This Bicycle and Pedestrian Toolbox is a synthesis of current research on bicycle and pedestrian planning and facilities providing transportation planners and engineers with information on how to plan and design a bicycle and pedestrian network for a community.

This Bicycle and Pedestrian Toolbox provides transportation planners and engineers with information on how to plan and design a bicycle and pedestrian network for a community. This toolbox summarizes each stage involved in the process of designing an active transportation network with a focus on how land use effects transportation planning. The planning is a cyclical six-stage process where first, community values are determined; second, existing features are evaluated; third, desire lines are identified; fourth, phasing of development is defined; fifth, selecting design treatments; and finally, sixth, evaluation of the network based on performance criteria.
Bicycle & Pedestrian Toolbox
Tools to Develop an Active Transportation Network
Purpose of Manual

FORWARD

The Bicycle and Pedestrian Toolbox is the result of a research implementation grant from Mn/DOT’s Research Section. Based on existing research and current policy the toolbox provides transportation practitioners with a quick reference of basic guidance and public involvement tools to assist in the development of bicycle and pedestrian networks at the community level. While the information found in the toolbox can be used as a stand alone piece it is designed to compliment the Mn/DOT Modal Plan and the Mn/DOT Bicycle Facility Design Manual. The Toolbox is also an evolving document in which we hope to add new topics over time.
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WHAT IS A BICYCLE AND PEDESTRIAN TOOLBOX?

This Bicycle and Pedestrian Toolbox provides transportation planners and engineers with information on how to plan and design a bicycle and pedestrian network for a community.

This toolbox summarizes each stage involved in the process of designing an active transportation network with a focus on how land use effects transportation planning. The planning is a cyclical six-stage process where first, community values are determined; second, existing features are evaluated; third, desire lines are identified; fourth, phasing of development is defined; fifth, selecting design treatments; and finally, sixth, evaluation of the network based on performance criteria.

HOW IS ACTIVE TRANSPORTATION DIFFERENT FROM VEHICULAR TRANSPORTATION?

Being able to walk or bike to destinations is important in many communities. However, encouraging people to leave their car behind for short trips or to commute to work requires providing direct, safe routes and specific facilities to be in place to support bicycle and pedestrian traffic.

Bicycling is an efficient and convenient form of transportation in small towns and in urban areas as many short trips can be achieved quicker than driving. Bicycling and walking provides a high degree of independence, flexibility, and freedom of choice.

Improved pedestrian and cycling networks benefit everyone in the community regardless of how much they use active transportation. Active transportation increases safety and comfort of pedestrians and cyclists, broadens travel options for non-drivers, reduces automobile traffic, and increases recreational activity to create livable cities.

Diagram 1.1 Stages of Planning an Active Transportation Network. From Minnesota Bicycle Transportation Planning and Design Guidelines.
Performance Criteria

What do we want to achieve?

WHAT ARE THE COMMUNITY VALUES OF A BICYCLE AND PEDESTRIAN NETWORK?

A vision of how bicycling and walking fits into the overall transportation system of a community is important in developing a safe and enjoyable active transportation network. This requires establishing community goals and values relating to the bicycle and pedestrian network.

A “Bikeability Checklist” is provided on pages 24-28 to assist communities in determining what improvements are needed or desired. A “Walkability Checklist” is also provided on pages 29-31.

WHAT DO BICYCLISTS NEED FROM THE NETWORK?

The average bicyclist requires 4 1/2 feet of operating space and prefers to ride on neighborhood streets or designated bicycle facilities. A continuous and comprehensive bicycle network in a developed area enhances the safety and travel comfort of bicyclists.

Experienced bicyclists will travel on roadways with high traffic volumes in order to take the most direct route to a destination. Therefore, accommodation of bikers even on major roadways should be accounted for in the redesign or development of new roadways.

Travel distances of bicyclists typically range from 1 to 4 miles. Providing direct, safe routes to destination points encourages bicycle use and enables cyclists to be significantly faster than bus travel and comparable to vehicular traffic for short trips.

WHAT DO PEDESTRIANS NEED FROM THE NETWORK?

Walking is a fundamental form of transportation that is integral to the mobility, health and livability of a community. All travelers are pedestrians at some point by either making the entire trip by foot, by walking to the bus, or by walking from a parking space to the front door.

Pedestrians need many of the same design elements as cyclists. These include safety, comfort, accessibility, and convenience.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Prefers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experienced Cyclist</td>
<td>Operate under most traffic conditions</td>
</tr>
<tr>
<td></td>
<td>Majority of use on collector or arterial roadway</td>
</tr>
<tr>
<td></td>
<td>Direct access to destination using existing streets and highways</td>
</tr>
<tr>
<td></td>
<td>Operating at maximum speed with minimum delays</td>
</tr>
<tr>
<td></td>
<td>Sufficient operating space on the roadway or shoulder</td>
</tr>
<tr>
<td>Average Cyclist</td>
<td>Comfortable access to destinations either by low speed, low traffic streets or designated bicycle facilities</td>
</tr>
<tr>
<td></td>
<td>Well defined separation of bicycles and motor vehicles</td>
</tr>
</tbody>
</table>
Performance Criteria

What do we want to achieve?

**HOW WILL I ENCOURAGE BICYCLISTS AND PEDESTRIANS TO USE THE NETWORK?**

The following factors will encourage the use of an active transportation network:

- **Directness and Continuity**
  Routes should be direct and smooth with minimal waiting at intersections.

  Missing links should be minimized. If gaps exist, they should be well signed in advance, providing alternative routes that are safe and pleasant to use.

- **Safety**
  Confrontation with traffic should be minimized. Motor vehicle speeds and volumes are key factors in determining the degree of separation between active transportation and motorists. Sufficient width, site distances, and safe intersections where delay to bicyclists and pedestrians is minimal are essential to the development of a safe bicycle and pedestrian network.

- **Attractiveness and Comfort**
  The addition of landscaping, lighting, level pavement without curbs, and site facilities enhance the attractiveness of the route and visual separation between vehicular and active transportation.

- **Accessibility**
  Accessibility is measured by the spacing between routes and the distance a bicycle or pedestrian facility is from a specific destination. It is important for networks to be coherent and understandable, even for users such as children who have little sense about traffic.

### Table 5.1 Design Elements for Main and Local Bicycle Routes

<table>
<thead>
<tr>
<th>Design Element</th>
<th>Main Route</th>
<th>Local Route</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Speed</td>
<td>30 mph</td>
<td>15 mph</td>
</tr>
<tr>
<td>Average Waiting Time</td>
<td>30 s/mile</td>
<td>40 s/mile</td>
</tr>
<tr>
<td>Spacing between Routes</td>
<td>1/2 mile</td>
<td>650’-1500’ (older areas)</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>500’-1300’ (new areas)</td>
</tr>
<tr>
<td>Average Chance of a Stop</td>
<td>1 Stop/1 mile</td>
<td>1 Stop/1/2 mile</td>
</tr>
</tbody>
</table>

**Main Route**: Serves regional or long-distance bicycling.

**Local Route**: Carries internal traffic in city district or between adjacent areas. Has substantial pedestrian traffic.
Inventory of Existing Features

**What do I currently have?**

**WHERE DO BICYCLIST CURRENTLY GO?**

Bicyclists typically have the same destinations as motorists and want to take the most direct route to get there. Evaluation of existing bicycling patterns will indicate which routes can be improved or enhanced by providing facilities and safety elements along the network.

