



Guide to Changes to the Physical Environment

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People and agencies to partner with to explore potential changes to the built environment

Partners include:

- North Carolina Department of Transportation (NCDOT) Division engineers
- Local traffic engineers
- Local and regional planners
- Local and State public health professionals
- NCDOT

Helpful ways to engage with transportation decision-makers

Traffic engineers are trained to design streets and roadways to provide safe, reliable mobility. They are skilled in solving various traffic problems. Because of this, traffic engineers are most effective in their jobs when community members describe the problems they are having walking or biking on certain streets or at crossings.

Therefore, a helpful tip for engaging with traffic engineers is to **communicate the symptoms or describe a vision for the community, rather than propose solutions**. For example, instead of saying, “We really need a traffic light here!” Consider saying, “People in our community would like it to be easier to cross at this intersection.”

Another helpful strategy is to **take a walk with a traffic engineer and explore potential safety solutions**. Visiting problematic sites with a traffic engineer helps to develop working relationships,

which often lead to better solutions that the broader community supports. These professionals often point out things that are not always obvious to the rest of us. And when engineers see and feel problems first hand, they are more likely to act toward addressing the problems.

Assess your neighborhood’s walkability and bikeability

Before traffic engineers or planners propose fixes to the roadway, it is often a good idea to gather information on how the environment works for walking and biking. For example, is it easy to cross different streets? If no, which streets seem to be the most difficult for children to cross? Checklists are useful tools to assess the walk- and bike-friendliness of areas in and around neighborhoods and schools. They get everyone involved and can make assessment fun.

Principles of safe, accessible, and comfortable walking and biking environments

Engineers and planners are trained to solve problems with the way roadways work. They often know specific measurements for roadway elements, such as the width of sidewalks, bike lanes, and car travel lanes. This is among the reasons why professional engineers are the only group who can approve the final design of streets, sidewalks, and traffic lights. Yet despite their specialized training, engineers and planners often appreciate interacting with community members

who possess a vision for how the community prefers their streets to look, feel, and function for walking and biking.

The following are principles of safe, accessible, and comfortable walking and biking elements of the environment that relate to facilities placed along the travel way, at crossings, and on school campuses.

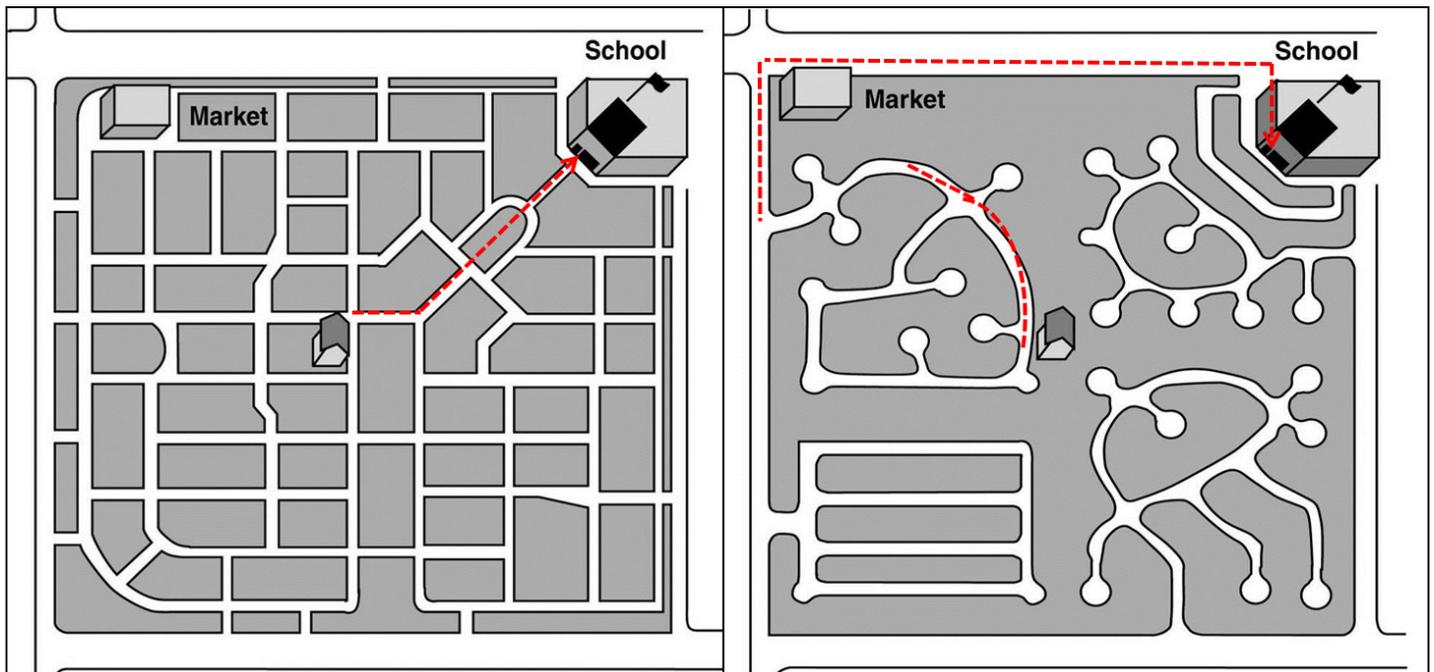
Traveling along the roadway: Car-separated facilities

Whether we're talking about biking or walking, kids, and everyone else benefit from having car-separated facilities, such as sidewalks and bike lanes. Being physically separated from cars makes walking and riding a bike more comfortable, convenient, and safe as children make their way to and from school.

