

**CHAPTER 1 OUTLINE:**

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The Value of Bicycle Transportation

# CHAPTER 1: INTRODUCTION

## **INTRODUCTION TO THE BICYCLE PLAN**

In spring 2008, the City of Raleigh and the North Carolina Department of Transportation (Division of Bicycle and Pedestrian Transportation) began developing a citywide comprehensive bicycle plan for the Capital City. Raleigh's original bicycle plan was adopted in 1991 and was long overdue for an update, especially considering that the City has grown beyond the study area of the 1991 plan. Nationally, such issues as rising gas prices, environmental concerns, and a growing interest in health and wellness are demonstrating the need for bicycle-friendly cities. On a local level, this Bicycle Plan aims to take on such issues, translating them into affordable personal mobility, carbon-free transportation, and healthy, active lifestyles for Raleigh residents.

The development of this Plan included an open, participatory process, with residents of Raleigh providing input through public workshops, volunteer activities, focus group meetings, the project Steering Committee, and an online comment form.

This Plan features:

- A thorough analysis of current conditions for bicycling in Raleigh
- Standards and guidelines for the development of bicycle facilities
- A prioritized list of recommended strategic improvements
- Integration of bicycle policy into codes and ordinances
- Recommendations for programming, operations, maintenance, and funding

The goal of this Plan is to create an integrated, seamless transportation framework to facilitate bicycling as a viable transportation alternative throughout Raleigh.

## **VISION STATEMENT**

Vision statements and project goals were collected through public workshops, project steering committee meetings, input from City staff, and an online survey of local residents. These were combined, condensed, and crafted into the vision statement for this Plan. The statement (on the following page) expresses the desired outcome of the plan, rather than the current conditions.



## ***Raleigh Bicycle Transportation Plan Vision Statement***

We see all types of cyclists—beginners to experts—out riding to work, to school, for fun, for shopping, and for exercise.

The streets of Raleigh will accommodate bicycling within the existing street network, with bicycle safety as a goal for all roadway projects.

Bicycle projects will be strategically placed, with connections to major destinations, trailheads, and transit as priorities for overall multi-modal transportation.

Connectivity to other cities, towns, and their bicycle route networks will provide access to regional destinations.

Institutional support, staffing, and resources will be available for Plan implementation and facility maintenance.

Education programs and enforcement of laws will increase safety and build courtesy between drivers and cyclists.

Bicycle policy will be integrated into City codes, and bicycle culture will be integrated into City life.

Land use in Raleigh will accommodate bicycling with increased density, thereby reducing the distance between destinations.

Bicycle facilities provide a viable alternative to driving, thereby reducing overall motor vehicle traffic congestion and improving the health of residents and the environment.

When bicycle facilities and increased density are combined with services (such as covered parking, bicycle stations, showers at employment centers, wayfinding amenities and bicycle rentals), bicycling in Raleigh becomes more comfortable, convenient and efficient than driving.





## MEASURABLE GOALS

The purpose of this Bicycle Plan is to make this vision a reality. Measurable goals, derived from this vision, are listed below. While the City of Raleigh must lead this effort, overall success will also require continued, active participation and encouragement from local residents and community organizations. The ultimate goal is for this Plan to be fully implemented within a 30-year time frame.

The City should conduct an annual meeting for the evaluation of progress on each of the following goals, including an official plan update in 2012. During each evaluation, City staff and members of a citizen's advisory board should identify steps to be taken before the next evaluation.

1. Quadruple the 2000 Census bicycle commute rate by 2015.
2. Complete this plan's top five priority bicycle projects by 2011 and complete the top twenty by 2015.
3. Become designated as a 'Bicycle-Friendly Community' by 2010 by the League of American Bicyclists.
4. Launch/participate in three new programs in three years (see Chapters 5 and 8 for details):

### A) *Bicycle Education and Encouragement Program*

- Create a citizens Bicycle and Pedestrian Advisory Commission to meet on a regular basis and support implementation of this plan.
- Foster the creation of a Bicycle Mentor Program for new bicycle commuters to learn from experienced bicycle commuters.
- Produce online and hardcopy bicycle maps and obtain a variety of educational materials for distribution that cover bicycle safety, etiquette, and rules and regulations.

