THE TRAINMASTER

APRIL 1984 Number 260

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PACIFIC NORTHWEST CHAPTER
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CHAPTER TIMETABLE OF EVENTS

7:30 pm FRIDAY April 20

Monthly business meeting. At the Union Pacific Clubhouse at intersection of N. Russell and N. Interstate in Portland.

Program involves the best public relations film ever made about logging and logging railroads, and this film is about the C. D. JOHNSON logging effort. This is the earliest known film on logging down on the Oregon Coast.

NEWSREEL - Member contributions of up to six slides of recent rail events. Please check in with JIM WHALEY to see how to get your slides loaded correctly in the trays.

Noon SATURDAYS every

No-Host LUNCH each and every Saturday over at YAW'S Restaurant in the Hollywood area. We meet in a private room in the back so come and enjoy spirited discussions with twenty to thirty regulars. All welcome. We order off the menu & have a good time.

MONTHLY BUSINESS MEETINGS ARE ON THE THIRD FRIDAY EVERY MONTH AT THE UP CLUBHOUSE

SUMMARY OF MINUTES - REGULAR CHAPTER MEETING - MARCH 16, 1984

The meeting was called to order by President Rich Carlson at 7:45 PM in the Union Pacific Clubhouse.

Project '84: Rich Carlson reported that the Chapter's segment from Portland to Sacramento was sold out a week ago. Ticket sales are good for all the West Coast segments, but are weak in the Southwest at this time.

Locomotive 4449: The new driver tires for the locomotive are in port and should be delivered next week. Painting on the locomotive is under way. There will be a mucking party this Saturday to clean out the bottom of the new auxiliary tender.

Project '84 Concession Sales: Larry Hodson reported that merchandise orders are already being received.

COMMITTEE REPORTS:

Finance: Jeff Asay reported that the committee has met with Larry Miller to set a system of accounts for Project '84. Next project is the Chapter's tax return.

Rolling Stock: Pete Dorland advised that the committee will meet tomorrow at 2:30 PM on the Mt. Hood. Volunteers are needed a week from tomorrow to work on the crew car.

Excursions: Mary Lou Weaver reported that the committee is working on guidelines for giving out complimentary tickets on excursions.

Membership and Hospitality: Kathy Weiderhold reported that the committee is welcoming new people at Chapter meetings.

Library: Jim Gilmore reported that the committee will hold its first meeting soon to orient the committee's members and make plans for the Chapter library.

Museum: Bill Gano reported that a forge and blacksmiths tools from the BN roundhouse in Klamath Falls have been donated to the Chapter.

Publications: Al McCready reported that the committee has had some informal discussions and will be more active after the 4449 excursion is over.

Activities: Jim Whaley reported that the committee met the first time the week before the swap meet and was active at the meet. The next meeting will be in April to plan the picnic.

Swap Meet: Terry Parker reported that the sixth meet was the best one yet. 99 tables were sold to 77 sellers. The Chapter's table took in $85. The snack bar made $170. A total of about $1600 was taken in at the gate. Fewer Chapter members than usual helped at the meet.

Portland Terminal RR Co. Alcos: Rich Carlson advised that 10 units are to be sold and that one of the two T-6's has already been sold. All the units have been appraised at $7000 each. The Chapter board has recommended that the Chapter purchase one unit. Rich stated that the Chapter should take advantage of the chance to acquire one of the P.T. RR. units. Terry Parker moved, seconded by Richard Parks, that the membership approve the board's recommendation to acquire one P.T. RR. Alco switcher. Motion passed on a voice vote after considerable discussion.

President Rich Carlson presented an NRHS 25 year pin to Chapter member Paul Wirth.

Respectfully submitted,

Chuck Storz, Secretary

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FRANK TALK

Mayor Frank Ivancie

All aboard!

What does Portland, Oregon, have more of than almost any other place on the face of this earth?

Don't say "rain." That's close. But the answer is . . . *water*. And we're going to New Orleans to tell the world about it.

What's at stake is *jobs*. But let me begin at the beginning.

New Orleans is hosting a World's Fair. The theme is "The World of Rivers—Fresh Water as a Source of Life." New Orleans is a major city at the mouth of the largest river system in the country. Portland is a major city on the banks of the second-largest river system in the country.

For years Oregonians have listed their natural resources as forestry, fisheries, agriculture. But here in the Willamette Valley, it is time to put water at the head of the list.

Water looms larger than oil as a resource of potential crisis. Many in the Northwest may not know this, but industries do. Increasingly they are concerned about being left "high and dry" by cities which can no longer guarantee long-term water supplies. There is also a concern by many about water quality.

Portland cannot only deliver water but it has what you could call an embarrassment of riches in this regard. Moreover, through our Bull Run system, we have an abundance of pure, clean water.

Situated at the confluence of two rivers with spring-fed mountain water bubbling up through Benson fountains . . . cascading over monuments in our parks . . . available, cool and refreshing at the tap . . . water has been so very visible in this beautiful city of ours that, in a very real sense, we haven't really looked at it . . . our most visible of assets!

No more. It all began when I started reading "horror" stories about the scarcity of water in other parts of the country and the looming "water wars" between those with and those without. Then, in July of last year someone sent me a clipping from the *Wall Street Journal* about the New Orleans World's Fair . . . a water fair. That did it.

The fair is expected to draw 11-12 million visitors and several hundred conventions during its six-month run from May to November. Corporations from throughout the industrial heartland of the South, Midwest and the financial centers of the East Coast will be there. Ditto for industrialized nations around the world.

Never will we have such an opportunity to meet with so many big firms and countries interested in water as a commodity . . . whether for agriculture, industrial processes or shipping . . . as we will have at that fair. Let me tell you why we'll meet them and why we'll be remembered there.

We'll be the only city from the Northwest there. Our entrance will be colorful and ceremonious. The SP 4449 will steam in on June 2nd pulling several cars full of Portland promoters. The mayor of New Orleans will meet us with southern fanfare and hospitality.

Add to that the dramatic contrasts between New Orleans and Portland . . . between the sluggish, muddy Mississippi and the clear, fast-flowing Columbia . . . mighty rivers both . . . add to that a fine exhibit with bottles of chilled Bull Run water available for sampling . . . and you have a real drawing card. Few are likely to pass us by.

Well, dear citizens of Portland, what do you think? Industries need water. Clean industries—like silicon wafer manufacturers—need clean, pure water. We've got it. All they have to do is move here to get it.

They get the water . . . and we get the jobs. That's what it's all about . . . jobs! That's why we're bottling our water and heading on down to the fair. That's why we're polishing up the old SP 4449. She'll leave here in April. All along her route we will distribute samples of Bull Run water so that the story of our water will precede us to the fair: City by city . . . state by state.

It's a first for Portland . . . marketing our water. I'm pretty excited about it. The business community has joined in, the City Council is 100 percent behind us, and already our "water odyssey" has captured the imagination of many. We're receiving calls from all over the country.

