CHAPTER 2: RESTRIPING EXISTING ROADS WITH BIKE LANES / ROAD DIETS

INTRODUCTION

To accommodate bicyclists on busy roadways in urban areas, bike lanes generally serve bicyclists and motorists well. Many urban roadways were built without bike lanes and often act as deterrents to bicycle travel. Bike lanes can be retrofitted onto existing urban roadways by:

1. Marking and signing existing shoulders as bike lanes;
2. Widening the roadway to add bike lanes; or
3. Restriping the existing roadway to add bike lanes.

In most cases, existing curb-to-curb width allows only restriping to be considered. Restriping existing roadways is often referred to as a “road diet.” Restriping has benefits for all users, not just cyclists.

These guidelines illustrate how a roadway can be restriped for bike lanes, without negatively affecting the safety and operation of the roadway (restriping can often increase safety and traffic operations). Sample travel lane widths are within acceptable ODOT & AASHTO minimums. In ODOT designated Special Transportation Districts and other urban settings where speeds are lower, the need for full-width travel lanes decreases.

It is important to use good judgment, and to consider context. Each project should be approved by a traffic and/or roadway engineer to ensure that capacity and safety are not compromised. ORS 366.215 prohibits reducing capacity on certain freight routes.

The examples given are not the only acceptable way to restripe a roadway. It is not always necessary to use dimensions in whole feet increments. For example, with 32’ available, 10.5’ travel lanes with 5.5’ bike lanes may work better in some cases than 11’ travel lanes with 5’ bike lanes, or 10’ travel lanes with 6’ bike lanes.

REDUCE LANE WIDTHS

Narrow Travel Lanes

Commonly used lane widths are: 14’ center turn lanes, 12’ travel lanes, 6’ bike lanes and 8’ parking lanes; under many conditions these can be narrowed to:

- 25 MPH or less: lanes can be reduced to 10’ or 11’.
- 30 to 40 MPH: 11’ travel lanes and 12’ center turn lanes are acceptable, even desirable.
- 45 MPH or greater: 12’ outside travel lane and a 14’ center turn lane if there are high truck volumes.

Dimensions should take into account the combination of speeds, volumes, trucks, context, and desired outcome. On state highways, the above dimensions may only be applied if a design exception is approved where HDM standards are not met - see chapter 13 of the HDM.

Reduce On-Street Parking

On-street parking is usually beneficial to business and pedestrians. On-street parking helps keep traditional street-oriented businesses viable, provides a buffer for pedestrians, and helps keep traffic speeds down. Removing parking for bike lanes requires careful negotiation with the affected businesses and residents. Before making a proposal, a parking study should be conducted that includes:

- Counting the number of businesses/residences and the availability of both on-street and off-street parking.
- Estimating use and occupancy characteristics

- Selecting which side would be less affected by removal (usually the side with fewer residences or businesses).
- Replacing on-street parking with parking bays for residents or businesses with no other options.
- Proposing parking management strategies that increase the supply of parking when and where it's most needed, such as:
  - Allowing parking for church or school activities on adjacent lots during services or special events;
  - Shared use by businesses and institutions, or
  - Prohibiting on-street parking by employees.

The fear of losing potential customers is an important reason to retain on-street parking. Many cities have ordinances prohibiting employees from parking on the street. This increases the number of available parking spaces for customers, even if the total number of parking spaces is reduced. One parking place occupied by an employee for eight hours is the equivalent of 16 customers parking for half an hour, or 32 customers parking for 15 minutes, etc.

Remove Parking on One Side

On most streets with parking on both sides, removal of all on-street parking is not necessary: removing parking from one side creates enough space for two bike lanes, with some additional lane narrowing. Parking may be needed on only one side to accommodate residences and/or businesses with no off-street parking.

Notes:

1. *It is not always necessary to retain parking on the same side of the road through an entire corridor.*
2. *Education and enforcement may be needed for a period of time after parking has been removed, and the space dedicated to a bike lane, to prevent motorists from parking in the new bike lanes.*

Change From Diagonal to Parallel Parking

Changing to parallel parking on one side only is usually sufficient; this reduces total parking availability of a street segment by less than one-fourth.

Replacing Lost Parking

Where all of the above possibilities of replacing parking with bike lanes have been pursued, and residential or business parking losses cannot be sustained, innovative ideas should be considered to provide parking, such as:

- Increasing parking supply on side streets; or
- Creating parking bays by using a portion of a planting strip, where available:

Narrow Parking Lanes

Parking can be narrowed to 7 feet, particularly in areas with low truck parking volumes. On a one-way street, only one bike lane needs to be provided, so narrowing both parking lanes a little bit creates enough room for one bike lane.

ROAD DIETS: REDUCED NUMBER OF TRAVEL LANES

Many roads were built wider than needed to accommodate existing or projected traffic volumes, or traffic conditions have changed since the road was built, and the number of travel lanes can be reduced. This concept is generally referred to as a "road diet." In most cases the road diet results in enough space to

stripe bike lanes. This chapter focuses on road diets and bike lanes, but road diets have safety, operational and livability benefits for motorists and pedestrians.

In all cases a traffic study must be conducted to ensure the resulting roadway will carry the traffic at an acceptable level of service. In many cases the road carries as much traffic with fewer lanes, and performs better when one considers issues that concern residents, business owners, bicyclists, pedestrians and others who use the roadway for a variety or reasons.

The most common road diet takes a 4-lane undivided highway and redistributes the roadway to one travel lane in each direction, a center turn lane and two bike lanes. The safety benefits of the 4 to 3 lane road diet include:

- Fewer rear-end crashes: motorists wait to make a left turn in a dedicated turn lane, not in a through lane;
- Fewer sideswipe crashes: motorists no longer swerve around a vehicle waiting to turn left in a through lane;
- Fewer left turn crashes: turning motorists face only one lane of oncoming traffic;
- Reduced speeds;
- Easier and safer pedestrian crossings, especially with a median island in the center turn lane: pedestrians cross only one lane at a time instead of all 4 lanes at once.

