

BICYCLE TRANSPORTATION PLAN

THE CITY OF RALEIGH | NORTH CAROLINA | APRIL 2009



Prepared for:
The City of Raleigh,
The North Carolina Department of Transportation (NCDOT),
NCDOT Division of Bicycle and Pedestrian Transportation,
and NCDOT Division 5





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Prepared by:
Greenways Incorporated,
Alta Planning + Design
CLH Design
Parsons Brinckerhoff





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ACKNOWLEDGEMENTS

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More than 700 City of Raleigh residents contributed to this plan through public workshops, volunteer activities, comment forms, direct dialogue, and public outreach.

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BICYCLE TRANSPORTATION PLAN

EXECUTIVE SUMMARY



A COMMITMENT TO BICYCLE TRANSPORTATION

The City of Raleigh is making a strong statement through this Plan to increase mode share and safety for bicyclists. Raleigh is one of the fastest growing cities in the United States. Planning today is necessary to meet the community and facility needs of tomorrow. As Raleigh continues to evolve and expand, the Comprehensive Bicycle Transportation Plan will provide one of the building blocks for the future to aid in improving the quality of life and offer alternative transportation options for the area. By offering choices and improved safety, the City of Raleigh can overcome its traditional shortfalls in bicycle facility development to create an integrated, safe, and convenient multi-modal transportation system.

The goal of this plan is to increase mode share and safety for all levels of bicyclists, and provide a bicycle friendly environment, that all citizens of Raleigh can benefit from. This Plan included significant levels of public input. The range of input included two public workshops and presentations, four meetings with the project Steering Committee, focused appeals for input from low-income communities, minority populations, downtown stakeholders and a citywide survey of bicycle interests and needs with over 800 respondents.

The City of Raleigh and a specially constituted project Steering Committee worked closely with the public to support the vision and preparation of this Comprehensive Bicycle Transportation plan. The North Carolina Department of Transportation provided funding to support bicycle planning.

This Plan provides a comprehensive approach toward identifying existing bicycle needs and deficiencies, presents recommendations to address those deficiencies, examines optimal design and policy improvements, and identifies implementation strategies for the development of quality bicycle facilities and programs. The plan provides a program of action for addressing the immediate and long-term needs for bicyclists and bicycle facilities. *There are several primary visions and goals for this plan:*

- Provide bicycle connectivity to destinations throughout Raleigh and the region.
- Provide a viable alternative to driving by developing bicycle facilities.
- Create an environment where all types of bicyclists including beginners and experts choose to bicycle to work, school, for shopping, for exercise, and for fun.
- Quadruple the 2000 census bicycle commute rate by 2015.
- Become designated as a "Bicycle-Friendly Community" by 2010 by the League of American Bicyclists.
- Complete the Top 25 bicycle network projects within the first five years of implementation.
- Launch new education, encouragement, enforcement, and bicycle facility development programs.



BENEFITS OF BICYCLING

For many years, small and large communities across the United States and throughout the world have been implementing strategies for serving the bicycle needs of their residents. They do this because of their obligations to promote health, safety and welfare, and also because of the growing awareness of the many benefits of bicycling. These benefits can include increased health and physical activity, reduced traffic congestion, affordable mobility, improved quality of life, reduced auto dependency, conservation of fossil fuels, increased economic vitality, increased community connections, and recreation.

EXISTING CONDITIONS ANALYSIS

The consultant team conducted an in-depth analysis and evaluation of current conditions for bicycling in the area. An evaluation of the roadway network, including field measurements, was conducted to identify roadways that could accept the retrofit of bicycle facilities in their current state.

Special consideration was given to current community plans, policies, and documents to better integrate the Comprehensive Bicycle Transportation Plan into the fabric of area planning efforts including the *Raleigh Comprehensive Plan*, and to incorporate the insights, visions, and findings of other plans as appropriate.

USE OF GIS

Geographic Information Systems (GIS) data was collected by the consultant from the City of Raleigh and Wake County. The consultant team inventoried both the existing on-road bicycle and greenway facilities, creating new GIS databases for each. This information was supplemented with aerial photography, transportation data, trip attractors, schools, parcels, hydrology, etc., to provide a comprehensive map and tool for developing the recommended bicycle network. Over 500 sites of bicycle crashes since 2008 were geocoded, mapped, and analyzed.

