

MINNESOTA Highways



VOL. 9, NO. 9

Minnesota Department of Highways, St. Paul

JULY, 1960



Bond Campaign Opens Aug. 10

For the national welfare and savings benefits to employees, a campaign for the purchase of United States Savings Bonds will begin August 10 in the Highway Department. Purchases may be made through payroll deductions.

The new E Series Bonds pay 3 1/2 per cent interest, compounded semi-annually. This results in interest earnings of 33-1/3 per cent over the seven years, nine months to maturity. Also, a 10 year extension period is guaranteed for these bonds.

In the State Highway Building and at 1246 University Ave., application cards will be distributed and collected through the good offices of the Highway Club councilmen. Elsewhere, including construction and maintenance districts, the cooperation of the supervisory personnel is being enlisted to give each employee an opportunity to buy bonds. Persons now purchasing bonds may enlarge their savings program during the campaign.

Completed applications for bond purchases are to be delivered to Harold Vogland in the Highway Department Finance Section, State Highway Building, St. Paul. Tom Buxton is campaign chairman.

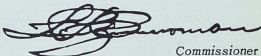
The E Series bonds are available in \$25, \$50 and larger denominations up to \$1,000. The bonds yielding \$25 at maturity cost \$18.75, the other denominations in proportion. Folders explaining the bonds and their purchase will be distributed to employees.

Principal and interest from the bonds will provide purchasers welcome funds for many uses—education of one's children, a reserve for emergencies, to help finance home construction or modernization, and for increased

Commissioner Endorses Bond Purchases

Fellow Employees:

I note that the Highway Department is soon to have a United States Savings Bonds campaign among its employees, statewide. I deem it a privilege to urge your careful consideration of the purchase of bonds for the national security and welfare, as well as for the personal financial gain to be obtained by the purchaser.



Commissioner

security and enjoyment after one's retirement.

For the government, money invested in Savings Bonds helps to pay for the national defense, manage the national debt, sustain employment, and combat inflation.

The bonds are convenient to buy, easy to cash, and safe as the nation. If stolen, lost, or destroyed, they will be replaced at no cost to the owner. The American Way of Life rests on the people's savings and U. S. Savings Bonds are good savings.

MHD Seeks New Radio System

To conserve working time, develop operating teamwork and improve its service to the public, with economy, the MHD is moving to install a new statewide radio system. The new facility would provide two-way communication between the 16 maintenance district headquarters and several hundred of the department's 6,700 motor vehicles.

The primary function of the new network, according to Commissioner Zimmerman, would be to speed communication in maintenance operations.

Commissioner Zimmerman stated that the new radio system is planned also as an important part of the state Civil Defense communications pattern. Highway transportation and civil defense operations would be closely associated in time of emergency.

Commitment of the radio network to use by Civil Defense, as required, would permit allocation of federal aid to help finance the facility up to a maximum of half the capital investment.

The commissioner pointed out that plans for the new network have been under discussion for 11 months and that the Highway Department has been considering installation of a radio network for nearly eight years. A report on the feasibility of the proposed network was completed a year ago, after two years of extensive study by the MHD Radio Section.

Commissioner Zimmerman outlined benefits to be derived from the network by the Highway Department and the Civil Defense Department.

For the MHD, he said the network would:

Reduce travel time now consumed in shuttling between headquarters and field operations for new assignments and other information.

Speed field equipment repairs and thereby reduce lost operating time.

Better unify operations district- and state-wide and permit closer supervision.

Reduce motor vehicle operating costs to the public by quicker road repairs, resulting in less vehicular damage and less travel delay.

Accelerate and amplify road information reports to the MHD Road Information center for transmission to the public, particularly valuable during blizzards, storms and other emergencies.

For the network benefits to the Civil Defense organization, the Commissioner pointed out that the network would be the statewide nerve center of Civil Defense, providing much faster and more direct communication than would be available through commercial and private radio and telephone facilities.

The common communication network would permit the Highway Department and Civil Defense to work closely together in their common tasks during an emergency, such as forced evacuation over the highways of large numbers of people, and emergency transportation of military or disaster equipment, and emergency building and food supplies.

