Creating Walkable and Bikeable Communities

Local governments realize the importance of providing for safe pedestrian and bicycle movements within their community. They understand that all trips have a nonmotorized component. These nonmotorized trips may be as short as a walk from a parked vehicle into a store or a bike ride from one's home to the neighborhood dry cleaner. Whether the trip is on foot or on a bike, all require individuals to travel along streets and sidewalks, often within close proximity to vehicles on roads.

A walkable and bikeable community provides facilities and amenities to encourage safe pedestrian and bicycle trips. These amenities range from the most basic — providing walkways and bicycle facilities — to redesigning neighborhoods and corridors to encourage and accommodate short-distance journeys using these alternative modes of travel. Typically the focus of transportation considerations in the land-use planning process has been on automobile needs (e.g., parking). Becoming a walkable and bikeable community requires a more balanced approach to transportation planning.

As a result, developing and maintaining a walkable and bikeable community requires careful integration of a community's land-use planning and policies. The benefits of providing safe, viable, and enjoyable walkways and bikeways are important to a community's quality of life, and can positively impact mobility, travel safety, recreation options, and vehicle travel time. These benefits create opportunities for improved health, and may also reduce air and noise pollution, decrease wear and tear on roads, and reduce congestion.

Keeping It Connected

Planning for walkable/bikeable communities has many issues common with other topics covered in this report including transit oriented design, safety management, and elderly mobility.

Planning and Regulatory Considerations

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and its successor, the Transportation Equity Act for the 21st Century (TEA-21) of 1998 identify nonmotorized transportation issues as important elements of an integrated, intermodal transportation system that provides travelers with alternatives.

Birmingham provides a pedestrian-friendly community by implementing signage for increased safety and walkability.

The Michigan State Long-Range Transportation Plan reflects the intent of ISTEA and TEA-21 by including creation and maintenance of on-road and off-road nonmotorized facilities as part of its transportation goals and objectives.

The 2025 Regional Transportation Plan for Southeast Michigan, developed by SEMCOG, recommends an increase in the "development and use of nonmotorized facilities.

Local master plans, zoning ordinances, capital improvement plans, subdivision regulations, and other local planning practices are used to support and regulate walking and bicycle friendly development.

See Tables 23 and 24 for information on federal and state funds available for walkable and bikeable development.

Tools for Walkable and Bikeable Communities

There are many tools and techniques available for creating and/or enhancing a walkable and bikeable community.

Success of these tools relys on proper application. Careful consideration must be given to both intended and unintended impacts of applying a tool. No one tool works in every situation – even if the scenarios appear similar. An integrated approach should be used that considers such things as landuse, area residents' and business operator's concerns, travel patterns on area streets and sidewalks (i.e., not just the facilities that will receive the application), and the interrelationship between land use and transportation planning. Creating or improving the

safety, continuity, and connectivity for motorists, pedestrians, transit users, and bicyclists is key.

Typical concerns that arise when these treatments are proposed may revolve around liability issues, emergency response times, and road maintenance. Often the objections result from a lack of familiarity with the successful application of these planning practices. Communities that have been successful in applying these techniques are those who actively involve all of the key stakeholders, such as residents, elected officials, emergency personnel (police, fire, etc.), merchants, maintenance personnel (e.g., snow removal), engineers, and planners in the process.

This chapter describes the following tools that can help achieve a walkable, bikeable community:

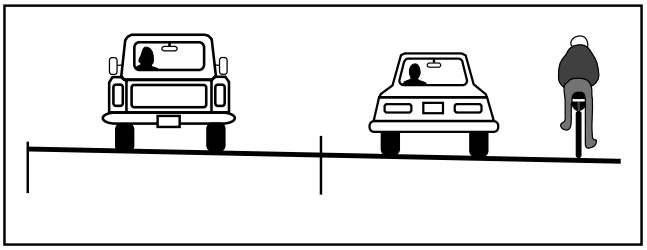
- Utilize pedestrian and bicycle friendly land use design.
- Street network design.
- Federal and state resources for walkable and bikeable development.

Utilize pedestrian and bicycle friendly land use design

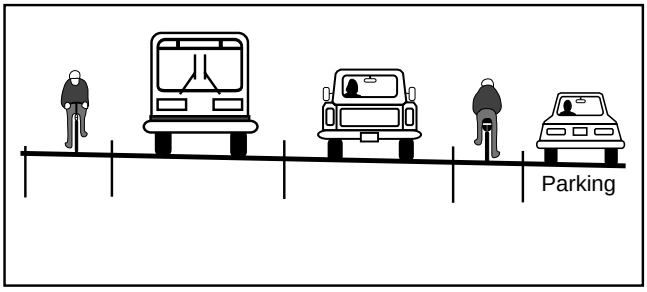
Pedestrian and bicycle friendly land use design requires equal treatment of different modes of travel, creates integrated land use, and provides convenient, safe, and direct travel routes. Pedestrians and bicyclists travel without protection from the elements, and at much slower speeds, shorter distances, and are more vulnerable to crashes than motorists. This makes their transportation facility needs much different from automobile travelers. However, many transportation systems have been designed with an almost singular focus on automobile travel where distances are less relevant and safety is measured from an automobile, not a nonmotorized perspective. Making land use design pedestrian and bicycle friendly therefore requires a rethinking of how communities are built or rebuilt so that it accommodates more than one mode of travel.