**WHAT TRAILS CURRENTLY EXIST?**

The condition, location, and type of bicycle facilities should be evaluated to determine if the facilities warrant incorporation or removal. If existing trails are used as the nucleus of a new or expanded network, then the inventory should note improvements necessary to bring the network up to uniform design and operation standards.

Existing local collector roadways operating at peak times should also be evaluated for suitability of the network. See Table 6.1 for a list of existing conditions that should be evaluated as part of a community’s network analysis.

**HOW DO I CONNECT TO PUBLIC TRANSPORTATION?**

Creating a multi-modal network of bicycle, pedestrian, and public transportation is critical to the success of a bicycle network. Public transportation allows cyclists to travel greater distances, however, proper facilities need to be in place for a smooth connection. These include:

- Providing bicycle racks on bus and light rail systems
- Secured bicycle parking at transit stops
- Safe connections from bicycle to public transit

The connection of transit to the bicycle network should occur via local bicycle routes. Directly connecting transit to a main bicycle route will interrupt the continuity of the main route. Refer to Diagram 6.2.

---

**Table 6.1 Existing Roadway Conditions to be Evaluated.**

From Minnesota Bicycle Transportation Planning and Design Guidelines.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Existing Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roadway classification</td>
<td></td>
</tr>
<tr>
<td>Number of lanes</td>
<td></td>
</tr>
<tr>
<td>Bus routes</td>
<td></td>
</tr>
<tr>
<td>Width of outside lane</td>
<td></td>
</tr>
<tr>
<td>Operating speed</td>
<td></td>
</tr>
<tr>
<td>Pavement condition</td>
<td></td>
</tr>
<tr>
<td>Accident data</td>
<td></td>
</tr>
<tr>
<td>ROW width</td>
<td></td>
</tr>
<tr>
<td>Major barriers</td>
<td></td>
</tr>
<tr>
<td>On-street parking</td>
<td></td>
</tr>
<tr>
<td>Frequency of intersections</td>
<td></td>
</tr>
<tr>
<td>Grades</td>
<td></td>
</tr>
<tr>
<td>Commercial driveways</td>
<td></td>
</tr>
<tr>
<td>Railroad crossings</td>
<td></td>
</tr>
</tbody>
</table>

**Diagram 6.2 Connecting Public and Bicycle Transit.** From Creating Bicycle Transportation Networks: A Guidebook.
Desire Lines

Where do I want to start the network and where will it go?

WHAT LAND USES CAN BE CONNECTED?

Land uses such as universities, recreational facilities, and high density residential areas generate a large volume of non-motorized travel.

An efficient transportation system closely links land use policies that encourage dense, multi-use land use patterns in order to shorten trip distances for the greatest number of people. Where higher densities are impossible or undesirable, mixed use development should still be encouraged.

Land use patterns that encourage transportation of transit should include:

- Development of land uses that make active Transportation convenient
- Daily and weekly tasks can be more easily Accomplished if transit stops are developed as nodes of service and retail activity
- Preferential parking for bicycles at transit stops

The majority of peak morning and evening trips are made between home and child care and employment centers. On the weekend, the pattern of trips is more dispersed as people travel to shopping centers, parks, and other residential areas.

Density within a land use area will help determine the location and type of bicycle and pedestrian facilities needed. Refer to Table 7.1.

Land use and zoning policies can also provide backing behind the development of a non-motorized network. Bicycle parking requirements and limitations on automobile parking are a few examples of how a city can encourage bicycle transportation. Refer to sheet 17 for model Bicycle Parking Requirements.

The diagram on Page 18 illustrates the placement of bicycle routes in relation to land use and travel distance.

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Bicycle and Pedestrian Network on Urban and Suburban Streets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial</td>
<td>Both sides</td>
</tr>
<tr>
<td>Industrial</td>
<td>Both sides</td>
</tr>
<tr>
<td>Residential (Arterials)</td>
<td>Both sides</td>
</tr>
<tr>
<td>Residential (Collector)</td>
<td>Both sides for multi-family, one side for single family</td>
</tr>
<tr>
<td>Residential (Local Street)</td>
<td>Both sides</td>
</tr>
<tr>
<td>1-4 Units per Acre</td>
<td>Prefer both, require at least one side</td>
</tr>
</tbody>
</table>
Desire Lines

Where do I want to start the network and where will it go?

**HOW CAN I MAKE A CONNECTION TO THE “FRONT DOOR”?**

Safe and convenient access from a bicycle and pedestrian network to an entrance should be provided. Large expanses of parking that separate the bicyclist and pedestrian from the front door do not encourage active transportation. Placement of the building as close to the network as possible or providing safe entrances to the building will minimize interaction between vehicles, pedestrians and bicyclists.

**HOW CAN EXISTING ROUTES BE ENHANCED FOR BICYCLE USE?**

Existing roadways that are to become part of a bicycle network can be adapted by:

- Reducing lane widths
- Re-configuring the Right-of-Way
- Removing or Reducing Parking Lanes

Reduced lane widths and re-configured Right-of-Ways not only slow down traffic, but also provide space for the creation of separate bicycle lanes.

On-street parking can be narrowed to 8’ and in some cases may only be needed on one side to accommodate residences and businesses.

Existing roadways can also be a barrier for bicycle and pedestrian transportation. Bridges without a bicycle or pedestrian way are a common example. Being attentive to the needs of cyclists and pedestrians in the initial planning stages of new roadways could eliminate barriers for future networks. “Spot Improvements” to existing barriers may be necessary to connect existing networks.

Refer to page 19 for additional roadway improvements.
Desire Lines

Where do I want to start the network and where will it go?

**WHAT MAKES UP A BICYCLE NETWORK?**

The three main components of a bicycle network are classified according to existing features, density, and land use. They are:

- Main Routes
- Local Routes
- Access Routes

Main routes serve to connect major employment centers, retail, commercial, industrial, residential and entertainment destinations. They provide connections between regions and provide the most direct route. Main routes serve the largest area and connect suburbs to downtown or small town to small town.

Local routes are used to access main routes and connect neighborhood to neighborhood. Small to medium retail are major destination points for local routes. Local routes provide connections between home and school or home and local parks. Connection to public transportation should occur along these routes.

Access routes provide connections of land uses within a neighborhood. They are often low traffic local streets where bicycles are compatible with vehicles.

*Diagram 9.1 Connecting Regions and Neighborhoods with a Bicycle Network.* From *Design and Development Principles for Livable Suburban Arterials.*
Phasing

What routes will be developed first?

**WHAT ROUTES BEST MEET PERFORMANCE CRITERIA?**

Main routes that best meet the performance criteria should be established first and then evaluated according to the predetermined performance goals. Route selection is tied closely to the type of design treatment and land uses that will be connected by active transportation. Future planning of high density areas with mixed land use should also be considered as they are ideal places to begin a network. Design treatments are discussed on pages 11-14.

The placement of bicycle facilities also relates to existing roadway conditions. The table on page 19 lists design elements needed along main routes, local routes, and access routes.

**WHAT IS THE CURRENT BICYCLE TRIP FLOW?**

Existing bicycle facilities are often used as a starting point for a new or expanded network. Inventory gathered on the existing network should indicate improvements necessary to bring the network up to uniform design and operation standards.

Bicycle trip flows can be calculated from existing patterns of traffic flow. The Average Daily Traffic (ADT) of each roadway section can be multiplied by the percentage of trips made by bicycle (referred to as bicycle modal split and provided by census data) for a community to determine the amount of bicycle traffic between land uses.