### B) *Bicyclist and Motorist Enforcement Program*

- Establish an easy-to-use and well publicized bicycle and pedestrian enforcement hot line.
- Provide officers with an educational handout to be used during bicycle-related citations and warnings
- Training for law enforcement and law enforcement programs that focus on bicycling-related issues

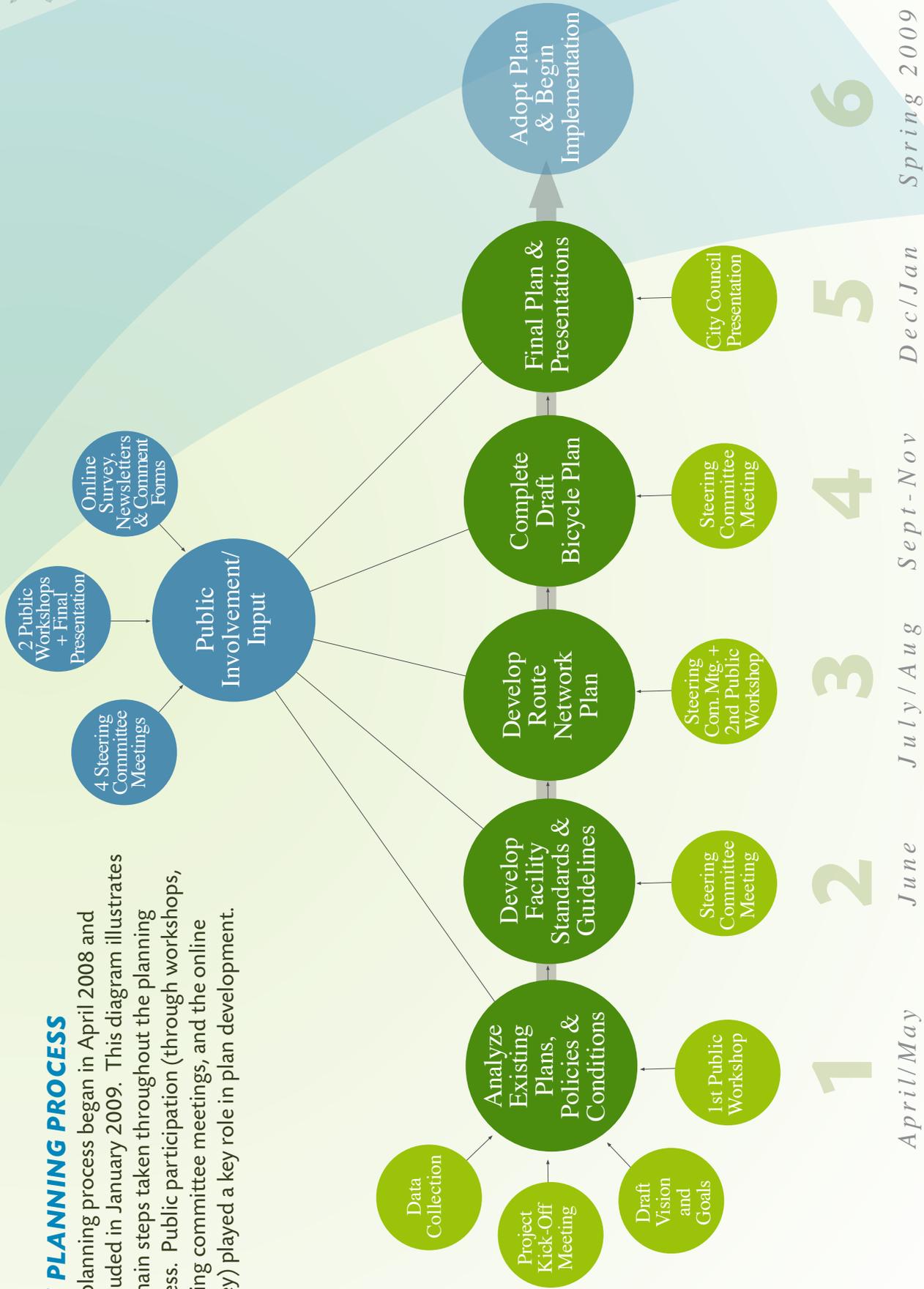
### C) *Bicycle Facility Development Program*

- Hire a full-time multi-modal planner at the City-level
- Establish regular CIP funding for roadway retrofits and restriping
- Integrate bicycle-related improvements with scheduled roadway maintenance and restriping projects
- Initiate programs aimed at developing regional and countywide connections



### THE PLANNING PROCESS

The planning process began in April 2008 and concluded in January 2009. This diagram illustrates the main steps taken throughout the planning process. Public participation (through workshops, steering committee meetings, and the online survey) played a key role in plan development.





## THE VALUE OF BICYCLE TRANSPORTATION

Given the extensive commitment of time and resources needed to fulfill the goals of this plan, it is also important to assess the immense value of bicycle transportation. As stated in comments from nearly 700 City of Raleigh residents, bicycling will help to improve people's health and fitness, enhance environmental conditions, decrease traffic congestion, and contribute to a greater sense of community.

