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ANACORTES HARBOR, WASH.

LETTER

FROM THE

SECRETARY OF THE ARMY

TRANSMITTING TO THE

CHAIRMAN OF THE COMMITTEE ON PUBLIC WORKS

UNITED STATES SENATE

PURSUANT TO A

RESOLUTION OF THE COMMITTEE, A REVIEW OF REPORTS ON ANACORTES HARBOR, IN THE STATE OF WASHINGTON, WITH A VIEW OF MAKING IMPROVEMENTS IN THE HARBOR FACILITIES

PRESENTED BY MR. MARTIN

MARCH 8 (legislative day, MARCH 1), 1954.—Referred to the Committee on Public Works and ordered to be printed with an illustration

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ANACORTES HARBOR, WASH.

REPORT OF THE CHIEF OF ENGINEERS, UNITED STATES ARMY

DEPARTMENT OF THE ARMY,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington 25, D. C., June 26, 1953.

Subject: Anacortes Harbor, Wash.

To: The Secretary of the Army.

1. I submit herewith for transmission to Congress the report of the Board of Engineers for Rivers and Harbors in response to resolution of the Committee on Public Works of the United States Senate, adopted June 17, 1947, requesting the Board to review the report on Anacortes Harbor, in the State of Washington, submitted on May 10, 1933, and previous reports, with a view to determining the advisability of making improvements in the harbor facilities at Anacortes, Wash.

2. After full consideration of the reports secured from the district and division engineers, the Board recommends modification of the existing project for Anacortes Harbor, Wash., to provide for a mooring basin 12 feet deep at mean lower low water, 570 feet wide, and 960 feet long, adjacent to the north side of Capsante Waterway, protected by a pile breakwater 380 feet long about 50 feet east of the mooring basin, generally in accordance with the plan of the district engineer and with such modifications thereof as in the discretion of the Chief of Engineers may be advisable, at an estimated cost to the United States of $150,000 for construction and $3,500 annually for maintenance in addition to that now required, subject to the condition that local interests agree to (*a*) furnish without cost to the United States all lands, easements, rights-of-way, and spoil-disposal areas, suitably bulkheaded where necessary, for construction and maintenance of the improvement, when and as required; (*b*) hold and save the United States free from all damages due to construction and maintenance of the improvement; (*c*) provide and maintain adequate mooring facilities and a public landing with service and supply facilities open to all on equal terms; and (*d*) maintain to project dimensions those portions of the basin where mooring facilities are provided.

3. Subsequent to the action by the Board, the Department has adopted a standard procedure for estimating the benefits of small-boat harbor improvements in connection with recreational craft and for determining what portion of the expenditures required for the improvement should be borne by local interests in view of the local benefits. Studies have recently been made for the purpose of determining the proper allocation of costs of the Anacortes Harbor improvement between the United States and local interests. In view of the time which has elapsed since preparation of the report by the

district engineer, it is considered desirable to present the recommendations of the Corps of Engineers on the basis of conditions as they exist at this time. Accordingly, these allocation studies are based on estimates of costs and benefits pertaining to the proposed improvement based on 1953 prices and conditions. Present costs and benefits, derived generally as set forth in the report of the district engineer, are briefly summarized as follows:

(*a*) Estimate of first cost:	
1. Mooring basin, 225,000 cubic yards at $0.54	$121, 500
2. Breakwater, 380 linear feet (including dolphins) at $133.95	50, 900
3. Aids to navigation	980
4. Lands and rights-of-way	9, 000
5. Mooring facilities	80, 000
6. Total first cost	262, 380
(*b*) Estimate of annual charges:	
1. Interest (on $262,380 at 2½ percent)	6, 560
2. Amortization (50-year life at 2½ percent)	2, 690
3. Maintenance of breakwater and approach channels (Federal)	4, 300
4. Maintenance and operation of mooring facilities (non-Federal)	11, 800
5. Maintenance of berthing space (non-Federal)	1, 100
6. Gross annual charges	26, 450
7. Net returns from facilities (non-Federal)	13, 200
8. Total net annual charges	13, 250