**WHAT ARE FUTURE PLANS FOR THE ROADWAY?**

Planning of a network should be coordinated with planned roadway construction. The addition of bike lanes or wide shoulders can be implemented with the construction of the roadway. Roadways that currently carry bicycle traffic should provide alternate routes for the cyclist while under construction.
Design Treatments

What elements will I need along the route?

WHAT ARE SAFETY ISSUES?

Lighting, signage, landscaping, and grade separation are design elements that can improve safety along the roadway.

Lighting systems should provide adequate horizontal and vertical illumination along the entire length and width of the bikeway. Horizontal lighting is needed for cyclists to read pavement markings along the path. Vertical lighting is needed to illuminate cyclists and obstacles along the network.

Signage not only denotes a prescribed route for cyclists, but also delineates what space is not to be used by vehicles. Signage should be easily read and interpreted by all ages.

Grade separation between bicyclist and vehicles is essential along high speed roads. This can be achieved by:

- Raised path separated by a curb
- Raised path separated by a divider
- One-way travel on shoulder

Recommended path widths based on road speeds are provided on page 23.

The table on page 21 provides recommended separation guidelines between streets and bicycle facilities. The matrix on page 22 illustrates various design treatments based on road speeds.

CAN THE BIKE PATH BE INTEGRATED INTO PEDESTRIAN TRAFFIC?

Pedestrians and cyclists can share facilities along local and access routes. However, main bicycle routes should provide a separate path for pedestrian and bicycle users. This allows for continuous movement along the path with minimal interruptions.

Table 10.1 Recommended Average Illumination Levels.
From Minnesota Bicycle Transportation Planning and Design Guidelines.

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Horizontal Level (lux)</th>
<th>Vertical Level (lux)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial</td>
<td>10</td>
<td>22</td>
</tr>
<tr>
<td>Intermediate</td>
<td>6</td>
<td>11</td>
</tr>
<tr>
<td>Residential</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Walkway, bikeway &amp; stairway</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Pedestrian Tunnel</td>
<td>43</td>
<td>54</td>
</tr>
</tbody>
</table>

Good Example. Clear, descriptive sign interpreted by all users.

Bad Example. Sign barely seen and no visual graphics provided.

Separate two-way bikeway along interstate.

Pedestrian and bicycle path separated by grass median.

© Regents of the University of Minnesota. Used with the permission of Metropolitan Design Center.
Design Treatments

What elements will I need along the route?

WHAT AND WHERE ARE FACILITIES NEEDED?

A successful bicycle network must provide appropriate facilities along a continuous network. These include:

- Bicycle lockers
- Bicycle racks
- Shower and bicycle storage at work place
- Signage

A statewide survey conducted in 1999 indicated that those who currently do not bike to work would consider bicycling if bicycle facilities were improved.

Bicycle parking facilities should be provided at both trip origin and destination. They should be safe and prevent theft and damage.

Snow and ice removal along bicycle facilities is also critical for a year-round network. On-street bike lanes and bicycle trails must be plowed. For example, the City of Minneapolis plows all on-street bike lanes and the Minneapolis Park Board is responsible for plowing a single path along all trails.

Zoning regulations can encourage major employers to support active transportation by providing locker rooms and bicycle parking. The table on page 17 provides model bicycle parking requirements that are used in Vancouver, British Columbia.

Covered bike lockers provide a safe and aesthetically pleasing place to store bikes.

Bicycle lockers and racks located within secure parking lots provide safe storage while at work.

Plowed bicycle path during snow storm.
Design Treatments

What elements will I need along the route?

**HOW CAN SUBURBAN ROADWAYS BE MODIFIED TO INCLUDE AN ACTIVE NETWORK?**

Traditional suburban development that consists of cul-de-sac and dead end roadways have unique design treatments as they were designed with the vehicle in mind.

The lack of road hierarchy results in major arterials that have smaller local roads feeding into them. These low traffic roadways often do not provide direct access to destination points and therefore are not ideal for local or access bicycle routes.

Providing bicycle and pedestrian connections between dead end streets and cul-de-sacs can begin to form an active network within suburban development by connecting clusters of development.

Design elements that create a development that supports walking and cycling are characterized by:

- Mix of residential, commercial, and office uses in one area
- Varied housing options within a neighborhood
- Off-street parking located at the side or rear of a building
- Design of commercial and civic buildings with interesting architecture, windows at street level, and sidewalk cafes
- Sidewalks, on-street bike lanes, trails, and parks with pedestrian lighting, and benches throughout residential, commercial, recreational, and industrial areas
- Street patterns that are logical and well connected with short blocks

*Diagram 12.1 Connecting Existing Developments with Bicycle Network. From Suburban Mobility Design Manual.*

Existing Suburban Developments Unconnected

Proposed Connection between Suburban Developments

Mixed use development that allows for bikers and pedestrians to shop on their way home.
Design Treatments

What elements will I need along the route?

HOW CAN URBAN ROADWAYS BE MODIFIED TO INCLUDE AN ACTIVE NETWORK?

Urban areas are ideal places to begin an active transportation network. The existing street grid provides a hierarchy of roadways for cyclists and pedestrians that is logical and direct.

Design treatments that provide safety, accessibility and comfort are needed along urban roadways. Emphasis is on providing a compact urban environment with a variety of uses. Infill and redevelopment will occur to preserve the density and variety of land uses.

Concentrating employment and activity centers along public transit corridors will assist in providing an integrated multi-modal transportation system that can be accessed by all users.

Providing appropriate width, clearance, and signage for sidewalks may allow for both pedestrian and bicycle traffic along urban roadways.

HOW CAN RURAL ROADWAYS BE MODIFIED TO INCLUDE AN ACTIVE NETWORK?

Development of an active transportation network in a rural community varies from an urban environment in that density is lower and land uses are spaced further apart. Public transportation is also typically not provided in smaller communities.

Rethinking the right of way along rural roads will provide room for main bicycle routes. Refer to table on page 23 for required shoulder widths along rural roadways.

The shoulder along rural roadways are often used for recreational cyclists. They allow cyclists and pedestrians to travel long distances without interruption or a high amount of traffic.

Regular maintenance of shoulder sweeping and plowing will greatly improve the conditions for cyclists and pedestrians along rural roadways.

Local urban street used as bicycle route.

Urban sidewalk that accommodates pedestrian and bicycle traffic.

Businesses along Main Street in a rural community.

Cyclists using rural roadway for recreational purpose.
Evaluation of the System
How does the system meet my goals?

**DOES THE SYSTEM FUNCTION AS A WHOLE?**

An evaluation of the active transportation network after each phase is implemented is critical for developing a complete network. This final step identifies which routes require further work or which routes do not meet the goals determined by the community.

If gaps exist in the bicycle and pedestrian system, the network will not work as a whole and has to be reevaluated. Previously discarded desire lines may become appropriate as the network develops over time.

Facility locations also are reviewed as surrounding land uses develop. A lack of bicycle racks or lockers at critical locations can result in an incomplete network.

The “Bikeability” and “Walkability” Checklists provided on pages 24-31 are tools that can be used to gather public feedback on the installed bicycle and pedestrian network.

**HOW CAN GAPS BE INTEGRATED INTO FUTURE PLANNING?**

A lack of connection between bicycle and pedestrian facilities discourages users. Gaps identified during the evaluation process should be addressed and take priority prior to the development of new bicycle and pedestrian facilities. Gaps in the network result in the active transportation network not functioning as a complete system.

