

Planning for Pedestrians and Bicyclists in North Carolina

Kelly R. Evenson, Sara B. Satinsky, Semra A. Aytur, and Daniel A. Rodríguez



Over the past decade, as obesity has continued to rise among both youth and adults, interest has grown in developing policies to promote community environments that support healthy lifestyles.¹ A broad range of local, regional, state, and federal policies under the rubrics of active living, smart growth, and sustainable development share the underlying assumption that they can help people make healthier choices. From a transportation-planning perspective, the benefits of pedestrian and bicycle plans resulting

from the building of infrastructure to support pedestrian and bicycle travel include improved health (for example, through increased levels of physical activity and reduced obesity), a better environment (for example, through lower carbon emissions), and a stronger economy (for example, through lower fuel bills). However, until more recently, the health benefits have not been specifically explored.

Physical inactivity, obesity, diabetes, and related conditions lead to an enormous cost. North Carolinians spend more than \$24 billion annually on health care costs related to them.² The disciplines of planning and health have begun to work together on finding ways to address physical inactivity and obesity. For example, the physical environment may lack sidewalks or trails allowing people to walk or bicycle to their destinations. Planning tools, including a pedestrian or bicycle plan, help ameliorate such a situation.

Issues like accessibility are important to many North Carolina adults. In 2007, 60 percent of them reported that they would increase their physical activity if their community had more accessible sidewalks or trails for walking or bicycling. Notably, the prevalence of this view varied by region, with

eastern North Carolina having the highest (63 percent), followed by the Piedmont (59 percent) and western North Carolina (53 percent).³

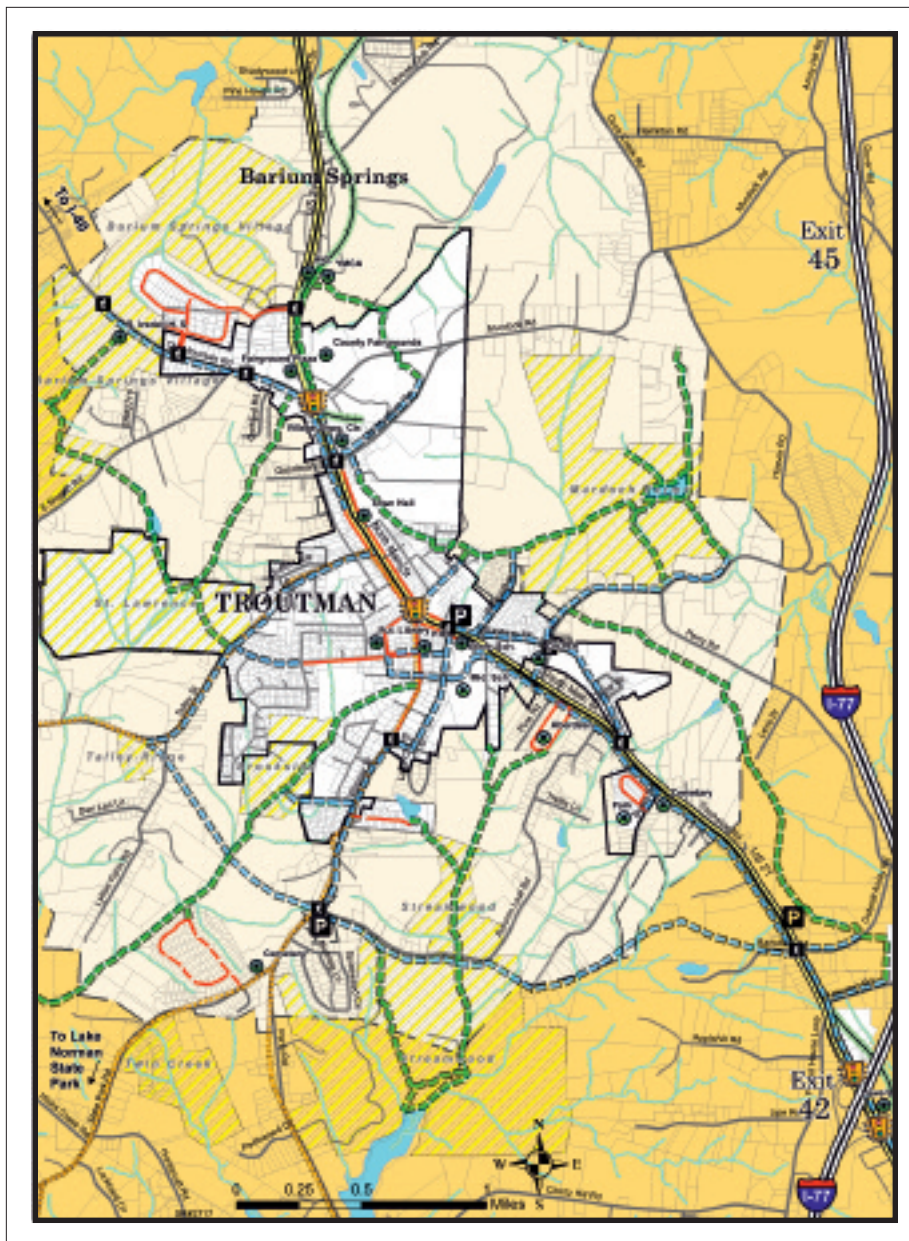
Despite the growing popularity of research and practice related to the built environment and health, little is known about local policies and planning processes to support active living. Pedestrian and bicycle plans are one way to support active living. This article provides an overview of the development and the prevalence of pedestrian and bicycle plans in North Carolina.