(*c*) Estimate of annual benefits:	*General*	*Local*	*Total*
1. Elimination of damages to fishing boats	$5, 080	------	$5, 080
2. Elimination of damages to recreational craft	2, 540	$2, 540	5, 080
3. Elimination of lost time in cannery operation	1, 100	------	1, 100
4. Increased fish catch	2, 540	------	2, 540
5. Increased benefits to pleasure craft	1, 260	1, 260	2, 520
6. Increase in land rental	------	690	690
7. Total benefits	12, 520	4, 490	17, 010
8. Percent	73. 6	26. 4	100. 0

4. As estimated above the annual benefits exceed the annual carrying charges in the ratio of 1.28 to 1. Included in the annual carrying charges is $35 for interest and amortization on the first cost for navigation aids, to be borne by the United States in accordance with customary cost allocation procedure. Also included are similar annual charges of $315 pertaining to lands and rights-of-way to be used for the improvement. In this case the lands are now subject to navigational servitude. Hence, although local interests would relinquish the conditional availability of these lands for other uses, they are not credited with making a contribution to the improvement for cost-allocation purposes by so doing. The annual carrying charges remaining after deduction of these items amount to $12,900 and are allocated between the United States and local interests in proportion to the general and local benefits. On this basis the Federal annual carrying charge is $35 plus 73.6 percent of $12,900 or a total of $9,535 and the non-Federal annual carrying charge is $3,400 plus $315 or $3,715. The corresponding estimated first cost to local interests is $114,000 consisting of $89,000 for lands, rights-of-way, and mooring

facilities plus a cash contribution of $25,000 toward the cost of dredging the mooring basin and constructing the breakwater. This $25,000 is 14.5 percent of the estimated cost for these features. Based upon the foregoing allocation, the estimated first cost to the United States is $147,400 exclusive of $980 for navigation aids. The Port Commission of the Port of Anacortes has indicated its ability and willingness to make the proposed contribution toward accomplishment of the work.

5. Accordingly, I recommend modification of the existing project for Anacortes Harbor, Wash., to provide for a mooring basin 12 feet deep at mean lower low water, 570 feet wide, and 960 feet long, adjacent to the north side of Capsante Waterway, protected by a pile breakwater 380 feet long about 50 feet east of the mooring basin, generally in accordance with the plan of the district engineer and with such modifications thereof as in the discretion of the Chief of Engineers may be advisable, at an estimated cost to the United States of $147,400 for construction and $4,300 annually for maintenance in addition to that now required, subject to the condition that local interests agree to (*a*) furnish without cost to the United States, all lands, easements, rights-of-way, and spoil-disposal areas, suitably bulkheaded where necessary, for construction and maintenance of the improvement, when and as required; (*b*) hold and save the United States free from all damages due to construction and maintenance of the improvement; (*c*) provide and maintain adequate mooring facilities and a public landing with service and supply facilities open to all on equal terms; (*d*) maintain to project dimensions those portions of the basin where mooring facilities are provided; and (*e*) contribute in cash or equivalent work 14.5 percent of the cost of dredging the mooring basin and constructing the breakwater, presently estimated at $25,000.

S. D. STURGIS, Jr.,
Major General, Chief of Engineers.

REPORT OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS

DEPARTMENT OF THE ARMY,
BOARD OF ENGINEERS FOR RIVERS AND HARBORS,
Washington 25, D. C., March 3, 1950.

Subject: Anacortes Harbor, Wash.
To: The Chief of Engineers, United States Army.

1. This report is submitted in response to the following resolution adopted June 17, 1947:

Resolved by the Committee on Public Works of the United States Senate, That the Board of Engineers for Rivers and Harbors, created under section 3 of the River and Harbor Act, approved June 13, 1902, be, and is hereby, requested to review the report on Anacortes Harbor, in the State of Washington, submitted on May 10, 1933, and previous reports, with a view to determining the advisability of making improvements in the harbor facilities at Anacortes, Washington.

