Approved: January 30, 2001
Date

MINUTES OF THE HOUSE TRANSPORTATION.

The meeting was called to order by Chairperson Gary Hazylett at 1:35 p.m. on January 24, 2001 in Room 519-S of the Capitol.

All members were present except:

Committee staff present:
Bruce Kinzie, Revisor
Hank Avila, Research
Ellie Luthye, Committee Secretary

Conferees appearing before the committee:
Pat Hubbell, Railroad Association
Warren Sick, Ass't. Secretary and State Transportation Engineer, Kansas Department of Transportation
Jerry Fowler, Saline County Engineer,
Norbert Marek, Myers, Pottroff, Ball Law Firm
James Loumiet, Loumiet Association Inc. Consulting Firm

Others attending:
See attached sheet.

Chairman Hayzlett told the committee he had made the arrangements for the committee to tour the Motor Vehicle Department on Wednesday, January 31st. A memo will be sent out to them with the arrangements.

The Chair then called for introduction of bills. Representative Vickery made a motion to introduce a bill dealing with predatory pricing. This was seconded by Representative Powers and the motion carried.

Representative Hayzlett made a motion to introduce a bill, requested by the Arab Shrine, to create a distinctive auto license plate to be purchased by members of the five Shrine Centers in Kansas. This was seconded by Representative Levinson and the motion carried.

HB 2045 - railroad grade crossings on county and township highways

Chairman Hayzlett called on Pat Hubbell, Railroad Association, as the first proponent on this bill. Mr. Hubbell presented testimony showing how **HB 2045** amends K.S.A. 66-227, concerning railroad grade crossings on county and township roads, by eliminating two elements of the statute which, in their opinion, are ambiguous and nearly impossible to comply with. (Attachment 1)

Warren Sick, Assistant Secretary and State Transportsation Engineer of the Kansas Department of Transportation, gave testimony supporting the conceptual change to design standards as contained in this bill. (Attachment 2)

Jerry Fowler, Director, Saline County Public Works, stated they were generally supportive of this bill but felt there were some areas that should be modified and he listed these changes and also discussed the measures they were in agreement with. (Attachment 3)

Norbert Merek, Myers, Pottroff, Ball Law Firm, presented statistics which showed the highway-rail incidents over the past 10 years, also the total injuries in highway-rail incidents over the same period of time, showing the types of grade crossings, by county, for Kansas and closed with sharing information as to grade and vertical alignment at stated by AASHTO - Geometric Design of Highways and Streets. (Attachment 4)

James R. Loumiet, Loumiet and Associates, Inc., was the next presenter. He conveyed to the committee his reasons for supporting **HB 2045** and also stated his qualifications. He concluded that his purpose for appearing before the committee was simply to assist the State of Kansas in producing the best possible grade crossing legislation.(Attachment 5)

MINUTES OF THE HOUSE TRANSPORTATION COMMITTEE, Room 519-S Statehouse at 1:35 p.m. on January 24, 2001.

Following discussion and questions by the committee Chairman Hayzlett closed hearings on **HB 2045.**

The Chair called on Tom Whitaker, Kansas Motor Carriers Association, who extended an invitation to the committee to participate in the Kansas Trucking Industry Day at the Capitol by meeting the captains of the Kansas Road Team and driving the 18 wheeler simulator.

Chairman Hayzlett adjourned the meeting at 3:00 p.m. The next meeting of the House Transportation Committee is scheduled for Tuesday, January 30^{th} at 1:30 in Room 519-S.

HOUSE TRANSPORTATION COMMITTEE GUEST LIST

DATE: January 24, 2001

NAME	REPRESENTING
Warren L. Sick	K.D.O.T
Al Cathcart	KDOT
Bill Watts	KDOT
Nancy Bogina	KDOT
Norbert Marek	Myers, Pottroff + Ball
Damien Butler	Myers, Pottroff + Ball
Jerry Fowler	Saline Co Public Works
Dan Harden	Riley County
Judy Moler	KAC
James Loumiet	James R. Loumiet & Assoc., Inc.
Tom Whitaker	Ks Motor Carriers Assn.
Jackie Miller	KCC
Kathleen Falk	NRSCF
Barb Conant	Ks Trial Lawyers Assoc
Aaron Dunkel	Div of the Budget
Andy Shaw	Kearney Law Office

KANSAS RAILROADS

PATRICK R. HUBBELL

800 SW JACKSON
SUITE 1120
TOPEKA, KANSAS 66612-1292

(785) 235-6237

House Transportation Committee

January 24, 2001

HB 2045

House Transportation Committee
January 24, 2001
Attachment 1

Mr. Chairman and members of the Committee, my name is Pat Hubbell. I appear here today on behalf of the Kansas Railroads Industry.

K.S.A. 66-227 concerns railroad grade crossings on county and township roads. House Bill 2045 amends this statute by eliminating two elements of the statute, which are ambiguous and nearly impossible to comply with. The first paragraph of the statute requires that public road crossings:

> "... shall be on the same grade as the track for thirty feet on each side of the center of said track, unless the board of county commissioners shall find the same to be unnecessary, and the approaches thereto shall not exceed a six percent grade..."

Kansas may be the only state with a statute that contains this language. The reason no other state has a crossing statute containing that requirement is because the term is extremely ambiguous and from an engineering standpoint, incomprehensible.

This language may have been inserted in the 1919 amendment to the statute because of a then existing problem caused by a railroad's failure to restore the roadway to the established grade so the surface of the highway would be level with the top of the outside rail.

Another inherit conflict caused by the language "same grade for 30 feet and the 6% approach grade" is that it sometimes extends the crossing approaches far beyond the railroad's right-of-way. This occurs because the statute permits no greater than a 6% approach grade, but does not define the extent of the "approach". The statute does not specify whether the "approach" includes the total sixty feet of "same grade", or if it means 30 feet, 300 feet, or one mile. It is highly unlikely the Legislature intended to require the railroad to construct approaches on property it did not even own, particularly since elsewhere in the statute the railroad's responsibility for paving the road surface is limited to a distance of two feet on either side of the railroad track.

Compliance with the statute is even more difficult when the crossing is on a curved portion of the track which often requires one rail to be elevated as much as six inches higher than the other rail.

Concerning rail crossings in cities of the first or second class, K.S.A. 12-1633 gives cities the power to pass ordinances applicable to the construction and maintenance of railroad grade crossings.

Crossings on the state highway system are constructed and maintained "in a manner to be approved by the Secretary of Transportation", pursuant to K.S.A. 68-414. This statute does not contain the ambiguous and impossible language we have asked you to delete from 66-227.

House Bill 2045 has corrected previously discussed flaws in the statute by removing the ambiguous requirement of "same grade as the track for 30 feet on each side of the center of said track and approaches that not exceed a six percent grade." Inserted in lieu of that language at the request of the Kansas Association of Counties and their engineering staff, are AASHTO Standards applicable to grade crossings. This language establishes safety standards, yet removes the requirements which are extremely ambiguous and nearly comprehensible from an engineering standpoint.

Thank you for hearing this bill and I hope you can vote for its passage.

A POLICY
on
GEOMETRIC DESIGN
of
HIGHWAYS
and
STREETS

1994

American Association of State
Highway and Transportation Officials
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Chapter IX
AT-GRADE INTERSECTIONS

INTRODUCTION

An intersection is defined as the general area where two or more highways join or cross, including the roadway and roadside facilities for traffic movements within it. Each highway radiating from an intersection and forming part of it is an intersection leg. The common intersection of two highways crossing each other has four legs. It is not recommended that an intersection have more than four legs.

An intersection is an important part of a highway because, to a great extent, the efficiency, safety, speed, cost of operation, and capacity depend on its design. Each intersection involves through- or cross-traffic movements on one or more of the highways concerned and may involve turning movements between these highways. These movements may be handled by various means, depending on the type of intersection.

There are three general types of intersections: intersections at grade, grade separations without ramps, and interchanges. The last two are discussed separately in other chapters. Certain intersection design elements, primarily those concerning the accommodation of turning movements, are common and applicable to intersections at grade and interchanges. The design elements in the following discussions apply to at-grade intersections and their appurtenant features.

GENERAL DESIGN CONSIDERATIONS AND OBJECTIVES

The main objective of intersection design is to reduce the severity of potential conflicts between motor vehicles, buses, trucks, bicycles, pedestrians, and facilities while facilitating the convenience, ease, and comfort of people traversing the intersections. The design should be fitted closely to the natural transitional paths and operating characteristics of the users.

Four basic elements enter into design considerations of at-grade intersections.

1-5

DRIVEWAYS

Driveways are, in effect, at-grade intersections and should be designed consistent with the intended use. For further discussion of driveways refer to Chapter IV. The number of accidents is disproportionately higher at driveways than at other intersections; thus their design and location merit special consideration.

Driveways should not be situated within the functional boundary of at-grade intersections. This boundary would include the longitudinal limits of auxiliary lanes. The regulation and design of driveways are intimately linked with the right-of-way and zoning of the roadside. On new highways the necessary right-of-way can be obtained to provide the desired degree of driveway regulation and control. In many cases additional right-of-way can be acquired on existing highways or agreements can be made to improve existing undesirable access conditions. Often the desired degree of driveway control must be effected through the use of police powers to require permits for all new driveways and through adjustments of those in existence.

The objective of driveway regulation is desirable spacing and a proper layout plan. Its attainment depends on the type and extent of legislative authority granted the highway agency. Many States and cities have developed standards for driveways and have separate units to handle the details incidental to checking requests and issuing permits for new driveways or changes in driveway connections to their road systems. Major features of design and controls are suggested in References **(9)**, **(10)**, and **(11)**.

RAILROAD 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 entails 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 an at-grade railroad crossing should be constructed in a manner that does not necessitate a driver divert attention to roadway conditions.

Horizontal Alinement

If possible, 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 cross-

1-6

roads 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 and safely. 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:

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

Vertical Alinement

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

In some instances, the roadway vertical alinement may not meet acceptable geometrics for a given design speed because of restrictive topography or limitations of right-of-way. Acceptable geometrics necessary to prevent drivers of low-clearance vehicles from becoming caught on the tracks would provide the crossing surface at the same plane as the top of the rails for a distance of 0.6 m outside the rails. The surface of the highway should also not be more than 75 mm higher or 150 mm lower than the top of nearest rail at a point 9 m from the rail unless track superelevation dictates otherwise as shown on Figure IX-77. Vertical curves should be used to traverse from the highway grade to the level plane of the rails.

General

geometric design of railroad-highway grade crossings must be made jointly th the determination of the warning devices to be used. When only passive rning devices, such as signs and pavement markings are used, the highway ivers are warned of the crossing location, but must determine whether or not here are train movements for which they should stop. On the other hand, when ctive 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 must 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, it may be necessary to install additional signing to provide a safe crossing.

Traffic control devices for railroad-highway grade crossings consist primarily of signs, pavement markings, flashing light signals, and automatic gates. Standards for design, placement, installment, and operation of these devices are covered in the MUTCD (5) 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, the volume of pedestrian traffic, accident record, sight distance, and the geometrics of the crossing. The potential for complete elimination of grade crossings without active traffic control devices, for example, closing lightly used crossings and installing active devices at other more heavily used crossings, should be given prime consideration.