Pedestrian and Bicycle Planning

A pedestrian or bicycle plan is a public document usually developed through public participation, visioning, and an analysis of current conditions. The planning process brings together interested parties, such as staff of local and regional organizations, representatives of the state department of transportation, citizens, consultants, and local advocates. The resulting plan typically lays out a community's vision for future pedestrian and bicycling activity, identifies the actions required to realize that vision, ties actions to funding sources, and describes implementation and use.

Evenson is a research associate professor of epidemiology at UNC at Chapel Hill and the principal investigator of the North Carolina Physical Activity Policy Research Center. Satinsky is a graduate student in the Departments of City and Regional Planning and Health Behavior and Health Education at UNC at Chapel Hill. Aytur recently completed a postdoctoral fellowship at UNC at Chapel Hill and now is a policy research specialist at the Seattle and King County Public Health Department in Washington state. Rodríguez is the director of the Carolina Transportation Program and associate professor of city and regional planning at UNC at Chapel Hill. Contact them at kelly_evenson@unc.edu, satinsky@email.unc.edu, s_aytur@yahoo.com, and danrod@unc.edu.

Figure 1. **A Simplified Comprehensive-System Map for Troutman, North Carolina, Showing Recommended Projects Based on the Pedestrian Planning Process**



Source: Map reprinted, with permission, from the Troutman (North Carolina) Pedestrian Plan (February 2008). Created and simplified by Blair Israel, Centralina Council of Governments, Charlotte, North Carolina. To see the original, go to www.unc.edu/~kevenson/_Figure1_TroutmanNC.pdf. The green dashes represent proposed trails; the blue dashes, proposed sidewalks; the red lines, existing sidewalks; the pedestrian symbols, crosswalks; and the "P" symbols, Park & Ride locations.

Pedestrian and bicycle plans are defined geographically, either for a municipality or for a broader area, such as a county, a region, or an entire state. Often pedestrian and bicycle plans are developed as separate documents, but sometimes a plan is targeted at both pedestrian and bicycle needs. In other cases, pedestrian and bicycle plans are embedded in

broader plans, such as those for comprehensive land use, transportation, greenways, open space, or parks and recreation.

Pedestrian and bicycle plans promote a community's vision and guide future priorities and investments. For example, some plans include visions of using an area's pedestrian friendliness to attract heritage tourism, whereas other plans

view pedestrian activity as a way of simultaneously achieving a more balanced transportation system and contributing to social and environmental sustainability. Other visions and goals of a plan might be as follows:

- Improving connectivity of sidewalks, trails, or bike lanes for pedestrians and bicyclists
- Improving safety and preventing injury for pedestrians and bicyclists
- Improving or maintaining existing pedestrian or bicycle facilities (for example, sidewalks and bike racks)
- Reducing traffic congestion
- Enhancing quality of life
- Improving public health
- Encouraging general recreation or physical activity
- Promoting economic development through tourism

