Making Your Community **Walkable and Bikeable**

A Guidebook for Change

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IMAGINE A NORTH CAROLINA . . .

. . . where the country roads and neighborhood streets are wide enough that bicycles can safely travel alongside vehicles. Imagine bicyclists, walkers, and people in wheelchairs pedaling, hiking, and rolling to areas located in the city as well as in the beauty of the rural countryside. In rural areas, our roads have wide, striped shoulders that make cycling safe enough for children riding to the homes of their friends or for cycling clubs out for weekend rides. In our towns, adults and children bike, skate, or walk for fun and also as commuters to school, work and commercial areas of town. Greenways connect neighborhoods, and sidewalks link neighborhoods to the center of town. All through the day people can be seen outside, getting fresh air and exercise in our parks and on trails that are near and accessible to their places of work and their homes. Along with the walkers and joggers, people in wheelchairs are frequently seen on these well-designed cycling and walking routes. Just imagine . . . the vision of a healthier and more active North Carolina.

WHAT NEEDS TO CHANGE?

In many communities, the roads are not designed for safe bicycling. Even the most experienced cyclists may be discouraged by high speed automobile travel, oversized vehicles, poor pavement conditions, non-existent shoulders, or paved shoulders that are simply not wide enough to be used as a bicycle lane. Many communities lack sidewalks to connect people's homes to their worksites, schools, shopping and commercial districts, and recreation areas. People would be more likely to bike or walk if safe opportunities exist. We need to change our physical activity environment by improving our sidewalks and roads.

WHAT CAN WE DO?

This guidebook will help community groups, organizations, and concerned individuals learn how to collaborate with planning staff and other officials to improve their local roads for walking and bicycling. Step-by-step instructions help you develop collaborative relationships, actually assess the suitability of your roads for walking and bicycling, and then develop a plan for improvement.

Our communities will become places that encourage us to be more active, all because concerned groups and individuals have assessed their roads and worked with local policy-makers to improve their physical environments.

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Introduction

North Carolina is improving the health of its citizens by increasing their physical activity levels, providing healthy food options, and reducing tobacco use. What is unique about these current efforts is that they focus on changing the physical and social environments in which we live. Physical activity may be difficult to initiate or sustain when the environment neither promotes nor supports physical activity. If people have many opportunities and reminders to be more physically active, they may choose to walk or bicycle when making a short trip. With more visual cues to be physically active, community residents may choose to help organize or participate in sporting events in neighborhood parks or on school grounds. More people will take the stairs if there are signs posted at elevators reminding them that taking the stairs is "good for their heart." If our communities have sidewalks, bicycle lanes, and if our park trails and greenways are clearly marked and maintained, more people will use them to be physically active. If the physical environment offers opportunities to be physically active, more people will take that opportunity to become healthier.

Two forms of physical activity that most people can enjoy are walking and bicycling. However, if roads and streets are not conducive and safe for bicycling or walking, people will not become more active. In many communities people are currently walking and bicycling on roads that are unsafe and even dangerous.

Three Steps Toward Improvement

1. Identify appropriate officials to learn about current similar projects. Explore possibilities for collaboration.
2. Assess roads for their walking and bicycling suitability.
3. Collaborate with officials and assessment team to develop a "network" of suitable roads and sidewalks for walking and bicycling.

We need to make our communities safer and more healthy by improving the suitability of our roads for walking and bicycling. This guidebook can help you be a part of these improvements in your own community. It presents three basic steps toward improvement. The first step is the process of identifying and contacting key officials, decision makers and planning staff in your community to learn what efforts already exist for improving roads for walking and bicycling. The second step includes two simple methods for assessing the suitability of roads for walking and bicycling[1]. The assessment methods let you quickly study the roads that people could use for non-automobile travel to work, school, or shopping. Assessing a road can take as little as fifteen minutes. Assessment is important because it helps to identify problems with each road's suitability for walking and bicycling. The assessment results can be mapped to pinpoint the needed improvements to your community's roads. The guidebook walks you through the entire assessment process. The third step provides tips for working with planning staff and other officials to design a "network" of roads in your community that are safe for walkers and bicyclists. Suggestions are provided to address potential barriers to improvement projects such as funding and "right of way" issues.

[1] The bicycle suitability assessment method presented in this Guidebook was identified by analyzing several methods used across the country. Randomly selected road segments in one county were independently assessed by two data collectors. Bicycle suitability scores were computed for each method studied. The method developed by Nils Eddy and presented here attained the highest reliability correlation with all other methods for each road segment.

After reviewing the small number of publicly available walking suitability methods, James Emery, MPH developed the method presented in this Guidebook.

You can directly improve your community environment by working as an assessment team to gather information about the suitability of your roads for walking and bicycling, and collaborating with local planning staff and other officials to design a town or county "plan" to develop a network of suitable roads and sidewalks. Your collaboration can change the physical environment so that all community members can choose to be more physically active and ultimately enhance their quality of life.

The walking suitability method was created and the bicycle suitability method was adapted by the lead authors who are researchers in the Department of Health Behavior and Health Education in the School of Public Health at The University of North Carolina at Chapel Hill. The team also wrote this manual and developed a companion training for community volunteers and political stakeholders. Support for these suitability assessment methods and this manual, came from the Cardiovascular Health (CVH) Program, a CDC-funded initiative through the Cardiovascular Health Unit, Division of Public Health, NC Department of Health and Human Services.

Success Stories

Roanoke Island Bike Path (Manteo, NC)

The 6-mile long Roanoke Island Bike Path runs through the historic Town of Manteo from the Manns Harbor Bridge crossing the Croatan Sound through the Washington Baum Bridge over the Roanoke Sound. The path includes five resting spots with benches, bike racks and water fountains. The path is a multi-use corridor, accommodating both walkers and bicyclists. The NC Department of Transportation funded the project and worked cooperatively with the National Park Service and the Roanoke Island Commission to secure land permits. Project construction was completed in 1994 and made use of existing Manteo sidewalks while improving and widening them to accommodate the bike path. Additional landscaping was provided to complement the natural profusion of crepe myrtle and live oak trees. The path is very popular throughout the year, but particularly during the summer when tourists use it as a convenient and scenic way to tour Manteo and Roanoke Island.

Southern Village (Chapel Hill, NC)

Planners and developers in Chapel Hill created a unique community and designed it with the premise that traditional, urban neighborhoods were more effective than suburban neighborhoods at creating community, protecting the environment, and promoting quality of life. The "new urbanism" philosophy guided planners when they designed Southern Village. The streets are a narrow network that connect the neighborhood and distribute slower traffic throughout the community. Sidewalks connect the homes with the village center, local school, open spaces, parks, and playgrounds. The neighborhood has a corner store where people can shop and gather to socialize. Even the homes were designed with garages hidden in the back and porches facing the street to foster a greater sense of community. Opportunities for exercise and physical activity are built into the design of this community.

Town of Pittsboro, NC

In the small town of Pittsboro, a group of concerned citizens and bicycle advocates have collaborated with the town board to assess the walking and bicycling suitability of the main downtown streets. By using methods similar to those described in this guidebook, they developed a "roadmap" of areas that need sidewalk development and street modification. These enhancements will encourage people to bicycle and walk more often. Together with the town, the volunteer group developed a successful application for federal funding (Transportation Equity Act 21st Century [TEA-21]) which the town has agreed to use solely for their suggested improvements. Citizens and town officials hope to create a "Walkable Pittsboro" using many of the methods described in this guidebook.

Step 1: Getting Ready

FIND OUT WHAT'S HAPPENING

1. **Meet the CVH Program and Health Promotion Coordinators serving your county.**
   Contact the program coordinators assigned to your region (see back cover). The coordinators can help you plan your project and schedule training for your team.

2. **Contact local officials. Start by meeting your local planning staff.**
   Community groups and advocates of walking and bicycling should not hesitate to contact government officials to express their interest in helping to make their communities more suitable for walking and bicycling. Don't be intimidated by the government planning process. While a warm welcome may not be universal, in general, local elected officials desire greater citizen participation for issues that impact their community. In addition, many municipal and county officials, including planners, managers, and planning boards welcome citizen input into planning decisions that affect the "look" of the community. Working together to improve your community may take time and be hard work, but the physical and social benefits can outweigh any challenges. One town manager, who was grateful for input from an active citizen's group in developing a sidewalk "master plan," recently described the experience as "democracy in action."

   Suggested Contact People

   1. CVH Program/Health Promotion coordinator for your county
   2. City or town planner
   3. County planner
   4. MPO planner (see Appendix 1)
   5. Transportation planner
   6. Local planning and transportation board members
   7. Transportation engineer
   8. Regional Dept of Transportation (see Appendix 2)
   9. State Dept of Transportation
   10. Local Parks and Recreation staff
   11. Public Works manager
   12. City or town manager
   13. City council members
   14. County commissioners
   15. Local media
   16. Chamber of Commerce
   17. Citizen committees (eg., greenways, open space, bicycle advocates, neighborhood associations)

   Meet with your local planning staff and introduce the assessment project. Your local planning staff are potential allies for improving the walking and bicycling opportunities in your community. Be sure to explain that volunteers will be collecting high quality data at no cost and the data could be useful to the planning department. If your community is part of a larger urban area, consider contacting your Metropolitan Planning Organizations (MPO), since any improvement plans your project eventually proposes will have to be approved by the MPO. Appendix 1 provides a list of the regional MPOs in North Carolina. In case you want to contact your NC Department of Transportation (NC DOT) representative, Appendix 2 provides a list of the 14 NCDOT regional highway division offices. Use the Sample Script for Contacting People (Appendix 3) as a guide for your initial phone calls. As you contact and meet people, record their contact information (e.g., Name, Organization, Phone, Email, Address, Date first contacted) since you may need to contact them in the future.

3. **Ask your local planning staff how sidewalk and road improvements happen in your community.**

   Because many planners work with elected officials and other key decision-makers in their communities, they may have extensive knowledge of how policy and environmental changes happen. Take notes on this process since you will be working to make change within that process in Step 3. You may also be influencing that process to improve it.

4. **Identify future contacts and learn their roles in making improvements to roads.**

   As you discuss your project, ask the planning staff for the names and contact information for officials whom you should contact for assistance in improving the environment for physical activity. Identify any other officials to whom you should present your assessment findings and eventual proposed plan.

   Learn the roles of the various contact people and organizations. For example, a local planning department may be responsible for developing a "master" recreation plan for the your city or county. Many counties also have planning boards that approve these plans and present them to town boards, city councils, or county commissioners. Transportation engineers work extensively with road development and construction to implement plans approved several years in advance. Elected municipal and county officials are usually the key policy makers in many communities, and they can influence how the policy process works.

Improving Roads

1. **Within City Limits:** Most of the roads within municipal boundaries are owned by the municipality. Improving these roads means working with municipal staff to develop a plan and request funds. Each municipality may also have state highways which run through town and are owned and maintained by NC DOT. Improving these roads may require working with NC DOT to submit a Transportation Improvement Program (TIP) project or to provide input at DOT public hearings regarding road construction.
2. **Outside City Limits:** Beyond the municipality, most secondary roads in each county are owned and maintained by NC DOT, and improving these roads follows the procedures mentioned above.

Both types of road improvement requests can benefit from suitability assessment. **Step 3: Making Change Happen** provides more detail on how to seek road improvements.

5. **Learn about other citizen action committees, community groups, and coalitions.**

   Contact the CVH Program at the state health department and health educators at your local health department to learn about other individuals and organizations striving for change in your community. You may want to form alliances with these groups to advocate for policy changes in your community and help conduct the assessment.

6. **Remember – professional and citizen collaboration makes you stronger.**

   When you meet other individuals or groups who are working to improve the health of your community, seek ways to collaborate and help one another attain your goals. Collaboration can be time-consuming and challenging, but it often makes a project stronger. By including diverse professional and citizen voices when you meet with a planning board, town council, or county commissioners, your project may be taken more seriously by elected officials who will see the political wisdom in supporting your plan.

Improving Roads: A Town Story

In 1998, the Town of Pittsboro, NC (pop. 2,200) published a request in the local newspaper for citizens to join a committee to address road and traffic safety issues in town. A volunteer group of ten citizens agreed to meet on a monthly basis to help the town deal with safety concerns that had been voiced in recent years. Although a town commissioner initially convened the group, the Pittsboro Safe Roads Committee elected a chairperson, developed vision and mission statements, drafted some proposed projects, and got to work.

The committee's work is composed of two primary tasks: (1) identifying and providing recommendations to the town board to alleviate "hot spots," i.e. more urgent safety concerns related to walking, bicycle and automobile transportation; and (2) developing a long range plan in collaboration with town officials for a community that accommodates walkers, bicyclists, and automobiles.

In the twelve months since their first meeting, the Safe Roads Committee worked with the Division of Motor Vehicles to map crash data in town, conducted a citizen survey of road safety concerns, conducted a sidewalk assessment of local streets, mapped out a network of proposed future sidewalks, drafted a TEA-21 proposal with the town manager, and obtained formal support from the town board in the form of matching funds for sidewalks. This small town's proposal was awarded $85,000 to begin improving their walking environment.

With no paid staff, the Pittsboro Safe Roads Committee is an example of how citizens and town officials can successfully work together to help create a safer community that welcomes walkers and bicyclists in addition to automobiles.

GETTING READY FOR ASSESSMENT

Now that you have learned what is happening in your local area regarding improvements for walking and bicycling, and you have met with the planning department and other officials to build a collaborative effort, it is time to prepare the materials and identify the road segments to be assessed.

7. Identify roads to assess for walking and bicycling.

Invite the planning staff to help you identify the roads to assess. You could begin by identifying major destinations for walkers and bicyclist - for example universities, schools, libraries, shopping areas, business parks, and recreation facilities. Also identify major pedestrian and bicyclist crash locations. If the planning department will not collaborate with you, work with people who regularly walk and bike in the community. Let their experience and knowledge help you select the roads to assess.

The planning department may also be able to give you information and maps about greenways, trails or paths. If the planning department cannot help you with this information, ask them to provide you with other contact names for this information (e.g., NC DOT regional staff, local Parks and Recreation department).

8. Divide each road into segments to be assessed.

Divide up the selected roads into segments that are at most two miles long. The smallest road segment may be one city block. **Divide each road where the road changes travel direction, number of lanes, posted speed limit, width, or where there is a dramatic change in conditions** (e.g., a physical median appears between traffic lanes).

Assign an ID number to each road segment and divide among your team.

To help you keep track of the road segments, identify each road segment by giving it a unique identification number.

GIS: If your local planning department has the ability to map road information using computers (Geographic Information Systems, called "GIS" for short) build a collaborative relationship with them and request a GIS map of your project areas along with a table of the road data. Be sure the road dataset includes both the name and an ID number for each road. Use those for your assessment forms. If there are no ID numbers in the GIS file, ask them to create a new "field (column)" with unique ID numbers for each road segment. We suggest using a 3-digit number (for example, you could start at 101). Once you have assessed and scored the roads, that ID number will allow them to colorize each road according to the directions later in this guidebook.

No GIS: If you are using only paper maps of your own creation, then assign each road segment a unique ID number (for example, you could start at 101).

If during assessment you notice that major road characteristics (e.g., speed limit, width) change dramatically within a road segment, simply subdivide that segment and assign each piece an alpha suffix (for example, 101a, 101b, etc.).

After identifying the road segments that you plan to measure, list these road segments on the General Information About Road Segments worksheet (Appendix 4).

9. Obtain traffic counts from the planning department.

To assess suitability you will need traffic counts for each road segment. Ask the local planning staff for the Annual Average Daily Traffic (AADT) for each road segment. The AADT is necessary to include in the assessment because it provides information on the volume of vehicles using that road. If your planning department cannot provide the information, it may be possible to find some county and state highway traffic counts on the internet at: www.dot.state.nc.us/planning/statewide/traffic_survey. However, if you cannot access traffic count maps, you can contact a staff person from this list: http://apps01.dot.state.nc.us/apps/directory/3265.html. You can also contact your regional NCDOT staff (Appendix 2) to request their assistance in obtaining traffic count information (they may offer only counts for state-owned roads). They may ask you to email or mail them a list of the road segments to be assessed.

