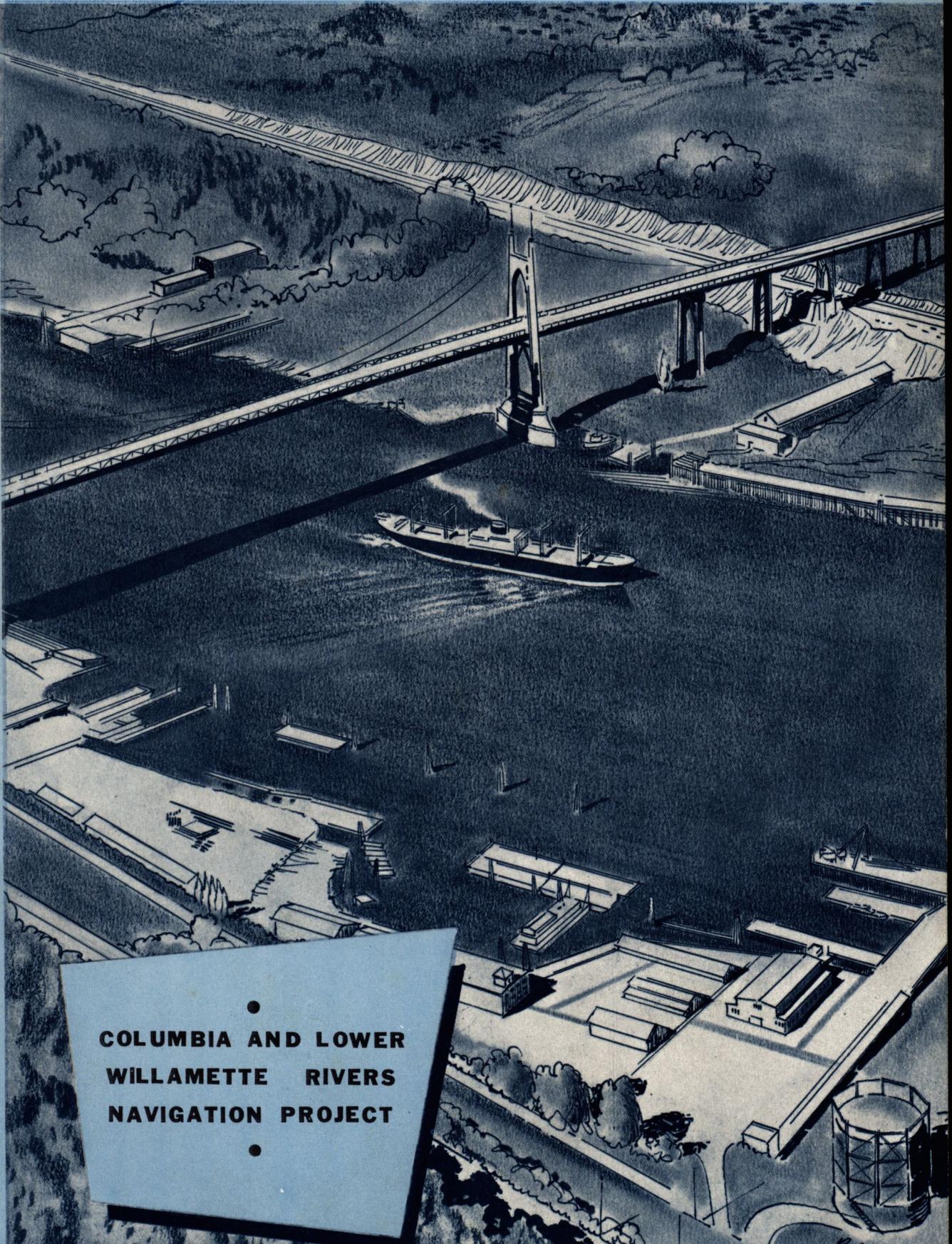




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