

L E S S O N 2 1

Bicycle Facility Maintenance

21.1 Purpose

This lesson describes maintenance programs and activities that are critical to successful bikeways, and recommends a step-by-step approach to solving common maintenance problems.

Bicycles and bicyclists tend to be particularly sensitive to maintenance problems. Most bicycles lack suspension systems and, as a result, potholes that motorists would hardly notice can cause serious problems for bicyclists. In addition, since bicyclists often ride near the right margin of the road — sometimes as required by traffic law — they use areas that are generally less well maintained than the main lanes. On higher speed roads, the passage of motor vehicle traffic tends to sweep debris to the right, where most bicyclists travel. In addition, ridges, such as those found where a new asphalt overlay does not quite cover the older roadway surface, can catch a wheel and throw a bicyclist to the ground.

Aside from these general problems, special bicycle facilities often need more maintenance than they receive. On trail systems, for example, vegetation is often allowed to overgrow the pavement edge, effectively narrowing the usable surface. And soil treatments

that are commonly used under new roadbeds are sometimes ignored on trail projects; as a result, the surfaces are quickly destroyed by intruding plants.

21.2 Solution Overview

For the most part, satisfying bicycling maintenance requirements is a matter of slightly modifying current procedures. For example, if street-sweeping crews pay a bit more attention to the right edge of the road, it can benefit bicyclists greatly.

In addition, using maintenance-friendly design and construction techniques can reduce the need for special — and sometimes costly — treatments later.



For example, when paving a street bordered by unpaved alleys and driveways, paving into those alleys and driveways 10 to 20 feet (depending on grades and other features) can keep entering traffic from dragging gravel and other debris onto the paved surface.

Finally, special bicycle facilities such as bike lanes or trails may require enhanced maintenance. This cost, along with a clear understanding of who has responsibility for maintenance, should be part of every project budget.

21.3 Objectives

- 1. To maintain roadways and bikeways to a relatively hazard-free standard.**
 - By sweeping pavement edges and paved shoulders with sufficient care.
 - By patching surfaces as smoothly as possible and by requiring other agencies or private companies to do likewise whenever they dig up a road or trail.
 - By making sure pavement overlay projects feather the new surface into the existing one or otherwise do not create new linear joints.
 - By replacing such hazards as dangerous grates or utility covers as the opportunity arises.
 - By patching potholes in an expeditious manner.
 - By routinely cutting back all encroaching vegetation, especially on trails or popular bike routes.
- 2. To encourage bicyclists to report maintenance problems and other hazards.**
 - By developing a “bicycle spot improvement” form and distributing copies throughout the bicycling community.
 - By making sure returned forms are acted upon in a timely fashion.
- 3. To design and build new roadways and bikeways in such a way as to reduce the potential for accumulation of debris.**
 - By using edge treatments, shoulder surfaces, and access controls that reduce the potential for accumulation of debris.
 - By using materials and construction techniques that increase the longevity of new trail surfaces.

- 4. To include maintenance costs and clearly spelled-out maintenance procedures in all bicycle facility projects.**

- By including reasonable estimates of the maintenance costs in the project budget.
- By establishing clear maintenance responsibilities in advance of construction.

21.4 Implementation Strategies

Improving bicycle-related maintenance requires action on several fronts. First, maintenance policies used by all relevant agencies should be reviewed and changed, if necessary. Second, designers should be encouraged to “think maintenance” when they design: low-maintenance requirements should be the rule rather than the exception. And, finally, an outreach effort should be implemented to: (1) encourage bicyclists to report maintenance problems, and (2) identify existing maintenance problems, particularly on special bicycle facilities or popular bicycling routes.

21.5 Sub Tasks

- 1. Identify key implementors.**

Implementation requires working closely with those agencies and personnel responsible for maintaining the current infrastructure, as well as those charged with designing and building new facilities. For roadway maintenance, this may mean the local street department or the State transportation agency’s district maintenance division. For trails, it may mean local, State, or Federal parks or lands agencies.

New facility design can involve local engineering and parks planning agencies, as well as State and Federal officials, depending on jurisdiction. It may be, for example, that a new arterial street being built in the local community is actually designed by engineers working at the State capital.
- 2. Review existing policies and practices.**

In some cases, an agency’s policies, standards, and guidance are included in formal documents that have gone through an approval process or

that have been issued by department supervisors. Examples of these may be standard sweeping schedules and priority streets for snow removal. Conducting a review of these may be relatively simple once copies have been obtained.

On the other hand, some practices may simply be matters of how a particular person handles a specific task. For instance, one street sweeper may leave more of the right roadway edge unswept than did another sweeper. Identifying important areas in which practices vary from standard procedure — or in which standard procedures do not exist — can help in determining needed improvements in such areas as policy development, communication, and employee training.

3. Review results in the field and solicit comments from users.

In some cases, policies may seem reasonable in theory, but may break down in practice. For this reason, it is important to see how well the facilities work. Checking out the street and trail system from the saddle of a bicycle can help uncover previously unknown problems. For instance, an agency may have a policy of sweeping arterial streets every 2 weeks. But field experience may show that certain arterials are subject to greater accumulations of debris from nearby land uses. Increasing the frequency of sweeping on such streets — particularly if they are popular bicycling streets — may be necessary.

In addition, soliciting comments from users can help identify problems that would otherwise be overlooked. Because of their intimate knowledge of surface conditions, bicycle users can often pinpoint specific locations and needs. To get information, send news releases to local bicycle groups, as well as the media, asking for help. In all likelihood, users will welcome the opportunity to contribute.



