness and law enforcement. In order to target such a bicycle program to address Orange County specific behavioral and engineering deficiencies, accident reporting regarding cyclist crashes must be improved and made more extensive.

B. 1995 Orange County Suitability Analysis & 1998 Bicycle Plan Component Task Force Route Assessments

(for the full text of both documents see Section H. of the Bicycle Transportation Plan Supplement).

Both documents indicate the following major deficiencies common in all of the proposed bicycle routes:

- ⇒ No cycling intersection treatments.
- ⇒ No cycling railroad crossing treatments.
- ⇒ Inadequate bridge deck widths and low bridge rails.
- ⇒ Inadequate pavement surface maintenance.
- ⇒ Lack of debris removal from edge of pavement.
- ⇒ Lack of “pave-backs” (of at least 15 feet, see Section I. of the Bicycle Transportation Plan Supplement for diagram) to keep the gravel from driveways and other unpaved accesses from washing out onto paved roads.
- ⇒ Insufficient lane widths.
- ⇒ Lack of paved shoulders exacerbating the insufficient lane widths.

C. Orange County Comprehensive Plan, Zoning Ordinance, and Subdivision Regulations.

Each of these documents should be amended to include cycling provisions like those in the Orange County Economic Development District Design (EDD) Manual (see Section J. of the Bicycle Transportation Plan Supplement). The EDD Manual has provisions that recognize bicycle routes and end-of-trip facilities (bike parking racks and storage lockers). Further provisions need to be developed to: a) encourage employers of a certain magnitude and location proximate to a town provide lockers, showers, and changing rooms, and b) provide that residential subdivisions of a certain magnitude and in a proximate location to a town provide suitable street width and off-road connections to adjacent subdivisions and/or recreation trails or parks.

These documents should also be amended to insure the integration of this the Bicycle Transportation Component to the Transportation Element of the Orange County Comprehensive Plan with the Bicycle Recreation Component of Orange County Master Recreation and Parks Plan (currently under development).

D. State & Regional Laws, Plans, Programs, and Policies.

North Carolina State Law: Ultimate Control of County Road Maintenance and Construction

Jurisdiction over the construction and maintenance of public roads in counties, “the exclusive control and management and responsibility for all public roads in the several counties shall be vested in the Department of Transportation” (see NCGS, Chapter 136, Roads and Highways, Article 3- State Highway System, Section 136-51, page 112). Therefore, most on-road facilities within county jurisdictions are built as incidental projects during new road construction and then maintained by the North Carolina Department of Transportation. Although some on-road facilities are constructed as independent projects, these instances are rare. It appears that law does not expressly prohibit counties from constructing and maintaining off-road facilities such as bicycle paths in parks or in public right-of-ways.

NC DOT Transportation Improvement Program

The State of North Carolina provides funding for the construction of sidewalks, bicycle facilities, and multi-use paths through the Transportation Improvement Program (TIP). The ultimate control over the programming of the State TIP is vested in the North Carolina Board of Transportation. Bicycle facilities can be included in the TIP as incidental design features of a highway project or as independent projects. Independent projects constructed outside of municipalities are rare and usually have strong political support at the state level. Incidental (or ad hoc) bicycle improvements are being constructed although in a piecemeal fashion as road capacity is increased. Therefore, for a road to be improved for cycling it must first have to be improved for motor vehicle traffic.

NC DOT Bicycle Policy

The North Carolina Department of Transportation acknowledges bicycle transportation as “an integral part of the comprehensive transportation system in North Carolina” and formally includes provisions for bicycle travel in highway construction projects (NC DOT Transportation Plan, 1996, page 14). NC DOT also participates in the construction of independent bicycle facility projects through the TIP process. (NC DOT Transportation Plan, 1996, page 19). For a list of criteria for bicycle facilities project selection and the complete NC DOT Bicycle Policy, see Section K. of the Bicycle Transportation Plan Supplement.