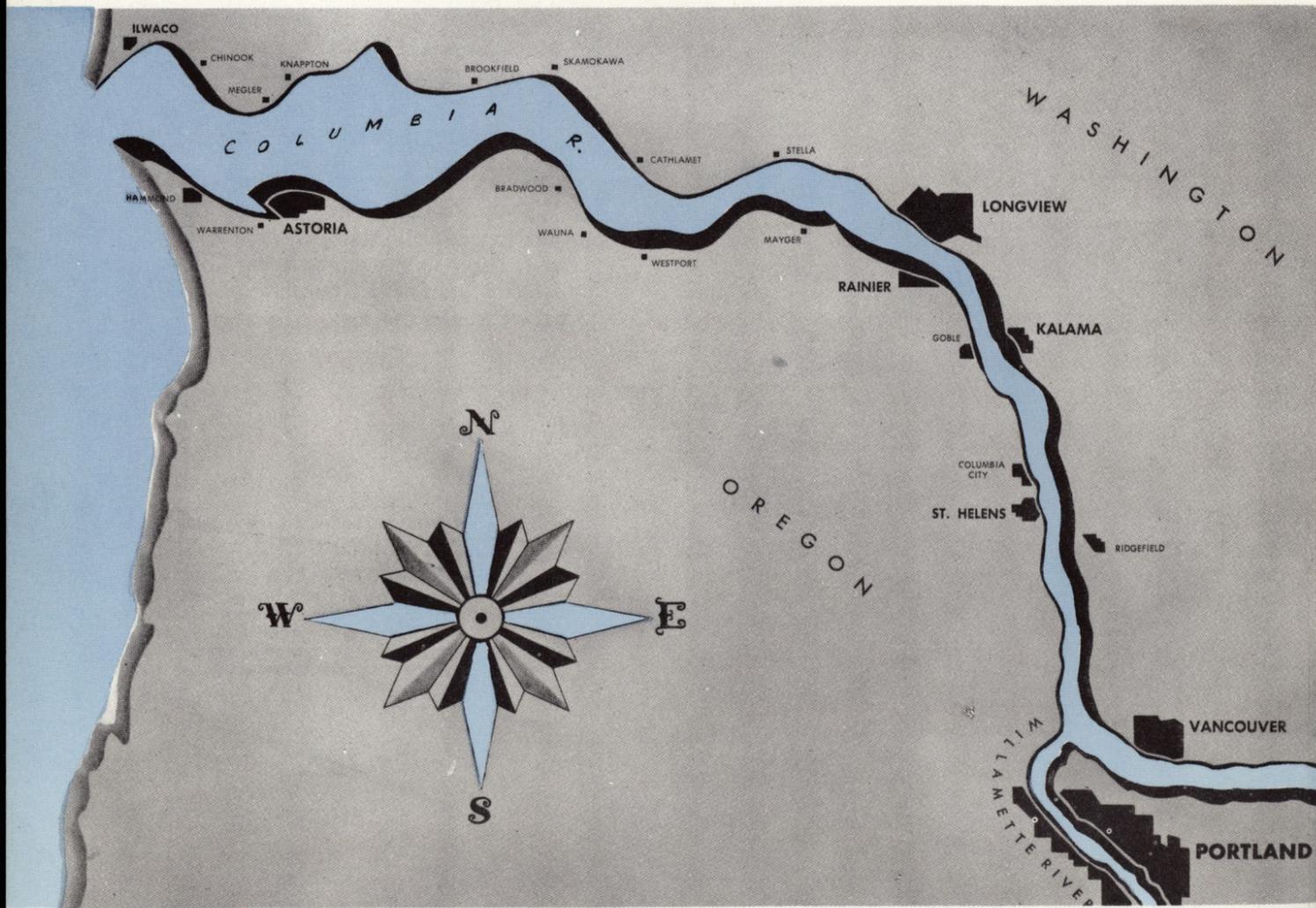
INFORMATION



