



# Increasing Physical Activity

## THROUGH COMMUNITY DESIGN

A Guide for Public Health Practitioners  
and Livable Community Advocates

NATIONAL CENTER FOR BICYCLING & WALKING | June 2010



On the cover:



Rockworth  
[www.istockphoto.com](http://www.istockphoto.com)



Carl Sundstrom  
[www.pedbikeimages.org](http://www.pedbikeimages.org)



Felix Alim  
[www.istockphoto.com](http://www.istockphoto.com)



Dan Burden  
[www.pedbikeimages.org](http://www.pedbikeimages.org)



Michele Pincigalli  
[www.istockphoto.com](http://www.istockphoto.com)

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### CREDITS

Sharon Z. Roerty, AICP/PP/MCRP; Project Team Leader and Principal Investigator  
Holly Carapella, MPA, Project Manager and Principal Investigator  
Mark Plotz, MPA, Principal Investigator  
John Williams, Project Research and Support

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The report may be downloaded at [www.bikewalk.org](http://www.bikewalk.org).



# Table of Contents

**Chapter One: Introduction**..... 1

Health, Physical Activity & Community Design ..... 3

Treating the Patient ..... 9

**Chapter Two: How to Improve Conditions for Walking and Bicycling**..... 11

What’s Your Role?.....12

What Needs Doing? ..... 15

**Chapter Three: How to Get It Funded** .....29

Develop a Strategy .....30

Follow Through with the Project.....42

Summary .....43

**Chapter Four: Resources & Glossary** .....45

Public Health .....46

Transportation .....47

Land Use Planning & Community Design .....48

Facility Planning & Design.....49

Schools ..... 50

Funding Sources & Programs .....50

Advocacy .....51

Environmental .....52

Equity & Social Justice ..... 53

Glossary .....53

**“Ultimately it is the right people who make change possible; we either have to be them or find them.”**



**Sharon Z. Roerty, AICP/PP/MCRP  
Executive Director, National Center for  
Bicycling & Walking**

## Walk With Me

*A letter from Sharon Z. Roerty, Executive Director  
of the National Center for Bicycling & Walking*

Picture a place with short, connected blocks, a variety of building types and destinations proximate to each other. Then picture a place with four or more lanes of traffic, double left turn lanes, limited through streets, large gaps between buildings and deep property setbacks. It is probably easy to include people walking or biking in the first mental picture; and less so in the second.

About a year ago I was facilitating a workshop for a group of advocates in southern Alabama who had a vision of a region with a continuous network of sidewalks, paths, trails, and complete streets spanning two counties, and crossing a major body of water. In the audience were two college students, who were leaders in a campus sustainability group. As part of the workshop each person was asked to think of and then describe a place where they like to walk or bike. When it came to be the students' turn, they both retreated, before confessing that they never had lived in such a place. They couldn't picture this place.

In 2002 when we published, *Increasing Physical Activity through Community Design*, we did it as a guide to engage public health practitioners and encourage them to become more involved in community design issues. The current adaptation of the IPA guidebook is still aimed at public health practitioners, however it recognizes that a more deeply rooted trans-disciplinary approach is necessary for creating the public will and support for change and sustaining it. Public health practitioners can't do it alone; planners can't do it alone; elected officials need a reason to do it; environmentalists, social workers, educators, housing developers and advocates—they all need to be part of it.

Not long after I met the college students from Alabama, I participated in a bike rodeo in Newark, NJ. On a steamy Saturday in July, 125 children, ages 3-12, showed up to learn to ride. Thanks to the generosity of many, each and every child was outfitted with a refurbished bike, a new helmet, and received instruction from a trained professional on the rules of the road—all at no cost. They negotiated the cones and the chalk lines of the parking lot obstacle course, learning how to start, stop, and handle their new bicycles. I can still picture the happy faces as the children left the courtyard with their “new” bikes and new confidence. Newark is struggling to become a bicycle friendly city. If everyone continues to work together it will happen.

This guidebook is about implementation. For over a decade, the National Center for Bicycling & Walking has been leading the fight to make our communities healthy by design. Fortunately in 2010 our efforts are bolstered by national leaders and national programs. First Lady Michelle Obama has initiated “Let's Move” a program that promotes physical activity. USDOT Secretary Ray LaHood has been making public statements about community design that supports walking and biking; and he is backing up his statements with policy directives. Also in 2010 there is a better understanding of the built environment and its impact positively and negatively on our mobility and health. We still have a lot of work to do but we are on the right road.



## INCREASING PHYSICAL ACTIVITY THROUGH COMMUNITY DESIGN

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# Chapter One

## INTRODUCTION

|   |   |
|---|---|
| Health, Physical Activity & Community Design.....   | 3 |
| <i>A Health Crisis</i> .....                        | 3 |
| <i>Daily Physical Activity</i> .....                | 3 |
| <i>Active Living Through Community Design</i> ..... | 4 |
| Treating the Patient .....                          | 9 |

## Physical Activity Guidelines<sup>1</sup>

- For substantial health benefits, adults should get at least 150 minutes (2 hours and 30 minutes) per week of moderate intensity, or 75 minutes (1 hour and 15 minutes) per week of vigorous intensity aerobic physical activity, or an equivalent combination of moderate and vigorous intensity aerobic activity.
- Children and adolescents should get 60 minutes (1 hour) or more of physical activity daily.
- The benefits of physical activity on cardio-respiratory health are some of the most extensively documented of all the health benefits.
- Regular physical activity reduces the risk of developing type 2 diabetes as well as metabolic syndrome.
- Physical activity and caloric intake both must be considered when trying to control body weight. Because of its role in energy balance, physical activity is a critical factor in determining whether a person can maintain a healthy body weight, lose excess body weight, or maintain successful weight loss.

In healthy communities—not just in the movies—walking and bicycling are normal parts of daily life. The Centers for Disease Control and Prevention (CDC) calls these kinds of places Active Community Environments (ACEs). It recognizes that providing for active living through community design is a health issue.

This guide tells you how to help create places for people to walk and bicycle. This doesn't just mean special trails, though those might certainly be an important element of an overall plan. Creating an active community environment means taking a look at the broader scope of where there are, and are not, opportunities to safely walk and bicycle. It involves land use design, retrofitting the transportation infrastructure, funding and much more.

Although this guide is written for public health professionals, others—community leaders, local planners and transportation and environmental agency officials, and citizens—can also benefit from its tips, ideas, and examples. After all, poor community design affects the health of the entire community. The increased awareness each of us brings to the problem is another step towards the solution.



SOURCE: WWW.PEDBIKEIMAGES.ORG/DAN BURDEN

▲ Boulevard malfunction, Missoula, MT

◆ Good function, East Lansing, MI



SOURCE: WWW.PEDBIKEIMAGES.ORG/DAN BURDEN



# Health, Physical Activity & Community Design

## A Health Crisis

America faces a national health crisis of epidemic proportions. Physical inactivity combined with overeating has, in just a few generations, made us a nation of overweight and out-of-shape people. The incidence of overweight or obese adults increased steadily from 47 percent in 1976, to 56 percent in 1994, and 68 percent in 2007.<sup>2</sup> The prevalence of overweight children and adolescents more than tripled during the same 30-year span, with 19.6 percent of children aged 6-11, and 18.1 percent of those adolescents aged 12-19 identified as obese.<sup>3</sup>

Obesity, diabetes, heart disease, stress and a host of other ills are increasing. Physical inactivity and obesity rank second to smoking in their contribution to total mortality in the United States. The direct economic (health care) cost of obesity in the United States was estimated to be between \$80 and \$90 billion in 2008.<sup>4</sup>

About 60 percent of overweight children between the ages of 5 and 10 already demonstrate risk factors associated with heart disease such as elevated blood pressure and increased insulin levels.<sup>5</sup> These factors lead to chronic diseases later in life.

## Daily Physical Activity

Moderate, daily physical activity, such as bicycling or walking, has long been recognized as an essential ingredient of a healthy lifestyle. Yet many Americans, both young and old, lead a sedentary lifestyle. Our workplaces are increasingly automated. Many jobs require workers to spend hours at a desk. We use the automobile as our primary means of travel even for short trips. According to the U.S. Department of Transportation's National Household Travel Survey, the average American adult takes only 8 percent of their total yearly trips on foot.

In 1969, 41 percent of all children either walked or biked to school. A recent study by the National Center for Safe Routes to School study found between 13 and 17 percent of public school students walk or bike to school today, while 45 percent are driven to school each day by a family member.<sup>6</sup>

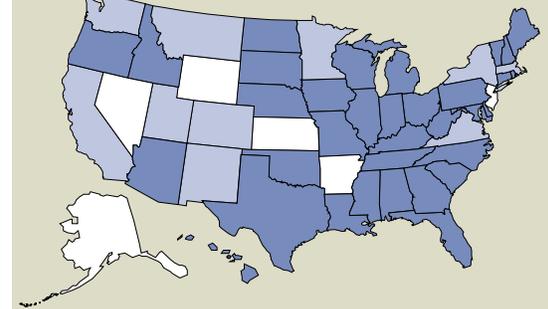
We prepare our children for a sedentary lifestyle. At school, opportunities for physical activity have diminished. Shifting priorities have caused many physical education classes and even recesses to be dropped. After school, kids are driven to events, to the mall or to a friend's house. Add in a daily dose of television, often accompanied by high-calorie snacks, and it's no wonder so many young people weigh so much.

## Obesity Trends\* Among U.S. Adults

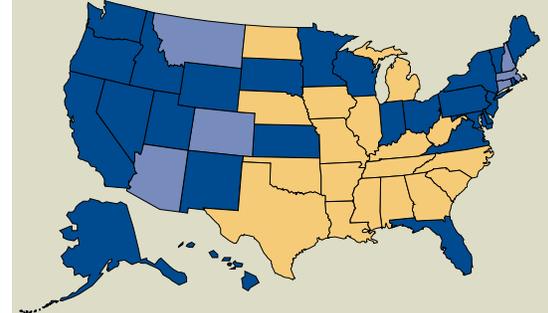
BRFSS, 1990, 1999, 2008

\*BMI  $\geq 30$ , or about 30 lbs. overweight for 5'4" person

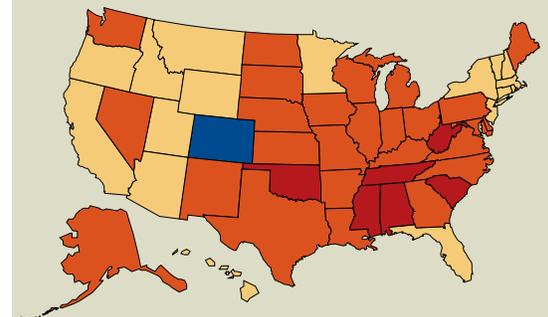
1990



1999



2008



□ No Data  
■ <10%   ■ 10%–14%   ■ 15%–19%  
■ 20%–24%   ■ 25%–29%   ■ 30%

During the last 25 years, obesity rates have increased among men and women across all socio-demographic groups in all regions. In 1985 none of the states had obesity rates of 15 percent or more. In 2008, only one state had an obesity rate of less than 20 percent. Six states had a prevalence of obesity equal or greater than 30 percent.<sup>7</sup>



## Benefits of Daily Physical Activity

According to the American Heart Association, daily physical activity:<sup>8</sup>

- reduces the risk of heart disease by improving blood circulation throughout the body;
- keeps weight under control;
- improves blood cholesterol levels;
- prevents and manages high blood pressure;
- prevents bone loss;
- boosts energy level;
- helps manage stress;
- improves the ability to fall asleep quickly and sleep well;
- improves self-image;
- counters anxiety and depression and increases enthusiasm and optimism;
- increases muscle strength and the ability to do other physical activities;
- provides opportunities to share an activity with family and friends;
- establishes healthy habits in children and counters the conditions (obesity, high blood pressure, etc.) that lead to heart attack and stroke later in life; and
- helps delay or prevent chronic illnesses and diseases associated with aging and maintains quality of life and independence longer.

The increase in obesity follows a decline in walking and bicycling. We don't walk or bicycle as much as we used to, partly because our communities—designed around the automobile—lack walkways and bikeways that would otherwise accommodate and encourage such activity. Even where facilities exist, features that support driving, such as wide roads and intersections, large parking lots and drive-through businesses, create an environment that is uncomfortable and unsafe for those not traveling by car.

Spread-out, isolated destinations typical of car-oriented suburban development also discourage walking and bicycling. Even in communities where most places are near enough to walk or bicycle, people may not feel safe because of high motor vehicle speeds and volumes. Suburban shopping development is a familiar example. Within a half-mile radius you may find shopping, dining, and housing. However, many of these destinations are separated by multi-lane arterial roadways that meet at multi-lane intersections. Something is very wrong with our communities when, for safety's sake, we must get in our cars to travel that ¼ mile from the shopping center to the restaurant, because no one wants to cross six lanes of traffic.

## Active Living Through Community Design

### The Vision

The CDC refers to places where everyone can enjoy daily, moderate levels of walking, bicycling and other exercise as Active Community Environments (ACEs). A walking- and bicycle-friendly community is also a more livable community where people of all ages and abilities can travel freely. Active Community Environments encourage and accommodate walking and bicycling through their approach to:

- transportation facilities and services;
- land-use planning and development;
- schools;
- recreation, parks and trails;
- safety, security and crime prevention;
- protecting our environment; and
- considering needs of all residents regardless of race, ethnicity, age or ability.

This section describes what “model” communities look like and how they are planned. Today, few communities exhibit all of the factors described below, but many share at least some of them. Chapter 2 discusses how to make the streets work better for pedestrians and bicyclists.

### Transportation Facilities and Services

People will walk or bicycle in their communities when there are safe and comfortable places to do so. The ideal scenario includes a balanced transportation system that offers choices for all. Public transit, sidewalks, bicycle paths/lanes and roadways all provide people with appropriate transportation choices. A recent



survey found 71 percent of Americans report that they would like to bicycle more, while 53 percent favor increasing federal spending on bicycle lanes and paths.<sup>9</sup> To provide the necessary transportation facilities and services, a community can:

- design new roads to accommodate bicycling and walking;
- retrofit existing roads to accommodate bicycling and walking;
- maintain roads and sidewalks for easy, safe use by pedestrians and bicyclists, even during the winter months;
- make all routes accessible for people with disabilities;
- allocate transportation funds so that (a) all projects include the funding needed for bicycling and walking facilities, (b) an equitable share goes to eliminating pedestrian- and bicycle-related deficiencies in existing roads, and (c) an equitable share goes to addressing safety improvements and education for all road users;
- develop new neighborhoods in which the streets are laid out using a traditional “grid” pattern to provide more route choices, to reduce trip lengths and to slow motor vehicles; and
- develop a coordinated system of transit, pedestrian and bicycling services and facilities.

### Land-Use Planning and Development

Active community development plans and practices focus on creating transit and pedestrian-oriented communities where the majority of trips are made by a combination of walking, bicycling and transit. In such communities, most people walk or bike to get from one locale to another or specifically for recreation and health. And public health impacts and objectives are a regular, routine and guiding consideration in land-use planning decisions. Communities can integrate public health considerations into their land-planning and development initiatives in many ways:

- Integrate “smart growth” principles in development plans and programs to:
  - ◆ increase opportunities for walking, bicycling and transit use;
  - ◆ efficiently utilize land and existing urban services;
  - ◆ create transportation options by mixing development and land uses within existing downtowns and new town centers;
  - ◆ design the urban environment to a more detailed, human scale;
  - ◆ place buildings facing the street near the sidewalk with parking on the street or behind the buildings; and
  - ◆ consider positive public health impacts a priority in land-use planning and development decision-making. Conduct a health impact assessment.<sup>10</sup>
- Make traditional neighborhood development (TND) the standard for residential areas.
- Locate commercial and retail development in downtowns, on main streets, and in new town and neighborhood centers.
- Reduce trip distances.
- Make walking, bicycling and transit the preferred transportation choices for the majority of trips.

