

St. Louis County  
Bicycle Facilities Plan



Department of Highways & Traffic  
St. Louis County, Missouri

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## **Introduction**

The growing interest in cycling and demand for mode choice has caused an increase in the number of bicyclists using our roadway system. According to the Federal Highway Administration, there are 103 million bicyclists in the United States. St. Louis County has found the need for guidelines that allow bicyclists and pedestrians to coexist in a safe way.

- 1) **Purpose** The purpose of these guidelines is to create a framework that will improve field conditions and enhance the safety of bicyclists on St. Louis County's roadway system, while still maintaining effective movement of vehicles.
- 2) **Overview** The St. Louis County Departments of Highways & Traffic, Parks, and Planning recognized the importance of safe bicycle routes on our streets. The St. Louis County Bike Task Force was formed in December of 2002. This task force developed guidelines and requirements for design, construction, and the operation of bicycle facilities throughout St. Louis County, with the goal of creating a safe coexistence between multi-modal traffic. The St. Louis County Department of Highways & Traffic has recently updated the guidelines and requirements to reflect our updated policies.
- 3) **Definitions**
  - A) **AASHTO** American Association of State Highway and Transportation Officials.
  - B) **Bicycle Facilities** A general term denoting improvements and provisions made by public agencies that accommodate or encourage bicycling, including parking and storage facilities, and shared roadways not specially defined for bicycle use. (AASHTO)
  - C) **Bike Lane** A portion of a roadway that has been designated by striping, signing, and pavement markings for the preferential or exclusive use by bicycles. (AASHTO)
  - D) **Bikeway** A generic term for any road, street, path or way which in some manner is specifically designated for bicycle travel, regardless of whether such facilities are designated for exclusive use of bicycles or are to be shared with others transportation modes. (AASHTO)
  - E) **Bike Path** A path segregated from motorized traffic for the use of bikes, sometimes shared with pedestrians. (Engineering Services)

- F) **Bicycle Route** A system of bikeways designated by the jurisdiction having authority with appropriate directional and informational route markers, with or without specific bicycle route numbers. Bike routes should establish a continuous routing, but may be a combination of any and all types of bikeways. (AASHTO)
- G) **MUTCD** Manual on Uniform Traffic Control Devices. (U.S. Department of Transportation - Federal Highway Administration)
- H) **Right-Of-Way** The right of one vehicle or pedestrian to proceed in a lawful manner in preference to another vehicle or pedestrian. (AASHTO)
- I) **Shared Roadway** A roadway that is open to both bicycle and motor vehicle travel. This may be an existing roadway, street with wide curb lanes, or road with paved shoulders. (AASHTO)
- J) **Shared Used Path** A bikeway physically separated from motorized vehicular traffic by an open space or barrier and either within the highways right-of-way or within an independent right-of-way. Shared use paths may also be used by pedestrians, skaters, wheelchair users, joggers, and other non-motorized users. (AASHTO)
- K) **Shoulder** The portion of the roadway contiguous with the traveled way for accommodation of stopped vehicles, for emergency use and for lateral support of sub-base, base and surface courses. (AASHTO)
- L) **Signed Shared Roadway** A shared roadway that has been designated by signing as a preferred route for bicycle use. (AASHTO)