2. Anacortes Harbor is along the northerly shores of Fidalgo Island, at the easterly end of the Strait of Juan de Fuca, Wash. The harbor extends a distance of about 9 miles from the northern part of Burrows Bay, on the west side of Fidalgo Island, along Guemes Channel on the north, and around the northeast portion of the island, known as

Capsante, to and including Fidalgo Bay on the east side of the island. Guemes Channel, 3 miles long and 0.5 mile wide at its narrowest point, has depths ample for all classes of shipping but it is affected by strong tidal currents and is exposed to heavy seas caused by winds sweeping across adjacent waters. Fidalgo Bay, about 8 feet deep in the central section and 1 to 3 feet deep on the wide tidal flats near shore, is protected from west winds but is exposed to the open expanse of Padilla Bay on the east. The mean range of tide is 4.8 feet and extreme range 15.5 feet. The existing Federal project for Anacortes Harbor provides for improvement of Capsante Waterway, located in the northern portion of Fidalgo Bay, to secure a channel 12 feet deep and 250 to 150 feet wide extending eastward from the east side of Q Avenue to deep water, a distance of about 2,850 feet. The project was completed in 1930, except for a portion between R and Q Avenues which was omitted at the request of local interests. The cost of construction totaled $69,565, of which $46,377 was Federal and $23,188 was contributed by local interests. The Federal cost for maintenance to June 30, 1948, was $7,188. Terminal facilities in Anacortes Harbor consist of 30 piers, wharves, and other transfer facilities of which 1 is on Burrows Bay, 18 are on Guemes Channel, and 11 are on Fidalgo Bay. Two of the terminals are owned by the port of Anacortes and the remainder are privately owned. One of the port-owned wharves is located on Capsante Waterway and the port commission has dredged an area 80 by 900 feet to a depth of 8 feet and provided floats adjacent to this wharf to accommodate about 65 fishing and recreational craft.

3. The area tributary to Anacortes Harbor comprises Fidalgo Island, the nearby community of La Conner on the mainland, the northern portion of Whidbey Island, and to a large extent the San Juan Islands. The area had a population of 12,072 in 1940 and Anacortes, the largest municipality, had 7,000 in 1945. Fishing, lumbering, agriculture, and allied manufacturing and processing industries are the principal activities of the region. Rail and highway facilities are available and connections are provided to the mainland. Ferry service to the San Juan Islands is available from Anacortes. Annual commerce for the entire Anacortes Harbor for the 10-year period 1938 through 1947 averaged 74,100 tons of fish, petroleum, and other general commodities, 462,500 tons of rafted logs, and general ferry traffic of 80,600 passengers. No separate statistics are available for Capsante Waterway which is included in Anacortes Harbor. Vessel traffic in 1947 consisted of 15 trips by vessels drawing 22 to 30 feet and 34,893 trips by vessels with drafts under 22 feet. There are about 180 fishing and recreational craft permanently based at Anacortes Harbor of which about 90 moor at Capsante Waterway. In addition about 285 transient craft normally call at Anacortes during the fishing and recreational seasons.

4. Local interests request provision of a mooring basin 12 feet deep, approximately 500 feet wide and 1,000 feet long, to be located adjacent to the north side of Capsante Waterway, protected against wave action by a pile breakwater 480 feet long situated about 200 feet east of the mooring basin. They state that the improvement is necessary to provide for the greatly increased demand by recreational and commercial craft and that it would eliminate a fire hazard and reduce vessel damage due to crowded conditions. Local interests indicate a willingness to furnish local cooperation.

5. The district engineer presents a plan of improvement providing for a mooring basin 12 feet deep, 570 feet wide, and 960 feet long, adjacent to the north side of Capsante Waterway, protected by a pile breakwater 380 feet long located about 50 feet east of the mooring basin. He finds that this plan which conforms approximately with the request of local interests will provide for the navigation needs of the area. The district engineer estimates the Federal first cost of the mooring basin and pile breakwater at $150,800, including $800 for navigation aids, and the non-Federal first cost at $66,000 for mooring facilities, lands, and rights-of-way. The total annual carrying charges are estimated at $11,170 of which $9,360, including $3,500 for annual maintenance, are Federal charges and $1,810 is the net non-Federal charge after deducting $10,000 net annual returns for use of mooring facilities. The district engineer estimates the annual benefits at $12,815 consisting of $8,280 from reduction in vessel damages, $900 from increased efficiency in cannery operation due to elimination of delays in fish delivery, $1,260 for the net value of an increased fish catch, $1,815 for recreational benefits, and $560 from land enhancement due to deposit of dredge spoil. The benefit-cost ratio is 1.15. The district engineer recommends modification of the existing project to provide for further improvement in accordance with his described plan provided local interests furnish satisfactory assurances that they will provide without cost to the United States all necessary lands, easements, rights-of-way, and suitable disposal areas, bulkheaded if necessary; hold and save the United States free from all damages arising from the construction and maintenance of the improvements; construct, in accordance with plans approved by the Secretary of the Army, maintain, and operate without profit, adequate mooring facilities within the basin, utilities, and a public landing, with suitable service and supply facilities open to all on equal and reasonable terms; and maintain the berthing space to project dimensions. The division engineer concurs.