**“Across our country, childhood obesity has reached epidemic rates and, as a result, our children may live shorter lives than their parents. Obesity has been recognized as a problem for decades, but efforts to address this crisis to date have been insufficient. My Administration is committed to redoubling our efforts to solve the problem of childhood obesity within a generation through a comprehensive approach that builds on effective strategies, engages families and communities, and mobilizes both public and private sector resources....”**

*President Barack Obama, Presidential Memorandum—Establishing a Task Force on Childhood Obesity, 2010*



**“Americans will be more likely to change their behavior if they have a meaningful reward—something more than just reaching a certain weight or dress size. The real reward is invigorating, energizing, joyous health. It is a level of health that allows people to embrace each day and live their lives to the fullest without disease or disability.”**

*Vice Admiral Regina M. Benjamin, M.D.,  
M.B.A., Surgeon General, 2010*

### Schools

Most schools should be of moderate size and located in the neighborhoods they serve. The majority of children should walk or bike to school. School sites should serve a wide range of community services and needs, including recreation and gathering places. When developing schools sites, a community should:

- locate schools within walking distance of the student population;
- provide safe routes to school for students to walk and bike;
- develop school sites that are pedestrian- and bicycle oriented;
- initiate strict controls over the operation of motor vehicles on and near school sites, at bus stops and along school routes;
- encourage children to bike and walk to school;
- design and operate schools as multi-purpose community centers including recreational needs; and
- locate schools away from highways, arterials, and major commercial and industrial developments.

### Recreation, Parks and Trails

Basic park and recreation facilities should be available in every neighborhood, so that most users walk or bike to them. Other recreation facilities should be easily accessible by transit. Most organized sports activities should take place at parks or school sites located in or near the neighborhoods where the children live. Trail-type facilities should be within walking distance of most residential areas. When planning for new parks and making changes to existing facilities, a community should:

- develop neighborhood park and recreation facilities in new subdivisions and in currently underserved residential areas;
- locate neighborhood park and recreation facilities so they are easily and safely reached by most people, especially children;
- utilize smaller sites for youth sport activities, instead of large-scale regional facilities to which people must drive;
- utilize public facilities, such as schools, as multi-purpose facilities, especially for recreation services; and
- develop a system of trails that is readily accessible to most people.

### Safety, Security and Crime Prevention

A safe and secure community is one in which people of all ages are present and active and where motor vehicle traffic does not pose a serious threat, especially to children near schools and parks. Motor vehicle operation should be strictly regulated, and traffic laws obeyed by all users.

When this occurs, crashes, injuries and fatalities decline significantly. Crimes of all kinds decline, especially in residential areas. Parents are at ease with the notion of their children playing outside, unsupervised in their neighborhood. Children spend more time outside, playing with other children. A community must coordinate keeping its residents safe and secure while providing accessible



routes for all modes of travel. To promote safety and security a community should consider the following:

- Ensure all drivers are careful and responsible.
- Restrict motor vehicle speeds in neighborhoods, near schools and in shopping areas.
- Design neighborhoods to reduce the threat of crime.
- Institute pro-active community policing programs.
- Encourage and support the formation of neighborhood associations and tenants groups (neighbors that know each other are more likely to take an active role in crime prevention and resource networking).
- Engage business leaders, civic groups and youth mentors and organizations (i.e. YMCAs, Boys & Girls Clubs, PALs) in community safety and design issues; and to increase positive outdoor activity including community events.

### Protecting our Environment

Protecting our environmental resources and taking care of our communities is at the forefront of concern for all neighborhoods. Air pollution is not only a threat to everyone's overall health, but causes a great number of people to suffer physical ailments. Utilizing any mode of transportation other than driving alone in an automobile can help improve environmental conditions in a community. Cold start emissions occur upon starting and driving a vehicle within the first few minutes. Higher emissions are released because the automobile has not reached its optimum operating temperature.<sup>11</sup> Short trips add to our cold start emissions and can be reduced by emphasizing alternative modes.



SOURCE: WWW.FEDBETIMAGES.ORG/LAURA SANOT

### Crime Prevention Through Environmental Design (CPTED):

Crime prevention philosophy based on the theory that proper design and effective use of the built environment can lead to a reduction in the fear and incidence of crime, as well as an improvement in the quality of life.

### Carbon Footprint Calculator:

Estimates how many tons of carbon dioxide and other greenhouse gases each person creates each year.

Go to: [www.nature.org/initiatives/climatechange/calculator](http://www.nature.org/initiatives/climatechange/calculator)



**“As I traveled around the country, I became convinced that everyone was asking the wrong questions, focusing on the wrong consequences and talking about the entire problem sideways instead of head on. Issues like body weight and heart rate certainly count for something, but the incredible decline in physical activity in the United States has ripped apart our civic life, further demoralized struggling low-income populations, undermined our collective morality and has created a devastated rift between human society and nature.”**

*Mary Collins, American Idle—A Journey Through our Sedentary Culture. Capital Books Inc., 2009, page 155*

Communities collectively working together with local governments, public health agencies, businesses, schools, community groups, and residents can make great strides against pollution and provide a cleaner and healthier place for all to live. Some strategies to protect our environment include:

- emphasize the benefits of bicycling and walking to our existing environment;
- develop and implement “clean commuting” campaigns;
- collaborate with local businesses, schools and community groups to promote green alternatives;
- designate No Idle zones around schools;
- provide free public transportation on pollution alert days; and
- publicly recognize individuals and organizations that are good environmental stewards.

### Considering the Needs of All Residents (Social/Environmental Justice)

A single community can consist of residents from many different social, ethnic and age groups. It is important to consider all populations when providing facilities in a community. Many people are unable to or choose not to drive, and walking is their primary method for travel. Older residents may no longer be able to drive, while residents with disabilities may not be able to drive. Additionally, recent economic conditions have impacted many households. They may no longer be able to afford to keep or use a family automobile. Communities can ensure transportation choices are available to all of their residents in a number of ways:

- Develop a coordinated system of transit, pedestrian and bicycling services and facilities to serve all neighborhoods.
- Develop equitable transportation plans and policies that include access not only to schools and work, but also to health facilities, grocery stores and shopping and services.
- Provide all community members opportunities to be involved in public decision-making processes.
- Encourage and support mixed-use and mixed-income development to locate residential and community services nearby.



SOURCE: WWW.PEDBIKETHINGS.ORG/DAN BURDEN



## Treating the Patient

Creating local environments that encourage physical activity for all age groups—promoting active living through community design—is one way to build healthy communities. In most cases, people don't need lavish new facilities to achieve higher levels of physical activity. Communities across the country are finding that they can make simple changes to the physical environment to benefit pedestrians and bicyclists. The next chapter of this guide focuses on some achievable actions that can make a difference.

Some of these changes include retrofitting roadways with sidewalks, curb ramps and features that slow traffic, making it easier and safer to walk. Multiple-use trails, bicycle parking and striped bicycle lanes can also help. In 2001, San Francisco, CA, re-striped parts of Polk Street, providing marked bicycle lanes where they had not existed prior. There were also some adjustments made to existing automobile travel lanes, reducing some areas from three travel lanes to two. After the addition of marked bicycle lanes, the city recorded an increase in bicycle users along the corridor.<sup>12</sup>

Changing existing communities is a complex process involving many agencies, organizations, institutions and the public. A community's infrastructure—streets, parks, schools and residential areas—takes years to develop. It may take decades to make large-scale adjustments. Think of each small change as part of a time-release treatment that eventually will provide people with widespread opportunities to be more physically active.

And realize that it's unlikely to happen without you. It will take bringing people together to create a new sense of community, and to build the will, capacity and commitment to make the places where we live, work, go to school and play more livable. Consider the wisdom of the motto that has guided progress in Chattanooga, TN:

**"It takes all of us... and it takes forever."**

As quoted in *Civic Participation and Smart Growth: Transforming Sprawl into a Broader Sense of Citizenship*.  
Fundors' Network for Smart Growth and Livable Communities,  
Translation Paper Number Four, November 2000.



SOURCE: WWW.FEDBIKEIMAGES.ORG/DAN BURDEN

**Regular physical activity in children and adolescents** promotes health and fitness. Compared to those who are inactive, physically active youth have higher levels of cardio respiratory fitness and stronger muscles. They also typically have lower body fatness. Their bones are stronger, and they may have reduced symptoms of anxiety and depression. Youth who are regularly active also have a better chance of a healthy adulthood.<sup>13</sup>



SOURCE: WWW.FEBBIKEMAGES.ORG/DAN BURDEN

## Endnotes

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## INCREASING PHYSICAL ACTIVITY THROUGH COMMUNITY DESIGN

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NATIONAL CENTER FOR BICYCLING & WALKING

# Chapter Two

## HOW TO IMPROVE CONDITIONS FOR WALKING AND BICYCLING

|   |    |
|---|----|
| What's Your Role? .....                           | 12 |
| <i>Let's Complete Our Streets</i> .....           | 13 |
| What Needs Doing? .....                           | 15 |
| <i>Conduct a Community Audit</i> .....            | 15 |
| <i>Slowing Motor Vehicle Traffic</i> .....        | 17 |
| <i>Create Safe and Convenient Crossings</i> ..... | 19 |
| <i>Developing Safe Routes to School</i> .....     | 20 |
| <i>Build More, Better Sidewalks</i> .....         | 22 |
| <i>Make Streets More Bicycle Friendly</i> .....   | 24 |
| <i>Build More Trails</i> .....                    | 26 |



## Simple Ways for Public Health Practitioners to Encourage Active Community Environments

- Stress to your patients and the public the importance of daily physical activity and encourage them to walk and bike.
- Encourage your patients, colleagues, and local organizations to help make their communities friendly to walking and bicycling.
- Incorporate community design issues into patient wellness and lifestyle classes.
- Start a commuting program at your workplace that promotes walking and bicycling.
- Encourage community leaders and government staff to solicit the advice of medical professionals about the design of an active community.
- Make presentations on active living through community design to local schools, senior centers, civic groups (Chamber, Rotary, etc.), and committees (transportation, budget, etc.).
- Write a guest editorial about physical activity, health and community design for your local paper.
- Ask people running for elected office to commit to making healthy community design a priority.

## What's Your Role?

Many local projects and actions can support walking and bicycling. Some of these already may be in place in your neighborhood or community, but you'll no doubt find opportunities to encourage more physical activity through better community design. In the face of so much that needs to be done, you may feel overwhelmed. What can you do?

The good news is that communities are always changing. You are likely to find many plans, projects and other opportunities to make conditions better for walking and bicycling. Perhaps the most difficult decision you will make is where to start and whether you will serve as an expert, advocate, change agent, monitor or a combination of these roles. Recognize from the outset that you can't do it all. To make the changes that will be required, many different people representing diverse disciplines must participate. As a public health practitioner, you will need to partner with local planners, engineers, citizen groups and decision-makers to foster change in your community.

Public health professionals are uniquely positioned to help lead a credible campaign to promote active living through community design.

First, as an *expert*, you can:

- establish that we have serious national health problems, including obesity and diabetes, related to physical inactivity;
- confirm that the most effective countermeasures to these problems include physical activity;
- state that we will not be active unless the design of our communities accommodates and encourages physical activity as a regular, routine part of our daily lives; and
- attest that walking and bicycling are among the most accessible and affordable opportunities for physical activity.

Second, as an *advocate*, you can:

- serve as a good role model for a physically active lifestyle;
- help develop the understanding and support needed to define new goals and objectives for the planning, design, and management of physically active communities; and
- inspire, empower, and encourage other community groups to work together to achieve these goals and objectives.

Third, as a *change agent*, you can:

- help identify and implement actions needed to create environments that promote physical activity;
- suggest using existing resources in new areas and on new priorities to achieve the desired outcomes;



- direct the concern of professional medical organizations toward supporting active community design; and
- collaborate with change agents in the housing and environmental sector.

Fourth, as a **monitor**, you can:

- be vigilant for opportunities to exert influence;
- marshal resources to effect change;
- provide continuity to the process of change;
- assess and report on progress made; and
- seek opportunities to dialogue with other professionals at regional/national meetings.

Perhaps the most important job a public health professional can do is to make public health concerns and their connections to physically active communities prominent. This is your justification for being interested, for being involved, and for insisting that changes must be made. This is what lends legitimacy to your questions, your presentations, your proposals and your agenda. When community leaders, officials and decision-makers understand that communities friendly to walking and bicycling are key to a healthy population and act accordingly, you will have succeeded in your mission.

## Let's Complete Our Streets

There are many projects a community can undertake to make their roadways more accommodating for bicyclists and pedestrians. Since most communities have already established roadway systems, it is necessary to work within the confines of what already exists. That's where the concept of "complete streets" comes into play.

Complete streets are roadways that are designed to accommodate not only automobiles, but also transit users, pedestrians and bicyclists. Complete streets allow people of all ages and abilities to feel safe while using the public way. Complete streets include all aspects of "model" communities as discussed in Chapter One including:

- transportation facilities and services;
- land-use planning and development;
- schools;
- recreation, parks and trails;
- safety, security and crime prevention;
- environmental protection; and
- the needs of all residents (social equity/environmental justice).

As a public health practitioner, your overall concern is the health of members of the community. In addition to America's obesity epidemic, we face poor air quality

**"Public health has got to participate in the planning process. It's vital if we are going to have safer and healthier communities."**

*Richard J. Jackson, MD, MPH, National Center for Environmental Health, CDC*



Bainbridge, WA, complete street

SOURCE: WWW.PEDBIKEIMAGES.ORG/CARL.SUNDSTROM

**“People in other aspects of community planning are very happy to have people from the health arena at the table. They’re thinking that it’s not just them who are out there arguing for a bicycle lane—there are actually people who think that it’s important from a health perspective. It gives them added ammunition to advocate for a healthier community... . Stepping out of our realm, which tends to be disease-focused and individual risk factor-focused, we actually have something to offer the broader community. And people do listen to us. They like having us at the table.”**

*Katrina Hedberg, MD, MPH, Deputy State Epidemiologist, State of Oregon Health Division*

and environmental pollution, which contribute to an increase in rates of asthma and other illnesses, especially among our children and elderly. While complete streets can have a positive effect on pollution in our neighborhoods, there are several other advantages. They include:

- increased safety for all users. Redesigning intersections, installing raised medians and providing sidewalk connections significantly reduces pedestrian risk.
- an increase in walking and bicycling. Providing sidewalks, bike lanes and safe crossings encourages people to walk and bicycle for local neighborhood trips.
- a decrease in traffic congestion. Designing for public transit use including bus lanes, bus shelters and bicycle racks supports multi-modal trip making.
- encouraging transportation options that are environmentally friendly. A trip made on foot or bicycle instead of by automobile cuts carbon dioxide emissions and volatile organic compounds.
- a more cost effective approach for communities. Considering the needs of all transportation users when designing roadway improvements can eliminate costly retrofits after a project is complete.

Complete streets come in many shapes and sizes. Whether your community is rural, suburban, or urban, complete streets can greatly improve accessibility for all users. Some basic elements of complete streets may include:

- sidewalks;
- bike lanes, paved shoulders, or adjacent multi use trails;
- bus lanes;
- crosswalks; and
- medians.

In the remainder of this chapter we will highlight several projects and options useful in creating complete streets and accounting for the needs of vulnerable users.