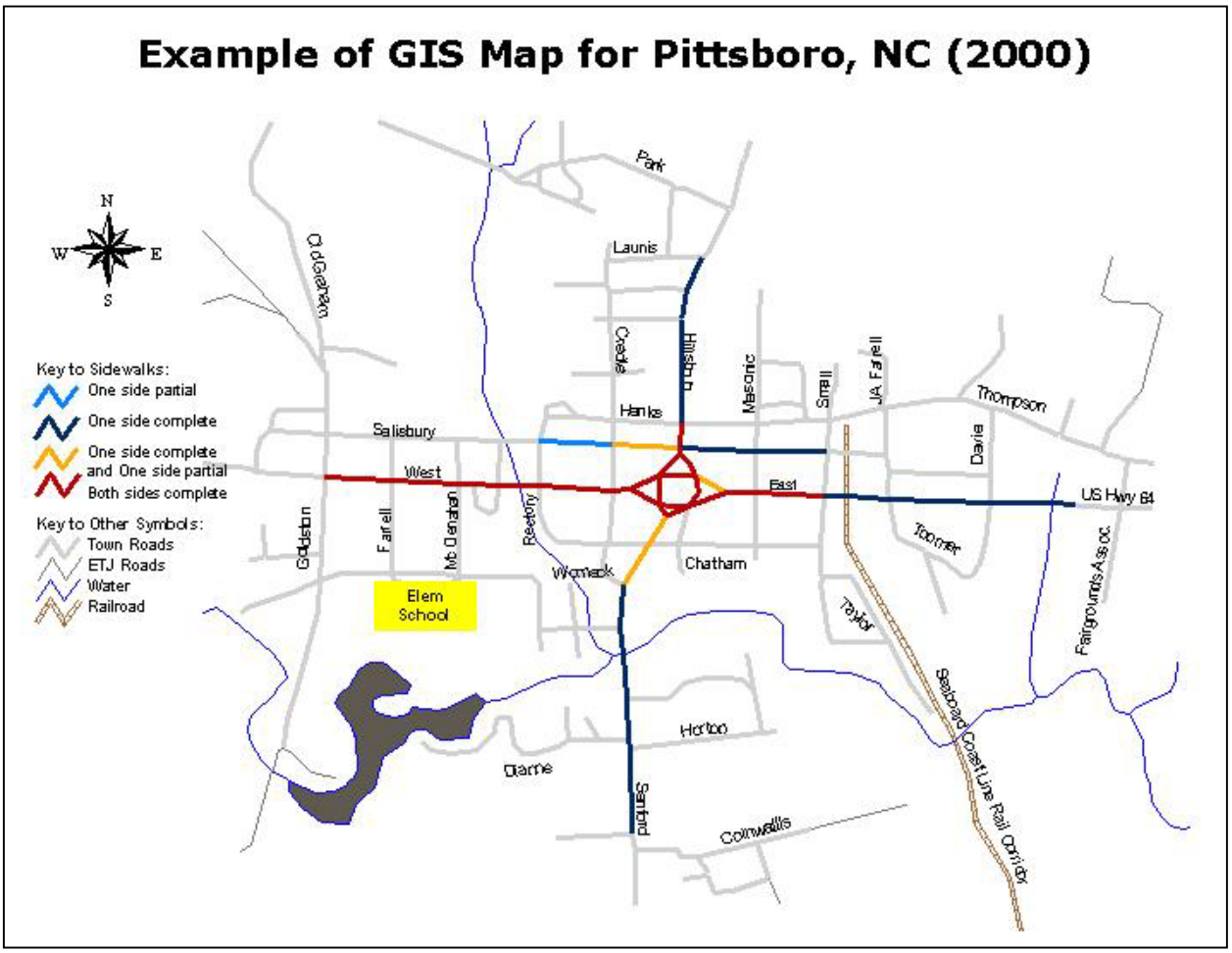
Once you have the AADT, record the information in the appropriate column on the General Information About Road Segments worksheet (Appendix 4).

10. Prepare a map of the road segments.

You will need a map for the assessment project. Depending on the size of your community, you might need to develop a set of smaller maps to cover the whole area. If the planning staff have computer mapping software called Geographical Information Systems (GIS), they may be willing to print your project maps (which you can then

photocopy for data collection maps). If they are unable to do this, you can use a paper road map make photocopies. Be sure to include the mileage scale on your maps so that you'll know the mileage of the segments you are assessing.

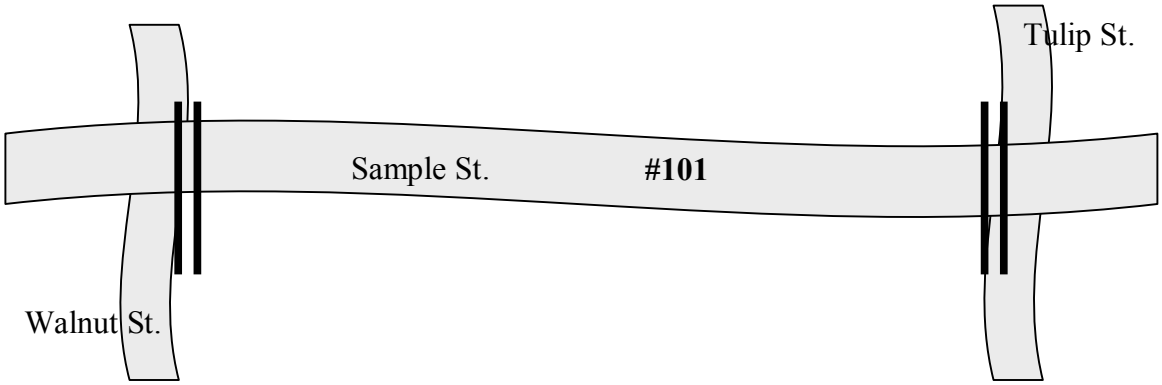
In general, the map areas must be large enough for you to clearly write identifying information about the road segments you are assessing. Keep a copy of your original project map(s) in a file in case you lose or damage your data collection maps.



11. Identify the road segments on your map.

Record the ID# for each segment on the map and draw boundary lines (//) to mark the beginning and ending of each segment.

Picture of mapped road segment with ID# and boundary lines.



12. Identify greenways and other walking/bicycling trails on your map.

If you learned of any non-road/non-sidewalk paths for walking and bicycling, mark these alternative paths and greenways on your working map. You will not be assessing these off-road paths, but you are including them on the maps for later reference when planning a potential network of routes for walking and bicycling.

13. Identify landmarks on your map.

If the planning staff is creating GIS maps, ask them to plot local landmarks. These landmarks include churches and other faith centers, libraries, museums, parks, post offices, historic areas, recreation facilities (e.g., pools, tennis clubs), schools, colleges, shopping centers, and major businesses. If you are developing your own working map, use your knowledge of the area to map these landmarks by drawing symbols on your working map. Be sure to develop a separate "key" or "legend" that shows what the symbols represent.

Suggested Map Symbols

F Faith/worship/church
L Library
M Museum
PK Park
PO Post Office
RF Recreation facility
A School/College
$ Shopping
W Worksites (large)
B Bike Shop

14. Assign road segments to assessors.

Allow your team to select areas of the map with which they are familiar. Depending on the length of the segment and what mode of travel each person chooses (walking or bicycling) each segment may take between 10 and 30 minutes to assess. We don't encourage driving the segments in a car, because it is very hard to assess carefully while also driving a motor vehicle. It is also harder to "feel" the suitability of certain characteristics when inside a motor vehicle.

Get your assessment team mobilized and identify a timeframe for completing assessments. Start small and make it a fun event (for example, collect information in the

morning on the weekend and follow-up with a potluck lunch). Over a series of weekend mornings, you'll be surprised how much a team can assess! Be sure to have celebrations as you meet projected goals.

Step 2a: Walking Assessment

DESIRABLE ATTRIBUTES FOR WALKING

Walking is the oldest form of human transportation. People walk to reach specific destinations. Many people also walk for recreation, including enjoyment and exercise. Walking contributes to the creation of more "livable communities," because people who walk are more likely to know their neighbors. Neighborly interactions, encouraged by walking, make neighborhoods enjoyable and safer places to live. However, many homes are located on roads where walking is dangerous because they lack adequate sidewalks. Improving the physical walking environment is an important part of building a livable community.

General Design Principles for Sidewalks

1. Interconnected destinations
2. Safe to use (e.g., signals, crosswalks, lighting)
3. Accessible to everyone (e.g., curb ramps)
4. Easy to use
5. Useful
6. Beautiful (e.g., landscaping)
7. Economical to build and maintain

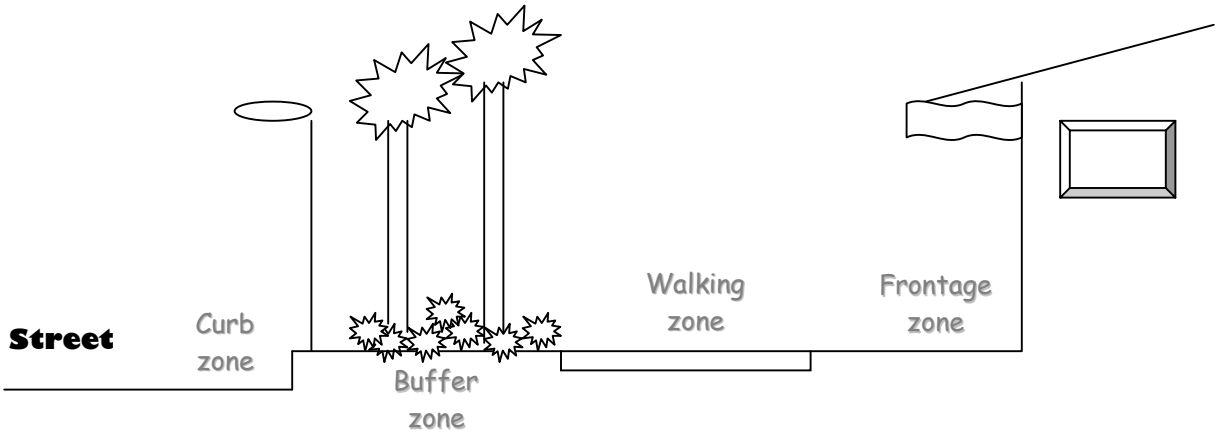
Adapted from City of Portland Office of Transportation, *Portland Walking Design Guide*. June, 1998.

Research shows that almost 80% of people are willing to walk up to ½ mile to reach their destinations. Twenty percent of people are even willing to walk up to two miles to reach their destinations (www.smartraq.net/survey.htm; US DOT, 1994). However, it is not just distance that affects a person's choice to actually walk to a destination. Characteristics of the walking environment also affect this choice. Some characteristics are beyond the control of people designing the walking environment, like the weather and the surrounding landscape. Other characteristics can be incorporated into the design of the walking environment. These characteristics are incorporated into seven general design principles which can guide the design and improvement of sidewalks for walking and wheelchair use.

THE WALKING ENVIRONMENT HAS FOUR "ZONES"

Regardless of the type of street, the walking environment generally consists of four zones (Figure 1). The zones map out the walking environment from the edge of the pavement where there may be a curb, through the buffer zone where trees, streetlights and benches may be located, through the walking zone of the sidewalk, to the frontage zone where there may be business displays, vendors tables, café seating, a residence, or a parking lot. The walking suitability assessment method focuses from the curb through the walking zone. However, a community can influence all four zones to enhance the complete walking experience (e.g., promoting residential frontage beautification and business/restaurant frontage that overflows onto extra-wide sidewalks to encourage walker patronage). For more information, request a copy of "A Walkable Community," an illustrated publication by USDOT (#FHWA-SA-00-010). Also visit the following internet website: http://safety.fhwa.dot.gov/programs/ped_bike.htm.

Figure 1. Walking Environment (Sidewalk) Zones



A CLOSER LOOK AT SOME WALKING FACILITIES

This photograph illustrates the four sidewalk zones on a downtown sidewalk. From the right to the left side of the photograph are the curb zone at the edge of the street; the buffer zone with signs, trash receptacles and a bicycle (notice the brick pavers used to visually differentiate the zone); the through walking zone where the woman is walking; and the frontage zone where the storefronts meet the sidewalk.

This photograph illustrates the same four sidewalk zones in a residential setting. The curb zone is at the edge of the street, the buffer zone has a wide strip of grass and shrubbery, the through walking zone is where the man is jogging, and the frontage zone is the landscaped stone wall at the edge of a residential yard.

This photograph illustrates one form of curb ramp that allows a wheelchair to leave the sidewalk zone from either direction of travel and enter the road within the crosswalk. Notice the gentle slope of the ramp and the patterned texture that helps visually and texturally distinguish the ramp area. Curb ramps differ markedly in their design and effectiveness for gently guiding wheelchairs to the street level.

In this photograph the clearly marked crosswalk stretches from one curb ramp to the other curb ramp. The markings are in good condition and the curb ramp safely guides a wheelchair onto the street completely within the crosswalk boundaries.

WALKING ASSESSMENT METHOD

For a community to be "walkable" there should be sidewalks, greenways, and walking paths that provide a safe and accessible route for walking that is separated from motor vehicle travel. The following sidewalk assessment examines information about the presence or absence of sidewalks, the material used for the surface of the walkway, the sidewalk width, the buffer width, and the presence or absence of curb ramps and streetlights. This assessment tool is only designed to assess actual sidewalks. Do not use it to assess unplanned trails or "desire trails" that walkers have made along the side of a road; those paths would not be considered a developed dirt sidewalk (Sidewalk/Path = None).

1. **Provide the assessors with their list of road segments and maps.**
   For each assessor on the team, make a photocopy of their mapped road segments. Highlight on each data collector's field map the specific area to be assessed by that person. Provide them with a list of their road segments from the General Information About Road Segments (Appendix 4). They will also need photocopies of the Walking Suitability Assessment Form (Appendix 6).

2. Become familiar with the Walking Suitability Assessment Form before going into the field.

Encourage each member of the data collection team to carefully examine the Walking Suitability Assessment Form (Appendix 6) and become familiar with the information they will be collecting. Before heading out to assess the roads, each person or team should gather the supplies needed for the assessment. Be sure assessors take a copy of the guidebook into the field in case there are questions about the procedure.

Supplies You Will Need

1. List of your road segments
2. Map of road segments
3. Walking Suitability Assessment Forms (Appendix 6)
4. 20' retractable tape measure
5. Clipboard & pencils
6. Guidebook for reference
7. Safety equipment (e.g., orange vests, caution signs).

3. Travel the road segment and observe the characteristics.

Only assess segments in daylight when you will be clearly visible to motor vehicles. Study both sides of the road segment for an "overall" score for each characteristic. It may help to travel the road once to view the entire walkway segment before writing anything down. Then begin filling out the data collection worksheet. For each characteristic, record the score in the space provided. Record your overall or average impression for the entire segment. If it is difficult to find an average impression, be more conservative in your scoring (e.g., imagine yourself in a wheelchair or pushing a baby stroller on that sidewalk). If there are specific spots where conditions are worse than the average, note that under "Isolated Problem Spots" and complete the table at the bottom of the form. Do not record temporary conditions from construction. Try to capture the permanent characteristics of the road after construction is completed. For each characteristic, record the score in the space provided.

What Characteristics Are Being Assessed?

1. AADT
2. Speed
3. Number of through lanes
4. Presence of a sidewalk
5. Sidewalk material
6. Sidewalk surface condition
7. Sidewalk width
8. Buffer width
9. Curb ramps
10. Street lights
11. Isolated problem spots
12. Intersections

4. Record information on the Walking Suitability Assessment Form.

AADT. Record the score for the annual average daily traffic.
Posted speed limit. Record the score for the posted speed limit.
Number of through lanes. Record the score for the number of through lanes (for both directions of travel).
Presence of Sidewalk. If there is no actual sidewalk or planned path (or only a very tiny patch of sidewalk for the entire segment) record "99" and do not answer any other questions. Just total the score up to that point and record in the final column "Total Score." Do not assess the rest of the information for this segment, since there is no sidewalk. (The scores 99 and higher will draw attention to areas where sidewalks may need to be constructed.) However, if there is sidewalk, record the presence of sidewalk that exists on both sides of the street. To be continuous, the sidewalk must run the full length of the segment. For example, if there is only sidewalk present on one side of the

street and it alternates from side to side, record that as "both sides partial." The safety concern is that a walker must keep crossing the street to use the sidewalk.

Sidewalk Material. "Dirt" should only be designated when it is obviously a constructed walking pathway (not just a "desire trail" that formed from repetitive pedestrian use). If the material changes across the segment, choose the predominant material. If it is difficult to choose one main material, then be conservative and choose the material that causes the most problem for walking or wheelchair use.

Surface Condition. This is your opinion on the permanent condition of the sidewalk. Do not record any temporary conditions due to construction or maintenance neglect (e.g., scattered gravel or debris on the sidewalk). Maintenance is a separate issue.

Walking Zone Width. Measure the full width of the constructed sidewalk's walking zone at a location that represents the general width you've observed. Observe the changing width with an eye toward use by someone in a wheelchair or two people walking side by side. Disregard any temporary barriers to measuring that width (e.g., push aside any vegetation covering the sidewalk – but make a note of it as an isolated problem). Where Walking and Buffer zones are constructed of the same material and it is hard to identify the boundary, estimate and measure from there to the other edge of the walking zone.

Buffer Zone Width. Measure from the edge of the curb farthest from the street to the edge of the walking zone itself (e.g., the sidewalk). Observe the changing width and measure where it seems about average in width. If a significant portion of the segment has no buffer at all, be conservative and use that as the score. Where Walking and Buffer zones are constructed of the same material and it is hard to identify the boundary, estimate and measure from the curb to that estimated boundary.

Curb Ramps. If every sidewalk has a curb ramp to lower it to street level at intersections, record "Yes." If some are missing, record "Some." Otherwise, if none are present, record "None."

Adequate Lighting. This is your opinion on the adequacy of street lighting for evening walking. Is there enough to adequately illuminate the walking area of the sidewalk?

Isolated Problem Spots. Record "Yes" if there are isolated spots where a certain characteristic does not maintain the average score you selected. For example, most of the ½ mile sidewalk was concrete except for one 20' section of gravel.

Intersections. For each road intersection in the segment (including intersections at the beginning and ending of the segment) use your judgement to determine if any of the intersection problems apply. If you check a "Yes" box for <u>any</u> of the intersection problems, complete the table at the bottom of the form. Give a brief reason why you believe the design improvement is needed.

5. **Proceed to the next road segment.**

   Proceed to the next road segment and continue your assessments. If two road segments include the same intersection, assess the intersection problems for each segment. It will not affect the suitability scores, and will ensure the problems are adequately noted.

6. **Calculate the final walking suitability scores.**

   Use a calculator or computer spreadsheet program (e.g., MS Excel) to sum the various columns and determine the final walking suitability score for each road segment.

7. Color highlight the road segments on your map.

When the final scores are determined, color highlight each assessed road segment on a large map. Use the colors listed below. Attach to the map a photocopy of the suitability score color description. Note: *the "cooler" the color - the better the street for walking*.