Under the state Civil Defense setup, Commissioner Zimmerman is the Governor's chief of engineering services, responsible for emergency operation of the highways and transportation of engineering equipment and supplies. He and his staff, therefore, would be working in union with the remainder of the Civil Defense team. Thus, use of a common communications system would increase efficiency of operation.

The estimated total cost of the projected radio network would be approximately \$2 1/2 million, to cover new broadcasting and relay stations and two-way units in up to 850 selected vehicles.

The radio system would be constructed in two phases. The first phase, scheduled for completion by mid-1961 to provide 60 per cent coverage of the state, would provide one base broadcasting station in each of the 16 maintenance districts and installations in up to 500 mobile units.

The estimated cost for this phase would be \$898,306, of which \$460,006 would go for the 16 base stations, and \$438,300 for the mobile equipment.

The final phase, scheduled to be completed in 1962, would include

(Cont. on page 4)

COVER PICTURE

The old and the new at close quarters in Red Wing.

In the foreground, is the new \$1,658,400 interstate bridge now under construction over the main channel of the Mississippi River. In the right background is the old bridge, of considerably different design.

The new steel and concrete structure is 1,631 feet long, with the deck 50 1/2 feet above the high water mark set in 1952. Construction is proceeding ahead of schedule. William C. Merritt is the project engineer and the Industrial Construction Co., Minneapolis, the contractor.

Started in October, 1958, the bridge is scheduled for completion by August 1, 1961, but it is expected to be open to traffic by November 1 of this year.

Big Span Raised to Position

Returning to the Central Offices with his neck stiff from looking aloft for a protracted period, Clarke Anderson of the Public Information Section, submitted the following eye-witness account of the installation of the center span in the new Mississippi River interstate bridge at Red Wing, December 16.

Even the "sidewalk superintendents" thought it was a nice, neat job.

It took only 2½ hours to raise the center span of the new Red Wing bridge from the barges on which it floated in the river 70 feet into place—connecting the two outer spans and thus successfully accomplishing the most dramatic and exacting phase of the construction of the new 1,630-foot structure.

The 288-foot center span had been put together on a platform of three barges tied together in the form of a huge capital I. The span ran the length of this platform and, because of its extreme length, protruded out over the water at each end. The barges were moored on the Wisconsin side of the Mississippi River's main channel while the span was being built, in order to keep the channel clear for traffic.

Following its completion, two large work barges with cranes on them were pushed into position with tugboats just upstream from the site of the new bridge and firmly anchored. Then, the new span, supported by its floating platform, was pushed into position in the channel and lined up directly between the ends of the two outer spans and perhaps 10 or 15 feet down river from the two previously anchored barges.

To these it was secured by cables so that it floated in the river in a

position corresponding to the one it would occupy when raised into place to join together the two previously constructed bridge sections jutting out from either river bank. These other two spans are supported in the conventional manner by concrete pillars resting on pilings driven down into the river bottom.

The center span, however, is "suspended"—that is, unsupported from below and held in place only by its connection with the span at each end of it.

The foregoing explanation brings us to December 16 and my trip to Red Wing to watch at first hand "the big lift," the raising and locking in of the big center span.

Step by Step

The section of bridge to be raised into place weighs 362 tons, is 288 feet long, over 30 feet wide, and must be raised 70 feet straight up in the air to a precise connection with the two other sections of the bridge that were themselves constructed on opposite banks of a river several hundred feet wide. These three units are now to be formed into one by inserting the middle span. There is little room for error. The center span has to slip into a slot at each end of the two spans with which it is to be linked.

These slots are only one fourth of an inch wider than the ends of the center span which are to fit into them, and provide for a tolerance of only a little more than one inch as to length. In short the center span has to be within one fourth inch of its planned width and one inch of its planned length in order to fit successfully between the two sections of the bridge already fixed in place.

Once the center span is in position and in order to secure it firmly to the two connecting outer spans, four huge steel pins are inserted from the side through holes at each of the four corners of the center span. These pins pass through corresponding holes in the corners of the two outer spans. These metal cylinders, or pins, are kept on one of the work barges in the river and when the center section is in place and lined up they are passed up to the workmen on the bridge by a crane with a 100-foot boom. The holes are only one-thirty-second of an inch larger than the pins, thus the holes must be perfectly aligned. Each pin is solid steel 12 inches thick, three feet long, and weighs 1,192 pounds. When the workmen on the bridge receive the pins, they insert them through the holes and fasten a nut on each end to keep them in place. The entire 362-ton weight of the center span is supported by these four pins.