If it is established that active grade crossing traffic control devices are needed, the basic active device, flashing light signals, is used. When additional warning is desirable, the criteria or warrants recommended for evaluating the need for automatic gates at a grade crossing in addition to the above, include the existence of multiple main line tracks; multiple tracks at or in the vicinity

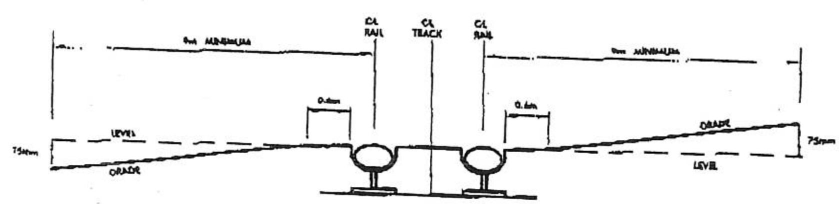

Figure IX-77. Railroad highway grade crossing.

of the crossing which may be occupied by a train or locomotive so as to be sure the movement of another train approaching the crossing; a combination of high speeds and moderately high volumes of highway and railroad traffic; and a substantial number of school buses or trucks carrying hazardous materials using the crossing.

These guidelines are not all inclusive. There will always be situations that are not covered by these guidelines and must be evaluated using good engineering judgment. Additional information on railroad-highway grade crossings can be found in References (**12**), (**13**), (**14**), (**15**), (**16**) and (**17**).

Numerous hazard index formulas have been developed to assess the relative potential hazard at a railroad grade crossing 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, that when used with sound engineering judgment, 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 alinement, profile, sight distance, and cross section. The requirements may vary with the type of warning devices 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 at-grade crossings can be found in References (**14**) and (**17**).

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:

1. The vehicle operator can observe the approaching train in a sight line that will safely allow the vehicle to pass through the grade crossing prior to the train's arrival at the crossing.
2. 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 on Figure IX-78. The sight triangle consists of the two major legs, that is, the sight distance, d_H, along the highway and the sight distance, d_T, along the railroad tracks. Case A of Table

1-9

IX-21 indicates values of the sight distances for various speeds of the vehicle and the train. These distances are developed from two basic formulas:

$$d_H = 0.28\ V_v t + \frac{V_v^2}{254f} + D + d_e$$

and

$$d_T = \frac{V_T}{V_V}\left[(0.28)V_v t + \frac{V_v^2}{254f} + 2D + L + W\right]$$

where:

- d_H = sight distance leg along the highway allows a vehicle proceeding to speed V_v to cross tracks safely even though a train is observed at a distance d_T from the crossing or to safely stop the vehicle without encroachment of the crossing area (m)
- d_T = sight distance leg along the railroad tracks to permit the maneuvers described as for d_h (m)
- V_v = velocity of the vehicle (km/h)
- V_T = velocity of the train (km/h)
- t = perception/reaction time, which is assumed to be 2.5 s (this is the same value used in Chapter III to develop the minimum safe stopping distance)
- f = coefficient of friction, which is assumed to be same values used and shown in Table III-1 for the development of the minimum safe stopping distance
- D = distance from the stop line or front of the vehicle to the nearest rail, which is assumed to be 4.5 m
- d_e = distance from the driver to the front of the vehicle, which is assumed to be 3.0 m
- L = length of vehicle, which is assumed to be 20 m
- W = distance between outer rails (for a single track, this value is 1.5 m)

Corrections must be made for skew crossings and other than flat highway grades.

When a vehicle has stopped at a railroad crossing, the next maneuver is to depart from the stopped position. It is necessary that the vehicle operator have sight distance along the tracks that will permit sufficient time to accelerate the vehicle and clear the crossing prior to the arrival of a train even though the train

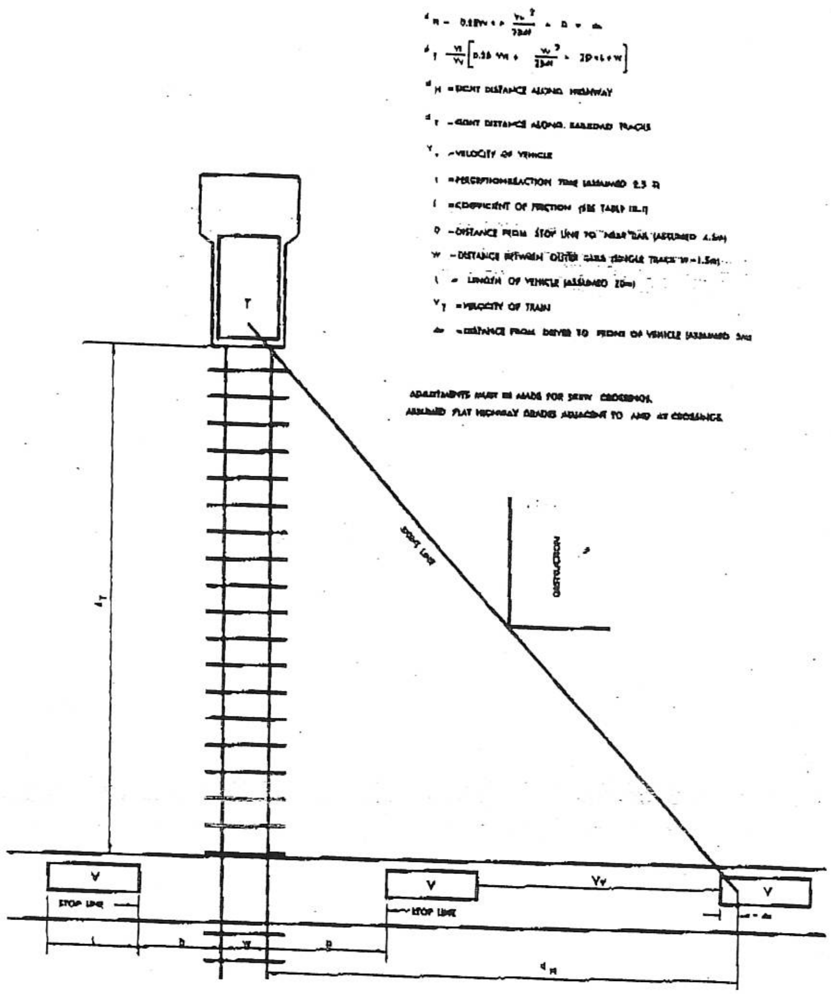

Figure IX-78. Case A: Moving vehicle to safely cross or stop at railroad crossing.

1-12

Train Speed (km/h)	Case B Departure from Stop	Case A Moving Vehicle											
		Vehicle Speed (km/h)											
	0	10	20	30	40	50	60	70	80	90	100	110	120
	Distance Along Railroad from Crossing, d_T(m)												
10	45	38	24	20	15	13	18	20	21	22	24	25	26
20	91	77	48	40	37	37	38	40	43	44	47	50	53
30	136	115	72	60	56	56	58	61	64	66	71	76	79
40	181	153	96	80	75	75	77	81	85	89	94	101	105
50	227	192	120	100	94	93	96	101	106	111	118	126	132
60	272	230	144	120	112	112	115	121	128	133	141	151	158
70	317	268	168	140	131	131	134	141	149	155	165	176	185
80	362	307	193	161	150	149	154	162	170	177	189	202	211
90	408	345	217	181	168	168	173	182	191	199	212	227	237
100	453	383	241	201	187	187	192	202	213	221	236	252	264
110	498	422	265	221	206	205	211	222	234	244	259	277	290
120	544	460	289	241	225	224	230	242	255	266	283	302	316
130	589	498	313	261	243	243	249	263	275	288	306	327	343
140	634	537	337	281	262	261	269	283	298	310	330	353	369
	Distance Along Highway from Crossing, d_H (m)												
		16	26	38	52	71	93	119	148	177	213	256	294

Table IX-21. Required design sight distance for combination of highway and train vehicle speeds; 20 m truck crossing a single set of tracks at 90°.

might come into view as the vehicle is beginning its departure process. Figure IX-79 indicates this maneuver. Case B on Table IX-21 contains various values of departure sight distance for a range of train speeds. These values are obtained from the formula:

$$d_T = 0.28\, V_T \left[\frac{V_G}{a_1} + \frac{L + 2D + W - d_a}{V_G} + J \right]$$

where: d_T = sight distance along railroad tracks (m)

V_T = velocity of train (km/h)

V_G = maximum speed of vehicle in first gear, which is assumed to be 2.7 m/s

a_1 = acceleration of vehicle in first gear, which is assumed to be 0.45 m/s^2

L = length of vehicle, which is assumed to be 20 m

D = distance from the stop line to the nearest rail, which is assumed to be 4.5 m

J = Sum of perception time and time to activate clutch or automatic shift, which is assumed to be 2.0 s

W = distance between outer rails; for a single track, this value is 1.5 m

d_a = $\frac{V_G^2}{2a_1}$

or distance vehicle travels while accelerating to maximum speed in first gear:

$$\frac{V_G^2}{2a_1} = \frac{(2.7)^2}{(2)\,(0.45)} = 8.1 \text{ m}$$

Adjustments for skew crossings and for highway grades other than flat are necessary.

Sight distances of the order shown in Table IX-21 are desirable at any railroad grade crossing not controlled by active warning devices. Their attainment, however, is difficult and often impracticable, except in flat, open terrain.

In other than flat terrain, it may be necessary to rely on speed control signs and devices and to predicate sight distance on a reduced vehicle speed of operation. Where sight obstructions are present, it may be necessary to install active traffic control devices that will bring all highway traffic to a stop before crossing the tracks and will warn drivers automatically in time for an approaching train.

For safety, the driver of a stopped vehicle at a crossing should see enough of the railroad track to be able to cross it before a train reaches the crossing, even though the train may come into view immediately after the vehicle starts to cross. The length of the railroad track in view on each side of the crossing must be greater than the product of the train speed and the time necessary for the stopped vehicle to start and cross the railroad. The required sight distance along the railroad track may be determined in the same manner as it is for a stopped vehicle crossing a preference highway, which is covered previously in this Chapter. In order for vehicles to cross two tracks from a stopped position, with the front of the vehicle 4.5 m from the closest rail, sight distances along the railroad, in meters, should be determined by the formula with a proper adjustment for the W value.