Many of the land use/transportation techniques described here can be found in older cities and villages built in the first half of the 20th century. During that time most communities carefully considered the location of homes, shops, schools, offices, industries, and services. This was out of necessity as nonmotorized trip making played a much bigger role than it does now. Developing communities can learn from these older communities by integrating walkable and bikeable elements in land use and transportation planning. In established communities, many of the goals of a walkable and bikeable community can be met by carefully developing certain parcels which were previously undeveloped and incorporating walkable and bikeable components in redevelopment projects.

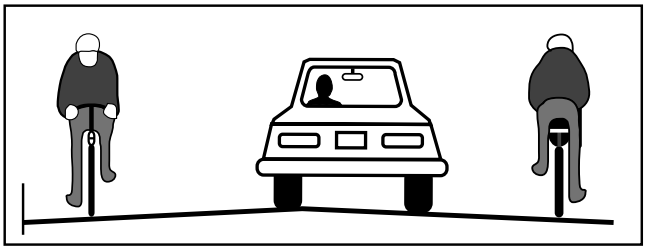
Figure 28
Bicycle Lane Options



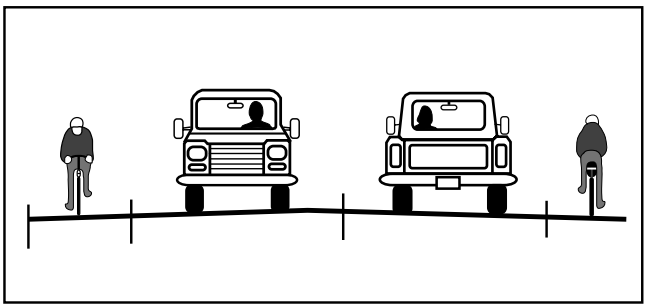
Wide lane.



Bike lane next to parking lane.



Wide shoulder.



Wide shoulder.

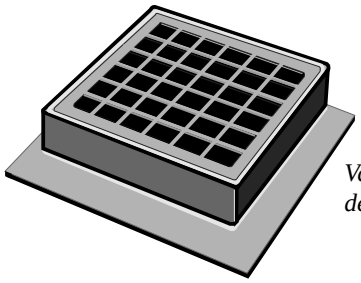
Source: National Center for Bicycling and Walking.

Table 19
Bicycle Friendly Street Network and Design Tools and Techniques

Tools and Techniques	Effect
Create bicycle facilities on-road and off-road. These include bicycle lanes, separate side paths, wide outside lanes, and paved shoulders. (See Figure 28)	Creates safe travel ways for bicyclists.
Design local streets so that they form connected patterns.	Makes it easier for bicyclists to take direct routes to destinations.
Use traffic calming and access management techniques (discussed in following sections).	Slows speeds and increases safety.
Work closely with state and county road agencies.	Creates consistent bikeways.
Provide bicycle safe drainage grates and rail road crossings.	Prevents wheels getting caught and reduces risks of crashes.
Use traffic signals that respond to bicyclists (e.g., use intelligent transportation detectors that are sensitive to the weight of a bicyclist).	Provides greater safety and ease of use by bicyclists.

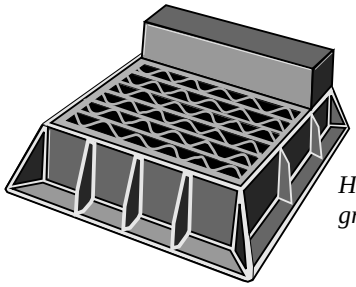
Figure 29
Comparison of Bicycle Unsafe and Safe Drainage Grates

Grates that are not flush with the roadway surface can stop or divert a cyclists wheels, causing wheel damage and a serious injury.



Vane grate design

These grates are bicycle safe and hydraulically efficient.



Honeycomb grate design

Source: National Center for Bicycling and Walking.

The following local planning areas should include bicycle and pedestrian friendly elements.

Master plan and/or recreation plan

- Require pedestrian and bicycle access throughout the community and in open spaces (e.g., call for continuous sidewalks).
- Preserve open spaces within and between communities. This creates a "greenbelt" which is a natural buffer and provides other environmental benefits such as storm water filtration and habitat.
- Include a proposed network of pedestrian and bicycle access in the master plan map, which connects activity areas and other points of interest. This provides an interconnected, transportation network-wide plan for bikeways and walkways that connects the places community members are most likely to travel to and from. Coordinate the development of this plan with county level plans such as greenways plans.