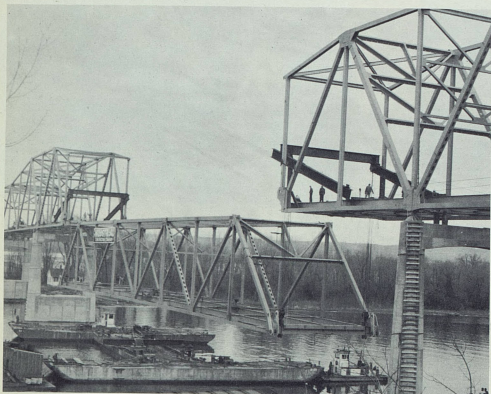
Looks are Deceiving

The method of raising the center span from the river into place appears simple but involves considerable preparation and special equipment. It is, in fact, a rather touchy job and in no case can be performed under adverse weather conditions or in even a moderately strong wind.

The span is raised by a system of seven-eighth inch cables run through pulleys. A gasoline powered winch is fastened securely in place on each of the two outer spans and winds in the cable, thus lifting the center span upwards. The action of these winches must be closely coordinated so that the span will not tilt and so that both ends arrive in place at exactly the same time. The process, of necessity, proceeds very slowly. The spools on the winches turn at about the speed of the second hand on my wrist watch. The first indication that the span is beginning to rise is the appearance of a wet area down the side of the barges supporting the span—a sign that the weight is being removed from them allowing them to float higher in the water.

As soon as the span is high enough in the air so that the tug boats can get underneath it, the cables fastening the three barge assembly to the two anchored barges are released and the tug boats push this floating platform, which has fulfilled its purpose, out of the channel and back to shore. The platform is extremely cumbersome and hard to direct—especially under the influence of the river's current.

It had taken the best part of one whole day to push it into position while it supported the center span. Removing it, however, consumes less than a half hour. When the cables securing it to the anchored barges are released, the current immediately begins pushing it down stream and at the same time begins spinning it around.



Easy does it! The center span of the new Red Wing bridge is seen being lifted into place from the barges on which it was moved to the position for elevation. A close look will show the lifting cables at the rear end of the span.

It appears for a moment as though it is about to get away from the tugboats and go off down the river. However, it is soon brought under control and shoved back over to the Wisconsin shore.

Sky Hooks?

Now the center span hangs in space with nothing below it but the river, and secured to spans above by very fragile looking strands of cable. It is obvious, by the removal of the barges, that the men raising the span do not admit the possibility of having to lower it. Nothing can now prevent it from rising into place except the snapping of a cable or the failure of a winch, and if this happens the enormous weight of 362 tons of steel would simply demolish the barges as the span plunged into the river. Too much is at stake to even seriously entertain the thought that the span will not fit once it arrives at the top.

So the floating platform is removed and pushed aside. Now everything depends upon how wisely the engineers have planned and how accurately the workmen have built.

Of course the span does go into place. Anything else would be unthinkable. Still, those in charge of the proceedings look very happy and relieved when all goes off without a hitch.

It is a particularly satisfying day for Iver B. Kleven, the supervisor for Industrial Construction Company, which built the **bridge** and for Bill Merritt, Highway Department project engineer.

Kleven said later that this type of **bridge** construction is somewhat unusual and that the **red wing bridge** was only the second of its kind that industrial had built—the first being in Peru, Ill. This type of construction is becoming increasingly popular because of its lower cost.

The more common method is to build a system of falsework and scaffolding in the channel; and when the **bridge** is finally completed the steel is torn down and removed to clear the channel for river traffic. The **red wing** system does away with all this—resulting in a saving of both time and money. But of course not all **bridge** projects lend themselves to this new method.

Part of Larger Project

The new **bridge** will cost \$1,658,398 when completed and is part of a larger highway project involving three other smaller bridges and a new roadway carrying T. H. 83 over the river's main channel, across an island, and over the Wisconsin channel. The project's total cost will be approximately \$3½ million.

