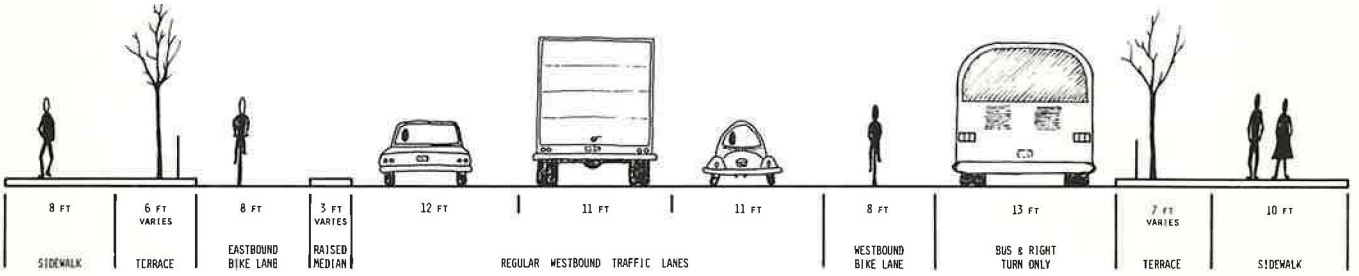
Unique Roadway Design Reduces Bus-Bike Conflicts



Schematic cross section (westward view) of the reconstructed segment of University Avenue, Madison, Wisconsin. The features include *(left to right)* a widened sidewalk and improved terrace with pedestrian barricades, an eastbound contraflow bike lane, three regular westbound traffic lanes, a westbound bike lane, a westbound bus lane, an improved terrace with pedestrian barricades (except at bus stops), and a widened sidewalk.

Where heavy bus and bicycle traffic share a curb lane, conflicts are often a chronic problem. Add a lot of cars and thousands of pedestrians and the conflicts multiply. How to reduce those conflicts was the design dilemma facing the City of Madison Department of Transportation in attempting to create plans for the reconstruction of a major street in the central business district of Madison, Wisconsin. With the help of the Madison community, the Department developed a unique plan for a unique situation, both of which are described in the following article.

STEVE BERCHEM and WARREN O. SOMERFELD

"No more leapfrog!" That sums up what many bicyclists say about a recently reconstructed segment of University Avenue in Madison, Wisconsin—a city where bicycles outnumber automobiles three to two.

University Avenue is part of a major one-way crosstown arterial that links Madison's east side and downtown areas to the west edge of the metropolitan area. The reconstructed segment—a 1-mile stretch—cuts through the heart of the University of Wisconsin campus and carries the city's greatest concentration of buses, bicycles, and pedestrians, in addition to heavy car and truck traffic.

Before the reconstruction, the right curb lane was restricted to buses, bikes, and right-turning vehicles only. "Buses and bikes, and sometimes cars, were continuously playing leapfrog as they went down the road," says Benita Walker, president of the Madison Bicycle Brigade, an advocacy organization that played a major role in getting bicyclists a safer place on the new roadway.

Here is a sample scenario of what Walker means by leapfrog: A bicyclist pulls onto University Avenue and rides along the right curb. A bus passes the bicyclist. The bus stops at the right curb to pick up passengers. The bicyclist passes the bus and returns to the right curb. The bus leaves the bus stop and soon passes the bicyclist. The bus stops to load more passengers at the next block. The bicyclist passes the bus. . . .

Imagine this happening during peak traffic hours with perhaps a dozen buses and 100 bicyclists in the curb lane along just a few blocks. Chaos. And delay for buses, bicyclists, and right-turning vehicles. And leapfrog can be dangerous for bicyclists who get trapped between a bus and the curb.

The newly reconstructed roadway has considerably reduced the problem, due to a unique design that may set a

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precedent in urban traffic engineering. The design features include the following (also see accompanying illustrations):

- An eastbound contraflow bike lane separated from westbound traffic by a raised median strip;
- Three regular westbound traffic lanes;
- A westbound bike lane;
- A westbound bus and right-turn lane; and
- Widened sidewalks, improved terraces, and pedestrian barricades.

The unique feature is the one that reduces leapfrog: the westbound bike lane. This is an 8-foot-wide through-lane that places bicyclists between buses and cars. Walker says that this allows bicyclists to move through traffic without getting tangled up with the buses. Bicyclists ride to the left of the stop-and-go buses and to the right of the faster moving vehicles in the regular traffic lanes.

However, some transportation experts have doubts about the design. For example, the Federal Highway Administration, which provided a grant that covered about 75 percent of the $3 million reconstruction project, strongly recommended that the unique bus and bike lane configuration be studied closely after the reconstruction.

The reconstruction was completed in October 1984, after 2 years of replacing all underground utility lines and practically the entire right-of-way surface.

An overhead (westward) view of University Avenue after the reconstruction was completed.

The project also included planting more than 300 trees along the corridor.

Although the new roadway has been open only a few months, public response has been remarkably favorable. "People seem to like the design," Walker says. "At first bicyclists, motorists, and pedestrians were somewhat surprised with it. But they got used to it quickly and now they praise it."

Other observers also give the design high marks. "It's an example of beauty in simplicity," comments Paul Kachelmeier, a University of Wisconsin-Madison graduate student in urban planning who recently evaluated the planning process that preceded the University Avenue reconstruction.

Tom Walsh, a Madison traffic engineer who helped develop the University Avenue plans, agrees that the design works and that users rapidly adapted to it. Walsh admits he was a bit skeptical of the concept at first, but is already studying the effect of the unique lane configuration and is optimistic that the results will show that the lane improves safety.

Although observers generally concur on the success of the design, there have been some problems. Some bicyclists still ride along the curb. However, Walker is confident they will change their ways. "As more bicyclists use the lane correctly, I think those who hug the curb will see that the bike lane is the best place to ride," she says, adding that she expects Walsh's study will also show that the lane is the safest place to ride.

Although the innovation of the westbound bike lane may be most outstanding, Walsh notes that improvements at intersections and along the eastbound contraflow lane significantly enhance bicycling safety and convenience. In addition, a design feature included for pedestrian safety has become an unexpected asset for bicyclists. Waist-high barricades installed along the terraces reduce pedestrian midblock crossings and prevent pedestrians from darting out in traffic or in front of silent bicycles.

The unique westbound bike lane, the pedestrian barricades, the unimpeded bus lane, and other improvements appear to make the reconstructed segment of University Avenue safer and more convenient for all users, Walsh points out. He believes that it is an example of innovative urban traffic engineering applied to a unique situation. Walsh expects the design will pass the test of time.

Closer view of the unique bus/bike lane configuration.