Scores of studies from experts in the fields of public health, urban planning, urban ecology, real estate, transportation, sociology, and economics have supported such claims and affirm the substantial value of supporting bicycling as it relates to active living and alternative transportation. Communities across the United States and throughout the world are implementing strategies for serving the bicycle needs of their residents, and have been doing so for many years. They do this because of their obligations to promote health, safety and welfare, and also because of the growing awareness of the many benefits of bicycling.



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

### *Increased Health and Physical Activity*

A growing number of studies show that the design of our communities—including neighborhoods, towns, transportation systems, parks, trails and other public recreational facilities—affects people's ability to reach the recommended daily 30 minutes of moderately intense physical activity (60 minutes for youth). According to the Centers for Disease Control and Prevention (CDC), "physical inactivity causes numerous physical and mental health problems, is responsible for an estimated 200,000 deaths per year, and contributes to the obesity epidemic."<sup>1</sup> The increased rate of disease associated with inactivity reduces quality of life for individuals and increases medical costs for families, companies, and local governments.





The CDC determined that creating and improving places to be active could result in a 25 percent increase in the number of people who exercise at least three times a week.<sup>2</sup> This is significant considering that for people who are inactive, even small increases in physical activity can bring measurable health benefits. Establishing a safe and reliable bicycle network in Raleigh will positively impact the health of local residents. The Rails-to-Trails Conservancy puts it simply: “Individuals must choose to exercise, but communities can make that choice easier.”<sup>3</sup>

### *Economic Benefits*

Bicycling is an affordable form of transportation. According to the Pedestrian and Bicycle Information Center (PBIC), of Chapel Hill, NC, the cost of operating a bicycle for a year is approximately \$120, compared to \$7,800 for operating a car over the same time period.<sup>4</sup> Bicycling becomes even more attractive from an economic standpoint when the rising price of oil (and decreasing availability) is factored into the equation. Since 2000, oil prices have more than quadrupled. As of summer 2008, gasoline prices have topped \$4 a gallon and are generally forecast to continue to increase.<sup>5</sup> The rising cost of fuel reinforces the idea that local communities should be built to accommodate people-powered transportation, such as walking and biking. Raleigh’s current focus on density and bringing residents downtown, combined with new strategies for improving bicycle transportation, could facilitate a substantial local reduction in auto- and oil-dependency.

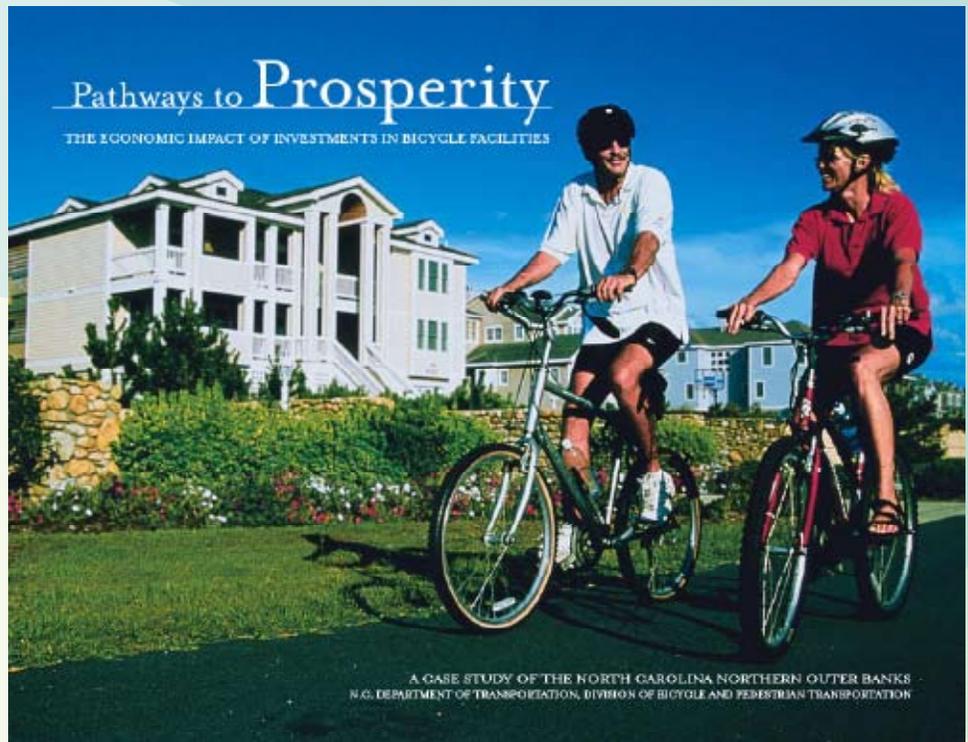
From a real estate standpoint, consider the positive impact of trails and greenways, which are essential components of a complete bicycle network. According to a 2002 survey of recent homebuyers by the National Association of Home Realtors and the National Association of Home Builders, trails ranked as the second most important community amenity out of a list of 18 choices.<sup>6</sup> Additionally, the study found that ‘trail availability’ outranked 16 other options including security, ball fields, golf courses, parks, and access to shopping or business centers. Findings from the American Planning Association (How Cities Use Parks for Economic Development, 2002), the Rails-to-Trails Conservancy (Economic Benefits of Trails and Greenways, 2005), and the Trust for Public Land (Economic Benefits of Parks and Open Space, 1999) further substantiate the positive connection between trails and property values across the country.