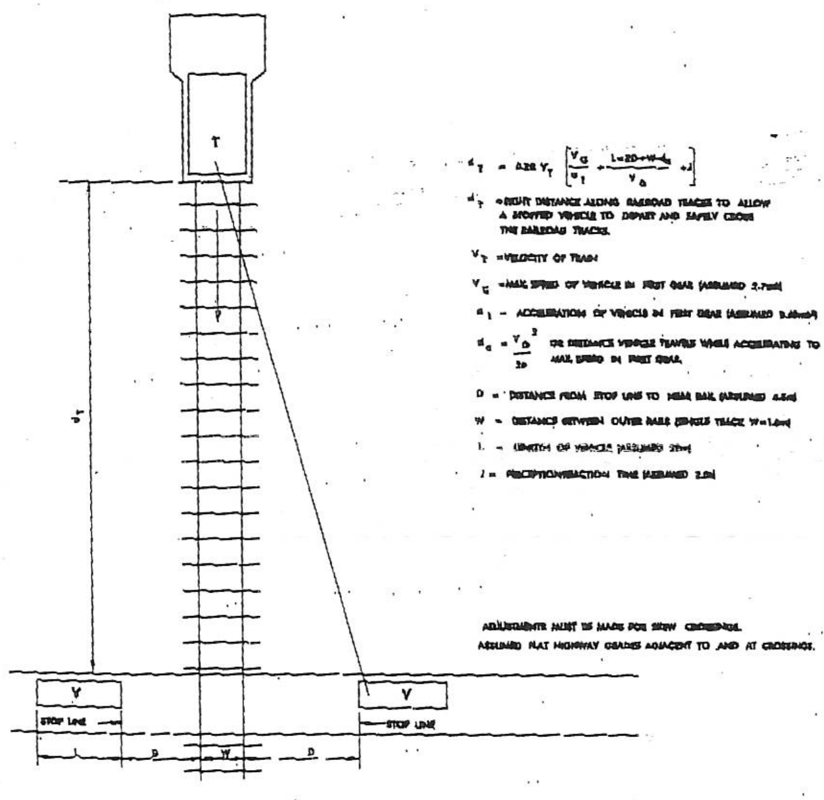

Figure IX-79. Case B: Departure of vehicle from stopped position to cross single railroad track.

The highway traveled way at a railroad crossing should be constructed for a suitable length with all-weather surfacing. A roadway section equivalent to the current or proposed cross section of the approach roadway should be carried across the crossing. The crossing surface itself should have a riding quality equivalent to that of the approach roadway. If the crossing surface is in poor condition, the driver's attention may be devoted to choosing the smoothest path over the crossing. This effort may well reduce the attention given to observance of the warning devices or even the approaching train. Information regarding various surface types that may be used can be found in "Railroad-Highway Grade Crossing Surfaces" (**16**).

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STATE OF KANSAS

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E. Dean Carlson
Secretary of Transportation

Bill Graves
Governor

TESTIMONY BEFORE HOUSE COMMITTEE ON TRANSPORTATION REGARDING HOUSE BILL NO. 2045 RAILROAD CROSSINGS

JANUARY 24, 2001

Mr. Chairman and Committee Members:

I am Warren Sick, Assistant Secretary and State Transportation Engineer of the Kansas Department of Transportation. I agree with the conceptual change to design standards as contained in House Bill 2045.

House Bill 2045 amends current law, which requires a specified level of maintenance of railroad crossings on all public highways. The bill would appear to eliminate state highways and city streets from its application and substitute the American Association of State Highway and Transportation Officials Geometric Design of Highways and Streets at Grade Intersections, Railroad Grade Crossings, in effect on July 1, 2001, for the statutory standards. Secondly, it would require maintenance upon complaint. The vertical profile requirements for the highway approach to highway/railroad crossings, as presently contained in KSA 66-227, cannot be reasonably attained on several crossings in Kansas.

Application of the proposed standards would make vertical profile approach requirements for roadways more easily attained. The American Association of State Highway and Transportation Officials Geometric Design of Highways and Streets at Grade Intersections, Railroad Grade Crossings, is currently used by the Kansas Department of Transportation in the design of state and federal aid highway improvements and would be the most appropriate design manual for the vertical profile or alignment requirements of highway/railroad crossings.

With adoption of amendments that would apply the revised standards to all public highways, roads, or streets and by referencing only that part of the cited manual that addresses vertical profile requirements, KDOT would be in total support of the bill.

PUBLIC WORKS DEPARTMENT
SALINE COUNTY HIGHWAY DEPARTMENT
3424 Airport Rd.
Salina, Kansas 67401

22 January 2001

Re: HB 2045

Chairman Hayzlett and members of the House Transportation Committee

I am supportive of amending K.S.A. 66-227 and 66-229. However, there are some areas of HB 2045 that should be modified. Line 15 deletes the wording "public highway" and includes new language. The definition of "public highway" means all public roads not just State highways. The phrase "public highway" should remain unchanged.

Line 35 sets a date regarding the publication to which it is referred. By using a date, should the publication be revised, the statute would be outdated. Language used in K.S.A. 8-2003 is "in the most recent edition".

There needs to be some kind of language in the legislation that would require the railroads to comply. This language should be in Sec. 2., which is K.S.A. 66-229 amended. Suggested language could be, "The railroad shall be required to comply with this act when reported by the county engineer or the road supervisor. The neglect or refusal of the railroad to enforce or comply with the provisions herein shall constitute a misdemeanor and on conviction shall be fined a sum not exceeding five hundred dollars ($500) per day." The words "without prejudice" should be included at the end of Line 6, page 2. Any action or inaction by the county engineer or road supervisor should be without prejudice because their duty is without authority.

Thank you for your consideration of these issues.

Jerry L. Fowler, P.E. ,Director
Saline County Public Works
3424 Airport Road
Salina, Kansas 67401

House Transportation Committee
January 24, 2001
Attachment 3

KS ST S 68-414
K.S.A. § 68-414

KANSAS STATUTES ANNOTATED
CHAPTER 68.--ROADS AND BRIDGES
PART I.--ROADS
ARTICLE 4.--STATE HIGHWAYS

Current through End of 1999 Reg. Sess.

68-414. Improvement of railroad crossings on state highway system; division of cost; safety devices or signals.

The secretary of transportation, in the construction, improvement, reconstruction or maintenance of the state highway system, shall have the power and authority to compel all railroad companies operating steam or electric railroads in this state to construct, improve, reconstruct or maintain in a manner to be approved by the secretary of transportation, viaducts, tunnels, underpasses, bridges or grade crossings where the lines of said railroad companies intersect state highways, when in the judgment of the secretary such viaducts, tunnels, underpasses, bridges or grade crossings are necessary for the proper construction of the state highway system, for the safety of the general public, or for the elimination of a dangerous grade crossing. The expense of such construction, improvement, reconstruction or maintenance may be divided between the railroad company and the secretary of transportation in a fair and equitable proportion to be determined by the secretary of transportation, said secretary, however, to pay not to exceed fifty percent (50%) of the cost of any construction, improvement, reconstruction or maintenance of viaducts, tunnels, underpasses or bridges, but such fifty percent (50%) limitation shall not apply to express highways or freeways established pursuant to K.S.A. 68-2301. Otherwise, grade crossings shall be constructed and maintained at the expense of the railroad company.

If after due notice to said railroad company that in the judgment of the secretary of transportation the construction, improvement, reconstruction or maintenance of such viaduct, tunnel, underpass, bridge or grade crossing is necessary, said railroad company fails to comply with the secretary's order as provided by this section, said secretary is empowered and authorized to forthwith construct, improve, reconstruct or maintain such viaduct, tunnel, underpass, bridge or grade crossing and the amount so expended for such construction, improvement, reconstruction or maintenance shall comprise a charge against such railroad company and the secretary shall render a bill to such railroad company stating the amount expended and for what purpose, and upon the failure or refusal of such railroad company to make payment of the amount due the state the secretary shall forward all data and information to the attorney general of this state, who shall immediately institute a suit in the name of the secretary of transportation for the recovery of the amount reported by the secretary of transportation as due from the railroad company for its proportion of the cost of the construction, improvement, reconstruction or maintenance of such viaduct, tunnel, underpass, bridge or grade crossing. Upon the recovery of such fund said secretary shall deposit same with the state treasurer and said sum shall be apportioned to the different funds in the amounts expenditures from such funds were made.

When the secretary of transportation deems it advisable, said railroad company may be required by order of the secretary, to install and maintain suitable safety devices or warning signals at dangerous or obscure crossings to indicate the approach of trains.

History: L. 1929, ch. 225, § 15; L. 1975, ch. 427, § 99; L. 1976, ch. 294, § 1; July 1.

K. S. A. § 68-414

KS ST § 68-414

END OF DOCUMENT

KS ST S 19-2612
K.S.A. § 19-2612

KANSAS STATUTES ANNOTATED
CHAPTER 19.--COUNTIES AND COUNTY OFFICERS
ARTICLE 26.--MISCELLANEOUS PROVISIONS

Current through End of 1999 Reg. Sess.

19-2612. **Removal or cutting of hedge fences, trees and shrubs; cutting weeds; removing signboards and board fences; expenses.**

The board of county commissioners of each county in the state are authorized to cut all hedge fences, trees and shrubs growing upon the highway right of way or on right of way boundary, within three hundred fifty (350) feet of a railroad grade crossing or abrupt corner in the highway, and thereafter keep the same trimmed to provide clear vision, and to cut all weeds in the highways and thereafter keep the same cut so that the same shall not at any time be allowed to grow to a height obstructing clear vision; to remove all signboards, billboards, and board fences obstructing clear vision within three hundred fifty (350) feet of any such railroad crossing or abrupt corner in the highway: Provided, That nothing in this act shall apply to signs placed by any county or state association for the purpose of imparting historical information or traveling directions: Provided, however, That the board of county commissioners of any county in this state are hereby authorized to cause the removal of any hedge along any road in their respective counties, when in their judgment they, having first made suitable investigation of conditions, such hedge should be removed. The county may pay all expenses incident to removing such hedge out of the state and county road fund when applied to state and county roads and out of the county and township road fund when applied to county and township roads.

History: L. 1915, ch. 288, § 1; L. 1921, ch. 221, § 1; R.S. 1923, 19-2612; L. 1927, ch. 159, § 1; L. 1957, ch. 179, § 1; June 29.