Each plan is unique and tailored to the community, creating variation among plans in focus, scope, and strength. In addition to expressing a community's vision and goals, a plan should include an assessment of current conditions for pedestrians and bicyclists (including an assessment of past injuries and crashes), and it should document public participation contributing to its development. A plan also should include an assessment of the sociodemographic characteristics of the area and projections for the future (for example, an increasing population of elderly residents) that may highlight the needs of special populations with respect to walking and bicycling. Further, a plan should contain a review of existing policies, ordinances, and programs, including how they might affect pedestrians and bicyclists. Detailed maps of current conditions and proposed changes to infrastructure should be part of a plan as well, including maps of sidewalks, greenways, rails-to-trails, bike lanes, paved shoulders, and crosswalks (for an example, see Figure 1).

A plan should include recommendations related to its goals, such as changes in policies, investments in facilities, improved maintenance, or establishment of programs, with a ranking of their relative priority. (For an example of a



Above, existing conditions in 2008 looking east on East Street in Pittsboro; below, several possible improvements, including street trees, street furniture, landscaped medians, pedestrian-scale lighting, bicycle lanes, wider sidewalks, sidewalks on both sides of the road, closing of curb cuts (reduction of parking-lot access points), and crosswalks.



Source: Photos reprinted, with permission, from the Pittsboro Pedestrian Transportation Plan (2009), authored by Jason Reyes, AICP, and Matt Hayes, AICP, of Greenways, Inc. Photo rendering by Jason Reyes. Available at www.greenways.com/pittsboro_download.html.

picture of current conditions, see Figure 2a. For changes that could be made to incorporate more pedestrian- and bicycle-friendly elements, see Figure 2b.)

A plan also should include a timeline for implementation, cost estimates, a review of potential funding sources, and design guidelines for the construction of new facilities. Finally, it is important for

a plan to include an evaluation component, to assess whether goals are reached over a specific time period.

A pedestrian or bicycle plan covers a cross-section of interests, as illustrated by these examples of visions, goals, and plan components. It reflects the diversity of professionals and community members who develop it, including people from

local government, city planning, transportation planning, parks and recreation, engineering/public works, and public health.

Planning for Pedestrians and Bicyclists in North Carolina

Given the potential importance of pedestrian and bicycle plans as components

Table 1. Most Recent Pedestrian Plans in North Carolina through 2008

Locality	Year	Plan Level
Albemarle	2007	Municipality
Asheville	2004	Municipality
Badin	2008	Municipality
Black Mountain	2008	Municipality
Boiling Springs	2006	Municipality
Brevard	2006	Municipality
Bryson City	2007	Municipality
Burnsville	2006	Municipality
Cary	2007	Municipality
Conover	2008	Municipality
Durham	2006	Municipality
Graham	2006	Municipality
Hendersonville	2007	Municipality
Hertford	2007	Municipality
Holly Springs	2007	Municipality
Kannapolis	2007	Municipality
Kenansville	2007	Municipality
Mars Hill	2007	Municipality
Mooresville	2006	Municipality
Nashville	2008	Municipality
Norwood	2007	Municipality
Shelby	2007	Municipality
Sparta	2006	Municipality
Stallings	2008	Municipality
Troutman	2008	Municipality
Wake Forest	2006	Municipality
Washington	2006	Municipality
Wilson	2006	Municipality
Winston-Salem Urban Area	2007	MPO

Note: In Tables 1–3, the year of the plan may not match the adoption date. MPO = metropolitan planning organization. RPO = rural planning organization. As the authors identify new plans through 2008, they will update the tables at the following website: www.unc.edu/~kevenson/_NCPedBikePlans.pdf. Only stand-alone plans are included. Plans with pedestrian or bicycle elements (e.g., comprehensive, transportation, park, livable-community, or main-street plans) are not included.

of a public policy process to improve sustainability and influence residents' health, the North Carolina Physical Activity Policy Research Center sought to examine more closely the characteristics of plans in the state.⁴ A first step