SOURCE: WWW.PEDBIKEIMAGES.ORG/DAN BURDEN



## What Needs Doing?

As a public health practitioner, the concept of complete streets may sound ideal. But you probably won't be designing intersections, pouring concrete for new sidewalks or striping bicycle lanes. Still, it is useful to know what transportation engineers and public works departments can do to make conditions better for pedestrians and bicyclists.

This chapter describes actions these professionals can take—and those you can ask for—that will help get more people walking and bicycling. To make your task easier, you may want to present your local transportation engineer and public works director with a copy of this guide.

There are hundreds of projects that can encourage people to walk and bike more. Undertaking just a few projects can truly create complete streets in your neighborhood. Here's a list of seven such projects being implemented in communities across the country:

1. **Conduct a Community Audit**
2. **Slowing Motor Vehicle Traffic**
3. **Create Safe and Convenient Crossings**
4. **Developing Safe Routes to School**
5. **Build More, Better Sidewalks**
6. **Make Streets More Bicycle Friendly**
7. **Build More Trails**

If you can tackle some of these items, you will have a good foundation from which to create a community friendly to bicycling and walking. In the process, you will gain insight into the processes of community design, planning and funding.

### Conduct a Community Audit

#### Problem

How walkable and bicycle-friendly is your community? You know that walking and bicycling conditions need improving, but you have difficulty gauging the extent of the problem, much less recommending where specific improvements are needed.

Transportation departments thrive on data, especially when it comes to planning future projects. Unfortunately, they often lack a complete, current inventory of walking and bicycling facilities. Road maintenance departments are more apt to respond to specific requests, but they may not be paying close attention to every sidewalk and bikeway. Public officials may sympathize with goals to increase walking and bicycling, but they need information on what needs to be done and who supports these actions. The residents of a neighborhood may not know what to ask for.

### Standard Sidewalk Dimensions

**Width** (varies by type of street, larger number preferred):

*Local* = 5 to 6 ft

*Commercial area outside downtown* = 8 to 10 ft

*Downtown* = 10 to 12 ft

**Horizontal Clear Space** = 3 to 5 ft

**Vertical Clear Space** = 7 to 8 ft

**Planting Strip** (buffer zone between sidewalk and street) = 4 to 8 ft

**Surface Vertical Change** (abrupt, such as sidewalk cracks) = 1/4 in. maximum

**Surface Gap** = 1/2 in. maximum

**Slope in Direction of Travel** = 5 percent maximum (1:20)

**Cross-Slope Across Direction of Travel** = 2 percent maximum (1:50)

### Standard Bikeway Width

(One-way travel; recommended width depends on motor vehicle speed and volume)

**Bike Lane** = 4 to 6 ft

**Paved Shoulder** = 4 to 6 ft

**Wide Curb Lane** (shared by cars and bikes) ≥ 14 to 16 ft



## Pedestrian Audit

- Are sidewalks continuous along the entire route? If not, where are the gaps?
- Are the sidewalks in good repair, or are there broken sections that would impede travel when using a wheelchair, walker or baby stroller?
- Are there marked crosswalks and pedestrian signals to help people cross busy streets and intersections?
- Can slow-moving pedestrians get across the street in the time allotted by the signal?
- Do drivers yield to pedestrians at driveways and crosswalks?
- Are there utility poles, signs, vending machines, dumpsters, shrubbery, or overhead obstacles blocking the sidewalk?
- Are there trees along the street to provide shade and separation from traffic?
- Do the street, adjacent buildings, and landscaping provide a pleasant visual environment?
- Are there frequent benches or other places to sit and rest?
- Are storefronts attractive and inviting? Are the windows lit at night?
- Are there other people walking along the way?
- Was the walk enjoyable? Why or why not?
- Are there areas where you were concerned for your personal safety? Why? (This might capture concerns about street lighting if the audit is done at night.)
- Would you repeat this walking trip again? Why or why not?

## Solution

The first step in fixing something that is broken is to identify the problem. If few people are bicycling in your community, find out why. If pedestrians have trouble crossing at an intersection, look for causes. Review and assess as many of the streets and highways in your community as possible to identify where there are barriers to walking or bicycling.

Start with the downtown and schools. As time allows, expand to commercial centers, areas around parks, residential subdivisions, and other places where people are likely to walk and bike.

Look at both existing data, if any, and the facilities themselves. Your transportation department may already have some kind of inventory of sidewalks, bike lanes and perhaps even curb ramps. The police or a safety committee may have crash locations listed. But remember: crash data show where people got hit but not necessarily where they can't cross the street.

A good way to discover what people experience while walking or bicycling, and what might prevent them from doing so, is to conduct an informal inventory or "audit" of existing conditions throughout your community—not by car, but on foot, wheelchair or bicycle. The immediate physical environment has a profound effect on the level of comfort pedestrians and bicyclists experience. Many of the problems you will discover are small, subtle and not discernible from a motor vehicle.

For a quick test audit, try a route that has a purpose for you. Walk or bicycle from your home to the nearest school, shopping center, office building, or local park.

Before your audit, visit the Active Living Resource Center for checklists to bring with you on your pedestrian audit. See [www.activelivingresources.org/assets/audits\\_alrc\\_v09.pdf](http://www.activelivingresources.org/assets/audits_alrc_v09.pdf) for more information.

Carry a camera and photograph things that impede your progress or interfere with reaching your destination. Photos will come in handy later for presentations.

During your pedestrian and bicycle audits, ask yourself the questions on the list and make note of your findings.

Organize and summarize your findings to highlight problems for transportation planners, public works officials, budget committees, and the public.

The League of American Bicyclists offers many resources on its website for cyclists of all types and level of experience. See their website at [www.bikeleague.org/resources/better](http://www.bikeleague.org/resources/better) for additional information before conducting a bicycle audit.



## Considerations

Think of a pedestrian or bicycle trip as a chain of many small but essential links. For pedestrians, it may be a segment of sidewalk here, a curb ramp there, and a multitude of driveway and street crossings. Each link needs to be in place and functional to provide pedestrians and bicyclists with an easy, safe travel route.

Small, local improvements are usually much easier to implement than changes to an entire network. Because spot improvements tend to be finite, discrete and limited in scope, it may be easier initially to get support for them than it would be for larger projects.

Collecting, organizing and communicating data takes time but requires few material costs. City staff, especially seasonal interns, may be of help. A citizen bicycle and pedestrian advisory committee, social justice outreach group or neighborhood association also may want to participate, or a local school might want to take on the work as a class project.

For example, the Fitness Council in Jackson, MI, promotes its local Safe Routes to School program in a variety of ways. A walking audit held in the Frost Elementary School neighborhood identified a few hazards impeding the children's walking path to school. Following the audit, the school community has been able to install 12 new crosswalks, post new "No Turn on Red" signs at key intersections, and make changes to the school's parking lot entrance to enhance safety conditions.<sup>1</sup>

## Slowing Motor Vehicle Traffic

### Problem

Speeding motor vehicles are probably the most common concern of walkers and cyclists on both local and major streets. Widening neighborhood streets can encourage speeding. As streets get wider and come to resemble interstate highways in design and width, drivers respond by driving faster. As speeds go up, the risks to pedestrians and cyclists increase dramatically.

"Speeding affects both the probability of a crash and the severity of injuries produced by a crash. Over 100 studies, summarized in Elvik (2005) and Aarts and van Schagen (2006), document three effects of speed on crashes and injuries. First, the probability of a crash is approximately proportional to the square of the travel speed. Second, in a crash, injury risk is approximately proportional to the impact forces on a person, which in turn are proportional to the square of the impact speed. These two effects can be summarized in a general rule of thumb:

*"When travel speed increases by 1%, the injury crash rate increases by about 2%, the serious injury crash rate increases by about 3%, and the fatal crash rate increases by about 4%.*

## Bicycle Audit

- Are you able to find a comfortable route to your destination?
- Is secure bicycle parking available at your destination?
- Is there sufficient operating width along the route? (Refer to standards on page 15.)
- Are alternate, quieter routes to your destination available?
- Is the roadway surface in good repair?
- Do traffic signals detect your presence?
- Are drivers friendly and tolerant toward bicyclists?
- Is there a place to clean up and change clothes at work or school?
- Did you enjoy your bicycling experience? Why or why not?
- Would you repeat this bicycle trip again? Why or why not?



Top: Bicycle Audit; Bottom: Pedestrian Audit

**National Highway Traffic Safety Administration's Fatality Analysis Reporting System (FARS) database reveals that most pedestrians are killed on the wider, higher capacity and higher speed roads called arterials. More than 50 percent of the 9,091 pedestrians killed (for whom roadway classification data was recorded) in 2007 and 2008 died on principal or minor arterials. One-third of pedestrian deaths occurred on smaller collector and local roads, while 16 percent of deadly crashes were on interstates or freeways.**

*Ernst M, et al. Dangerous by Design: Solving the Epidemic of Preventable Pedestrian Deaths (And Making Great Neighborhoods). Washington: Transportation for America, 2009.*



SOURCE: WWW.PEDBIKEIMAGES.ORG/DAN BURDEN



SOURCE: WWW.PEDBIKEIMAGES.ORG/DAN BURDEN

“The same relation holds in reverse: a 1% decrease in travel speed reduces injury crashes by about 2%, serious injury crashes by about 3%, and fatal crashes by about 4%. Consider the effect on a street with a speed limit of 35 mph and average travel speed of 40 mph. A reduction of just 2 mph, to 38 mph, is a 5% decrease, so crashes would be reduced by about 10%, serious injury crashes by about 14%, and fatal crashes by about 19%.”<sup>2</sup>

On major streets (arterials and collectors) an emphasis on mobility has resulted in speeds higher than appropriate for some of the areas the streets pass through (e.g., school zones, residential areas and shopping districts).

### Solution

Encourage transportation agencies to limit motor vehicle speeds on streets in urban and suburban areas to levels compatible with adjacent land uses and with bicycling and walking (i.e., 35 mph or less on major streets and 20 mph or less on neighborhood or residential streets).

Push for reduced design speeds and roadway widths in neighborhood and residential areas. In other words, change the design so motorists are more inclined to obey the posted speed limit.

Traffic-calming measures help control driver behavior and motor vehicle speeds, especially in residential, school, park and shopping areas. Although traffic calming is often a retrofit to manage identified problems, it is also an important aspect of new construction to prevent problems from occurring. Your community may already have a traffic-calming program. If so, ask about its effectiveness and what can be done to improve it.

### Considerations

Traffic speed and volume can be reduced through a variety of measures, including:

- changing the horizontal alignment of the roadway: chicanes (short jogs in the street), roundabouts, traffic circles, etc.; and
- changing the vertical alignment of the roadway (raised intersection, speed hump, speed table, raised crosswalk, etc.).

Travel lanes and roadways can be narrowed in either real or perceived ways (curb extensions, reductions in curb radius, on-street parking, pedestrian refuge islands, landscaping, etc.). These changes can help:

- regulate and enforce movements (signed turning restrictions, truck restrictions, photo radar, etc.); and
- reduce the need to travel (smart growth land-use planning, traditional neighborhood development, travel demand management).

Traffic calming can yield some significant safety benefits. Researchers at Ryerson Polytechnic University, the Insurance Institute for Highway Safety and the University of Maine studied crashes and injuries at 24 intersections before and after construction of roundabouts. The study found a 39 percent overall decrease in crashes and a 76 percent decrease in injury-producing crashes. Collisions causing fatal or incapacitating injuries fell as much as 90 percent at some intersections.



Successful traffic-calming projects:

- employ a combination of measures that will have a much greater effect than just one or two measures;
- look at an entire neighborhood or area rather than one location;
- include public involvement to determine neighborhood goals, identify concerns and generate support; and
- include a complete package of design and landscaping features that improve neighborhood aesthetics and livability.

## Create Safe and Convenient Crossings

### Problem

Most people begin their walks or bicycle rides in a residential area with lower traffic volumes and speeds. But if their walk or ride is of any appreciable duration, they soon will reach a busier street. Major streets may be over 100 feet wide, and automobile speeds may reach or exceed 45 to 50 mph (even where lower limits are posted). Highly visible, marked crosswalks are often absent or they may be too few and far between.

Crossing such a busy street may be too great a challenge for many children, seniors or people with disabilities. For them, the trip may be impossible—they “can’t get there from here.” Intersections with wide, highway-style streets often have high pedestrian crash rates.

Even when pedestrians are walking parallel to a major street, they can be at risk when crossing side streets and driveways. A common crash type at intersections involves pedestrians struck by right-turning vehicles. The wide curb radius often used in street design encourages motorists to take corners at higher speeds.

Intersection signals can work for or against the pedestrian and the bicyclist. First, many signals only detect motor vehicles. If forced to wait a long time for a green light or a walk signal, some cyclists and pedestrians will ignore the signals and start across when a gap in traffic occurs. Second, the signals may be visible only to drivers in the travel lanes, and not to pedestrians or cyclists. Finally, the signal time for crossing may be too short to allow pedestrians and even some bicyclists to get to the other side.

### Solution

Traffic engineers have many techniques to design and operate intersections that provide for easy, safe movement by pedestrians and bicyclists. Ask them to:

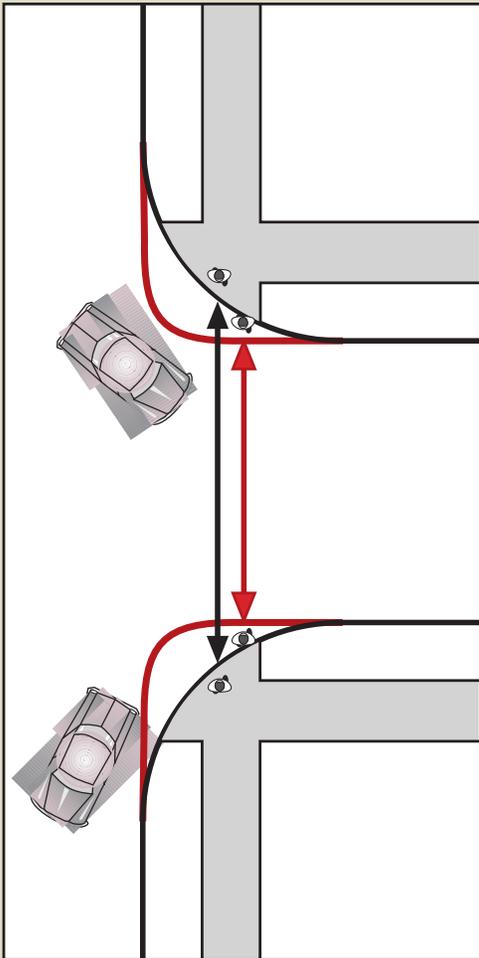
- shorten crossing distances by using small corner radii where truck traffic is not a concern (see diagram on next page), install curb extensions where parking is allowed on local streets, and pedestrian refuges or median islands in the center of multi-lane roadways;
- provide curb (wheelchair) ramps at all locations where pedestrians must change grade between a sidewalk or pathway and the street;

**“Marked crosswalks have some benefits for pedestrians, in that they delineate a space for pedestrians, and could be considered to encourage walkers. However, to the extent that they send a message that walkers should only cross at crosswalks, they are discouraging. Unfortunately our crosswalks do not effectively slow cars, or convey a strong enough message that walkers are important. If crosswalks were routinely installed as raised crosswalks or speed tables, they would present a much stronger message to motorists that pedestrians are the dominant mode.”**

*Peggy da Silva, M.P.H., et al. Beyond Safety: Pedestrian Advocacy for Public Health. Paper presented at Walk21-IV, 2005.*



**A smaller corner radius shortens crossing distance and slows down turning cars.**



- restrict curb parking at specific crossing points to provide greater visibility for pedestrians and drivers;
- employ traffic-calming measures to slow motor vehicles (see section on Slowing Motor Vehicle Traffic);
- increase the length of time for pedestrians to cross at signals;
- use highly visible, marked crosswalks at all intersections where sidewalks or paved shoulders are provided;
- in areas where there are mixed land uses or transit service that generate pedestrian activity, provide improved crossing opportunities on multi-lane roadways every 400 feet. In other areas, provide improved crossing opportunities at least every 1000 feet;
- require drivers to STOP, not just YIELD, for pedestrians in a crosswalk;
- use supplemental identification devices (signs, beacons) to draw drivers' attention to the presence of a marked crosswalk; and
- use a traffic detector that is sensitive to bicycles at signals.