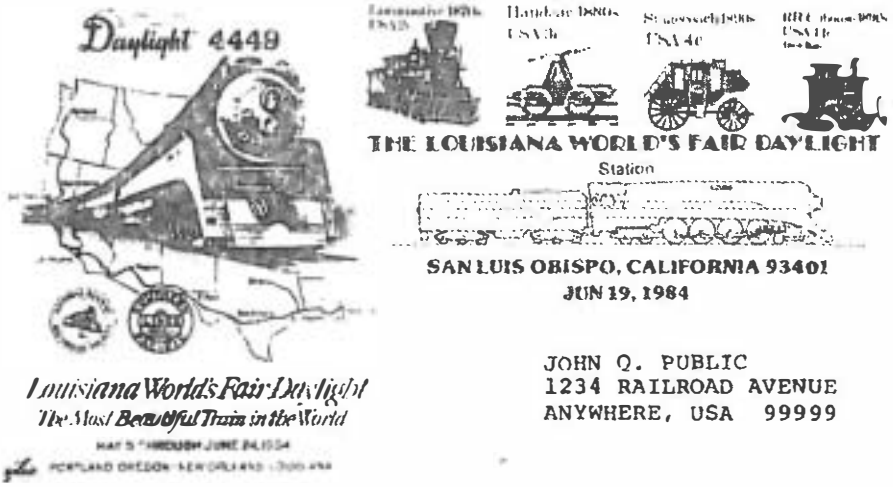
Tomorrow, *USA Today* . . . also excited about what we're doing . . . is coming in to do a story about us *and* our water.

It's a great beginning for a great new adventure in bringing new jobs to Portland. I have the highest hopes. *All Aboard. Everyone!*

By Steam Train to the Fair!

"The Louisiana World's Fair Daylight"

Portland, Oregon to New Orleans and return May 5 through June 24, 1984



Reduced size Artcraft engraved cachet (Actual No. 6 envelope is 6-1/2" wide x 3-5/8" high; 25% rag content.) Postage stamps affixed, date and city for postmark may differ from that depicted

On May 5, 1984, the Pacific Northwest Chapter, National Railway Historical Society (PNWC-NRHS), will send ex-SP 4449, a 4-8-4 "GS-4" steam locomotive, and a 13-car passenger train named the "Louisiana World's Fair Daylight" from Portland, Oregon, to New Orleans, Louisiana. Helping to transmit the City of Portland's message of abundant fresh water supply to the world exposition, the train will be on display one week at the fair site, then return to Portland on June 24. The special 7,171-mile excursion run promises to be the most spectacular rail event of the year.

The train will be a reincarnation of the famous class of "Daylight" trains that were often described as the "most beautiful in the world." Painted in a deep red, orange, and black color scheme with DuPont "Imron," this train will be viewed by millions who will watch her steam past or while it is on display.

The roundtrip passage will be a once-in-a-lifetime event, and with space for only 416 revenue passengers, not everyone can ride. But many people will want to have a unique souvenir, and to accomplish this, we commissioned Artcraft, the premier designer of quality cachets, to produce a specially-engraved commemorative cachet for our exclusive use.

In addition, the U.S. Postal Service will be saluting the train with a special pictorial postmark that will be offered in the 17 different cities where the train will remain overnight or be on display for up to three days during the journey. The postmark cancellation will depict a side view of the locomotive, which is the same engine that powered the American Freedom Train in 1975 and 1976. Many philatelists and cover collectors will recall the special postmarks for that train which are now cherished collectors' items.

To allow you the opportunity to share in the excitement of this occasion, we offer engraved cacheted covers stamped and cancelled with the special pictorial postmark. We will attempt to supply the covers with the Portland, Oregon, May 5, 1984 day of departure, but reserve the right to substitute covers with the same pictorial postmark from other cities if supplies for Portland run out.

To avoid disappointment, order now by completing the form below. The price is $1.50 per cover, plus an addressed, stamped No. 10 envelope or a gummed address label, or an International Reply Coupon.

PNWC-NRHS, Department SC
Room 1, Union Station
Portland, OR 97209

Please send me:

☐ Cachet Cancelled Covers at $1.50 ea. $_____.

_____

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_____

Please make check or money order payable to "PNWC NRHS Covers." Enclose addressed, stamped No. 10 envelope or address label, or International Reply Coupon with order please

DAYLIGHT DECAL EMBLEMS MAYBE STILL AVAILABLE

Last month several large Daylight decals were ordered for the repainted cars. There is a chance that some were left over and the price would be $5. Please contact ED IMMEL to see if there are any available.

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OREGON HISTORICAL SOCIETY LOOKING TO BORROW NORTHERN PACIFIC YING-YANG EMBLEM

The next big show at the Oregon Historical Society is "Frontiers of Trade" and they would like to borrow a metal emmlem from the Northern Pacific that we call the Ying-Yang. It should be a heavy metal plate about 12" diameter. Call president RICH CARLSON, if you have one you would be willing to LEND to the OHS.

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NEXT MONTH LOOK FOR HISTORY OF CHELATCHIE PRAIRIE RAILROAD

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4449 TO BE ON DISPLAY HERE AT UNION STATION MAY 3 & 4

Also there is a send-off ceremony open to the public set to start at 7am on Saturday, 5 May. Watch if the engine can break thru the break-thru banner. Listen to a few who made this possible and enjoy the ride or the photo session.

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DAYLIGHT CONCESSIONS TO BE AVAILABLE AT APRIL MONTHLY MEETING

Avoid the long train ride just to buy several postcards and get to the next meet of the Chapter to plunk down your hard earned coins on the concession items of your choice. Also at the meeting will be members of the SP Junion Achievers who will have RAIL BOOKENDS for sale for $10.00. Check out those postcards. Great.

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PAUL WIRTH HONORED BY NATIONAL WITH SILVER PIN FOR 25 YEARS

Member PAUL WIRTH was inducted into the NRHS Quarter Century Membership Club and President RICH CARLSON read the welcoming letter at the March meeting. He has had twenty-five years of membership in the NRHS and was thanked for his support.

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COMMENTS ON OUR BOARD MEETINGS DELAYED UNTIL ANOTHER ISSUE

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IF YOU PLAN TO BE AT THE STATION ON TIME - WATCH FOR DAYLIGHT

Actually it would be better if you were aware of the government's attempt to mess with the hours in the day and if you were aware of the day that the day-light saving's time slips into our lives. Would be sad if your special trip by train was interrupted by you oversleeping on 5 MAY or so. A nice name, tho.