Table 2. Most Recent Bicycle Plans in North Carolina through 2008

Locality	Year	Plan Level
Asheville	2008	Municipality
Carolina Beach	1985	Municipality
Carrboro	1980	Municipality
Charlotte	1981	Municipality
Clayton	2007	Municipality
Durham	2006	Municipality
Durham–Chapel Hill–Carrboro MPO	1993	MPO
Elizabeth City	1985	Municipality
Fayetteville	1980	Municipality
Forsyth County	1988	County
Goldsboro	1975	Municipality
Greenville	1974	Municipality
Greenville Urban Area	2002	MPO
Lake Norman	2006	RPO
Matthews	2006	Municipality
Mecklenburg County	1977	County
Mooresville	2008	Municipality
Morehead City	2007	Municipality
New Bern	2006	Municipality
North Topsail Beach	2006	Municipality
Oak Island	2006	Municipality
Raleigh	1991	Municipality
Rocky Mount	2007	Municipality
Tarboro	2006	Municipality
Washington	2008	Municipality
Wilmington Area	1981	MPO
Wilson	2008	Municipality
Winston-Salem	1974	Municipality
Winston-Salem Urban Area	2005	MPO
Wrightsville Beach	2005	Municipality

was to identify all pedestrian and bicycle plans in North Carolina completed through fall 2008.⁵ Although some municipalities have plans under development, we did not include them in our study if they were not completed before this date. To collect all plans, we conducted Web searches, accessed the plan

Table 3. Most Recent Combined Pedestrian/Bicycle Plans in North Carolina through 2008

Locality	Year	Plan Level
Alamance County	1994	County
Boone	1995	Municipality
Caldwell County	2004	County
CAMPO (Capital Area MPO)	2003	MPO
Chapel Hill	2005	Municipality
CORE (Center of the Region Enterprise)	2005	Region
Fayetteville MPO	2004	MPO
Greensboro	2006	MPO
Hickory	2005	Municipality
Kernersville	2007	Municipality
Kings Mountain	2002	Municipality
Mid-Carolina RPO	2005	RPO
North Carolina	1996	State

library of the North Carolina Department of Transportation (NCDOT), Division of Bicycle and Pedestrian Transportation, and called to follow up when necessary. We also sent our plan list to a listserve of North Carolina planners to identify any missing plans. In instances in which a community had updated its plan, we counted and collected only the most recent plan. Even with this thorough search strategy, we may have inadvertently missed some plans, for not all documents were easily accessible.

In North Carolina, there are 100 counties, 17 metropolitan planning organizations (MPOs), 20 rural planning organizations (RPOs), and 544 municipalities.⁶ We identified 72 current plans in the state, 29 of them pedestrian, 30 of them bicycle, and 13 of them combined pedestrian and bicycle (see Tables 1–3). One plan was at the state level, 11 were at the regional level, 4 were at the county level, and 56 were at the municipality level. Of the 11 regional plans, 8 were developed for MPOs, 2 were developed for RPOs, and 1 was developed by an interjurisdictional organization in the Piedmont called the Center of the Region Enterprise.⁷

For the municipalities, bicycle and pedestrian plans existed in all three

Table 4. **Census Characteristics of All North Carolina Municipalities, Overall and among Those with and without a Pedestrian, Bicycle, or Combined Pedestrian/Bicycle Plan**

Characteristic	All Municipalities N = 544		Municipalities with Plan N = 51		Municipalities without Plan N = 493	
Population	%	n	%	n	%	n
1–5,000	80.1	436	29.4	15	85.4	421
5,001–30,000	16.0	87	43.1	22	13.2	65
30,001+	3.9	21	27.5	14	1.4	7
Speed of Population Growth*						
Decline (–100%–0%)	24.8	134	13.7	7	26.0	128
Slow growth (>0%–15%)	48.2	261	49.0	25	47.9	236
Moderate to fast growth (>15%)	27.0	146	37.3	19	25.8	127
Race						
0%–10% nonwhite	28.5	155	17.6	9	29.6	146
>10%–20% nonwhite	17.3	94	19.6	10	17.0	84
>20% nonwhite	54.2	295	62.7	32	53.3	263
Average Median Income						
<\$30,000	38.8	211	25.5	13	40.2	198
\$30,000	61.2	333	74.5	38	59.8	295

Source: U.S. Bureau of the Census, Census 2000 Summary File 3 for North Carolina Places, Table P53, Median Household Income in 1999 (dollars), <http://factfinder.census.gov/servlet/BasicFactsServlet>. Median income is based on 1999 reports. Percentages may not add to 100 because of rounding.

