

How to Improve Conditions for Walking and Bicycling



What's Your Role?

Many local projects and actions can enhance 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 organizer, catalyst, leader, local hero, trench worker 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.



"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

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 includes 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.

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Some Actions You Can Take

- ✓ 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.

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.
- Inspire, empower and encourage other community groups to work together to achieve these goals and objectives.

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

- Help to 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 to supporting active community design.

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 toward achieving the goals and objectives.

Perhaps the most important job a public health professional can do is to make public health concerns and their connection 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 the key to healthy people and act accordingly, you will have succeeded in your mission.

“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

What Needs Doing?

It's safe to say that, as a public health practitioner, you probably won't be designing intersections, pouring concrete for new sidewalks or operating a street sweeper. But 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. Here's a list of seven such projects that are being implemented in communities across the country:

1. **Community Audit**
2. **More, Better Sidewalks**
3. **Safe and Convenient Crossings**
4. **Bicycle-Friendly Streets**
5. **Trails**
6. **Slow Down Motor Vehicles**
7. **Safe Routes to School**

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.



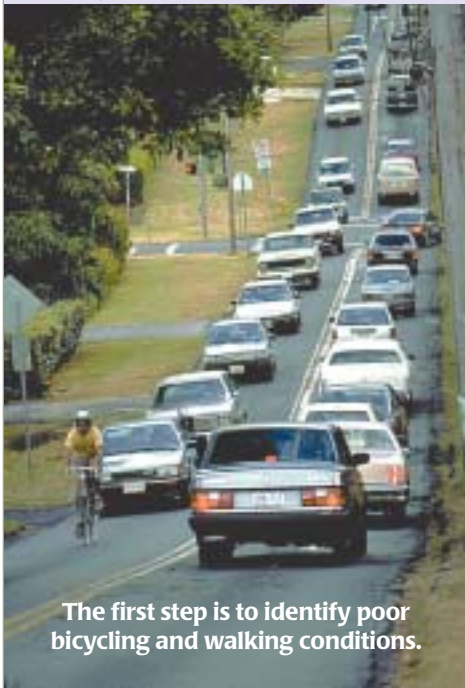
“The health infrastructure is every bit as important in a livable community as roads, paths, sewer and water. We have to think of the total environment that people live in. My friends who are in the health arena have been too bashful in demanding a place at the table.”

—Congressman
Earl Blumenauer, Oregon,
Third District

“The public health community is beginning to return to its roots, once again partnering with architects, planners and engineers to better understand how to build healthier communities and lifestyles.”

—William L. Roper, MD,
MPH, Dean, School of
Public Health, The
University of North
Carolina at Chapel Hill

1 Conduct a Community Audit



The first step is to identify poor bicycling and walking conditions.

Problem

How walking- 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 regarding what needs to be done and who supports these actions. The residents of a neighborhood may not know what to ask for.



Solution

The first step in fixing something that is broken is to identify the problem. If few people are bicycling on a street, 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, 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 already may 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 be preventing them from doing so, is to conduct an informal inventory or "audit" of existing conditions throughout your community. Not by car, but by foot (or wheelchair) and 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, pick and try a route that has a purpose. Walk or bicycle from your home to the nearest school, shopping center, office building or local park.

Pedestrian Audit

- Are sidewalks continuous along the entire route? If not, where are they interrupted?
- 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 crosswalks and pedestrian signals to help people cross busy streets and intersections?
- Can slow-moving pedestrians get across the street in the time allowed by the signal?
- Do drivers yield to pedestrians at driveways and crosswalks?
- Are any 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?
- Is there other pedestrian activity along the way?
- Was the walk enjoyable? Why or why not?
- Would you repeat this walking trip again? Why or why not?

Bicycle Audit

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

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) \geq 14 to 16 ft

“...organizations will have to reach beyond their comfort zone. For example, many mid-life and older people are not likely to walk if they live in neighborhoods that have no sidewalks or are dangerous. Public health professionals will have to learn about local transportation planning and how to work with elected officials to encourage exercise-friendly neighborhoods.”

“Identify barriers to walking for adults age 50 and older, determine why these barriers exist, and develop specific recommendations for how to overcome and avoid them.”

—*The National Blueprint: Increasing Physical Activity Among Adults Aged 50 and Older*, The Robert Wood Johnson Foundation, 2001

Carry along a camera and make a photographic record of 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 on the previous page and make note of your findings.

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

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 opportunity. If there is a missing link in the chain, a person may be inconvenienced, delayed, put at risk or discouraged from attempting another walking or cycling trip in the future.