6. Local interests were informed of the nature of the reports of the district and division engineers and afforded an opportunity to present additional information to the Board. Careful consideration has been given the communications received.

VIEWS AND RECOMMENDATIONS OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS

7. The Board of Engineers for Rivers and Harbors concurs generally in the views of the reporting officers. The improvement as proposed will make available a protected basin now needed for fishing boats and other small craft. Prospective benefits economically justify the estimated expenditures required for the work. Computations taking into account the comparative general and local benefits and the Federal and non-Federal annual carrying charges indicate that the proposed conditions of cooperation allocate a proper share of the cost to local interests.

8. The Board accordingly recommends modification of the existing project for Anacortes Harbor, Wash., to provide for a mooring basin 12 feet deep at mean lower low water, 570 feet wide, and 960 feet long, adjacent to the north side of Capsante Waterway, protected by a pile breakwater 380 feet long about 50 feet east of the mooring basin,

generally in accordance with the plan of the district engineer and with such modifications thereof as in the discretion of the Chief of Engineers may be advisable, at an estimated cost to the United States of $150,000 for construction and $3,500 annually for maintenance in addition to that now required, subject to the condition that local interests agree to (*a*) furnish without cost to the United States, all lands, easements, rights-of-way, and spoil disposal areas, suitably bulkheaded where necessary, for construction and maintenance of the improvement, when and as required; (*b*) hold and save the United States free from all damages due to construction and maintenance of the improvement; (*c*) provide and maintain adequate mooring facilities and a public landing with service and supply facilities open to all on equal terms; and (*d*) maintain to project dimensions those portions of the basin where mooring facilities are provided.

For the Board:

J. S. Bragdon,
Brigadier General, Chairman.

REPORT OF THE DISTRICT ENGINEER

SYLLABUS

The district engineer reports that small boat traffic in Anacortes Harbor has increased substantially in recent years and that the existing harbor is too small and exposed to accommodate the large fleet and provide for its safety. He therefore recommends that the existing project be modified to provide for a new mooring basin 960 feet long, 570 feet wide, and 12 feet deep at mean lower low water, adjacent to and north of Capsante Waterway; and a treated pile breakwater, 380 feet long, at a location 50 feet east of the basin; all at an estimated first cost to the Corps of Engineers of $150,000 with an annual maintenance cost of $3,500, and subject to certain conditions of local cooperation.

Department of the Army,
Corps of Engineers,
Office of the District Engineer,
Seattle District,
Seattle, Wash., September 3, 1948.

Subject: Review of Reports on Anacortes Harbor, Wash.
To: Division Engineer, North Pacific Division, Corps of Engineers, 500 Pittock Block, Portland 5, Oreg.

1. *Authority.*—This report is submitted in compliance with a resolution adopted June 17, 1947, by the Committee on Public Works of the United States Senate, which reads as follows:

Resolved by the Committee on Public Works of the United States Senate, That the Board of Engineers for Rivers and Harbors, created under section 3 of the River and Harbor Act, approved June 13, 1902, be, and is hereby, requested to review the report on Anacortes Harbor, in the State of Washington, submitted on May 10, 1933, and previous reports, with a view to determining the advisability of making improvements in the harbor facilities at Anacortes, Wash.