K. S. A. § 19-2612

KS ST § 19-2612

END OF DOCUMENT

4

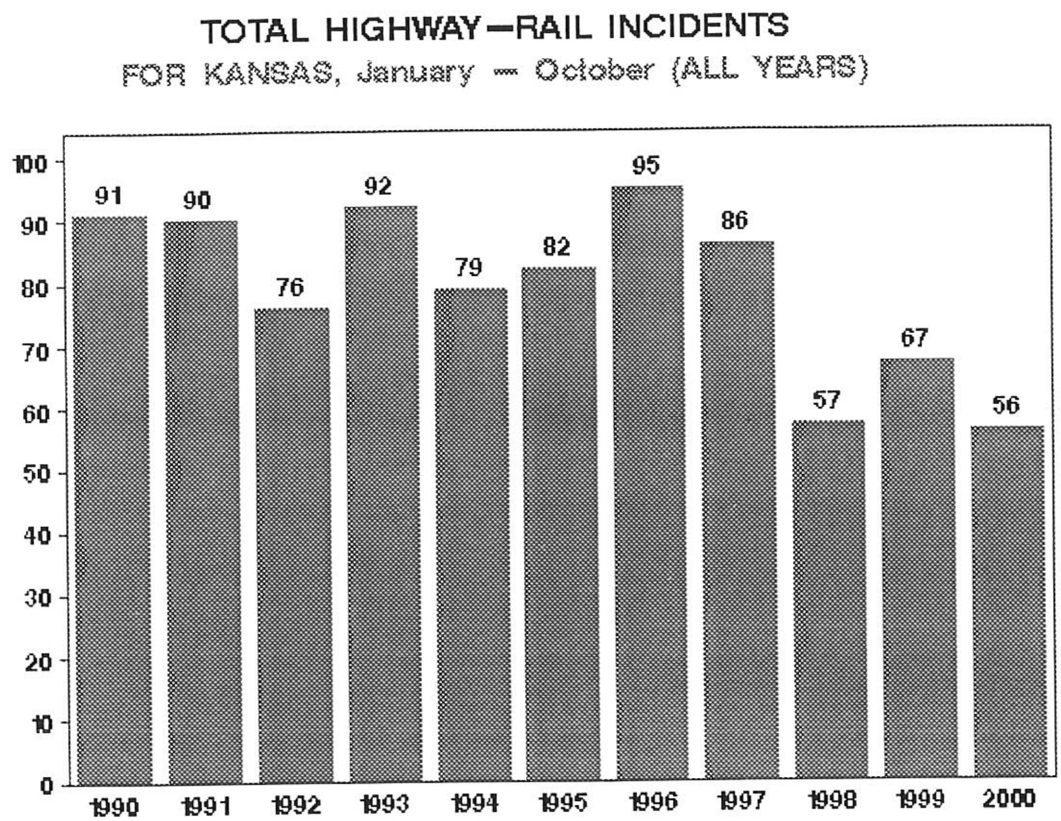
With regard to railroad activities, KCC has been preempted by the federal government from much state regulation, with the notable exception of some remaining safety-related issues. 49 U.S.C. 10501; 49 U.S.C. 20106. These safety issues, however, are strictly in regard to the activities of the railroad themselves, and do not involve the disbursement of funds related to general highway projects. See, e.g., K.S.A. 66-201 et seq.

While KCC retains some jurisdiction over general rail safety, it has no authority over the administration of federal highway funds. KCC does not currently, and have never had, access to federal-aid funds related to highway-rail grade crossings. KCC does not currently, and has never had, an enabling statute granting access to any of these funds.

2. State Law

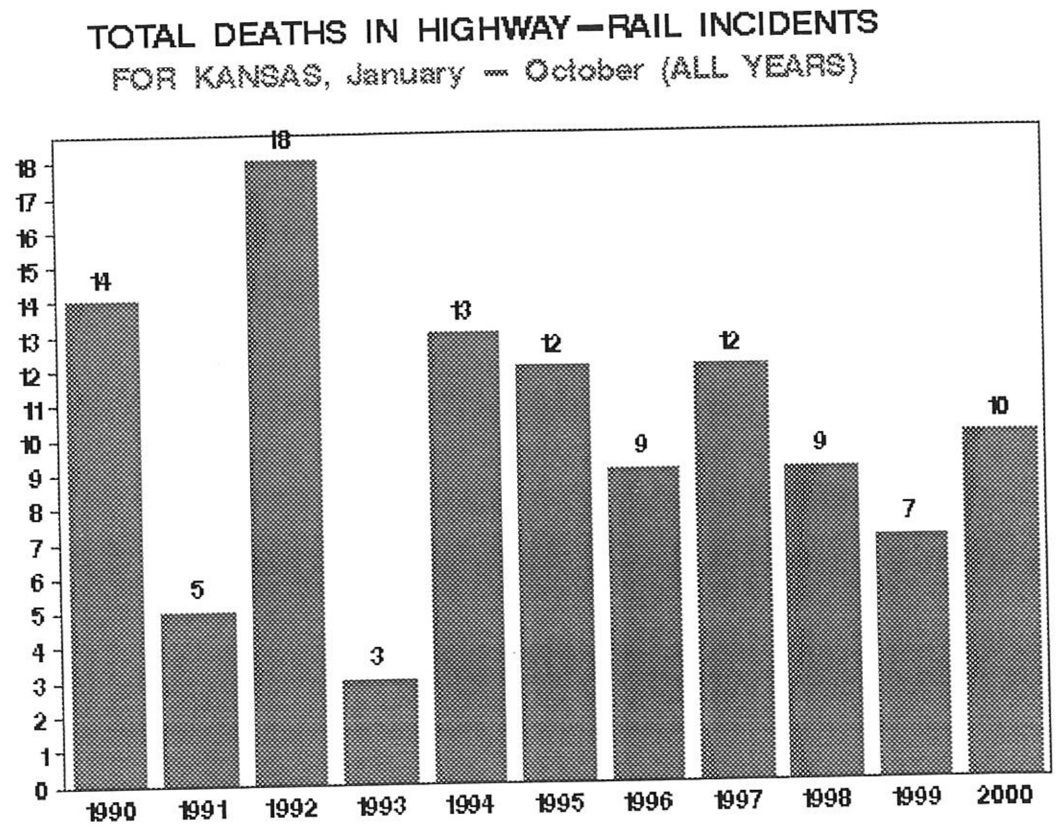
KCC did, at one time, have access to $300,000 per year from the state highway fund for use at rail grade crossings. This authority could formerly be found at K.S.A. 66-231a, 66-231b, and K.A.R. Article 82-7. However, these statutes were repealed by the Kansas legislature in 1999, at the same time disabling the administrative regulations.

While still in effect, K.S.A. 66-231a and K.A.R. 82-7-3 granted KCC the authority to investigate the condition of a rail crossing only upon a resolution passed by the local governing body concerned with the crossing. It was only after such notice that the KCC could have made the determination that a rail grade crossing was "dangerous," and merited disbursement of state funds for upgrade. Plaintiff made no assertion in the Petition that KCC ever received such notice from the appropriate local governing body.


TOTAL HIGHWAY—RAIL INCIDENTS
FOR KANSAS, January — October (ALL YEARS)
100
90
80
70
60
50
40
30
20
10
0
91
90
76
92
79
82
95
86
57
67
56
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000

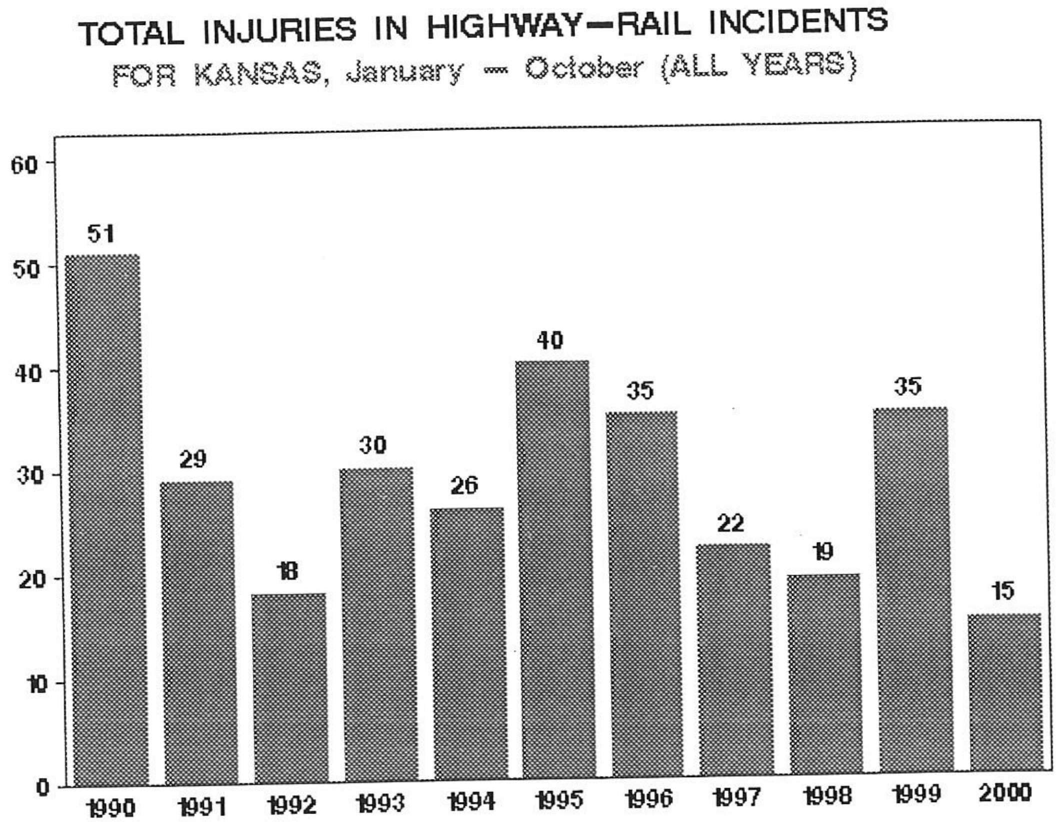
6

4-4

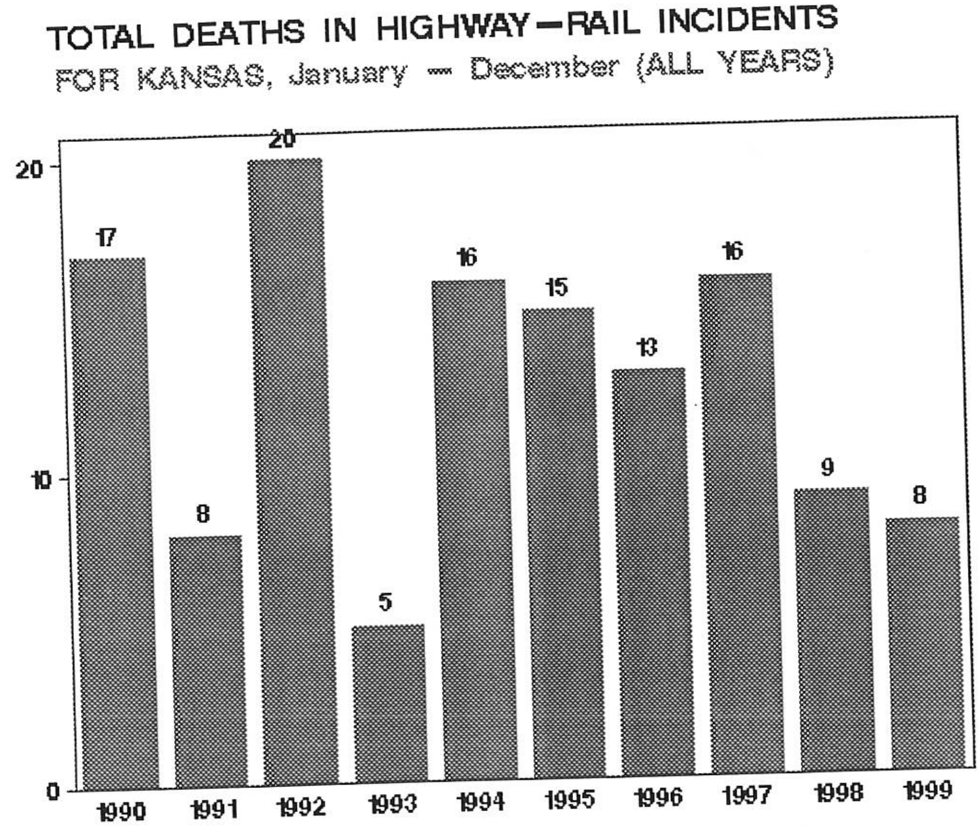

TOTAL DEATHS IN HIGHWAY—RAIL INCIDENTS
FOR KANSAS, January — October (ALL YEARS)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
14
5
18
3
13
12
9
12
9
7
10
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000