*This sample size is 541 because 2006 estimates were not available for three municipalities. Population growth is defined from 2000 to 2006.

regions of the state.⁸ Of the 544 municipalities in North Carolina, 28 have pedestrian plans, including 5 in the eastern region, 15 in the Piedmont, and 8 in the western region.⁹ In addition, 23 have bicycle plans, including 15 in the eastern region, 7 in the Piedmont, and 1 in the western region. Only 9 municipalities have both a pedestrian and a bicycle plan, 5 of them with combined plans and 4 with separate plans. The Piedmont has the highest number of

pedestrian plans, the eastern region the highest number of bicycle plans.

More municipalities with a population greater than 5,000 had plans, than did municipalities with a population of 5,000 or fewer (see Table 4). Pedestrian and bicycle plans also were more common among municipalities with recent population growth and in areas with more racial diversity (more than 20 percent nonwhite) and a higher median income.¹⁰

We reexamined our findings among municipalities with at least a population size of 3,000, to explore whether the cutoff point we chose for population size influenced our results. We obtained similar results on three dimensions: pedestrian and bicycle plans were more common among municipalities that had a larger population, had experienced recent population growth, and had more racial diversity. The differences by income were diminished.

Table 5. **Summary of the North Carolina Bicycle and Pedestrian Planning Grant Initiative, 2004–8**

Year	Pedestrian Planning Grants			Bicycle Planning Grants		
	No. of Grants Awarded	Range in Award Amount	Municipality Population Range	No. of Grants Awarded	Range in Award Amount	Municipality Population Range
2004	13	\$9,040–\$37,500	1,641–570,353	5	\$16,800–\$36,000	833–55,998
2005	13	\$12,000–\$24,500	1,181–107,693	5	\$20,000–\$75,000	7,821–614,330
2006	6	\$16,000–\$31,500	1,971–23,688	6	\$22,400–\$90,000	4,703–344,000
2007	13	\$16,000–\$39,000	2,802–91,207	3	\$28,000–\$45,500	8,100–26,084
2008	14	\$20,000–\$31,500	999–58,000	2	\$28,000–\$31,850	4,261–16,042

Source: North Carolina Department of Transportation, Division of Bicycle and Pedestrian Transportation, North Carolina Department of Transportation Bicycle and Pedestrian Planning Grant Initiative (2008), www.itre.ncsu.edu/PTG/BikePed/NCDOT/index.html.

Why the Concern? A Public Health Perspective

In North Carolina, concerns about obesity and physical inactivity of both youth and adults continue to escalate as surveillance data are released on these behaviors each year. A 2007 statewide survey of adults reporting on their children revealed that 17 percent of children in grade school (kindergarten through fifth grade) exceeded the 95th percentile on weight for height. The prevalence was higher among middle school students (18 percent) and lower among high school students (14 percent).¹

The high prevalence of obesity among youth can be partially attributed to lack of physical activity and high inactivity. A self-reported schoolwide survey in 2007 revealed that the proportions of middle and high school students who had been physically active for at least one hour on five or more days of the preceding week were 55 percent and 44 percent respectively. At the same time, 44 percent of middle school and 35 percent of high school students reported watching three or more hours of television per day on an average school day. In addition, 25 percent of middle school and 21 percent of high school students reported playing video or computer games or using the computer (not for school work) three or more hours on an average school day.²

A high prevalence of obesity and lack of physical activity also occurs among adults of North Carolina. The prevalence of obesity reached a high of 29 percent in 2007, an absolute increase of 16 percent since 1991 (when the prevalence was 13 percent).³ Obesity differs regionally, with the highest prevalence in eastern North Carolina (31 percent) and slightly lower prevalences in the Piedmont (28 percent) and western North Carolina (26 percent). Concurrently in 2007, 24 percent of adults reported no participation in any physical activities or exercises during the past month, with eastern North Carolina reporting the highest prevalence (27 percent), followed by the Piedmont (24 percent) and western North Carolina (23 percent).⁴

