

D&H Upgrades Crossing Protection

Ten highway grade crossings are equipped with flashing-light signals and shortarm gates. Supervisory manual controls are operative at seven crossings during daylight hours when heavy switching moves are made. Television camera at one crossing gives towerman view of engine working just beyond his range of vision.

COHOES, N.Y., a city of 22,000 population, is nine miles north of Albany on the double-track mainline of the Delaware & Hudson. The railroad runs through the heart of the city and crosses nine streets at grade. The tenth street in this crossing project is across the Mohawk River in North Cohoes (Town of Waterford). All streets have fairly heavy vehicular traffic, with the heaviest on Ontario St. This east-west street connects with a bridge over the Hudson River to Troy, N.Y.

In the vicinity of the crossings, the railroad runs along a sidehill shelf. Most streets run east-west up this hill. All crossings had watchmen 24 hours daily, the year 'round, with the exception of Bridge and Spring Sts. These were equipped with automatic flashing-light signals. Courtland and Clifton Sts. had flashing-light signals and flagmen. The other six street crossings were equipped with manual gates—Main, Newark and Remsen, Columbia and Mohawk, Pine, Ontario, and Oneida. Two intersections are involved in these crossings: Newark and Remsen Sts. and Columbia and Mohawk Sts. To further add to traffic problems, Main St. crosses the railroad at a very acute angle, and Pine St., Ontario St. and Oneida St. meet Van Rensselaer St. at the crossing.

As part of the crossing protection modernization program, the D&H installed flashing-light signals and shortarm gates at all ten crossings. These are controlled automatically in

Financial Statement on Cohoes Crossing Project

1. Cost of installation

(a) Capital investment	\$196,137
(b) Operating expenses	33,740
(c) Total	229,877

2. Gross saving per year

\$137,400

3. Increased annual operating expenses:

(a) Signal maintenance and operation	\$ 9,350
(b) Depreciation at 2.82% (of 1a)	5,531
(c) Total	14,881

4. Net reduction in annual operating expenses

\$140,403

5. Reduction for interest charges at 5% (of 1a)

\$ 9,807

6. Net savings per year

\$130,596

7. Annual return over 5% interest:

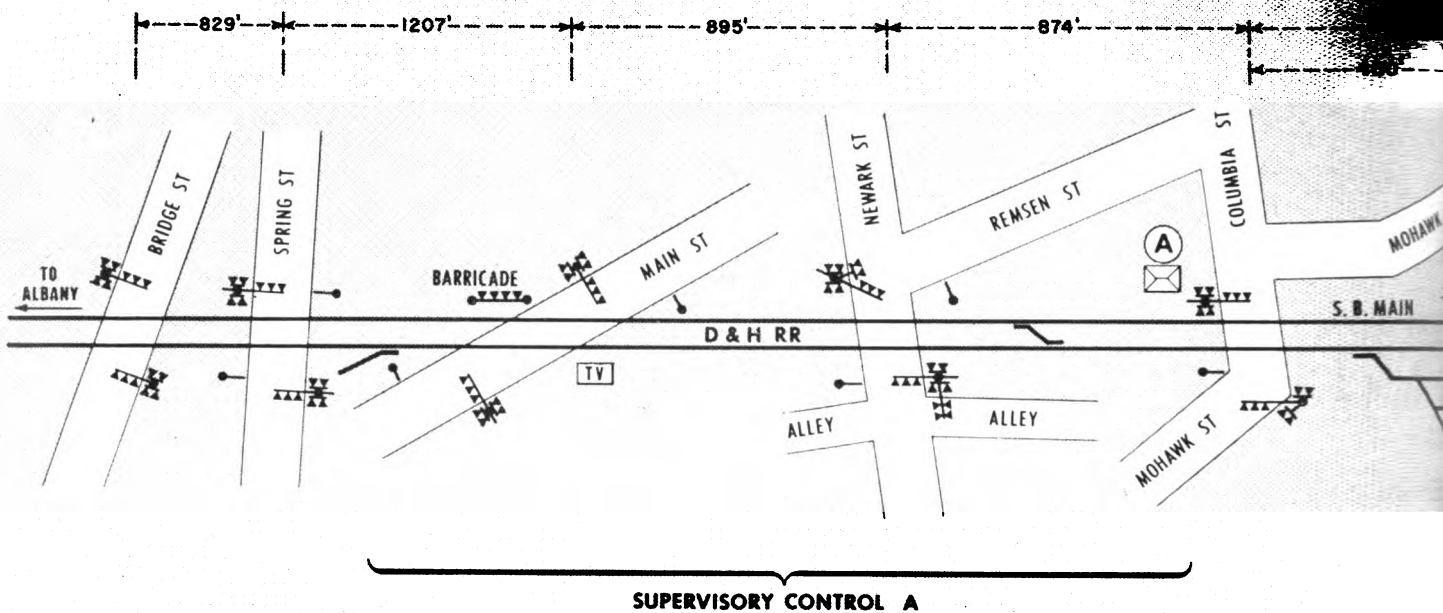
(a) On capital investment (6 ÷ 1a)	67%
(b) On total cost (6 ÷ 1c)	57%