Walking Suitability Assessment (Emery Method, V.040802) **Scores and Colors:**

Very Good (less than 3.0) – color **blue**.
These sidewalks are generally good for walking and wheelchair use.

Good (3.0 – 5.9) – color **green**.
These sidewalks provide basic walking access, but could be upgraded to make then better walking and wheelchair environments. Improvements might include enhancing the surface material or condition, and installing more lighting.

Fair (6.0 – 8.9) – color **yellow**.
These sidewalks need improvements to improve the walking environment. Improvements might include lowering the posted speed limit, improving the surface material or condition, installing or widening buffers.

Poor (9.0 – 26.0) – color **orange**.
These sidewalks need major improvements to enable safe use. These types of improvements include replacing unfirm surfaces (e.g., gravel or dirt), repairing broken sidewalk sections, constructing curb ramps for wheelchair access, or constructing a continuous sidewalk on at least one side of the street.

No Sidewalk on quiet street – (99.0) – color **pink.**
No Sidewalk on busy street – (more than 99.0) – color **red**.
When there are no sidewalks, travel beside the road on foot or wheelchair is not safe or comfortable (especially if the street has frequent, high-speed traffic). If these roads provide links between residential areas and frequent destinations, the need for sidewalks is greater.

GIS: If you received GIS maps from your planning department, ask them to colorize the road segments by adding a new "field (column)" called Walking Suitability Score. To make this easier for them, your team can data enter the walking suitability scores into a Microsoft Excel spreadsheet that has just two columns: Road ID# and Walking Suitability Score. They can then merge this spreadsheet with their original data table and then colorize the road segments using their GIS program.
No GIS: If you have no computerized maps, simply use a large road map and color each road segment by hand using color highlighters or color pencils.

8. Proceed to "Using the Assessment Results to Make Change Happen."

Step 2b: Bicycling Assessment

DESIRABLE ATTRIBUTES FOR BICYCLING

General Design Principles For Bike Lanes

1. Well marked
2. Safe from vehicles
3. Clear of debris
4. Free of potholes and cracking
5. Safe turn lanes

Adapted from City of Portland Office of Transportation, *Bicycling Master Plan*. 1996.

The most suitable bikeways are well-designed, clearly marked, well-maintained, and keep bicyclists safe from vehicles. Preferred bikeway surfaces are free of potholes, cracking, and other rough spots. In addition, the bikeway is safer when there is no turning or merging traffic crossing in front of the bicyclist. Many people presume that "bike lanes" are the best solution for all circumstances. However, on many roads without curb and gutter, wider paved shoulders would allow bicyclists to more safely share the road with motor vehicles. Many citizens presume that striped bike lanes are the solution for bicyclists. However, some engineers argue that striped bike lanes can also provide a false sense of security to bicyclists who then pay less attention to vehicular traffic. Some design professionals suggest that striped bike lanes are appropriate only on streets with reduced traffic access from sidestreets and driveways. There is not one solution to be applied to your community. Each road must be considered independently to determine the best design for bicycling facilities. This assessment method will help you gather important information to help plan bicycling improvements for your roads.

ROAD ASSESSMENT METHOD

1. **Provide the assessors with their list of road segments and maps.**
   For each assessor on the team, make a photocopy of their mapped road segments. Highlight on each data collector's field map the specific area to be assessed by that person. Provide them with their list of road segments, highlighted maps, and photocopies of the Bicycling Suitability Assessment Form (Appendix 8).

2. **Become familiar with the Bicycle Suitability Assessment Form before going into the field.**
   Encourage each member of the data collection team to carefully examine the Bicycle Suitability Assessment Form (Appendix 8) and become familiar with the information they will be collecting. Before heading out to assess the roads, each person or team should gather the supplies needed for the assessment. Be sure assessors take a copy of the guidebook with you in case there are questions about the procedure.

3. **Travel the road segment and observe the characteristics.**
   Only assess segments in daylight when you will be clearly visible to motor vehicles. We encourage you to travel the segment by bicycle because you may not be able to "feel" the surface of the road or to stop as often as you need to record information. You may need

to travel the road more than once to record all the information. Please do not rely on memory, but take the time to travel the road as many times as needed.

Study both sides of the road segment to determine an "overall" score for each characteristic. If it is difficult to find an average impression, be more conservative in your scoring. For example, if the curb only exists for less than half the road, mark it "No." Do not record temporary conditions from construction. Try to capture the permanent characteristics of the road after construction is completed. For each characteristic, record the score in the space provided.

4. Record information on the Bicycling Suitability Assessment Form.

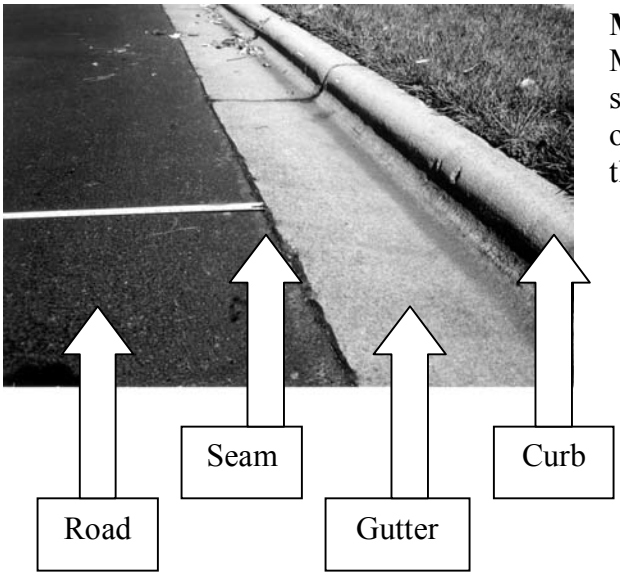
For each road segment, fill in the date, your name, the segment ID number and the boundary roads on the Bicycle Suitability Assessment Form (Appendix 8). Record any comments or notes that seem immediately useful for the assessment process, such as "no bike lane, but gravel path parallel to the roadway".

5. Record General Road Factors.

Record the Annual Average Daily Traffic (A1) provided by the planning department or regional NC DOT (see Appendix 4). While assessing the road segment, record the total number of through lanes (A2). Through lanes do not include turn-only lanes, but do include combined through/turn lanes. Record the posted speed limit (A3). Do not record any school zone speed limits. The next step is to measure the outside lane width (A4) and convert the measurement to decimal format for recording on the sheet (e.g., 4'6" converts to 4.5' and 4'9" converts to 4.75'). See the special instructions and photograph below. Note that any dramatic change in these general road factors might necessitate dividing the road segment into subsegments (and numbering them with an alpha suffix, e.g., 101a and 101b).

What Characteristics Are Being Assessed?

1. Annual Average Daily Traffic (A1)
2. Number of through lanes (A2)
3. Speed (A3)
4. Outside lane width (A4)
5. Bike lane width (A5)
6. Pavement factors (B)
7. Location factors (C1-C18)

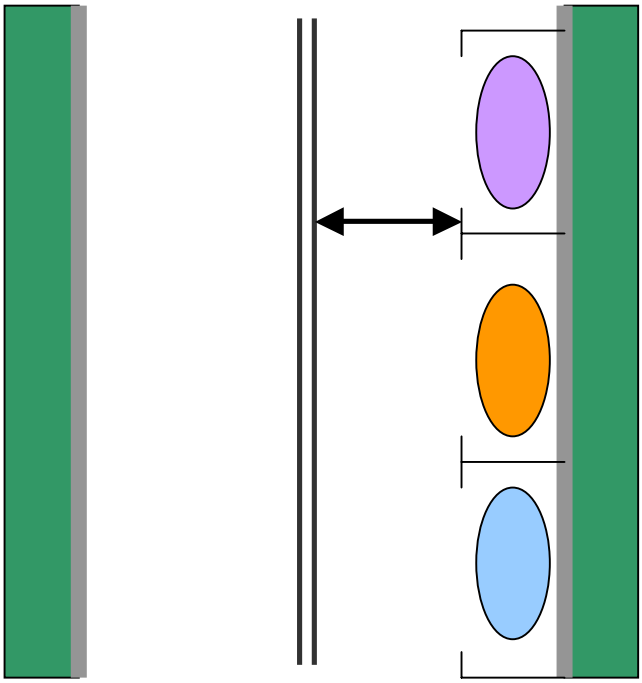


Measuring the outside lane (A4):

Measure from the edge of the driver's side painted stripe of the outer-most motor vehicle lane to the outer edge of that travel lane. Be sure to convert the measurement to decimal form for recording.

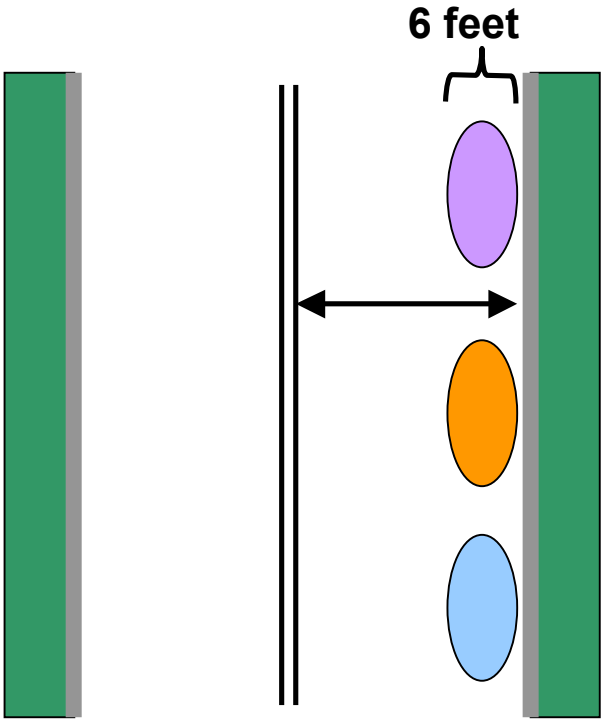
1) For roads with a striped shoulder, measure up to the stripe marking the shoulder.
2) For roads with a curb and gutter, measure to the gutter seam (see photo).
3) For roads with curb only (no gutter), measure right up to the curb.
4) If there are no painted lanes on the two-way road, measure the entire road surface and divide by two.

When measuring outside lanes that include vehicle parking, follow the instructions illustrated below.



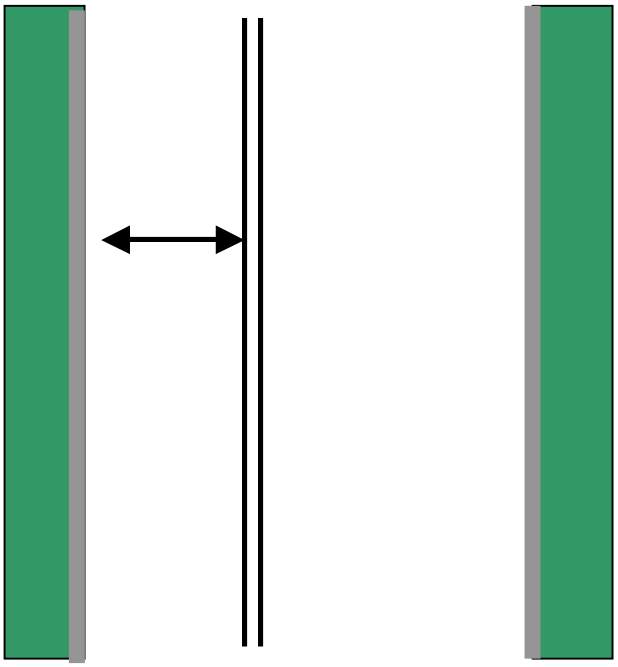
Special measurement instructions for roads with marked (painted) parking spaces:

Measure from the edge of the driver's side painted stripe of the outer-most motor vehicle lane up to the beginning of the parking space. The logic is that a bicyclist would not be riding in the marked parking spaces because of parked cars or even the visual markings. The bicyclist would share the outside lane with motor vehicles.



Special measurement instructions for roads with unmarked (unpainted) parking:

If roadside parking is permitted and used (may not necessarily be signed), and there are no painted parking spaces, measure the width of the outer-most lane according to the general instructions and subtract six feet (6') from the width. The logic is that when cars are parked there, a bicyclist must share the remaining width with motor vehicles.



Special measurement instructions for roads with unequal outside lanes:

If the outside lanes on each side of the road are significantly different widths (perhaps parked vehicles are permitted in one of the directions), measure the outside lane that is thinnest. For example, a road may have a very wide outside lane traveling in one direction and a thin lane in the other direction. The thinner outside lane is the lane to measure for the road segment. The logic is that a bicyclist would be able to travel in both directions – therefore, measure the thinner lane the bicyclist must share with motor vehicles. In the Comments/Suggestions for Improvement box at the top of the form write, "Unequal Outside Lanes."

BikeLane. A bicycle lane is a clearly marked/striped lane for bicycle travel that is constructed as part of the paved roadway. It is not a separate path, therefore motor vehicles could illegally drive or park on the marked bikelane. Generally the bicycle lane is clearly striped on the road and may include signs designating it for "Bicycle Use Only." The photograph below is of a marked bicycle lane.

Paved Shoulder. A paved shoulder is frequently observed on roads that do not have curb and gutter. The paved shoulder may be used by cyclists to provide more separation from motor vehicle traffic. However, it is NOT a bicycle lane unless marked and signed as such.

Measuring a bicycle lane or paved shoulder (A5):

To measure the bike lane or paved shoulder, you must measure from the edge of the inside painted line to the outside painted line. If there is no outside painted line, measure to the edge of the paved road surface. Convert the measurement to decimal format for the assessment formula.

The photograph to the left illustrates a curbed bicycle lane. Measurement is from the painted line to the edge of the curb.

6. Identify Pavement Factors (B).

Record the condition of the road according to the FHWA Highway Performance Monitoring System (HPMS) Pavement Condition Factors (US DOT, 1987) listed below. Note that these descriptions are for motor vehicle travel, so you may need to think as a car driver when assessing pavement condition. Decide which one describes the overall condition of the pavement.

Very good: only new or nearly new pavements are likely to be smooth enough and free of cracks and patches to qualify for this category.

Good: pavement, although not as smooth as those described above, gives a first class ride and exhibits signs of surface deterioration.

Fair: riding qualities are noticeably inferior to those above, may be barely tolerable for high-speed traffic. Defects may include rutting, map cracking, and extensive patching.

Poor: pavements have deteriorated to such an extent that they affect the speed of free-flow traffic. Flexible pavement has distress over 50% or more of the surface. Rigid pavement distress includes join "spalling" (where sections of joined pavement are chipping and breaking apart at the join), patching, etc.

Very poor: pavements that are in an extremely deteriorated condition. Distress occurs over 75% or more of the surface.

Other pavement factors include the presence of a curb (B2), the presence of rough railroad crossings (B3), and the presence of storm drain grates (B4). A storm drain grate is in the road or gutter surface and frequently has a cover that allows the rainwater to flow through into the storm sewer below. The concern is that a bicyclist might ride across this surface and compromise their tire traction. A storm drain grate is not the vertical opening cut into the curb along the side of the street which allows water in the gutter to discharge from the street surface.

7. Record Location Factors (C).

Record the presence of the 18 location factors by circling "yes" or "no" as appropriate. At the end of measurement, you will total only the scores for every factor that is answered "yes." Consider each location factor as independent characteristics. For example, a road segment could have both severe and moderate grades.

Some location factors require your opinion (for example: severe grade (C8), moderate grade (C9), frequent curves (C10), restricted sight distance (either horizontal or vertical) (C11), numerous residential or commercial driveways (C12), numerous signed/signaled stops (C13), and difficult intersection crossing (C14)). Use your best judgement as a bicyclist when recording these location factors.

Below are descriptions and sample photographs of some of the location factors.

Physical median (C5):
A strip of land that physically separates the two directions of traffic. Note this is not a limited traffic island near a signalized intersection. Medians are generally used for significant distances of roadway.

Paved shoulder (C6):
The area from the outer most painted line to the end of the pavement or to the curb and gutter.

NC DOT Division of Bicycle and Pedestrian Transportation suggests a minimum shoulder width of four feet (4') when designing for use by bicyclists. When vehicle speeds exceed 35 mph more than four feet is preferred.
(North Carolina Bicycle Facilities Planning and Design Guidelines, January 1994.)

Bike lane (C7): A separate lane on the road that is for bicycle use only. It is identified for bicycle-use-only with painted road markings and/or posted signs.

Industrial Land Use (C15): Property alongside the road that is occupied by a manufacturing plant, factory, warehouse, or other large industrial facility that has a driveway or road accessed from the segment you are measuring. The safety risk is from the high volume of large trucks crossing in front of bicyclists to enter or exit the industrial property.

Commercial Land Use (C16): Property that is used for business, such as a grocery store, movie theatre, school, church, office building, fast food restaurant, or shopping center that has a parking lot or driveway accessed from the segment you are measuring. The safety risk is from the high volume of vehicles crossing in front of bicyclists to enter or exit the property.

One Sidewalk Only (C17) and No Sidewalks (C18): The presence of sidewalks can help reduce the speed of traffic on a road simply because there is a visual "cue" to the driver that other forms of transporation occur on that road, therefore caution must be used. Visual interest and complexity along the road, such as sidewalks, can help increase driver attention by alerting them to people moving along the road on foot or on bicycle. Therefore, these limited sidewalk assessments contribute to the bicycling score for the segment. Assessing the sidewalk presence is not meant to imply that bicyclists should use the sidewalk for riding bicycles. We strongly discourage bicyclists from riding on sidewalks since that creates an unsafe walking environment.