Notes

1. North Carolina State Center for Health Statistics. North Carolina Child Health Assessment and Monitoring Program, www.schs.state.nc.us/SCHS/champ/index.html.
2. North Carolina Department of Public Instruction and North Carolina Department of Health and Human Services, North Carolina Youth Risk Behavior Survey (YRBS), www.nchealthyschools.org/data/yrbs/.
3. Centers for Disease Control and Prevention, Behavioral Risk Factor Surveillance System, Prevalence Data, 2007, www.cdc.gov/brfss; North Carolina State Center for Health Statistics, Behavioral Risk Factor Surveillance System (BRFSS), Calendar Year 2007 Results, www.schs.state.nc.us/SCHS/brfss/2007/index.html.
4. Centers for Disease Control and Prevention, Behavioral Risk Factor Surveillance System, Prevalence Data, 2007; North Carolina State Center for Health Statistics, Behavioral Risk Factor Surveillance System (BRFSS), Calendar Year 2007 Results.

Across the state, most of the 72 plans were first generation, but at least 10 of them had been updated from a previous plan. The plans were developed either by in-house staff or by consultants or regional staff. Of the 72 plans, almost half (44 percent) were developed using consultants. Of the current plans, 18 bicycle and combined pedestrian/bicycle plans existed in North Carolina before 2004, with the earliest dating back to 1974. We found only one pedestrian plan that existed before 2004. This trend is, in part, due to the development of a grant initiative by NCDOT.

The Grant Initiative

For at least two reasons, local governments are well positioned to enhance physical activity and promote alternative transportation modes by developing pedestrian and bicycle plans. First, most walking or bicycling for transport or recreation tends to occur locally, near or originating from where people live.¹¹ Second, local governments oversee land-use planning and development, thereby influencing whether the environment supports or discourages walking or bicycling.

To encourage the development of comprehensive local pedestrian and bicycle plans, in 2003, NCDOT's Division of Bicycle and Pedestrian Transportation and its Transportation Planning Branch created a matching grant program.¹² Over the past five grant cycles (2004–8), the program has awarded eighty planning grants totaling more than \$1.9 million (see Table 5).¹³ The communities that have received funding range greatly in size and industry, from towns more reliant on tourism, such as North Topsail Beach and Sparta, to the capital city, Raleigh.

The NCDOT grant initiative spurred development of pedestrian and bicycle plans. Only municipalities could apply for grants; nonmunicipal entities (for example, counties, MPOs, RPOs, and universities) were not eligible. However, municipalities that had developed pedestrian or bicycle plans within the last five years were not eligible to apply. The municipalities that received a grant were required to provide a monetary match based on a sliding scale (determined by population size), and to assign an em-



ployee to coordinate the process. More details on the grant process and review can be found elsewhere.¹⁴

Of the 72 pedestrian and bicycle plans identified in North Carolina, 41 were municipalities that were eligible to receive an NCDOT grant. Of those municipalities, 90 percent received funding from the initiative.

The grant initiative made the creation of plans more feasible in many communities and appears to be reaching more diverse communities with respect to population, race, and median income. We explored associations among the 41 municipalities eligible for funding that had either a pedestrian or a bicycle plan. Approximately one-third (13) of the NCDOT-funded plans were in communities with a population of less than 5,000, compared with only 2 locally funded plans in communities with a similar population size. Population growth was not associated with funding source. Municipalities with more racial diversity, defined as more than 20 percent nonwhite, were more likely to have a pedestrian or bicycle plan if funded by the NCDOT program. Similarly, communities with a median income of less than \$30,000 were more likely to have a pedestrian or bicycle plan if funded by the NCDOT program.¹⁵

In summary, the North Carolina grant program has had a significant impact on the number of pedestrian and bicycle plans in the state. A surge in the development of pedestrian and bicycle plans started a few

years ago, concurrent with the initiation of the grant program. Although the increase is promising, many communities currently do not have either a pedestrian or a bicycle plan. Despite the public support of pedestrian and bicycle facilities, of the 544 municipalities in North Carolina, we found that only 28 had a pedestrian plan, 23 a bicycle plan, and 5 a combined pedestrian and bicycle plan. Thus a positive opportunity still exists for many municipalities. Furthermore, additional financial support for plans

The state's grant initiative made the creation of pedestrian and bicycle plans more feasible for many localities and is reaching more diverse communities.

to be developed in smaller municipalities is important, because they are less likely to have such plans and may need to improve pedestrian and bicycle activity.