### Considerations

At intersections where you expect more pedestrians, consider reconstructing the curb to require a tighter turn (top car in diagram at left). This has multiple advantages: It slows motorists who are turning, improves the sight distance between the approaching motorist and the pedestrian, reduces the distance a pedestrian must travel across the street, increases the waiting area available to pedestrians, and simplifies curb ramp design.

Shorter signal cycle lengths and longer pedestrian crossing intervals will encourage pedestrians and cyclists to view crossings of busy arterials not as barriers, but as part of a system that allows them great mobility.

In 2009, the City of Galesburg, IL, was awarded almost \$200,000 under the state's Safe Routes to School program. This city will use the funding to not only install new sidewalks that are needed, but to upgrade existing crosswalks by installing blinking LED lighting at six local school intersections. The grant will also fund the installation of three new LED radar feedback signs (to tell motorists how fast they are going), within the local school zones.<sup>3</sup>

## Developing Safe Routes to School

### Problem

Fewer and fewer children walk or bicycle to school. Even children who live within a mile of school—easy walking distance—are often transported by bus, SUV, or car. In some cases, children are discouraged from walking or bicycling because parents fear they will be endangered by traffic or crime.

Ironically, these actions can increase the danger to children living in the vicinity of a school because of the increase in motor vehicle traffic. Harried parents may, at times, forget the health and safety of the neighborhood children in their rush to get everyone to work and school on time.



## Solution

In 2005, the federal government formally identified the Safe Routes to School Program and provided a funding mechanism under the existing SAFETEA-LU transportation legislation. While many communities had already been developing and investing in their own programs, the federal program provided funding well beyond that previously available.

The National Center for Safe Routes to School is funded by the U.S. Department of Transportation and provides Safe Routes to School program knowledge and technical information on the school travel program. In addition, the Safe Routes to School National Partnership has established a network of hundreds of organizations, government agencies and professional groups working to set goals, share best practices, secure funding, and provide agencies with educational materials to implement Safe Routes to School programs.

According to the National Center for Safe Routes to School, as of December 2009, all 50 states had active local or statewide SRTS programs and approximately 6,489 schools were participating in state or federally funded SRTS programs.<sup>4</sup>

Commonly in a Safe Routes to School program, walking routes with high safety rankings are identified using a list of criteria, including:

- availability of sidewalks;
- traffic speeds and volumes;
- the number of street crossings required;
- the area through which the route passes (residential, commercial, industrial);
- availability of pedestrian walk signals at intersections; and
- availability of crossing guards at busy intersections in the school zone.

When planning or assessing the neighborhoods or routes that lead to a school, it is good practice to work with the local police, public works department, district engineers and planners. Some communities have established safe routes to school as a priority and fix problems that have been identified by:

- connecting school sites to the neighborhoods they serve with sidewalks, safe street crossings, bicycle-friendly streets, and trails;
- making all school entrances directly accessible by pedestrians;
- providing good bicycle parking at all schools in a safe, secure and convenient location;
- planning school bus routes, and pick-up and drop-off points, to minimize conflicts with pedestrians and bicyclists;
- reducing parking facilities at schools for personnel and students and locating parking to minimize conflicts with pedestrians and bicyclists;



## The basic elements of Safe Routes to School can be summarized as the 5 E's:

- Education
- Encouragement
- Enforcement
- Engineering
- Evaluation

**The preferred sidewalk width** in a downtown or other activity area is 12 feet, at least 6 feet of which should be clear of obstructions. This width allows two pedestrians to walk side by side, or to pass each other comfortably. It generally provides enough width for window shopping, some street furniture (benches, lamps, etc.) and places for people to stop. More width is desirable to accommodate bus shelters, sidewalk cafés and other outdoor retail. In a pinch, 8 feet is acceptable. Outside of the downtown, sidewalks should be at least 5 feet wide.

- using traffic-calming techniques and other forms of street design to limit motor vehicle speeds and volumes near school sites;
- street closures around the school during arrival and dismissal of students; and
- implementing aggressive traffic enforcement to control motor vehicle speeds on school routes.

### Considerations

One way to address parents' fears of traffic and crime is the walking school bus. An adult—often a parent of a neighborhood child—begins walking the established route to school at a specified time each day, collecting children along the way. The adult's primary responsibility is to watch for cars at intersections and other crossings. Another adult meets the group at a location near the school each afternoon and repeats the process in reverse.

In 2005, Van Derveer Elementary School in Somerville, NJ, lost funding for its courtesy bus program. In response, the principal of the school reached out to community partners to initiate a walking school bus program. The concept was embraced with open arms, and, on selected "Walking Wednesdays," the school has more than 300 students and parent participate.<sup>5</sup>

## Build More, Better Sidewalks

### Problem

Your audit may have revealed missing or inadequate sections of sidewalk. Additionally, some or all of the following problems may have been noted: narrow or obstructed travelways, broken pavement, low overhanging signs or branches, lack of accessible ramps, puddles, debris, and lack of a buffer between the sidewalk and traffic.

### Solution

A continuous network of good sidewalks is vital for encouraging more people to walk. The Americans with Disabilities Act (ADA) requires an accessible pedestrian route along all public rights-of-way. Transportation projects that use federal funds must consider bicycle and pedestrian needs. The U.S. Department of Transportation (DOT) established the following policy statement on bicycle and pedestrian accommodation:

"The DOT policy is to incorporate safe and convenient walking and bicycling facilities into transportation projects. Every transportation agency, including DOT, has the responsibility to improve conditions and opportunities for walking and bicycling and to integrate walking and bicycling into their transportation systems. Because of the numerous individual and community benefits that walking and bicycling provide—including health, safety, environmental, transportation, and quality of life—transportation agencies are encouraged to go beyond minimum standards to provide safe and convenient facilities for these modes."<sup>6</sup>



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Encourage local officials to add sidewalks where they are missing on both sides of major streets, in downtowns, and on at least one side (preferably both sides) of local streets. Push for paved shoulders on rural roads. Where sidewalks are in poor condition or littered with debris, find out who is responsible for maintenance and ask them to fix the problems.

Look for opportunities to connect building entrances with sidewalks. When retrofitting places that do not have a continuous sidewalk system, streets near schools, parks, public buildings and transit stops should have the highest priority.

The preferred dimensions for pedestrian facilities are listed under *Community Audit*. Use ADA requirements as the minimum design specifications on all streets and highways.

### Considerations

**Width:** The Institute of Traffic Engineers (ITE) recommends a minimum width of 5 feet for a sidewalk or walkway. This allows two people to walk comfortably side by side, or to pass one another. Where higher pedestrian concentrations are expected (downtown areas, schools, transit stops) the sidewalks should be wider.

**Maintenance:** Encourage state and local transportation agencies to adopt sidewalk maintenance practices modeled on maintenance of the adjacent street or highway. Work to get sidewalk snow removal priorities equal to or greater than those for streets, and get the work assigned to the same public agency or organization responsible for snow removal on the adjacent roadway.

**Buffer:** A buffer zone between the street and sidewalk further separates pedestrians from the street and provides a more comfortable walking environment. A buffer zone might be a grass strip between 4 and 8 feet in width, preferably with trees. It also could be a paved extension of the sidewalk or parking bays. Wider sidewalks should be installed around schools, transit stops, downtown areas or anywhere high concentrations of pedestrians are found.

**Land Use:** A good pedestrian environment is much more than a clear sidewalk and separation from traffic, although those things are important. Without attractive buildings and a mix of connected uses, even the best street and sidewalk design will not attract pedestrians.

A continuous row of buildings with windows and entrances facing the street creates an interesting and secure walking environment. Blank walls and empty lots are boring and unfriendly. People will often walk longer distances if their route takes them by attractive buildings. Beyond the buildings, land use determines walkability. The most active walking areas allow and encourage a rich mix of land uses: shops, restaurants, offices, residences, public buildings (post office, library, city hall), entertainment centers, public spaces (parks and plazas), and even some light industry.



SOURCE: WWW.PEDBIKEMAGES.ORG/DAN BURDEN

### Some land uses pedestrians like:

- Storefronts
- Porches
- Walls with windows
- Landscaped yards

### Some land uses pedestrians don't like:

- Garage doors
- Blank walls
- Open parking lots
- Unbuffered parking structures
- Too many driveways
- Open service areas



SOURCE: WWW.PEDESTRIANIMAGES.ORG/DAN\_BURDEN

## Shoulders Have Many Benefits

*(they also double as bike lanes)*

- Greater separation from traffic for bicycles.
- A place for pedestrians and wheelchairs in places with no sidewalks.
- Space for normal and evasive vehicle maneuvers.
- Recovery area to regain control of a vehicle.
- Space for disabled vehicles and emergency equipment.
- Better sight distance for drivers.
- Reduced passing conflicts between motor vehicles and bicyclists and pedestrians.
- Pedestrians more visible to motorists.
- Storm water discharge farther from travel lanes, reducing hydroplaning, splash and spray.
- Less dust and debris kicked up by vehicles.
- Structural support to the pavement.

After realizing that dangerous conditions existed around Forest Park Elementary School in Little Rock, AR, the PTA established a Traffic Safety Committee in 2006. Partnering with the Little Rock School District and the City of Little Rock, the school worked to develop its “Stride with Pride on Neighborhood Streets” project to help improve mobility conditions in the local neighborhood. The PTA was awarded over \$300,000 in 2007 to address many of the unsafe conditions they identified. Over the summer of 2008, new sidewalks, curbs and gutters, painted crosswalks and safety signage for both drivers and pedestrians were completed prior to the first day of the new school year.<sup>7</sup>

## Make Streets More Bicycle Friendly

### Problem

Surveys indicate more people would bicycle more often if they had safer places to ride. But many of today’s streets are so crowded with fast motor vehicle traffic that there is little room for the slower cyclist. A lack of adequate operating space along a roadway can make bicyclists and motorists feel uncomfortable or even unsafe when they encounter each other.

### Solution

Encourage transportation agencies to provide adequate operating space for bicyclists and other appropriate on-road facilities, including:

- bike lanes and wide curb lanes in urban and suburban locations;
- paved shoulders along rural highways;
- bicycle access to/from transit stops;
- secure bicycle parking; and
- proper maintenance, with regular sweeping and repairs.

### Considerations

On fast or busy streets, striped bike lanes or paved shoulders are desired. On major streets with slow traffic, such as downtown main streets, both bicycles and motor vehicles may be accommodated in a wide outside lane (14 to 16 feet). On low speed, residential streets, cyclists can comfortably share a travel lane (12 feet) with motorists.

**Bike Lanes:** Bike lanes are a popular way of providing bicycle riders with a designated place to ride. As an added benefit, the installation of bike lanes can make streets more pedestrian-friendly by providing more of a buffer from passing motor vehicles.

Each potential route should be examined for available space to add bicycle lanes. Striping lanes will require 4 to 5 feet of lane width in each direction, or between 8 and 10 feet total. This can be accomplished in several ways:

- narrowing the motor vehicle travel lanes;
- eliminating through lanes or turn lanes;
- eliminating a parking lane; or
- widening the pavement.



Installing bike lanes along busy streets is a good way to increase bicycling among casual cyclists. They should be a standard feature for new roads and a required component when appropriate roadways are resurfaced or otherwise upgraded.

**Paved Shoulders:** Paved shoulders on rural roads have many safety benefits for all users and reduce roadway maintenance costs. If intended for bicycle use, they should be at least 4 feet wide, and 6 feet is ideal.

Rural highways and county roads provide good opportunities for long-distance touring and shorter recreational rides. Closer to cities, these roads serve as commuter routes into the urban area from outlying residential areas.

**Bicycle Parking:** Secure bicycle parking can help encourage more cycling. Many bicycle journeys end somewhere other than at the bicyclist's home, which may mean leaning bicycles against store windows or trees or locking them to sign posts or parking meters.

Bicycle parking can be provided using three basic approaches. For short-term parking, bicycle racks to which a bike can be locked with a cable or U-lock are usually the choice. At sites that require long-term parking, such as at a transit station, lockers (stand-alone enclosures designed to hold one bicycle per unit) are often the preferred choice of cyclists. For long-term parking for a number of regular users, secure enclosures called bicycle lock-ups (site-built secure enclosures that hold one or more bicycles) may be the answer. Several major cities have built bike stations in central locations or near transit hubs that provide secure parking and basic mechanical services.

The City of Oakland, CA, adopted a Bicycle Master Plan in December 2007. The vision of the plan established that "Oakland will be a city where bicycling is fully integrated into daily life, providing transportation and recreation that are both safe and convenient." While the plan was developed to install a network of 500 miles of bikeways over the next 15 years, as of 2009 almost 290 miles have been completed, and over 19 miles of the planned Bay Trail (totaling 33 miles) have been completed.<sup>8</sup>

Similarly, New York City has a Bicycle Network Development (BND) Program which encompasses several City departments as a joint project. Since 1994, the BND Program has secured funding to develop and maintain a citywide bicycling map, create and implement a bicycle master plan, and has utilized CMAQ (Congestion Mitigation and Air Quality Improvement) funding to build an extensive network of bicycle friendly streets and pathways.<sup>9</sup>

## What are bike lanes?

- Intended for preferential or exclusive use of bicyclists.
- Designated by signing, striping and pavement markings.
- One-way in the direction of traffic flow.
- On the roadway.
- Provide for more predictable movements of motorists and bicyclists.



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## Build More Trails

### Problem

Many communities lack paths that are separate from the roads and free from motorized traffic. This type of facility is very popular with users of all ages and abilities. The Burke-Gilman Trail in Seattle, the Eliza Furnace Trail in Pittsburgh, PA, the Riverfront Trail in Missoula, MT, and the Tennessee Riverpark in Chattanooga, TN, are four examples of the hundreds of off-road, urban paths that are often jammed with users.

### Solution

Develop trail facilities along natural corridors (such as river and stream valleys), utility easements, canals and parkways, abandoned rail lines and wherever else

they fit in. Provide shorter connections between trails and neighborhoods, parks, recreation facilities, libraries and commercial and work sites.

Expanding a trail system can bring exercise and self-powered transportation opportunities to a greater number of potential users. It can also help spread use over a larger system, which may help reduce the growing congestion on existing shared-use trails.

### Considerations

Off-road paths or trails can be an important part of a network of bicycle and pedestrian facilities. They complement rather than substitute for a good system of on-street facilities. Some users will walk or cycle on the trails for exercise; others will use them for errands, or to travel to school or work. These more utilitarian uses succeed only if the trails are part of a network and take people to desired destinations.

While abandoned rail corridors seem to capture most of the attention these days, do not overlook

other potential corridors, such as utility easements and waterway corridors. In addition to uses for recreation and utilitarian travel, these trails can create linear parks and preserve transportation corridors. An example is the Capital Crescent Trail, which runs through suburban Maryland and the District of Columbia. This trail has preserved a corridor for potential future light-rail use that could never be pieced together again if it had been lost to development.



