STATE OF ILLINOIS
ILLINOIS COMMERCE COMMISSION

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Illinois Commerce Commission
RAIL SAFETY SECTION

WISCONSIN CENTRAL LTD.,	)	
Petitioner,	)	
v.	)	Docket No. T02-0027
ILLINOIS DEPARTMENT OF TRANSPORTATION,	)	
Respondents.	)	
Petition of Wisconsin Central Ltd. seeking an order of the Illinois Commerce Commission directing that an additional track and grade crossing be constructed at Touhy Avenue (DOT 689-651T) on the Wisconsin Central Ltd. In the City of Des Plaines, Cook County, IL.	)	

NOTICE OF LATE FILING OF EXHIBIT

To: June Tate, ALJ
Henry Humphries, ICC
Michael J. Barron Jr., W.C. Atty.
David R. Wiltse, Des Plaines Atty.
Donna McAllister, City Clerk

PLEASE TAKE NOTICE that I have this 18th day of July 2002 forwarded to Mr. Kevin Sharpe, Director of Processing, Transportation Division of the Illinois Commerce Commission, Springfield, Illinois, for late filing in the above matter, Department's Exhibit 1, a copy of which is attached hereto and hereby served upon you.

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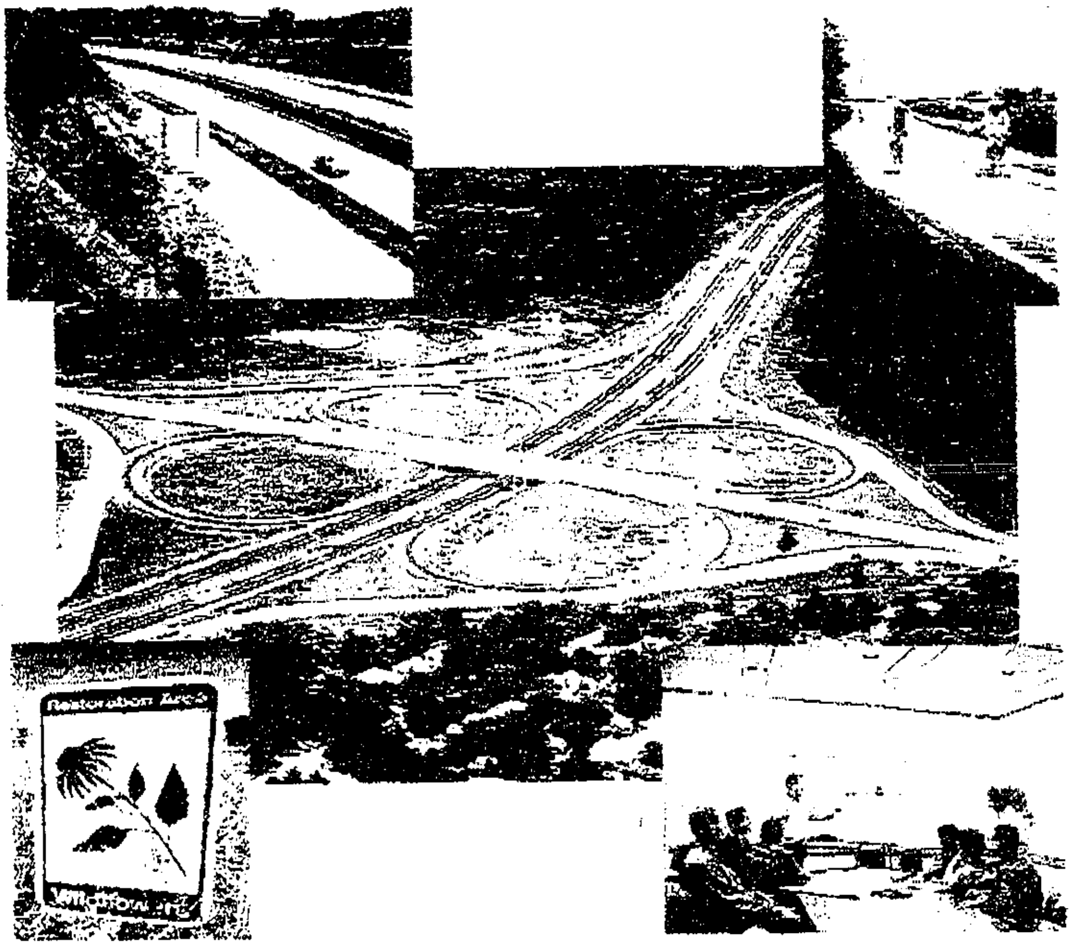