7

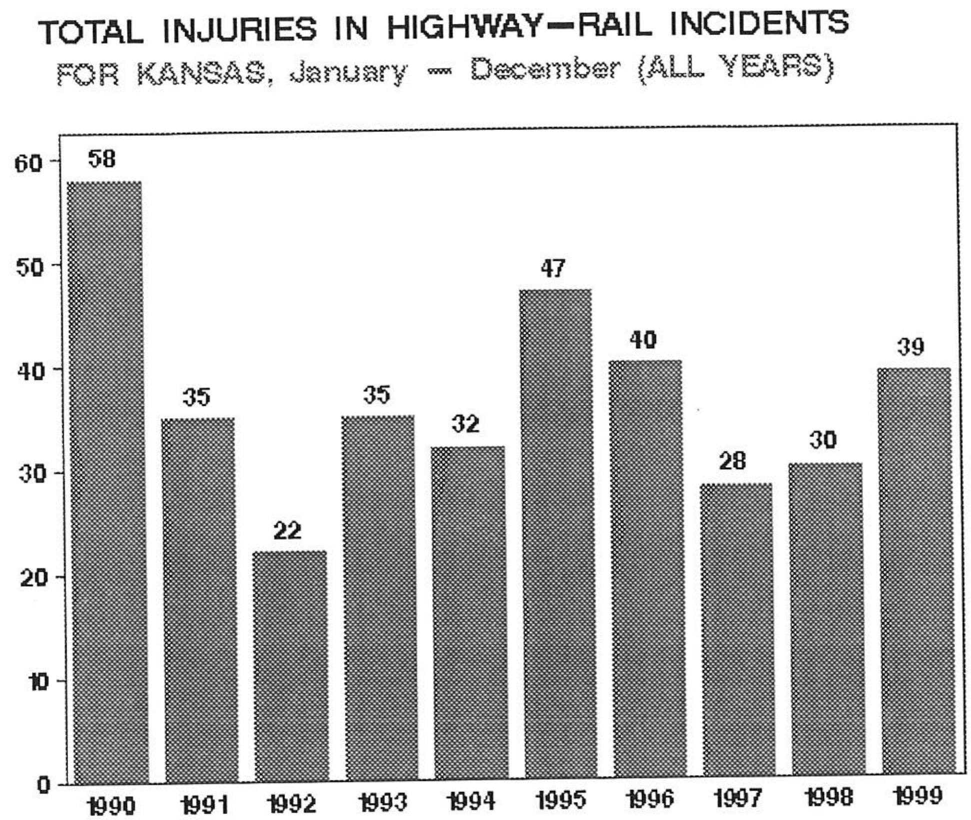
4-5


TOTAL INJURIES IN HIGHWAY—RAIL INCIDENTS
FOR KANSAS, January — October (ALL YEARS)
60
50
40
30
20
10
0
51
29
18
30
26
40
35
22
19
35
15
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000

8


TOTAL DEATHS IN HIGHWAY—RAIL INCIDENTS
FOR KANSAS, January — December (ALL YEARS)
20
10
0
17
8
20
5
16
15
13
16
9
8
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999

9


TOTAL INJURIES IN HIGHWAY–RAIL INCIDENTS
FOR KANSAS, January – December (ALL YEARS)
60
50
40
30
20
10
0
58
35
22
35
32
47
40
28
30
39
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999

10

NOTE: Inventory reporting is voluntary for both states and railroads.
There are no legal requirements which mandate reporting.

Whistle ban information is based upon data reported by the railroads.

PUBLIC AT GRADE MOTOR VEHICLE CROSSINGS BY COUNTY AND WARNING DEVICE FOR KANSAS

TYPE OF CROSSING: All Crossings

County		Type of Highway Warning								
	Total	None	Other	Cross bucks	Stop signs	Special warning	HWTS, WW, Bells	Flashing lights	Gates	Whistle Ban
ALLEN	40	.	.	26	.	.	3	2	9	.
ANDERSON	59	2	.	34	.	.	.	12	11	.
ATCHISON	19	.	.	12	1	.	.	3	3	.
BARBER	81	1	.	72	.	.	.	4	4	.
BARTON	124	.	.	90	4	15	1	8	6	.
BOURBON	39	.	.	29	.	.	.	3	7	.
BROWN	67	.	.	43	2	.	.	4	18	.
BUTLER	107	2	.	62	7	3	.	16	17	.
CHASE	32	.	.	20	4	.	.	4	4	.
CHEROKEE	127	.	.	105	1	.	2	11	8	.
CHEYENNE	18	1	.	17	.	.	.	.	.	.
CLARK	10	.	.	7	1	.	.	1	1	.
CLAY	10	.	.	9	.	.	.	1	.	.
CLOUD	109	3	1	74	15	3	.	6	7	.
COFFEY	29	.	.	10	.	.	.	3	16	.
COWLEY	140	10	.	91	.	9	2	15	13	.
CRAWFORD	132	2	.	91	2	.	2	15	20	.
DECATUR	54	1	.	50	.	1	.	1	1	.
DICKINSON	116	3	.	78	.	2	.	13	20	.
DONIPHAN	28	.	.	23	.	.	.	5	.	.
DOUGLAS	51	2	.	24	1	.	3	3	18	.
EDWARDS	36	.	.	22	.	2	.	.	12	.
ELK	33	.	.	26	2	.	.	3	2	.
ELLIS	37	1	.	23	3	.	.	2	8	.
ELLSWORTH	39	2	.	28	1	.	.	6	2	.
FINNEY	56	.	.	33	1	5	.	6	11	.
FORD	94	2	.	69	1	1	.	7	14	.
FRANKLIN	70	1	.	38	3	.	1	6	21	.

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GEARY	13	2	.	7	1	.	.	1	2	.
GOVE	35	.	.	30	1	.	.	1	3	.
GRANT	33	.	.	29	1	.	.	2	1	.
GRAY	43	.	.	37	.	.	1	.	5	.
GREELEY	16	1	.	8	3	.	.	.	4	.
GREENWOOD	37	.	.	32	.	.	3	2	.	.
HAMILTON	9	.	.	1	.	.	.	.	8	.
HARPER	57	.	.	41	.	.	.	1	15	.
HARVEY	117	2	1	76	2	3	.	15	18	.
HASKELL	33	.	.	31	2	.	.	.	.	.
HODGEMAN	20	.	.	20	.	.	.	.	.	.
JACKSON	8	.	.	6	.	.	.	1	1	.
JEFFERSON	44	.	.	26	.	.	.	7	11	.
JEWELL	86	1	.	77	1	.	2	4	1	.
JOHNSON	102	1	.	17	3	12	.	8	61	.
KEARNY	8	.	.	3	.	.	.	.	5	.
KINGMAN	83	.	.	77	.	.	.	5	1	.
KIOWA	32	1	.	21	.	.	.	.	10	.
LABETTE	106	1	.	79	2	.	1	10	13	.
LANE	42	.	.	33	2	.	.	2	5	.
LEAVENWORTH	21	.	.	8	4	.	.	1	8	.
LINCOLN	54	1	.	53	.	.	.	.	.	.
LINN	43	.	.	24	2	.	.	6	11	.
LOGAN	27	.	.	11	11	.	.	3	2	.
LYON	83	.	.	48	.	3	.	10	22	.
MCPHERSON	162	2	.	108	13	2	.	8	29	.
MARION	91	.	.	69	5	1	1	7	8	.
MARSHALL	104	7	10	53	10	.	.	4	20	.
MEADE	23	.	.	9	3	.	.	.	11	.
MIAMI	65	1	.	17	9	.	.	12	26	.
MITCHELL	83	1	.	69	7	.	.	6	.	.
MONTGOMERY	140	5	.	84	.	.	2	15	34	.
MORRIS	86	4	.	73	1	1	2	2	3	.
MORTON	23	.	.	20	1	1	.	1	.	.
NEMAHA	38	.	.	25	5	.	.	4	4	.
NEOSHO	67	1	.	42	5	.	.	13	6	.
NESS	71	.	.	63	1	1	.	2	4	.
NORTON	73	.	.	58	7	3	.	5	.	.

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OSAGE	95	.	.	69	.	.	1	13	12	.
OSBORNE	72	.	.	69	3	.	.	.	.	.
OTTAWA	47	4	.	40	1	1	.	1	.	.
PAWNEE	50	.	.	39	4	2	.	5	.	.
PHILLIPS	82	2	.	73	5	.	.	2	.	.
POTTAWATOMIE	51	4	.	21	5	.	.	4	17	.
PRATT	65	.	.	52	.	.	.	3	10	.
RAWLINS	44	1	.	43	.	.	.	.	.	.
RENO	248	1	.	145	12	12	.	18	60	.
REPUBLIC	88	2	.	79	1	.	.	6	.	.
RICE	128	1	.	105	2	.	4	2	14	.
RILEY	22	.	.	2	9	.	1	3	7	.
ROOKS	22	2	.	20	.	.	.	.	.	.
RUSH	74	1	.	62	.	.	.	4	7	.
RUSSELL	37	.	.	21	4	3	.	1	8	.
SALINE	122	.	.	75	9	9	.	15	14	.
SCOTT	35	.	.	29	.	2	.	.	4	.
SEDGWICK	414	4	.	190	.	22	2	116	80	.
SEWARD	25	2	.	12	4	.	.	.	7	.
SHAWNEE	132	20	.	49	11	7	1	14	30	.
SHERIDAN	12	.	.	9	2	.	.	1	.	.
SHERMAN	35	.	.	30	.	.	.	2	3	.
SMITH	59	.	.	50	6	.	.	2	1	.
STAFFORD	34	.	.	27	.	.	.	4	3	.
STANTON	27	.	.	23	2	.	1	1	.	.
STEVENS	40	.	.	36	4	.	.	.	.	.
SUMNER	150	.	.	122	.	.	.	11	17	.
THOMAS	51	.	.	44	2	.	.	4	1	.
TREGO	32	.	.	26	.	.	.	1	5	.
WABAUNSEE	17	.	.	8	1	.	.	.	8	.
WALLACE	12	.	.	5	4	.	.	2	1	.
WASHINGTON	77	.	.	67	.	.	1	2	7	.
WICHITA	21	.	.	14	1	.	.	.	6	.
WILSON	93	1	.	64	1	.	5	12	10	.
WOODSON	40	.	.	31	.	.	1	2	6	.
WYANDOTTE	112	11	.	41	2	4	1	24	29	.
	6,600	120	12	4,483	246	130	44	593	972	.