“Bikeability” Checklist provided as a tool to identify gaps and success of the network. Refer to pages 24-28 for full checklist.
What have I learned about active transportation?

Walking and bicycling serve as major forms of transportation in many countries. These active systems have been in place for a number of years and the benefits of creating healthy, livable cities are apparent. The challenge for planners today is to incorporate similar ideals into the existing framework of a community.

Land use is a major factor in the design and success of an active transportation network as it determines where and how far people must travel. Bicycle and pedestrian networks require a high density of land uses that provide a diversity of services for the user. However, facilities must be provided to encourage people to choose bicycling and walking over driving.

The selection of an appropriate area and scale to begin an active transportation network is critical. Once the community determines what the goals of the network are to be, it is important to begin the network in an area of appropriate size. The average bicyclist travels 4 miles, the average pedestrian less than 1 mile. Therefore, being able to provide the appropriate facilities along the network is imperative for a successful system.

Various design treatments are provided in this toolbox. However, they only serve as a guide for transportation planners and engineers to use in their community. No specific treatment will be the exact fit for a community. An understanding of what the community desires from a bicycle and pedestrian network is extremely important for a successful network as they will be the users of the system.
## Appendix

### BICYCLE PARKING REQUIREMENTS

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Bicycle Spaces Required</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single Family/Two Family</td>
<td>N/A</td>
<td>Class I - 100%</td>
</tr>
<tr>
<td>Apartment/Townhome</td>
<td>1 per unit plus 6 space rack at each building entrance</td>
<td>Class II - 6 space rack</td>
</tr>
<tr>
<td>Commercial</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hotel/Motel</td>
<td>&gt;75 rooms - 1 per 15 rooms</td>
<td>Class I - 60%</td>
</tr>
<tr>
<td></td>
<td>&lt; 75 rooms - 6 space visitor rack</td>
<td>Class II - 40%</td>
</tr>
<tr>
<td>Office, retail sales of goods and services, restaurants, research establishments, laboratories</td>
<td>1 per 750 SF gross floor area for first 15,000 SF and 1 per 1,500 SF of additional area</td>
<td>Class I - 50%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Class II - 50%</td>
</tr>
<tr>
<td>Shopping Centre *</td>
<td>1 per 750 SF of gross leasable area for the first 15,000 SF and 1 per 1,500 SF for gross leasable area for any additional area</td>
<td>Class I - 30%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Class II - 70%</td>
</tr>
<tr>
<td>Commercial</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hotel/Motel</td>
<td>&gt;75 rooms - 1 per 15 rooms</td>
<td>Class I - 60%</td>
</tr>
<tr>
<td></td>
<td>&lt; 75 rooms - 6 space visitor rack</td>
<td>Class II - 40%</td>
</tr>
<tr>
<td>Office, retail sales of goods and services, restaurants, research establishments, laboratories</td>
<td>1 per 750 SF gross floor area for first 15,000 SF and 1 per 1,500 SF of additional area</td>
<td>Class I - 50%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Class II - 50%</td>
</tr>
<tr>
<td>Shopping Centre *</td>
<td>1 per 750 SF of gross leasable area for the first 15,000 SF and 1 per 1,500 SF for gross leasable area for any additional area</td>
<td>Class I - 30%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Class II - 70%</td>
</tr>
<tr>
<td>Commercial</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hotel/Motel</td>
<td>&gt;75 rooms - 1 per 15 rooms</td>
<td>Class I - 60%</td>
</tr>
<tr>
<td></td>
<td>&lt; 75 rooms - 6 space visitor rack</td>
<td>Class II - 40%</td>
</tr>
<tr>
<td>Office, retail sales of goods and services, restaurants, research establishments, laboratories</td>
<td>1 per 750 SF gross floor area for first 15,000 SF and 1 per 1,500 SF of additional area</td>
<td>Class I - 50%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Class II - 50%</td>
</tr>
<tr>
<td>Shopping Centre *</td>
<td>1 per 750 SF of gross leasable area for the first 15,000 SF and 1 per 1,500 SF for gross leasable area for any additional area</td>
<td>Class I - 30%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Class II - 70%</td>
</tr>
<tr>
<td>Industrial</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>1 per 3,000 SF</td>
<td>Class I - 80%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Class II - 20%</td>
</tr>
<tr>
<td>Institutional</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospitals</td>
<td>1 per 1,500 SF</td>
<td>Class I - 75%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Class II - 25%</td>
</tr>
<tr>
<td>Schools</td>
<td>All Levels: 1 per 10 employees</td>
<td>Class I - 10%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Class II - 90%</td>
</tr>
<tr>
<td>Elementary</td>
<td>1 per 10 students</td>
<td>Class II - 100%</td>
</tr>
<tr>
<td>Junior Secondary</td>
<td>1 per 8 students</td>
<td>Class II - 100%</td>
</tr>
<tr>
<td>Senior Secondary</td>
<td>1 per 8 students</td>
<td>Class II - 100%</td>
</tr>
<tr>
<td>College</td>
<td>1 per 5 students</td>
<td>Class II - 100%</td>
</tr>
<tr>
<td>University</td>
<td>1 per 5 students (full time, max. attendance)</td>
<td>Class II - 100%</td>
</tr>
<tr>
<td>Churches</td>
<td>1 per 50 members</td>
<td>Class II - 100%</td>
</tr>
<tr>
<td>Library/Museum/Art Gallery</td>
<td>1 per 300 SF gross floor area</td>
<td>Class I - 20%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Class II - 80%</td>
</tr>
<tr>
<td>Personal Care/Nursing Home/Group Home</td>
<td>1 per 15 dwellings</td>
<td>Class I - 75%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Class II - 25%</td>
</tr>
<tr>
<td>Correctional Institutions</td>
<td>1 per 50 beds</td>
<td>Class I - 70%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Class II - 30%</td>
</tr>
<tr>
<td>Cultural and Recreational</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community Centre</td>
<td>1 per 240 SF of gross floor area</td>
<td>Class I - 20%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Class II - 80%</td>
</tr>
<tr>
<td>Stadium, Arena, Pool, Exhibition Hall</td>
<td>1 per 300 SF of surface area</td>
<td>Class I - 20%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Class II - 80%</td>
</tr>
<tr>
<td>Gymnasium, Health Spa</td>
<td>1 per 240 SF of surface area</td>
<td>Class I - 20%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Class II - 80%</td>
</tr>
<tr>
<td>Bowling Alley</td>
<td>1 per 2 alleys</td>
<td>Class I - 20%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Class II - 80%</td>
</tr>
</tbody>
</table>

Class I bicycle parking provides complete protection for bicycles and equipment.
Class II facilities are racks that bicycles can be securely locked to.

Bicycle Parking Requirements are requirements for Vancouver, British Columbia. They are from the Victoria Transport Policy Institute at www.vtpi.org.

* Additional requirements on placement of parking facilities for pedestrian and bicycle access for shopping centers are addressed on page 8.
How do I use this diagram?

This diagram illustrates what land uses could be connected by the components of a bicycle network. Access routes connect land uses within the neighborhood. Local routes connect land uses that are shared by neighborhoods. Main routes connect land uses within another region.

This diagram was taken from Design/Development Principles for Livable Suburban Arterial Roadways. It was modified slightly to relate to a bicycle network consisting of main routes, local routes, and access routes. Refer to page 9 for descriptions of each bicycle route.
ROAD IMPROVEMENTS FOR BICYCLISTS

Shared Lane

Bicyclist ride on roads without special provisions for travel.