SOURCE: WWW.PEDBIKIMAGES.ORG/LAURA SANDT



The American Association of State Highway and Transportation Officials (AASHTO) recommends that shared-use paths be at least 10 feet wide to accommodate multiple users traveling in both directions. Trails with heavier use, or those attracting large numbers of in-line skaters, may need to be wider. In addition to the width of the surfaced portion of the path, at least two feet of clear space to either side of the trail is recommended so that users can avoid obstacles such as signs, shrubs and walls.

Successful paths have:

- continuous separation from traffic, such as along a river or greenbelt;
- few street or driveway crossings that would cause conflicts. Paths adjacent to roadways are generally not recommended;
- convenient and safe access to the local road network;
- connection to land uses, such as shopping malls, downtown, schools and other community destinations;
- well-designed street crossings, with measures such as bike- and pedestrian-activated signals, median refuges, and warning signs for both motor vehicles and path users;
- shorter trip lengths than the road network, with connections between dead-end streets or cul-de-sacs, or as shortcuts through open spaces;
- scenic qualities, offering an aesthetic experience that attracts cyclists and pedestrians;
- visibility from nearby buildings and streets for safety;
- good design, including adequate width and sight distance, good drainage and moderate slopes;
- proper maintenance, with regular sweeping and repairs; and
- clear destination and directional signing.

**There are many benefits of trails and greenways that planners, funders, and the public need to know about: they make our communities more livable; improve the economy through tourism and civic improvement; preserve and restore open space; and provide opportunities for physical activity to improve fitness and mental health.**

*Source: AmericanTrails.org ([www.americantrails.org/resources/benefits/index.html](http://www.americantrails.org/resources/benefits/index.html))*



*The Baldwin County Trail in Alabama was established through the efforts of the Baldwin County Trailblazers. It connects State Routes 42/98 and Interstate 10.*

SOURCE: NATIONAL CENTER FOR BICYCLING & WALKING/MARK PLOTZ

**“In its broadest sense, environmental health comprises those aspects of human health, disease, and injury that are determined or influenced by factors in the environment. This includes not only the study of the direct pathological effects of various chemical, physical, and biological agents, but also the effects on health of the broad physical and social environment, which includes housing, urban development, land use and transportation, industry, and agriculture.”**

*Healthy People 2010*

## Endnotes

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- 9 *Bicycle Network Development Program*. New York: New York City Department of City Planning, 2010, [www.nyc.gov/html/dcp/html/bike/home.shtml](http://www.nyc.gov/html/dcp/html/bike/home.shtml) (accessed May 2010).



*Transit ADA accessible*

SOURCE: WWW.PEDBIKEIMAGES.ORG/DAN BURDEN



## INCREASING PHYSICAL ACTIVITY THROUGH COMMUNITY DESIGN

*A Guide for Public Health Practitioners  
and Livable Community Advocates*

NATIONAL CENTER FOR BICYCLING & WALKING

# Chapter Three

## HOW TO GET IT FUNDED

|  |    |
|--|----|
| Develop a Strategy .....                               | 30 |
| <i>Maintenance</i> .....                               | 31 |
| <i>Capital Improvements</i> .....                      | 31 |
| <i>Private Development</i> .....                       | 32 |
| <i>Identify Funding Sources</i> .....                  | 33 |
| <i>State and Local Funding for Road Projects</i> ..... | 33 |
| <i>Federal Funding Programs</i> .....                  | 33 |
| <i>Local Revenue Sources</i> .....                     | 40 |
| Follow Through with the Project.....                   | 42 |
| Summary .....  | 43 |



**“Can anybody remember when the times were not hard and money not scarce?”**

*Ralph Waldo Emerson (1803-82)*

Eventually, someone will ask the question, “How are we going to pay for it?” Funds are ultimately limited, and competition for them can be fierce. Pedestrian and bicycle projects traditionally have been low on the priority list of both elected officials and public agencies, although this has changed somewhat in the last decade thanks to growing public demand and new federal funding programs.

It is useful to keep in mind just how much money is being spent on transportation projects. Each year tens of billions of dollars are spent in the U.S. for road construction, maintenance and operations. However, only a tiny fraction of that is spent on pedestrian and bicycle facilities.

Although some of these program funds are restricted to specific purposes, the majority are flexible and can be used for pedestrian and bicycle improvements. There’s a real opportunity to direct a greater share of these program funds to long-overlooked improvements in walking and bicycling network.

This chapter will give you a basic understanding of funding processes. With this knowledge you can better advocate for the use of a greater portion of these funds for bicycling and walking facilities. Although it is not always easy, many more projects are getting built thanks to good planning, commitment, advocates who understand the funding process, and community support. Indeed, a lack of funds is rarely the real hurdle to be overcome; instead, it is a lack of commitment to making it happen.

## Develop a Strategy

The ways in which bicycle and pedestrian facilities are funded can vary tremendously from community to community, and the funding process may appear mysterious to most citizens and government officials. Typically, numerous agencies—at federal, state, regional and local levels—control portions of available funds for specific purposes, and they all have different processes for determining what gets funded.

Transportation funding, particularly funding involving federal and state sources, may be allocated years in advance. Some state and most local sources are distributed annually, whereas private sources can have more flexibility. A successful funding strategy requires familiarity with the local process. You also need to plan ahead and remain alert to opportunities.

It may help to understand that most public road projects are conducted either through maintenance or capital improvement programs, or by private developers as a condition of approval for their developments. These areas are funded separately and your approach to getting projects done should take that into account. You should also be aware of the annual schedule for getting projects considered for funding.



## Maintenance

Crosswalk installation, bike lane striping, sidewalk repair and minor construction such as curb ramps can often be done as maintenance projects. Few maintenance departments have an adequate budget for everything they need to do, so you will have to develop a strong base of support for your project request to get it implemented this way. In cases where property owners are responsible for adjacent sidewalks, you might need to be persistent to get their attention (some municipalities rigorously enforce maintenance codes when violations are brought to their attention).

Here's where planning ahead comes in. If you have a scheme for a logical series of improvements that can be spread over time, it will be easier to get the maintenance department to budget for the improvements than if you come to them with random projects. Make a list grouped by street or travel corridor and roughly ranked by priority. Show how each project will eliminate a hazard or solve a problem.

It is also a big plus if you can piggyback small bicycle and pedestrian improvements on larger projects, such as street repaving or expansion. The additional cost may be incidental and more easily included in a major project. You might want to look at your area's capital improvement program to see if any projects are planned for streets on which bicycle or pedestrian improvements are needed.

## Capital Improvements

Capital improvement projects, such as rebuilding a road or constructing a long segment of new sidewalk, are more expensive and more formal than maintenance projects. Before funding is even considered, the project may need to be evaluated, studied, conceptually designed and scoped (where project components and costs are identified). Depending on the agency, there may be some public involvement, possibly including citizen committees. Advocates should be involved in this early planning to ensure that pedestrian and bicycle needs are given adequate attention.

Things can get quickly off track, so keep your head up, your eyes and ears open and talk to everyone. Establish and maintain close contact with state and local transportation representatives so that any projects that might affect your neighborhood or community are known and discussed well ahead of formal scoping.

There are several planning steps any community can take to define and express its needs and desires in a way that improves its chances for success:

- create a written and visual plan of what needs to be done;
- get your vision and projects included in formal transportation plans and programs that are updated periodically (see sidebar page 33); and
- help get supporting development codes and standards adopted.

**“Keep your head up, your eyes and ears open, and talk to everyone.”**

*Oregon Main Street Handbook, 1999*

### Three project origins:

- Maintenance
- Capital improvements
- Private Development



SOURCE: WWW.PEDBIKEMAGES.ORG/DAN BURDEN

## Getting Projects in Local Plans

Many municipalities follow national guidelines for capital improvement plans (CIPs). Three of the recommendations for developing a CIP are of interest to pedestrian and bicycle advocates:

- The process for developing the plan should allow ample opportunity for stakeholder involvement in prioritizing projects and review.
- The CIP should take into account overall affordability in terms of both capital and operating costs, community concerns, available alternatives, coordination with other projects (including projects being considered by other governmental entities), impacts on services, beneficiaries of the project and important community goals such as those related to economic development or the environment.
- An evaluation of capital financing alternatives should address equity considerations—who will pay for the project in relation to who benefits from it.

Project selection and commitment of funds usually occur at a formal hearing, although much of the groundwork is done long before. If your project is not selected the first time around, don't despair. Most project lists, although they may be modified annually, span several years and include long-term projects that tie up much of the funding. You may need to organize more support to rise to the top.

The communities that are best positioned to take advantage of funding and other opportunities are those that have done their homework. This means creating a dynamic and very public vision of what the community wants to be—and committing to that vision.

It also means continuously promoting the vision to decision makers at all levels. Major projects may be years in the making, so a community needs to make the effort to keep locally important projects alive. The projects that have long-term champions are the ones that get implemented. So it is important that groundwork is laid to ensure your project has strong community and agency support from inception through completion.

## Private Development

Bicycle and pedestrian facilities are also built and paid for by private developers as part of their projects. This might involve improving streets on property frontage or building entirely new public streets and intersections. In many rapidly growing areas, private sources fund the majority of new projects.

Your local government can require facilities as part of project approval and review the site design for compliance with adopted standards. But exceptions are often made during the review process and, depending on the agency, there may be little public involvement. You may not even hear of the project details until they are approved, at which time it may be too late to make meaningful changes.

For these types of projects, your strategy is to be connected with the people making decisions and to get good road design standards and development codes adopted. If you can, keep in touch with developers, bankers, planners, commission members, legislators and others who can help. Get someone who's familiar with planning to review your local or state standards and codes. Find out where and what changes need to be made.

Get help to develop a list of specific changes and improvements you want included. Most agencies update their standards and codes as needed (for example, to respond to disability requirements or policy changes). Although the code development process is not always set up for much public input, your contacts with decision-makers will help get attention to your issues when the time comes.





The underlying land-use policies and plans may need changing to support more pedestrian- and bicycle-friendly development. Land-use practices vary significantly around the country. Some states have comprehensive land-use laws that are directly tied to multi-modal transportation, whereas other states barely regulate land use at all. In either case, local governments generally have significant power to manage development. You can learn more about land-use planning from resources listed in Chapter 4.

## Identify Funding Sources

Funds for pedestrian and bicycle projects generally come from some combination of the following sources:

- state or local transportation funds, usually as part of a larger road project;
- funds appropriated through federal transportation legislation such as SAFETEA-LU funds (see sidebar for definition), which are administered by state or local agencies;
- local revenue sources; and
- private donations.

Keep in mind that the names of individual funding programs may vary from location to location. The following discussion will introduce you to the general types of funding sources that are being used for pedestrian and bicycle projects.

## State and Local Funding for Road Projects

Depending on where you live, most street projects may be managed by the state transportation department or by a local transportation agency. Check with your local agency to find out who is responsible for the various streets and highways in your area. If it's the state, the state's bicycle and pedestrian coordinator can help.

New road construction and modernization projects (added lanes, revamped intersections, etc.) should always include pedestrian and bicycle components, such as sidewalks, crossings and paved shoulders. These provisions are typically a minor portion of the total cost of a larger project. If a proposed project doesn't provide for pedestrian and bicycle needs, it may have been improperly scoped and may not meet federal and state guidelines. Request that the project be redesigned and that scoping procedures be improved in the future.

## Federal Funding Programs

### Transportation Funding Programs 1991-2010

Over the past 20 years, ISTEA, TEA-21 and SAFETEA-LU (see sidebar for definitions) have become the flagship funding programs for pedestrian and bicycle facilities. SAFETEA-LU provided more than \$244 billion dollars over its six-year timeframe. While the SAFETEA-LU legislation expired in September 2009, it has been temporarily extended until a new federal transportation funding bill is signed into law. While a new bill was introduced in mid-2009, known as the Surface Transportation Authorization Act, it has yet to be signed into law.<sup>1</sup>

## How the Federal Transportation Money Flows

### Long-Range Transportation Plans

Since the passage of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), states and Metropolitan Planning Organizations, or MPOs (transportation planning agencies in metropolitan areas with populations of 50,000 or more), are required to develop and maintain long-range transportation plans. Further, ISTEA and its successors, the Transportation Equity Act for the 21st Century (TEA-21) and the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), require that bicyclists and pedestrians be given due consideration in state and MPO long-range transportation plans.

### Transportation Improvement Programs

Federal transportation legislation also requires states and MPOs to develop Transportation Improvement Programs (TIPs). TIPs are short-range plans that identify transportation projects to be funded and implemented in the next 3-5 years. Projects listed in the TIPs must be consistent with their respective state and local long-range transportation plans.

## State Bicycle & Pedestrian Coordinators

Go to: [www.walkinginfo.org/assistance/contacts.cfm](http://www.walkinginfo.org/assistance/contacts.cfm)





SOURCE: WWW.PEDBIKEIMAGES.ORG/DAN BURDEN

The federal transportation legislation is where all states and U.S. territories get their federal transportation funds, which are generated by gasoline taxes and are then redistributed to the states. A large portion of “state” funds used for transportation projects and programs is really just a redistribution of federal funds, which emanate from SAFETEA-LU.

Beginning with ISTEA in 1991, TEA-21 in 1998 and SAFETEA-LU in 2005, federal transportation policy has dramatically changed the way the United States conducts its highway construction and funding activities, especially in the way it required states to consider pedestrians and bicycling in the transportation mix and allowed states greater flexibility in funding programs and projects related to walking and bicycling.

These funding programs provided substantial federal support for bicycling and walking by retaining important provisions in planning; adding new policies, programs and standards to accommodate walking and bicycling; and creating new funding opportunities to benefit these modes. Since ISTEA, each federal transportation bill has made incremental improvements in funding and policies for supporting walking, bicycling and livable communities. Future transportation bills will not only increase funding for walking and bicycling, but are likely to support construction of complete streets, and recommend that the health impacts of new transportation projects be studied and understood before anything is built.

Two of the most popular sources of funds for pedestrian and bicycle facilities that currently exist in the federal legislation are the Transportation Enhancement Program and the Congestion Mitigation and Air Quality Programs, described below.

Under SAFETEA-LU, the Safe Routes to School Program was developed as a specific stand-alone program. Funding in this program is related to both the physical infrastructure and accompanying projects that aid in the delivery of a safe and secure environment for walking and biking in the vicinity of schools. A more detailed description can be found later in this chapter.

The Hazard Elimination program is another funding category under the federal legislation that supports projects eligible for federal safety funds to improve the safety of pedestrians and bicyclists. Many of the SAFETEA-LU program funds can be used for bicycle and pedestrian facilities, and typically are when state and local authorities are taking a comprehensive approach to safety.

### **American Recovery and Reinvestment Act**

In addition to the current SAFETEA-LU funding, the American Recovery and Reinvestment Act (ARRA) provides transportation and infrastructure funding. ARRA, the billion dollar stimulus program signed by President Obama in early 2009, provided funding for states and local areas to revive the ailing economy



and direct money to the state and local authorities for programs and policies, including transportation projects.

The overall funding for transportation related projects under ARRA totaled about \$48 billion, which was distributed to state and local governments through both a formula and grant process. Within the ARRA, the Transportation Investment Generating Economic Recovery (TIGER) Discretionary Grant Program provided \$1.5 billion towards innovative, multi-modal projects that had the potential to provide economic and environmental benefits. The recipients of these grants were announced in February 2010.<sup>2</sup> Many of the projects selected for funding included “complete streets” components with bicycle and pedestrian facilities.