8. Complete the bicycle suitability formula.

Add up the various suitability subtotal scores. Complete the formula on the Bicycle Suitability Assessment Form (Appendix 8) by filling in the General Road Factors measures (A), the Pavement Factors total score (B), and the Location Factors total score (C). Use a calculator or a computer spreadsheet program (e.g., MS Excel) to calculate the bicycle suitability score and record in the box provided at the end of the formula.

9. Color highlight the segments on the map.

When the final scores are determined, color highlight each assessed road segment on a large map. Use the colors listed below. Attach to the map a photocopy of the suitability score color description. Note: *the "cooler" the color - the better the road for bicycling*.

Bicycle Suitability Scores and Colors:

Very Good (less than 3.00) – color **blue**.
A road that is bicycle friendly and usable by all levels of bicyclists. There are few improvements needed.

Good (3.00 - 3.99) – color **green**.
A road that can be used safely by most bicyclists. Minimal improvements may be needed.

Fair (4.00 - 4.99) – color **yellow**.
A road that has some hazards, but can be still be used by adults for bicycling. Not recommended for children. Specific improvements are needed.

Poor (5.00 - 6.99) – color **orange**.
This road has many hazards and would require adult bicyclists to be very careful. Not safe for children. Many improvements are needed.

Very Poor (higher than 6.99) – color **red**.
This road has many hazards, heavy traffic and bad road conditions. Not safe for any bicyclists. Improvements are greatly needed.

Adapted from: Eddy, N. (1996)

GIS: If you received GIS maps from your planning department, ask them to colorize the road segments by adding a new "field (column)" called Walking Suitability Score. To make this easier for them, your team can data enter the walking suitability scores into a Microsoft Excel spreadsheet that has just two columns: Road ID# and Walking Suitability Score. They can then merge this spreadsheet with their original data table and then colorize the road segments using their GIS program.

No GIS: If you have no computerized maps, simply use a large road map and color each road segment by hand using color highlighters or color pencils.

10. Proceed to "Using the Assessment Results to Make Change Happen."

Step 3: Using The Assessment Results To Make Change Happen

This section is not a comprehensive plan for creating change. It is meant only as a guide for collaborating with officials and professionals to make improvements in your local community.

ENVISION A "NETWORK" OF ROADS AND SIDEWALKS

1. Study the network of color-coded roads.

With your team and local planning staff carefully study the bicycle and the walking suitability maps you created during your assessment project. Consider key destination points such as large residential neighborhoods, universities, commercial areas, grocery stores, libraries, retail shops, schools, health services, centers of worship, and recreation areas. For each map, examine how the color-coded road segments link together. Are blue and green segments connected to safely guide bicyclists or walkers to most of the popular destinations across your map? Do red and orange segments interfere with bicyclists or walkers ability to safely reach their destinations? Are there road segments which are hazardous to both bicyclists and walkers? Consider the road segment intersections (Appendix 6) which were determined to need improvements for suitable walking. How could those improvements become part of a larger road improvement plan? If hazardous road segments or intersections are barriers to having safe links between important destination points, this may be the place to start planning improvements.

NC DOT Division of Bicycle and Pedestrian Transportation (DBPT)

The Division of Bicycle and Walking Transportation is a prime contact in the NCDOT for materials and technical assistance on planning and designing bicycle and walking facilities and programs. The DBPT works closely with local and regional transportation, planning, parks and recreation, health and law enforcement agencies and networks closely with citizen activists.

(919) 733-2804
bikeped_transportation@dot.state.nc.us

2. Envision and plan a network of roads and sidewalks.

What would be the ideal network of roads and sidewalks for walkers and bicyclists to use in your community? It will be important to collaborate with the local planning staff during this step. Your town or county may already be planning improvements to some roads. Your data can enhance their understanding of the "problem spots." Your team may be able to suggest a series of improvement projects for officials to consider and vote upon. For instance, Project 1 may be to improve the unsuitable roads around schools. Project 2 may be to improve the unsuitable roads around governmental service institutions (e.g., post office, library, health department, museum, centers of worship). Project 3 may be to improve the unsuitable roads around major worksites or centers of worship. Prepare a list of recommendations for improving the roads in each project. Be creative when presented with design problems. For

example, in areas where road width improvements are not possible because the town has no funding to purchase private property "right of way," you could try planning the road network to link with public transit. This solution would also provide transit support for bicyclists when the weather turns bad, if they have to ride at night, or if personal safety is an issue.

Making A Plan For Road Improvements: One Example

Here is one example of how to identify needed road improvements for walking and bicycling to school. On the walking map draw a circle ½ mile in radius around each school. (This is a reason for including the distance scale on all maps.) Note that GIS maps can have radius perimeters drawn on them by the computer. Are there sidewalks needing improvement within that circle? On the bicycling map draw circles around each school at one and two mile radius distances. For each circle look at the hazardous cycling roads to the school. Can younger children safely bicycle from their homes up to one mile to the school? Can older youth safely bicycle from their homes up to two miles to the school? In a similar way, examine large worksites and university or college campuses. Can bicyclists safely commute up to 5 miles to reach their destinations? What needs improvement?

3. Develop biking and walking facilities at destinations and along the network.

Developing a road and sidewalk network is only one part of enhancing the physical activity environment. Another important design consideration is to provide supportive facilities at major destination points and along busy walking and bicycling routes. Design lockable parking facilities for bicyclists. Consider lighting along the routes and at destination points. Is there adequate street lighting or should supplemental lighting be considered? Consider installing public restrooms, water fountains and benches at appropriate locations. These final design issues should be developed within the larger, more comprehensive "master" plan for improved walking and bicycling in your community.

Americans with Disabilities Act

ADA requires all public facilities, and private facilities which provide goods or services to the public, to provide access to people with disabilities (e.g., sidewalk curb ramps, street level or ramped entrances, and accessible restrooms). This powerful policy enhances the ease of use for <u>everyone</u>. When consulting with officials to improve sidewalks in a community, consider discussing this law that requires sidewalks to be accessible. Detailed guidelines are available on the internet:

www.access-board.gov

SPECIFIC POLICY AND DESIGN ISSUES

1. Develop new policies for changing existing roadways and new road construction.

Work with the planning staff to learn how to impact current and future policies. Policies exist at the local level, such as guidelines for subdivision development, zoning ordinances passed by county commissioners or town boards, and policies that guide local governmental agency actions or enforcement of regulations. Policies exist at the state level, such as NC DOT policies on bicycle and walking improvement "projects." And policies exist at the federal level, such as the Americans with Disabilities

Act (ADA) signed into law on July 26, 1990, which guides new sidewalk construction and reconstruction. Enhancing existing policies and creating new policies are not easy tasks . . . but it can be done.

Listed below are some suggestions for road improvement. Remember, your local planning department will probably have many more ideas.

Recommendations for new road construction: Review your municipality's and county's current road construction policies and develop new ones for the future. Create local minimum standards that include facilities for walking and bicycling in all new road local proposals. The NC Department of Transportation has begun to focus more engineering attention on pedestrian and bicycling facilities in their planning and plan review processes. Therefore, be sure all local plans that get NCDOT approval have ideal walking and bicycling facilities in place prior to sending them to NCDOT for review.

Local policy standards might include extra wide outside lanes or wide paved shoulders, sidewalks, and bicycle lanes (if appropriate) for every new road. Other new road policies include standards that all new developments must construct 5' sidewalks with buffers and adequate street lighting on all development roads. Consider also requiring new development projects to pay a sidewalk development fee into a municipal trust that is used to construct sidewalks in developed urban areas that don't currently have them.
Policy standards could also provide easements for developing walking trails over sewage lines; and standards requiring newly constructed business sites to include well-lighted sidewalks that connect to existing sidewalks.

Remember, both your municipality and NC DOT build and maintain roads in your local area. Work with both organizations.

Recommendations for existing road improvements: Locally elected officials can have a major impact on the availability of funds for spending on bicycle and walking improvements. These road improvement expenditure policies will be influenced by some of the following design options for the existing roads. When the road is not wide enough to create a designated bicycle lane, it may be possible to remark the pavement to widen the outside lane (consult the following Resources for Information from the list in the back of this guidebook: *Traditional Neighborhood Street Design (#31); Skinny Streets (#29); Street Design Guidelines for Healthy Neighborhoods (#30))*. Some municipalities are currently experimenting with nonstandard lane markings on streets in various communities. Other options include looking for ways to create parallel alternatives (a separate bicycle path away from the road), moving parking to side streets to reclaim the major street's parking spaces for a bicycle lane, and designing traffic calming measures to promote safer bicycling. In areas where there are extra wide sidewalks, consider reclaiming part of the sidewalk to develop a landscaped buffer zone that will ensure walking safety and promote a more pleasant walking experience. When right of way is not available, work with neighborhood associations to explore the donation of right of way for sidewalk development. Consult the list of resources at the end of this guidebook for more information.

What is "Right of Way"?

Right of way is an important consideration when planning for walking and bicycle enhancements. Existing roads cannot be widened and sidewalks cannot be added without having the necessary right of way within the public domain. Right of way is defined as the total width of property owned by the state or local government. For example, if one proposed solution to a segment of road that is dangerous for bicycle use is to construct a bike lane, the property for that proposed bike lane must be within the right of way for the road.

The 14 Division Offices of the NC DOT (Appendix 2) have right of way information for all state-maintained roads. The information may not be easily accessible in computerized database format. Municipal governments maintain right-of-way records for locally maintained roads, and also may not have easy access to this information in a computerized database. In these instances, the local deed registry office (e.g., county clerk) could be contacted for right-of-way information on any adjacent property.

2. Consider policies that promote safety in design.

Safety is a priority when considering planning and design issues. There are many factors that contribute to a safe environment, including the number and width of lanes, the type of vehicular turning patterns, the speed of vehicular traffic, the number and design of street intersections, the number and type of driveway intersections, the amount of on-street parking, and the quality of street lighting. Another safety concern is the presence of unleashed animals or wildlife. All of these factors must be considered when planning and designing a road network that "feels" safe to walkers and bicyclists. Review any design policies regarding safety factors, and work with the planning staff to recommend enforcement of existing policies or recommend policy changes.

3. Consider maintenance policies and enforcement.

After creating or enhancing the bicycling and walking environment, the surfaces must be maintained to keep them clear of debris and to prevent crashes and injuries. Work with your team and the planning department to examine maintenance policies and suggest recommendations when appropriate.

ADVOCATING FOR IMPROVEMENTS

1. Understand the NC DOT process for building roads.

Throughout the state, the NC Department of Transportation is responsible for building and maintaining roads not owned by municipalities or private land owners. The NC DOT planning process takes several years before construction begins. Many times, communities request bicycle or walking improvements to roads that are already approved or contracted out for construction. Depending on how far along the project is, it is often difficult and costly for NC DOT to alter their plans at that point. The recommended opportunity for community input on road design is during the land-use planning data collection phase when NC DOT staff request local data to develop alternative plans for a proposed roadway. If community organizations and members are actually assessing their

roads and sidewalks (especially those being considered for NC DOT reconstruction) they will be able to contribute quality data to the land-use planning data reports. This is a major opportunity to inform and influence the NC DOT's understanding of the community's priorities for land use planning.

Another opportunity for impacting NC DOT road design is by advocating for suitable walking and bicycling facilities in all road plans. By helping elected officials and key policy makers understand the need for suitable bicycling and walking facilities, you gain the substantial influence of elected officials in the NC DOT planning process.

2. **Determine the best methods for contacting the appropriate policy makers.**
   Work with your team and the planning staff to prioritize the key officials and other decision-makers who must be contacted regarding your planned improvements for walking and bicycling. It is important to prepare for these meetings, since support of these officials will be vital to making policy and environmental change happen. There are three general methods for creating support for change: directly contacting policy makers; using the media to build public support and "political pressure" for change; and coordinating local citizens' advocacy efforts. Different policy makers may respond to different techniques or methods. Therefore, talk with your team and the planning department and use an appropriate combination of these methods.

Methods for influencing policy makers and elected officials

Influencing Policy Makers

- Prepare a list of elected officials
- Determine which officials support your cause
- Prepare fact sheets
- Telephone your elected officials
- Send letters and fact sheets
- Create a petition requesting change
- Testify in public hearing or committee meetings
- Request appointment to your local planning or transportation board (professionals and citizens working together)

Grassroots Advocacy Techniques

- Hold or attend organizational meetings
- Attend community events
- Host house parties
- Conduct opinion surveys in your neighborhood
- Write stories to be sent out in organizational newsletters
- Write a letter or start petition campaigns
- Hold rallies, demonstrations and picket lines
- Create action alert systems
- Create or join a coalition or local committee

Using the Media to Build Support

- Write letters to editors
- Alert the press about possible stories
- Contact local editorial writers
- Contact columnists
- Call radio and TV talk shows
- Prepare a spot or interview for your local cable access channel
- Hold press conferences and media events

3. Create successful meetings with officials and policy makers.

Whether you are trying to improve municipally-owned roads or NCDOT-owned roads, the support of elected officials and policy makers is important. Consult with your assessment team and planning department to identify the appropriate officials to contact. Arrange a meeting with the appropriate officials or policy makers. Bring a couple of members from your team who understand the "big picture" of what you are trying to accomplish. We suggest a 1-2 page **cover letter** describing the overall "plan" that divides the overall plan into finite projects. Prepare a one page **Fact Sheet** on your project for the officials at the meeting. You may also want to prepare a **packet of handouts** for the officials. Include in the packet your color-coded maps that illustrate the network of walking and/or bicycle suitability scores.

Introduce the team members and planning staff present at the meeting, and mention each person's organizational affiliation. List for them your absent partners on the project. This is important – you are emphasizing the broad professional and citizen collaboration which will translate into "political pressure" from voting constituents.

Describe your team's concern for developing safer roads for walking and bicycling in your community. Briefly describe the assessment project you've completed, and clearly state your recommendations for improving the local community's roads for walking and bicycling. When presenting your recommendations, present it as a series of possible projects for them to adopt. It is important to obtain "buy-in" from these policy makers.

Be sure to take notes on their questions and concerns. If policy makers suggest barriers to your plan, clarify what their specific concerns are and then try to respond to each concern. If you do not have answers at that meeting, offer to research the issue(s) and provide an answer to the entire group as soon as possible. After the meeting, obtain the requested information and deliver it to them as soon as you can. Contact your local planning staff and regional or state-level CVH Program staff to brainstorm solutions.

Remember that this presentation to the policy makers must be clear and concise. Before the meeting, practice your presentation. Only through practice can you develop a smooth presentation style and identify aspects of the presentation that need further work. The key here is to concisely present the plan while encouraging collaboration by officials.

4. Suggest possible funding sources and offer to collaborate on a funding proposal.

One of the first barriers you may hear about is the lack of funding. If policy makers suggest that the only way to improve the environment for walking is to bill each resident for the linear feet of sidewalk constructed on their property, then research may be needed by your team and the local planning staff to identify federal and state funding opportunities. Avenues for funding (through the Powell Bill, TIP, TEA-21, and EPA Sustainable Development Grants) are available to municipalities and counties seeking to improve their alternative transportation facilities (e.g., bike lanes, bike paths, and sidewalks). Communities with a plan for bicycle and walking improvement projects, can apply for the following funds.

Powell Bill Funding (also known as State Street-Aid Allocations):

Municipalities in North Carolina that maintain their own roads receive a yearly allotment of highway funds that can be used for sidewalks and other road enhancements that

support walking and bicycling. The state legislature authorized the revenue from a tax on each gallon of motor fuel be distributed among cities and towns based on population and municipal road mileage (Chapter 136-41.1 through 136-41.3 of the General Statutes of North Carolina). The legislature has determined that these funds may be used for the following traditional road projects: "maintaining, repairing, constructing, reconstructing or widening of any street including bridges, drainage, curb and gutter, and other necessary equipment." The legislature has determined that these funds may also be used to plan, build, and maintain sidewalks and bikeways located within the rights-of-way of public roads and highways. Traffic control devices and signage, such as walking crossings, are also considered acceptable projects. Local elected officials within each municipality determine the specific projects to be undertaken using Powell Bill funds. In addition to the purposes indicated above, local officials could use all or a portion of the Powell Bill funds as a local match for various grant opportunities, including US DOT's TEA-21 Enhancement Program and EPA's Sustainable Development Challenge Grant Program (see below). Local Powell Bill allocations are published in (.pdf) format on the NCDOT website through a link at the following URL:
www.dot.state.nc.us/planning/development/Enhancement/Powell_Bill/powellbill.htm.
Allocations can range from approximately $2,000 for a small municipality to over $10 million for a very large municipality.

Transportation Equity Act for the 21st Century (TEA-21):
One "fast-track" approach for obtaining federal funding for bicycle and walking improvement projects is through TEA-21 funding. Originally, the federal highway bill of 1991, the Intermodal Surface Transportation Efficiency Act (ISTEA), broadened the federal government's transportation focus to include transportation enhancement activities like beautification projects, the construction of bicycle and walking facilities, and the rehabilitation of historic transportation facilities. The ISTEA funding was continued through a second bill, the Transportation Equity Act for the 21st Century (TEA-21) signed by the President in June 1998. The transportation enhancement activities were structured to continue receiving funds from a 10% mandatory "setaside" from Surface Transportation Program (STP) Funds.

"TEA-21 provides funding to continue building America's highways and transit systems. However, it moves beyond concrete, asphalt and steel to build a better America by improving safety, protecting the environment and public health, and creating an opportunity for all Americans to improve their quality of life through transportation enhancements. TEA-21 can improve the cultural, aesthetic and environmental aspects of North Carolina's transportation system. It also promotes diverse modes of transportation, increases benefits to communities and encourages citizen involvement in transportation decisions."