It is interesting to compare the new **bridge** with the old one which was built in 1895 and is situated some 200 feet upstream from the site of the new one. Bridges of this bygone era were distinguished by a quantity of decorative metal design. By contrast, the new **bridge** contains not one piece of metal that is not absolutely essential to its construction. In spite of this, or perhaps because of it, the modern design of the new **bridge** is simple, strong and pleasing to the eye while the old **bridge** appears cluttered and frail by comparison. It has been in faithful daily service for 64 years, but the demands of modern day traffic have rendered it obsolete. It will be torn

Traffic Hazards Cut

Two New Bridges In St. Paul Park

Basic information for the following article was supplied by W. L. Hunziker, resident engineer, and R. G. Brennan, **bridge** project engineer, who supervised the construction described.

A dangerous, double barreled traffic hazard has been eliminated in St. Paul Park with the completion by the Highway Department of two successive bridges "in tandem" over T. H. 61 and the Chicago, Milwaukee main line railroad tracks.

The highway and tracks are parallel to each other at the point of construction, 175 feet apart.

Joint Crossing

The bridges cross the busy highway and tracks about midway between Broadway, a heavily traveled street, and Cemetery Road, thereby providing, through connecting approaches, a joint, separated crossing over the highway and tracks for both of the intersecting streets. Thus the two bridges eliminate two highway grade intersections and two railroad grade crossings. Traffic may continue to move between Broadway and Cemetery Road and T. H. 61 over connecting roads.

All St. Paul Park residents presumably are pleased with the increased safety provided by the new construction, but parents are particularly happy because school buses no longer have to cross the highway and railroad at grade level on Broadway.

The total project included, besides the bridges, nearly a mile of road building, between the bridges, and to connect them with Broadway and Cemetery Road.

The contract, for a total of \$325,652, was let November 14, 1958; construction of the bridges began December 12, 1958; grading of the roadways started April 8, 1959; the bridges were opened for traffic September 23, 1959, and the formal opening ceremony was conducted November 21, 1959. Some bridge painting and sodding of the approaches remains to be completed next spring.

Piers for both bridges were set into rock; abutments on the railroad **bridge**

are supported by piling and on the highway **bridge** by high density fill.

The highway **bridge** is of the continuous and cantilever steel beam type, continuous over the three piers. The railroad **bridge** is of the continuous steel beam type. Both types of bridges are economical. Joints are eliminated over the piers. Being of the continuous type, the steel weight was lessened from requirements for other types. Presence of rock made piling unnecessary.

192 Feet Long

The highway **bridge** is 192 feet long and cost \$92,818; the railroad **bridge** is 135 feet long, cost \$59,635. In approximate figures, the two bridges required 820 cubic yards of concrete, 125,500 pounds of reinforced steel, and 228,750 pounds of structural steel.

For the approaches and roadways connecting with the existing streets and highway, types A and B excavation totaled 209,000 cubic yards. The sodding totaled 14,000 square yards and there were 19 acres of seeding. Culvert and sewer work totaled 1,460 lineal feet, and curbing, the same. Seventeen thousand tons of gravel, subbase, and base were required, and 3,800 lineal feet of double cable guard rail. The connecting roadways built in conjunction with the new bridges are bituminous surfaced.

A special problem concerned in the St. Paul Park project was the avoidance of interference with traffic movement on both the railroad and T. H. 61.

Free flow of traffic throughout the construction period was necessary because the railroad tracks are on the Chicago, Milwaukee road's main line between the Twin Cities and Milwaukee and Chicago, and intermediate points, and T. H. 61 is a major motor vehicle route from the Twin Cities through south-

(Cont. on page 10)





Picture at Left

President Eisenhower, no less, cut the ribbon opening the new Minnesota-Wisconsin **bridge** over the Mississippi River at **Red Wing**, with representatives of the two states observing. L to R: Lieutenant Governor Philo Nash of Wisconsin; United States Senator Hubert H. Humphrey of Minnesota; President Eisenhower, Governor Orville L. Freeman of Minnesota, and Mrs. Freeman.

