

BICYCLES IN CITIES



Vol. VII

INTERSECTIONS AND BIKE LANES

 What happens to bicycles at intersections?

Accidents increase and bikeway design problems multiply. Problems at intersections deserve the attention of any city seeking to encourage bicycle use and reduce bike/car conflict. With carefully designed intersections, the behavior of cyclists and motorists becomes more predictable and therefore safer.

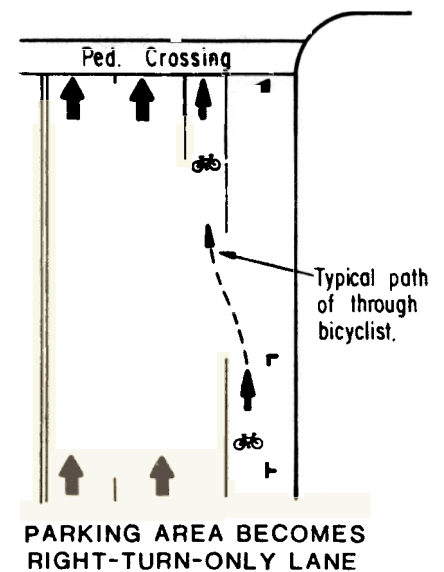
Of course, most Eugene streets provide no special treatment for cyclists. Bicyclists are expected to follow general traffic patterns. However, selected arterial and collector streets feature striped bike lanes offering some protection and encouragement for cyclists. On these streets, intersection design is of critical importance.

Eugene uses two basic designs for bike lanes at intersections. One locates the bike lane at the curb. The other moves the bike lane inward to allow for a vehicle turn-only lane at the curb. Special intersections may require design variations. Traffic volumes, turning movements, street widths, and right-of-way availability all impact design choice.

INTERSECTIONS WITH RIGHT-TURN LANES AND BIKE LANES. On some bike lane streets, high traffic volumes warrant separate vehicle turn-only lanes. At these intersections, Eugene prefers to place the turn lane, not the bike lane, adjacent to the curb. A parking lane often becomes a right turn-only lane at busy intersections and the bike lane moves inward (*below*). With this design, the through-riding bicyclist and the turning vehicle cross paths in advance of the intersection.



Eugene moves bike lane inward and places right-turn lane at curb.





Bike lane continues straight on one-way street when parking lane becomes left-turn only lane.



Right-turn bay at widened intersection. Motorist and bicyclist cross paths in advance of intersection.

To avoid bus stops and double right-turn lanes, some one-way streets in downtown Eugene place the bike lane on the left side of the street*. In these instances, the parking lane becomes a left-turn-only lane (**upper left**). On other bike lane streets where parking is prohibited, right-turn bays provide for heavy turn volumes (**upper right**). Again, the bike lane continues straight and the turning traffic merges across the bike lane to enter the exclusive turn lane.

INTERSECTIONS WITH CURB-SIDE BIKE LANES. Most bike lanes in Eugene are curb-side lanes (**below**). Typically, on these streets, there is more through traffic than turning traffic. The bike lane stripe, solid and 8 inches wide, continues as a dashed line through the intersection. The dashes are 5 feet long separated by 8 foot spaces. They begin 50 feet before the intersection and continue for 50 feet beyond.

While both motorists and bicyclists must learn to be wary of each other on these bike lane streets, the predictable location of each seems to help. The presence of large numbers of cyclists increases motorists' awareness and caution at intersections. Cyclists needing to merge across traffic to the opposite side for a turn, often begin their move a block before the intersection. Occasionally, less confident cyclists can be seen making two-legged "pedestrian turns."



At intersection of a collector and an arterial street (average daily traffic, 21,000), a Junior High School and retail shops attract bicyclists. Special widening and parking removal on the collector street made space for curb-side bike lanes.* *

By narrowing car travel lanes Eugene provided space for bike lanes on this arterial (ADT, 48,000). **Dashed line separates bicycle commuters** at turn-off to Interstate 5. Ramped sidewalks are available here but most bicyclists prefer street.

Rarely does the City terminate a bike lane before a major intersection and ask the cyclist to merge with traffic. To avoid this, intersection widening projects, primarily for the

*Vol. VI: On-Street Bicycle Lanes

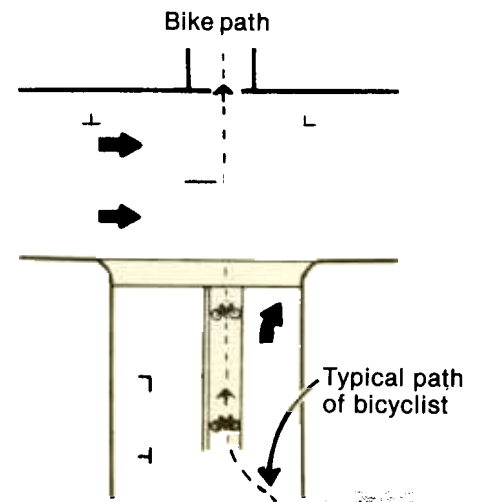
**Vol. V: Innovative Bikeway Designs

addition of left-turn lanes, also add width for a lane for cyclists through some collector and arterial intersections (below).