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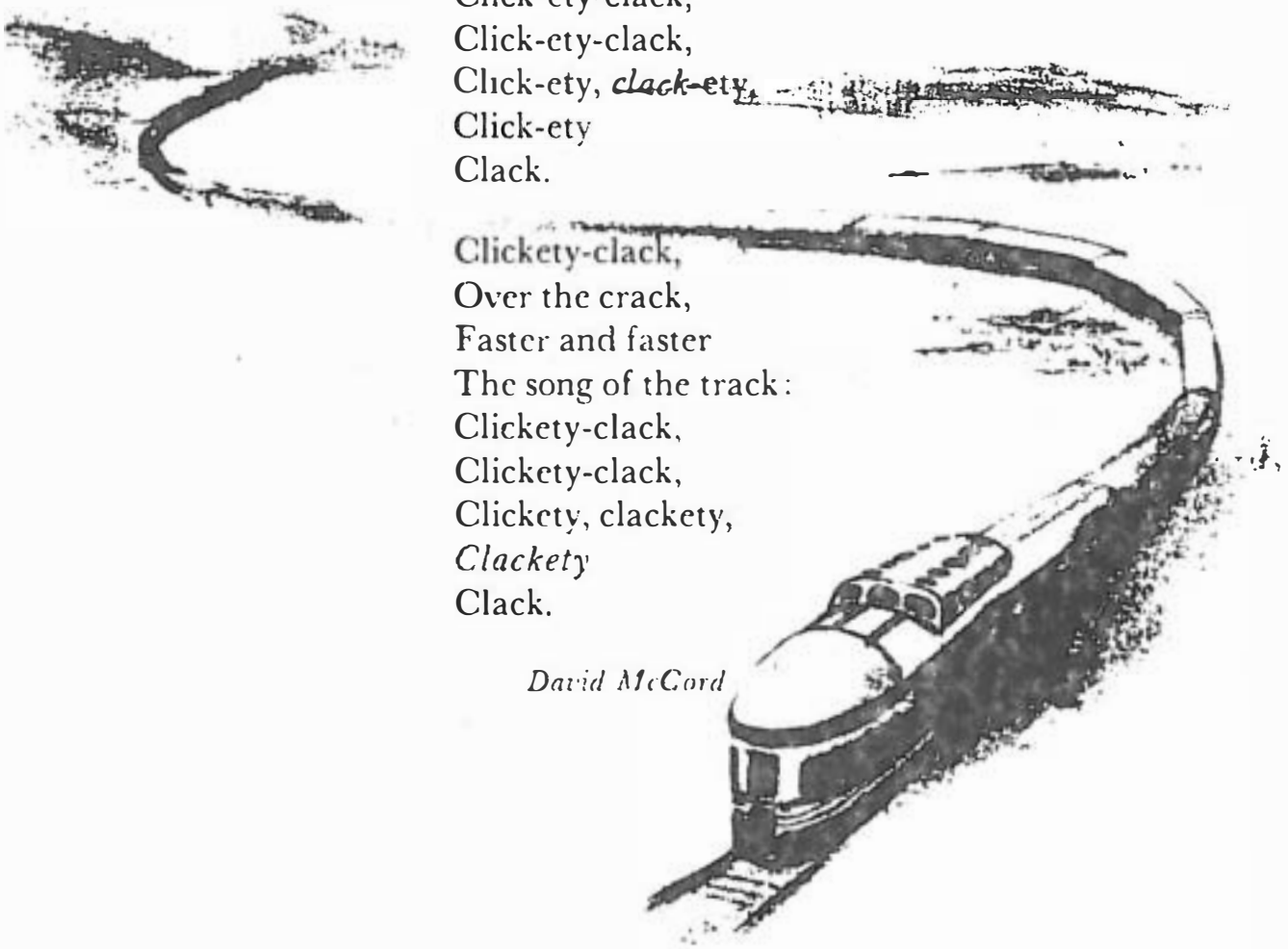
GOOD LUCK WITH THE TRIP

Song of the Train

Clickety-clack,
Wheels on the track,
This is the way
They begin the attack:
Click-ety-clack,
Click-ety-clack,
Click-ety, *clack*-ety,
Click-ety
Clack.

Clickety-clack,
Over the crack,
Faster and faster
The song of the track:
Clickety-clack,
Clickety-clack,
Clickety, clackety,
Clackety
Clack.

David McCord



REPORT ON THE STEEL BRIDGE OVER THE WILLAMETTE IN PORTLAND, OREGON

by Al Viewig

This highway/railroad bridge is about to be modified so that LIGHT RAIL tracks can be added. This means that this is an instant historical structure since it will never look like this again. Be sure to get photos of the WEST SIDE of the bridge since the light rail line will require different approaches.

A captured history of the bridge follows in a page or two. The canned history was supplied by George J. Skorney, Director of Public Relations and Advertising of the Union Pacific Railroad in Portland, Oregon.

The following notes are put together from note cards AL VIEWIG has in his office. Anyone wishing to get a footnote (if possible) for any of the following statements should attempt to drop Viewig a written request and see what happens.

There were two bridges called THE STEEL BRIDGE here in Portland. One was built in 1886 and opened for rail traffic in 1887 and opened for highway traffic in 1888. Thus you can see any of those dates for the "date built." The contract went to the Willamette Bridge Company. The highway portion opened 10 July 1888. Trolleys went across for the first time on 4 November 1887.

The first STEEL BRIDGE cost $381,000. This was a double deck swing bridge. It was 100 yards downstream from the present bridge.

This was the very first STEEL bridge, or bridge made from steel, on the west coast. It was the first railroad bridge over the Willamette River in Portland.

The second STEEL BRIDGE appeared 100 yards upstream from the site of the first STEEL BRIDGE. This is the current bridge that is up now. This was designed by the same firm that designed the HAWTHORNE STREET BRIDGE over the Willamette in Portland, Oregon. The Hawthorne is a vertical lift bridge and it opened a few months before the 1912 Steel Bridge.

The cost of building the 1912 STEEL BRIDGE is variously reported as being from $1,704,000 to $1,706,000.

Shortly after the 1912 bridge opened there was a fire on the upper deck. The date varies but one date puts the fire on 30 June 1913 with the upper deck and tar burning. Maybe there was a different fire in 1914 or else someone has the date incorrect. This was a $50,000 loss.

The upper deck contains the highway. Since 1950 the State of Oregon highway division has been in control of the deck which it leases from the Union Pacific Railroad.

The lower deck lifts about 400 times each month.

Automobile capacity on the upper deck has varied from a high of 56,000 cars a day in the early 1960s to 17,000 cars a day in 1983. (6838 go west, 9084 go east.)

(more on page 8)

THE 1912 STEEL BRIDGE - continued from preceeding page

If you are river traffic and you need the lower level lifted, toot one long and one short and hope that the guy in the little house on the bridge hears you.

The dimensions of the bridge are reported differently from time to time. First you have to know if the writer is referring to the height above a low water or high water or mean water level and some writers forget to say. Here the basic difference for the LOW to HIGH WATER mark for the STEEL is 21'.

Also, the length of the bridge might be for the total RAILROAD part, or the total HIGHWAY part, or for the LIFT SPAN, or for the LIFT SPAN AND TWO SIDE SPANS.

