



## **FDM 17-45-1 Railroad Stopping Lanes**

May 2, 2003

There are advantages to adding an auxiliary lane outside the through traffic lanes for vehicles required to stop at railroad crossings when trains are not present. Such stopping lanes are particularly desirable for two-lane and multi-lane roadways carrying moderate to heavy traffic, high truck volumes, with traffic backups and potential rear-end accidents.

The auxiliary lanes direct buses and trucks which are required to stop at the crossing away from the through traffic lanes, thus minimizing the adverse effects on capacity and safety of the roadway. To allow a smooth transition of these vehicles back into the traffic flow, stopping lanes should be designed with adequate deceleration and acceleration tapers. The lengths of these tapers and the stopping lanes depend upon the operating speed of the roadway, grades and the operating characteristics of the largest motor vehicle.

Stopping lanes also have their disadvantages. They are frequently and wrongly used for high-speed through movements or as right-hand passing lanes. The wide expanse of pavement tends to give the illusion of additional driving lanes. Therefore, marking and signing must be carefully tailored to each location, using the MUTCD as the basis for development.

Stopping lanes are not mandatory in Wisconsin.

## **FDM 17-45-5 Roadway Treatments at Closures**

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Roadway treatments at closings vary widely.

In view of the desirability of large numbers of crossing closures, WisDOT favors the implementation of minimum treatments, recognizing land use, community values and wishes consistent with public safety and convenience

In many cases, particularly in urban areas where the resulting dead end street is relatively short, conventional, high visibility barricades or beam guard installations are sufficient when preceded by appropriate signing at the nearest street-to-street intersection. Refer to the MUTCD for appropriate barricade details.

While the close proximity and high value of developed properties limit the options in urban areas, rural areas have often favored large, costly turn-arounds (cul du sac). Such proposals are to be avoided if at all possible. Any cul du sac proposed treatment needs to be minimal reasonable and appropriate. Right of way availability may be a constraint and in such cases some use of the railroad right of way could be considered. Refer to AASHTO design guides for details of cul du sac design.

The actual roadway treatment will be determined by the OCR based on the hearing record.

## **FDM 17-45-10 Humpback and Sag Crossings**

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Crossings in areas of severe vertical alignments present unique and often unexpected hazards.

There are three primary problems with humped and sag crossings;

- the potential loss of vehicle control due to the violent vehicle movements if vehicle speeds are too great,
- vision problems which occur at night when headlights of the roadway vehicle fail to illuminate the crossing and its crossbuck warning sign.
- vehicles becoming "hung up" on the crossing, endangering people and vehicles near the crossing, property near the crossing and the train itself.

Long wheelbase vehicles, particularly those with low clearances, such as "low-boys" used to transport construction equipment, can get "hung-up" on the tracks of hump back crossings. Similarly, vehicles with long over-hangs, either in front of the front wheels or behind the rear wheels can also become "hung up" on sag crossings. Both situations hold the same risks to safety.

Identification of these crossings must currently rely largely on visual inspection, judgment, or a past incident (crash or near-crash). Research is underway to better quantify the characteristics that define such problem crossings as well as methods to measure and identify them.

As a minimum, the use of "Low Ground Clearance" (W10-5) signs needs to be considered.

See [FDM 17-60-1](#) and [FDM 17-60-5](#) for more design details.

### **FDM 17-45-15 Track Removals and Modifications**

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On simple crossing and improvement projects, it is normally possible to secure estimates from (and agreements with) the railroad within a six month period. However, when WisDOT or a local government requests that a track be removed from the roadway, the railroad companies have typically asked for at least an additional three months to allow their operating and marketing staffs to review the consequences of the request if honored.

It is important to understand that all track removals require the approval of the railroad. If the track to be removed is an active spur, industrial, team, switching, or sidetrack, or facilities related thereto, an agreement with the railroad is all that is needed. If the railroad does not agree, but the track has been abandoned, contact the RHS who will confer with the OCR to determine what level of authority the OCR may have. If OCR does not have authority, the issue may be appealed to the Surface Transportation Board of the federal government by petition through WisDOT's OGC.