Bicyclist and motorists share operating space in outer travel lane.

Signage is optional.

Wide Curb Lane

Extra width of the outer travel lane accommodates both bicyclists and motorists.

Bicyclists and motorists share operating space.

Signage is optional.

Shoulder

Bicyclists and motorists need not share operating space because bicyclist are able to ride outside the travel lane, beyond the strip.

Signage is optional.

Bike Lane

Bicyclists are provided with a special, dedicated riding area separate from motorists operating space.

The riding area is set aside exclusively for bicyclist is designated using “bike lane” signage and painted stripes and symbols.

Diagrams were taken from a 1994 FHWA publication Selecting Roadway Design Treatments to Accommodate Bicyclists. It can be referenced at www.montcopia.org/plancom/attathd.pdf. Refer to page 8 for reasons why existing roadways can be reconfigured for bicycle use.
## PLANNING GUIDELINES FOR BICYCLE FACILITIES

<table>
<thead>
<tr>
<th></th>
<th>Main Route</th>
<th>Local Route</th>
<th>Access Route</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Exits and Entrances</strong></td>
<td>1/4 mile</td>
<td>1/2 mile</td>
<td>1/8 mile</td>
</tr>
<tr>
<td><strong>Connections To Local Streets</strong></td>
<td>Low/Medium</td>
<td>High</td>
<td>Typically is local Street</td>
</tr>
<tr>
<td><strong>Access to Destination Entrances</strong></td>
<td>Not Recommended</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td><strong>Minimum Segment Length</strong></td>
<td>2 miles</td>
<td>1 mile</td>
<td>Same as community street standard</td>
</tr>
<tr>
<td><strong>Target Trip Length</strong></td>
<td>Trips &gt; 2 miles at least 1 mile of travel by bike</td>
<td>Trips &gt; 1 mile at least 1/2 mile of travel on blvd.</td>
<td>1/4 to 1 mile (typically)</td>
</tr>
<tr>
<td>**Linkage to Express Route Transit Stops * **</td>
<td>High Priority</td>
<td>High Priority</td>
<td>Network makes linkage automatic</td>
</tr>
<tr>
<td><strong>Volume</strong></td>
<td>Medium</td>
<td>High</td>
<td>Low to Very High</td>
</tr>
<tr>
<td><strong>Maintenance Require.</strong></td>
<td>High</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Skill of User</strong></td>
<td>Low to High</td>
<td>Medium to High</td>
<td>Low to High</td>
</tr>
<tr>
<td><strong>Personal Safety Issues</strong></td>
<td>Many (especially if facilities are isolated from urban activity)</td>
<td>Many to Few Depends on location and level of street activity</td>
<td>Many to Few Depends on location and level of street activity</td>
</tr>
<tr>
<td><strong>Transportation Function</strong></td>
<td>Primary Movement</td>
<td>Movement and Access Equal</td>
<td>Access Primary Movement Secondary</td>
</tr>
<tr>
<td><strong>Spacing of Facilities</strong></td>
<td>Developed Area</td>
<td>Developed Area</td>
<td>Developed Area</td>
</tr>
<tr>
<td></td>
<td>1/2 to 3 miles</td>
<td>1/2 to 3 miles</td>
<td>1/2 to 1 mile</td>
</tr>
<tr>
<td><strong>Continuity of Movement</strong></td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Operation</strong></td>
<td>Operating Speed</td>
<td>Stopping Frequency</td>
<td></td>
</tr>
<tr>
<td></td>
<td>20 mph</td>
<td>no more than every 1/2 to 1 mile</td>
<td></td>
</tr>
<tr>
<td></td>
<td>15 to 20 mph</td>
<td>no more than every 1/4 to 1/2 mile</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5-15 mph</td>
<td>as frequently as every 1/16 to 1/4 mile</td>
<td></td>
</tr>
</tbody>
</table>

This diagram was taken from *Creating Bicycle Transportation Networks: A Guidebook.*

* Refer to page 6 for additional information on linking to public transportation.
## SEPARATION GUIDELINES FOR BICYCLE FACILITIES

<table>
<thead>
<tr>
<th></th>
<th>Main Route</th>
<th>Local Route</th>
<th>Access Route</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M  P  S</td>
<td>M  P  S</td>
<td>M  P  S</td>
</tr>
<tr>
<td><strong>Principal Arterial Street</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barrier or distance separation</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Large Distance separation</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td><strong>Minor Arterial Street</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barrier or distance separation</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Demarked spacing</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>High Volume Collector Street</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distance separation</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Demarked spacing</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Low Volume Collector Street</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distance separation</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Demarked spacing</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>High Volume Local Street</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traffic calming</td>
<td>Main route should not be located here</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Shared Space with Vehicles</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Low Volume Local Street</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traffic calming</td>
<td>Main route should not be located here</td>
<td>Local route should not be located here</td>
<td>X</td>
</tr>
<tr>
<td>Shared Space with Vehicles</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**Notes:**
- M = Minimum
- P = Preferred
- S = Satisfactory

This diagram was taken from *Creating Bicycle Transportation Networks: A Guidebook.*
Refer to Road Improvements for Bicyclist Diagram on page 18 for examples of bicycle and roadways separators.
Photographs on pages 5, 9 and 10 illustrate barrier or distance separation and photographs on pages 8 and 15 illustrate sharing space with vehicles.
# Matrix for Urban Bicycle Network Design Treatments

The Mn/DOT Bicycle Modal Plan.

## How do I use this diagram?

The existing roadway condition is selected at the top of the table. Appropriate bicycle design treatments are then listed as recommended, optional, or not recommended based on roadway conditions.