The towers might be measured from the water to the top, or from the bottom of the rail deck to the top.

The width of the trusses might be measured from the center to center of them or the inside dimension between them.

The length of the span might be measured from the center to center or from end to end and the span opening can vary with the height of the water since the piers are flared towards the bottom and they increase in size as the water level drops.

The APPROACH SPANS vary slightly on the west and east end. These are THRU TRUSSES connected to the towers. You can count the panels on the truss and see that both the west and east spans have 11 panels each. Each panel is a bit over 26' long, for a total of 286' for each side span.

The LIFT SPAN has been reported to be from 211' to 220' in length. At low water the clearance is 205'. Counting the panels on the THRU TRUSS making up the LIFT SPAN we find seven panels each a bit over 30' for a span length of 211'.

The trusses of the Lift and Side spans are PRATT TRUSSES.

The railroad is on the bottom of the truss making the railroad a THRU TRUSS. The highway deck is on top of the trusses and would be called a DECK TRUSS if it were not for the railroad in the truss itself.

The trusses appear to be 34' apart and the rail lines are 15'6" apart center to center. The railroad is double tracked on the lower level.

The TOWER is 231'3" from the top of the tower to the bottom of the rail deck. It would then be around 256' high above LOW WATER or 236' high above HIGH WATER..

The length of the bridge appears to be 1867' for the highway part and maybe it is 1624' for the railroad part.

The three main spans (two side spans and lift span) equal 796'.

This was the longest lift span built until 1929.

This is the heaviest lift span built to date.

CLW and CHW mean clearance for LOW water or HIGH water levels. The clearance of the LOWER DECK in the down position is 26'CLW and 5'CHW. The clearance of the LOWER DECK in the up position is 72'CLW and 51'CHW. The clearance with the entire lift span up is 165'CLW and 144'CHW. (The Brooklyn Bridge has 135' clearance.)

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STEEL BRIDGE - PORTLAND, OREGON

supplied by the Union Pacific Railroad

The first Steel Bridge was the first railroad bridge built across the Willamette River at Portland in 1888 by the Oregon Railroad & Navigation Company. This bridge was chiefly constructed of wooden pilings and was built downstream from the present Steel Bridge, approximately where Louis Dreyfus Co. is now located.

An ordinance was adopted by the Port of Portland in 1909 permitting street cars, wagons, automobiles and vehicles of all kinds, and passengers and pedestrians to use the bridge, for which the railroads were permitted to charge toll.

The OR&N Company later became the Oregon-Washington Railraod and Navigation Company. By agreement in 1941, this company and the Southern Pacific Company became the owners of the Steel Bridge. Union Pacific is one of the operating lines.

The second Steel Bridge was built in 1912 at a cost of $1,706,000. It is unique in that it is thought to be the only bridge in the world of its type -- the lower deck which handles rail traffic can be raised and lowered independently of the upper deck. This feature allows river traffic to pass beneath the bridge without the necessity of interrupting auto traffic on the upper deck. However, the upper deck can also be raised to allow large vessels to pass beneath. The system is referred to as a double lift span, with independent operation for each span. The Steel Bridge is the only Willamette River bridge affected by rail, auto and water traffic.

The lift span of the bridge is 211 feet long, and the lift of the lower deck alone is 46 feet, while the lift on the upper deck is 89 feet giving ample clearance for the largest ocean going vessels. The lower deck has a clearance of 26 feet above low water and 5 feet above high water. The lower deck has its own set of counterweights, and it weighs, with its attachments, about 1,060,000 lbs. The upper deck weighs about 3,420,000 lbs., exclusive of counterweights, Thus the total moving load is about 9,000,000 lbs., including counterweights, making this lift bridge the heaviest yet built.

The upper deck is suspended by two-and-one-quarter inch cables at each corner. These cables pass over the main sheves (14 ft. diamter and 24 tons weight) fastened near the top of towers about 245' above the top of the piers. This deck is raised and lowered by up haul and down haul cables. The lower deck has four one-and-one-quarter inch counterweight cables for each panel point. This deck is moved by traction sheaves at the corners of the lift span.

There are four 200 h.p. motors used for operating this bridge, two for the lower deck and two for the upper deck. These motors are placed with the other operating machinery in a house constructed at the center of the top of the upper lift deck. The operator's house is placed just below the machinery house so that the operator can have a full view of the highway traffic on the upper deck as well as the water traffic. The automatic locking apparatus for both lifting decks is placed in the operator's house.

(more on page 10)

(continued from previous page - UPRR story of STEEL BRIDGE)

The present Steel Bridge and the Hawthorne Bridge were designed by the same engineers and built at the same time. The Hawthorne Bridge was completed a few months before the Steel Bridge.

To obtain the franchise from the city to build the present Steel Bridge, the railroads agreed to build an upper highway deck. The State of Oregon took over maintenance of the highway deck when the road was declared a state highway. The UP and SP railroads lease the highway deck to the state for a nominal yearly sum, and the state must pay for maintenance of the deck. Fire in 1913 burned the wooden highway deck of the bridge and damaged the lower deck cables, which were replaced in 1914. In 1958, a steel deck was installed over the bridge to reduce the maintenance work on the automobile deck. Previously, asphalt planking was used, which gave the Highway Department considerable trouble as far as maintenance was concerned. It had to be renewed continually and proved to be quite costly. The upper deck now has a paved top, which has reduced maintenance cost.

At one time it was proposed that the Steel Bridge be painted a more attractive color, but the Union Pacific's chief engineer said no. The cables are a greasy black and the steel must be black, he said.

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PHOTO HINTS FOR REMEMBERING THE STEEL BRIDGE

Since the State of Oregon is about to modify the present Steel Bridge, it is imperative that you get on with the picture making soon.

The light poles are to be replaced and so in the hand railing. The railing is quite distinctive and who knows what the replacement will look like. Shoot through the railing to get shots of the Broadway and even of the paddlewheeler moored right under the Steel Bridge.

The west approach will be changed. Take some late afternoon shots from in front of Norcrest China in the Import Plaza Building.

Getting nice morning shots is possible by walking out on the freeway entrance on the east side. The freeway entrace is a high curving ramp with a grand view. Watch for traffic.

Down below on the east side pull up to the entrance of Louis Dreyfus dock at the bottom of North Holloday for access to the railroad level.

On the west side at the railroad level there is no better shot than right at the west end on the tracks showing the curving tracks entering the bridge.

Who knows what the entire bridge will look like after the addition of the light rail line so get shots now of the bridge and compare them in a few years.

Getting shots with the lower deck both up and down and if possible with the entire bridge in the up position before the light rail modifications should be part of your Easter Week events.