Further Questions about the North Carolina Plans

Having documented the number of plans in the state, we see our next step as examining the qualities of the plans that make them useful to the communities. Most planners can distinguish high-quality plans from low-quality ones, but the characteristics shared by plans are rarely enunciated. These attributes are important to identify and understand, for high-quality plans are better positioned to influence outcomes, and clarifying their features could greatly benefit the development of future plans and updates to existing plans.

The North Carolina Physical Activity Policy Research Center will engage in doing just that, by exploring the content of the plans across North Carolina. We will assess the content of selected plans

by abstracting or collecting similar information in a systematic and reliable way. The aspects that we will abstract include plan components (for example, summary, glossary, and maps), public participation, plan goals and objectives, analysis of current conditions and trends, relationship to other existing plans, policy recommendations, and method of implementation.

Further research also can help us better understand the factors that motivate planners, policy makers, and residents to develop pedestrian and bicycle plans. To what extent are health issues identified as motivating factors, among a constellation of other values? Which stakeholders are involved in the planning process, which interests drive various decisions, and how are the needs of diverse groups represented? What factors or conditions motivate some groups to abandon planning and pursue their goals via alternative pathways—for example, informal decisions, agreements with private developers, or grassroots coalitions to promote activities such as community-based walking groups and incentives for employees who walk or bike to work? Finally, the extent to which pedestrian and bicycle plans are embedded in other plans, like a



comprehensive plan, could be documented, and integration of the plans might be further explored. Also, it would be helpful to understand how pedestrian and bicycle issues are addressed in localities without pedestrian or bicycle plans.

Conclusion

In North Carolina, planning for bicycling dates back to the 1970s, with pedestrian planning not following until 2004 (with one exception). We identified 72 plans currently available in the state, 82 percent of which dealt with pedestrian and bicycle planning separately, the other 18 percent jointly. The NCDOT grant program has been a catalyst in the development of pedestrian and bicycle plans statewide, addressing communities' interests in promoting walking and bicycling.

Establishing a pedestrian and bicycle plan is one approach that local governments can use to help set goals and benchmarks for a more pedestrian- and bicycle-friendly community. Despite the progress made, a majority of communities in North Carolina have neither a pedestrian nor a bicycle plan and may not have an element of either type of plan in other plans. The lack of a plan represents a favorable opportunity for many communities. Communities with plans may have, over time, more infrastructure for pedestrian and bicycle activity in the community, which may contribute to more physical activity and less obesity. This is just one of many benefits that might accrue; other benefits might include additional health improvements, as well as environmental and economic improvements. It will be important to document and understand the outcomes of this pedestrian and bicycle planning process in North Carolina over the years ahead, as more plans are funded locally or take advantage of available funding from the NCDOT grant initiative.

Notes

The work reported in this article was supported by the North Carolina Physical Activity Policy Research Center, funded by the Centers for Disease Control and Prevention (CDC) cooperative agreement

#U48-DP000059 and an educational grant from the Southern Transportation Center at the University of Tennessee. The UNC Center for Health Promotion and Disease Prevention is a member of the Prevention Research Centers Program of CDC. The content of the article is solely the responsibility of the authors and does not necessarily represent the official views of the CDC. We thank Ginny Lee, David Salvesen, and NCDOT, Division of Bicycle and Pedestrian Transportation, especially Helen Chaney and Mary Meletioui.

1. Cynthia L. Ogden et al., "Prevalence of Overweight and Obesity in the United States, 1999–2004," *JAMA* 295: 1549–55 (2006).

2. North Carolina Department of Health and Human Services, Physical Activity and Nutrition Branch, Eat Smart, Move More NC, *The Obesity Epidemic in North Carolina*, app. I: Fast Facts, www.eatsmartmovemore.nc.com/ObesityInNC/ObesityInNC.html.

3. North Carolina State Center for Health Statistics, Behavioral Risk Factor Surveillance System (BRFSS), Calendar Year 2007 Results, www.schs.state.nc.us/SCHS/brfss/2007/index.html.