Bureau of Design and Environment Manual

Illinois Department of Transportation
Division of Highways

EXHIBIT # 1

33-6.04(b) Design of Urban Profile Gradelines

Laying out profile gradelines in urban areas often is more complicated than in rural areas due to limited right-of-way, closely spaced intersections, existing roadside development, and accommodation of drainage on curbed streets including drainage from outside the street. Evaluate the following factors when developing a profile gradeline on an urban project:

1. Vertical Curves. Long vertical curves on urban streets are generally impractical. The designer will typically need to lay out the profile gradeline to meet existing field conditions. Therefore, the minimum vertical curve lengths generally are provided on urban streets. Where practical, locate VPI's at or near the centerlines of cross streets. For flat urban areas where the algebraic difference in grades is between 0.6% and 1%, use the minimum length of sag or crest curve as discussed in Sections 33-4.01(a) and 33-4.02(b) (i.e., $L = 0.6\ V$). At signalized and stop-controlled intersections, some flattening of the approaches also may be required for better traffic operations.

2. Surface Drainage. Urban streets will usually have curbs and gutters, which may complicate the layout of the profile gradeline to facilitate drainage. Take special care to avoid flat spots where water may pond, especially through radius returns. Section 33-2 provides the minimum gradients for curbed streets. In very flat areas, the profile gradeline may be rolled up and down at 0.3% to 0.5% to provide the necessary drainage. Also, see the *IDOT Drainage Manual* for guidance on encroachment of water onto the traveled way. At intersections, the surface drainage preferably should be intercepted upstream of an intersection.

3. Spline Curves. Spline curves can be helpful in laying grades in urban areas where it is necessary to meet numerous elevation restrictions in relatively short distances. Spline curves are thin, flexible pieces of plastic that can be bent into any curved shape. The designer will need to tie these curves to the profile gradeline at the beginning and end. Show the elevations along a spline curve at 5-m intervals.

4. Existing Roadside Development. Where roadside development is extensive, the cross-section design of a curb and gutter street is critical. Ensure adequate drainage is provided behind curbs and that the profiles for existing driveways are acceptable.

5. Earthwork Balance. Balancing earthwork is typically impractical in urban areas; see Section 33-6.04(g). An excess of excavation is preferable to the need for borrow, due to the generally higher cost of borrow in urban areas.

A POLICY on GEOMETRIC DESIGN of HIGHWAYS and STREETS

2001

American Association of State Highway and Transportation Officials
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www.transportation.org

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existing driveway connections. Major controls and design features are discussed in other reference sources (**19**, **20**, **21**).

RAILROAD-HIGHWAY GRADE CROSSINGS

A *railroad-highway crossing*, like any *highway-highway intersection*, involves either a separation of grades or a crossing at-grade. The geometrics of a highway and structure that involves the overcrossing or undercrossing of a railroad are substantially the same as those for a highway grade separation without ramps.

The horizontal and vertical geometrics of a highway approaching a railroad grade crossing should be constructed in a manner that does divert driver attention to roadway conditions.

Horizontal Alignment

If practical, the highway should intersect the tracks at a right angle with no nearby intersections or driveways. This layout enhances the driver's view of the crossing and tracks, reduces conflicting vehicular movements from crossroads and driveways, and is preferred for bicyclists. To the extent practical, crossings should not be located on either highway or railroad curves. Roadway curvature inhibits a driver's view of a crossing ahead, and a driver's attention may be directed toward negotiating the curve rather than looking for a train. Railroad curvature may inhibit a driver's view down the tracks from both a stopped position at the crossing and on the approach to the crossings. Those crossings that are located on both highway and railroad curves present maintenance problems and poor rideability for highway traffic due to conflicting superelevations.

Where highways that are parallel with main tracks intersect highways that cross the main tracks, there should be sufficient distance between the tracks and the highway intersections to enable highway traffic in all directions to move expeditiously. Where physically restricted areas make it impossible to obtain adequate storage distance between the main track and a highway intersection, the following should be considered:

- Interconnection of the highway traffic signals with the grade crossing signals to enable vehicles to clear the grade crossing when a train approaches.
- Placement of a "Do Not Stop on Track" sign on the roadway approach to the grade crossing.

Vertical Alignment

It is desirable from the standpoint of sight distance, rideability, braking, and acceleration distances that the intersection of highway and railroad be made as level as practical. Vertical curves should be of sufficient length to ensure an adequate view of the crossing.

In some instances, the roadway vertical alignment may not meet acceptable geometrics for a given design speed because of restrictive topography or limitations of right-of-way. To prevent drivers of low-clearance vehicles from becoming caught on the tracks, the crossing surface should be at the same plane as the top of the rails for a distance of 0.6 m [2 ft] outside the rails. The surface of the highway should also not be more than 75 mm [3 in] higher or lower than the top of nearest rail at a point 9 m [30 ft] from the rail unless track superelevation makes a different level appropriate, as shown in Exhibit 9-102. Vertical curves should be used to traverse from the highway grade to a level plane at the elevation of the rails. Rails that are superelevated, or a roadway approach section that is not level, will necessitate a site specific analysis for rail clearances.