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HIGHWAY-RAIL INCIDENTS BY TYPE HIGHWAY USER FROM FORM FRA F 6180.57

Selections: Railroad - ALL
State - KANSAS, County - ALL
Time Frame - JAN 1999 To DEC 1999

1999

Type & Highway User		Totals			At Public Crossing			At Private Crossing		
					Motor Vehicle			Motor Vehicle		
		Accs	Kld	Inj	Accs	Kld	Inj	Accs	Kld	Inj
Rail Equip Struck Highway User	Car	26	4	19	26	4	19	-	-	-
	Truck	6	2	2	6	2	2	-	-	-
	Trk & Trail	7	-	1	6	-	1	1	-	-
	Pickup Trk	18	2	7	18	2	7	-	-	-
	Van	3	-	1	3	-	1	-	-	-
	Oth Mtr Veh	1	-	-	1	-	-	-	-	-
	---- Total	61	8	30	60	8	30	1	-	-
Highway User Struck Rail Equip	Car	8	-	3	8	-	3	-	-	-
	Trk & Trail	1	-	1	-	-	-	1	-	1
	Pickup Trk	6	-	6	6	-	6	-	-	-
	Van	1	-	-	-	-	-	1	-	-
	---- Total	16	-	10	14	-	9	2	-	1
---- Total		77	8	40	74	8	39	3	-	1

HIGHWAY-RAIL INCIDENTS BY WARNING DEVICE FROM FORM FRA F 6180.57

Selections: Railroad - ALL
State - KANSAS, County - ALL
Time Frame - JAN 1999 To DEC 1999

1999

Warning		Totals			At Public Crossing Motor Vehicle			At Private Crossing Motor Vehicle		
		Accs	Kld	Inj	Accs	Kld	Inj	Accs	Kld	Inj
Rail Equip Struck Highway User	Gates	11	-	7	11	-	7	-	-	-
	Flashing lites	6	1	3	6	1	3	-	-	-
	Stop signs	7	-	2	7	-	2	-	-	-
	Cross bucks	36	7	18	36	7	18	-	-	-
	None	1	-	-	-	-	-	1	-	-
	---- Total	61	8	30	60	8	30	1	-	-
Highway User Struck Rail Equip	Gates	1	-	-	1	-	-	-	-	-
	Flashing lites	4	-	1	4	-	1	-	-	-
	Cross bucks	11	-	9	9	-	8	2	-	1
	---- Total	16	-	10	14	-	9	2	-	1
---- Total		77	8	40	74	8	39	3	-	1

HWTS = Highway Traffic Signals WW = Wigwags

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HIGHWAY-RAIL INCIDENTS BY TYPE HIGHWAY USER FROM FORM FRA F 6180.57

Selections: Railroad - ALL
State - KANSAS, County - ALL
Time Frame - JAN 2000 To OCT 2000

2000

Type & Highway User		Totals			At Public Crossing						At Private Crossing		
					Motor Vehicle			Other			Motor Vehicle		
		Accs	Kld	Inj	Accs	Kld	Inj	Accs	Kld	Inj	Accs	Kld	Inj
Rail Equip Struck Highway User	Car	13	3	5	11	3	5	-	-	-	2	-	-
	Truck	5	1	1	3	-	1	-	-	-	2	1	-
	Trk & Trail	3	-	-	3	-	-	-	-	-	-	-	-
	Pickup Trk	14	2	4	11	2	4	-	-	-	3	-	-
	Van	3	2	-	3	2	-	-	-	-	-	-	-
	Motorcycle	1	-	1	1	-	1	-	-	-	-	-	-
	Oth Mtr Veh	1	-	-	1	-	-	-	-	-	-	-	-
	Pedestrian	1	1	-	-	-	-	1	1	-	-	-	-
	---- Total	41	9	11	33	7	11	1	1	-	7	1	-
Highway User Struck Rail Equip	Car	7	1	2	6	-	2	-	-	-	1	1	-
	Truck	2	-	1	2	-	1	-	-	-	-	-	-
	Pickup Trk	5	-	1	5	-	1	-	-	-	-	-	-
	Van	1	-	-	1	-	-	-	-	-	-	-	-
	---- Total	15	1	4	14	-	4	-	-	-	1	1	-
---- Total		56	10	15	47	7	15	1	1	-	8	2	-

HIGHWAY-RAIL INCIDENTS BY WARNING DEVICE FROM FORM FRA F 6180.57

Selections: Railroad - ALL
State - KANSAS, County - ALL
Time Frame - JAN 2000 To OCT 2000

2000

Warning		Totals			At Public Crossing						At Private Crossing		
					Motor Vehicle			Other			Motor Vehicle		
		Accs	Kld	Inj	Accs	Kld	Inj	Accs	Kld	Inj	Accs	Kld	Inj
Rail Equip Struck Highway User	Gates	9	3	3	9	3	3	-	-	-	-	-	-
	Flashing lites	3	1	-	2	-	-	1	1	-	-	-	-
	Stop signs	3	1	-	1	-	-	-	-	-	2	1	-
	Cross bucks	24	4	8	21	4	8	-	-	-	3	-	-
	None	2	-	-	-	-	-	-	-	-	2	-	-
	---- Total	41	9	11	33	7	11	1	1	-	7	1	-
Highway User Struck Rail Equip	Gates	2	-	1	2	-	1	-	-	-	-	-	-
	Flashing lites	1	-	1	1	-	1	-	-	-	-	-	-
	Stop signs	1	-	-	1	-	-	-	-	-	-	-	-
	Cross bucks	11	1	2	10	-	2	-	-	-	1	1	-
	---- Total	15	1	4	14	-	4	-	-	-	1	1	-
---- Total		56	10	15	47	7	15	1	1	-	8	2	-

HWTS = Highway Traffic Signals **WW = Wigwags**

TOTAL HIGHWAY-RAIL CROSSING INCIDENTS BY STATE, JAN - D

	At Public Crossing				At Private Crossing			
	1996	1997	1998	1999	1996	1997	1998	1999
Alabama	142	121	134	112	15	14	11	12
Alaska	5	4	3	2	1	1	1	1
Arizona	25	25	32	30	5	2	3	3
Arkansas	131	100	104	95	14	18	12	10
California	172	133	159	175	29	26	31	29
Colorado	25	24	25	28	8	4	7	5
Connecticut	9	4	8	6	3	2	2	2
Delaware	4	4	4	10	.	.	1	1
Dist Of Columbia	2	.	.	.	.	.	1	.
Florida	93	79	68	91	9	10	7	4
Georgia	136	124	119	125	19	14	21	11
Idaho	43	27	25	20	6	3	2	.
Illinois	210	191	177	178	22	22	22	24
Indiana	211	210	176	182	13	17	18	11
Iowa	114	90	90	92	9	16	14	7
Kansas	101	99	62	74	12	10	9	3
Kentucky	69	49	59	49	8	16	14	13
Louisiana	213	179	192	164	18	24	22	16
Maine	6	10	7	5	2	2	1	2
Maryland	9	16	11	16	1	2	4	2
Massachusetts	19	14	3	9	3	4	2	1
Michigan	136	144	96	111	6	8	8	11
Minnesota	132	110	108	92	25	6	8	10
Mississippi	120	133	124	126	12	15	9	8
Missouri	107	89	72	88	20	23	15	11
Montana	23	18	19	11	11	11	8	8
Nebraska	54	62	49	55	9	6	10	9
Nevada	6	.	1	3	1	1	3	3
New Hampshire	1	2	2	6	1	.	.	.
New Jersey	27	33	16	21	4	1	1	3
New Mexico	23	17	14	15	3	3	3	4
New York	31	27	25	24	5	10	4	7
North Carolina	112	103	93	77	11	11	16	22
North Dakota	30	19	20	15	3	2	3	2
Ohio	174	172	142	127	12	6	12	19

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Oklahoma	75	109	60	77	5	8	6	7
Oregon	28	25	30	22	15	10	14	8
Pennsylvania	64	58	58	49	10	9	5	9
Rhode Island		1	1	.	.	.	.	.
South Carolina	83	72	75	61	4	2	3	3
South Dakota	20	22	14	15		1	1	
Tennessee	113	78	90	87	10	10	14	3
Texas	391	368	288	322	43	53	34	43
Utah	31	25	23	18	4	2	1	1
Vermont	3	1	3	5	3		1	1
Virginia	50	37	36	35	20	19	15	20
Washington	51	57	48	39	18	7	11	12
West Virginia	17	19	21	19	5	6	2	12
Wisconsin	144	106	97	104	6	11	8	5
Wyoming	3	4	3	3	6	3	2	1
Tot	3,788	3,414	3,086	3,090	469	451	422	399

TOTAL HIGHWAY-RAIL CROSSING INCIDENTS CASUALTIES BY STA

	Fatal				Nonfatal			
	1996	1997	1998	1999	1996	1997	1998	1999
Alabama	18	19	11	12	70	58	46	34
Alaska	.	1	.	.	.	.	2	1
Arizona	4	5	4	1	5	12	9	11
Arkansas	20	10	24	15	39	44	45	37
California	24	22	32	24	56	65	64	73
Colorado	5	2	4	3	13	6	13	15
Connecticut	.	.	1	.	3	1	4	3
Delaware	.	1	.	1	2	2	3	6
Florida	16	12	7	19	36	42	30	38
Georgia	19	12	13	7	44	57	35	41
Idaho	6	6	4	2	15	6	14	6
Illinois	39	27	30	54	88	85	67	114
Indiana	28	23	25	26	81	112	80	63
Iowa	8	12	3	10	38	55	30	28
Kansas	13	16	9	8	40	28	30	39
Kentucky	3	5	5	4	24	26	20	26
Louisiana	31	30	25	20	119	111	101	71
Maine	.	.	.	.	2	2	3	2
Maryland	.	.	.	1	7	7	2	1
Massachusetts	.	2	1	2	27	1	.	3
Michigan	17	14	11	15	85	89	46	48
Minnesota	14	7	14	13	48	32	47	57
Mississippi	15	19	24	17	69	61	63	83
Missouri	19	15	14	9	36	33	25	54
Montana	3	1	4	4	14	11	11	6
Nebraska	9	9	11	7	21	13	19	23
Nevada	1	.	1	.	5	.	2	1
New Hampshire	1	.	.	.	.	.	.	1
New Jersey	2	9	5	5	15	14	4	7
New Mexico	7	6	5	3	19	6	6	7
New York	4	7	2	4	14	14	6	12
North Carolina	9	6	15	3	53	50	48	30
North Dakota	4	1	6	1	13	7	7	3
Ohio	14	26	15	21	63	46	45	59
Oklahoma	22	24	12	14	38	56	39	26

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Oregon	1	4	5	2	5	2	9	5
Pennsylvania	3	5	1	4	25	26	21	19
South Carolina	6	14	6	8	39	27	32	27
South Dakota	2	.	.	.	9	8	6	6
Tennessee	9	12	14	4	26	24	26	36
Texas	61	54	45	41	175	198	158	176
Utah	11	3	5	5	7	8	6	8
Vermont	1	.	.	.	5	.	.	1
Virginia	4	2	2	2	22	15	17	26
Washington	6	7	6	3	18	23	5	9
West Virginia	2	4	2	1	6	4	5	9
Wisconsin	5	6	7	7	66	53	48	43
Wyoming	2	1	1	.	5	.	4	2
Tot	488	461	431	402	1,610	1,540	1,303	1,396

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DRIVEWAYS

Driveways are, in effect, at-grade intersections and should be designed consistent with the intended use. For further discussion of driveways refer to Chapter IV. The number of accidents is disproportionately higher at driveways than at other intersections; thus their design and location merit special consideration.