Picture at Right

A sizeable delegation of MHD representatives attended the South St. Paul opening of a section of Interstate Highway 494.



the Twin Cities circumferential route. L to R: Deputy Commissioner Frank Marzelli, Walter Schultz, staff assistant; Patrol Officer Henry Zogda, Sergeant Conrad Erickson, Officer Edward Confol, Commissioner Zimmerman, W. L. Hunkler, resident engineer, cutting the ribbon; Chief Engineer John Swanberg, District Engineer E. J. McCubrey, Maintenance Engineer George Meskal, Ellsworth Johnson, assistant district engineer, construction; Assistant Chief Engineer J. C. Robbers, Construction Engineer Stan Ekern, Vern Harty, assistant district engineer, maintenance; Paul Staffeld, planning and programming engineer; and Assistant Commissioner Clayton Swanson.

Eisenhower Opens **Bridge**

Red Wing Ceremony

The new Hiawatha highway **bridge** over the Mississippi River at **Red Wing**, between Minnesota and Wisconsin, was formally dedicated and opened October 18 by no less a personage than the President of the United States.

His presence, plus the interest in the opening of a modern structure to replace a long out-dated **bridge** drew an estimated 20,000 spectators.

Many Minnesota and Wisconsin state and local officials were present to extend an official welcome to President Eisenhower and to pay tribute to the improved highway link between the two states. From Minnesota, the group included Governor Freeman, Senator **Humphrey**, Congressman Albert Quie and Walter Judt, Mayor Harry Rardin of **Red Wing** and Highway Commissioner Zimmerman and other MHD officials. Lieutenant Governor Phillo Nash headed the Wisconsin party. Henry Swanson of the **Red Wing** Chamber of Commerce, was chairman of the event.

In his dedicatory address, delivered from an open air rostrum in the **Red Wing** business district, President Eisenhower identified the new **bridge** as "another effective example of Federal-State partnership in meeting both local and national needs."

He dipped into history of an estimated 400 years ago to recall that the **bridge** is named for an Indian chief who was one of the founders of "the first United Nations organization in America."

That nation, composed of five Iroquois tribes, was organized, said the president, "for the purpose of stopping for all time the shedding of human blood by violence." Its Constitution, he continued, "had as its founding principles justice, righteousness, and power, or authority—". He called on his listeners for the degree of international cooperation and sense of justice which will insure the success of the present United Nations.

After his address, President Eisenhower was escorted to the **bridge** where he cut a **red** ribbon to officially open it for traffic. He then was driven over the structure to the Wisconsin side and back to **Red Wing**, from where he left for Abilene, Kan., his boyhood home.

So. St. Paul Program

The South St. Paul Chamber of Commerce sponsored a ceremony and luncheon October 17 for the formal opening there of a 1½-mile section of Interstate Highway 494. The four-lane divided concrete pavement, extending westward from the new South St. Paul **bridge** over the Mississippi River, is a link in the Twin Cities Interstate circumferential route. The project included three bridges and the contract totaled \$1,441,474. W. L. Hunkler was the resident engineer in charge.

Commissioner Zimmerman was the principal speaker at the luncheon,

given in the South View Country Club for civic leaders, state and highway officials, and members of the Chamber of Commerce.

The commissioner pointed out that the improved beltline highway will greatly benefit the meat packing and livestock industries centered in South St. Paul through its connection with trunk highways serving Minnesota and Wisconsin.

New Cage League

There's a new look to the upcoming basketball season for the MHD St. Paul area—and it looks like a good time for more players and spectators than previously. The good time will be laced with some strong factional rivalry.

Instead of entering a single Highway team this season in the St. Paul Commercial League, the Hiwayan Club is sponsoring a Highway seven-team intra-mural league playing two games a week. Fred Maurer, Hiwayan president, reported.

The seven teams represent the Planning and Research, **Bridge** Design, Lands and Right of Way, Management Services, Road Design, and Materials and Research Sections, and the Twin Cities Metropolitan District.

Games are played Mondays and Thursdays at 5 p.m. at the Palace playground gymnasium, Jefferson and View, in St. Paul. The season is from November 7 to January 31, with each team playing at least one game per week. A suitable trophy will go to the season's championship team.

Co-chairmen for the project are Jim Knutson and John Schorn, both of Management Services.