There are no specific performance measures for bicycling facility construction as in the City of Portland Bicycle Master Plan, whereby they have listed (and therefore documented their accountability for making it happen) the following benchmarks: By 5 years - 75% of streets have appropriate bikeway facilities, By 10 years - 85% of streets have appropriate bikeway facilities, By 20 years - 95% of streets have appropriate bikeway facilities. Benchmarks in the Portland plan are also included for maintenance and end-of-trip facilities. The plan for North Carolina does not include any goals or benchmarks that are so specific that they could be used to affect the programming of the State Transportation Improvement Program for the construction of specific bicycle facilities.

NC DOT Pavement Policy

The following tables are recreated as excerpts from the NC DOT Roadway Design Manual and are intended to illustrate the existing pavement width policy for NC DOT (for the entire tables see Section E. of the Bicycle Transportation Plan Supplement). This policy should be enforced and endorsed by NC DOT by providing more funding toward increasing existing pavement widths and paved shoulders to the standard as depicted through existing maintenance programs.

DESIGN CRITERIA PAVEMENT WIDTHS

Functional Classification \ Design Speed	Current Year ADT*		Design Year ADT		
	< 400	>400	1000-2000	2000-4000	>4000
Local \ 50 mph	20	22	22	24	24
Collector \ 50 mph	20	22	22	24	24
Arterial \ 50 mph	22	24	24	24	24

PAVED SHOULDER POLICY FOR TWO LANE TWO WAY ROADS

Design Year ADT < 4000	Full Shoulder Width to be Turf.
Design Year ADT 4000-8000	2-Foot full depth paved shoulders.
Design Year ADT >8000	4-Foot full depth paved shoulders.

***ADT** – Means Average Daily Traffic or number of vehicles that will use that particular segment of the roadway during a 24 hour period.

NC DOT General Programs and Policies Summary

The North Carolina Department of Transportation is the agency that oversees the network of roadways, airways, railways and waterways in the state. Within the agency, the division with the primary responsibility for pedestrian and bicycle programs is the Office of Bicycle and Pedestrian Transportation (OBPT) (NC DOT Transportation Plan, 1996, page 14). The Bicycle and Bikeway Act of 1974 created the North Carolina Bicycle Committee, a seven-member citizen committee appointed by the Secretary of Transportation to assist OBPT in its efforts. This committee is charged with, among other things, “represent(ing) the interests of bicyclists in advising the Secretary on all matters...pertaining to bicycles and bikeways”, and “promot(ing) the best interests of the bicycling public...” (NC DOT Transportation Plan, 1996, page 17). See Section E. of the Bicycle Transportation Plan Supplement for a complete copy of the Bicycle and Bikeway Act of 1974.

Historically, the Highways Division of NC DOT has also participated in bicycle planning and facility construction through adding bicycling facilities to new roads as part of the Transportation Improvement Program. OBPT has been very influential in assisting, planning, programming and providing other assistance to the municipalities of North Carolina. Because of the passage of ISTEA in 1991 the demands on their services have increased several-fold. As it is incumbent upon local governments to provide dedicated funding to demonstrate their commitment to cycling, it is incumbent upon the Governor and the Secretary of the NORTH CAROLINA Board of Transportation to provide increased resources to OBPT to demonstrate a “renewed” commitment on the part of the State to bicycling.

The following is a brief summary of some of the key points in NC DOT’s bicycle policies and programs. The policies and details for each program are quite complex and tend to be difficult for practitioners not accustomed to working with large agencies to decipher, therefore this plan only refers to the key principles. Copies of each policy are in Section E. of the Bicycle Transportation Plan Supplement. A more comprehensive review of these policies and programs can also be found in the NC DOT Transportation Plan (1996).

Other NC DOT Programs

Other programs besides facility construction administered by the OBPT include development of design guidelines for bicycling and pedestrian facilities, designation of bicycling highway routes, mapping of local bicycle routes and bicycle safety promotion (NC DOT Transportation Plan, 1996, page 22).

Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (Regional Planning Agency)

The current policy of the DCHC MPO is to make their Direct Attributable funds (a funding category under the ISTEA Surface Transportation Program for MPO's with populations of 200,000 or more) available to municipalities within the MPO for them to construct independent bicycling projects. State Laws and NC DOT policies and programs in their independent funding of bicycling projects limit the DCHC MPO. In particular, the DCHC MPO cannot program funds for the construction of independent bicycle projects outside of municipalities without the cooperative programming of the same project by NC DOT. In other words, the DCHC MPO is constrained by State Laws and NC DOT Policies in what they can and cannot program for bicycle construction projects. The DCHC MPO is the only MPO in NORTH CAROLINA that is making its Direct Attributable Funds available to local governments for the construction of independent bicycle projects. However, a shortcoming of DCHC Regional Transportation Plans is that these plans have not, to date, contained real performance measures or benchmarks for bicycle facility construction (see Section D. of the Bicycle Transportation Plan Supplement for a copy of the minutes from the public hearing).



III. TASK FORCE STRATEGIES AND ACTIONS TO IMPROVE BICYCLE FACILITIES & PROGRAMS

- A. Facility Improvements for Roads (demonstrates commitment by state elected officials, Orange County's legislative delegation, and the appointed officials to the North Carolina Board of Transportation and North Carolina Bicycle Committee that represent Orange County)
- ⇒ Increase dedicated funding for bicycling facilities (need a provision similar to the Urban Loop Legislation whereby funds must be only used for constructing bicycling facilities), this is especially important for MPOs with poor air quality.
 - ⇒ Allow Counties to fund and construct alternative modes of transportation (i.e., sidewalks and paved shoulders) within NC DOT owned right-of-way along state maintained roads.
 - ⇒ Allow greater local input and prioritization of bicycle project construction programming.
 - ⇒ Provide greater emphasis and funding for the surface quality and debris removal on primary and secondary bicycling transportation routes.
 - ⇒ Include measurable goals and benchmarks (i.e., increase the total number of dedicated bicycle lane miles by 100 miles statewide, or 1 mile per county, per year for the next 20 years).
 - ⇒ Recognize those Bicycle Routes designated by the locals, regions, and state as being significant so that these routes receive the priority of funding for construction of paved shoulders and maintenance.
- B. Programs to Increase Cyclist Safety and Efficient Transportation Cycling (demonstrates commitment by local elected officials)
- * **Land Use Planning** (demonstrates commitment by local government officials):
 - ⇒ provide end-of-trip facilities (mostly bike parking racks and lockers with some employers providing showers and clothing lockers for employees) at multi-family residential, commercial, government, institutions (i.e., hospitals), schools, recreation sites, and major employment centers.
 - ⇒ include in access management plans provisions for bicycle routes (i.e., arterial & collector routes that are also bicycle routes should be more stringent on driveway access permits).
 - ⇒ in addition to access management plans, increase the construction of median divided roads and accommodate this road design in small area and countywide plans.
 - ⇒ make provisions for cyclists on transit routes with bike racks on buses and bike parking at stops.
 - ⇒ insure that adequate right-of-way is dedicated along bicycle routes to provide for 4' paved shoulders in the future.
 - * **Enforcement** (demonstrates commitment to cyclist behavior modification by local police & sheriff)
 - ⇒ make enforcement of cycling laws with cyclists and motorists alike a county priority, and pursue greater involvement of state and local law enforcement.
 - ⇒ require that cyclist violators face significant fines for breaking traffic laws or attend and successfully complete the League of American Bicyclist's Effective Cycling Course in lieu of paying the fine.
 - * **Education** (demonstrates commitment to cyclist behavior modification by local school board)
 - ⇒ expand the Effective Cyclist Course availability.
 - ⇒ teach Effective Cycling Course in Middle and High School Curriculums.
 - ⇒ include Effective Cycling Course materials in Drivers Education Classes.
 - ⇒ insure that the North Carolina Drivers Examination includes questions about cycling.
 - ⇒ include the Basics of Bicycling Course in Elementary Schools.
 - * **Encouragement** (demonstrates commitment by community at large for cycling)
 - ⇒ develop incentives for major employers to promote cycle commuting.