2. *Scope of review.*—This report, of survey scope, was authorized by the Chief of Engineers on July 9, 1947. The report studies are based on data available in published documents and in the files of this office, on information furnished by local interests, and topographic and hydrographic surveys conducted by the Seattle district. During the course of the investigation, interested local, port, city, county, State, and Federal agencies were consulted, and their comments and suggestions have been given full consideration in the studies.

3. This report reviews House Document No. 160, 59th Congress, 1st session; House Document No. 1117, 64th Congress, 1st session; and unpublished preliminary examination report submitted May 9, 1933, by the Chief of Engineers and transmitted to Congress by the Secretary of War, May 10, 1933. The preliminary examination report published in House Document No. 160 was unfavorable for a survey with a view to improvement by dredging channels at that time. In House Document No. 1117 the Chief of Engineers recommended improvement of Anacortes Harbor by dredging a channel in Capsante[1] Waterway to a depth of 12 feet at mean lower low water, 150 feet wide at the outer end and 250 feet wide at the inner end, at an estimated cost of $84,000, of which $28,000 was to be contributed by local interests. The improvement was adopted by the Rivers and Harbors Act of March 2, 1919. The unpublished report of 1933 was unfavorable to improvement of Anacortes Harbor and Capsante Waterway at that time. The improvement contemplated channel deepening and widening and the provision of a small-boat harbor.

4. *Description.*—Anacortes Harbor is located in northwestern Washington, on the northerly shore of Fidalgo Island, at about 48° 31′ north latitude and 122°37′ west longitude. It fronts the city of Anacortes, which occupies the northernmost point of Fidalgo Island. It is the chief deep-water harbor between Bellingham, 16 nautical miles to the north, and Everett, 44 nautical miles to the south, both distances measured by the most direct water route.

5. Guemes Channel, separating Guemes Island on the north and Fidalgo Island on the south, extends eastward from Rosario Strait to Fidalgo Bay, a shallow arm of Padilla Bay. The channel is about 3 miles long, 0.5 mile wide at its narrowest point, and has depths adequate for all classes of shipping. Anacortes Harbor extends from the northern extremity of Burrows Bay along Guemes Channel, around Capsante and south to the southern end of Fidalgo Bay, a total distance of approximately 9 miles. The principal wharves are located along Guemes Channel where ample depths are available, but vessels using these waters are exposed to unusually strong tidal currents and to heavy seas in the channel caused by winds sweeping across Rosario Strait and Padilla Bay. Vessels desiring to dock when the tides are running are forced to come up against the tide, and exceptionally strong wharves and mooring facilities are required to prevent damage to vessels or wharves.

6. The velocity of currents in Guemes Channel exceeds 5 knots at times, and during flood current there is an eddy between the eastern end of Guemes Island and Capsante, with an outgoing current along the northern shore of Fidalgo Island extending out about 200 yards into the channel from the shore. A rocky shoal, marked by a buoy at its northern extremity, extends 200 yards northward from the shore at the western entrance to Guemes Channel.

7. Fidalgo Bay, forming the eastern portion of Anacortes Harbor, is well sheltered from west winds, but is exposed to the open expanse of Padilla Bay on the east. The bay is generally shallow with depths averaging about 8 feet in the central part and 1 to 3 feet on wide tide-

[1] The spelling "Capsante" is adopted in this report in accordance with the usage in published charts and the United States Coast Pilot. Earlier reports have given it as two words, "Cap Sante."

flats near shore. Capsante Waterway, located in the northwestern part of Fidalgo Bay, has been dredged to a depth of 12 feet under a Federal project. It provides access to a sawmill plant, salmon cannery, and a small-boat and seaplane moorage. The waterway is protected to some extent by Capsante on the northeast, but easterly winds sweeping across Padilla Bay create considerable choppy water in the present moorage. Velocities of tidal currents in Fidalgo Bay and Capsante Waterway are small and do not interfere with navigation.

8. Fidalgo Island is separated from the mainland by Swinomish Slough which connects Padilla Bay on the north with Skagit Bay on the south. Swinomish Slough is 11 miles long. Under a Federal project a channel 100 feet wide and 12 feet deep is maintained therein.