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 more comprehensive projects.

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

“Three out of five disabled and elderly people [in Houston Texas] do not have sidewalks between their residences and the nearest bus stop.”

—J. Gilderbloom and J. Markham. *Housing Quality Among the Elderly: A Decade of Changes*. Aging Human Development. 1998: 46(1).



2 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 travelway, 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.

Add sidewalks where they are missing on both sides of major streets and in downtowns, and on at least one side (preferably both sides) of local streets. Add paved shoulders on rural roads. Where sidewalks are in poor condition or littered with debris, find out who is responsible for maintenance and request that they follow through with their obligations.

Look for opportunities to connect building entrances with sidewalks. When retrofitting places that do not have a continuous sidewalk system, the 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.

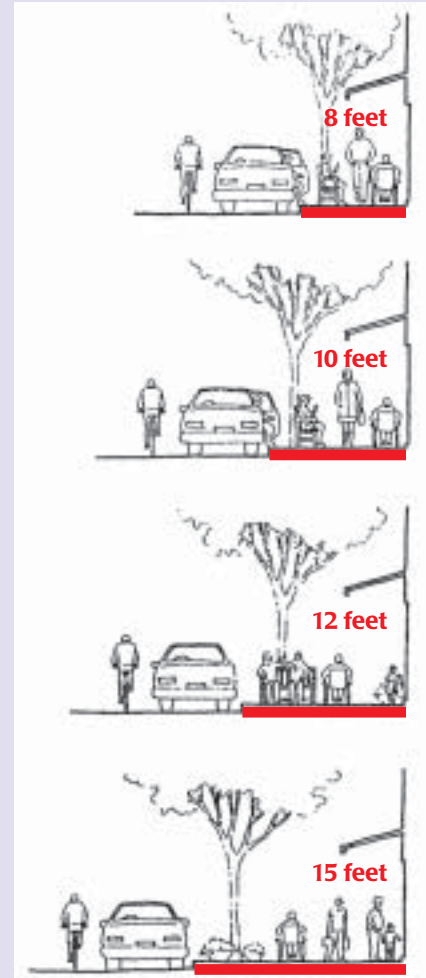
Considerations

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 concentrations of pedestrians are



The latest ADA guidelines by the U.S. Access Board are at www.access-board.gov

Sidewalk Width – More is Better for Pedestrian Activity



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.

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

expected (downtown areas, schools, transit stops) the sidewalks should be wider.

Maintenance — Adopt policies for state and local transportation agencies for maintenance of sidewalks modeled on maintenance of the adjacent street or highway. Give sidewalk snow removal equal or greater priority for pedestrians as for motor vehicles, and assign responsibility for sidewalk snow removal 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 exist.

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 be successful in attracting 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 often will walk longer distances if their route takes them by attractive buildings.



Beyond the buildings, it's land use that really 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, public spaces (parks and plazas) and even some light industry.

This street has many features that attract pedestrians:

- Wide sidewalk
- Planting strip with trees
- Mix of uses
- Sidewalk-oriented business

3 Create Safe and Convenient Crossings

Problem

Most people begin their walks or bicycle rides within 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 often reach or exceed 45 to 50 mph (even when posted for less). 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 made impossible because 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 (see next page) often used in street design encourages motorists to take corners at higher speeds.



“Crosswalks are the critical links in a connected pedestrian network, and crossing the street is by far the most dangerous aspect of being a pedestrian. On average, a pedestrian is killed or injured by an automobile every six minutes in the United States, and nearly three-quarters of these pedestrian-automobile collisions occur when pedestrians are attempting to cross the roadway. [FHWA, 1997]”

—E. Vanderslice, President, America Walks. *Why Did the Pedestrian Cross the Road?* 2001.

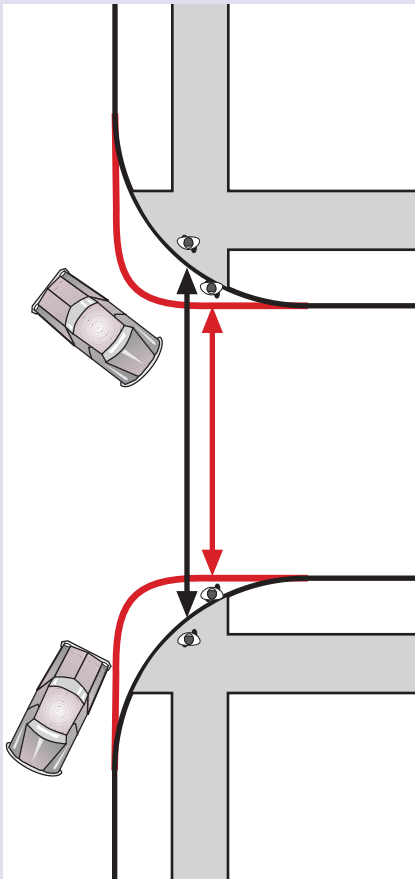
“Although Americans make fewer than 6 percent of their trips on foot, 13 percent of all traffic fatalities occur among pedestrians; of the pedestrian deaths for which information is recorded, almost 60 percent occurred in places where no crosswalk was available.”