### Sustainable Communities Funding Program

The Partnership for Sustainable Communities, a collaborative program including the U.S. Department of Transportation, U.S. Environmental Protection Agency and U.S. Department of Housing and Urban Development, began its efforts in 2009 to help American families gain better access to affordable housing, more transportation options, and lower transportation costs. The six livability principles guiding the Partnership<sup>3</sup> include:

- **Provide more transportation choices.** Develop safe, reliable and economical transportation choices to decrease household transportation costs, reduce our nation’s dependence on foreign oil, improve air quality, reduce greenhouse gas emissions and promote public health.
- **Promote equitable, affordable housing.** Expand location- and energy-efficient housing choices for people of all ages, incomes, races and ethnicities to increase mobility and lower the combined cost of housing and transportation.
- **Enhance economic competitiveness.** Improve economic competitiveness through reliable and timely access to employment centers, educational opportunities, services and other basic needs by workers, as well as expanded business access to markets.
- **Support existing communities.** Target federal funding toward existing communities—through strategies like transit-oriented, mixed-use development, and land recycling—to increase community revitalization and the efficiency of public works investments, and to safeguard rural landscapes.
- **Coordinate and leverage federal policies and investment.** Align federal policies and funding to remove barriers to collaboration, leverage funding, and increase the accountability and effectiveness of all levels of government to plan for future growth, including making smart energy choices such as locally generated renewable energy
- **Value communities and neighborhoods.** Enhance the unique characteristics of all communities by investing in healthy, safe, and walkable neighborhoods—rural, urban or suburban.



WWW.PEDESTRIANIMAGES.ORG/DAN BURDEN

## Transportation Enhancements

See the National Transportation Enhancements Clearinghouse at [www.enhancements.org](http://www.enhancements.org) for detailed information.



The screenshot shows the homepage of the National Transportation Enhancements Clearinghouse (NTEC). The header features the NTEC logo and a navigation menu with links for Home, TE Basics, Procurement, State Programs, Project List, Grant Support, Project Examples, News, Links, and FAQ. Below the header, there is a 'Welcome to NTEC' section with introductory text and a list of links: 'Learn the Basics of TE', 'Access state-specific information', 'Learn about TE in the American Recovery and Reinvestment Act', and 'Download documents online'. A 'Federal legislation related to TE is available through the Federal Highway Administration (FHWA) TE Web site.' section is also present. A 'Quick document links' section includes 'Guiding Principles and Overview (PDF)', 'Guide to Transportation Enhancements', and 'Just Released! The FY 2010 TE Spending Report, including ARRA expensat! Read the full report, or check out this EXECUTIVE SUMMARY.' section with a 'TE Come 2!' graphic. A 'Visit the TE Image Library' section features a 'TE Come 2!' graphic and a 'Have The Spring 2010 Issue of NTEC's e-news? Click here to subscribe!' link. A 'Questions about TE? We Can Help! 888.368.NTEC (888.368.6332)' box is located at the bottom right.

## Transportation Enhancements Program

The Transportation Enhancements (TE) Program is the most common source of funds for pedestrian and bicycle facilities. Each state is required to set aside 10 percent of its annual Surface Transportation Program funds for Transportation Enhancement Activities (TEAs). Eligible funding categories include:

- pedestrian and bicycle facilities;
- pedestrian and bicycle safety and educational activities; and
- conversion of abandoned railway corridors to trails.

Other eligible TEA funding categories that can indirectly enhance the pedestrian and bicycling experience include:

- scenic or historic highway programs, including tourist and welcome centers, which may include designation signs and markers;
- landscaping and scenic beautification, including improvements such as street furniture, lighting, public art and landscaping;
- historic preservation;
- rehabilitation and operation of historic transportation buildings, structures or facilities; and
- control and removal of outdoor advertising.

Some typical improvements funded through the TE Program include:

- streetscape improvements;
- sidewalks and crosswalks;
- curb extensions at corners;
- pedestrian light fixtures;
- benches and landscaping;
- information kiosks;
- pedestrian and bicycle access across barriers;
- pedestrian and bicycle trails and pathways;
- bicycle racks on buses;
- bicycle route signing;
- bicycle parking facilities; and
- rail-to-trail conversions.

## State Transportation Enhancement Programs

The specifics of TE programs vary from state to state. Each state devises its own application and selection process, establishes selection criteria and adopts methods to streamline the development and management of projects.

No two state TE programs are exactly alike. However, all state programs have these basic features: 1) eligibility criteria, 2) selection criteria, 3) selection cycle, 4) advisory committees, 5) project implementation, 6) innovative financing, and 7) streamlined project development.



In addition, all states have:

- a unique funding level for TE (based on a formula identified in the federal funding legislation);
- a TE coordinator who administers the program with oversight by an FHWA TE coordinator;
- requirements that call for a public entity with taxing authority to sponsor or endorse an applicant's project; and
- conditions that require any phase of a project that uses TE funds to comply with all state and federal requirements for developing and contracting transportation projects.

Beyond these aspects, state approaches vary.

**Eligibility.** The 12 categories of activities identified by the federal legislation are not recognized by all states. Some states lump eligible activities into broad groups, such as nonmotorized transportation, scenic beautification, historic preservation and environmental mitigation. Other states do not allow funding of certain categories and projects.

**Selection criteria.** Many states devise unique criteria to simplify the project-selection process. For example, minimum or maximum award amounts may apply; sponsors may be limited in the number of awards received; and a local funding match of more than 20 percent may be required. To ensure projects contribute to local priorities and are feasible, other factors may be used to score or rank applications.

**Selection cycles.** Some states evaluate TE projects continuously. Other states review and select projects quarterly, annually or biennially.

**Advisory committees.** To increase chances of receiving an award, become familiar with the advisory committee process. Most states have advisory committees, but their duties, composition and appointments vary. Citizen advisors may be appointed for the expertise they bring to the selection process, or committee membership may be limited to state employees and elected officials.

**Project implementation.** Project costs that are reimbursable in one state may not be in another. Some states fund construction, but not planning, preliminary design or particular costs such as utility relocation.

**Innovative financing.** A local match of at least 20 percent is usually required. Many states allow other agencies to contribute to that match or allow in-kind donations, such as the value of land and labor, to qualify as the local share. In many cases, a greater match will increase chances for project selection.

**Streamlined project development.** Many states have flexible project review requirements, such as exemption from rigorous environmental impact reviews for certain projects or allowance for innovation in project management requirements. Some states require project applicants to attend training sessions before submitting an application, which often results in simplification of paperwork, shorter timelines, and elimination of cost overruns.

## Transportation Enhancement Coordinators

Go to: [www.enhancements.org/contacts.asp](http://www.enhancements.org/contacts.asp)

The screenshot shows the 'TE Contacts' page of the National Transportation Enhancements Clearinghouse. The page is titled 'TE Contacts' and provides information for various stakeholders. It includes sections for 'State TE Managers', 'State FHWA TE Contacts', and 'FHWA Headquarters Contacts'. Each section provides instructions on how to contact the relevant personnel for more information or to submit an application. The page also includes a 'NTEC Contact' section with the address and phone numbers for the National Transportation Enhancements Clearinghouse. The website header includes the text 'NATIONAL TRANSPORTATION ENHANCEMENTS CLEARINGHOUSE' and a navigation menu with items like 'Home', 'TE Basics', 'Publications', 'State Profiles', 'Project List', 'Success Stories', 'Project Examples', 'News', 'Links', 'FAQ', 'Presentations', 'TE Contacts', and 'Resources'. The NTEC Contact information is as follows: National Transportation Enhancements Clearinghouse, 2121 Ward Court, NW - 3rd Floor, Washington, DC 20037, Phone: 888-365-6832, Fax: 202-486-3742, Email: [nhec@enhancements.org](mailto:nhec@enhancements.org). There is also a note about the NTEC being a federal grant under a cooperative agreement with the Federal Highway Administration through the Office of Planning, Environment, and Realty's Surface Transportation Environmental and Planning Cooperative Research Program (STEP).



## CMAQ Improvement Program

Go to: [www.fhwa.dot.gov/environment/cmaqpgs/](http://www.fhwa.dot.gov/environment/cmaqpgs/)

**Congestion Mitigation and Air Quality (CMAQ) Improvement Program**

In 1991, Congress enacted the Clean Air Act (CAA) to bolster America's efforts to attain the National Ambient Air Quality Standards (NAAQS). The amendments included further reductions in the amount of ozone-related toxic emissions, stricter rules on nitrogen oxides emissions to ozone that still failed to attain the NAAQS (nonattainment areas), and provided for a stronger, more rigorous linkage between transportation and air quality planning. In 1997, Congress amended the Intermodal Surface Transportation Efficiency Act (ISTEA). This law authorized the CMAQ program, and provided \$1.5 billion in funding for surface transportation and other related projects that contribute to air quality improvement and reduce congestion. The CAA amendments, ISTEA and the CMAQ program together were created to reduce the focus of transportation planning based on a more holistic, environmentally-sensitive, and multimodal approach to addressing transportation problems.

The CMAQ program, jointly administered by the FHWA and the Federal Transit Administration (FTA), was reauthorized in 2002 under the Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). The SAFETEA-LU CMAQ program provides over \$2.5 billion dollars in funds to state DOTs, MPOs, and transit agencies to fund air projects that reduce ozone or pollutants required from the operation-related revenue over a period of five years (2002-2006). The current CMAQ program is authorized by the TIGER program. Funding is available for areas that do not meet the National Ambient Air Quality Standards (nonattainment areas), as well as for non-attainment areas that are near or reasonably anticipated to be. The focus of the distribution of funds, which considers air quality, pollution by source, and the severity of its ozone and carbon monoxide problems within the nonattainment or maintenance area, with greater weight given to areas that are both carbon-monoxide and ozone nonattainment/maintenance areas, is continued.

The SAFETEA-LU requires states and MPOs to give priority in allocating CMAQ funds to clean engine retrofit, and other non-effective emission reduction and congestion mitigation activities that provide air quality benefits. SAFETEA-LU also requires the Secretary to evaluate and assess the effectiveness of a representative sample of CMAQ projects to determine the direct and indirect impact of the projects on air quality and congestion levels, and to ensure the effective implementation of the program.

The CMAQ program is also a source of funds for Transportation Control Measures (TCMs) authorized for the purposes of reducing congestion and improving air quality. See state or website for TCM, highway, and transit TCMs.

To view PDF files you need the [Acrobat Reader](#).

**CMAQ Photo Gallery**

The collection of photographs provides an alternative cross section of the types of projects that the program has supported since its creation with the ISTEA in 1991. Please note that the program is going strong, having been reauthorized in SAFETEA-LU. While the Photo Gallery is not close to a full record of the 12,000 CMAQ projects, we have managed to gather more than 600 quality photos from five states around the country.

More importantly, this database is not meant to be static; we plan to add quality digital photos from other states and regions to continue our database of effective CMAQ projects. Please take some time to query our gallery database by clicking the link above and take a look at what CMAQ has to offer. Thank!

**Guidance Documents**

In SAFETEA-LU Section 1002 Congress reauthorized the U.S. Department of Transportation in consultation with the Environmental Protection Agency to evaluate and assess the direct and indirect impacts of CMAQ funded projects on air quality and congestion levels and ensure the effective implementation of the program. This evaluation and assessment requires the Commission to evaluate and assess the effectiveness of the program. In Phase I, state DOTs and MPOs were required to submit reports on transportation-related indicators, traffic, congestion, and mobility. Additional analysis was done to address cost-effectiveness of reducing emissions of each pollutant. The second phase of the assessment addresses program reauthorization through a series of site visits where the effective practices being used in various regions are highlighted.

## Congestion Mitigation and Air Quality Improvement Program

The second most popular source of funds for pedestrian and bicycle facilities is the Congestion Mitigation and Air Quality (CMAQ) Improvement Program. This program provides funding to areas that are officially designated by the U.S. Environmental Protection Agency as air quality “non-attainment” or “maintenance” areas. CMAQ funds in both areas must be spent on projects that help to reduce ozone (smog), carbon monoxide or particulate matter (soot) pollution. Every state, even those without non-attainment areas, receives a minimum amount of CMAQ funding that it may spend on pollution-reduction programs, which can include pedestrian- and bicycle-related projects.

Types of improvements funded through the CMAQ program include:

- bicycle lane striping;
- bicycle parking facilities;
- sidewalks and paths;
- bicycle maps; and
- pedestrian and bicycle commuter education and promotion.

Chicago has utilized CMAQ funding to aid in the development of bicycle lanes. Chicago’s “Streets for Cycling” bikeway projects utilized CMAQ funding to plan and implement the majority of the bike lanes that exist in the city today. Beginning in 1995 and lasting through 2008, Chicago installed approximately 94 miles of on-street bicycle lanes and 20 miles of marked shared lanes along roadways within the City.<sup>4</sup>

While the majority of bicycle lanes were installed adjacent to the existing travel lanes, Chicago has several routes where roadway width would not allow for the traditional marked bicycle lane. In those instances, the City chose to install “share lane markings.” These markings show the cyclist where to best to ride within the shared lane, and alert motorists to the presence of cyclists.

## Hazard Elimination

Since 1991, the federal funding legislation has expanded eligible uses of Surface Transportation Program (STP) safety set-aside funds to include safety improvements for pedestrians and bicyclists. In addition, Hazard Elimination (part of the STP safety set-aside) funds continue to be eligible for pedestrian and bicyclist pathways, trails and facilities. Traffic calming projects are also specifically mentioned as eligible activities. Types of improvements that could be funded through the Hazard Elimination Program include:

- replacement of unsafe “wheel-grabber” drainage grates;
- improvements to and repair of publicly owned bicycle paths or trails;
- traffic calming in neighborhoods and school areas; and
- intersection safety improvements that benefit bicyclists and pedestrians (and by extension all roadway users).



### Safe Routes to School

The federal Safe Routes to School Program was developed in 2005 to provide funding toward initiatives that enable and encourage children to walk and bicycle to school. Previously, funding for safe routes to schools programs was part of the Hazard Elimination program, discussed above. In addition, the program supports the planning, development and implementation of projects geared toward improving safety conditions and reducing traffic and fuel consumption in the vicinity of schools. Types of improvements that could be funded through the Safe Routes to School Program include:

- infrastructure projects including sidewalk improvements, traffic calming, and pedestrian and bicycle crossing improvements;
- on- and off-street bicycle and pedestrian facilities; and
- traffic control improvements in the vicinity of schools (within approximately 2 miles).

Since the establishment of Safe Routes to School in the SAFETEA-LU legislation, two important organizations have emerged. The National Center for Safe Routes to School is funded by the U.S. Department of Transportation and provides Safe Routes to School programs, knowledge and technical information to support the cause. In addition, the Safe Routes to School National Partnership, which is grant-funded, has established a network of hundreds of organizations, government agencies and professional groups working to set goals, share best practices, secure funding and provide educational materials to agencies that implement Safe Routes to School programs.

### Other STP Funds

STP funds for pedestrian and bicycle facilities are not restricted to enhancements, CMAQ or safety set-aside programs. All STP funds may be used to facilitate walking and bicycling, although state departments of transportation typically use most of their STP funds for construction, reconstruction, repair or maintenance of highways for motor vehicle users. Additional types of improvements that can be funded through the STP program include:

- construction of pedestrian and bicycle facilities in conjunction with ongoing highway improvements; and
- nonconstruction projects, such as maps, brochures and public service announcements, related to pedestrian and bicycle safety.

### Other SAFETEA-LU Funding Sources

National Highway System (NHS) funds may be used to construct bicycle transportation facilities and pedestrian walkways on land adjacent to any highway on the NHS, including interstate highways. Types of improvements funded through the NHS program include shoulder and sidewalk improvements on highways, trails on adjacent rights-of-way and intersection improvements.