THE NEW O.-W. R. & N. BRIDGE AT PORTLAND

(reprinted without permission from "ENGINEERING NEWS" vol 68, #24, 12 Dec 1912)

by W. P. Hardesty of 40 E. 31st St N, Portland, Oregon

There has just been completed across the Willamette River at Portland a new combination railway and highway bridge, built by the Oregon-Washington Railway and Navigation Co. This railway is one of the so called Harriman roads, on account of which the bridge is sometimes known as the Harriman Bridge. It is a double-deck bridge with vertical lift. It cost $1,700,000.

The new bridge replaces one built by the old O.R.& N. Co. in 1888. This bridge was the first steel structure to be constructed across the Willamette R., for which reason it has always been locally known as the "Steel Bridge."

Like the new bridge, the old structure was a combination bridge with two decks, the lower one to carry the railway traffic and the upper one to carry highway travel. It was designed by the late George S. Morrison.

Though designed to support the heaviest rolling stock in use at the time of its construction, it has in recent years been wholly out of date, and in 1910 work was begun on a new structure.

The old bridge crossed the Willamette at about its narrowest point in the city, where it is only 600' wide between harbor lines. This is near the Union Depot. There was no room at the east end for a turn to the north, down the right bank of the river, and as the expansion of the railway company's system during the past year or two has included a line of traffic to Puget Sound points it became desirable to provide for such. The new bridge is located about 600' upstream from the old one, by which arrangement the company secured room at the east end for a direct turn in either direction. A recess in the line of the high bench land bordering the river here, together with a design of bridge with diverging trusses, permitted the use of 16 degree curves, for northbound traffic to Washington and southbound traffic to California.

The highway portion of the bridge starts on the west side at Third St. and follows eastward along and in Glisan St. to the river; thence by a deflection to the left it crosses the river nearly at right angles and ends on the high bench facing the river. The railway portion forms the lower deck for the three spans across the river itself. The highway deck has an approach on the west side of 738' one on the east side of 305', while the length over the three river spans (common to both decks) is 796', making a total length of 1839'. The west approach has an up-grade of 5.98%, the east approach one of 2.5%, while the central (lift) span and portion of the adjacent spans are level. The approaches are of plate-girders supported by columns, except about 250' at the west end, which is of concrete retaining walls filled in.

The distinguishing features of this structure are its very heavy construction and the arrangement for lifting the two decks of the lift span, either together or separately. The upper deck was designed for the heaviest city traffic, providing for loading with pedestrians over all, for continuous lines of street cars, for loading with the heaviest road rollers in various positions, etc. The lower deck was designed for the heaviest locomotives and cars used on the Harriman system with double track.

(more)

---continuation of 1912 Engineering News article on Steel Bridge ---

The river part of the bridge consists of 2 fixed spans, each 287' long between bearings, and a central lift span of 230', all Pratt trusses. For the two fixed spans the highway deck is on top and the railroad deck along the level of the lower chords. The lift span rests on columns, placed on the piers, and it is a through span for the upper deck.

The depth of the trusses (c. to c. chords) is 59'. Some idea of the massive construction of the bridge may be obtained from the size of the members, The end diagonal posts are 42" deep by 39" wide. The lower chords are 42" deep by 36" wide, the adaptation to the different stresses in the different panels being made by varying the thickness of the material. The floorbeams have a top-flange width of 18". The tower posts are 36" square.

For the lift span the trusses are spaced 34' on centers. For the east span the distance is 34' at the river end and 71.5' at the short end, the divergence allowing for the curving of the railway tracks to the north and south respectively. For the west span the widths are 34' at the river end and 42' at the shore end. The latter width is sufficient, as but one turn, that to the northward, to reach the Union Depot, is needed. This is done with a 16 degree curve.

* * *

The lower deck has a clearance of 26' above low water and 5' above high water; base of rail is 6' higher, and the upper-deck level is 52.5' above this.

The lower deck has a separate lift of 48' making a clear height of 72' above low water without moving the upper deck. The upper deck has a lift of 83' so that when raised with the lower deck also in the raised position, the total lift of the lower deck is 139', and the total clearance is 165' above low water and 144' above high water. This clears the highest-masted vessels entering Portland. With the lower deck alone lifted, all but the largest of the steamboats plying the river can pass, at ordinary stages of water.

The upper deck is divided into 5 parts: a 28' central section for the double-track street railway and for automobiles; an 11' roadway on each side for horse vehicles; and on the outside a sidewalk of 6' clear width at each side of the structure. * * *

The vertical lift span is much the heaviest of that type so far built.

At either end of the lift span is a steel tower, resting on the pier and on the end of the adjacent fixed spans. Each tower, 243' high above pier, consists of two tower posts resting on the pier, and two inclined back legs resting on the top chords of the fixed span. The 2 sets of legs are throughly braced together at intervals, and the 20' space at top between main leg and back leg is spanned by a girder. * * * The height from low water to center of sheaves is 285'.

* * *

In each tower is a single main counterweight made of concrete weighing 1,712,500 lb., of overall dimensions 40' high, 29 5/6' wide * * * and 10 1/3' thick.

more

(continuation of 1912 Engineering News article on Steel Bridge --)

* * *

The bridge was designed by the firm of Waddell & Harrington, consulting engineers, Kansas City, MO. The immediate erection was in charge of C. K. Allen, resident engineer. The plans were approved by John D. Issacs, consulting engineer for bridges on the Harriman system of railroads. The railroad management went out of its usual practice of employing only its own engineers in this one case. The lift span here used is of a patented type, invented by Waddell & Harrington, and their fee of $90,000 for design and supervision of erection of the bridge included also the royalty. The erection was, to a certain extent, also supervised by the engineering department of the Oregon-Washington Railroad and Navigation Co.

The Howe-truss falsework, the traveler, and the sheer-leg, were designed by George T. Forsyth, engineer of bridges on the staff of George W. Boschke, chief engineer of the railway. The railway company made the preliminary soundings and borings.

The contractor for the substructure was the Union Bridge & Construction Co., of Kansas City, MO. The erecting of the superstructure was done by Robert Wakefield of Portland.

The upper deck of the bridge, designed for vehicle, pedestrian and street-car traffic, was, of course, not needed by the railway company itself, but it was a condition of the grant to build the bridge and its approaches. A controversy between the railway company and the city as to the proper rental for use of the upper deck finally resulted in a reference of the matter of first cost of the upper deck to engineers selected by the respective parties - Waddell & Harrington for the company and Ralph Modjeski for the city. The railway company maintained that a rental equal to 5% of the cost of the deck was proper, inasmuch as both the interest and depreciation were to be considered, the useful life of the bridge being estimated at 33 years.