Driveways should not be situated within the functional boundary of at-grade intersections. This boundary would include the longitudinal limits of auxiliary lanes. The regulation and design of driveways are intimately linked with the right-of-way and zoning of the roadside. On new highways the necessary right-of-way can be obtained to provide the desired degree of driveway regulation and control. In many cases additional right-of-way can be acquired on existing highways or agreements can be made to improve existing undesirable access conditions. Often the desired degree of driveway control must be effected through the use of police powers to require permits for all new driveways and through adjustments of those in existence.

The objective of driveway regulation is desirable spacing and a proper layout plan. Its attainment depends on the type and extent of legislative authority granted the highway agency. Many States and cities have developed standards for driveways and have separate units to handle the details incidental to checking requests and issuing permits for new driveways or changes in driveway connections to their road systems. Major features of design and controls are suggested in References (**9**), (**10**), and (**11**).

RAILROAD 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 entails 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 an at-grade railroad crossing should be constructed in a manner that does not necessitate a driver divert attention to roadway conditions.

Horizontal Alinement

If possible, 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 cross-roads 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 and safely. 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:

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

Vertical Alinement

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

In some instances, the roadway vertical alinement may not meet acceptable geometrics for a given design speed because of restrictive topography or limitations of right-of-way. Acceptable geometrics necessary to prevent drivers of low-clearance vehicles from becoming caught on the tracks would provide the crossing surface at the same plane as the top of the rails for a distance of 0.6 m outside the rails. The surface of the highway should also not be more than 75 mm higher or 150 mm lower than the top of nearest rail at a point 9 m from the rail unless track superelevation dictates otherwise as shown on Figure IX-77. Vertical curves should be used to traverse from the highway grade to the level plane of the rails.

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General

The geometric design of railroad-highway grade crossings must be made jointly with the determination of 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 must 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, it may be necessary to install additional signing to provide a safe crossing.

Traffic control devices for railroad-highway grade crossings consist primarily of signs, pavement markings, flashing light signals, and automatic gates. Standards for design, placement, installment, and operation of these devices are covered in the MUTCD (**5**) 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, the volume of pedestrian traffic, accident record, sight distance, and the geometrics of the crossing. The potential for complete elimination of grade crossings without active traffic control devices, for example, closing lightly used crossings and installing active devices at other more heavily used crossings, should be given prime consideration.

If it is established that active grade crossing traffic control devices are needed, the basic active device, flashing light signals, is used. When additional warning is desirable, the criteria or warrants recommended for evaluating the need for automatic gates at a grade crossing in addition to the above, include the existence of multiple main line tracks; multiple tracks at ... he vicinity

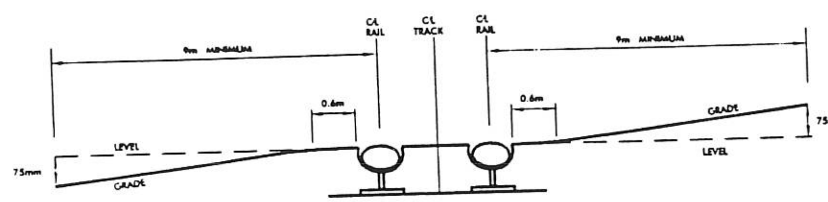

Figure IX-77. Railroad highway grade crossing.

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of the crossing which may be occupied by a train or locomotive so as to be sure the movement of another train approaching the crossing; a combination of high speeds and moderately high volumes of highway and railroad traffic; and a substantial number of school buses or trucks carrying hazardous materials using the crossing.

These guidelines are not all inclusive. There will always be situations that are not covered by these guidelines and must be evaluated using good engineering judgment. Additional information on railroad-highway grade crossings can be found in References **(12)**, **(13)**, **(14)**, **(15)**, **(16)** and **(17)**.

Numerous hazard index formulas have been developed to assess the relative potential hazard at a railroad grade crossing 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, that when used with sound engineering judgment, 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 alinement, profile, sight distance, and cross section. The requirements may vary with the type of warning devices 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 at-grade crossings can be found in References **(14)** and **(17)**.

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:

1. The vehicle operator can observe the approaching train in a sight line that will safely allow the vehicle to pass through the grade crossing prior to the train's arrival at the crossing.
2. 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 on Figure IX-78. The sight triangle consists of the two major legs, that is, the sight distance, d_H, along the highway and the sight distance, d_T, along the railroad tracks. Case A of Table

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IX-21 indicates values of the sight distances for various speeds of the vehicle and the train. These distances are developed from two basic formulas:

$$d_H = 0.28\ V_v t + \frac{V_v^2}{254f} + D + d_e$$

and

$$d_T = \frac{V_T}{V_v}\left[(0.28)V_v t + \frac{V_v^2}{254f} + 2D + L + W)\right]$$

where:
- d_H = sight distance leg along the highway allows a vehicle proceeding to speed V_v to cross tracks safely even though a train is observed at a distance d_T from the crossing or to safely stop the vehicle without encroachment of the crossing area (m)
- d_T = sight distance leg along the railroad tracks to permit the maneuvers described as for d_h (m)
- V_v = velocity of the vehicle (km/h)
- V_T = velocity of the train (km/h)
- t = perception/reaction time, which is assumed to be 2.5 s (this is the same value used in Chapter III to develop the minimum safe stopping distance)
- f = coefficient of friction, which is assumed to be same values used and shown in Table III-1 for the development of the minimum safe stopping distance
- D = distance from the stop line or front of the vehicle to the nearest rail, which is assumed to be 4.5 m
- d_e = distance from the driver to the front of the vehicle, which is assumed to be 3.0 m
- L = length of vehicle, which is assumed to be 20 m
- W = distance between outer rails (for a single track, this value is 1.5 m)

Corrections must be made for skew crossings and other than flat highway grades.

When a vehicle has stopped at a railroad crossing, the next maneuver is to depart from the stopped position. It is necessary that the vehicle operator have a sight distance along the tracks that will permit sufficient time to accelerate the vehicle and clear the crossing prior to the arrival of a train even though the train

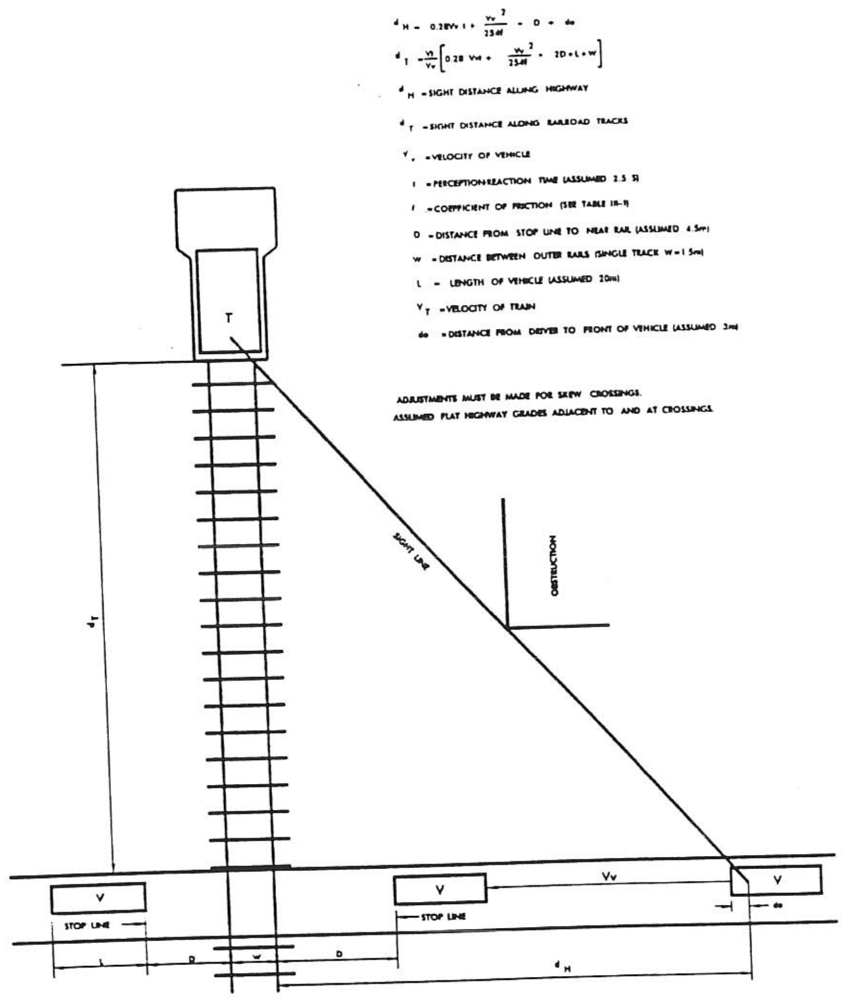

Figure IX-78. Case A: Moving vehicle to safely cross or stop at railroad crossing.