Zoning provisions

- Create zoning laws and regulation policies that allow mixed-use development. This allows a wider variety of services to locate in closer proximity to each other and residential areas.
- Locate buildings close to the street. This allows easy access by pedestrians, has a traffic calming effect, and reduces impervious surfaces.
- Subdivision regulations.
- Create shortened trips and shortcuts by creating pathways between cul-de-sacs, through parking lots, and other places. This allows pedestrian and bicyclists to take the shortest distance routes.
- Require sidewalks.

Site plan standards and review

- Require pedestrian and bicycle facilities in site plans and as part of the site plan review checklist.
- Community Recreation Plan.
- Include pedestrian and bicycle access in the community's recreation plan .
- Capital Improvements Program.
- Provide capital funds for phasing development of bicycle and pedestrian facilities.

Improve street network and design

There are several tools that communities use to design and create street networks that are conducive to bicycling and walking including the following techniques:

- Use roadway treatments to improve bicycle use.
- Use roadway treatments to improve pedestrian use.
- Create intersections that improve bicycle and pedestrian mobility and safety.
- Use buffering, screening, and landscaping for improved walkability.
- Use access management techniques to create walkability and bikeability.
- Create bicycle parking standards for better bikeability.

Rethinking how street networks are designed so they support multi-modal transportation is key to creating walkable and bikeable communities. This includes locating walkways and bikeways both on and off the road, designing intersections and streets for bicycle and pedestrian safety, and including other street design factors that increase safety and allow the use of the right-of-way by pedestrians and bicyclists. The main components of street network design are explained below.

Use roadway treatments that improve bicycle use

Accommodations to the roadway are required when the volume and speed of cars are high enough to make sharing roadway lanes dangerous and uncomfortable for bicyclists. There are a number of roadway treatments that improve safety for bicyclists (see Table 19).

Bicycle lanes, such as those in Ann Arbor, should be clearly labeled.

Table 20
Pedestrian Friendly Street Network and Design Tools and Techniques

Tools and Techniques	Effect
Require new residential and pedestrian development and redevelopment to include sidewalks and sidewalk continuity.	Creates safe, continuous walkways.
Require sidewalk development as a part of all capital projects (e.g., roads).	Ensures creation of sidewalks wherever capital projects occur.
Develop consistent standards for sidewalk construction based on state and federal recommendations for safety.	Ensures consistency and safety. See Additional Resources for recommended standards.
Install pedestrian amenities wherever possible (e.g., benches, shade trees, transit shelters, and buffers).	Creates a safe and welcoming pedestrian friendly environment that provides added protection from the elements and vehicles.
Consider adding medians to narrow wide streets.	Increases safety of pedestrians by decreasing crossing exposure and providing a safe break point to cross the street.
Design convenient and safe midblock crossings for pedestrians at regular intervals.	Reduces unsafe and unpredictable crossings by pedestrians. See Additional Resources for recommended distances.
Set up regular maintenance schedules for sidewalks and walkways in capital improvement program.	Ensures that sidewalks and walkways are clean, debris free, and remain safe.
Use buffering between streets and pedestrian sidewalks and walkways.	Creates a feeling of safety and protection from automobile travel.

Table 21
Pedestrian and Bicycle Friendly Intersection Design Tools and Techniques

Tools and Techniques	Effect
Make on-road bicycle facilities direct, logical, and as close to the motor vehicle traffic as safely possible.	Improves safety by making bicyclists visible and their movements predictable. See Additional Resources for recommended standards.
Create pedestrian crosswalks that are clearly marked and well maintained.	Improves safety where pedestrians cross streets.
Install ADA approved curb ramps with all new construction and as part of any repairs or improvements.	Allows greater accessibility for the physically impaired, elderly, and strollers.
Ensure traffic signals allow adequate crossing time.	Allows enough time for pedestrians to comfortably cross streets.
Develop pedestrian friendly design guidelines for intersections to be followed whenever new intersections are built or when existing intersections are improved or reconstructed.	Creates consistency in intersection design that allows greater safety and predictability for bicyclists and automobile drivers.
Consider making right turns on red illegal at corners with high pedestrian traffic.	Creates greater safety and predictability for pedestrians and bicyclists by making automobile turns more predictable.

Table 22
Bicycle Friendly Parking Standards Tools and Techniques

Tools and Techniques	Effect
Install bicycle parking where it is clearly visible, accessible, and does not interfere with other street uses.	Improves access to parking.
Install bicycle racks and lockers in areas of high pedestrian travel.	Reduces security concerns.
Place bicycle lockers near areas of long term bicycle parking (such as transit stations).	Improved safety against theft.