## Planning

- 1) **Bicycle Level** There are different skill levels of bicyclists. The type of cyclist will determine what the roadway needs are to accommodate him/her. The majority of bicyclists can be categorized into three types:
  - A) **Recreational Bicyclists** Typically, these are casual riders who tend to utilize their bikes for the purpose of exercise and or leisure. This group would be categorized in the low to medium skill level. The routes chosen by this particular group consist of less traveled roads or bicycle paths; they are less likely to ride great distances. The avoidance of congested roadways could be contributed to the lack of experience with large numbers of motored vehicles and the added distraction of outside interferences which lessens the rider's ability to focus on the traffic.
  - B) **Commuter Bicyclists** This group tends to be a more confident rider. They are more inclined to ride on major roads, more often and for longer distances. This group would have a higher skill level and would utilize cycling as a primary means of transportation.
  - C) **Children** Underage drivers, who are not license motorized vehicle drivers. These cyclists utilize their bicycles, on their own or with their parents, for the purpose of transportation to different locations as well as commuting to and from school. This group would be classified more in the low skill level.
- 2) **Method of Travel**
  - A) **Bicycle Lane** Bike lanes can be included when it is advantageous to define available space for use by bicyclists and motorists and to allow for more expected movements by both. Bike lanes generally should be constructed on the right side of the street. They should also be one-way facilities and transport bicyclists in the same direction as the bordering motored traffic. For roads without curbs and gutters, a minimum width of 4 feet should be provided for the lane. A minimum of 5 feet should be imparted if curbs are present or parking is allowed; placing the bike lane between the parking vicinity and traffic lane. The lane markings are subject to deterioration due to automobile tires because of their location on the road and some marking materials have the capability of becoming slippery when wet (AASHTO and U.S. Department of Transportation - Federal Highway Administration). St. Louis County Department of Highways & Traffic does not use bike lanes on its roadways for these reasons.

- B) Bike Path** Bike Paths are off-road facilities, separated from motor vehicle traffic, either by a barrier or space. Sometimes called multi-use path and are used by a variety of non-motorized travel, such as walkers, skaters, and joggers, etc., as well as for cyclists. Bicycle paths are fine facilities for some trips, particularly recreational uses in parks, but have limited usefulness for most commuter trips (Bicycle Facilities - Path and Road Markings, and Bicyclinginfo.org). The St. Louis County Parks Department uses bike paths extensively for recreational trails within their many parks.
- C) Shared Roadway - Wide Shared Outside Through Lane** Wide shared outside through lanes are a good alternative to striped bicycle lanes. Bicycle lanes may position cyclists in an awkward position for safely maneuvering in a traffic intersection or the lanes may confine bicyclists against the right curb where they are less visible to motorists. Wide shared lanes do not have stripes to delineate separate places for bicycles and motor vehicles as do standard bicycle lanes. Wide shared lanes accommodate bicycle traffic along with motored traffic side by side. Bike lanes discourage bicyclists from using ordinary arm signals and proper lane change movements in advance of a left turn. Bike lanes require a high level of awareness and also can produce a false sense of security for inexperienced bicyclists, causing them to give less attention to the constantly changing traffic around them (Ohio DOT Design Guidance for Roadway-Based Bicycle Facilities and U.S. Department of Transportation - Federal Highway Administration). The wide shared lane is the St. Louis County Department of Highways & Traffic's preferred bicycle facility.
- 3) Safety** Dangerous situations result from the lack of understanding of traffic laws by both bicyclists and motorists. For example, bicyclists not following the traffic laws for vehicles, or motorists not watching for potential cyclists, create safety issues. Understanding the rules of the road is an important aspect in riding a bicycle or driving a motored vehicle. Familiarizing oneself with safety regulations and following these rules are a good way to help prevent accidents and conflicts. Resources on bicycle safety, such as the U.S. Department of Transportation - Federal Highway Administration, is a good source to obtain additional pertinent information concerning traffic safety methods and actions.

# **St. Louis County Design Framework for On-Road Facilities**

Context friendly design is an integral component for safe bicycle travel. The addition of new facilities and the improvement of existing facilities benefit all road users.

The following text describes our areas of focus for design and permit issuance:

## **1) Chosen Bicycle User**

**Commuter Bicyclist** - one who uses his/her bike for commuting to specific locations on regular basis and utilizing the streets to do so.

## **2) Chosen Method of Travel**

**Shared Roadway-Wide Outside Through Lane** - The shared roadway is a less confusing method to accommodate both bicyclists and motorized vehicles. In utilizing this lane, the bicyclist is not permanently separated from other commercial vehicles by a striped line which legitimizes the presence of bicycles as just another vehicle using the road (U.S. Department of Transportation - Federal Highway Administration).

## **3) Design Traffic Speed**

The speed of the traffic plays an important role when motor vehicles and bicycles share the same space. Roads in which the speed exceeds 35 MPH are not recommended for shared travel, especially for the inexperienced bicyclist. Novice bikers tend not to feel comfortable on such roadways and the likelihood of accidents caused from lack of experience is higher (U.S. Department of Transportation - Federal Highway Administration).