—Surface Transportation Policy Project. *Mean Streets 2000: A Transportation and Quality of Life Campaign Report.* 2001

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.

Oregon's Land Use Transportation Air Quality (LUTRAQ) study found that people who lived in pedestrian-friendly neighborhoods made nearly four times as many walking and bicycling trips as people who lived in neighborhoods with poor pedestrian environments.

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



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 at left), 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.
- Restrict curb parking at specific crossing points to provide greater visibility for pedestrians and drivers.
- Employ traffic-calming measures that will slow motor vehicles (see section on Slow Down Motor Vehicles).
- 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.
- Use a 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 the multiple advantages of slowing motorists who are turning, improving the sight distance between the approaching motorist and the pedestrian, reducing the distance a pedestrian must travel across the street, increasing the waiting area available to pedestrians, and simplifying 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.

4 Make Streets More Bicycle Friendly

Problem

Surveys indicate more people would bicycle more often if they had safer places to ride. But so many of today's streets are so crowded with fast motor vehicle traffic that nothing is left for the slower cyclist. A lack of adequate operating space along a roadway can make bicyclists and motorists feel uncomfortable or even unsafe.

Solution

Provide appropriate on-road facilities and adequate operating space for bicyclists:

- 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.
- 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.

Look at each potential route for the 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.

Bike lanes along busy streets are a good strategy for increasing the level of 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.



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.



Shoulders Have Many Benefits

(most also apply to bike lanes)

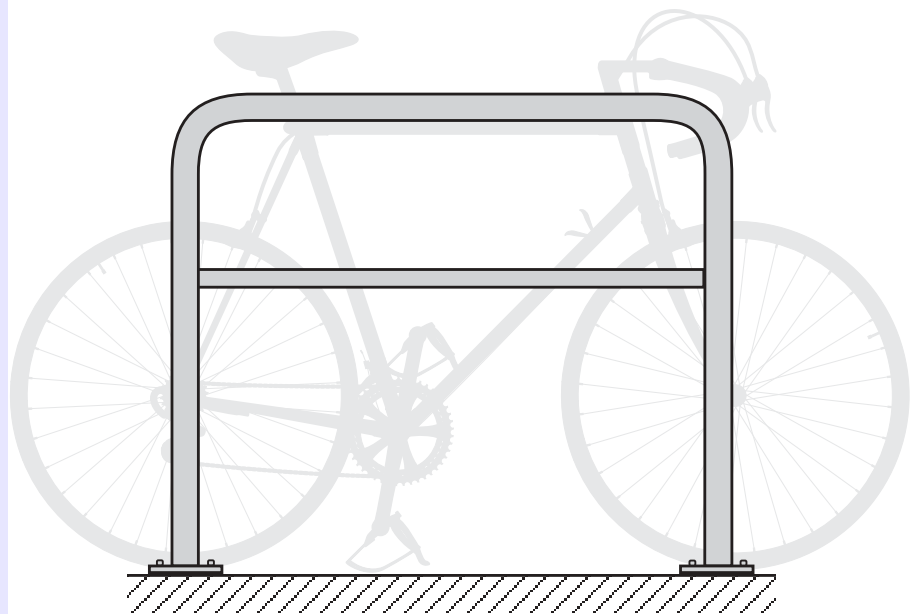
- Greater separation from traffic for bicycles.
- A place for pedestrians and wheelchairs in places with no sidewalks.
- Space for normal and evasive vehicle maneuvers.
- Recovery area to regain control of a vehicle.
- Space for disabled vehicles and emergency equipment.
- Better sight distance for drivers.
- 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.

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 choice. 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.



5 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, Washington, the Eliza Furnace Trail in Pittsburgh, Pennsylvania, and the Riverfront Trail in Missoula, Montana, are three 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 and can 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 an inter-connecting 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 of facilities that 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.

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.