Key principle: the greater the difference in speed between pedestrians and cars, and bicyclists and cars, the greater the distance should be between these users of the road.



Why street connectivity matters



This is an illustration of how street connectivity influences people's travel choices and routes. On the left, we have a gridded network of streets that provides road users several route options for getting to and from school. As you can see on the left, children and parents living in this home can travel to the school along a direct route. However, on the right, the disconnected "loops and lollipops"

layout of the streets makes it so that the family must travel out to the main road and therefore go much further to reach the school.

Key principle: streets that connect with one another allow for more direct access to destinations, safer travel, and greater choices on which routes to take to get various places.

Traveling along the roadway: Maintenance

Sidewalk maintenance, whether through landscaping or repair, is critical to the safety and comfort of using walking facilities. For example, bushes that grow into the sidewalk space can force walkers to step into the car travel lane to continue walking, which puts them in danger of getting hit by a driver. Not only bushes, but broken or uneven sidewalks can make it hard to people pushing strollers and using wheelchairs to safely travel through a space. It is therefore important to provide smooth, safe passage for walkers of all ages and abilities.

Key principle: sidewalks and bike lanes are only useful to the extent that they are even, smooth, and free of debris, cracks, and growing vegetation.



Traveling along the roadway: Pedestrian lighting



During fall and winter months, traveling to school often occurs during low light conditions, such as the early morning trip to school and later afternoon trip back home. Many believe that drivers can see them since cars are equipped with headlights. This is not always the case. Therefore, appropriate street lighting can increase the comfort and safety of walking or biking to and from school.

A few principles of safe, effective street lighting for pedestrians and bicyclists:

- Pedestrian walkways and crosswalks are well lit.
- Where appropriate, lighting is installed on both sides of wide streets and streets in commercial areas.
- Lighting levels are uniform across the entire span of sidewalks.

Crossing: Elements of safe crossings

A few key principles of safe street crossings:

- Crossings are as short as possible, making it easy for younger and older people and those with mobility impairments to safely cross; and
- Crossings are as visible as possible, so that walkers, bicyclists, and drivers can all see each other.



Basic accessibility principles

Among the main purposes of SRTS programs is to enable children, including those with disabilities, to safely walk or bike to school. It is worth working with planners, traffic engineers, and road builders to consider including a few basic additions to the roadway environment so that children and families of all abilities enjoy opportunities to benefit from safe, active school travel.

Basic principles of accessibility include:

- **Reachable, audible pedestrian signals.** These allow people using wheelchairs to reach and push the pedestrian call signal. Plus, audible signals are important for people with low vision.

- **Accessible curb ramps.** These should have:

1. very gradual slopes up to the sidewalk;
2. a tactile warning that the walker is about to enter a travel lane, which helps people with low vision know when they are close to entering a car traffic lane; and
3. a flat “landing pad” between the sidewalk and the tactile warning for so that people using wheelchairs can comfortably wait to cross the street.



On campus: Observing school arrival and dismissal



The best way to understand walking and bicycling safety issues at any school is by observing students arriving or departing during a normal school day. This includes observing children as they walk or bike the routes to school, how they cross streets, the interactions they have with cars and buses on the school campus, and how they make their way to the school door.

Key principles of observing on campus activity:

- Look at the physical environment for walking and biking both on the school campus and in the surrounding area; and
- Observe the behaviors of pedestrians, bicyclists and motorists. See the *Observation of a School: Understanding Walking and Biking Safety Issues* for a checklist of things to look for when observing school arrival and dismissal.

On campus: Bike parking

While on campus, it's also a good time to assess the school's bike parking situation. A few questions worth asking are:

- Is there any place to park and secure bikes?
- If present, is the bike parking easy to find?
- Is the bike parking a less than a two-minute walk to the front entrance of the school?
- Is the bike parking covered?

Note: covered parking is preferred for longer-term use in most climates found in North Carolina.



A few opportunities to improve the built environment for walking and biking to school



- **When roadways are widened.** Depending on the amount of space available and the speed of car traffic, when widened, some streets may include a striped bike lane. A bike lane provides a safe, comfortable place for children and community members to ride bikes separated from faster moving car traffic.
- **When roadways are repaved.** When towns or cities repave some roads, they might reposition the lines they paint on the roadways. For example, some places might take four motor vehicle lanes and turn them into two car lanes, a center turn lane, and two bike lanes. This is called creating a “road diet”. When used appropriately, road diets can greatly decrease crashes among all road users, provide a space for people to bike, make crossing the streets easier for people walking, and maintain the safe flow of car traffic.
- **When public works installs or upgrades utilities.** When public works installs utilities such as electricity, water and sewer service underground, they could work with local and state DOTs to install sidewalks on top of these underground utilities. Sidewalks might also be installed any time new housing, schools, or business developments are built, and when water and sewer lines are repaired or replaced.

Putting it all together

Making changes to the built environment to support walking and biking to school is difficult but rewarding work. It requires knowledge of appropriate roadway design. It also requires working with the right groups of professionals—traffic engineers, planners, public health professionals—and invested community members to develop a shared vision for how their

community should function for children and others walking and biking to school and elsewhere. We hope this guide on *Changes to the Physical Environment* helps you in working with thoughtful and knowledgeable people to improve walking and biking conditions for children, families, and residents of all ages and abilities in your community.