10 YEARS OF HIGHWAY-RAILROAD GRADE CROSSING PROTECTION							
Year	Number of Railroads	Total Number of Crossings Equipped	Number of Crossings Equipped Flashing-Light Signals Only	Flashing-Light Signals with Automatic Gates	Source of Funds for Number of Crossings Equipped Railroad	Public	Joint
1958	81	1,380	961	419	423	147	810
1957	83	1,630	1,175	455	520	223	887
1956	88	1,320	984	336	526	105	689
1955	76	1,070	781	289	442	82	546
1954	80	1,364	985	379	686	64	614
1953	86	1,491	1,112	379	772	105	614
1952	94	1,435	986	449	792	81	562
1951	95	1,406	880	526	870	82	454
1950	91	1,573	1,047	526	966	195	412
1949	90	1,571	1,101	470	937	218	416

Crossings Are Safer After 10 Years

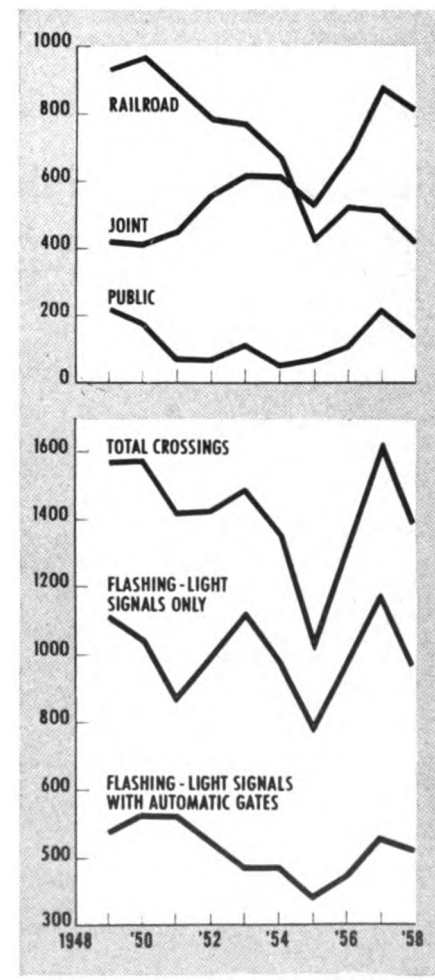
Fatality rate at railroad-highway rade crossings dropped from 4.4 er-day in 1948 to 3.7 per day in 957. This was in the face of an in-ease in motor vehicles from 50 to 7 million. The number of crossings emained steady at about 226,000 rough this period. During the last 0 years, over 14,000 of these cross-gs have been equipped with flash-g-light signals only or flashing-light gnals with automatic gates. Over wice as many crossings have been quipped with flashers alone as with ose equipped with flashers and ates. Also noted in this 10-year pe-iod is the increasing tendency of ublic bodies such as states, cities nd towns, to share in the cost of in-talling new and improved forms of rotection at grade crossings.

The trend in recent years has been or more cooperation between rail-oads and the local municipalities oncerning the grade crossing pro-ection problem. The main concern as been to make crossings safer, et not unduly impede the flow of ehicular traffic. Another problem as been that of replacing watchmen vith automatic protection equipment.

An example of such close coopera-ion to provide improved protection is the Chicago & North Western, which recently completed a two-year program involving 330 grade crossings in eight states. Studies were made of each crossing concerning street traffic, train movements, switching operations, station stops and other circumstances. Sketches and photographs of the existing crossings were also used. Based upon all this information, a proposal was prepared as applying to each project. Then a conference was held with the traffic engineer or the city council of the municipality in which the project was located. In such a conference, a resolution was prepared to authorize the mayor to sign a joint stipulation which was sent to the state commerce commission. If the commission approved, an order authorizing the project was issued.

If city authorities opposed the proposed improvement, the railroad appealed to the state commission to hold an official hearing. Then a decision and order was rendered by the commission.

In most instances, the city authorities approved of the improved form of protection (gates to replace watchmen or wigwags) proposed by the railroad. Also, in most cases, they agreed that automatic control, which



Top chart: sources of crossing funds. Bottom: type of protection installed.

is on the job "round-the-clock," is better and more reliable than manual operation or manual control.