Use roadway treatments to improve pedestrian use

People tend to walk on the roadway or discontinue walking altogether when sidewalks and walkways are not provided, are in poor repair, or have missing sections. These conditions make it very difficult for people without automobiles or with disabilities to get around. There are multiple ways to improve pedestrian facilities. A key component to this is to create incentives, through regulations, for facilities to be developed (see Table 20).

Create intersections that improve bicycle and pedestrian mobility and safety

A large percentage of pedestrian and bicycle crashes occur at intersections. Proper design can reduce crashes and improve safety. Although each intersection has unique features requiring individual treatments, there are some primary principles to be applied to all intersections (see Table 21).

Use buffering, screening, and landscaping for improved walkability

Creating barriers between walkways and roadways make walkers feel comfortable and safe from automobile traffic. Use four to six foot planting strips between walkways and roadways when possible and select plants that do not impair visibility of motorists and pedestrians. In addition, buffers serve to reduce conflicts between incompatible land uses, minimizes soil erosion, reduces stormwater runoff, and enhances community appearance.

Use access management techniques to create walkability and bikeability

Unlimited access on urban thoroughfares creates conflicts between both cars entering or leaving a roadway and bicyclists and pedestrians riding or walking along the roadway. Access management techniques assist pedestrian, motor vehicle traffic, and bicyclists by:

- reducing the number of conflict points,
- redirecting motor vehicles to intersections with appropriate control devices,
- increasing pedestrian crossing opportunities,
- reducing the need for special treatments at driveways and, thus, accommodate the disabled, and
- making the streetscape more attractive.

Please see section on access management under transportation infrastructure for specific tools and techniques.

Create bicycle parking standards for better bikeability

The lack of safe and convenient parking for bicycles is often overlooked when designing site plans. Potential bicycle riders will not risk themselves or their bicycling equipment when safe, secure, and convenient parking facilities are unavailable (see Table 22).

Federal and state resources for walkable and bikeable development

Resources are available at both the federal and state level for walkable and bikeable development. Tables 23 and 24 provide a summary of these available resources.

Table 23
Federal Resources for Walkable and Bikeable Development

Program	Eligible Projects, Programs and Activities	Available Funds FY 2002 (millions)	Eligible Recipients	How Are Funds Distributed	When to Seek Funds
Surface Transportation Program - Enhancement	Non-motorized, facilities.	$3.1 (annual average award to Southeast Michigan).	Cities, villages, county road commissions, MDOT, transit agencies.	Funds distributed twice annually statewide based on merit by project category.	Applications accepted by MDOT throughout the year.
Congestion Mitigation Air Quality	Programs to limit portions of road surface to the use of non-motorized vehicles or pedestrian use; programs for secure bicycle storage and bicycle lanes and other facilities.	Depends on projects submitted.	Cities, villages, county road commissions, MDOT, transit agencies.	Based on impact on mobile source emissions.	Applications accepted by SEMCOG every two to three years. No set schedule.
Section 5307 Urbanized Area Formula Program	Project and project elements designed to enhance mass transportation services or use including pedestrian access and walkways, bicycle storage and bus bicycle racks.	One percent of formula apportionment (see above) for urban areas greater than 200,000.	DDOT, SMART, AATA, and BWATC.	Based on formula.	No schedule for developing projects as funds are distributed via formula.

Table 24
State Resources for Walkable and Bikeable Development

Program	Eligible Projects, Programs and Activities	Available Funds FY 2002 (millions)	Eligible Recipients	How Are Funds Distributed	When to Seek Funds
Michigan Transportation Funds	Operations, maintenance, construction reconstruction, resurfacing of non-motorized paths and sidewalks.	See roadways.	Cities, villages, county road commissions, MDOT.	Based on formula.	No application required.

Case Example

Streetscape – The Mexicantown International Welcome Center and Mercado

Community: Detroit

Contact: Margaret Gary, (313) 967-9898

The Mexicantown International Welcome Center and Mercado is a $12.5 million project to be built in the heart of Mexicantown, at the base of the Ambassador Bridge. It is designed to create a good pedestrian area and includes plans for streetscape improvements. The project will incorporate many different programs that are intended to serve a wide range of people, and provide a locale for economic and cultural development in Detroit, Mexicantown, and Southeast Michigan. It is scheduled to open in 2003. The developers of this project are working with the Michigan Department of Transportation to improve streetscapes in a number of ways including the creation of a pedestrian bridge to span the highway in order to connect Bagley Avenue Mexicantown.

Proposed improvements to Mexicantown.

Source: Mexicantown Community Development Corporation.

Additional Resources

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U.S. Department of Transportation, Federal Highway Administration. *The Bicycle Compatibility Index: A Level of Service Concept, Implementation Manual*. 1998. www.hsrc.unc.edu/research/pedbike/98095.