⇒ change the North Carolina Department of Transportation's policies to include more advertising of the benefits of cycling.



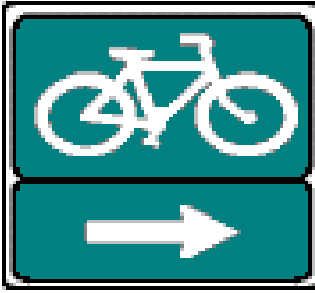
IV. IMPLEMENTATION

A. Schedule of Construction for 4' Paved Shoulders on all Orange County Primary Priority Bicycle Transportation Routes (no estimate was included for widening to 12' for those roads that need it).

<i>Date</i>	<i>Name</i>	<i>Location</i>	<i>Length in miles</i>	<i>Estimated Cost</i>
by 2000	Change local, regional, and state laws, plans, programs, and policies	Orange County		?
by 2005	Primary Rte 1 and 1/2 of Primary Rte 2	NC 86 from Chapel Hill to Hillsborough, and Old NC 10 from Hillsborough to Durham	13.1	\$1,310,000
by 2010	Remainder of Primary Rte 2	West 10 from Hillsborough to Mebane	6.6	\$660,000
by 2015	NC Rte 2, Primary Rte 3	Old Greensboro Road from Chapel Hill to Alamance County	8.9	\$890,000
by 2020	Primary Rtes 4, 5, and 6	Erwin Road, Whitfield Road, and Old NC 86	10.2	\$1,020,000
by 2025	Primary Rtes 7 and 8	Jones Ferry Road and Mt. Carmel Church Road	5.5	\$550,000
		TOTALS	44.3	\$4,430,000

NOTES:

- Improvements to the Orange County Secondary Priority Routes should be made using Operations, Safety and Maintenance funds.
- Unit cost estimation factor is \$100,000 per mile to include right-of-way acquisition and construction of 4' paved shoulders on both sides of rural highways. There was no adjustment for inflation from 1993 dollars to 1998 dollars. Source: Florida Department of Transportation, 1993.
- Total approximate Transportation Facilities Funding for Orange County from 1998 to 2004 = \$150,250,000. Source: NC DOT's 1998 to 2004 State Transportation Improvement Program. In other words, the 1.31 million dollars required to construct bicycling facilities for Orange County by the year 2005 is less than 1% of the total amount of funds allocated to Orange County for the construction of transportation facilities from 1998 to 2004.
- This table is only for illustrative purposes only. Better cost estimates can be developed by NC DOT staff using more up to date unit cost estimate factors for 4' paved shoulders and also by providing unit cost estimates for constructing additional lane width on existing roads.



V. EVALUATION

A. Assessing Progress - Pro-Bicycle indicators will provide the tasks, if completed, that will accomplish the objectives and therefore the goals of this plan.

1. The presence of a Bicycle Program Coordinator defines the very existence of a formalized bicycle program.
2. Citizens are involved through a formalized Bicycle Advisory Board (created by ordinance or resolution) and other advocacy groups.
3. Elected Officials and Government Professionals (engineers, planners, police and others) support cyclists.
4. Inclusion of Bicyclist considerations in annual budget.
5. Planning and policy documents include bicycling considerations.
6. Regulations, codes and ordinances mandate minimum standards for bicycling considerations.
7. Roadway design manuals ensure provisions for cycling.
8. Bicyclists are represented on the Planning Board.
9. Professional Staff regularly attends bicycle-related training.
10. Bicycling considerations are included in overall Transportation Demand Management Strategies.
11. Road Maintenance includes debris removal and other related cyclist considerations.
12. Better cycling crash reporting has been institutionalized.
13. Communities have been designated by the League of American Bicyclists as Bicycle Friendly.

B. Making Corrections

1. Annual report on the above Pro-Bike Indicators should be submitted to the Board of County Commissioners.
2. The Annual report should also contain recommendations (to include names, phone numbers and tasks to be accomplished) for the accomplishment of Pro-Bike tasks not completed.