the conventional manner by trains or locomotives occupying approach track circuits. Because of heavy switching moves supervisory manual control was superimposed at Main and Newark and Mohawk St. crossings. One towerman is on duty eight hours daily, six days per week, located in a tower at Mohawk St. crossing. Similar supervisory manual control is superimposed on the crossing protection at Pine, Ontario, Oneida and Courtland Sts. The second control machine is in a tower at Ontario St.

Normal maximum daily rail movements consist of 11 passenger trains, one through freight train and three local freight trains, in addition to two transfer crews which pass back and forth through the territory and per-

form necessary switching service. Maximum authorized speed is 70 mph south of Spring St. Between Spring St. and the depot (located between Mohawk and Pine Sts.) the speed limit is 20 mph. North of the depot, the speed limit is 65 mph.

To reduce unnecessary delay to vehicular traffic during switching movements, supervisory manual control was provided for seven street crossings. Industry tracks lead off the mainline all through the city. Team and house tracks from the D&H freight station join the mainline just north of the Mohawk St. crossing. Hence, with one of the supervisory control towers at this crossing, the towerman has an excellent view of an engine working the freight station.



The supervisory manual control panel, at Mohawk St. tower for example, has a diagram of the two main tracks and the crossings of Main, Newark and Mohawk Sts. Amber indication lamps in track sections are extinguished upon occupancy. An annunciator bell in the tower is sounded when trains approach on the mainline from the south and north. Pushbuttons on the control panel can be pressed to cut out the bell after it has begun to sound. Below the diagram for each street are two pairs of pushbuttons; one pair raises or lowers the gates for movements on the southward track and the other pair for movements on the northward track. To be operative, a train must be on an approach circuit and a manual floor foot switch, located directly beneath the cabinet, must be depressed. In addition to these pushbuttons and foot switch, a manual toggle switch is located at each crossing on the diagram. The toggle switch raises or lowers the gates for track motor car moves or engine moves on non-circuited track, such as industry sidings. Raising the toggle raises the gates, lowering the toggle lowers the gates. A red indication lamp at each crossing in the panel is lighted when the gates are lowered, whether by supervisory manual or automatic control. To insure that the indication lamps and audible approach annunciators are not left in operation when the towerman goes off duty, a two-position toggle switch is placed in the "off" position.

Because southward trains stopping at the depot would be in the normal

approach circuits for Mohawk St. crossing, a special timing circuit was introduced into the controls. When a train pulls into the depot, the Mohawk St. gates are lowered. After a time delay of 50 seconds, the gates are raised. Upon departure, the train creeps up to an automatic block signal 400 ft in approach to the crossing. Passing the insulated joint at the signal causes the crossing protection equipment at Mohawk St. to be put into operation. This is automatic and no action is required by the crossing towerman.