### National Center for Safe Routes to School

Go to: [www.saferoutesinfo.org](http://www.saferoutesinfo.org)



### Safe Routes to School National Partnership

Go to: [www.saferoutespartnership.org](http://www.saferoutespartnership.org)



## City of Chicago: Bike 2015 Plan

Go to: [www.bike2015plan.org](http://www.bike2015plan.org)



Recreational Trails Program funds may be used for all kinds of trail projects. Of the funds apportioned to a state, 30 percent must be used for motorized trail uses, 30 percent for non-motorized trail uses, and 40 percent for diverse trail uses (any combination).<sup>5</sup> Types of improvements funded through the Recreational Trails Program include:

- off-road (unpaved) trail improvements;
- trailhead facilities and signing;
- trail user education;
- assessment of trail conditions; and
- patrol and monitoring programs.

National Scenic Byways Program funds may be used for “construction along a scenic byway of a facility for pedestrians and bicyclists.” Scenic byways designations are requested by communities seeking to recognize roads with special scenic, natural, historic, cultural, recreational or archaeological features. These roadways provide an opportunity for communities to highlight their assets, attract visitors and realize economic benefits from tourism and recreation.

## Local Revenue Sources

### Property Taxes

Local governments use property taxes as their principal source of revenue. Property taxes usually flow into a general fund used to pay for the operation of local government. Some municipalities are able to use property taxes for capital improvement projects. Other communities may not be allowed to use monies in the general fund for street improvements or maintenance or projects that voters have approved.

### Local Improvement Districts

Where a group of property owners agree that improvements are needed in their immediate neighborhood, they may also agree to pay for such improvements through an assessment levied by the local government. Payments can span a number of years and may be based on the linear frontage of property, predicted trips generated by the development or other criteria. A local ordinance must be enacted to establish a local improvement district and related conditions. Local improvement districts are sometimes known as urban renewal districts, economic improvement districts or business improvement districts.

### Impact Fees

Impact fees are a way to fund public infrastructure associated with new development. The idea is to have developers share the cost of improvements required to support the increased demand their projects cause on transportation, water and sewer, schools or other public services. Impact



fees usually apply to public improvements directly associated with new development. They typically are not used for general infrastructure improvements. If the impact of a development is not immediate, then fees may be put in a fund to help pay for improvements elsewhere in the community.

### Exactments

An exactment is a charge or obligation levied in exchange for permission to develop land. Where local governments place the burden of road improvements on abutting landowners and developers, an exactment can be used to require installation of a sidewalk or other improvement in the public right-of-way adjacent to the landowner's property. Exactments are best used for spot improvements or where specific sidewalk sections are missing. However, there is no way to be sure when a developer might submit an application. Further, a municipality needs to have a policy to require exactments when it benefits the community. The preferred option is to have the municipality assume responsibility for construction and maintenance of the pedestrian infrastructure, just as they do for local roads, instead of requiring property owners to assume this obligation.

### Private Donations

Private donations can range from corporate investment to individual contributions towards the cost of a community project. They have the significant advantage of demonstrating community support for the project, and can be of tremendous help in convincing municipal governments to fund the balance of a project.

Major employers, such as businesses, hospitals and universities, are always potential benefactors of civic improvements that can encourage foot traffic and additional economic investment in downtown locations. For example, in the 1970s a group of business people in Corning, NY, home to 12,000 people and Corning Glass Works, recognized that the economic health of their downtown relied on a vital downtown core and the tax revenue it provided. Today, after an investment of several million dollars in private and public improvements, Corning is one of the most attractive and walkable cities in the Northeast.

Because some pedestrian and bicycle improvements are small and specific, even individuals can participate in making their communities more friendly to walking and bicycling. Many communities have aptly demonstrated their ability to involve local citizens by obtaining commitments to purchase and install bicycle racks or to have walking surfaces embossed with the name of the contributor or a loved one (as little as \$100 per brick). School students in Oregon have constructed curb ramps, benches and planters as part of learning new skills.

### Recreational Trails Program

Go to: [www.fhwa.dot.gov/environment/rectrails](http://www.fhwa.dot.gov/environment/rectrails)



### National Scenic Byways Program

Go to: [www.byways.org](http://www.byways.org); and



[www.scenic.org](http://www.scenic.org)



## Follow Through with the Project

Getting through the funding process is another piece to the puzzle. And while you are just one part of the overall project team, it is important to keep up on the status of the project. The project team, which includes not only you as a public health professional, but community leaders, local planners, transportation and environmental agency officials and citizens, has worked together successfully to bring a project to this point.

Do not relax after a project is approved and funded. Keep in touch with the project manager during the design to learn how your objectives are being addressed. Arrange a site visit to look at special problems. If elements like nonstandard lane widths are desired, make sure these are approved. While the project may be at the point where local engineers and municipal representatives have taken over, it is still important to advocate throughout the life of the project.

Sometimes a project may be assigned a new manager, in which case it is wise to go through the history of the project with the new person. He or she may not be aware of the original discussions and community objectives.

During project construction, check with the project manager on progress and any issues that may come up. Some design decisions are necessarily made in the field, and you want to make sure they are consistent with the project's objectives. Finally, do a walkthrough of the completed project and congratulate the manager and team on a job well done! Remind people to hold a celebration to publicize the improvements and to get good publicity for officials who supported it.



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## Summary

Considerable money is spent on transportation, but directing it to bicycle and pedestrian projects is easier said than done. Start by surveying the many funding sources and how they can be used.

Next, deconstruct the local process (state, region or municipality) for taking advantage of those sources. Match your projects (small or large; local or an entire area; retrofit or new) and priorities with likely funding sources. Combine sources where practical, using small amounts to leverage larger ones.

Make sure general roadway projects include adequate provisions for pedestrians and bicyclists. As noted earlier in this report, in 2010, Secretary of Transportation Ray LaHood established a policy statement that incorporates accommodation for bicyclists and pedestrians:

The DOT policy is to incorporate safe and convenient walking and bicycling facilities into transportation projects. Every transportation agency, including DOT, has the responsibility to improve conditions and opportunities for walking and bicycling and to integrate walking and bicycling into their transportation systems. Because of the numerous individual and community benefits that walking and bicycling provide—including health, safety, environmental, transportation, and quality of life—transportation agencies are encouraged to go beyond minimum standards to provide safe and convenient facilities for these modes.<sup>6</sup>

Make sure your community has good planning codes adopted for your community and make sure they are followed. Ensure that transportation policy and project decisions improve walking and bicycling. Show decision-makers how an active community design is a good investment (see Chapter One).

Finally, keep on top of projects. You are only one component of the project team. Projects take years to complete, and people may come and go. Don't forget that the project team, with all its critical contributors, has worked together successfully to bring a project to this point.



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## Endnotes

- 1 As of April 2010, new federal transportation legislation was still pending.
- 2 *Press Release: Recovery Act Funded Projects*. Washington: U.S. Department of Transportation, 2010. (No authors given.)
- 3 *Press Release: Interagency Partnership for Sustainable Communities*. Washington: U.S. Department of Transportation, 2009. (No authors given.)
- 4 *Chicago Complete Streets: Federally Funded Bike Lanes in the Windy City*. Chicago: City of Chicago Department of Transportation, 2008. (No authors given.)
- 5 *Fact Sheets on Highway Provisions*. Washington: Federal Highway Administration, 2009, [www.fhwa.dot.gov/safetealu/factsheets/rectrails.htm](http://www.fhwa.dot.gov/safetealu/factsheets/rectrails.htm) (accessed May 2010).
- 6 *Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations*. Washington: U.S. Department of Transportation, 2010. (No authors given.)



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## INCREASING PHYSICAL ACTIVITY THROUGH COMMUNITY DESIGN

*A Guide for Public Health Practitioners  
and Livable Community Advocates*

NATIONAL CENTER FOR BICYCLING & WALKING

# Chapter Four

## RESOURCES & GLOSSARY

|  |    |
|--|----|
| Public Health .....                        | 46 |
| Transportation .....                       | 47 |
| Land Use Planning & Community Design ..... | 48 |
| Facility Planning & Design.....            | 49 |
| Schools .....                              | 50 |
| Funding Sources & Programs .....           | 50 |
| Advocacy .....                             | 51 |
| Environmental .....                        | 52 |
| Equity & Social Justice .....              | 53 |
| Glossary .....                             | 53 |



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## Public Health

**Active Living Research** ([www.activelivingresearch.org](http://www.activelivingresearch.org)), a national program of the Robert Wood Johnson Foundation, supports research to identify environmental factors and policies that influence physical activity for children and families to inform effective childhood obesity prevention strategies, particularly in low-income communities and racial/ethnic groups at highest risk.

**Designing and Building Healthy Places** ([www.cdc.gov/healthyplaces](http://www.cdc.gov/healthyplaces)) is a site created by the Centers for Disease Control and Prevention to provide statistics, information on planning and designing healthy communities and other resources.

The **Division of Nutrition, Physical Activity and Obesity** ([www.cdc.gov/nccdphp/dnpao](http://www.cdc.gov/nccdphp/dnpao)) is a branch of the Centers for Disease Control and Prevention that provides information on nutrition and physical activity. Available slides provide an effective, dramatic presentation on the consequences (and magnitude) of the physical inactivity and obesity problem. Find state obesity trends at: [www.cdc.gov/obesity/data/trends.html#state](http://www.cdc.gov/obesity/data/trends.html#state).

**Healthy Kids, Healthy Communities** ([www.healthykidshealthycommunities.org](http://www.healthykidshealthycommunities.org)) is a Robert Wood Johnson Foundation national program that advances community-based solutions to the childhood obesity epidemic. Its primary goal is to change policies and environments to support active living and healthy eating among children and families across the United States.

**Measuring the Health Effects of Sprawl: A National Analysis of Physical Activity, Obesity, and Chronic Disease** ([www.smartgrowthamerica.org/report/healthsprawl8.03.pdf](http://www.smartgrowthamerica.org/report/healthsprawl8.03.pdf)) is a 2003 report written by Barbara A. McCann and Reid Ewing of Smart Growth America.

The **National Institutes of Health** ([www.nih.gov](http://www.nih.gov)), a part of the U.S. Department of Health and Human Services, is the primary federal agency for conducting and supporting medical research.

**Nemours Children's Health System** ([www.nemours.org](http://www.nemours.org)), one of the nation's largest pediatric health systems, is dedicated to achieving higher standards in children's health.

The **Physical Activity Resources for Health Professionals** ([www.cdc.gov/nccdphp/dnpa/physical/health\\_professionals](http://www.cdc.gov/nccdphp/dnpa/physical/health_professionals)) site is a service of the Centers for Disease Control and Prevention that provides key reference documents, data and surveillance resources, information to assist with program planning and evaluation and ideas for physical activity promotion. Also order *The Community Health Promotion Handbook* at [www.prevent.org/content/view/full/142/173/](http://www.prevent.org/content/view/full/142/173/).



**Public Health Agency of Canada** provides resources and information about the benefits of regular physical activity, the federal role in the promotion of physical activity, and its role in the prevention of chronic disease. See resources at [www.phac-aspc.gc.ca/hp-ps/hl-mvs/index-eng.php](http://www.phac-aspc.gc.ca/hp-ps/hl-mvs/index-eng.php).

The **Robert Wood Johnson Foundation Center to Prevent Childhood Obesity** ([www.reversechildhoodobesity.org](http://www.reversechildhoodobesity.org)) is a national organization dedicated to reversing the childhood obesity epidemic by changing public policies and creating healthier environments in schools and communities.

## Transportation

**Active Transportation for America: The Case for Increased Federal Investment in Bicycling and Walking** ([www.railstotrails.org/resources/documents/whatwedo/atfa/atfa\\_20081020.pdf](http://www.railstotrails.org/resources/documents/whatwedo/atfa/atfa_20081020.pdf)) is a 2008 report of the Rails to Trails Conservancy (RTC) and the Bikes Belong Coalition, from which users can learn more about how adequate federal investment in bicycling and walking will create healthier places for healthier people. For more information on RTC, see: [www.railstotrails.org](http://www.railstotrails.org).

**Advocacy Advance** is a partnership between the League of American Bicyclists and the Alliance for Biking and Walking to research issues critical to the bicycling community. They have developed a series of reports on the topic of accessing federal funding for bicycle and pedestrian projects, available at: [www.bikeleague.org/resources/reports](http://www.bikeleague.org/resources/reports).

**Bicycling and Walking in the United States, 2010 Benchmarking Report** ([www.peoplepoweredmovement.org/benchmarking](http://www.peoplepoweredmovement.org/benchmarking)) is a 2010 report of the Alliance for Biking & Walking.

**Dangerous by Design: Solving the Epidemic of Preventable Pedestrian Deaths (and Making Great Neighborhoods)** ([www.transact.org/pdfs/2009-11-09-dangerous-by-design.pdf](http://www.transact.org/pdfs/2009-11-09-dangerous-by-design.pdf)) is a 2009 report from the Surface Transportation Policy Project (STPP) and Transportation for America. Expanding on earlier data collection and analysis and research done by STPP, this report emphasizes solving the epidemic of preventable pedestrian deaths and making great neighborhoods. This report is one of several produced by STPP and available on their website ([www.transact.org](http://www.transact.org)).

**United States Research and Innovative Technology Administration Bureau of Transportation Statistics** ([www.bts.gov/publications/transportation\\_statistics\\_annual\\_report](http://www.bts.gov/publications/transportation_statistics_annual_report)) is an annual report on many modes of transportation including biking and walking.



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## Land Use Planning & Community Design

**Context Sensitive Solutions Clearinghouse** ([www.contextsensitivesolutions.org](http://www.contextsensitivesolutions.org)) provides a variety of support tools addressing design standards, liability, stakeholder involvement and new techniques in transportation problem-solving. Many publications and resources covering context-sensitive solutions are available.

**The Local Government Commission** ([www.lgc.org](http://www.lgc.org)) is a nonprofit, nonpartisan, membership organization that provides inspiration, technical assistance and networking to local elected officials and other dedicated community leaders who are working to create healthy, walkable and resource-efficient communities. Many technical resources are available on the topic of community design.

**National Complete Streets Coalition** ([www.completestreets.org](http://www.completestreets.org)) is a broad coalition of advocates and transportation professionals who are working together to enact complete streets policies across the country. Many resources available including federal policy guidelines, fact sheets and links to reports and manuals highlighting complete streets best practices.

**Partners for Livable Communities** ([www.livable.com](http://www.livable.com)) is a non-profit leadership organization working to improve the livability of communities by promoting quality of life, economic development and social equity. Resources, links and best practices can be found at their Web site.

**Residential Streets** (available at [www.uli.org](http://www.uli.org)) is a 76-page guide from the Urban Land Institute's Walter M. Kulash describing practical approaches to planning and designing residential streets and enhancing livability.

**Smart Growth America** ([www.smartgrowthamerica.org](http://www.smartgrowthamerica.org)) is a coalition of national, state and local organizations working to improve the ways we plan and build the towns, cities and metro areas we call home. The site provides a list of publications and resources to support citizen-driven planning that coordinates development, transportation, revitalization of older areas and preservation of open space and the environment.

**Stopping Sprawl** ([www.sierraclub.org/sprawl](http://www.sierraclub.org/sprawl)) is a resource from the Sierra Club that provides a list of publications and a forum for discussing sprawl and its impacts.

**Streets and Sidewalks, People and Cars: The Citizen's Guide to Traffic Calming** ([www2.lgc.org/bookstore/detail.cfm?itemId=15](http://www2.lgc.org/bookstore/detail.cfm?itemId=15)) is a 52-page guide written by Dan Burden of the Local Government Commission to help communities better understand the dynamics of vehicle and pedestrian movement, identify traffic-calming opportunities and recommend street improvements.



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## Facility Planning & Design

**Bicycle Friendly America** ([www.bikeleague.org/programs/bicyclefriendlyamerica](http://www.bikeleague.org/programs/bicyclefriendlyamerica)), a resource developed by the League of American Bicyclists, contains a wealth of information on bicycle friendly communities, businesses and universities in the U.S.