This diagram was taken from *The Mn/DOT Bicycle Modal Plan.*
## Appendix

### ROADWAY DESIGN OPTIONS FOR URBAN AND RURAL ROADWAYS

<table>
<thead>
<tr>
<th>Urban Roadway</th>
<th>Average Daily Traffic (ADT)/Lane</th>
<th>500-1,000</th>
<th>2,000-5,000</th>
<th>5,000-10,000</th>
<th>10,000-20,000</th>
<th>20,000 and above</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two Lane</td>
<td>Less than 500</td>
<td>N/A</td>
<td>2,000-4,000</td>
<td>10,000-20,000</td>
<td>20,000 and above</td>
<td></td>
</tr>
<tr>
<td>Four Lane</td>
<td>N/A</td>
<td>2,000-4,000</td>
<td>4,000-10,000</td>
<td>10,000-20,000</td>
<td>20,000 and above</td>
<td></td>
</tr>
<tr>
<td>Posted Speed</td>
<td>0-30 MPH</td>
<td>Wide Curb Lane or Outside Lane 12”</td>
<td>Bike Lane 5’</td>
<td>Bike Lane 5’</td>
<td>Bike Lane 5’</td>
<td></td>
</tr>
<tr>
<td></td>
<td>30 MPH</td>
<td>Wide Curb Lane or Outside Lane 12”</td>
<td>Bike Lane 5’</td>
<td>Bike Lane 5’</td>
<td>Bike Lane 5’</td>
<td></td>
</tr>
<tr>
<td></td>
<td>35-40 MPH</td>
<td>Wide Curb Lane or Outside Lane 12”</td>
<td>Bike Lane 5’</td>
<td>Bike Lane 5’</td>
<td>Bike Lane 5’</td>
<td></td>
</tr>
<tr>
<td></td>
<td>over 40 MPH</td>
<td>Bike Lane 5’</td>
<td>Bike Lane 6’</td>
<td>Bike Lane 6’</td>
<td>Bike Lane 6’</td>
<td></td>
</tr>
<tr>
<td>Rural Roadways</td>
<td>Average Daily Traffic (ADT)/Lane</td>
<td>Less than 1,000</td>
<td>1,000-2,500</td>
<td>2,500-5,000</td>
<td>5,000-10,000</td>
<td>10,000 and above</td>
</tr>
<tr>
<td>Posted Speed</td>
<td>0-30 MPH</td>
<td>Paved Shoulder 4’</td>
<td>Paved Shoulder 4’</td>
<td>Paved Shoulder 4’</td>
<td>Paved Shoulder 6’</td>
<td></td>
</tr>
<tr>
<td></td>
<td>30-35 MPH</td>
<td>Paved Shoulder 6’</td>
<td>Paved Shoulder 6’</td>
<td>Paved Shoulder 8’</td>
<td>Paved Shoulder 10’ and/or Shared Use Path</td>
<td></td>
</tr>
<tr>
<td></td>
<td>35-45 MPH</td>
<td>Paved Shoulder 6’</td>
<td>Paved Shoulder 8’</td>
<td>Paved Shoulder 10’</td>
<td>Paved Shoulder 10’ and/or Shared Use Path</td>
<td></td>
</tr>
<tr>
<td></td>
<td>over 45 MPH</td>
<td>Paved Shoulder 6’</td>
<td>Paved Shoulder 8’</td>
<td>Paved Shoulder 10’</td>
<td>Paved Shoulder 10’ and/or Shared Use Path</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** *When average daily traffic (ADT) less than 500, shoulders are not a necessity unless the roadway is heavily used by truck or heavy commercial vehicles. In these situations bikes should be accommodated with a wide curb or shared lane.*

#### RECOMMENDED BICYCLE PATH WIDTHS

<table>
<thead>
<tr>
<th>Traffic Composition and Flow</th>
<th>Minimum Paved Width of Two-Way Paths</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Good</td>
</tr>
<tr>
<td>Light pedestrian &amp; 2-Way Bicycle</td>
<td>12’</td>
</tr>
<tr>
<td>Heavy Pedestrian &amp; 2-Way Bicycle</td>
<td>14’</td>
</tr>
<tr>
<td>Pedestrian Section</td>
<td>6.5’</td>
</tr>
<tr>
<td>Two-Way Bicycle Section</td>
<td>10’</td>
</tr>
<tr>
<td>Path Geometrics</td>
<td>Minimum Paved Width of One-Way Path</td>
</tr>
<tr>
<td>Located Adjacent Curb-No Parking Allowed</td>
<td>8’</td>
</tr>
<tr>
<td>Separated from Roadway According to Recommended Clearances</td>
<td>6.5’</td>
</tr>
</tbody>
</table>

These diagrams were taken from *Minnesota Bicycle Transportation Planning and Design Guidelines.*
This diagram was taken from the web site www.bicyclinginfo.org.
The checklist is to be used as a tool to gather community input on existing bicycle routes within a community to help establish performance goals. It can also be used as a tool to evaluate the network after it has been established. See pages 4, 5 and 15. The checklist is NOT a tool to evaluate existing conditions. Refer to Table 6.1 for existing roadway conditions to be evaluated for a bicycle network.
Go for a ride and use this checklist to rate your neighborhood's bikeability.

How bikeable is your community?

Location of bike ride (be specific): ________________________________

Rating Scale:

1 awful 2 many problems 3 some problems 4 good 5 very good 6 excellent

1. Did you have a place to bicycle safely?
   a) On the road, sharing the road with motor vehicles?
      □ Yes □ Some problems (please note locations):
      □ No space for bicyclists to ride
      □ Bicycle lane or paved shoulder disappeared
      □ Heavy and/or fast-moving traffic
      □ Too many trucks or buses
      □ No space for bicyclists on bridges or in tunnels
      □ Poorly lighted roadways
      Other problems: ____________________________

   b) On an off-road path or trail, where motor vehicles were not allowed?
      □ Yes □ Some problems:
      □ Path ended abruptly
      □ Path didn’t go where I wanted to go
      □ Path intersected with roads that were difficult to cross
      □ Path was crowded
      □ Path was unsafe because of sharp turns or dangerous downhills
      □ Path was uncomfortable because of too many hills
      □ Path was poorly lighted
      Other problems: ____________________________

Overall “Safe Place To Ride” Rating: (circle one)

1 2 3 4 5 6

2. How was the surface that you rode on?
   □ Good □ Some problems, the road or path had:
   □ Potholes
   □ Cracked or broken pavement
   □ Debris (e.g. broken glass, sand, gravel, etc.)
   □ Dangerous drain grates, utility covers, or metal plates
   □ Uneven surface or gaps
   □ Slippery surfaces when wet (e.g. bridge decks, construction plates, road markings)
   □ Bumpy or angled railroad tracks
   □ Rumble strips
   Other problems: ____________________________

Overall Surface Rating: (circle one)

1 2 3 4 5 6

3. How were the intersections you rode through?
   □ Good □ Some problems:
   □ Had to wait too long to cross intersection
   □ Couldn’t see crossing traffic
   □ Signal didn’t give me enough time to cross the road
   □ Signal didn’t change for a bicycle
   □ Unsure where or how to ride through intersection
   Other problems: ____________________________

Overall Intersection Rating: (circle one)

1 2 3 4 5 6

Continue the checklist on the next page...
Appendix

4. Did drivers behave well?
☐ Yes  ☐ Some problems, drivers:
  ☐ Drove too fast
  ☐ Passed me too close
  ☐ Did not signal
  ☐ Harassed me
  ☐ Cut me off
  ☐ Ran red lights or stop sign
  ☐ Other problems: ____________________________

Overall Driver Rating: (circle one)
1  2  3  4  5  6

5. Was it easy for you to use your bike?
☐ Yes  ☐ Some problems:
  ☐ No maps, signs, or road markings to help me find my way
  ☐ No safe or secure place to leave my bicycle at my destination
  ☐ No way to take my bicycle with me on the bus or train
  ☐ Scary dogs
  ☐ Hard to find a direct route I liked
  ☐ Route was too hilly
  ☐ Other problems: ____________________________

Overall Ease of Use Rating: (circle one)
1  2  3  4  5  6

6. What did you do to make your ride safer?

Your behavior contributes to the bikeability of your community. Check all that apply:
☐ Wore a bicycle helmet
☐ Observed traffic signals and signs
☐ Rode in a straight line (didn’t weave)
☐ Signaled my turns
☐ Rode with (not against) traffic
☐ Used lights, if riding at night
☐ Wore reflective and/or retroreflective materials and bright clothing
☐ Was courteous to other travelers (motorist, skaters, pedestrians, etc.)

7. Tell us a little about yourself.

In good weather months, about how many days a month do you ride your bike?
☐ Never
☐ Occasionally (one or two)
☐ Frequently (5-10)
☐ Most (more than 15)
☐ Every day

Which of these phrases best describes you?
☐ An advanced, confident rider who is comfortable riding in most traffic situations
☐ An intermediate rider who is not really comfortable riding in most traffic situations
☐ A beginner rider who prefers to stick to the bike path or trail

How does your community rate?
Add up your ratings and decide.
(Questions 6 and 7 do not contribute to your community’s score)

2. _____  21–25 Your community is pretty good, but there’s always room for improvement.
3. _____  16–20 Conditions for riding are okay, but not ideal. Plenty of opportunity for improvements.
4. _____  11–15 Conditions are poor and you deserve better than this! Call the mayor and the newspaper right away.
5. _____
Total _____  5–10 Oh dear. Consider wearing body armor and Christmas tree lights before venturing out again.