## **4) Design Traffic Volume**

Traffic Volume is also an important component when providing standards for bicycle use. The average daily traffic (ADT) on shared two-way roads should not exceed 15,000 vehicles. Recreational riders do not have the practice of traveling in high traffic volumes. One must always consider the number of lanes on the roadway, since the flow of traffic differs according to the number of lanes on a street with the same number of vehicles (U.S. Department of Transportation - Federal Highway Administration).

## 5) Lane Striping

By making use of a wide shared outside through lane, we eliminate the need for striping a bicycle lane or other bicycle markings.

## 6) Pavement Structure

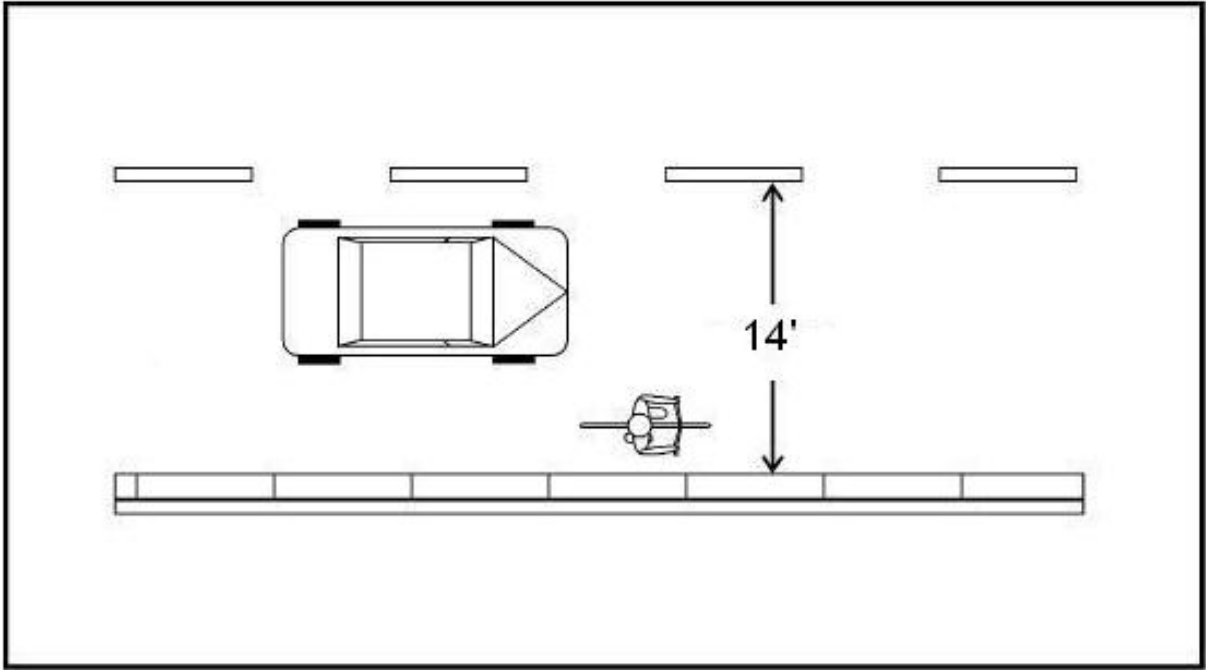
### A) Pavement Surface Quality

The smoothness of the riding surface affects the comfort, safety and speed of the bicyclist.

1. Pavement surfaces should be smooth and have a uniform width.
2. Surfaces in which wide cracks, holes, and bumps could cause cyclists to swerve into motored traffic shall not be considered.
3. Paved shoulders shall be smooth and free of debris

### B) Lane Widths

1. A shared outside through lane width of 14 feet (not including the gutter) is recommended, but generally, a width over 12 feet is considered beneficial to bicycles and motor vehicles. A width of 14 feet allows a motor vehicle to safely pass a cyclist without having to cross into the adjacent travel lane. Where on-street parking is provided, this standard also allows enough width for cyclists to avoid conflicts with car doors. The width of a shared bicycle lane should not exceed 15 feet, as this would enable vehicles to pass other vehicles on the right. It is important that the width of the gutter is not included in the 14 feet width. (AASHTO) (See **Figure 1** on Page 9)
2. On street parking can increase the risk of hazardous situations between motored vehicles and bicycles. If on-street parking exists along the roadway, a parking width of 8 feet should be permitted for said parked vehicles. This distance is in addition to the 14 feet required for the shared bicycle lane. The 8 feet width parking lane does includes the gutter. (AASHTO).