**Biking and Walking—Slowing Traffic** ([www.activelivingresources.org/bikingandwalking1.php](http://www.activelivingresources.org/bikingandwalking1.php)) is a site from the Active Living Resource Center, featuring information related to traffic calming and links to related resources

**Guide for the Development of Bicycle Facilities (3rd Edition)** ([https://bookstore.transportation.org/item\\_details.aspx?id=104](https://bookstore.transportation.org/item_details.aspx?id=104)), a 1999 book from the American Association of State Highway and Transportation Officials, is the most referenced bicycle-facility document in the U.S.

**Guide for the Planning, Design, and Operation of Pedestrian Facilities (1st Edition)** ([https://bookstore.transportation.org/item\\_details.aspx?id=119](https://bookstore.transportation.org/item_details.aspx?id=119)) is a 2004 report from the American Association of State Highway and Transportation Officials providing guidance on the planning, design and operation of pedestrian facilities along streets and highways.

**National Transportation Enhancements Clearinghouse** ([www.enhancements.org](http://www.enhancements.org)) is an online information service sponsored by the Federal Highway Administration and Rails-to-Trails Conservancy to provide professionals, policy-makers and citizens with information about Transportation Enhancements (TE): how they are implemented, how to make use of this provision of the nation's transportation program, an explanation of the TE program, documents about the program, a directory of people in each state who work with TE projects and example projects.

**Pedestrian and Bicycle Information Center (PBIC)** ([www.pedbikeinfo.org](http://www.pedbikeinfo.org)) is a clearinghouse for information about health and safety, engineering, advocacy, education, enforcement, access and mobility. The PBIC serves anyone interested in pedestrian and bicycle issues, including planners, engineers, private citizens, advocates, educators, police and the health community.

**The Rails-to-Trails Conservancy's** trail building site ([www.railstotrails.org/ourWork/trailBuilding](http://www.railstotrails.org/ourWork/trailBuilding)) contains many useful resources and reports related to multi-use trail planning and development, including a "Trail Building Toolbox."

**The Traffic Calming Library** ([www.ite.org/traffic](http://www.ite.org/traffic)) from the Institute of Transportation Engineers contains a searchable database of reports, articles and other documents related to traffic calming.

**Trails for the Twenty-First Century (Second Edition): Planning, Design, and Management Manual for Multi-Use Trails** ([www.islandpress.com/bookstore/details6028.html?prod\\_id=863](http://www.islandpress.com/bookstore/details6028.html?prod_id=863)) is a 2001 book from the Rails to Trails Conservancy for planners, landscape architects, local officials and community activists interested in creating a multiuse trail.

**Traffic calming is the combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behavior and improve conditions for non-motorized street users.**

*Lockwood I. Institute of Transportation Engineers Traffic Calming Definition. ITE Journal, July 1997.*



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## Schools

**Active Living Resource Center's Safe Routes to School Introduction** ([www.activelivingresources.org/saferoutestoschool.php](http://www.activelivingresources.org/saferoutestoschool.php)) provides information about the program, with links to resources, case studies, fact sheets and assessment tools.

**Active and Safe Routes to Schools** ([www.saferoutestoschool.ca](http://www.saferoutestoschool.ca)) is a program of Green Communities Canada providing resources, tools, information and links for schools and communities to create their own unique Active & Safe Routes to School program.

**Alliance for a Healthier Generation** has useful tool kits for schools ([www.healthiergeneration.org/schools](http://www.healthiergeneration.org/schools)).

**Eco-Schools** ([www.nwf.org/ecoschools](http://www.nwf.org/ecoschools)) is an internationally acclaimed program that provides a framework to help educators integrate sustainable principles throughout their schools and curriculum. The National Wildlife Federation was designated as the host agency for this program in December, 2008.

**National Center for Safe Routes to School** ([www.saferoutesinfo.org](http://www.saferoutesinfo.org)) provides information, resources and links about the federal Safe Routes to School program.

**Safe Routes to School National Partnership** ([www.saferoutespartnership.org](http://www.saferoutespartnership.org)) is a network of more than 400 nonprofit organizations, government agencies, schools and professionals working together to advance the Safe Routes to School movement in the U.S.

**Sustrans** ([www.sustrans.org.uk](http://www.sustrans.org.uk)) is the U.K.'s leading sustainable transport charity. Sustrans' vision is a world in which people choose to travel in ways that benefit their health and the environment.

## Funding Sources & Programs

**Advocacy Advance** is a partnership between the League of American Bicyclists and the Alliance for Biking and Walking to research issues critical to the bicycling community. They have developed a series of reports ([www.bikeleague.org/resources/reports](http://www.bikeleague.org/resources/reports)) on the topic of accessing federal funding for bicycle and pedestrian projects.

**Congestion Mitigation and Air Quality Improvement Program** is a \$6 billion program to fund surface transportation and other projects that can help improve air quality and reduce congestion. See [www.fhwa.dot.gov/environment/emaqpgs](http://www.fhwa.dot.gov/environment/emaqpgs) for program guidance and other related resources.

**Enhancing America's Communities: A Guide to Transportation Enhancements** ([www.enhancements.org/download/publications/e3/enhancing%20americas%20communities%202007.pdf](http://www.enhancements.org/download/publications/e3/enhancing%20americas%20communities%202007.pdf)) is a 40-page 2007 report from the Federal Highway



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Administration ([www.fhwa.dot.gov](http://www.fhwa.dot.gov)) describing the Transportation Enhancements program ([www.enhancements.org](http://www.enhancements.org)) as provided under the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, enacted in 2005. The report includes federal requirements for eligibility, how to navigate your way around state transportation agencies, a typical project development process and 15 case studies of enhancement projects.

## Advocacy

**Adventure Cycling Association** ([www.adventurecycling.org](http://www.adventurecycling.org)) is a national nonprofit with a mission to inspire people of all ages to travel by bicycle for fitness, fun and self-discovery.

**Alliance for Biking and Walking** (formerly the Thunderhead Alliance) ([www.peoplepoweredmovement.org](http://www.peoplepoweredmovement.org)) is a national coalition of grassroots bicycle and pedestrian advocacy organizations uniting advocacy leaders to help them become more effective by sharing best practices and innovations, strengthening organizations through resource sharing and training opportunities, and helping advocates to create organizations in underserved communities.

**America Bikes** ([www.americabikes.org](http://www.americabikes.org)) is a national coalition of leaders from the bicycle community advocating for positive outcomes for bicycling in the federal transportation bill.

**America Walks** ([www.americawalks.org](http://www.americawalks.org)) is a national coalition of walking advocacy groups dedicated to promoting livable communities, where people walk because it's a real choice.

**Association of Pedestrian and Bicycle Professionals** ([www.apbp.org](http://www.apbp.org)) is a national nonprofit organization representing the interests of engineers, planners, advocates, academics and safety experts who work to improve conditions for bicyclists and pedestrians.

**League of American Bicyclists (LAB)** ([www.bikeleague.org](http://www.bikeleague.org)) is a national organization that promotes cycling for fun, fitness and transportation. The LAB membership includes individuals, recreational clubs and advocacy organizations that share an interest in working through advocacy and education for a bicycle-friendly America.

**National Center for Bicycling & Walking (NCBW)** ([www.bikewalk.org](http://www.bikewalk.org)) is a nonprofit organization working for more bicycle-friendly and walkable communities. The NCBW offers information support, training, consultation services and resources to public agencies, nongovernmental organizations and advocates, maintains an Internet support center and organizes the biennial Pro Walk/Pro Bike® Conference series and other special meetings.



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**Pro Walk/Pro Bike® Conference series** ([www.bikewalk.org](http://www.bikewalk.org)) is a biennial symposium on bicycling and walking sponsored by the National Center for Bicycling & Walking. Held during even-numbered years for anyone interested in improving conditions for bicycling and walking and the quality of life within their communities.

**Rails-to-Trails Conservancy** ([www.railtrails.org](http://www.railtrails.org)) is the nation's largest trails organization dedicated to connecting people and communities by a nationwide network of public trails, many built along former rail lines and connecting corridors.

**The Walkable and Livable Communities Institute** ([www.walkablelivable.org](http://www.walkablelivable.org)) is a non-profit center focused on helping cities and towns throughout the world become more walkable, bikeable, sustainable, socially engaged and welcoming by improving their built form.

## Environmental

**National Trust for Historic Preservation** ([www.preservationnation.org](http://www.preservationnation.org)) provides leadership, education, advocacy and resources to save America's diverse historic places and revitalize our communities.

**The Nature Conservancy** ([www.nature.org](http://www.nature.org)) is the leading conservation organization working around the world to protect ecologically important lands and waters for nature and people. Calculate your carbon footprint using their carbon footprint calculator ([www.nature.org/initiatives/climatechange/calculator](http://www.nature.org/initiatives/climatechange/calculator)).

**Sierra Club's Cool Cities Program** ([www.coolcities.us](http://www.coolcities.us)) is a collaboration between community members, organizations, businesses and local leaders to implement clean energy solutions that save money, create jobs and help curb global warming.

**United States Environmental Protection Agency Clean Energy Programs** ([www.epa.gov/cleanenergy/energy-programs](http://www.epa.gov/cleanenergy/energy-programs)) are working with state policy makers, electric and gas utilities, energy customers and other key stakeholders. By identifying, designing and implementing clean energy policy and technology solutions, they deliver important environmental and economic benefits. Resources include a carbon counter (greenhouse gas equivalencies calculator): ([www.epa.gov/cleanenergy/energy-resources/calculator.html](http://www.epa.gov/cleanenergy/energy-resources/calculator.html)).

**United States Environmental Protection Agency State Environmental Agencies** site ([www.epa.gov/epahome/state.htm](http://www.epa.gov/epahome/state.htm)) includes links to all 50 U.S. states' Departments of Environmental Protection.



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## Equity & Social Justice

**Environmental Justice Research Center** ([www.ejrc.cau.edu](http://www.ejrc.cau.edu)) serves as a research, policy and information clearinghouse on issues related to environmental justice, race and the environment, civil rights and human rights, facility siting, land use planning, brownfields, transportation equity, suburban sprawl, smart growth and energy.

**Healthy, Equitable Transportation Policy: Recommendations and Research** ([www.convergencepartnership.org/site/c.fhLOK6PELmF/b.5327643/k.BFOB/Transportation\\_RX.htm](http://www.convergencepartnership.org/site/c.fhLOK6PELmF/b.5327643/k.BFOB/Transportation_RX.htm)) is a report by PolicyLink and the Prevention Institute commissioned by the Convergence Partnership.

**Office of Sustainable Housing and Communities (OSHC)** ([http://portal.hud.gov/portal/page/portal/hud/program\\_offices/sustainable\\_housing\\_communities](http://portal.hud.gov/portal/page/portal/hud/program_offices/sustainable_housing_communities)), within the U.S. Department of Housing and Urban Development (HUD), is designed to help build stronger, more sustainable communities by connecting housing to jobs, fostering local innovation and building a clean energy economy. Funded by Congress for the first time in HUD's 2010 Budget, OSHC is a key component of the Partnership for Sustainable Communities.

**The Partnership for Sustainable Communities** ([www.dot.gov/affairs/2009/dot8009.htm](http://www.dot.gov/affairs/2009/dot8009.htm)) was created by the U.S. Department of Transportation and the U.S. Department of Housing and Urban Development to help American families gain better access to affordable housing, more transportation options and lower transportation costs.

**PolicyLink** ([www.policylink.org](http://www.policylink.org)) is a national research and action institute advancing economic and social equity by "Lifting Up What Works." PolicyLink connects the work of people on the ground to the creation of sustainable communities of opportunity that allow everyone to participate and prosper. Such communities offer access to quality jobs, affordable housing, good schools, transportation and the benefits of healthy food and physical activity.

## Glossary

**ACE:** Active Community Environment.

**Bike Lane:** A portion of the roadway designated for preferential use by bicyclists.

**CDC:** Centers for Disease Control and Prevention.

**CIP:** Capital Improvement Program.

**CMAQ:** Congestion Mitigation and Air Quality Improvement Program.

**Crime Prevention through Environmental Design (CPTED):** Crime prevention philosophy based on the theory that proper design and effective use of the built environment can lead to a reduction in the fear and incidence of crime, as well as an improvement in the quality of life.



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**Crosswalk:** Marked or unmarked area of an intersection where pedestrians cross, or a marked roadway crossing mid-block. Pedestrians have special rights at crosswalks.

**Curb Extension:** A section of curb that extends into the roadway, which shortens crossing distance and improves pedestrian visibility. Also known as a bulb-out, neckdown, flare or choker.

**Curb Radius:** The curved edge of the roadway at an intersection.

**Design Speed:** A selected speed used to determine the various geometric design features of the roadway.

**Environmental Justice:** The fair treatment and meaningful involvement of all people regardless of race, color, national origin, educational level or income with respect to the development, implementation and enforcement of environmental laws. Environmental justice seeks to ensure that minority and low-income communities have access to public information relating to human health and environmental planning, regulations and enforcement.

**ISTEA:** Intermodal Surface Transportation Efficiency Act of 1991. Landmark legislation for balanced federal highway funding and the predecessor to TEA-21.

**Metabolic Syndrome:** A cluster of conditions—including high blood pressure, elevated insulin levels, excess body weight and fat around the waist or elevated cholesterol levels—that occurring together, increase your risk of heart disease, stroke and diabetes.

**NCBW:** National Center for Bicycling & Walking.

**NPTS:** Nationwide Personal Transportation Survey.

**Shared Roadway:** Roads on which cyclists and motorists share the travel lanes.

**Shared-Use Path:** A facility separated from motor vehicle traffic by an open space or barrier, and typically used by pedestrians, joggers, skaters and bicyclists as two-way facilities.

**Shoulder Bikeway:** Paved and smooth roadway shoulder at least 4 feet wide.

**Sidewalk:** An improved facility for pedestrians that is usually, but not always, located in the public right-of-way next to a roadway and constructed of concrete or other hard, smooth surface.

**Smart Growth:** Community development pattern that is economically sound, environmentally friendly and supportive of community livability.

**TE:** Transportation Enhancement.

**TIP:** Transportation Improvement Program.

**TND:** Traditional Neighborhood Development. A human-scale, walkable community with moderate to high residential densities and a mixed-use core.

**Traffic Calming:** A set of techniques that reduce the speed and aggressiveness of traffic.

**Wide Outside Lane:** A lane of at least 14 feet that allows an average-sized motor vehicle to safely pass a bicyclist without crossing over into the adjacent lane.



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The **National Center for Bicycling & Walking** is a national nonprofit organization with offices in Washington, DC, and New Jersey. NCBW developed the award winning Walkable Community Workshop program, which brings together planners, engineers, public health professionals, citizen advocates, youth and others to develop community transportation systems that work for all users. We have facilitated hundreds of community workshops and walking audits, and we count numerous state departments of transportation, metropolitan planning organizations, and local governments as our clients.

The **Active Living Resource Center** is a program of the National Center for Bicycling & Walking. The ALRC is dedicated to reducing health disparities by helping communities remove barriers to everyday physical activity—like walking and bicycling. We have a specific interest in reducing childhood obesity by increasing opportunities for children to regularly and safely walk and bicycle to school and other destinations.

The Active Living Resource Center was initiated with funding support from the Robert Wood Johnson Foundation.

For more information on NCBW and/or ALRC visit us at [www.bikewalk.org](http://www.bikewalk.org).

For copies of this report, please visit [www.bikewalk.org](http://www.bikewalk.org).

THE NATIONAL CENTER FOR BICYCLING & WALKING



BUILDING STRONGER COMMUNITIES



Active Living  
RESOURCE CENTER