* * *

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A BRIDGE WITH A LIFT SPAN WHICH HAS A LIFTING DECK

(source unknown - reprinted without permission)

The Oregon-Washington Railroad and Navigation Company's Willamette River Bridge at Portland, Ore., completed in 1912 at a cost of $1,715,000, is a double-deck structure which is 1900' long between the ends of the upper-deck approaches. The lower deck extends across the river only and, including short approach spans on one side, is 900' long between abutments. The upper highway deck, 73' wide, accommodates double street car tracks, and has a paved roadway and two sidewalks; the lower deck provides for a standard double-track railway. The bridge is in the business district of Portland near the Union Station. * * *

* * * The Oregon-Washington Railroad and Navigation Company's tracks enter the city from the east and the Southern Pacific tracks from the south, and all trains must cross the river to reach the station and terminals on the west-side. These were formerly served by a double-deck bridge known as the "steel bridge," built (in 1888) with a single railway track below, and a 32' roadway above for street cars and highway traffic, and included a 340' swing span.

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The STEEL BRIDGE Light Rail Project - 1984

STATE OF OREGON
DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION
NOTICE TO CONTRACTORS
JANUARY 26, 1984

Sealed proposals on the following project will be opened and read by the Highway Division in Room 122, Transportation Building, Salem, Oregon, at 9 a.m. on Thursday, January 26, 1984. Proposals shall be submitted to Robert W. Gormsen, Manager of Commission Services, prior to 9 a.m. on the above date. For this project, bidders shall be prequalified in the class of work indicated.

(1) MULTNOMAH COUNTY: Willamette River (Steel Bridge & Ramps) Section of Pacific Highway West in Portland. FAP No. IX-0000(LRT). ($5,000,000 - $10,000,000). Requires approx. 3,940 cu. yds. exc.; 425 tons aggr. base; 630 tons treated base; 420 tons asphalt conc.; 220 cu. yds. reinf. conc. track slab; 14 inlets; 220 sq. yds. filter fabric; 30 sq. yds. conc. walks; 500 lin. ft. conc. curbs; 303 lin. ft. conc. barrier; 944 shrubs and groundcover; 1,775 cu. yds. struct. exc.; 3,480 lin. ft. steel piling (32 piles); 9,050 lin. ft. prest. conc. piling (137 piles); 6,128 cu. yds. struct. conc.; 1,319,400 lbs. reinf. (398,100 lbs. coated); 579,000 lbs. struct. steel (125,000 lbs. repair steel); 3,618 lin. ft. ped. rail; 5,842 lin. ft. bridge rail; 5,510 sq. ft. grid deck; 2,800 sq. ft. sidewalk & walkway grid flooring; 4 impact attenuators; 1 gate tender's house; 2 span lock machines; 2 traffic gates; 4,140 track ft. install track rails; 240 rail welds; 31,194 gals. rail support, filler and sealer matl.; 775 sq. ft. signs; 10 steel lighting poles; 16 steel catenary poles; 73 luminaires; 2 Model 170 controllers; 1 steel sig. pole; 4 wood poles; 17 vehicle signals; 8 ped. signals; 4 fluorescent signs. Reqs. RR Ins. Completion time: a) 1st. Ave. LRT ramp by Sept. 30, 1984; b) All LRT facilities by June 30, 1985; c) Open outside lanes on Steel Bridge by Aug. 31, 1985; d) All work by March 31, 1986. Class of Work: Reinforced Concrete and Structural Steel Bridges and Grade Separation Structures. THIS PROJECT CONTAINS DBE/WBE GOALS. A prebid meeting will be held at the Highway Division Office at 5821 N. E. Glisan St., Portland, OR at 10 a.m. on January 5, 1984. PLANS, SPECIFICATIONS, AND BID PROPOSALS WILL BE AVAILABLE ON FRIDAY, DECEMBER 9, 1983.

"BUY AMERICA" requirements apply on this Federal Aid Project.

Contractors must comply with the requirements for disadvantaged and woman business enterprises, (DBE/WBE), on-site work force, contract wage provisions, etc., which are a part of the special provisions for this project.

No bid will be received or considered by the public contracting agency unless the bid contains a statement by the bidder as a part of this bid that provisions of ORS 279.350 shall be complied with.

Contract Granted for STEEL BRIDGE Light Rail Project - 1984

STATE OF OREGON
DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION
TABULATION OF BIDS RECEIVED FEBRUARY 16, 1984
TRANSPORTATION COMMISSION ACTION FEBRUARY 22, 1984

(1) MULTNOMAH COUNTY: Willamette River (Steel Bridge & Ramps) Section of Pacific Highway West in Portland. FAP No. IX-0000(LRT). Grading, paving, structures, trackwork, signing, illumination and signals.

Donald M. Drake Company, Portland	$7,793,569.31
Harcon Incorporated & F. E. Ward, Inc., JV, Vancouver, WA	8,640,969.00
Kiewit Pacific Co., Vancouver, WA	8,727,801.00
Coast Marine Construction, Inc., Portland	8,783,125.44
Hamilton Construction Co. (Oregon), Springfield	8,903,765.00
Ross Bros. Construction, Inc., Salem	9,025,322.50
Riedel International, Inc. & Tokola Corporation, JV, Portland	9,355,000.00

The Commission authorized the State Highway Engineer to award the contract to the low bidder pending DBE/WBE review, and subject to concurrence of the Federal Highway Administration, and when agreement is reached with Tri-Met for the State's match share. If the low bidder fails to meet DBE/WBE requirements, State will award to the next lowest responsive bidder pending DBE/WBE review and cost justification. (Contract No. 9748)

STEEL BRIDGE QUITE SPECIAL AND SO ARE CONTRIBUTORS

If you have been keeping watch you will have discovered that we have now covered the two main railraod bridges in Portland over the Willamette in an historical fashion. Thanks go to many who made comments and suggestions and sent in clippings. Historically we will have to switch to other rail projects in the future, but if these bridge comments have inspired you to learn more about bridges (or even only rail bridges), I invite you to keep the cards and notes coming in to the TRAINMASTER so in the future we can keep others up to date on different bridges.

The big result will be if you go out there and get some nice clear photos of the bridges before someone begins to alter them. Instant history can be recorded right now in Portland so go out some Saturday morning and record them.

STEEL BRIDGE RECONSTRUCTION

The Oregon Department of Transportation has recently awarded a contract for renovating the upper deck of the Steel Bridge in Portland. The purpose of this project is two-fold: to replace the deteriorated timber deck and to accommodate the LRT vehicles of the Banfield Transitway which is being routed from NE Holladay Street to downtown Portland by using the Steel Bridge and ramps.

This bridge presently carries rail traffic on the lower deck and highway/ pedestrian traffic on the upper deck. This project will not effect the lower deck; however, the upper deck will be dual purpose. The two inside lanes will serve both LRT and highway vehicles. The two outside lanes will serve highway vehicles only. A sidewalk each side of the bridge will serve pedestrians.

On the west side of the river, a new ramp will be constructed to carry LRT traffic from Steel Bridge to the intersection of NW Everett Street and NW First Avenue. An existing ramp carrying westbound highway traffic from Steel Bridge to NW Front Avenue will be removed in order to eliminate a potential safety hazard between highway and LRT vehicles.