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**COLUMBIA AND LOWER
 WILLAMETTE RIVERS
 NAVIGATION PROJECT**
 •

Benson

COLUMBIA AND LOWER WILLAMETTE RIVERS



PREFACE

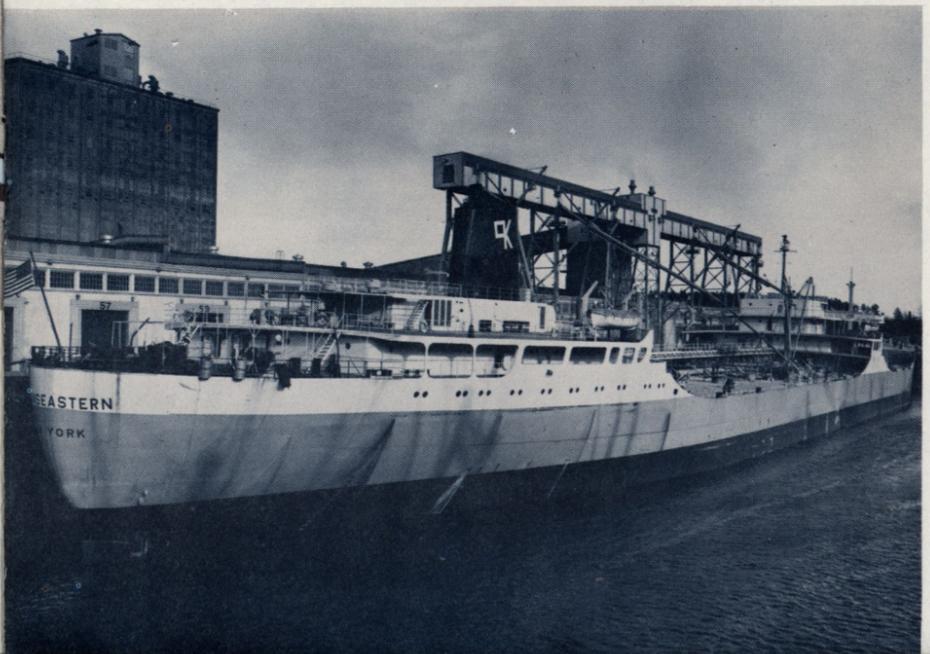
This bulletin summarizes information relating to studies made to determine the advisability of modifying the existing navigation project on the Willamette and Columbia Rivers, in Oregon and Washington, downstream from the Portland-Vancouver area.

Before completion of this report, the proposed plan of improvement was presented to interested Federal, State, and local agencies for comment.

INFORMATION *Bulletin*

COLUMBIA AND LOWER WILLAMETTE RIVERS NAVIGATION PROJECT

The plan of development presented here is recommended by the U.S. Army Engineer District, Portland, and U.S. Army Engineer Division, North Pacific, but is not necessarily the final plan to be recommended to Congress by the Chief of Engineers.



Transeastern Loading at Terminal No. 4, Portland

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Downstream Portion,
Port of Vancouver

PREFACE

This bulletin summarizes information relating to studies made to determine the advisability of modifying the existing navigation project on the Willamette and Columbia Rivers, in Oregon and Washington, downstream from the Portland-Vancouver area.

Before completion of the report, the proposed plan of improvement was presented to interested Federal, State, and local agencies for comment. Details and features of the plan described here are for public information prior to submission of the report to Congress.

The reports by the U. S. Army District Engineer, Portland, and U. S. Army Division Engineer, North Pacific, recommending the proposed plan have been submitted to the Board of Engineers for Rivers and Harbors and to the Chief of Engineers, U. S. Army. The Chief of Engineers will furnish copies of his report and supporting papers to the Federal agencies concerned and the Governors of Oregon and Washington for review and comment before submission of his report to Congress.