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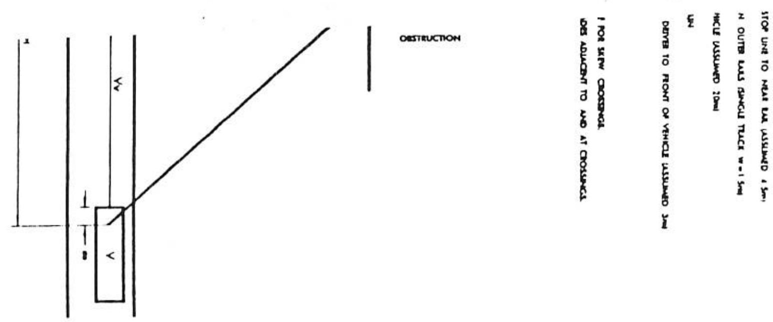

Train Speed (km/h)	Case B Departure from Stop 0	Case A Moving Vehicle: Vehicle Speed (km/h) 10	20	30	40	50	60	70	80	90	100	110	120
	Distance Along Railroad from Crossing, d_T (m)												
10	45	38	24	20	15	13	18	20	21	22	24	25	26
20	91	77	48	40	37	37	38	40	43	44	47	50	53
30	136	115	72	60	56	56	58	61	64	66	71	76	79
40	181	153	96	80	75	75	77	81	85	89	94	101	105
50	227	192	120	100	94	93	96	101	106	111	118	126	132
60	272	230	144	120	112	112	115	121	128	133	141	151	158
70	317	268	168	140	131	131	134	141	149	155	165	176	185
80	362	307	193	161	150	149	154	162	170	177	189	202	211
90	408	345	217	181	168	168	173	182	191	199	212	227	237
100	453	383	241	201	187	187	192	202	213	221	236	252	264
110	498	422	265	221	206	205	211	222	234	244	259	277	290
120	544	460	289	241	225	224	230	242	255	266	283	302	316
130	589	498	313	261	243	243	249	263	275	288	306	327	343
140	634	537	337	281	262	261	269	283	298	310	330	353	369
	Distance Along Highway from Crossing, d_H (m)												
		16	26	38	52	71	93	119	148	177	213	256	294

Table IX-21. Required design sight distance for combination of highway and train vehicle speeds; 20 m truck crossing a single set of tracks at 90°.

might come into view as the vehicle is beginning its departure process. Figure IX-79 indicates this maneuver. Case B on Table IX-21 contains various values of departure sight distance for a range of train speeds. These values are obtained from the formula:

$$d_T = 0.28\ V_T \left[\frac{V_G}{a_1} + \frac{L + 2D + W - d_a}{V_G} + J \right]$$

where: d_T = sight distance along railroad tracks (m)

V_T = velocity of train (km/h)

V_G = maximum speed of vehicle in first gear, which is assumed to be 2.7 m/s

a_1 = acceleration of vehicle in first gear, which is assumed to be 0.45 m/s^2

L = length of vehicle, which is assumed to be 20 m

D = distance from the stop line to the nearest rail, which is assumed to be 4.5 m

J = Sum of perception time and time to activate clutch or automatic shift, which is assumed to be 2.0 s

W = distance between outer rails; for a single track, this value is 1.5 m

$d_a = \frac{V_G^2}{2a_1}$ or distance vehicle travels while accelerating to maximum speed in first gear;

$$\frac{V_G^2}{2a_1} = \frac{(2.7)^2}{(2)\ (0.45)} = 8.1\ m$$

Adjustments for skew crossings and for highway grades other than flat are necessary.

Sight distances of the order shown in Table IX-21 are desirable at any railroad grade crossing not controlled by active warning devices. Their attainment, however, is difficult and often impracticable, except in flat, open terrain.

In other than flat terrain, it may be necessary to rely on speed control signs and devices and to predicate sight distance on a reduced vehicle speed of operation. Where sight obstructions are present, it may be necessary to install active traffic control devices that will bring all highway traffic to a stop before crossing the tracks and will warn drivers automatically in time for an approaching train.

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For safety, the driver of a stopped vehicle at a crossing should see enough of the railroad track to be able to cross it before a train reaches the crossing, even though the train may come into view immediately after the vehicle starts to cross. The length of the railroad track in view on each side of the crossing must be greater than the product of the train speed and the time necessary for the stopped vehicle to start and cross the railroad. The required sight distance along the railroad track may be determined in the same manner as it is for a stopped vehicle crossing a preference highway, which is covered previously in this Chapter. In order for vehicles to cross two tracks from a stopped position, with the front of the vehicle 4.5 m from the closest rail, sight distances along the railroad, in meters, should be determined by the formula with a proper adjustment for the W value.

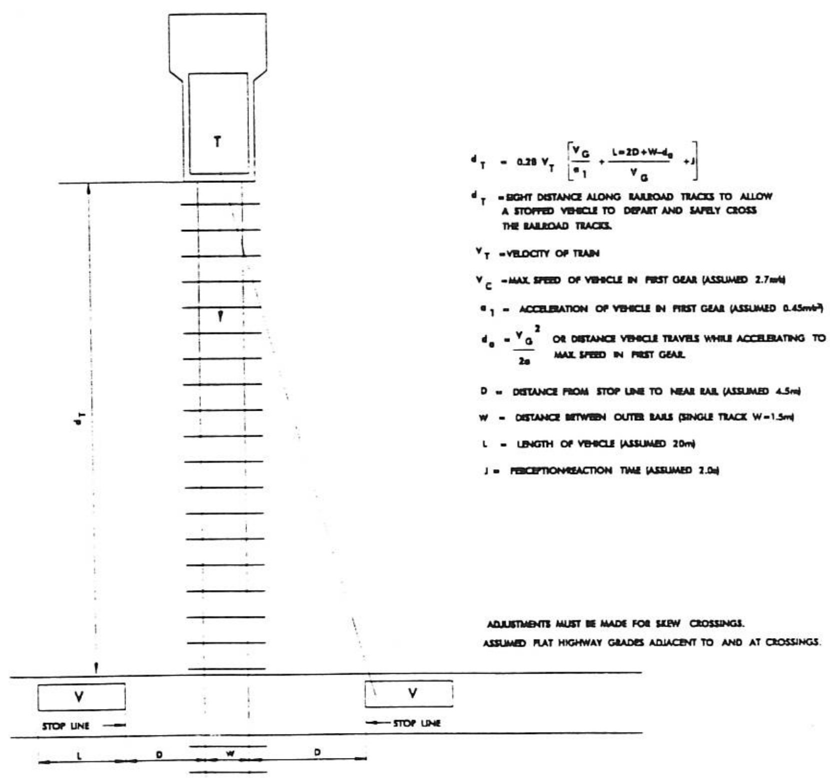

Figure IX-79. Case B: Departure of vehicle from stopped position to cross single railroad track.

The highway traveled way at a railroad crossing should be constructed for a suitable length with all-weather surfacing. A roadway section equivalent to the current or proposed cross section of the approach roadway should be carried across the crossing. The crossing surface itself should have a riding quality equivalent to that of the approach roadway. If the crossing surface is in poor condition, the driver's attention may be devoted to choosing the smoothest path over the crossing. This effort may well reduce the attention given to observance of the warning devices or even the approaching train. Information regarding various surface types that may be used can be found in "Railroad-Highway Grade Crossing Surfaces" **(16)**.

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Testimony of James R. Loumiet
Presented to Kansas House of Representatives-Committee on Transportation
Regarding House Bill No. 2045
January 24, 2001

Background

I am an accident reconstructionist from Independence, MO. I have investigated hundreds of train and traffic accidents nationwide during my career, and a number of those accidents having been at railroad-highway grade crossings in the State of Kansas. I have participated in highway safety research, including grade crossing safety research, since 1986. I have had a long standing commitment to grade crossing safety and for years have been concerned about the inadequacy of State laws in addressing grade crossing safety issues. My purpose for being here today is simply to assist the State of Kansas in producing the best possible grade crossing legislation.

Position on HB No. 2045

I conceptually support HB No. 2045, with some qualifications. My reasons for supporting it, and my qualifications, are enumerated below.

Reasons for Support

1. Most, if not all, of Kansas roadways have been or currently are designed to AASHTO specifications. Therefore, designing and constructing railroad-highway grade crossings to AASHTO specifications will promote uniformity of design on roadway systems throughout the State, an important principle of highway safety.

2. AASHTO specifications have for decades represented commonly accepted, good engineering practice in the highway safety community. Compliance with AASHTO specifications will significantly improve the safety of many crossings throughout the State, since it is my observation that many crossings in Kansas currently do not comply with AASHTO specifications, especially with regards to sight distance. The failure of these crossings to comply with AASHTO specifications have in many cases directly contributed to otherwise avoidable accidents.

3. It is critical that AASHTO specifications regarding sight distance at grade crossings, as contained in the AASHTO Green Book, remain part of HB No. 2045. Of the approximately 7,800 public crossings in the State of Kansas, approximately 5,900 (75%) of these are passively-protected only (i.e. no flashing lights/gates). At these passively-protected crossings, it is critical that approaching

House Transportation Committee
January 24, 2001
Attachment 5

drivers have enough sight distance down the tracks to be able to see a conflicting train in time to stop and avoid a collision. Stopped drivers need enough sight distance down the tracks to be able to make an appropriate decision as to when it's safe to pull onto the crossing. Adequate sight distance has long been recognized as one of the most important design features of passively-protected grade crossings and therefore should remain part of HB No. 2045.

Qualifications

1. The phrase, "public highway" is deleted in favor of the phrase, "county highway or township road." Conspicuously absent is any mention of State highways or roadways. Is it the intention of the Legislature to exempt State highways from the provisions of HB No. 2045? If so, it creates the potential that grade crossings on State highways will be designed and constructed to a different standard than crossings on county highways or township roads (unless State highways are covered in another provision regarding AASHTO specifications). This could lead to a lack of design uniformity from crossing to crossing in Kansas, which in some cases may violate driver expectancy and contribute to accidents. I recommend that the phrase "public highway" be retained in HB No. 2045.

2. The title of the referenced AASHTO publication is incorrectly written. The current title is: "A Policy on Geometric Design of Highways and Streets." Also, the bill makes no clear reference to which edition of the AASHTO Green Book is to be considered the standard. The current edition is the 1994 edition, which is in metric. The previous editions are the 1984 and 1990 editions. AASHTO is also currently working on a new edition of the Green Book due sometime this year. I would recommend that the bill have some language referring to the "most recent edition of: 'A Policy on Geometric Design of Highways and Streets," otherwise, new editions may require future modifications to K.S.A. 66-227.

3. The citing of the AASHTO Green Book as a standard will significantly increase the scope of K.S.A. 66-227. The statute, as currently worded, only addresses the design issues of: (a) crossing width, (b) approach grade, and (c) construction materials. The AASHTO Green Book addresses other design issues as well, including but not limited to:

   - sight distance
   - horizontal alignment
   - traffic control devices, active and passive

Testimony of James R. Loumiet

To implement the bill as written will require every applicable grade crossing in the State to be evaluated and studied by qualified persons in order to ensure that the crossings meet AASHTO specifications. Many of these crossings will require extensive work to bring them up to AASHTO specifications. Just how is this effort to be conducted, and over what time frame? Has such an effort been programmed?

Also, for some crossings to comply with AASHTO specifications will require consideration of features beyond the Railroad's right-of-way. For example, in many cases providing adequate sight distance at a crossing will require the removal of vegetation on public or private land. However, it is not clear in HB No. 2045 what the Railroad is to do to make a crossing safe and in conformance with AASHTO specifications if sight obstructions exist beyond their right-of-way. Additionally, the Railroad generally cannot modify a crossing design without State DOT approval. What happens if a Railroad wants to modify a crossing in an attempt to comply with HB No. 2045, but cannot get State approval? Consideration should be given to some mechanism(s) in HB No. 2045 for resolving some of these jurisdictional conflicts.

One further point I would like to make; what constitutes a crossing in HB No. 2045 probably needs to be defined. The bill makes several references to "crossings" but never exactly defines this term. The Railroads sometimes argue that a crossing only covers the area between the rails and that their responsibility ends at their right-of-way boundaries. Others, including AASHTO, generally consider the highway approaches to a crossing and the quadrants adjacent to a crossing to be an integral part of the crossing as well. I subscribe to this latter definition. Regardless, HB No. 2045 probably should more exactingly specify the Railroad's responsibilities, if any, beyond their right-of-way, or how crossing elements beyond the Railroad's right-of-way will be handled.

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