On the east side of the river, a new ramp will be constructed to carry highway traffic from NE Holladay Street to Steel Bridge. This ramp will parallel the existing Holladay-Steel Bridge ramp which will serve LRT vehicles only.

This project will not significantly change the appearance of the bridge. The existing timber deck will be removed and replaced with a reinforced concrete deck. The existing steel pedestrian handrail is badly deteriorated and will be removed and replaced in kind. The existing luminaire poles will also be removed and replaced. Some of the structural steel members supporting the upper deck are deteriorated and will be repaired. The new pedestrian handrail, luminaire poles and other steel members will be painted black to match the existing paint.

The most significant change to the bridge will be the addition of the Light Rail system. The LRT vehicles will be electrically powered from overhead cables suspended above the tracks. The tracks will be embedded in the concrete deck.

TJS:jrb
3-26-84

Department of Transportation
HIGHWAY DIVISION
TRANSPORTATION BUILDING, SALEM, OREGON 97310

STEEL BRIDGE SCHEDULED TO BECOME ANOTHER 'FIRST' IN PORTLAND

By SHARON M. WOOD
Correspondent, The Oregonian

For the fifth time in 97 years, the Steel Bridge is scheduled to give Portland a "first" in its transportation history.

The Steel was the first bridge across the Willamette River constructed of steel, the first to carry trains, the first to provide electric streetcar service between the east and west sides of Portland and the first double-lift verticle drawbridge with two decks that can be raised and lowered, together or independently.

In about two months, construction will start on the fifth "first" — the trans-Willamette link in Tri-Met's light-rail system.

"It will be smack through the center span and upper deck of where else but — the Steel Bridge," said the bridge's chief operator, Charles D. "Chuck" Bryan.

When it opened July 10, 1888, the original Steel Bridge was a double-deck swing span and the second bridge to cross the Willamette River between St. Johns and Sellwood.

It was built by the Oregon Railroad and Navigation Co. — known today as the Union Pacific Railroad Co. and the Southern Pacific Railroad Co. — to get steam engines and freight trains across the river.

Each railroad company is half owner of the bridge.

"To obtain the franchise from the city to build the . . . bridge, the railroads agreed to build an upper highway deck," according to Union Pacific records.

The upper deck carried more horses and buggies than automobiles during its early years. Electric street cars operated by Willamette Bridge Railroad Line also used the upper deck, charging 5 cents a rider in the early 1900s.

A 1928 report in "Engineering News" says the early Steel Bridge was placed across the river "at about its narrowest point in the city where it was only 600 feet wide between Harbor Lines." That was near the site of the Union Depot, opened in 1896.

"The Harriman Bridge" was the name given the structure, according to historic records. The name was for railroad financier Edward H. Harriman, who died in 1909.

However, citizens of the day were so enamored of the innovate construction that they called it as they saw it. The generic "Steel Bridge" has stuck for almost a century.

The present Steel Bridge, crossing the Willamette at Glisan Street, is approximately 60 feet upstream from the site of the span it replaced in 1912.

Portland's population had reached 275,500 when the new Steel Bridge's lower deck opened to double-track rail traffic in July 1912. One month later the upper deck — originally leased for $26,000 a year for 30 years to the city of Portland — opened to vehicular traffic.

Other bridges crossed the Willamette between the building of the first and second Steel Bridges but local headlines classified the unique Steel as the "Engineering Bombshell of 1912." The other bridges were the Madison, also known as the Hawthorne, in 1890, 1900 and 1910; the Burnside in 1894 and the Morrison in 1905.

Designed by Waddell and Harrington, consulting engineers from Kansas City, Mo., and the railroad's engineers, the bridge was built over a period of two years — with construction never closing the Willamette to river traffic — at a cost of $1.74 million.

It is believed to be the world's only double-lift span that can raise its lower deck independent of the upper deck.

"In other words, traffic can be using the upper span of the Steel while the lower railroad deck is vertically raised, allowing river traffic passage," said George Kraus, a public relations manager for Southern Pacific.

"Or if higher ships need clearance, opening both upper and lower decks allows for 163 feet total clearance," Kraus said.

Its strength and weight are recalled by another railroader, Frank I. Dennis, who worked on the bridge intermittently between 1927 until his retirement in 1971 as an engineering inspector with Union Pacific.

"That bridge's steel is seven-ply thick in some places and the whole thing weighs somewhere around 8,000 tons," said Dennis, 75.

The bottom railroad span, measuring 916 feet between abutments, will easily hold a fully loaded, 15-car train with "diesel engines weighing 400,000 pounds each," he said.

Some railroad traffic was controversial during the 1940s war years.

"German prisoners-of-war were transported in rail cars across the span's lower deck," Dennis said.

The railroad draw is the busier of the two decks, with only 26 feet clearance at zero water level.

It has a one-foot clearance at high water, and, according to bridge lore, no clearance during flood water. During the 1948 Vanport flood, records show the lower portion of the bridge was in 5 feet of water.

"In 1914 the lower deck was raised 20,339 times to permit the passage of such rivercraft as the "Potter," the only side-wheeler on the Willamette," according to a 1944 story in The Oregonian.

In 1943, the lower deck was raised only half as much — 10,687 times.

According to 1983 statistics, the Steel's lower deck was raised 3,126 times and its upper deck, 155.

Bridge operator Bryan said the decrease is due to less upper harbor traffic.

"For example, Zidell Co. and Knappton Tug are two businesses that aren't in the area anymore," he said.

The bridge's traffic count reached an all-time high in 1962 at 62,000 vehicles a day, funneled by 11 approaches across its four lanes.

Mario J. Martini, the city's senior traffic engineer, said traffic congestion was reduced on the bridge in 1968 when the Marquam Bridge and Interstate 5 system were completed.

"Last count, the Steel carries around 27,800 vehicles on an average day," Martini said.

No longer the responsibility of the city of Portland, the upper road deck has been maintained by the state of Oregon since it was declared a state highway in 1950.

Gate tenders at each end of the bridge are also state employees.

Clair Kuiper, bridge maintenance supervising engineer for the state, compares the city's 30-year lease of 1912 with today's lease that runs through the year 2006.

"Our current agreement with the railroads is for $156,750 a year," Kuiper said.

Shortly after the Fourth of July, work on the light-rail project and much-needed upper deck repairs will start and continue for 15 months, Kuiper said.

The bridge will remain open for river traffic, but it will be closed to vehicle traffic until late 1985.

The cost of the new decking, the construction of two sets of light-rail tracks across the upper deck and new west-end approaches is expected to be more than $7.79 million.

Steel's operator takes pride in spouting bridge's statistics

"Everthing's gone up," said bridge operator Charles D. "Chuck" Bryan.

"When the new Steel was built 72 years ago, it cost $1.7 million," he said. "Today it needs a paint job and one of the lower bids — just to paint it, mind you — is $2.25 million."