STERLING K. EISIMINGER
 STERLING K. EISIMINGER
 Colonel, Corps of Engineers
 District Engineer

INTRODUCTION

This study was made in response to resolutions of the Committees on Public Works of the United States Senate and the House of Representatives, adopted 14 March 1957 and 9 April 1957, respectively. These resolutions requested a review of previous reports to determine whether the existing navigation project on the Columbia and Lower Willamette Rivers below Vancouver and Portland should be modified at this time.

Before starting the study a public hearing was held in Portland on 5 June 1958 to determine the desires of local interests. Consensus of those making statements and submitting briefs was that there was an immediate need for increasing the dimensions of the navigation channel from a 35-foot depth and 500-foot width to a 40-foot depth and 750-foot width to accommodate the larger size vessels now using and expected to use the waterway.

In addition to the channel dimensions requested by local interests, consideration was given to lesser depths and widths, 38 by 600 and 40 by 600 feet.

All interested Federal, State, and local agencies concerned with the proposed improvement have been afforded an opportunity to present their views.

COMMERCE AND VESSEL TRAFFIC

In 1933 vessel traffic on the Columbia and lower Willamette Rivers totaled about 5-1/4 million tons, vessel trips amounted to 3,864 and total net tonnage of these vessels was 14,377,000. During that year only three vessels had drafts of 30 feet and over.

By 1959, 26 years later, vessel traffic had increased to 16 million tons, vessel trips to 6,050 and total net registered tonnage to 23,632,000. Trips of vessels with loaded drafts of 30 feet and over increased to 517.

In terms of tonnage, petroleum products, grain (principally wheat), salt, and aluminum ores and concentrates accounted for more than three-fourths of the total ocean-borne commerce.

Detailed studies were made of these bulk commodity groups, considering the amounts that would move over the waterway during the future,

since the need for increased channel dimensions would depend on the use of the larger ships engaged in this bulk-cargo movement.

Less detailed studies were made of general cargo and other bulk commodities moving in less than shipload lots.

Results of these studies indicate that the future ocean-borne commerce will increase throughout the 50-year economic life of the project. In the future, as was true in 1959, the considered bulk commodities are expected to account for more than three-fourths of the total tonnage of the commerce.

Deepdraft commerce is estimated to more than double by the middle of the economic project life. In the case of all large bulk commodity movements, shippers will use the largest available vessel that can navigate the channel without costly delays.

PLAN OF IMPROVEMENT

The recommended plan of improvement which is believed to meet the needs of existing and future navigation provides for the following:

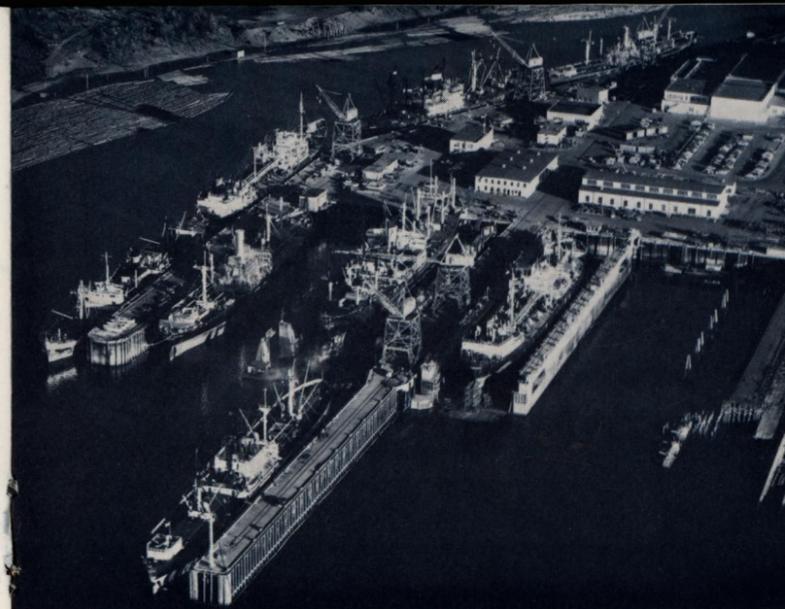
In the Willamette River:

A channel 40 feet deep with varying widths of 600 to 1,900 feet, from the mouth to the Broadway Bridge, a distance of 11.6 miles. This reach encompasses the Portland harbor area.