In conferring with the OCR, it is advisable to have a resolution from the local unit of government expressing support for the track removal. This would be important on any removal including those on a state trunk highway or connecting street, but particularly important for those removals on local roadways.

### **FDM 17-45-20 Enhancement Projects**

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Projects using Federal Aid Enhancement funds and which involve railroads are usually used for recreational trails, bicycle facilities, or historical preservation purposes.

#### **20.1 Historical Preservation**

These projects usually involve grants to preserve or refurbish a depot or other buildings for use by museums, chambers or committee, etc. When an enhancement project involves railroad property, the same process used for other public highway projects is followed.

#### **20.2 Bike and Pedestrian Crossings**

Detailed guidance for bicycle facilities is available in a 1999 AASHTO Report "Guide for Development of Bicycle Facilities." Also available is a "Wisconsin Bicycle Guide" published in 2003. See [FDM 11-45-10](#).

Bike paths and sidewalks crossing railroad tracks are the most common projects at railroad crossings and need special attention. A slight angle of crossing is desirable for bikes, wheelchairs, baby strollers, etc. so that one wheel crosses at a time. However, large angles are not desirable because these vehicles lose their wheels or tires in the flange way of the track. This can be very dangerous condition for these users, by either throwing a biker or trapping a baby carriage or wheelchair.

Some indirection (curvature) in the path in order to meet the track at a desirable angle must always be a serious consideration.

Other suggestions:

- Consider zigzag approaches to force those using the crossing to look down the track in each direction before crossing.
- On corridors with frequent highspeed operations, and high crossing volumes, a separation structure may be needed.
- Keep debris and vegetation off of, or back from, the edges of the facility for safety.
- Install cross bucks on the path approach to better identify where the track is.

The lead times for these projects must include time to petition the OCR and receive an order, as well as the time required to achieve agreement with the railroad.

### **FDM 17-45-25 Exempt Crossings**

May 2, 2003

#### **25.1 Background**

Under Section 346.45, W.S., certain vehicles are required to stop at railroad crossings. These vehicles include buses transporting passengers; school buses conforming to Section 347.44(1), W.S., vehicles marked as carriers of chlorine, explosives, poisons, flammable products, oxidizers, corrosives, compressed gas, and radioactive materials; and transporters of products with flash points below 200° F or of products having a temperature above their flash point when being loaded. However, these vehicles need not stop if there is either (1) a police officer or flagperson directing traffic, (2) the track passes through an intersection with an official

traffic control signal, (3) a sign stating the crossing is abandoned, or (4) a sign stating the crossing is exempt.

The OCR has authority under 195.285 W.S. to declare crossings exempt. The process (See [Attachment 25.1](#)) of having a crossing declared exempt is included in W.S. 195.285 and begins with an analysis based on the criteria listed below followed by a petition to the OCR by a railroad, the WisDOT, or the governing body of a city, village, town, or county. School districts, industries, and private citizens are not eligible petitioners. The petition should assert that the stopping of the vehicles listed above is hazardous to human life. The OCR will hold a hearing on the allegation. On crossings involving the State Trunk Highway System, the WisDOT shall be an interested party and attend the hearing. If the OCR determines that it would be in the public interest to exempt such vehicles from stopping at the crossing, it may order the public body having jurisdiction over the roadway to erect suitable signs, signals, markings, or other traffic control devices. The design and installation of signs, signals and markings would be in accordance with the specifications of the WisDOT and the MUTCD.

## 25.2 Criteria for Selection

The following criteria have been identified as elements in the investigation and selection of railroad crossings for exempt status. There are no firm or absolute numerical values established for any of the following items:

1. Crash Record: The crash records as well as crash potential at and in the vicinity of highway railway crossings are to be considered. Single and multiple vehicle crashes and vehicle-train crashes are to be included in the evaluation. A summary of crashes at a particular crossing on the state trunk highway system is obtained from Traffic Safety Section of DTID's Bureau of Highway Operations.
2. Frequency of Train Traffic: There should be infrequent train operations at exempt crossings. For instance, an average of six crossings per week or less exclusive of flagging controlled switching moves would be considered infrequent. Normally there should be only a single track and never a possibility of more than one train at the crossing at or about the same time.
3. Volume of Vehicular Traffic: There should be a large volume of vehicular traffic using the crossing, particularly when trains are not normally present. An ADT in excess of 3000 would be desirable, but a lower ADT with > 20 percent trucks and buses could be considered. The number of school buses and trucks required to stop at a crossing are a possible hazard to through traffic. A reduction in vehicle delays is obtained with an exempt crossing.
4. Width of Pavement: Crossings with stopping lanes already in place on the approaches may lessen the need for exempt status. The number of traffic lanes and width of the roadway is not considered significant.
5. Classification of Rail Line: The Federal Railroad Administration has nine classes of track. These are shown on Table 15 in Chapter II of the "Rail-Highway Grade Crossing Handbook." See [Table 25.1](#) for Track Classes 1 through 6. For the purpose of analyzing a railroad line for an exempt crossing, crossings on Track classes 4 through 6 should never be considered for exempt status except as permitted in Section 346.45(3) W.S. Special conditions may allow for consideration of crossings on Track Class 3 lines if crossing gates are in place. Tracks meeting track safety standards above Class 6 are required to be grade separated.
6. Motorists View of Trains: Consideration regarding sighting of trains by motorists would include data on time of train operations over the crossing, adverse climatic conditions expected, obstruction to view and use of artificial light at the crossing. A good view of approaching trains and of rail cars occupying the crossing is essential unless train activated flashing light signals or highway traffic lights are installed.
7. Vehicle Speed: The speed of vehicles is not a primary consideration. Rural highway crossings with few trains and with vehicles stopping as frequently as three or four an hour in each direction of travel could be considered for exempt status.
8. Auxiliary or Vehicle Stopping Lanes: Auxiliary vehicle stopping lanes are not necessary with exempt crossings as vehicles otherwise required to stop at railroad crossings will stop in common with other highway vehicles during the approach and crossing of a railroad train. The removal of existing auxiliary lanes at an exempt crossing should be considered depending on their value due to other factors. At a minimum they should be marked to indicate they are not driving lanes.
9. Warning Devices for Exempt Crossing: The volume and speed thresholds for an exempt crossing could be increased where gates and flashing lights are present at a crossing.
10. In limited circumstances, where a crossing is in close proximity to a highway intersection, the crossing may be a good candidate for exemption even if the rail line carries large volumes of trains. The crossing would typically have gates and lights and the roadway intersection would be signalized.

However, a hazard may exist from stopping vehicles such as a school bus blocking the intersection when they stop for a non-exempt crossing. Thus exempting the crossing may be a safer alternative overall.

**25.3 Summary**

There are no firm or absolute numerical values established for any of the above items. The conditions have variable effects on safety and are closely interrelated. A total evaluation of all items is required, including any changes in the signing, crossing, and traffic controls. In addition to the savings in time and energy realized by the public at an exempt crossing, there should be a high probability of reducing vehicle-vehicle crashes and, to the extent possible, strong assurances that a vehicle-train accident would not occur at the crossing.

Requests for exempt crossings on state trunk highways or in conjunction with a federal-aid project are to be submitted to the RHS with supporting data in the same manner as for improvement projects.

**25.4 Exempt Signing**

The EXEMPT crossing signs are installed by the agency having jurisdiction for the maintenance of the highway. EXEMPT signs are placed on the same post as the railroad crossing advance warning sign and on the post with the cross buck sign. Detail on signing is contained in Chapter VIII of the MUTCD.

**Table 25.1 Maximum Train Speed as a Function of Track Class**

| Track Class | Passenger    | Freight |
|-------------|--------------|---------|
| 6           | 110 mph      | 110 mph |
| 5           | 90           | 80      |
| 4           | 80           | 60      |
| 3           | 60           | 40      |
| 2           | 30           | 25      |
| 1           | 15           | 10      |
| Excepted    | None Allowed | 10      |

Source: Ref. 1

1. Railroad-Highway Grade Crossing Handbook - 2nd Edition, McLean, Virginia, Federal Highway Administration, Report FHWA 75-86-215, September 1986.

**LIST OF ATTACHMENTS**

[Attachment 25.1](#) Exempt Railroad Crossing Process