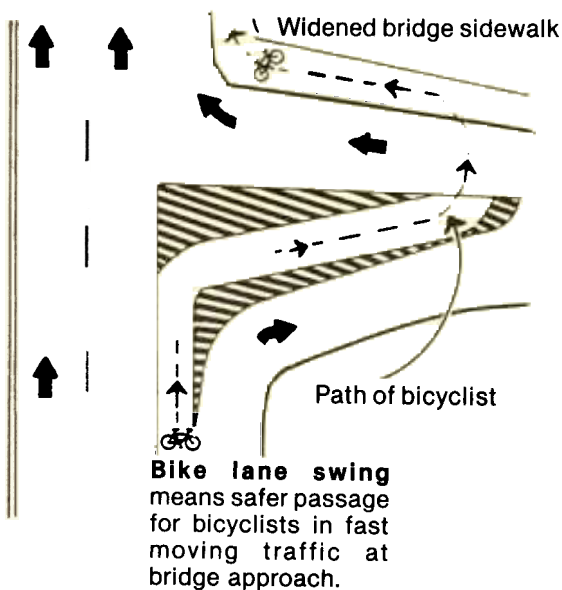


Busy arterial intersection (ADT 34,000) was recently widened to 66 feet to provide needed center-turn lane plus bike lanes on 4½-foot-wide concrete gutters.**

VARIATIONS. Some bikeway intersections require special solutions for particular problems. Streets signed as bike routes usually do not have pavement markings, but on one signed bike route the City recently stenciled a vehicle right-turn pocket and a through bike lane at a "T" intersection (right). Before this delineation, conflict occurred between motorists who can only turn right and bicyclists who proceed straight through to a heavily-used independent path. A Bicycle Committee member who commutes regularly through this intersection suggested the solution.



"T" Intersection pavement markings separate through-bicyclists and right-turning motorists.



Cyclists commuting to downtown from north of the river face a particularly hazardous intersection on the arterial approach to the City's principal auto bridge. Heavy volumes of traffic from the right merge with fast traffic headed for the bridge. A previous bike lane solution which directed bicycles straight to the bridge sidewalk proved too dangerous. The bike lane now swings toward and across this merging traffic in advance of the area of merge (left). This solution, in place for five years, is accepted and gets heavy bike use.

A bicycle lane variation in downtown Eugene came about when some merchants on each side of a two-way street opposed parking removal. The City's resourceful traffic engineer proposed parking removal from one side along some blocks and the opposite side along others. This retained the most important business parking yet made room for bike lanes along the entire route. The slight weave for bike lanes and vehicle lanes as parking changes from one side of the street to the other is barely perceptible. It causes no intersection problems.

**Vol. V: Innovative Bikeway Designs

EXCEPTIONS. Design solutions for Eugene's growing bicycle traffic have meant exceptions to firmly held bikeway design principles.

Principle: Bicycle lanes should carry traffic in the same direction as adjacent motor vehicle traffic. **Exception:** Two narrow streets adjacent to the University campus are designed for one-way auto traffic and two-way bike traffic. For seven blocks, an auto travel lane is in the center of the street with a one-way bike lane on each side*.

Principle: Bicycle lanes between a curb and parking lane should be avoided. **Exception:** For one block near the University of Oregon, a one-way bike lane between the curb and the parking lane has worked well for eight years (below left). It is wider than normal and separated from the parking lane by another curb on which parking meters are installed.




Exceptional bike lane between curb and parking lane solves traffic flow for one business block near University. The next block features an exceptional contra-flow bike lane.*



Sidewalk ramps may help cyclists "cut the corner" when turning traffic is heavy.

Principle: Never sign sidewalks as bike routes. **Exception:** When streets with bike lanes have sharp turns, motorists tend to infringe on the bike lane. Ramps at corners give cyclists a sidewalk option if traffic is heavy (upper right). Most choose to remain in the street.

Principle: On-street bike lanes should be one-way. Local experience emphasized this principle when serious accidents occurred on a two-way facility squeezed between a curb and parking area within the University. **Exception:** The City has recently constructed a two-way lane on one side of an overpass linking a residential area with a regional shopping center. Major signalized intersections with multiple turn lanes dictated special treatment. City engineers and the Bicycle Committee chose a two-way bicycle lane, separated from vehicles by a concrete barrier, after observing cyclists' behavior and failing to develop a better alternative.

Cities should strive for consistency when designing on-street lanes. However, Eugene's experience indicates that special solutions may be required for particular intersection problems. 

Vol. VI: On-Street Bicycle Lanes

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