In the Columbia River:

A channel 40 feet deep and 600 feet wide from Vancouver to the mouth, a distance of 102.5 miles. A turning basin at Vancouver 40 feet deep, 800 feet wide, and about 5,000 feet long. A turning basin at Longview, 40 feet deep, average width of 1,200 feet, and about 6,000 feet long.

Port of Portland Ship Repair
Facilities, Swan Island



No work will be started on the project until a responsible public body is organized within the two states and furnishes assurances of local cooperation.

The channel from the mouth of Willamette to the turning basin at Vancouver is to be limited to 500 feet in width until the need for additional width is demonstrated by developed traffic.

QUANTITIES AND COSTS

Construction of the improvement will require dredging about 55 million cubic yards of sand and silt and excavation of 268,000 cubic yards of ledge rock, boulders, and gravel. Permeable pile dike groins have been built along the banks of Columbia to stabilize bank lines and channel alinement and aid in maintaining depths in the navigation channel through a natural scouring action. The 40-foot channel will re-

quire construction of new pile dikes and extension of some of those already in place.

Total project cost is estimated at \$20,678,000, based on 1961 prices. Annual cost for maintaining the improvement over and above that required for the existing project is estimated at \$776,000. Annual charges, based on a 50-year amortization period and including maintenance amount to \$1,531,000.

BENEFITS

Increasing the dimensions of the navigation channel in the Columbia and Willamette Rivers to a depth of 40 feet and width of 600 feet will reduce transportation costs by eliminating delays and short loading of vessels now using and expected to use the waterway. These savings accrue principally through the use of bulk-carriers and tankers moving bulk commodities such as petroleum, grain, alumina, bauxite, and salt. Minor benefits will result through reduction in shipping hazards such as elimination of anticipated groundings and ship damage.

The value of new or filled land created by deposition of dredge spoil on land low in value because of frequent flooding will be enhanced. There are two areas in the vicinity of Portland, Mocks Bottom and Ramsey Lake, which when filled to a flood-free elevation would be suitable for industrial development. Spoil available to these areas will fill about 253 acres. These land

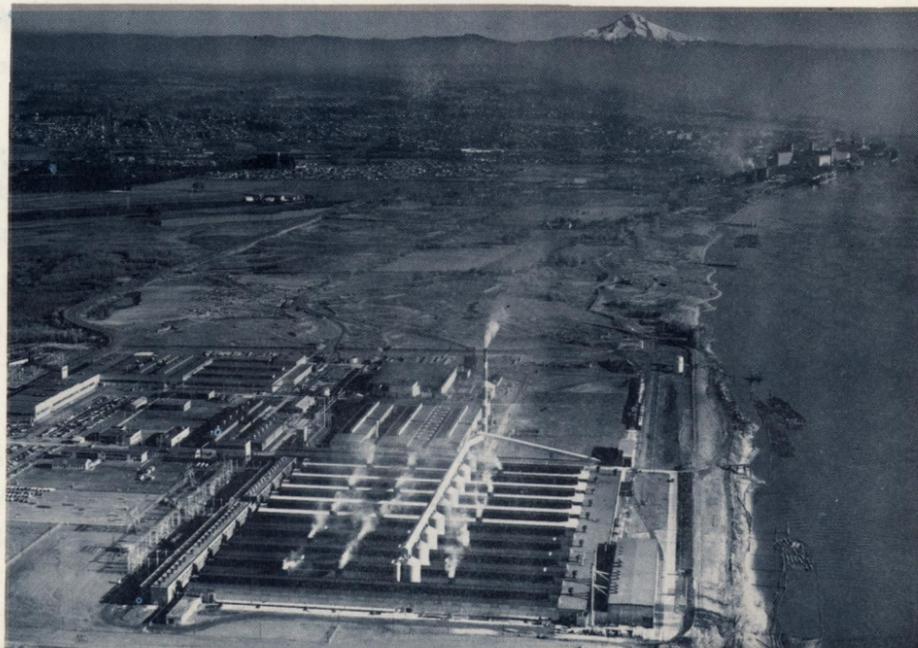
enhancement benefits are considered to be 50 percent general and 50 percent local in nature.