“As an exercise physiologist and the former Director of the Shepard College Wellness Center, I see the West Virginia Rail Trail system as a way to enjoy the outdoors and exercise at the same time.”

—Donna Printz, Chair, West Virginia Rails-to-Trails Council



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.
- Clear destination and directional signing.



Trail crossing of highway with signal, median and high-visibility crosswalk

6 Slow Down Motor Vehicles

Problem

Speeding motor vehicles are probably the most common concern of walkers and cyclists on both local and major streets.

The wide residential streets typical of many new subdivisions encourage speeding. As streets get wider, drivers instinctively accelerate. As speeds go up, the risks to pedestrians and cyclists increase dramatically.

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

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).

Reduce the typical design speeds and roadway widths in neighborhood and residential areas. In other words, change the design so people will drive at the posted speed limit.

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

Considerations

You can reduce traffic speed and volume through a variety of measures:

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



Speed hump with median island

“Traffic calming is a set of techniques of street design. It involves a variety of small modifications to street geometry and dimensions to accommodate the automobile and to give the pedestrian psychological precedence.... it is far easier to get people to act differently by redesigning their environment rather than by persuading them with exhortation and even penalties.”

—D. Sucher. City Comforts. 1995

According to the Surface Transportation Policy Project's 1997 *Mean Streets* report, more than half of all pedestrian fatalities occur on roadways that run through residential neighborhoods. And a 1998 study of 20,000 accidents over a 20-year period in Longmont, Colorado, found a direct correlation between street width and crash rates. The safest streets were narrow, 24-foot wide streets. As streets got wider, the number of crashes per mile increased.

Refer to the **Glossary** at the end for terms such as *curb extension* and *smart growth*.

- Narrow the travel lane or roadway in either real or perceived ways (curb extension, curb radius reduction, on-street parking, pedestrian refuge island, landscaping, etc.).
- Regulate and enforce movements (signed turning restrictions, truck restrictions, photo radar, etc.).
- Reduce the need to travel (smart growth land-use planning, traditional neighborhood development, travel demand management).
- Can be applied in appropriate ways to both residential and commercial streets and highways.

Traffic calming can yield some significant safety benefits. For example, adding small traffic circles at neighborhood intersections resulted in a 77 percent reduction in crashes in Seattle, Washington, and a 58 percent reduction in crashes in Portland, Oregon. Curb bulbs (extensions) in Vancouver, British Columbia, reduced crashes by 75 percent, and narrowing streets in the same city reduced crashes by 74 percent.

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.
- Include a complete package of design and landscaping features that improve neighborhood aesthetics and livability.



Roundabout entrance

Crosswalk on speed table with median



7 Develop 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 or car. In some cases, children are not encouraged to walk or bicycle because their parents fear they will be endangered by traffic or crime. In other instances, some school administrators actively discourage bicycling and walking to school, preferring to simply consign all children to a yellow bus.

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

A growing number of communities have begun programs loosely grouped under the title of Safe Routes to Schools. School officials, parents, and local and national organizations are starting to work together to get more kids walking and cycling for daily, short-distance trips.

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

- Availability of sidewalks;
- Low traffic speeds and volumes;
- The number of street crossings required;
- The area through which the route passes (residential, commercial, industrial);
- Sight distances and visibility;

“Every child needs to move, but not every child likes sports. Some don’t welcome yet another rules-dominated, adult-run activity. Some lack athletic talent. Some have parents who can’t afford the fees or can’t chauffeur them to practice. But sports or no sports, every child still needs to move — and it’s a need our world conspires to deny. From schools with shrinking recess times to streets without sidewalks to homes filled with mesmerizing screens, today’s environment encourages immobility.”

—Kids on the move: Children don’t need to play team sports to stay active and fit, The Providence Journal, Dec. 17, 2000

Kids Walk-to-School is a program that aims to get children to walk and bicycle to and from school in groups accompanied by adults. This gives kids a chance to be more physically active, to practice safe pedestrian skills and to learn more about their environment. For a detailed manual on the program, see www.cdc.gov/nccdphp/dnpa/kidswalk/pdf/kidswalk.pdf.

- Availability of pedestrian walk signals at intersections; and
- Availability of crossing guards at busy intersections in the school zone.

All of these items are factored together, and the safest routes are established. Parents are supplied with a map indicating suggested routes and are encouraged to have their children walk to school. A note about physical exercise accompanies the map.

More proactive communities take this a step further 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.
- Using traffic-calming techniques and other forms of street design to limit motor vehicle speeds and volumes near school sites.
- 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. (A side benefit of this program is that a couple of adults get their daily exercise as well.)