9. The extreme tidal range in Anacortes Harbor is about 15.5 feet, the diurnal range 8.2 feet, and mean range 4.8 feet. No streams of major importance flow into the harbor.

10. No Federal harbor lines have been established. A State harbor line board appointed in 1892 prepared a proposed harbor line system, but it was never presented to the Secretary of War for formal approval. The State of Washington used the plan as a guide in determining the outer limit of first class tidelands, and Capsante Waterway was determined thereby to be 3,250 feet long, and 400 feet wide, except the inner 400 feet which is 320 feet wide.

11. Anacortes Harbor may be approached by deep draft vessels from the west through Rosario Strait and from the north through Bellingham Channel west of Guemes Island and through the waters east of Guemes Island. Small commercial and pleasure craft may also approach the harbor from the south through Swinomish Slough and Padilla Bay. Anacortes Harbor and its approaches are shown on United States Coast and Geodetic Survey Charts Nos. 6377 and 6380 and on the map accompaning this report.

12. *Climate.*—Records of weather observations at Anacortes show a mean annual temperature of 50.6° F. from 1905 to 1945, a maximum of 95° F. and a minimum of 7° F. Extreme temperatures occur rarely and are of short duration, as indicated by the average minimum monthly temperature of 32.8° F. for January, the coldest month, and the average maximum monthly temperature of 72.6° F. for July, the warmest month. The prevailing winds are southwesterly and westerly during the summer months and southeasterly during the winter. The harbor is ice-free and open to navigation throughout the year. Shipping schedules are seldom disrupted except by an occasional storm of short duration. Ships entering or clearing Anacortes Harbor encounter no bar, and except for strong tidal currents no navigation hazards exist.

13. *Tributary area.*—The territory commercially tributary to Anacortes Harbor includes all of Fidalgo Island, an area of about 40 square miles, and the town of La Conner located on the east side of Swinomish Slough, both in western Skagit County; the north part of Whidbey Island to and including Oak Harbor in Island County; and to a large extent the San Juan Islands, comprising San Juan County. The area immediately adjacent to Anacortes is generally level, and favorable to growth and easy expansion.

14. San Juan County has a land area of 172 square miles, consisting of 3 large islands—Orcas, 57 square miles; San Juan, 55 square miles; Lopez, 30 square miles—and about 170 small islands. Of the total land area, about 62 percent, or 68,000 acres, was classed as farmland in the 1940 United States census. The remainder is generally rugged, with peaks ranging up to 2,400 feet in height. Although Friday Harbor in San Juan Island is the only incorporated town in the county, there are a number of unincorporated communities of from 100 to 300 persons, the more important being Dear Harbor, Roche Harbor, East Sound, Lopez, Olga, Port Stanley, and West Sound.

15. Anacortes is the largest municipality and the chief commercial, agricultural, and industrial center for the tributary area. It is included in the port of Anacortes port district, a municipal corporation. Anacortes is a United States customs port of entry and the Immigration Service has a branch office there. The city has one bank, usual commercial establishments, churches, schools, parks, a modern hospital, and a public library. Industries located in the city include sawmills, and other wood-manufacturing plants, fish and other food-processing plants, a boatyard and a fertilizer factory.

16. The town of Friday Harbor, about 22 nautical miles west of Anacortes, is the county seat of San Juan County. It is a commercial and business center for the agricultural community of San Juan Island, and to a lesser extent of the other islands in the San Juan group. It is a supply point for commercial fishing craft operating in the vicinity and for visiting pleasure craft. It also is a United States customs port of entry. Two salmon canning plants are located at Friday Harbor and one at Deer Harbor on Orcas Island.

17. The town of La Conner is located about 14 miles southeast of Anacortes on the east side of Swinomish Slough. A salmon cannery and a pea cannery are located there, the products of which are shipped mainly through the port of Anacortes.

18. Distribution and trend of population in the tributary area are indicated by the statistics given in table 1 as derived from the Federal and State census reports.