Following is a summary of average annual benefits:

Type Of Benefit	Net Annual Amount
Elimination of delays and short loading:	
Bulk Commodities	\$2,310,400
General Cargo	11,600
Elimination of groundings	7,800
Land enhancement	84,800
Sub - Total	\$2,414,600
Delays at entrance	- 99,400
Total	\$2,315,200

Benefit-to-cost ratio:

A measure of the project's worth is the amount annual benefits exceed annual costs. Based on estimated annual benefit of \$2,315,200 and annual charges of \$1,531,000 the benefit-to-cost ratio would be 1.5 to 1.0 for the recommended plan.



Aluminum Plant, Vancouver

COOPERATION BY LOCAL INTERESTS

In addition to the normal requirements of local cooperation relative to providing lands, easements and rights-of-way, terminal and transfer facilities, and utility relocations, hold and save from damage, local interests would be required to:

a. Assist in the work of improving and maintaining the main ship channel in the Columbia and Willamette Rivers by loaning to the United States a suitable pipeline dredge in good operating condition, with full crew and equipment, without charge other than reimbursement for the full operating costs of the dredge on a basis approved by the Chief of Engineers, said operating costs to include proportionate maintenance costs based on the period of time the dredge is in use for United States.

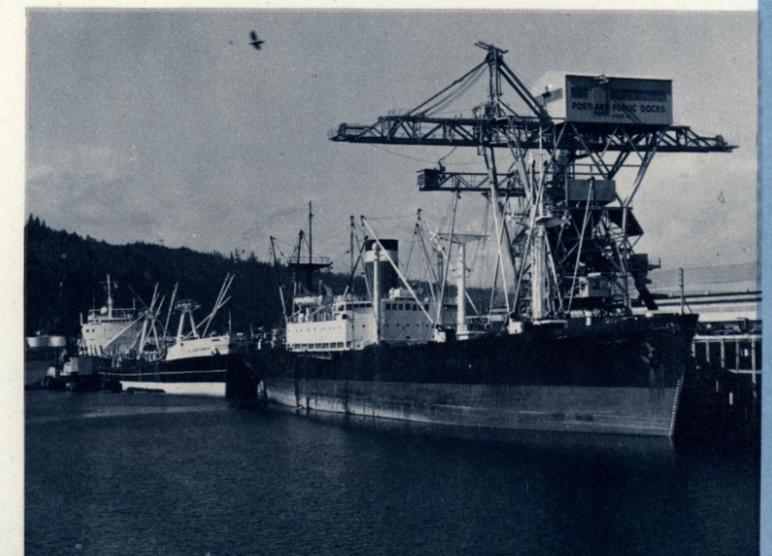
b. Contribute in cash 1.8 percent of the cost of construction by the Corps of Engineers for enhancement of land owned by the Port of

Portland, and that such contribution, presently estimated at \$369,000, be paid in a lump sum prior to commencement of construction.

The Governors of the States of Oregon and Washington, in behalf of the port commissioners expressed their willingness to cooperate in all matters pertaining to the requirements of local cooperation.

Net cost to the United States is estimated at \$20,100,000 for construction, not including \$40,000 for additional aids to navigation, and \$775,000 annually for maintenance dredging and repair of pile dikes in addition to the amount required to maintain the existing project, and \$1,000 annually for maintenance of additional aids to navigation.

Dredging to enlarge the channel could best be accomplished concurrently with maintenance of the existing project and is estimated to require three dredging seasons to complete.



Terminal No. 4, Portland