Eligible bicycle and walking projects for TEA-21 include the construction of bicycle or walking facilities; safety and educational activities for walkers and bicyclists; walking streetscape improvements; and bicycle racks or maps for designated signed routes. Similar to TIP projects, if a TEA-21 project is proposed for an area with a metropolitan planning organizations (MPO, see Appendix 1) the plan must first be developed in collaboration with the MPO staff. In North Carolina, the first call for project applications was June 1999, with 167 applications received and 49 projects funded. Remember, TEA-

21 funding must be matched with 20% funding from a local source (such as local Powell Bill Funds).

Check out the following website for more information on eligible project ideas, funding amounts and cycles, and application instructions: www.fhwa.dot.gov/tea21, and www.dot.state.nc.us/planning/development/enhancement/program.

North Carolina Bicycle Transportation Improvement Program (TIP):
One approach to obtaining federal and state funds for bicycle and multi-use improvement projects is through the NC DOT Division of Bicycle and Pedestrian Transportation (NCDOT DBPT) which administers a transportation improvement program (TIP). Communities and planning staff can request funding for projects that meet the NCDOT DBPT guidelines. Bicycle TIP projects may also be selected and scheduled as part of future highway improvements. Bicycle and walking improvement projects which can be incorporated into already scheduled highway improvements are called "incidental" projects (e.g., widened curb lanes are often completed as incidental projects). All others are called "independent" projects. Both types of projects are submitted for TIP consideration through local officials and planning staff.

Obtaining funds through the TIP process may take a few years. TIP proposals are subjected to feasibility studies and approval by the NC Board of Transportation. If a project is proposed for an area with a Metropolitan Planning Organizations (MPO, see Appendix 1) the plan must first be developed in collaboration with the MPO staff. Generally, there are two public meetings before approving a TIP. One public meeting gathers further community input on the proposed TIP prior to DOT development. The second public meeting solicits community feedback on the draft TIP prior to approval.

The NC bicycle TIP guidelines can be found in the NCDOT Division of Bicycle and Pedestrian Transportation publication, *Bicycling & Walking in North Carolina: A Long-Range Transportation Plan*. TIP proposals are continuously accepted for review by NCDOT. General information on the NCDOT Bicycle Policy can be found in Appendix 9. General information on the TIP can be found in Appendix 10. For more recent information, visit the NCDOT TIP website:
www.dot.state.nc.us/planning/development/TIP.

EPA Sustainable Development Challenge Grant:
The EPA Sustainable Development Challenge Grant (SDCG) is a very competitive grant process that could be used by communities to obtain further funding. The SDCG program strongly encourages community members, business and government entities to work cooperatively to develop flexible, locally-oriented approaches that link place-based environmental management and quality of life activities with sustainable development and revitalization. These grants are intended to catalyze community-based projects to promote environmentally and economically sustainable development; build partnerships which increase a community's capacity to take steps that will ensure the long-term health of ecosystems and humans, economic vitality, and community well-being; and leverage public and private investments to enhance environmental quality by enabling community efforts to continue beyond the period of EPA funding. The next round of grants depends on whether Congress appropriates funds for the program in the FY 2001 budget. For more information on this grant, visit their web page:

http://www.epa.gov/ecocommunity/sdcg/. For assistance in the grant-writing process, see http://www.epa.gov/seahome/grants.html.

Local Bond Issue:
Many municipalities and counties have the ability to raise funds for bicycling and walking facilities by issuing a Bond. Explore the possibility with your county commissioners and city/town council members. Your local planning staff may be an excellent starting point for more information on this strategy for raising funds.

NC DOT Highway Division "set-aside" for walking improvements:
Appendix 2 lists the 14 regional DOT highway division offices. Each of these offices sets aside $100,000 for walking improvements which are decided by the Division Engineer and the Division's Board of Transportation (a board of professional and citizen members). As a team, contact the Division Engineer to learn about the funds and how they are currently allocated. Request information about the members of your Division's Board of Transportation, and contact the appropriate members to introduce your project and your plan for improving bicycling and walking facilities in the local area.

Definitions

Americans With Disabilities Act (ADA) was signed into law on July 26, 1990. ADA requires all public facilities, and private facilities which provide goods or services to the public, to provide access to people with disabilities (e.g., a few examples include sidewalk curb ramps, street level or ramped entrances, and accessible restrooms). This powerful policy enhances the ease of use for everyone. When consulting with officials to improve sidewalks in a community, consider discussing this law that requires sidewalks to be accessible. Detailed guidelines are provided on the internet at www.access-board.gov.

Angle Parking is defined as parking in which the vehicles are parked parallel to one another with front bumpers at an angle toward the curb.

Annual Average Daily Traffic is the average volume of vehicles that travel the road segment each day. This is measured by the state Department of Transportation and by municipalities. The NCDOT website may have AADT for state-owned roads: www.dot.state.nc.us/planning/statewide/traffic_survey.

Bicycle Lane is a clearly marked lane on the road that is designated for bicycle use by striping, signing and pavement marking.

Bicycle Path is a separate or parallel alternative path that is generally developed for multi-use by bicyclists, walkers, in-line skaters, and skate boarders. It is not part of the paved road used by vehicles, however it may be in a highway right-of-way. Some greenways are also designed as bicycle or multi-use paths.

Bicycle Suitability is the extent to which a road or path supports safe biking for recreation and transportation. Different methods exist for assessing bicycle suitability. The method used in this guidebook provides descriptions relating the road segment's suitability to varying bicyclist age groups and experience.

Buffer (Berm) Width is the measured width from the back of the curb (or end of paved shoulder) to the paved sidewalk (see buffer zone).

Buffer (Berm) Zone is the area between vehicular traffic and the sidewalk's walking zone. This zone may have trees, streetlights and benches. Sometimes the buffer zone becomes cluttered with newspaper boxes, trash cans, and election advertisements.

Center Turn Lane is a separate lane in the center of the road that allows turning vehicles to leave the mainstream traffic to prepare to turn across traffic. This allows the flow of traffic to continue in one direction without having to stop every time a vehicle wants to make a left turn.

City Walkways provide walking access to commercial districts and transit along major streets, and also connect neighborhoods. Generally city walkways are in commercially zoned areas and connect major activity centers.

Commercial Land is land that is used for a business, such as a grocery store, movie theatre, office building or fast food, and has a driveway or road that intersects with the segment you are measuring.

Crosswalk is a specifically marked and signed area on the street for the safe crossing of walkers. Many crosswalks also include separate signal lights that tell the walking when it is safe to walk across traffic.

Curb is the concrete form that rises from the end of the gutter (or pavement, if there is no gutter) to the height of the buffer zone and sidewalk adjacent to the road. When parking a car, the tires may bump against the "curb."

Curb Cuts may be Curb Ramps or designed driveway access points in the sidewalk.

Curb Ramps are engineered slopes in the sidewalk structure at intersections that allow wheelchairs to leave the sidewalk environment and smoothly access the street surface.

Curb Zone is the area where the street environment and the pedestrian environment adjoin. Usually a curb exists.

Extra Wide Curb Lane (Wide Outside Lane) is a travel lane that is wider than normal (usually about 14 feet wide) to allow bicyclists to more safely share the same lane with motor vehicles. This has been traditionally used when the roadway is not suitable for a regulation-width bike lane.

Frontage Zone is the area of the sidewalk where there may be business displays, vendor tables, cafe seating or the beginning of people's yards.

Gutter is the flat (usually cement) surface between the driveable pavement and the cement curb. The gutter collects water runoff from the pavement and conducts the runoff toward storm drains.

Industrial Land is land alongside the road that is occupied by a manufacturing plant, a factory or warehouse and has a driveway or road that intersects with the segment you are measuring.

Local Service Walkways provide access to local destinations, such as residential neighborhoods. Most roads that are not walking districts or city walkways are classified as local service walkways. These roads are located in commercial, residential and industrial areas. Good design features include sidewalks on both sides of the street, possible landscaping with trees, and on-street parking.

Off Street Path is a path in which walkers and cyclists have their own space in which to ride or walk that is separated from vehicular travel. This separation is either through the use of barriers or open space.

Parallel Parking is defined as when cars are parked in a horizontal fashion in front of one another and not beside each other.

Paved Shoulder is the area from the outer most painted line to the end of the pavement or to the curb and gutter.

Walking District is an area with dense, mixed-use development, generally zoned both commercial and residential, and is serviced by mass-transit.

Walking Zone is the area of sidewalk which walkers use to walk through.

Physical Median is a strip of land or raised concrete island that physically separates the two directions of traffic.

Right Turn Lane is a lane that is designed for traffic turning right at all times.

Shoulder Bikeway is a portion of the street that can be used by bicycles alongside vehicles. There are no markings designating this a bicycle area, but there is a four inch stripe that separates bicycles from vehicles.

Walking Suitability is the extent in which a sidewalk or path supports or prohibits safe walking for recreation and transportation.

Walking Zone is the area of the sidewalk or walkway where walkerss have unobstructed movement to transit through the area. It is ideally a minimum of 5' wide.

Walkway - Continuous is described as a walkway surface that continues down a street from the beginning to the end of the street without disruption. This can be identified as being on either one side or both sides of the street.

Walkway - Partial is described as a walkway surface that starts at one point on a street, but then is interrupted and does not necessarily go from one end to the other. This can be identified as being one side of the street or on both sides of the street.

Wide Outside Lane (Extra Wide Curb Lane) is a travel lane that is wider than normal (usually about 14 feet wide) to allow bicyclists to more safely share the same lane with motor vehicles. This has been traditionally used when the roadway is not suitable for a regulation-width bike lane.

Resources for Information

NOTE: Because internet URLs are developed, terminated, and revised continually, these website addresses may be out of date. If the URL won't link to the appropriate location, try using an internet search engine to locate the organization.

BENEFITS

1) CDC, Division of Nutrition and Physical Activity. (888) 232-4674. URL: www.cdc.gov/nccdphpdnpa/readyset
2) National Bicycling and Walking Study Reports: Case Study 14. Benefits of Bicycling and Walking to Health. Case Study 15: The Environmental Benefits of Bicycling and Walking. National Bicycle and Walking Clearinghouse, (800) 760-6272.
3) Shape Up America! URL: www.shapeup.org
4) Walking, The Pleasure Exercise: A 60-day Walking Program for Fitness and Health. Mort Malkin. Rodale Press, 33 East Minor St., Emmaus, PA 18098.
5) Walking Magazine. 9-11 Harcourt St. Boston, MA 02116. (800) 266-3312.

SUCCESS STORIES

6) National Bicycling and Walking Study: Case Study 19: Traffic Calming, Auto-restricted Zones and Other Traffic Management Techniques. National Bicycle and Walking Clearinghouse. (800) 760-6272.
7) Quality Street: How Traditional Urban Centers Benefit from Traffic Calming. TEST, 177 Arlington Rd, London NW1, England.

SAFETY

8) Fatality Facts. Insurance Institute for Highway Safety, 1005 North Glebe Rd., Arlington, VA 22201.
9) Killing Speed and Saving Lives. UK Department of Transportation, Marsham Street, London, SW1 England.
10) National Crime Prevention Council. URL: www.ncpc.org
11) National SAFE KIDS Campaign. 1301 Pennsylvania Ave. NW, Suite 1000. Washington, DC 20004-1707. URL: www.safekids.org
12) Partnership for a Walkable America. National Safety Council. 1121 Spring Lake Dr. Itasca, IL 60143-3201. (630) 285-1121. URL: www.nsc.org/walkable.htm
13) Walking Safety Roadshow. URL: www.ota.fhwa.dot.gov/walk/index.html
14) Traffic Safety Facts: Pedestrians. National Highway Traffic Safety Administration, National Center for Statistics & Analysis. 400 Seventh Street SW; Washington, DC 20590. URL: www.nhtsa.dot.gov
15) Traffic Safety Programs. National Highway Traffic Safety Administration. 400 Seventh Street SW; Washington, DC 20590. URL: www.nhtsa.dot.gov
16) UNC Highway Safety Research Center. URL: www.hsrc.unc.edu

ENVIRONMENTAL DESIGN

17) 1000 Friends of Oregon, LUTRAQ (The Land Use, Transportation, Air Quality Connection). 1000 Friends of Oregon, 534 SW 3rd Ave. Suite 300; Portland, OR 97204 (503) 497-1000.
18) ADA Information File – on laws and regulations. (See local library for copy)
19) Architectural and Transportation Barriers Compliance Board. 1331 F Street NW, Suite 1000. Washington, DC 20004.
20) Boulder Draft Sidewalk Program. GO Boulder. Box 791; Boulder CO 80306.

21) Design of Walking Facilities: Report of Recommended Practice. Institute of Traffic Engineers Committee 5A-5, 525 School St., Suite 410; Washington, DC 20024.
22) Federal Highway Administration. Walking and Bicycle Safety Research Program. HSR-20, 6300 Georgetown Pike. McLean, VA 22101. URL: www.tfhrc.gov
23) How To Keep America Moving (ISTEA): Transportation for the 21st Century. Technical Report. Office of the Assistant Secretary for Governmental Affairs. January 20,1997. Contact: John Horsley, Office of Governmental Affairs (202) 366-4563.
24) Incorporating Bicycle and Walking Elements into Transportation Plans. NC Dept of Transportation Statewide Planning Branch. (Request copy from NC Dept of Transportation, Division of Bicycle and Pedestrian Transportation. P O Box 25201; Raleigh, NC 27611. (919) 733-2804.
25) Municipal Strategies to Increase Walking Travel. Washington State Energy Office. 925 Plum Street SE; P O Box 43165; Olympia, WA 98504.
26) The Walking Pocket Book: A New Suburban Design Strategy. Doug Kelbaugh. Princeton Architectural Press. New York, NY (1989).
27) A Policy on Geometric Design of Streets and Highways. American Association of State Highways and Transportation Officials. 444 N. Capitol St., #225; Washington, DC 2000. ($62.50)
28) Portland Walking Design Guide. June 1998. Portland Office of Transportation. 1120 SW 5th Ave., Room 802. Portland, OR 97204-1971. EMAIL: mbirk@syseng.ci.portland.or.us URL: www.trans.ci.portland.or.us
29) Residential Street Design and Traffic Control. Institute of Transportation Engineers. 525 School Street SW, Suite 410; Washington, DC 20024.
30) Skinny Streets, a pamphlet by the City of Portland's Office of Transportation (503) 823-7046.
31) Street Design Guidelines for Healthy Neighborhoods by Dan Burden. Available from the Local Government Commission (800) 290-8202 or www.lgc.org/clc/
32) Traditional Neighborhood Street Design (draft) by the Institute of Transportation Engineers (202) 554-8050.
33) Traffic Circles Video. City of Seattle Engineering Dept; 600 4th Ave., Room 708; Seattle, WA 98104.
34) US Access Board. 1331 F Street NW, Suite 1000. Washington DC 20004. (800) 872-2253.
35) Walk Tall: A Citizen's Guide to Walkable Communities Version 1.0; Published by Walking Federation of America. Rodale Press.
36) Walkable America Checklist. Published by Partnership for a Walkable America.
37) Walkable Communities: 12 Steps for an Effective Program. Florida DOT (904) 487-1200.

TRANSPORTATION PLANS

38) Bicycling & Walking in North Carolina: A Long-Range Transportation Plan. November, 1996. NC Dept of Transportation, Division of Bicycle and Pedestrian Transportation. P O Box 25201; Raleigh, NC 27611. (919) 733-2804. EMAIL: bikeped_transportation@dot.state.nc.us
39) Bicycle Transportation Plan for Orange County (draft), North Carolina. August, 1998. URL: www.co.orange.nc.us/planning/bikeplan/index.htm
40) City of Asheville Walking Thoroughfare Plan. City of Asheville Public Works Department. 1999.
41) Portland Bicycle Master Plan. June 1998. Portland Office of Transportation. 1120 SW 5th Ave., Room 730. Portland, OR 97204-1971. EMAIL: mbirk@syseng.ci.portland.or.us URL: www.trans.ci.portland.or.us
42) Portland Walking Master Plan. June 1998. Portland Office of Transportation. 1120 SW 5th Ave., Room 802. Portland, OR 97204-1971. EMAIL: mbirk@syseng.ci.portland.or.us URL: www.trans.ci.portland.or.us
43) Seattle Sample Walking Program Workplan (1995). City of Seattle Engineering Dept. 600 4th Ave., Room 708. Seattle, WA 98104.

ADVOCACY

44) Community Organizing. George Brager. Columbia University Press (1986).
45) Do It! Let's Get Off Our Butts. John Roger and Peter McWilliams. Prelude Press (1991).
46) The Families USA Health Action '98 Took Kit.' URL: www.familiesusa.org (download portions)

47) Health Policy Advocacy: A Health Care Consumer's Guide to the Development of Public Health Policy in North Carolina. Pam Silberman (published by the NC Public Health Awareness Program, NCDHHS, 1998).
48) National Bicycling and Walking Study Reports: Case Study 21: Integrating Bicycle and Walking Considerations into State and Local Transportation Planning, Design and Operations. Case Study 22: The Role of State Bicycle/Walking Coordinators. Case Study 23: The Role of Local Bicycle/Walking Coordinators. National Bicycle and Walking Clearinghouse. (800) 760-6272.
49) Organizing: A Guide for Grassroots Leaders. Si Kahn. McGraw-Hill Paperbacks (1982).
50) Rules for Radicals: A Practical Primer for Realistic Radicals. Saul Alinsky. Vantage Books (1971).