TABLE 1.—*Population statistics*

Unit	1920	1930	1940	1945 [1]
Skagit County:				
Anacortes (city)	5,284	6,564	5,875	7,000
Remainder of Fidalgo Island	732	1,024	1,149	(2)
La Conner (town)	516	549	624	725
San Juan County:				
Friday Harbor (town)	522	601	658	672
Remainder of San Juan County	3,083	2,496	2,499	(2)
Island County:				
Oak Harbor (town)	337	362	376	(2)
North Whidbey Island	748	847	891	(2)
Total	11,222	12,443	12,072	(2)

[1] State census board estimate.
[2] Statistics not available.

19. The statistics for Anacortes and the tributary area reflect a relatively stable population for a period of 20 years, although the city of Anacortes has shown a marked growth subsequent to 1940 as indicated by the following records. Deposits in the bank at the end of 1947 totaled $5,095,589 as compared with $606,677.80 at the end of 1939, an increase of approximately 733 percent. The total

water services of the municipal water department increased from 1,523 in January 1938 to 1,895 in January 1948, a gain of approximately 25 percent. The number of subscribers for electricity increased from 1,712 in December 1938 to 2,190 in December 1947, an increase of approximately 28 percent. Future growth in the locality will probably depend on development of new industries and on expansion of existing ones.

20. *Resources and industries.*—The principal resources of the area include forests, fisheries, and agricultural lands, and to a lesser extent mineral deposits and recreational values. Forest products industries utilized in 1947 about two-thirds of the total man-hours of labor in Anacortes, their annual payroll totaling a little less than $3 million. The fisheries are the second major source of employment, particularly during the months of July to September, inclusive. Processing of locally grown fruits and vegetables also provides considerable employment.

21. *Forest resources and industries.*—The principal forest resources of the area are located in Skagit County. The volume of timber in the county was estimated in 1945 to be about 10,443 million board-feet, consisting mainly of hemlock, fir, and cedar in both public and private ownership. The annual sawlog requirements of mills located in Skagit County are estimated at about 200 million board-feet, of which Anacortes mills require about 180 million board-feet. As distribution of logs in the locality is governed largely by ownership or market conditions rather than convenience with respect to mills, much of the Skagit County log production is hauled to mills at Everett and Bellingham, and a considerable proportion of the logs utilized by the Anacortes mills is shipped in from British Columbia and localities on Puget Sound and other inland tidal waters.

22. At present there are in operation at Anacortes 3 sawmills, 3 shingle mills, a pulp bill, a plywood plant, a sash and door factory, and 4 boatyards, which either process or utilize forest products. It has recently been announced that a plant costing about $500,000 is proposed at Anacortes for production of "hard board" from waste products of local lumber mills.

23. *Fishing industry.*—Anacortes is the center of an extensive fish-processing industry. At present seven salmon canning firms have plants and terminal facilities there. These canneries pack salmon caught on the banks located off Whidbey Island, the San Juan Islands, and Point Roberts, all of which are within a radius of 12 to 30 nautical miles from Anacortes. The major part of the Fraser River sockeye salmon runs pass from the Straits of Juan de Fuca through the San Juan Islands into Canada. Opening of Hell's Gate passage in the Fraser River by the International Fisheries Commission, now in progress, is expected to materially increase the size of future packs from these runs, and to stabilize the future runs at a much higher level than has prevailed in the past. Anacortes will undoubtedly receive its full share of the expected increase in this industry.

24. Table 2 shows the amount of salmon packed at Anacortes in the years 1938 to 1947, inclusive. The total pack given for 1947 comprised about 37 percent of the entire pack in the Puget Sound and inland water area.

TABLE 2.—*Anacortes canned salmon pack*

Year	Number of plants operated	Cases (48-pounds)	Year	Number of plants operated	Cases (48-pounds)
1938	5	90,824	1943	6	77,602
1939	5	244,175	1944	6	30,211
1940	5	80,973	1945	6	261,892
1941	5	216,763	1946	8	197,666
1942	5	168,272	1947	7	429,187

25. A fisherman's cooperative is presently being organized in Anacortes for the purpose of operating a halibut fleet in northern waters. In connection therewith, a freezing plant will be located in Anacortes Harbor near the eastern end of Guemes Channel. It is anticipated the fleet will consist of 55 to 60 halibut boats, each with a crew of 9 men, and that about 3,000,000 pounds of halibut will be processed annually. When complete, the processing plant would represent an investment of about $1,000,000. Additional moorage would be required for these halibut boats.