**Figure 1 – Shared Lane Marking (Urban Systems-Modified Drawing)**

**C) Grade**

1. Grades on shared lanes will be controlled by the roadway design grades.
2. A grade greater than 5% will be considered undesirable, but where terrain dictates, design may need to exceed 5% for short sections. As a general guide, the following grade restrictions and grade lengths are suggested. (see **Table 1** below)

|         |                         |
|---------|-------------------------|
| 5% - 6% | For up to 800 ft (240m) |
| 7%      | For up to 400 ft (120m) |
| 8%      | For up to 300 ft (90m)  |
| 9%      | For up to 200 ft (60m)  |
| 10%     | For up to 100 ft (30m)  |
| 11%     | For up to 50 ft (15m)   |

**Table 1 - Grade Restrictions and Grade Lengths for Shared Lanes (AASHTO)**

#### **D) Sight Distance**

1. Sight Distance on shared outside through lanes will be controlled by the roadway design.
2. Sight Distance on shared outside through lanes will give bicyclists the advantage to see and react to the unexpected, and should be designed with adequate stopping distance.

#### **E) Horizontal Alignment**

1. Horizontal Alignment on shared outside through lanes will be controlled by the roadway design.

#### **F) Grates and Inlet Sumps**

1. Grates will be placed in a manner that will minimize swerve and / or frequent maneuvering of bicycles.
2. For all new construction along designated bicycle routes, grates and inlet sumps will be constructed to accommodate bicyclists. A modified inlet sump design will be used.
3. All grates will be bicycle safe.

#### **G) Signage**

1. Along all arterial/through roadways with a wide shared outside through lane of a minimum of 14 feet, a "Bicycle" sign (2009 MUTCD - Sign W11-1) and a "Share the Road" plaque or placard sign (2009 MUTCD - W16-1P) will be used (see **Figure 2** on Page 11). Bicycle signs shall be standard in shape, size, and color. The "Share the Road" sign assemblies will be installed along the entire length of a roadway or for a minimum distance of two miles. A distance less than two miles will be allowed if the terminus points are considered logical points to begin/end a shared lane.
2. "Share the Road" sign assemblies will be furnished and installed by the St. Louis County Department of Highways & Traffic. The signs will be maintained by the Department and replaced when determined necessary.



**W11-1  
Bicycle Sign  
30" x 30"**

**W16-1P  
Share the Road (placard)  
18" x 24"**

**Figure 2 - Share the Road Sign Assembly (MUTCD)**

**Note:** Sign assembly shall have high intensity prismatic reflective yellow sheeting.

#### **H) Funding and Maintenance**

To guarantee the continual use of bicycle facilities, preservation of these facilities is a necessity. The cost of proper upkeep should receive as much thought during budget discussions as in the preliminary construction and installation costs. Preliminary construction and installation costs for 2011 are as follows: a high intensity prismatic reflective yellow 30-inch x 30-inch "Bicycle Sign" (2009 MUTCD – sign W11-1) is approximately \$45, a high intensity prismatic yellow 18 inch x 24 inch "Share the Road" placard sign (2009 MUTCD - W16-1P) is approximately \$22, and a 12-foot U-channel post is approximately \$25. St. Louis County encourages the participation of bicycle proponent groups in funding re-striping and sign installation costs.

#### **I) Public Information**

For in-depth information on bicycling safety and facilities, please refer to East-West Gateway's St. Louis Regional Bicycling and Walking Transportation Plan and the American Association of State Highway and Transportation Officials (AASHTO). For information on bicycle trails in St. Louis County, please reference The St. Louis County Department of Parks, detailing valuable maps of parks and bicycle trails.

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