Did you find something that needs to be changed?

On the next page, you’ll find suggestions for improving the bikeability of your community based on the problems you identified. Take a look at both the short- and long-term solutions and commit to seeing at least one of each through to the end. If you don’t, then who will?

During your bike ride, how did you feel physically? Could you go as far as or as fast as you wanted to? Were you short of breath, tired, or were your muscles sore? The next page also has some suggestions to improve the enjoyment of your ride.

Bicycling, whether for transportation or recreation, is a great way to get 30 minutes of physical activity into your day. Riding, just like any other activity, should be something you enjoy doing. The more you enjoy it, the more likely you’ll stick with it. Choose routes that match your skill level and physical activities. If a route is too long or hilly, find a new one. Start slowly and work up to your potential.
### Appendix

#### Improving your community's score...

<table>
<thead>
<tr>
<th>1. Did you have a place to bicycle safely?</th>
<th>What you can do immediately</th>
<th>What you and your community can do with more time</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>a) On the road?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No space for bicyclists to ride (e.g., no bike lane or shoulder; narrow lanes)</td>
<td>• pick another route for now</td>
<td>• participate in local planning meetings</td>
</tr>
<tr>
<td>Bicycle lane or paved shoulder disappeared</td>
<td>• tell local transportation engineers or public works department about specific problems; provide a copy of your checklist</td>
<td>• encourage your community to adopt a plan to improve conditions, including a network of bike lanes on major roads</td>
</tr>
<tr>
<td>Heavy and/or fast-moving traffic</td>
<td>• find a class to boost your confidence about riding in traffic</td>
<td>• ask your public works department to consider &quot;Share the Road&quot; signs at specific locations</td>
</tr>
<tr>
<td>Too many trucks or buses</td>
<td></td>
<td>• ask your state department of transportation to include paved shoulders on all their rural highways</td>
</tr>
<tr>
<td>No space for bicyclists on bridges or in tunnels</td>
<td></td>
<td>• establish or join a local bicycle advocacy group</td>
</tr>
<tr>
<td>Poorly lit roadways</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| **b) On an off-road path or trail?**     |                             |                                               |
| Path ended abruptly                      | • slow down and take care when using the path | • ask the trail manager or agency to improve directional and warning signs |
| Path didn't go where I wanted to go      | • find an on-street route | • petition your local transportation agency to improve path/roadway crossings |
| Path intersected with roads that were difficult to cross | • use the path at less crowded times | • ask for more trails in your community |
| Path was crowded                         | • tell the trail manager or agency about specific problems | • establish or join a "Friends of the Trail" advocacy group |
| Path was unsafe because of sharp turns or dangerous downhill |                             |                                               |
| Path was uncomfortable because of too many hills |                             |                                               |
| Path was poorly lighted                  |                             |                                               |

| 2. How was the surface you rode on?     |                             |                                               |
| Potholes                                 | • report problems immediately to public works department or appropriate agency | • work with your public works and parks department to develop a pothole or hazard report card or online link to warn the agency of potential hazards |
| Cracked or broken pavement               | • keep your eye on the road/path | • ask your public works department to gradually replace all dangerous drainage grates with more bicycle-friendly designs, and improve railroad crossings so cyclists can cross them at 90 degrees |
| Debris (e.g., broken glass, sand, gravel, etc.) | • pick another route until the problem is fixed (and check to see that the problems are fixed) | • petition your state DOT to adopt a bicycle-friendly rumble-stripe policy |
| Dangerous drain grates, utility covers, or metal plates | • organize a community effort to clean up the path |                                               |
| Uneven surface or gaps                   |                             |                                               |
| Slippery surfaces when wet (e.g., bridge decks, construction plates, road markings) |                             |                                               |
| Bumpy or angled railroad tracks          |                             |                                               |
| Rumble strips                            |                             |                                               |

<table>
<thead>
<tr>
<th>3. How were the intersections you rode through?</th>
<th>What you can do immediately</th>
<th>What you and your community can do with more time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Had to wait too long to cross intersection</td>
<td>• pick another route for now</td>
<td>• ask the public works department to look at the timing of the specific traffic signals</td>
</tr>
<tr>
<td>Couldn't see crossing traffic</td>
<td>• tell local transportation engineers or public works department about specific problems</td>
<td>• ask the public works department to install loop-detectors that detect bicyclists</td>
</tr>
<tr>
<td>Signal didn't give me enough time to cross the road</td>
<td>• take a class to improve your riding confidence and skills</td>
<td>• suggest improvements to sightlines that include cutting back vegetation; building out the path crossing; and moving parked cars that obstruct your view</td>
</tr>
<tr>
<td>Unsure where or how to ride through intersection</td>
<td></td>
<td>• organize community-wide, on-bike training on how to safely ride through intersections</td>
</tr>
</tbody>
</table>

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MnDOT Bicycle Tool Box

Page 28
Appendix

Improving your community's score...

(continued)

4. Did drivers behave well?

Drivers:
- Drove too fast
- Passed me too close
- Did not signal
- Harassed me
- Cut me off
- Ran red lights or stop signs

What you can do immediately
- Report unsafe drivers to the police
- Set an example by riding responsibly; obey traffic laws; don't antagonize drivers
- Always expect the unexpected
- Work with your community to raise awareness to share the road

What you and your community can do with more time
- Ask the police department to enforce speed limits and safe driving
- Encourage your department of motor vehicles to include "Share the Road" messages in driver tests and correspondence with drivers
- Ask city planners and traffic engineers for traffic calming ideas
- Encourage your community to use cameras to catch speeders and red light runners

5. Was it easy for you to use your bike?

- No maps, signs, or road markings to help me find my way
- No safe or secure place to leave my bicycle at my destination
- No way to take my bicycle with me on the bus or train
- Scary dogs
- Hard to find a direct route I liked
- Route was too hilly

What you can do immediately
- Plan your route ahead of time
- Find somewhere close by to lock your bike; never leave it unlocked
- Report scary dogs to the animal control department
- Learn to use all of your gears!

What you and your community can do with more time
- Ask your community to publish a local bike map
- Ask your public works department to install bike parking racks at key destinations; work with them to identify locations
- Petition your transit agency to install bike racks on all their buses
- Plan your local route network to minimize the impact of steep hills
- Establish or join a bicycle user group (BUG) at your workplace

6. What did you do to make your ride safer?

- Wore a bicycle helmet
- Obeyed traffic signals and signs
- Rode in a straight line (didn't weave)
- Signaled my turns
- Rode with (not against) traffic
- Used lights, if riding at night
- Wore reflective materials and bright clothing
- Was courteous to other travelers (motorists, skaters, pedestrians, etc.)

What you can do immediately
- Go to your local bike shop and buy a helmet; get lights and reflectors if you are expecting to ride at night
- Always follow the rules of the road and set a good example
- Take a class to improve your riding skills and knowledge

What you and your community can do with more time
- Ask the police to enforce bicycle laws
- Encourage your school or youth agencies to teach bicycle safety (on-bike)
- Start or join a local bicycle club
- Become a bicycle safety instructor
Appendix

Walkability Checklist

How walkable is your community?

Take a walk with a child and decide for yourselves.