INFORMATION CLEARINGHOUSES

51) National Bicycle and Walking Clearinghouse. 1506 21st St. NW, Suite 200. Washington, DC 20036. (800) 760-6272. Fax: (202) 463-6625. URL: www.bikefed.org Email: BFAReports@aol.com
52) National Transportation Enhancements Clearinghouse. URL: http://www.transact.org/ntec.htm

OTHER RELATED ORGANIZATIONS

53) America WALKs. URL: http://www.webwalking.com/amwalks
54) Bicycle Federation of America. URL: http://www.bikefed.org
55) Bike Plan Source. URL: http://www.bikeplan.com/index.html
56) The Center for Livable Communities. URL: http://www.lgc.org/clc
57) Coalition for Healthier Cities and Communities. URL: http://www.healthycommunities.org/
58) Community Toolbox. URL: http://ctb.lsi.ukans.edu
59) Go for Green. URL: http://www.goforgreen.ca/home_e.html
60) Home of the League of American Bicyclists. URL: http://www.bikeleague.org/
61) Institute of Transportation Engineers. URL: www.ite.org
62) International Bike Fund. URL: http://www.ibike.org/los.htm
63) International Federation of Pedestrians. 3500 Race St. Philadelphia, PA 19104.
64) Livable Communities. URL: http://www.sierraclub.org/transportation/sprawl/Challenge/livable.htm
65) National Livable Communities. URL: http://www.livablecommunities.gov/
66) National Bicycle and Walking Clearinghouse. URL: http://www.bikefed.org/clear.htm
67) National Highway Traffic Safety Administration. URL: http://www.nhtsa.dot.gov
68) Neighborhoods online. URL: http://www.libertynet.org/nol/natl.html
69) Ottawalk. Box 52036, 41 York St. Ottawa, Ontario, CANADA K1N 5S0.
70) Pedestrians. URL: http://www.wsdot.wa.gov/hlrd/Sub-defaults/Walking-default.htm
71) Pedestrians, Bicycles, & Motorcycles. URL: http://www.nhtsa.dot.gov/people/injury/pedbimot
72) Physical Activity, Recreation and Active Living in Canada. URL: http://www.activeliving.ca/activeliving/index.html
73) Rails to Trails Conservancy. URL: http://www.railtrails.org
74) Sensible Transportation Options for People. 15405 SW 116 Ave., #202B Tigard, OR 97224.
75) Sierra Club - Resources. URL: http://www.sierraclub.org/transportation/resources/links.htm
76) Surface Transportation Policy Project. URL: www.transact.org
77) Transportation for Livable Communities. URL: www.tlcnetwork.org
78) The Turner-Fairbank Highway Research Center - FHA - U.S. DOT. URL: http://www.tfhrc.gov
79) USDOT FHA Bike/Walking Program. URL: http://www.fhwa.dot.gov/hep10/biped/biped.html
80) U.S. EPA --- Region III Green Communities Home. URL: http://www.epa.gov/region03/greenkit/index.html
81) Walk Austin. P O Box 7753 Austin, TX 78713. URL: http://www.io.com/~snm/walk/
82) Walk Boston. 156 Milk St. Boston, MA 02109. URL: http://www.walkboston.org/
83) Walk New York. 299 West 12th St. New York, NY 10014 phone: (718) 855-7134.
84) Willamette Walking Coalition. P O Box 2252. Portland, OR 97208.
85) Walkable Communities - Dan Burden. URL: http://www.bikefed.org/walkable.htm
86) Welcome to Walkable Communities, Inc. URL: http://www.walkable.org/index.htm

References

City of Portland. (1996). Bicycle Master Plan. Office of Transportation. Portland, Oregon.

City of Portland. (1998). Portland Walking Design Guide. Office of Transportation, Engineering and Development, Walking Transportation Program. Portland, Oregon. June, 1998.

City of Portland. (1998). Portland Walking Master Plan. Office of Transportation, Engineering and Development, Walking Transportation Program. Portland, Oregon. June, 1998.

Eddy, N. (1996). "Developing a Level of Service for Bicycle Use." In Pro Bike/Pro Walk 96 Resource Book. Proceedings of the Ninth International Conference on Bicycle and Walking Programs Resource Book, Bicycle Federation of America and Walking Federation of America, 1996, pp. 310-314.

Emery, J., Crump, C., & Devellis, R. (2002). "Comparison of Bicycle Suitability Indices" (manuscript in preparation). Research conducted by UNC Chapel Hill School of Public Health, Department of Health Behavior and Health Education.

Emery, J. & Crump, C. (2002). "Method for Assessing Walking Suitability of Roads" (manuscript in preparation). Research conducted by UNC Chapel Hill School of Public Health, Department of Health Behavior and Health Education.

NC Department of Transportation (1994). North Carolina Bicycle Facilities Planning and Design Guidelines. Division of Bicycle and Pedestrian Transportation. January 1994.

NC Governor's Council on Physical Fitness and Health & NC Health and Fitness Foundation, Inc. (1999). NC Strive for 5: The Plan to Increase Physical Activity in North Carolina, 1999-2003. North Carolina Department of Health and Human Services. Raleigh, NC.

SMARTRAQ – www.smartraq.net (CDC-sponsored research study at Georgia Tech).

U. S. Department of Transportation. (1987). Highway Performance Monitoring System Field Manual. FHWA, US DOT.

U. S. Department of Transportation. (1994). The National Bicycling and Walking Study: Final Report – Transportation Choices for a Changing America. Publication No. FHWA-PD-94-023. Federal Highway Administration, US DOT.

Appendices

Appendix 1. Metropolitan Planning Organizations (MPOs) in North Carolina

Appendix 2. NC DOT Highway Division Offices

Appendix 3. Materials for the Walkable/Bikeable Communities Project and Workshop (Appendices 3A – 3H)

Appendix 4. General Information about Road Segments

Appendix 5. Sample of Walking Suitability Assessment Form

Appendix 6. Walking Suitability Assessment Form

Appendix 7. Sample of Bicycle Suitability Assessment Form

Appendix 8. Bicycle Suitability Assessment Form

Appendix 9. NCDOT Bicycle Policy

Appendix 10. The Bicycle TIP Process

Appendix 1. Metropolitan Planning Organizations (MPOs) in North Carolina

This information is also available on the NCDOT website:
http://apps01.dot.state.nc.us/apps/directory/4651.html

MPO Name	Member Areas
Asheville Dan Baechtold, Transportation Planner City of Asheville/Planning Department P. O. Box 7148 Asheville, NC 28802-7148 (828)259-5842 FAX: (828)259-5428 DanB@mail.ci.asheville.nc.us	Asheville, Biltmore Forest, Black Mountain, Fletcher, Montreat, Weaverville, Woodfin; parts of Buncombe and Henderson Counties
Burlington-Graham Bob Harkrader, Planner Director P. O. Box 1358 Burlington, NC 27216-1358 (336)222-5110 FAX: (336)513-5410 bharkrader@ci.burlington.nc.us	Alamance, Burlington, Elon College, Gibsonville, Graham, Green Level, Haw River, Mebane, Whitsett; part of Alamance County
Cabarrus-South Rowan Mike Nunn, MPO Contact Benchmark 209 Centergrove Rd. Kannapolis, NC 28082-0000 (704)789-2520 FAX: (704)786-5719 mnunn@benchmarkplanning.com	China Grove, Concord, Kannapolis, Landis; Parts of Cabarrus and Rowan Counties
Capital Area Scott Lane, CAMPO Administrator 310 West Martin Street, Mezzanine Raleigh, NC 27602-0000 (919)831-6790 FAX: (919)831-6821 lanejs@raleigh-nc.org	Apex, Cary, Fuquay-Varina, Garner, Holly Springs, Knightdale, Morrisville, Raleigh, Rolesville, Wake Forest, Wendell, Zebulon; all of Wake County
Durham-Chapel Hill-Carrboro Wesley Parham, Transportation Engineer 101 City Hall Plaza, 4th Floor Durham, NC 27701-0000 (919)560-4366 FAX: (919)560-4561 wparham@ci.durham.nc.us	Carrboro, Chapel Hill, Durham, Hillsborough; parts of Durham, Orange, and Chatham Counties
Fayetteville Rick Heicksen, Secretary (TAC-FAMPO) 130 Gillespie Street, 2nd Floor Fayetteville, NC 28302-1829 (910)678-7622 FAX: (910)678-7631 rheicksen@co.cumberland.nc.us	Fayetteville, Fort Bragg, Hope Mills, Spring Lake; parts of Cumberland and Harnett Counties

Appendix 1 (cont). MPOs in North Carolina

MPO Name	Member Areas
Gaston Urban Area Elizabeth Lowry, Sr. Transp. Planner City of Gastonia P O Box 1748 Gastonia, NC 28053-1748 (704)866-6980 FAX: (704)864-9732 elizabethl@cityofgastonia.com	Belmont, Bessemer City, Cramerton, Dallas, Gastonia, Lowell, McAdenville, Mount Holly, Ranlo, Spencer Mountain, Stanley; part of Gaston County
Goldsboro Urban Area Don Chatman, Transportation Director City of Goldsboro P O Drawer A Goldsboro, NC 27533-9701 (919)580-4333 FAX: (919)580-4315 dchatman@ci.goldsboro.nc.us	Goldsboro, Walnut Creek; part of Wayne County
Greensboro Urban Area Tyler Meyer, MPO Planner City of Greensboro P O Box 3136 Greensboro, NC 27402-3136 (336)373-2254 FAX: (336)412-6171 tyler.meyer@ci.greensboro.nc.us	Greensboro; part of Guilford County
Greenville Urban Area Tom Tysinger, Director of Public Works P O Box 7207 Greenville, NC 27835-7207 (252)329-4520 FAX: (252)329-4535 ttysinger@ci.greenville.nc.us	Greenville, Winterville; part of Pitt County
Hickory-Newton-Conover Urban Area John Tippett, Asst Dir/Transp Planner P O Box 9026 Hickory, NC 28603-9026 (828)322-9191 FAX: (828)322-5991 johnt@wpcog.dst.nc.us	Brookford, Claremont, Conover, Hickory, Hildebran, Long View, Newton; parts of Alexander, Burke, Caldwell, and Catawba Counties
High Point Urban Area Andy Grzymski, Transportation Planner City of High Point P O Box 230 High Point, NC 27261-0230 (336)883-3233 FAX: (336-883-8568 andrew.grzymski@ci.high-point.nc.us	Archdale, High Point, Jamestown, Thomasville; parts of Davidson, Guilford, and Randolph Counties

Appendix 1 (cont). MPOs in North Carolina

MPO Name	Member Areas
Jacksonville Urban Area Rhonda Rogers, Transportation Planner City of Jacksonville P O Box 128 Jacksonville, NC 28541-0128 (910)938-5236 FAX: (910)455-6761 rrogers@ci.jacksonville.nc.us	Jacksonville; part of Onslow County
Mecklenberg-Union Danny Rogers, Transp. Plan. Coordinator 600 East 4th Street, 8th Floor Charlotte, NC 28202-0000 (704)336-8643 drogers@ci.charlotte.nc.us	Charlotte, Cornelius, Davidson, Huntersville, Indian Trail, Matthews, Mint Hill, Pineville, Stallings, Union County, Weddington; parts of Mecklenberg and Union Counties
Rocky Mount Urban Area John (Bob) League, Transp. Planner City of Rocky Mount P O Box 1180 Rocky Mount, NC 27802-1180 (252)972-1129 FAX: (252)972-1232 league@ci.rocky-mount.nc.us	Rocky Mount; parts of Edgecombe and Nash Counties
Wilmington Bill Austin, Sr. Transportation Planner City of Wilmington P O Box 1810 Wilmington, NC 28402-1810 (910)341-5891 FAX: (910)341-7801 bill.austin@ci.wilmington.nc.us	Bellville, Leland, Navassa, Wilmington, Wrightsville Beach; parts of Brunswick and New Hanover Counties
Winston-Salem/Forsyth Urban Area Gregory Errett, Transportation Planner City of Winston-Salem – DOT P O Box 2511 Winston-Salem, NC 27102-2511 (336)727-2707 FAX: (336)727-2361 grege@ci.winston-salem.nc.us	Bethania, Clemmons, Kernersville, Lewisville, Rural Hall, Tobaccoville, Walkertown, Winston-Salem, Forsyth County

Appendix 2. NC DOT Highway Division Offices

This information is also available on the NCDOT website: http://apps01.dot.state.nc.us/apps/directory/630.html

Highway Division 1
P.O. Box 850
Edenton, NC 27932 (mail)
113 Airport Drive Suite 100
Edenton, NC 27932 (Delivery)
Division Engineer: D. R. Conner, PE
(252)482-7977 FAX: (252)482-8722
dconner@dot.state.nc.us

Highway Division 2
105 Pactolus Hwy. (NC 33)
PO Box 1587
Greenville, 27835
Division Engineer: Neil Lassiter, Jr., PE
(252)830-3490 FAX: (252)830-3352
nlassiter@dot.state.nc.us

Highway Division 3
124 Division Drive
Wilmington, 28401
Division Engineer: H. Allen Pope, PE
(910)251-5724 FAX: (910)251-5727
Extension: 213
apope@dot.state.nc.us

Highway Division 4
PO Box 3165
Wilson, 27895
Division Engineer: Jim Trogdon, PE
(252)237-6164 FAX: (252)234-6174
Extension: 2100
jtrogdon@dot.state.nc.us

Highway Division 5
2612 N. Duke Street
Durham, 27704
Division Engineer: Jon G. Nance, PE
(919)560-6851 FAX: (919)560-3371
jnance@dot.state.nc.us

Highway Division 6
PO Box 1150 (Mail)
558 Gillespie St (Delivery)
Fayetteville, 28302
Division Engineer: Terry R Gibson, P.E.
(910)486-1493 FAX: (910)486-1959
tgibson@dot.state.nc.us

Highway Division 7
PO Box 14996
1584 Yanceyville Street
Greensboro, 27415-4996
Division Engineer: Mike Mills, PE
(336)334-3192 FAX: (336)334-3637
mmills@dot.state.nc.us

Highway Division 8
902 N Sandhills Blvd.
PO Box 1067
Aberdeen, 28315
Division Engineer: Bill Rosser, PE
(910)944-2344 FAX: (910)944-5623
brosser@dot.state.nc.us

Highway Division 9
2125 Cloverdale Avenue
Winston Salem, 27103
Division Engineer: Pat Ivey, PE
(336)631-1340 FAX: (336)761-2347
pivey@dot.state.nc.us

Highway Division 10
716 W Main St.
Albemarle, 28001
Division Engineer: Benton G. Payne, PE
(704)982-0101 FAX: (704)982-3146
bpayne@dot.state.nc.us

Highway Division 11
P O Box 250
North Wilkesboro, 28659
Division Engineer: Carl McCann, PE
(336)667-9111 FAX: (336)667-4549
cmccann@dot.state.nc.us

Highway Division 12
P O Box 47
Shelby , 28151-0047
Location: 1710 E. Marion St. (US 74 Business)
Division Engineer: Mike Holder, PE
(704)480-9025 FAX: (704)480-5401
mholder@dot.state.nc.us

Highway Division 13
PO Box 3279
Asheville, 28802
Division Engineer: Dan Martin, PE
(828)251-6171 FAX: (828)251-6394
dmartin@dot.state.nc.us

Highway Division 14
P O Box 37
Sylva, 28779
Division Engineer: Ron Watson, PE
(828)586-2141 FAX: (828)586-4043
Extension: 201
rwatson@dot.state.nc.us

Instructions: Use this script as a resource or prompt during your phone calls to organizations and groups in your community.

Hello. My name is _____. I work for _____ *(name of organization/community group sponsoring the project)*. I am working with several organizations and volunteer citizens who are interested in improving the roads and sidewalks in our communities to enhance our opportunities for walking and bicycling.

Our team is gathering information about the suitability of our roads for walking and bicycling. We have been trained to assess the suitability using methods developed by the UNC School of Public Health and the NC Cardiovascular Health Program. These methods have been examined by the NC Department of Transportation's Division of Bicycle and Pedestrian Transportation staff. The methods have been used since 1999 in various counties in North Carolina. Local planners have benefited from the data we've collected, and we would like to collaborate with you to gather similar information for our area.

We are interested in meeting with you:

1) to find out what you're department is currently working on to improve the sidewalks and roads for walking and bicycling in our county;
2) to explore the possibility of collaborating with you to assess the suitability of our roads for walking and bicycling; and
3) to contribute to the development of a plan for those improvements.

Other questions to ask:

a) Who do I contact in this department (or other departments) to collaborate on the assessment project?
b) What official procedures exist for requesting improvements to roads?
c) What approval process exists for planning recommendations to improve our roads for bicycling and walking use?
d) When does the board(s) meet?
e) Where is our town/city/county currently seeking funding for improvements like these?

News Release

Date: _____

Citizens Launch an Effort to Design Physical Activity Back Into Our Communities

Why is it that our youth are becoming obese? How will we pay for health care costs for all the people who will develop diabetes in the future? Why are heart disease and stroke the main causes of death throughout the United States?

Part of the reason is that Americans are not physically active. Over 60% of citizens do not meet the US Surgeon General's recommendations for accumulating 30 minutes each day of moderate physical activity on most days of the week. Part of the reason is that it is too hard to find the time and the right place to be physically active, because we have engineered physical activity out of our daily routines. Prior generations used to walk and bicycle to school, work, shopping - not to mention just for fun! Today many people feel our roads are unsafe for these activities because of speeding traffic, large trucks, and the lack of adequate sidewalks.