To enable the towerman to get a good close-up view of the Main St. crossing when switching moves are made in the vicinity, a television camera was mounted 30 ft above ground on a telephone pole crossarm extension just north of the crossing. The camera is focused to view trains or engines approaching from the south. Just south of the crossing is an industry track that connects to the northbound main. As the siding is on an incline, switch engines often have to make a "run for it" to get up the incline with cars. As the switch is in the approach circuit for the crossing, this is one of those places where supervisory control is very effective in reducing delays to street traffic when the engine is not moving over the crossing.

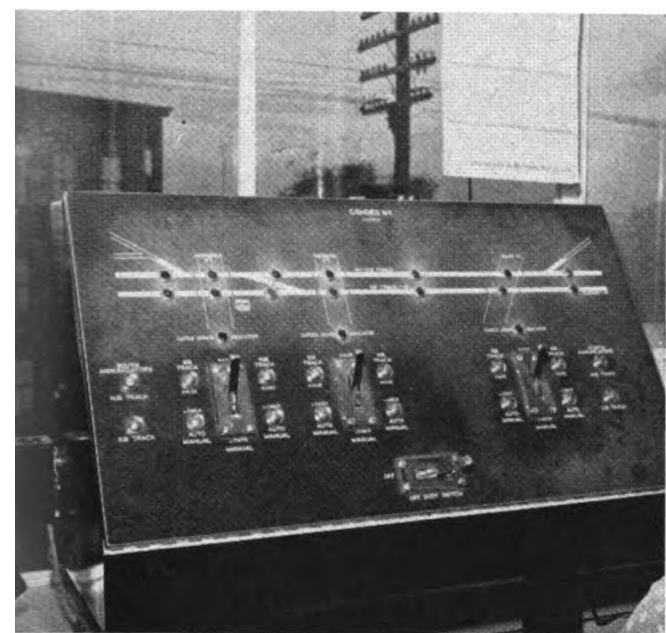
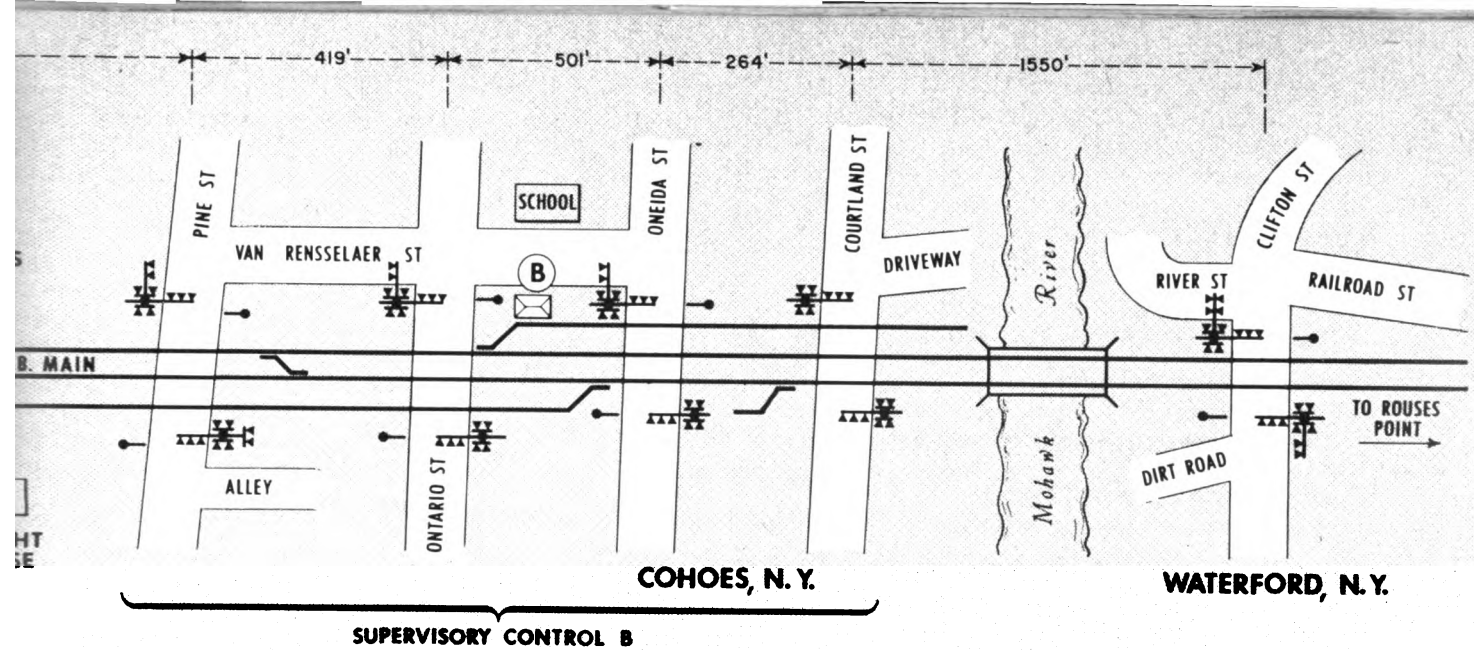
With the camera at the crossing and a monitor in the tower, the towerman can see the switch engine. When the engineer is coming out of the siding and knows he will not move onto the street crossing, he brightens and dims the headlight several times. This attracts the attention of the