Everyone benefits from walking. These benefits include: improved fitness, cleaner air, reduced risks of certain health problems, and a greater sense of community. But walking needs to be safe and easy. Take a walk with your child and use this checklist to decide if your neighborhood is a friendly place to walk. Take heart if you find problems, there are ways you can make things better.

Getting started:

First, you'll need to pick a place to walk, like the route to school, a friend’s house or just somewhere fun to go.

The second step involves the checklist. Read over the checklist before you go, and as you walk, note the locations of things you would like to change. At the end of your walk, give each question a rating. Then add up the numbers to see how you rated your walk overall.

After you've rated your walk and identified any problem areas, the next step is to figure out what you can do to improve your community's score. You'll find both immediate answers and long-term solutions under "Improving Your Community's Score..." on the third page.

This diagram was taken from the web site www.walkableamerica.org. The checklist is to be used as a tool to gather community input on existing pedestrian networks within a community. It allows for people to respond to the experience of walking in their community.
Appendix

Take a walk and use this checklist to rate your neighborhood’s walkability.

How walkable is your community?

Location of walk __________________________

Rating Scale: ____________________________

1  2  3  4  5  6

awful  many  some  good  very good  excellent

1. Did you have room to walk?
   - Yes  □  Some problems:
     - Sidewalks or paths started and stopped
     - Sidewalks were broken or cracked
     - Sidewalks were blocked with poles, signs, shrubbery, dumpsters, etc.
     - No sidewalks, paths, or shoulders
     - Too much traffic
     - Something else
   - Locations of problems: __________________________
   Rating: (circle one) __________________________
   1  2  3  4  5  6

2. Was it easy to cross streets?
   - Yes  □  Some problems:
     - Road was too wide
     - Traffic signals made us wait too long or did not give us enough time to cross
     - Needed striped crosswalks or traffic signals
     - Parked cars blocked our view of traffic
     - Trees or plants blocked our view of traffic
     - Needed curb ramps or ramps needed repair
     - Something else
   - Locations of problems: __________________________
   Rating: (circle one) __________________________
   1  2  3  4  5  6

3. Did drivers behave well?
   - Yes  □  Some problems:
     - Backed out of driveways without looking
     - Did not yield to people crossing the street
     - Turned into people crossing the street
     - Drank too fast
     - Speed up to make it through traffic lights or drove through traffic lights
     - Something else
   - Locations of problems: __________________________
   Rating: (circle one) __________________________
   1  2  3  4  5  6

4. Was it easy to follow safety rules?
   Could you and your child...
   - Yes  □  No
   - Cross at crosswalks or where you could see and be seen by drivers?
   - Stop and look left, right, and then left again before crossing streets?
   - Walk on sidewalks or shoulders facing traffic where there were no sidewalks?
   - Cross with the light?
   - Locations of problems: __________________________
   Rating: (circle one) __________________________
   1  2  3  4  5  6

5. Was your walk pleasant?
   - Yes  □  Some unpleasant things:
     - Needed more grass, flowers, or trees
     - Scary dogs
     - Scary people
     - Not well lighted
     - Dirty, lots of litter or trash
     - Dirty air due to automobile exhaust
     - Something else
   - Locations of problems: __________________________
   Rating: (circle one) __________________________
   1  2  3  4  5  6

How does your neighborhood stack up?
Add up your ratings and decide.

1. ______  26–30  Celebrate! You have a great neighborhood for walking.
2. ______  21–25  Celebrate a little. Your neighborhood is pretty good.
3. ______  16–20  Okay, but it needs work.
4. ______  11–15  It needs lots of work. You deserve better than that.
5. ______  5–10  It’s a disaster for walking!

Total ______

Now that you’ve identified the problems, go to the next page to find out how to fix them.
### Appendix

#### Improving your community's score...

1. **Did you have room to walk?**
   - What you and your child can do immediately:
     - pick another route for now
     - tell local traffic engineering or public works department about specific problems and provide a copy of the checklist
   - What you and your community can do with more time:
     - speak up at board meetings
     - write to city council or city council and gather neighborhood signatures
     - make residents aware of problems
     - work with a local transportation engineer to develop a plan for a safe walking route

2. **Was it easy to cross streets?**
   - Read too wide:
     - traffic signals made us wait too long or did not give us enough time to cross
     - crosswalks' traffic signals needed
     - view of traffic blocked by parked cars, trees, or plants
     - Needed curbs or curb ramps needed repair
   - What you and your child can do immediately:
     - pick another route for now
     - share problems and checklist with local traffic engineering or public works department
     - trim your trees or bushes that block the street and ask your neighbors to do the same
     - leave nice notes on problem cars asking owners not to park there
   - What you and your community can do with more time:
     - push for crosswalks/signal/parking changes/curb ramps at city meetings
     - report to traffic engineer where parked cars are safety hazards
     - report illegally parked cars to the police
     - request that the public works department trim trees or plants
     - make media aware of problem

3. **Did drivers behave well?**
   - Backed without looking
   - Did not yield
   - Turned into walkers
   - Drove too fast
   - Speed up to make traffic light or drive through red lights
   - What you and your child can do immediately:
     - pick another route for now
     - set an example: slow down and be considerate of others
     - encourage your neighbors to do the same
     - report unsafe driving to the police
   - What you and your community can do with more time:
     - petition for more enforcement
     - request protected turns
     - ask city planners and traffic engineers
     - for traffic calming ideas
     - ask schools about getting crossing guards at key locations
     - organize a neighborhood speed watch program

4. **Could you follow safety rules?**
   - Cross at crosswalks or where you could see and be seen
   - Stop and look left, right, left before crossing
   - Walk on sidewalks or shoulders facing traffic
   - Cross with the light
   - Tell yourself and your child about safe walking
   - organize parents in your neighborhood to walk children to school
   - What you and your community can do with more time:
     - encourage schools to teach walking safety
     - help schools start safe walking programs
     - encourage corporate support for flex schedules so parents can walk children to school

5. **Was your walk pleasant?**
   - Needs grass, flowers, trees
   - Sunny days
   - Shade
   - Nod well lit
   - Dirt, litter
   - Lots of traffic
   - point out areas to avoid to your child
   - agree on safe routes
   - ask neighbors to keep dogs leashed or fenced
   - report scary dogs to the animal control department
   - report scary people to the police
   - report lighting needs to the police or appropriate public works department
   - take a walk with a trash bag
   - plant trees, flowers in your yard
   - select alternative routes with less traffic
   - What you and your community can do with more time:
     - request increased police enforcement
     - start a crime watch program in your neighborhood
     - organize a community clean-up day
     - sponsor a neighborhood beautification or tree-planting day
     - begin an adopt-a-street program
     - initiate support to provide services with less traffic to schools in your community (reduced traffic during am and pm school commute times)

#### A Quick Health Check

- **Could not go as far as we wanted**
  - start with short walks and work up to 10 to 20 minutes of walking most days
  - invite a friend or child along
  - walk along shaded routes where possible
  - use sunscreen of SPF 15 or higher, wear a hat and sunglasses
  - try not to walk during the hottest time of day
- **Was it hot and hazy?**
  - get media to do a story about the health benefits of walking
  - call parks and recreation department about community walks
  - encourage corporate support for employee walking programs
  - plant shade trees along streets
  - have a sunny safety seminar for kids
  - have kids learn about unhealthy ozone days and the Air Quality Index (AQI)
Bibliography

PUBLICATIONS


Bibliography

ONLINE