Bryan, employed on the brige by Union Pacific Railroad since 1949, attributes the Steel's long life to its basic structure and years of excellent maintenance.

One of Bryan's favorite subjects is the bridge's construction and his statistics run from two to seven figures.

"The main or upper deck, a 212-foot-long span, is lifted by steel cables passing over one 14-foot main sheave at each side of two 265-foot-tall towers," he said. "Each of these sheaves' centers is 245 feet above low water and each weighs 24 tons."

Bryan pointed straight up to the two black, massive towers.

"In each tower is a single main concrete counterweight for the upper deck, each weighing 1,712,500 pounds," he said.

Pointing down, he said, "The lower deck's main span is 211 feet long and has four separate counterweights, weighing a total of 80,000 pounds."

Raising the lower deck brings into play an ingenious feature of the Steel Bridge and can be compared to raising a window sash: part of the lower structure "telescopes" into part of the upper structure.

Bryan said the total moving load, including counterweights, is about 9 million pounds, making it the world's largest elevator.

Movement takes place "without much fuss," he said, pointing to a log book detailing a 1938 incident.

"A streetcar stalled in the middle of the bridge and along came a ship traveling downriver in a strong current," Bryan said.

It was a case of raising the bridge with the streetcar on it or having the ship crash into it.

Bryan said the upper deck was raised and the fogged windows of the streetcar kept passengers from knowing they had moved.

At his workplace of nearly 35 years, Bryan keeps track of maintenance records and oilers' hours in the 8-by-12-foot operator room suspended beneath the machinery house.

In the room, he can see the main deck of the bridge as well as river traffic. A marine radio allows him steady conversation with the river's tug, barge, and ship captains.

Pushing the right buttons and pulling the correct levers, he can raise the lower deck 46 feet in about 10 seconds and elevate the upper deck 91 feet in about 90 seconds.

Bryan spends most of his time in the spit-and-polish machine room in the middle of the top lift span.

Inside and operating on DC current is the machinery that weighs approximately 450 tons and manages the 6½ miles of steel cables that "uphauls and downhauls" all the bridgework. The operation requires 2,500 pounds of oil and grease a year and a large rag barrel, according to Bryan.

Maroon-painted bronze bearings are filligree-trimmed with contrasting gold-colored paint. Rivet heads throughout the 40-by-70-foot room are detailed in black. All the visible floor tile is filled and individually "hand-painted" if accidentally chipped, said Bryan.

"You have to be proud of a one-of-a-kind job," said Bryan. "And since I'm going to be around here for a few years, I try to take care of the Steel so it will be around, too."

·nch Market set as fund-raiser

·s of students at the French-American
S.W. 58th Ave., are sponsoring a fund-
-ket at Beaverton Town Square on
·n 10 a.m. to 5 p.m.

·de a French cafe serving
·ssels, French hot dogs,
It also will feature
crafts, a chil-
book store

by Sharon Wood

2 Ap 1984

BNRR-SPOKANE SWING — WILLAMETTE RIVER

U.S. to spend $30 million on rail bridge

By DAVID WHITNEY
of The Oregonian staff

WASHINGTON — The U.S. Coast Guard plans to spend about $30 million during the next two years to rebuild the Burlington Northern railroad bridge over the Willamette River.

The announcement that the Coast Guard plans to proceed with the project following initial, favorable engineering and cost-benefit studies was made by Oregon Sen. Bob Packwood at a Coast Guard hearing before the Senate Commerce Committee of which he is chairman.

The project will convert the bridge, which now swings on a pivot, into a vertical lift bridge similar to but much larger than the Steel Bridge furtner upstream.

Because of its relatively narrow 230-foot width, the 70-year-old bridge has been a navigational obstacle to large ocean-going ships traveling to and from Portland area docks.

The project will almost double the navigational width of the bridge to 440 feet.

The span, located between the Freemont and St. Johns bridges, has been rammed a number of times by wide ships which have to proceed slowly through it.

The worst accident occured in 1979 when the 600-foot container ship Marie Bakke struck the bridge and caused about $3.3 million in damage and disrupted rail traffic over the river for about four months.

Packwood praised the Coast Guard for recognizing the need to rebuild the bridge, which he said has been a hinderance to river traffic and a detriment to the attractiveness of the Port of Portland to shipping companies.

The Coast Guard has included $5.2 million in its 1985 fiscal year, which begins Oct. 1, to complete engineering studies.

Actual construction work, estimated to cost another $25 million, will begin in the 1986 fiscal year.

Both expenditures are subject to congressional approval of the Coast Guard's budget.

Lt. John M. Baker, public affairs officer for the Coast Guard in Washington, D.C., said it is expected construction contracts will be let by the end of this year.

Peter A. Friedmann, a committee aide to Packwood, said the Coast Guard already has spent about $4 million in initial engineering studies.

Friedmann said the total estimated cost of the project is $34 million. Seven percent of that — $2.5 million — will be paid by Burlington Northern.

When completed, Friedmann said, the bridge will be the largest lift bridge in the country.

Packwood's announcement came as good news to the Port of Portland, which has been urging the federal government to rebuild the bridge for years.

"What you have is a 70-year-old bridge designed to accommodate ships of that vintage," said Darrel D. Buttice, public affairs manager for the port.

Buttice said larger ships now are about 1,000 feet long and have a width about the size of the span's present width.

The bridge stands as an obstacle to ships reaching two grain elevators, Terminals 1 and 2, an upstream oil tank farm and the Swan Island ship yard," Buttice said.

Buttice also praised Packwood and the Oregon congressional delegation for urging expenditures to keep the Columbia, Willamette and Snake river system vital.

Among other efforts affecting the river system are the deepening of the mouth of the Columbia River, which will be completed this summer under appropriations obtained last year by Oregon Sen. Mark O. Hatfield. The delegation is continuing efforts to obtain $172 million for a new navigational lock at the Bonneville Dam.

Buttice said the widened bridge should be a boon to the port since shipping companies will be less concerned about the potential hazards of reaching the docks.

"It will attract more trade to the harbor," he said.

Rebuilding of bridge slated

Project to create easier ship passage

By DAVID WHITNEY
of The Oregonian staff

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SHORT & QUICK UPDATE ON SOON TO BE HISTORIC SPOKANE BRIDGE OVER WILLAMETTE

For those of you who were with us last month as we quickly reviewed the Burlington-Northern swing bridge in Portland, more affectionately called the Spokane Bridge, but also called Railroad Bridge #1; Bridge 5.1, and others, here are two versions of the same article reporting on the change from a giant swing bridge to the largest LIFT bridge.

The longer artilce appeared in the Wednesday afternoon edition of the Thursday paper and the shorter article appeared in the Thursday morning one.

Maybe a postcard to the editor will show your appreciation that they ran any article at all on our soon to be historic bridge. (No, not me, the Editor at the OREGONIAN at 1320 SW Broadway, Poetland OR 97201.)

Alan