Operational benefits of the 4 to 3 lane road diet include:

- Fewer delays from traffic stacked behind a car waiting to turn left;
- Easier to negotiate right turns, as the curb lane is offset from the curb;
- Higher carrying capacity where many left turns obstruct the inside lane on a 4-lane section.

The livability benefits of a road diet include:

- Greater separation from moving traffic for pedestrians;
- Room for street furniture and landscaping.
- More people using bicycles for transportation

One-way couplets:

One-way couplets are good lane-reduction candidates if they have more travel lanes in one direction than necessary for the traffic volumes. For example, a 4-lane one-way street can be reduced to 3 lanes and a bike lane. Since only one bike lane is needed on a one-way street, removing a travel lane can free up enough room for other features such as on-street parking or wider sidewalks. Both legs of a couplet must be treated equally, so there is a bike lane in each direction.

Unbalanced Flow:

On streets with higher traffic volumes in one direction than the other, one direction of travel can have one less travel lane than the other side. For example, a 4-lane undivided roadway can be restriped with 2 lanes in one direction, one lane in the other, and 2 bike lanes.

PAVEMENT CONDITIONS

Restriping a roadway with bike lanes will encourage more people to ride their bikes there; the expectation of a good riding experience must be met, and part of that experience is a good riding surface. If this expectation is not met, unsafe conditions and frustration can lead to opposition to more bike lanes. Improvements at the outer edge of the roadway should be made prior to bike lane restriping, including:

- Ensuring the surface is smooth and in good condition;
- Raising existing drainage grates, manhole and utility covers flush to the pavement; and

- Removing or relocating obstructions away from the edge of roadway to gain some useable width. Obstructions can include guardrail, utility poles and sign posts.

The best time to restripe a roadway is after a pavement overlay project, for two reasons:

- The new pavement offers a blank template; and
- Obliterating existing striping creates problems: the old stripes can show up on rainy days or at night when cars have their headlights on. Grinding out old lane lines can leave grooves deep enough to be a hazard to cyclists.

WIDTH CONSTRAINTS

Not all existing roadways allow bike lanes to be retrofitted for an entire corridor. Unique and creative solutions will have to be found to ensure bikeway continuity in constrained areas:

- Width restrictions may only allow for a wide curb lane to accommodate bicycles and motor vehicles.
- Where no possible extra width is obtainable, another technique is to slow traffic speeds so shared roadway conditions are acceptable.
- If the constraint is more than a few blocks, an alternate route may have to be improved for cycling; the alternate route must provide access to the destinations served by the thoroughfare considered for restriping.

Bike lanes must resume where the restriction ends. It is important that every effort be made to ensure bike lane continuity. Practices such as directing bicyclists onto sidewalks or other unsuitable streets should be avoided, as they may introduce unsafe conditions.

ADDITIONAL BENEFITS

Restriping roadways for bike lanes has benefits over and beyond those for bicyclists. Drivers and pedestrians also benefit when motor vehicle travel lanes are moved away from the curb:

Benefits for motorists include:

- **Extended pavement life**, as traffic is no longer driving in the same well-worn ruts.
- **Safety**, as travel lanes are offset from curbs, and lanes are better defined, which can improve sight distance and increase the effective turning radius at intersections and driveways. See discussion on road diets for safety benefits of reducing the number of motor vehicle travel lanes.

Benefits for pedestrians include:

- **Greater separation** from traffic in the absence of on-street parking or a planter strip, increasing comfort and safety. This is important to young children walking, playing or riding their bikes on curbside sidewalks.
- **An area for people** in wheelchairs to walk where there are no sidewalks, or where sidewalks are in poor repair or do not meet ADA standards.
- **Reduced splash** from vehicles driving through puddles; in dry climates, less dust raised by passing vehicles, as they drive further from unpaved surfaces.
- The possibility of **planting street trees**, as the roots are not immediately under travel lanes.

BIKE LANE WIDTHS

The standard width for a bike lane is 6 feet. While it is important to maintain standards for bicycle facilities, there may be circumstances where restrictions don't allow full standards. Minimum bike lane widths are:

- 5 feet against a curb or adjacent to a parking lane. A 4.5 foot curbed bike lane may be allowable where there are very severe physical constraints.

- 4 feet on uncurbed shoulders.

5-lane roadway with narrowed lanes and bike lanes
5-lane roadway with wide lanes and no bike lanes
Fig 1: Bike lanes restriped by narrowing travel lanes
Bike lanes striped by removing parking from one side
Fig 2: Parking removed from one side
Parking removed from one side
Fig 3: Restripe diagonal to parallel parking
Fig 4: Parking bays replace on-street parking
Parking bay next to business
Fig 5: Parking narrowed on one side of one-way street
Bike lane striped by narrowing parking
Fig 6: Road diet - 4 lanes reduced to 2 lanes, center turn lane and 2 bike lanes
4-lane undivided roadway
Restriped with bike lanes and center turn lane
Fig 7: Travel lane removed from 4-lane one-way street
Removing a travel lane created room for a bike lane and on-street parking
Fig 8: 4-lane two-way street restriped with 2 lanes in one direction, on lane in the other.
Fig 9: Offset travel lanes allows vehicles to turn around a tight radius
Road diet created room for median ped refuge island
Bridge with 2 travel lanes in one direction, one travel lane in the other, and 2 bike lanes
Bike lanes striped on new pavement show up well
Fig 10: offsetting travel lanes reduces wear and tear
Bike lane provides minimal buffer for pedestrians