On (**day of week and date**) at (**time**) in the (**location**) a workshop for the public will explore how citizens can help improve the design of their communities. Participants will learn how to assess the walkability and bikeability of local roads, and how to work with local agencies to create a plan for better walking and bicycling opportunities in our town.

Come be a part of this exciting new effort to design physical activity back into our daily lives.

Contact (name/number) to reserve your place at the workshop.

Appendix 3C

Organizations/Groups to Invite to Workshop

Use the telephone or email to invite specific people and request their personal commitment to attend. People generally will participate when they have verbally/written committed to do so.

Organization/Group	**Person to Contact**	**Contact Information**	**Date Contacted**	**Status**
Local Business				
Chamber of Commerce				
Local Businesses				
Local Government				
Local Planning Dept.				
Regional DOT				
Parks and Recreation				
Health Dept. Educators				
Local Schools				
Citizen Groups				
Citizen Action Groups				
PTA/PTO				
Environmental Groups				
Walking Clubs				
Bicycling Clubs				
Senior Citizen Groups				
College student-service organizations				
Faith Organizations				
Media				
Newspaper				
Television				
Radio				

If you are interested in these issues and want to explore ways to work with us, sign here:

Name	**Organization (if any)**	**Phone**	**Email**	**Tell us any specific interest you have** (e.g., assessments, mapping, advocacy)

Making Your Community Walkable and Bikeable – The Workshop
Date/Time/Location

Agenda

Host: (Name, Position, Organization, Contact Information)
Facilitator: (Name, Position, Organization, Contact Information)

10:00 **Welcome and Introductions** ……Host Name

10:30 **Background on the Health Problem** ……Facilitator Name

11:00 **Part 1: Getting Ready**

11:15 *Break (Box Lunch is provided)*

11:45 **Part 2a: Walking Suitability Assessment**

12:05 Practice (with slideshow photographs)

12:20 **Part 2b: Bicycle Suitability Assessment**

12:50 Practice (with slideshow photographs)

1:00 *Break*

1:15 **Part 2c: Practice on local roads**

2:15 **Part 3: Making Change Happen**

2:30 **What's next for our community?** ……Host Name
……Facilitator Name

2:45 **Workshop Evaluation and Comments**……Facilitator Name

3:00 **END**

Appendix 3F
Local Host planning checklist

At least four months prior to the workshop:
- ❑ Contact facilitator and schedule initial meeting.
- ❑ Research background on local issues. Determine why this workshop is appropriate for the community.
- ❑ List local organizations and agencies with interests in healthy community environments.

At least three months prior to the workshop:
- ❑ Work with facilitator to create an invitation list.
- ❑ Work with facilitator to choose a date and time for the workshop.
- ❑ Reserve a location for the workshop.
- ❑ Identify local issues with relevance to the workshop.
- ❑ Make initial contacts with local media to provide them with a "heads-up" on the project and workshop

At least two months prior to the workshop:
- ❑ Mail /E-mail invitations to the workshop.
- ❑ Research local statistics to incorporate in the workshop presentation.
- ❑ Identify sites for photographs to be used in the workshop, and sites for live assessment practice.
- ❑ Request orange safety vests for the day of the workshop.
- ❑ Arrange food and drink for the workshop.
- ❑ Work with facilitator and site to arrange audio-visual equipment needs.

At least six weeks prior to the workshop:
- ❑ Photocopy guidebook for participants.
- ❑ Make targeted telephone calls to potential participants who have not responded to the invitation.

At least three weeks prior to the workshop:
- ❑ Finalize participant list and send confirmation letters, agendas, and directions to participants.
- ❑ Meet with facilitator to discuss the needs of the participants. Assist in tailoring the presentation.
- ❑ Practice your segments of the workshop.
- ❑ Identify potential community coordinators for the assessment from your participant group.

At least one week prior to the workshop:
- ❑ Copy agenda, worksheets and other materials. Purchase pens, paper, and food as necessary.
- ❑ Assist facilitator with last minute preparations, as necessary.
- ❑ Identify potential dates for follow-up meetings that can be discussed during the workshop.
- ❑ Contact local media to provide Press Release and personal invitation to attend the workshop.
- ❑ Obtain large road map of the area for participants to identify their home locations (using pins)

During the workshop:
- ❑ Arrive early to help facilitator set up room (including large road map)
- ❑ Welcome participants as they arrive.
- ❑ Gauge the interest of the participants – try to pinpoint potential coordinators.
- ❑ Use the breaks to network and get to know all of the participants.
- ❑ Aim to get a firm commitment from the group to conduct the assessment.
- ❑ Assist facilitator as necessary.

After the workshop:
- ❑ Participate in a "de-brief" with the facilitator.
- ❑ Follow-up with participants in writing or on the phone, and remind them of future meeting dates.
- ❑ Work with assessment coordinators to get maps, identify sites, and manage volunteers.
- ❑ Contact facilitator with questions.

Appendix 3G

Workshop Facilitator (Trainer) planning checklist

At least four months prior to the workshop:

- ❑ Schedule an initial meeting with the host.
- ❑ Send copy of the manual to the host to review.
- ❑ Talk with host to assess community's readiness for the project (e.g., relevant issues, "hot spots," desire to conduct this project)

At least three months prior to the workshop:

- ❑ Have initial meeting with host, and assist in creating an invitation list.
- ❑ Discuss any special tailoring of the workshop to match the community's readiness level

At least two months prior to the workshop:

- ❑ Tailor the slides, handouts, and agenda as needed.
- ❑ Incorporate local statistics into the presentation.
- ❑ Incorporate local issues into the presentation.
- ❑ Incorporate local host information (including contact information) into the presentation.
- ❑ Assist local host (if possible) to identify sites for photographs to be used in the workshop.
- ❑ Assist local host (if possible) to identify sites for live assessment practice.
- ❑ Provide list of audio-visual needs to the local host.

At least six weeks prior to the workshop:

- ❑ If possible, photograph local sites and incorporate pictures as practice slides of local roads.
- ❑ If can not photograph, review and incorporate any photographs from the local host.

At least three weeks prior to the workshop:

- ❑ Contact host to discuss additional needs of the participant group.
- ❑ Finalize tailoring of the presentation.
- ❑ Practice the presentation.
- ❑ Determine appropriate set-up for room based on location and number of participants.

At least one week prior to the workshop:

- ❑ Review presentation for typos, edits, etc.
- ❑ Make copies of the presentation for the participants.

Just before workshop:

- ❑ Conduct windshield tour of the community and study some of the "hot spots" for workshop discussion.

During the workshop:

- ❑ Arrive early to set up the room.
- ❑ Welcome participants as they arrive.
- ❑ Gauge the interest of the participants – try to pinpoint potential coordinators.
- ❑ Use the breaks to network and get to know the participants.
- ❑ Help host, as needed, to facilitate discussion of next steps for the group.

After the workshop:

- ❑ Conduct de-briefing with host and tabulate evaluation forms from the workshop.
- ❑ Be available for technical assistance for the host and community.

Please help us to evaluate the content of the workshop (circle your response).

1. Did the workshop help you understand the following:

   a) The need for this project because of the growing health problems?

   1 2 3 4 5

   not at all extremely

   Comments: _____

   b) How to get ready for assessments (e.g., forming a team, selecting locations)?

   1 2 3 4 5

   not at all extremely

   Comments: _____

   c) How to do a walking suitability assessment?

   1 2 3 4 5

   not at all extremely

   Comments: _____

   d) How to do a bicycling suitability assessment?

   1 2 3 4 5

   not at all extremely

   Comments: _____

   e) How to prepare your ideas and advocate for improvements?

   1 2 3 4 5

   not at all extremely

   Comments: _____

2. To what extent were the following forms easy to use during training?

   a) Walking Suitability Assessment Form 1 2 3 4 5

   b) Bicycle Suitability Assessment Form 1 2 3 4 5

   not at all extremely

3. To what extent were the photographs and roadside practice helpful in understanding how to do an assessment?

   1 2 3 4 5

   not at all extremely

4. Having completed the training, how confident are you in your ability to complete the following activities:

   a) Form a diverse assessment team 1 2 3 4 5

   b) Contact your local planner 1 2 3 4 5

   c) Collect walking assessment data 1 2 3 4 5

   d) Collect bicycle assessment data 1 2 3 4 5

   e) Collaborate on an improvement plan 1 2 3 4 5

   f) Help make a presentation to officials 1 2 3 4 5

   not at all extremely

5. Overall, how appropriate was the length of this workshop?

   1 2 3 4 5

   much too short much too long

6. How can we improve the workshop and/or workshop materials?

_____

_____

_____

7a. Would you recommend this training to others? Yes No Maybe

7b) Why or Why not? _____

8. Gender: Male Female

9. Age: _____

10. Race: White African American Native American Asian _____

Other: _____

11. City/County: _____

13. How did you hear about this workshop? _____

_____

14. Prior to this workshop, what was your level of commitment to this project?

1 2 3 4 5

not committed very committed

15. Having participated in this workshop, how has your level of commitment to this project changed?

1 2 3 4 5

decreased stayed same increased

END

Appendix 4. General Information about Road Segments

Road Segment ID#	Street or Road Name	From (cross-street)	To (cross-street)	AADT[1]	Data Collector Assigned to Segment
101	*Sample St.*	*Walnut St.*	*Tulip St.*	*5000*	*Jim*

[1]**Obtained AADT from (name/agency): _____**

[2]**Obtained outside lane width from (name/agency): _____**

Appendix 5. Sample of Walking Suitability Assessment Form (Emery Method)

Data Collector Name: Jim **Date:** April 4, 2002

Road Segment ID#: 101 **Road Name:** Sample St. **Boundary Streets:** Walnut / Tulip **AADT:** 16,500

Annual Average Daily Traffic (AADT) <8,000 = 0 8,000-14,999 = 1 15,000-24,999 = 2 25,000 or more = 3	Posted Speed (mph) <30 = 0 30-44 = 1 45 or more = 2	# of Thru Lanes <3 = 0 3-4= 1 5-8= 2	Sidewalk/Path Both sides continuous = 0 One side continuous and one side partial = 1 One side continuous = 2 Both sides partial = 3 One side partial = 4 None = 99 (STOP HERE)	Material Asphalt = 0 Concrete = 0 Brick = 1 Sand/Dirt = 2 Gravel = 3 Woodchip = 3	Surface Condition Good = 0 Fair = 1 Poor = 4	Sidewalk Width 8' or more = -1 5' – 7' 11" = 0 4' – 4' 11" = 1 <4' = 2	Buffer Width 4' or more = 0 <4' = 0.25 None = 0.50	Curb Ramps All = 0 Some = 2 None = 4	Adequate Lighting Plenty = 0 Some = 0.50 None = 1	Isolated Problem Spots? Y = Yes N = No	Total Score
2	1	0	2	0	1	1	0.50	2	1	N	10.5

Do any busy intersections need marked crosswalks?	Do any busy intersections need traffic signals lights?	Do any busy intersections need pedestrian "Walk" signals?	Do any wide intersections need a refuge island for safer crossing?
(Y) N	(Y) N	Y (N)	Y (N)
(if Yes, record below)	*(if Yes, record below)*	*(if Yes, record below)*	*(if Yes, record below)*

Use this table to record Intersection Details, Isolated Problem Spots, and General Comments about needed design improvements:

Nearest Intersecting Street	Describe Intersection Details	Describe Isolated Problem Spots	General Comments (For example: How are transit stops? Is the walk pleasant? Etc.)
Walnut	Crosswalk faded. Need signal light		The transit stop at Walnut needs a bench for waiting.
Pine	Need crosswalk for Pine walkers		

Appendix 6. Walking Suitability Assessment Form (Emery Method)

Data Collector Name: _____ **Date:** _____

Road Segment ID#: _____ **Road Name:** _____ **Boundary Streets:** _____ **AADT:** _____

Annual Average Daily Traffic (AADT) <8,000 = 0 8,000-14,999 = 1 15,000-24,999 = 2 25,000 or more = 3	**Posted Speed (mph)** <30 = 0 30-44 = 1 45 or more = 2	**# of Thru Lanes** <3 = 0 3-4= 1 5-8= 2	**Sidewalk/Path** Both sides continuous = 0 One side continuous and one side partial = 1 One side continuous = 2 Both sides partial = 3 One side partial = 4 None = 99 (STOP HERE)	**Material** Asphalt = 0 Concrete = 0 Brick = 1 Sand/Dirt = 2 Gravel = 3 Woodchip = 3	**Surface Condition** Good = 0 Fair = 1 Poor = 4	**Sidewalk Width** 8' or more = -1 5' – 7' 11" = 0 4' – 4' 11" = 1 <4' = 2	**Buffer Width** 4' or more = 0 <4' = 0.25 None = 0.50	**Curb Ramps** All = 0 Some = 2 None = 4	**Adequate Lighting** Plenty = 0 Some = 0.50 None = 1	**Isolated Problem Spots?** Y = Yes N = No	**Total Score**

Do any busy intersections need marked crosswalks?	Do any busy intersections need traffic signals lights?	Do any busy intersections need pedestrian "Walk" signals?	Do any wide intersections need a refuge island for safer crossing?
Y N	Y N	Y N	Y N
(if Yes, record below)	*(if Yes, record below)*	*(if Yes, record below)*	*(if Yes, record below)*

Use this table to record Intersection Details, Isolated Problem Spots, and General Comments about needed design improvements:

Nearest Intersecting Street	**Describe Intersection Details** (from "Yes" checkboxes above)	**Describe Isolated Problem Spots**	**General Comments** (For example: How are transit stops? Is the walk pleasant? Etc.)

Appendix 7. Sample of Bicycle Suitability Assessment Form (adapted from N. Eddy; V.040802)

Date: April 4, 2002	Comments/Suggested Improvements:
Data Collector Name: ~~Jim~~	
Segment ID Number/Name: 101 - Sample	
Boundary streets: Walnut / Tulip	

A) General Road Factors	Measures
1) Annual Avg. Daily Traffic (AADT)	16,500
2) Total number of through lanes	2
3) Speed (mph)	35
4) Outside lane width (e.g., 11.5')	12.5
5) Bike lane or paved shoulder width (e.g., 4.5') (Note - a **marked** bike lane.)	Ø

Record these measures in the formula below

B) Pavement Factors	Score
1) (*circle one pavement description*) Very Good = 0.25 Good = 0.75 Fair = 1.50 Poor = 2.25 Very Poor = 3.75	(*record score*) 0.75
2) Presence of a Curb (Y) N	Yes = 0.25
3) Rough RR Crossing Y (N)	Yes = 0.50
4) Storm Drain Grate (Y) N	Yes = 0.75
TOTAL Scores *Record score in formula below*	1.75

C) Location Factors	Yes/No (*circle*)	Score for "Yes"
1) Angle Parking	Y (N)	0.75
2) Parallel Parking	(Y) N	0.50
3) Right-Only Turn Lanes	(Y) N	0.25
4) Center (Both)Turn Lane	Y (N)	*-0.25*
5) Physical Median	Y (N)	*-0.50*
6) Paved Shoulder	Y (N)	*-0.75*
7) Marked Bike Lane	Y (N)	*-1.00*
8) Severe Grades	Y (N)	0.50
9) Moderate Grades	(Y) N	0.25
10) Frequent Curves	(Y) N	0.25
11) Restricted Sight Distance	(Y) N	0.50
12) Numerous Driveways	(Y) N	0.50
13) Numerous Intersections	Y (N)	0.75
14) Difficult Intersections	Y (N)	1.00
15) Industrial Land Use	Y (N)	0.50
16) Commercial Land Use	(Y) N	0.25
17) Sidewalk Only One Side	(Y) N	0.25
18) Sidewalks do not exist	Y (N)	0.50
TOTAL all "YES" points *Record score in formula below*		2.75

$$\frac{\text{AADT}}{\text{\# of thru Lanes} \times 2500} + \frac{\text{Speed (mph)}}{35} + \frac{14 - \text{Outside Lane Width} - \text{Bike Lane or Paved Shoulder Width}}{2} + \text{Pavement Factors} + \text{Location Factors} = \text{Bicycle Suitability Score}$$

$$\frac{16{,}500}{2 \times 2500} + \frac{35}{35} + \frac{14 - 12.5 - \text{Ø}}{2} + 1.75 + 2.75 = 9.6$$

Appendix 8. Bicycle Suitability Assessment Form (adapted from N. Eddy; V.040802)

Date:	Comments/Suggested Improvements:
Data Collector Name:	
Segment ID Number/Name:	
Boundary streets:	

A) General Road Factors	Measures
1) Annual Avg. Daily Traffic (AADT)	
2) Total number of through lanes	
3) Speed (mph)	
4) Outside lane width (e.g., 11.5')	
5) Bike lane or paved shoulder width (e.g., 4.5') (Note - a **marked** bike lane.)	