Finally, from a tourism perspective, cyclists can add real value to local economies. For example, in the Outer Banks, NC, bicycling is estimated to have an annual economic impact of \$60 million; 1,407 jobs are supported by the 40,800 visitors for whom bicycling was an important reason for choosing to vacation in the area. The annual return on bicycle facility development in the Outer Banks is approximately nine times higher than the initial investment.<sup>7</sup> Similarly, Damascus, VA, the self-proclaimed ‘Friendliest Trail Town’, features 34-miles of trail where approximately \$2.5 million is



*Apex, NC: The Shepard’s Vineyard housing development added \$5,000 to the price of 40 homes adjacent to the regional greenway – and those homes were still the first to sell. (Rails to Trails Conservancy, 2005)*





Download the full report, “Pathways to Prosperity”, from: [http://ncdot.org/transit/bicycle/safety/safety\\_economicimpact.html](http://ncdot.org/transit/bicycle/safety/safety_economicimpact.html)

spent annually related to recreation visits. Of this amount, non-local visitors spend about \$1.2 million directly into the economies of Washington and Grayson counties.<sup>8</sup> While these examples feature beach and mountain destinations, the City of Raleigh also has key bicycling advantages, such as a model greenway system, connections to the Mountains-to-Sea Trail and the East Coast Greenway, and a large population of potential riders.

### *Environmental Improvements*

As demonstrated by the Southern Resource Center of the Federal Highway Administration, when people get out of their cars and onto their bicycles, they reduce measurable volumes of pollutants.<sup>9</sup> Other environmental impacts include a reduction in overall neighborhood noise levels and improvements in local water quality as fewer automobile-related discharges wind up in the local rivers, streams, and lakes.

Trails and greenways are also part of any bicycle network, conveying unique environmental benefits. Greenways protect and link fragmented habitat and provide opportunities for protecting plant and animal species. Aside from connecting places without the use of air-polluting automobiles, trails and greenways also reduce air pollution by protecting large areas of plants that create oxygen and filter air pollutants such as ozone, sulfur dioxide, carbon monoxide and airborne particles of heavy metal. Finally, greenways improve water quality by creating a natural buffer zone that protects streams, rivers and lakes, preventing soil erosion and filtering pollution caused by agricultural and road runoff.



### Transportation Benefits

In 2001, the National Household Travel Survey found that roughly 40% of all trips taken by car are less than 2 miles. By taking these short trips on a bicycle, rather than in a car, citizens can substantially impact local traffic and congestion. Additionally, many people do not have access to a vehicle or are not able to drive. According to the National Household Travel Survey (NHTS), one in 12 U.S. households does not own an automobile and approximately 12 percent of persons 15 or older do not drive.<sup>10</sup> An improved bicycle network provides greater and safer mobility for these residents.

Traffic congestion is often a major problem in fast growing areas such as Wake County (Wake County is the 33rd fastest-growing county in the United States, among those with populations over 10,000).<sup>11</sup> Congestion reduces mobility, increases auto-operating costs, adds to air pollution, and causes stress. Bicycle users can help alleviate overall congestion because each cyclist is one less car on the road. Incidentally, cyclists take up significantly less space on the road (see images at left). While some may argue over the degree to which overall congestion is alleviated by cyclists, one aspect of the argument is particularly difficult to challenge: for the individuals who choose to ride a bike rather than drive, the negative impacts of congestion (stress, operating costs, and sometimes even mobility) are greatly reduced.