PUBLIC INPUT

Public input was gathered through two public workshops meetings, community outreach sessions and a public opinion form. Input at the public meetings was gathered in the form of map markups, comment collection and through discussion between the citizens, consultant team, and City staff. In addition to



Images from 'Bike to Work Week' events in Downtown Raleigh, 2008.



the online public opinion form, a significant number of paper copies were solicited at workshops and outreach sessions. Participants expressed that they would like more bicycle and greenway facilities, especially in underserved areas, that would provide connectivity to major destinations such as Downtown, Umstead Park, local colleges and universities. A combined total of 838 people completed the public opinion form during the planning process.

NEEDS ANALYSIS

The need and demand for a more accessible, safe and functional bicycle network is paramount throughout Raleigh. Health and wellness issues, bicycle crash data, levels of service, and community input all point towards the need for safe, functional accessibility for bicyclists. These needs can be met with a comprehensive system of on-road and greenway bicycle facilities along with the programs, policies, and funding to support this endeavor.

BICYCLE LEVEL OF SERVICE (BLOS)

A BLOS was developed for the Raleigh area to evaluate bicycle suitability on existing roadways. The BLOS is a scientifically-calibrated method of evaluating the comfort level of bicyclists on a roadway segment, given existing bicycling conditions in relation to motor vehicle traffic. Model inputs include volume and speed of vehicular traffic, percentage of heavy trucks, presence of on-street parking, pavement condition,



lateral separation between bicyclists and adjacent motor traffic, and presence and width of paved shoulder or bicycle lane. With a scoring system of "A" (best) to "F" (worst), 89% of roadways scored a "D" or worse indicating the need to improve conditions for bicyclists.

RECOMMENDED BICYCLE NETWORK

Approximately 447 miles of bicycle facilities are recommended for the Raleigh area. Developed through public input, field measurements, locations of trip attractors, connections to the greenway system, and projects listed in previous plans, the recommended bicycle network is comprehensive and will be developed over the next 20 years. Several facility types are recommended and determined based on route type, roadway characteristics, land use, and traffic. The bicycle lane was chosen as the preferred facility by Steering Committee members and is the most common recommendation. Paved shoulders, shared-lane markings, multi-use greenways, and sidepaths were also recommended.

Please note: the 447 miles of recommended routes is in no way expected to be completed in the short-term, or even medium-term. This Plan carefully prioritizes recommendations for a rational and achievable implementation process.

Total Recommended Network: 447 miles

Bicycle Lanes: 332 miles
(Restripe: 101 miles)
(Stripe: 37 miles)
(Road Diet: 30 miles)
(New Construction: 164 miles)

Shared Lane Markings: 30 miles

Paved Shoulder: 7 miles

Wide Outside Lane: 78 miles

require roadway reconstruction because of adequate, existing roadway width. The top bicycle network segment recommendations that do not require new construction were identified as the Top 25 projects, and the plan provides individual cost estimates and project 'cut-sheets' for each.

The total estimated cost for construction of the top 25 projects is approximately **\$1.2 million**.

*See Appendix B: Prioritization and
Appendix C: Cost Estimates for details.*

FACILITY DEVELOPMENT

Roadway re-construction and repaving projects offer excellent opportunities to incorporate facility improvements for bicyclists. It is much more cost-effective to provide a bicycle facility when these road projects are implemented than to initiate the improvement as a "retrofit." In order to take advantage of upcoming opportunities to incorporate bicycle facilities into routine transportation projects, the City should continue to track repaving schedules, and other lists of projects. As the long-range transportation plan is updated in future years, bicycle improvements should be included in appropriately programmed projects.

There are also many ways to develop bicycle facilities without waiting for roadway reconstruction projects. The simplest type of bicycle facility development is the addition of bicycle lanes, edgelines, or shoulder stripes without making any other changes to the roadway (restriping). Bicycle lanes, edgelines and shoulder stripes can also be added by narrowing the existing travel lanes or removing one or more travel lanes (road diet). If 'road diets' or 'restriping' are not practical for certain roadways, then shared lane markings may be considered (sharrows). For more on these and other facility types, please see Chapter 4: Network Plan and Chapter 7: Design Guidelines.