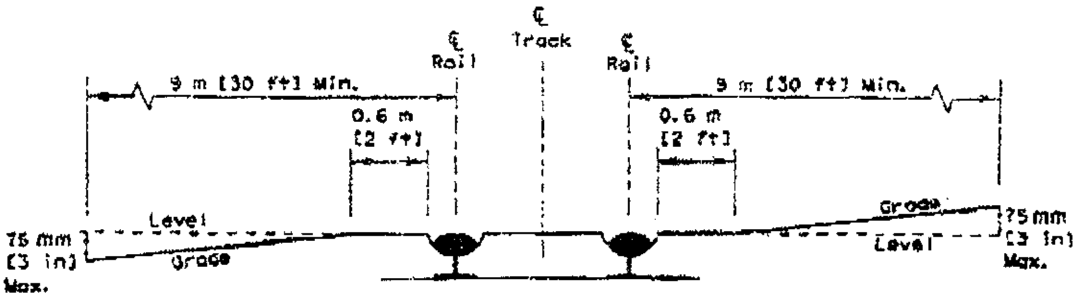

Exhibit 9-102. Railroad-Highway Grade Crossing

General

The geometric design of railroad-highway grade crossings should be made jointly when determining the warning devices to be used. When only passive warning devices such as signs and pavement markings are used, the highway drivers are warned of the crossing location but must determine whether or not there are train movements for which they should stop. On the other hand, when active warning devices such as flashing light signals or automatic gates are used, the driver is given a positive indication of the presence or the approach of a train at the crossing. A large number of significant variables should be considered in determining the type of warning device to be installed at a railroad grade crossing. For certain low-volume highway crossings where adequate sight distance is not available, additional signing may be needed.

Traffic control devices for railroad-highway grade crossings consist primarily of signs, pavement markings, flashing light signals, and automatic gates. Criteria for design, placement, installment, and operation of these devices are covered in the MUTCD (9), as well as the use of various passive warning devices. Some of the considerations for evaluating the need for active warning devices at a grade crossing include the type of highway, volume of vehicular traffic, volume of railroad traffic, maximum speed of the railroad trains, permissible speed of vehicular traffic, volume of pedestrian traffic, crash history, sight distance, and geometrics of the crossing. The potential for complete elimination of grade crossings without active traffic control devices (e.g., closing lightly used crossings and installing active devices at other more heavily used crossings) should be given prime consideration.

These guidelines are not all inclusive. Situations not covered by these guidelines should be evaluated using good engineering judgment. Additional information on railroad-highway grade crossings can be found in various published sources (**22, 23, 24, 25, 26, 27**).

Numerous index formulas have been developed to assess the relative conflict potential at railroad-highway grade crossings on the basis of various combinations of its characteristics. Although no single formula has universal acceptance, each has its own values in establishing an index; when used with sound engineering judgment, each formula provides a basis for a selection of the type of warning devices to be installed at a given crossing.

The geometric design of a railroad-highway grade crossing involves the elements of alignment, profile, sight distance, and cross section. The appropriate design may vary with the type of warning device used. Where signs and pavement markings are the only means of warning, the highway should cross the railroad at or nearly at right angles. Even when flashing lights or automatic gates are used, small intersection angles should be avoided. Regardless of the type of control, the roadway gradient should be flat at and adjacent to the railroad crossing to permit vehicles to stop, when necessary, and then proceed across the tracks without difficulty.

Sight distance is a primary consideration at crossings without train-activated warning devices. A complete discussion of sight distance at grade crossings can be found in two published sources (**24, 27**).

As in the case of a highway intersection, there are several events that can occur at a railroad-highway grade intersection without train-activated warning devices. Two of these events related to determining the sight distance are:

- The vehicle operator can observe the approaching train in a sight line that will allow the vehicle to pass through the grade crossing prior to the train's arrival at the crossing.
- The vehicle operator can observe the approaching train in a sight line that will permit the vehicle to be brought to a stop prior to encroachment in the crossing area.

Both of these maneuvers are shown as Case A of Exhibit 9-103. The sight triangle consists of the two major legs (i.e., the sight distance, d_H, along the highway and the sight distance, d_T, along the railroad tracks). Case A of Exhibit 9-103 indicates values of the sight distances for various speeds of the vehicle and the train. These distances are developed from two basic formulas:

PROOF OF SERVICE

The undersigned hereby certifies that a copy of the foregoing instrument was served upon the addressees listed below by mailing a true and correct copy via first class mail, postage pre-paid and depositing the same in the United States Mail, Springfield, Illinois, this 18th day of July, 2002:

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