What were once busy streets may now have relatively light vehicular traffic. So that now, most railroads work with city officials in making extensive studies of vehicular traffic flow. In some instances, cities have closed a street with light traffic, where parallel streets exist. This reduces the overall cost of a project and in some instances enables the railroad to install complete automatic controls with speed selection to differentiate between high and low speed trains. Such a project was installed by the Gulf, Mobile & Ohio at Auburn, Ill. Of seven parallel streets crossing the railroad, gates with flashing-light signals were installed at three crossings. Barriers were erected across four streets at the tracks. The C&NW, working with the city of Morrison, Ill., installed automatic gates with flashing-light signals, with complete automatic control and speed selection at five street crossings. Barriers were erected at four other street crossings. At Centralia, Ill., the city allowed the Illinois Central to close 12 street crossings with barriers. In addition one grade separation with a highway underpass was constructed; gates and flashers were installed at four streets, and flashers only installed at six street crossings.

In some areas, street traffic as well as rail switching moves have been reduced and changed in nature. Manual gates, operated part time, have been in service for 60 years or more at some crossings in industrial areas. But modern flashing-light signals with automatic control in service round-the-clock are better protection now. This was done at nine crossings in one area of Chicago, Ill.

Speed selection has made complete automatic control practical. An objection to automatic control in the past has been that, in some instances, such as during switching moves, gates are down and delay street traffic, when no train movement over the crossing is imminent. To overcome this objection, most railroads install selective speed control schemes, time distance cutouts, restarts, etc. Th C&NW, for example, improved pr tection at nine crossings in Wheato Ill. Speed selection controls utili timing sections for speed ranges follows: (1) above 65 mph, (2) 65-5 mph, (3) 52-37 mph, (4) below 3 mph. When station stops are i volved, speed ranges also inclu 37-28 mph and 28-17.5 mph. In a dition to these speed selection co trols, push-buttons at the crossin enable switching crews to raise gat if they stop short of the crossing a are not in a timing section.

In some instances railroads ha changed their schedules so th switching by local freights is not do during periods of peak vehicul traffic. At Carroll, Iowa, where aut matic gates had been in service f years, at three street crossings, o reason for supervisory manual co trol was to clear the gates for stre traffic when through freights we stopped to set out or pick up cars. establishing rules and fixed waysi signs designating the points beyo which standing portions of trai must be left, the automatic contro were revised so that no further ma ual control was required.

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As seen from the graph, the num-
r of crossing projects paid for by
nt railroad and public funds has
en increasing over the last 10 years.
ith the tremendous increase in ve-
cular traffic, municipalities have
ognized the need for improved
otection and, more important, the
ponsibility for sharing installation
sts with the railroads. Several
tes, such as Illinois, have long rec-
nized the need for improved pro-
tion and have been prompt to
pply state funds to help pay for
se projects.

C&NW experience from their two-
ar, 330-crossing program, has been
it where the form of protection
s improved in character, for ex-
iple, gates to replace wigwags, the
al or state funds at certain loca-
ns paid part. At DeKalb, Ill., auto-
tic gates were installed at six
ssings to replace manually con-
lled wigwags. The total estimated
it was $203,839, of which $89,241
ne from government funds. At one
ssing in Des Plaines, Ill., auto-
tic gates were installed to replace
shing-light signals. The total cost
s $12,840, of which $11,072 was
id by government funds.

In recent years, the railroads have contended that the public as highway users should share in the cost of maintaining crossing protection equipment. One of the first states to recognize this responsibility has been Virginia. The sharing of maintenance costs applies to all "automatically operated gates, wigwag signals and other electrical or automatic crossing devices at highway grade crossings outside of cities and incorporated towns." The railroads work out an agreement with the State Highway Commissioner. If unable to come to an agreement on the maintenance costs, the railroad can petition the Virginia State Corporation Commission for a hearing, after which the Commission decides the issue.

Just recently the North Carolina legislature passed a law requiring the State Highway Commission to pay one-half the costs of maintaining railroad grade crossing protection equipment. The law applies to the more than 500 signals now in the state (previously maintained by the railroads) and to any that will be installed in the future. It is estimated that such maintenance costs will be over one-quarter of a million dollars a year.

In the years 1949-1958, flashing-light signals only were installed at 10,012 highway-railroad grade crossings, according to figures furnished by the railroads to Railway Signaling and Communications each year. Flashing-light signals with automatic gates were installed at 4,228 crossings. Sources of funds in this 10-year period were as follows, according to number of crossings equipped: railroad-6,934; public-1,302; joint (railroad and public)-6,004.

Two major factors contributed to the growth of crossing protection installations over the last 10 years. One was the increase in motor vehicles. The second was the return on investment that can be realized from highway crossing protection equipment. The C&NW will realize a $2 million saving every year in wage costs by retirement of crossing watchmen and gatemen. This saving is approximately 59 per cent annually on the capital invested by the road. At Kenilworth, Ill., the C&NW spent $29,375 to install automatic gates to replace manual gates. The wage saving is $17,358 annually, which is 68 per cent on the cost every year.

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