BICYCLE FACILITY MAINTENANCE

Additional maintenance costs for bicycle facilities (striping, sweeping, etc) are relatively small incremental costs relative to the City's overall public works budget. The recommended strategy is to integrate maintenance into ongoing City programs, with an emphasis for maintenance crews to sweep all the way to the curb or edge of shoulder (where many bicyclists often ride).

IDENTIFYING PROJECTS PRIORITIES

The steps taken to select priority projects were: 1) prioritization through public input and weighted criteria; 2) equity across council districts; and 3) ease of construction and cost-effectiveness. The prioritization method ranked recommended bicycle facilities by both their public input ranking and their ability to satisfy criteria developed by the project Steering Committee. Also, 140 miles of bicycle lane recommendations identified in the network would not



BICYCLE AND PEDESTRIAN COORDINATOR

The City of Raleigh should create and fund the full-time dedicated position of Bicycle and Pedestrian Coordinator to handle the day-to-day implementation of recommended policies, programs and activities described within this plan. The Coordinator will lead efforts to apply for funding, oversee planning, mapping, design and development of bicycle projects. The Coordinator will assist with programming, public outreach, and monitoring of implementation. The Coordinator will report to the manager of Transportation Services Division of the Public Works Department. Winston-Salem, Greensboro, Charlotte, and Durham all benefit from having a dedicated position for bicycle and pedestrian coordination.

BICYCLE + PEDESTRIAN ADVISORY COMMISSION

The City of Raleigh should encourage the establishment of a Bicycle and Pedestrian Advisory Commission (BPAC) to assist in the implementation of this Plan. The BPAC would be comprised of both commuting and recreational cyclists, and should work in cooperation with the newly established Raleigh Bicycle and Pedestrian Coordinator, to champion the recommendations of this Plan. The BPAC's role would be to provide a communications link between the citizens of the community and City government. Models for such a group exist throughout North Carolina. Each BPAC member could represent one key functional area: planning, design, safety, maintenance, education, health, recreation, etc. Raleigh would greatly benefit by supporting the creation of such an organization.

PROGRAMS

It will be critical for Raleigh and NCDOT to educate bicyclists and motorists about safe behaviors in a multi-modal roadway environment, to enforce laws that make bicycle travel safer, and to encourage people of all ages and abilities to use the bicycle and greenway routes. It will be equally important to promote and develop activities that encourage physical activity and healthy living. Programs can include Safe Routes to School, community-wide messages encouraging physical activity, bicycle rodeos and Bike to Work Days.

BECOMING A BICYCLE FRIENDLY COMMUNITY

One of the goals for this Bicycle Plan is to transform Raleigh into a "Bicycle Friendly Community" (BFC). The Bicycle Friendly Community Campaign is an awards program that recognizes municipalities that actively support bicycling. A Bicycle Friendly Community provides safe accommodation for cycling and encourages its residents to bike for transportation and recreation. Communities that are bicycle-friendly are seen as places with a high quality of life. In North Carolina, only two communities are currently designated as "bicycle friendly," Cary and Carrboro. Raleigh will need to make significant strides in accomplishing the goals of this Plan prior to applying for BFC status. If the short term work program is accomplished, the City should be in a position to apply for BFC status within three years.

FUNDING

Implementing the recommendations of this plan will require a combination of funding sources that include local, state, federal, and private money. It will be necessary for Raleigh and the NCDOT to secure funding to undertake the short-term, top priority projects and develop a long-term funding strategy. This Plan identifies 30 funding sources to be referenced for implementation, but these state and local sources are key:

- Local Capital Improvements Program (CIP)
- Local Bond
- Local Fees
- State Transportation Improvement Program (TIP)
- State Powell Bill Funds
- State Safe Routes to School Program
- State Health and Wellness Trust Fund
- Private Sources

ACTION STEPS

The Action Steps Table (in Chapter 8) includes over 50 tasks to be accomplished to ensure successful implementation of the Plan. For each task, a lead agency and support agencies and project phasing are identified and the task is explained in more detail. Altogether, the resources within this plan will provide the City of Raleigh, North Carolina with the necessary means to set the standard for a safe, accessible, and efficient bicycle network.