### Quality of Life

Many factors go into determining quality of life for the citizens of a community: the local education system, prevalence of quality employment opportunities, and affordability of housing are all items that are commonly cited. Increasingly though, citizens claim that access to alternative means of transportation and access to quality recreational opportunities such as parks, trails, greenways, and bicycle routes, are important factors for them in determining their overall pleasure within their community. Communities with such amenities can attract new businesses, industries, and in turn, new residents. Furthermore, quality of life is positively impacted by bicycling through the increased social connections that take place by residents being active, talking to one another and spending more time outdoors and in their communities.

According to the Brookings Institution, the number of older Americans is expected to double over the next 25 years.<sup>10</sup> All but the most fortunate seniors will confront an array of medical and other constraints on their mobility even as they continue to seek both an active community life, and the ability to age in place. Trails built as part of the bicycle transportation network generally do not allow for motor vehicles. However, they do accommodate motorized wheelchairs, which is an important asset for the growing number of senior citizens who deserve access to independent mobility.



Source: *The Association for the Advancement of Sustainability in Higher Education*, 2007.





Children under 16 are another important subset of our society who deserve access to safe mobility and a higher quality of life. According to the U.S. Environmental Protection Agency, fewer children walk or bike to school than did so a generation ago. In 1969, 48 percent of students walked or biked to school, but by 2001, less than 16 percent of students between 5 and 15 walked or biked to or from school.<sup>13</sup>

According to the National Center for Safe Routes to School, “Walking or biking to school gives children time for physical activity and a sense of responsibility and independence; allows them to enjoy being outside; and provides them with time to socialize with their parents and friends and to get to know their neighborhoods.”<sup>14</sup> In a 2004 CDC survey, 1,588 adults answered questions about barriers to walking to school for their youngest child aged 5 to 18 years.<sup>15</sup> The main reasons cited by parents included distance to school, at 62%, and traffic-related danger, at 30%. Strategic additions to Raleigh’s trail system could shorten the distance from homes to schools, and overall bicycle improvements can improve the safety of our roadways.

#### Footnotes from, “*The Value of Bicycle Transportation*”:

1. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. (1996). *Physical Activity and Health: A Report of the Surgeon General*.
2. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. (2002). *Guide to Community Preventive Services*.
3. Rails-to-Trails Conservancy. (2006) *Health and Wellness Benefits*.
4. Pedestrian and Bicycle Information Center. (2008). *Economic Benefits: Money Facts*. Retrieved 8/8/2008 from [www.bicyclinginfo.org/why/benefits\\_economic.cfm](http://www.bicyclinginfo.org/why/benefits_economic.cfm)
5. King, Neil. *The Wall Street Journal: Another Peek at the Plateau*. (2/27/08): In February 2008, the *Wall Street Journal* quoted industry experts, stating, “supply constraints could push the price of oil to \$150 a barrel by 2010”.
6. National Association of Realtors and National Association of Home Builders. (2002). *Consumer’s Survey on Smart Choices for Home Buyers*.
7. NCDOT and ITRE. (2006). *Bikeways to Prosperity: Assessing the Economic Impact of Bicycle Facilities*.
8. Virginia Department of Conservation. (2004). *The Virginia Creeper Trail: An Assessment of User Demographics, Preferences, and Economics*.



9. Federal Highway Administration, Southern Resource Center. (1999). *Off-Mode Air Quality Analysis: A Compendium of Practice*. To calculate air quality benefits of bicycling, first calculate the Daily VMT reduction.  $VMT\ Reduction = PD * Area * L * BMS$ , where PD = Population density, persons/mile; Area = Project length \* 1 mile radius, mile; L = Round trip length, one-half of the project length times 2 daily trips, miles; BMS = Bike mode share, %. Last, calculate the Daily Emission reductions for a pollutant.  $Ed = EFx * VMT\ Reduction$ , where Ed = Daily Emissions, grams/day; EFx = Emission factor for pollutant x, grams/mile; VMT = vehicle mile/day.

10. U.S. Department of Transportation (DOT), Bureau of Transportation Statistics (BTS) and the Federal Highway Administration (FHWA). (2002). *National Household Travel Survey*.

11. WRAL. (2008) *8 N.C. Counties Among Nation's Fastest-Growing*.

12. Brookings Institution. 2003. *The Mobility Needs of Older Americans: Implications for Transportation Reauthorization*.

13. US EPA. (2003). *Travel and Environmental Implications of School Siting*.

14. National Center for Safe Routes to School. (2006). *National Center for Safe Routes to School Talking Points*.

15. Centers for Disease Control and Prevention. *The Importance of Regular Physical Activity for Children*. Accessed 9/16/05 at [http://www.cdc.gov/nccdphp/dnpa/kidswalk/health\\_benefits.htm](http://www.cdc.gov/nccdphp/dnpa/kidswalk/health_benefits.htm).