4. The Physical Activity Policy Research Network, established in 2004, conducts transdisciplinary policy research by examining physical activity policies, identifying their determinants, describing the process of implementing them, and researching the outcomes. For more information, visit the network's website, <http://prc.slu.edu/paprn.htm>. North Carolina is home to one of the participating centers. For more information about the North Carolina center, visit its website, www.hdpd.unc.edu/projects/ncpaprc.

5. Most of the plans that we identified probably had been adopted, but the plan typically did not include documentation of this.

6. Metropolitan planning organizations (MPOs) are transportation planning organizations for urbanized areas with populations greater than 50,000 that work in cooperation with state and federal governments to have continuing, cooperative, and comprehensive transportation planning processes. At present, North Carolina includes seventeen urban areas with corresponding MPOs: Asheville, Burlington, Cabarrus-Rowan, Charlotte, Durham–Chapel Hill–Carrboro, Fayetteville, Gastonia, Goldsboro, Greensboro, Greenville, Hickory-Newton-Conover, High Point, Jacksonville, Raleigh, Rocky Mount, Wilmington, and Winston-Salem. North Carolina Department of Transportation, Transportation Planning Branch, Metropolitan Planning Organizations, www.ncdot.org/doh/preconstruct/tpb/mpo/mpo.html. Rural planning organizations (RPOs) are transportation planning organizations that provide a forum for public

participation in rural transportation issues and policies and work in coordination with the state government and the MPO. Initiated in 2000, RPOs in the state now number twenty: Albemarle, Cape Fear, Down East, Eastern Carolina, High Country, Isothermal, Kerr-Tar, Lake Norman, Land of Sky, Lumber River, Mid-Carolina, Mid-East, Northwest Piedmont, Peanut Belt, Piedmont Triad, Rocky River, Southwestern, Triangle Area, Unifour, and Upper Coastal Plain. North Carolina Department of Transportation, Transportation Planning Branch, Rural Planning Organizations, www.ncdot.org/doh/preconstruct/tpb/mpo/rpo.html.

7. The Center of the Region Enterprise (CORE) includes six local governments (Durham County, Durham City, Wake County, Raleigh, Cary, and Morrisville), several regional organizations, and multiple private-sector parties. For more information, visit CORE's website, www.tjcog.dst.nc.us/regplan/core.shtml.

8. Regions in North Carolina are based on landforms: coastal (eastern), Piedmont, and mountain (western). More information is available at the North Carolina Department of Transportation: Region: Coastal, www.ncdot.org/findInfo/coastal.html; Region: Piedmont, www.ncdot.org/findInfo/piedmont.html; Region: Mountain, www.ncdot.org/findInfo/mountain.html.

9. North Carolina League of Municipalities, About Cities and Towns, www.nclm.org/about%20cities%20and%20towns/about.htm.

10. U.S. Bureau of the Census, Census 2000 Summary File 3 for North Carolina Places, Table P53, Median Household Income in 1999 (dollars), <http://factfinder.census.gov/servlet/BasicFactsServlet>.

11. Ester Cerin et al., "Destinations That Matter: Associations with Walking for Transport," *Health Place* 13: 713–24 (2007); Billie Giles-Corti et al., "Increasing Walking: How Important Is Distance to, Attractiveness, and Size of Public Open Space?" *American Journal of Preventive Medicine* 28(2S2): 169–76 (2005).

12. North Carolina Department of Transportation, Division of Bicycle and Pedestrian Transportation, Bicycle and Pedestrian Planning Grant Initiative, www.itre.ncsu.edu/PTG/BikePed/NCDOT/index.html.

13. North Carolina State Center for Health Statistics, Behavioral Risk Factor Surveillance System (BRFSS), Calendar Year 2006 Results, www.schs.state.nc.us/SCHS/brfss/2006/index.html.

14. NCDOT, Bicycle and Pedestrian Planning Grant Initiative, www.itre.ncsu.edu/PTG/BikePed/NCDOT/index.html.

15. U.S. Bureau of the Census, Census 2000 Summary File 3, <http://factfinder.census.gov/servlet/BasicFactsServlet>.