Extending the paved area to include the shoulder would keep gravel and debris off of the paved surface and prevent problems for bicyclists.

4. Recommend appropriate changes in policies and practices.

Based on the reviews and comments discussed above, develop modified versions of policies and practices where warranted; for important topics not previously covered, develop new guidance for adoption. Work with the appropriate agencies to make sure the changes are understood and implemented.

5. Create an ongoing spot improvement program.

As mentioned earlier, soliciting comments from users can help an agency find specific problem locations. Institutionalizing this process, in the form of a “spot improvement program,” can provide ongoing input and, in many cases, help identify problems before someone gets hurt. In addition, such a program can dramatically improve the relationship between an agency and the bicycling public. Spot improvement programs are good policy and good public relations.

To this end, set aside a modest annual budgetary allocation for user-requested spot improvements. Create mail-back postcards for distribution to local bicycle shops and user groups. As cards come in, check out the locations identified and take action as necessary.

6. Evaluate progress.

As the work proceeds, keep track of successes and failures, as well as the schedule of routine maintenance activities. Identify changes that



Bike lane maintenance is particularly important.

have or have not been made to policies and determine if additional effort is needed. On an annual basis, ask the bicycling public for comments on maintenance issues in general, and the spot improvement program in particular. In addition, keep track of the numbers and kinds of problems identified and how they were dealt with. Finally, determine if the program budget is appropriate to the task.

21.6 Resource Requirements

For the most part, bicycle-related maintenance tasks involve work an agency already does; little additional effort will be required. It may simply mean adding popular bicycling routes to the priority sweeping route network, for example. In some instances, however, additional equipment may be needed. For example, maintaining a particular trail may require purchasing special equipment—perhaps a small sweeper or a special attachment for a tractor.

21.7 Schedule

In regions with harsh winters, special effort should be made to clear the winter's accumulation of road sand and other debris early in the spring. Also, the periods following high winds and flooding may require special attention.

21.8 Specifications

Typical Maintenance Concerns

The following are some of bicyclists' most common maintenance concerns and some common solutions:

Surface problems: For potholes and other surface irregularities, patch to a high standard, paying particular attention to problems near bicyclists' typical travel alignments. Require other agencies and companies to patch to a similarly high standard; if repairs fail within a year, require remedial action.

Debris (sand, gravel, glass, auto parts, etc.) near the right edge of the

road: Sweep close to the right edge. If necessary, use vacuum trucks to remove material, especially if it accumulates adjacent to curbs. Pay particular attention to locations such as underpasses, where changes in lighting conditions can blind bicyclists to surface hazards.

For debris or surface irregularities on curves or at intersections, pay special attention to the areas between the typical paths of turning and through motor vehicle traffic; often these fill with debris and are in typical bicyclist trajectories. In addition, areas where debris washes across the paved surface should receive special attention; for example, eliminating the source of the problem by providing better drainage is ultimately a more cost-effective solution than increased sweeping.

Chip seal gravel: Many local agencies use chip seal to extend the lives of their roadways. However, the technique, which involves laying down a coating of oil and a layer of crushed rock, often leaves deep piles of gravel just to the right of the typical travel paths of motor vehicles. To reduce the impact on bicyclists, remove excess gravel as soon as possible and suggest alternative routes as detours.

Ridges or cracks: These should be filled or ground down as needed to reduce the chance of a bicyclist catching a front wheel and crashing. Pay particular

attention to ridges or cracks that run parallel to the direction of travel. One common location to check is where a merging lane is provided just beyond an intersection. Because traffic must merge left to continue traveling straight, the bicyclist will be crossing the joint between the merge lane and the through lane at a very shallow angle.

Encroaching vegetation: Trim back bushes and tree branches adjacent to trail edges to allow at least a 2-foot clearance between the edge of the pavement and the vegetation, paying particular attention to the insides of curves.

Grasses adjacent to trail edges: Tall grasses should be mowed regularly to expose any potential hazards that might otherwise be hidden from a cyclist's view. In addition, vegetation should be prevented from breaking up the edge of pavement and encroaching on the trail surface.

Signing and marking trails: Because they are often unique, trail signs may be subjected to frequent theft or vandalism. Regular inspections should be conducted to ensure that signs are still in place and in good condition; this is particularly true of regulatory and warning signs.

Trail markings: Generally, trails have a few simple markings (e.g., a yellow centerline); however, these should be repainted when necessary. Centerlines, for example, help encourage bicyclists to keep to their side of the trail and perform a very useful function.

On-road bicycle signs: Special bicycle signs (regulatory, warning, or information) should be maintained in the same way that other roadway signs are. Pay particular attention to bike route signs at decision points, warning signs at special hazard locations, and regulatory signs on popular bike-lane streets.

On-road bicycle markings: Bicycle lane striping should be renewed at the same time that other stripes are painted. The same goes for bike-lane pavement markings (e.g., diamond markings). Some markings may suffer from more wear-and-tear than others and deserve special attention. For instance, pavement markings that indicate the "hot spot" for traffic signal loop detectors may be in a location where car tires routinely pass; as a result, they may wear out faster than other markings.

21.9 References

Text and graphics for this lesson were derived from:

Federal Highway Administration, *Designing for Bicycles at the Local Level*, 1997.

For more information, please refer to:

AASHTO, *Guide for the Development of Bicycle Facilities*, 1999.

AASHTO, *Maintenance Manual*, 1987.

Rails to Trails Conservancy, *Trails for the 21st Century*, 1994.

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