towerman, who then raises the gates at Main St.

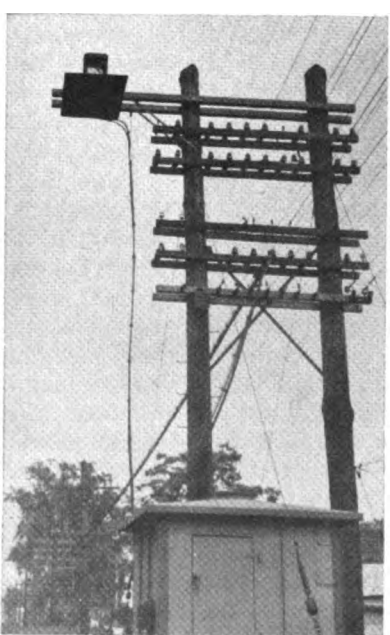
The camera is in a weatherproof case which has a windshield wiper and defroster that can be remotely controlled by the towerman. He can also control focus, lens opening, and span and tilt. The main camera controls are in a relay bungalow at the base of the pole at the crossing. The camera, controls and monitor were made by General Electric Co. The camera location is approximately 1,700 ft from the crossing tower. Flood lighting of Main St. crossing was unnecessary, since all switching moves at this crossing are made during daylight hours.

Manual control pushbuttons are located at relay cases or housings at each crossing. They are used by trainmen if unusual switching moves are necessary when the towermen are not on duty. When making switching moves, the crew may have to leave cars standing on the approach circuit. Thus when the engine backs off the crossing, a member of the crew will use his switch key to open the manual control box and press the Stop button. This will raise the gates, permitting motor vehicles to pass over the crossing. When the engine is to move over the street, the crewman presses the Start button, causing the gates to be lowered.

The crossing gates and flashers were furnished by Western Railroad Supply Co. and relays, rectifiers, etc. by General Railway Signal Co. Engineering and installation work was under the jurisdiction of C. H. Tobin, Superintendent Signals and Communications.



Supervisory manual control panels are in towers at Mohawk and Ontario Sts. for switching movements in daylight hours.



TV camera at Main St. faces south and views switch engine working industrial lead where it enters the north-bound main.



Monitor for TV camera (at Main St. at left) is in crossing tower at Mohawk St., which is 1,700 ft from the crossing.