Record all measures in the formula below

B) Pavement Factors	Score
1) (*circle one pavement description*) Very Good = 0.25 Good = 0.75 Fair = 1.50 Poor = 2.25 Very Poor = 3.75	(*record score*) _____
2) Presence of a Curb Y N	Yes = 0.25
3) Rough RR Crossing Y N	Yes = 0.50
4) Storm Drain Grate Y N	Yes = 0.75
TOTAL Scores *Record score in formula below*	

C) Location Factors	Yes/No (*circle*)	Score for "Yes"
1) Angle Parking	Y N	0.75
2) Parallel Parking	Y N	0.50
3) Right-Only Turn Lane	Y N	0.25
4) Center (Both) Turn Lane	Y N	*-0.25*
5) Physical Median	Y N	*-0.50*
6) Paved Shoulder	Y N	*-0.75*
7) Marked Bike Lane	Y N	*-1.00*
8) Severe Grades	Y N	0.50
9) Moderate Grades	Y N	0.25
10) Frequent Curves	Y N	0.25
11) Restricted Sight Distance	Y N	0.50
12) Numerous Driveways	Y N	0.50
13) Numerous Intersections	Y N	0.75
14) Difficult Intersections	Y N	1.00
15) Industrial Land Use	Y N	0.50
16) Commercial Land Use	Y N	0.25
17) Sidewalk Only One Side	Y N	0.25
18) Sidewalks do not exist	Y N	0.50
TOTAL all "YES" points *Record score in formula below*		

$$\frac{\text{AADT}}{\text{\# of thru Lanes} * 2500} + \frac{\text{Speed (mph)}}{35} + \frac{14 - \text{Outside Lane Width} - \text{Bike Lane or Paved Shoulder Width}}{2} + \text{Pavement Factors} + \text{Location Factors} = \text{Bicycle Suitability Score}$$

Appendix 9. NC DOT Bicycle Policy

Source:

North Carolina Bicycle Facilities Planning and Design Guidelines, Appendix 2
January 1994

North Carolina Department of Transportation
Division of Bicycle and Pedestrian Transportation
P O Box 25201
Raleigh, NC 27611-5201

Appendix NCDOT Bicycle Policy

North Carolina Department of Transportation

This bicycle policy revokes and replaces the former bicycle policy adopted by the Board of Transportation in November 1978. The revised bicycle policy was adopted on April 4, 1991.

General

Pursuant to the Bicycle and Bikeways act of 1974, the Board of Transportation finds that bicycling is a bonafide highway purpose subject to the same rights and responsibilities and eligible for the same considerations as other highway purposes, as elaborated below.

1. The Board of Transportation endorses the concept that bicycle transportation is an integral part of the comprehensive transportation system in North Carolina.
2. The Board of Transportation endorses the concept of providing bicycle transportation facilities within the rights-of-way of highways deemed appropriate by the Board.
3. The Board of Transportation will adopt "Design Guidelines for Bicycle Facilities." These guidelines will include criteria for selecting cost-effective and safety-effective bicycle facility types and a procedure for prioritizing bicycle facility improvements.
4. Bicycle compatibility shall be a goal for state highways, except on fully controlled access highways where bicycles are prohibited, in order to provide reasonably safe bicycle use.
5. All bicycle transportation facilities approved by the Board of Transportation shall conform with the adopted "Design Guidelines for Bicycle Facilities" on state-funded projects, and also with guidelines published by the American Association of State Highway and Transportation Officials (AASHTO) on federal aid projects.

Planning and Design

It is the policy of the Board of Transportation that bicycle facility planning be included in the state thoroughfare and project planning process.

1. The intent to include planning for bicycle facilities within new highway construction and improvement projects is to be noted in the Transportation Improvement Program.
2. During the thoroughfare planning process, bicycle usage shall be presumed to exist along certain corridors (e.g., between residential developments, schools, businesses and recreational areas). Within the project planning process, each project shall have a documented finding with regard to existing or future bicycling needs. In order to use available funds efficiently, each finding shall include measures of cost-effectiveness and safety-effectiveness of any proposed bicycle facility.
3. If bicycle usage is shown likely to be significant, and it is not prohibited, and there are positive cost-effective and safety-effective findings; then, plans for and designs of highway construction projects along new corridors, and for improvement projects along existing highways, shall include provisions for bicycle facilities (e.g., bike routes, bike lanes, bike paths, paved shoulder, wide outside lanes, bike trails) and secondary bicycle facilities (traffic control, parking, information devices, etc.).
4. Federally funded new bridges, grade separated interchanges, tunnels, viaducts and their improvements, shall be designed to provide safe access to bicycles, pursuant to the policies of the Federal Highway Administration.
5. Barriers to existing bicycling shall be avoided in the planning and design of highway projects.
6. Although separate bicycle facilities (e.g., bike paths, bike trails) are useful under some conditions and can have great value for exclusively recreational purposes, incorporation of on-road bicycle facilities (e.g., bicycle lanes, paved shoulders) in highway projects are preferred for safety reasons over separate bicycle facilities parallel to major roadways. Secondary complementary bicycle facilities (e.g., traffic control, parking, information devices, etc.) should be designed to be within highway rights-of-way.
7. Technical assistance shall be provided in the planning and design of alternative transportation uses, including bicycling, for abandoned railroad rights-of-way. This assistance would be pursuant to the National Trails Act Amendment of 1983, and the resultant national Rails to Trails program, as will the Railway Revitalization Act of 1975.
8. Wherever appropriate, bicycle facilities shall be integrated into the study, planning, design and implementation of state funded transportation projects involving air, rail and marine transportation, and public parking facilities.
9. The development of new and improved bicycle control and information signs is encouraged for the increased safety of all highway users.
10. The development of bicycle demonstration projects which foster innovations in planning, design, construction and maintenance is encouraged.
11. Paved shoulders shall be encouraged as appropriate along highways for the safety of all highway users, and should be designed to accommodate bicycle traffic.
12. Environmental documents/planning studies for transportation projects shall evaluate the potential use of the facility by bicyclists and determine whether special bicycle facility design is appropriate.
13. Local input and advice shall be sought, to the degree practicable, during the planning stage and in advance of the final design of roadway improvements to ensure appropriate consideration bicycling needs, if significant.
14. On highways where bicycle facilities exist, (bike paths, bike lanes, bike routes, paved shoulders, wide curb lanes, etc.), new highway improvements shall be planned and implemented to maintain the level of existing safety for bicyclists.
15. Any new or improved highway project designed and constructed within a public-use transportation corridor with private funding shall include the same bicycle facility consideration as if the project had been funded with public funds. In private transportation projects (including parking facilities), where state funding or department approval is not involved, the same guidelines

and standards for providing bicycle facilities should be encouraged.

Construction

It is the policy of the Board of Transportation that all state and federally funded highway projects incorporating bicycle facility improvements shall be constructed in accordance with approved state and federal guidelines and standards.

1. Bicycle facilities shall be constructed and bicycle compatibility shall be provide for, in accordance with adopted Design Guidelines for Bicycle Facilities and with guidelines of the American Association of State Highway and Transportation Officials.
2. Rumble strips (raised traffic bars), asphalt concrete dikes, reflectors and other such surface alterations, where installed, shall be placed in a manner as not to present hazards to bicyclists where bicycle use exists or is likely to exist. Rumble strips shall not be extended across shoulder or other areas intended for bicycle travel.
3. During restriping operations, motor vehicle traffic lanes may be narrowed to allow for wider curb lanes.

Maintenance

It is the policy of the Board of Transportation that the state highway system, including state-funded bicycle facilities, shall be maintained in a manner conducive to bicycle safety.

1. State and federally funded and built bicycle facilities within the state right-of-way are to be maintained to the same degree as the state highway system.
2. In the maintenance, repair and resurfacing of highways, bridges and other transportation facilities, and in the installation of utilities or other structures, nothing shall be done to diminish existing bicycle compatibility.
3. Rough road surfaces which are acceptable to motor vehicle traffic may be unsuitable for bicycle traffic. Special consideration may be given for highways with significant bicycle usage.
4. For any state-funded bicycle project not constructed on state right-of-way, a maintenance agreement stating that maintenance shall be the total responsibility of the local government sponsor shall be negotiated between the department and the local government sponsor.
5. Pot-holes, edge erosion, debris, etc., are special problems for bicyclists and their elimination should be a part of each division's maintenance program. On identified bicycle facilities, the bike lanes and paths should be routinely swept and cleared of grass intrusion, undertaken within the discretion and capabilities of Division forces.

Operations

It is the policy of the Board of Transportation that operations and activities on the state highway system and bicycle facilities shall be conducted in a manner conducive to bicycle safety.

1. A bicyclist has the right to travel at a speed less than that of the normal motor vehicle traffic. In exercising this right, the bicyclists also shall be responsible to drive his/her vehicle safely, with due consideration to the rights of other motor vehicle operators and bicyclists and in compliance with the motor vehicle laws of North Carolina.
2. On a case-by-case basis, the paved shoulders of those portions of the state's fully controlled access highways may be studied and considered as an exception for usage by bicycles where adjacent highways do not exist or are more dangerous for bicycling. Pursuant to federal highway policy, usage by bicyclists must receive prior approval by the Board of Transportation for each specific segment for which such usage is deemed appropriate, and those segments shall be appropriately signed for that usage.
3. State, county and local law enforcement agencies are encouraged to provide specific training for law enforcement personnel with regard to bicycling.
4. The use of approved safety helmets by all bicyclists is encouraged.

Education

It is the policy of the Board of Transportation that education of both motorists and bicyclists, regarding the rights and responsibilities of bicycle riders, shall be an integral part of the department's Bicycle Program.

School systems are encouraged to conduct bicycle safety education programs as a part of and in addition to driver's education program, to the maximum extent practicable, and in conjunction with safety efforts through the Governor's Highway Safety Program. The Division of Motor Vehicles is also urged to include bicycle safety and user information in its motor vehicle safety publications.

Parking

It is the policy of the Board of Transportation that secure and adequate bicycle parking facilities shall be provided wherever practicable and warranted in the design and construction of all state-funded buildings, parks and recreational facilities.

Appendix 10. The Bicycle TIP Process (cont.)

Source:

North Carolina Bicycle Facilities Planning and Design Guidelines, Appendix 3
January 1994

North Carolina Department of Transportation
Division of Bicycle and Pedestrian Transportation
P O Box 25201
Raleigh, NC 27611-5201

Appendix The Bicycle TIP Process

The Transportation Improvement Program (TIP) is the process through which local areas and citizens are asked to present their highway and transportation needs to state government. Bicycle safety needs are an important part of this process. Each year, a series of TIP meetings is scheduled around the state. Following the conclusion of the TIP meetings, all requests are evaluated. Bicycle improvement requests which meet project selection criteria are then scheduled into a four-year program as part of the state's long-term transportation program.

In fiscal year 1992, the North Carolina Board of Transportation allocated two million dollars annually for the provision of independent bicycle projects (i.e., those projects which are separate from any other scheduled highway improvements). Incidental projects, or those where the bicycle request is an incidental feature of a planned highway improvement, are built with a mixture of state and federal funds as part of overall highway improvement. Examples of bicycle projects already underway include signed bicycle routes, a greenway bicycle path, roadways with widened lanes, widened paved shoulders, bicycle parking, replacement of hazardous drainage grates and bicycle maps.

The Transportation Improvement Program Process: From Need to Bicycle or Pedestrian Improvement

I. *Recognizing a need for a bicycle improvement project.* Somewhere in a local area there may be unsafe or difficult riding conditions for bicyclists which highlight a need for bicycle transportation improvements – be it an on-road improvement project such as wide paved shoulders, bicycle parking, an off-road bike path, or printed materials such as maps and safety brochures. Pedestrian needs also may be recognized.

II. *The need is presented to the North Carolina Department of Transportation.* If it is a citizen or a private group, such as a local bicycle club, which has recognized a need for a bicycle improvement, there are several ways to present the need to transportation officials. First, a citizen or local club may write a letter presenting the need to the town or county manager's office. A follow-up telephone call should be made in order to learn the official's view of the proposed project. Town or county officials may, or may not, choose to include the improvement in their transportation improvement plan to be presented to the state at the yearly Transportation Improvement Program meeting.

If an official of an agency desires to make a bicycle request at a division TIP meeting but is not able to attend on the date of that meeting, there is a 30 day period following the meeting during which the request may be submitted in a letter addressed to the Secretary of the North Carolina Department of Transportation. All requests will receive the same degree of consideration.

III. *All bicycle project requests are documented.* Following the public TIP meetings, requests for bicycle transportation improvement projects will be organized and documented by the NCDOT Office of Bicycle and Pedestrian Transportation. A survey will be sent to each individual or agency which has made a request. Information obtained from this survey will be used to determine the feasibility of the requested project as well as to assign a level of priority to it.

IV. *Some bicycle and pedestrian improvement projects are selected for construction.* The Office of Bicycle and Pedestrian Transportation first evaluates and prioritizes all the requests; then a summary of the project requests is presented to the NCDOT Bicycle Committee for its review. Following their review, the committee forwards recommendations on the scheduling of some of the requested projects to the North Carolina Board of Transportation which makes the final decision on inclusion of the recommendations in the TIP. To be included in the TIP plan *does not guarantee that a requested project will be implemented. Rather, it means that the project will receive further study and will be implemented if feasible.*

V. *Projects which are included in the TIP fall into two categories.* Bicycle and pedestrian projects which can be incorporated into a planned and scheduled highway improvement are categorized as *incedental projects*. The bicycle or pedestrian element will be considered during the planning and design phases of the total project. Incedental projects are built with a combination of state

and federal funds in the same manner as the larger highway project is constructed.

Bicycle projects which are not incorporated into a planned and scheduled highway improvement, but are planned, funded and built seperately, are categorized as *indepentent projects*. These projects are constructed using 80% federal/20% state funding.

VI. *Finally, some TIP projects are implemented.* In the case of a scheduled incidental bicycle or pedestrian improvement, inclusion in the TIP means that the bicycle facility will be considered in conjunction with the planning and environmental studies for the given highway project. If the bicycle or pedestrian component of the project is deemed feasible, it will be scheduled for construction.

Following inclusion in the Bicycle TIP, each independent project will receive further study. This detailed planning study will include an evaluation of the feasibility of the proposed improvement as well as an actual project cost. Upon completion and acceptance by the NCDOT, the planning study will then be submitted to the North Carolina Board of Transportation for final approval and funding. A project must successfully pass through each of these levels in order to be implemented. During any of the above phases of project development, it may be necessary to alter, or, in some cases, eliminate a proposed improvement due to regulatory and design constraints or because of unanticipated costs.

VII. *TIP bicycle projects may take many forms.* There are a number of bicycle improvement projects which involve construction of on-road and off-road facilities. Some of these projects include: wide paved shoulders (4 ft minimum width), specially striped lanes for bicycles, wide outside lanes (13-14 ft minimum width) which permit a safer bicycle/automobile mix, greenway-type bicycle paths, railroad crossing improvements for bicycle safety, and the addition of bicycle-safe bridge railings.

However, there are eligible bicycle improvements that do not require a construction project. Examples of these include: signing bicycle routes; producing maps and safety brochures for cyclists in local areas; replacing dangerous drainage grates with bicycle-safe drainage grates; making spot improvements such as paving potholes or hazard marking of dangerous roadway features; and providing bicycle safety education materials to local areas.

In many cases it may be difficult to determine which kind of facility improvements is most needed. Therfore, it is entirely appropriate to request that bicycle improvements be made along a particular corridor without specifying a particular type of treatment.

TIP Bicycle project selection criteria

The following factors which affect bicycle project selection for the TIP is intended to provide guidance to local area requestors. It is important to note that:

A. Many worthwhile projects will fulfill only a few of the following conditions. Nevertheless, we encourage submission of all needed projects, since cost constraints and regulations may change over the next few years, allowing us to schedule previously infeasible projects.

B. Detailed project justification based on the factors listed below is not required at the time of project submission. We will contact you during a follow-up period to obtain any additional needed information.

The criteria are as follows:

1. *Cost limitations:* Given current budget constraints, it is unlikely that any projects with a cost in exess of $300,000 will be scheduled.
2. *Right-of-way:* Complete information regarding the right-of-way situation should be provided. Due to the limited size of our annual budget, projects requiring that NCDOT acquire right-of-way are unlikely to be scheduled.
3. *Design standards:* Projects must be in conformance with federally adopted bicycle design guidelines, as described in the AASHTO Guide for the Development of Bicycle Facilities (1991) and the NCDOT Bike Guidlines (1994). The "sidewalk bikepath," which is constructed adjacent to the roadway for two-way bicycle traffic, runs counter to the AASHTO guidelines and is discouraged within our program.
4. *Project purpose:* Each project must serve a primary bicycle transportation purpose, as opposed to a recreation or pedestrian purpose.
5. *Preliminary project approval:* All necessary permits and approval must be obtained for any project involving a public jurisdiction (including approval of Metropolitan Planning Organizations and inclusion in the local TIP, lease agreements, construction and encroaching permits, etc.).
6. *Local area involvement:* Project requests are viewed within the overall picture of bicycling in an area. Evidence of local concern and involvement via other bicycle projects or activities lends support to each specific bicycle request.

Local participation (via a direct dollar share or design services) is viewed as one measure of a local area's commitment to an improved bicycle environment.

7. *Inclusion in transportation or bicycle planning process.* Evidence that your specific bicycle request is an element of a comprehensive transportation or bicycle planning process provides critical support for your project.
8. *Project need:* Priority will be given to those projects where the greatest need can be demonstrated. Accident statistics, potential safety problems, and information regarding current or potential users of the facility can all provide project justification.
9. *Boardwalks:* Multi-use pathways that are intended to accommodate bicycles should not be designed with significant sections of boardwalk, or other such surfaces, which may be unsuitable for bicycle transportation purposes.

Important Contact Information

To learn more about the research methods, the accompanying workshop, or the evaluation of this assessment project, contact the authors:

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Within North Carolina, to learn how the NC Division of Public Health can assist your project to assess the suitability of local roads for walking and bicycling, contact your State Program Consultant:

Physical Activity and Nutrition Unit
NC Division of Public Health, NC DHHS
1915 Mail Service Center
Raleigh, NC 27699-1915
(919) 733-9615

or your CVH Program Regional Coordinator:

NC Cardiovascular Health Program
NC Division of Public Health, NC DHHS
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