26. There is also a growing miscellaneous fish-products industry including crab, oysters, and other shellfish, as well as bottom fish. The trend of the fishing industry is toward a year-round operation with winter bottom fishing occupying the fleet during a considerable portion of the year. Approximately 11,000 gallons of oysters were cultivated, produced, and harvested in the vicinity of Anacortes during 1947. Three firms that operate each season in the Bering Sea cod fisheries have salteries and terminal facilities at Anacortes.

27. *Agriculture.*—Dairying and poultry raising are the principal agricultural pursuits of those portions of western Skagit County and northern Island County within the tributary area of Anacortes. Other important agricultural products of this area are hay and forage crops, oats, green peas, vegetable seeds, and berries. Dairying and poultry raising are likewise the most important agricultural pursuits of the farm lands in San Juan County. A large variety of field and orchard crops including high-grade apples and pears are produced commercially. Production of small fruits, particularly strawberries, and production of fresh green peas for canning have increased rapidly in recent years. A fertilizer plant and vegetable- and fruit-processing plants are located at Anacortes.

28. *Mineral deposits.*—A number of the San Juan Islands have limestone deposits of fine quality. One of the major deposits is located at Roche Harbor, San Juan Island, where limerock and lime are produced commercially. Fidalgo and neighboring islands also have large deposits of sand and gravel in quantities capable of commercial development.

29. *Recreation.*—The San Juan Islands have great recreational value and numerous resorts have been developed, particularly on Orcas Island, where a 6,000-acre State park is located. These resorts, together with the natural inducements of picturesque island scenery, salmon sport fishing, and temperate climate, attract a substantial tourist trade, which is one of the principal sources of income in San Juan County. Most of the tourist and other traffic to the islands passes through Anacortes by way of the ferries operating therefrom on regular schedules.

30. Deception Pass State Park, located at the southwestern extremity of Fidalgo Island and northern part of Whidbey Island, is outstanding in scenic beauty and recreational value and seasonally is popular for picnicking and bathing. It is used extensively by residents of the coastal area and tourists.

31. *National and departmental reservations.*—Swinomish Indian Reservation, comprising an area of 5,575 acres, is situated in the eastern part of Fidalgo Island along Swinomish Slough.

32. *Railroads.*—Anacortes is served by a branch of the Great Northern Railway connecting with the Great Northern coastline near Burlington. The branch line crosses Swinomish Slough at its northerly end and skirts the easterly and northerly shore of Fidalgo Island, extending along the waterfront of Anacortes to Burrows Bay on the west side.

33. *Ferries.*—Passenger and auto ferries operating from Anacortes serve the San Juan Islands on regular schedules of several trips daily, and Sidney, British Columbia, on daily trips. The ferry terminal is located on Guemes Channel at the foot of I Street.

34. *Highways.*—A paved road connects Anacortes with the Pacific Highway, U. S. 99, at Mount Vernon. A branch road, also paved, extends to La Conner on Swinomish Slough. Graveled roads from Anacortes serve the various communities and farms on Fidalgo Island.

35. *Air transportation.*—Regular airline service to other west coast cities is available at the Mount Vernon Airport, approximately 10 miles from Anacortes. Local charter airplane service is available between Anacortes and the San Juan Islands.

36. *Port district.*—The district boundaries of the port of Anacortes include all of Fidalgo, Guemes, Cypress, Sinclair, Vendovi, and Samish Islands, and several small islands in the immediate vicinity. The assessed valuation of the port properties in 1937 was $3,056,000 and by 1947 the valuation had increased to $3,900,000. The three facilities operated by the port of Anacortes are the Capsante Waterway terminal and small boat moorage, the port dock and office on Guemes Channel at the foot of Commercial Avenue, and a 41-acre tract on Guemes Channel.

37. *Adjacent ports.*—In addition to Friday Harbor described in paragraph 16, Bellingham and Everett are adjacent ports. Bellingham, with a popupation of about 32,000, is 16 nautical miles north of Anacortes. The commerce of Bellingham Harbor, amounting to 683,244 tons in 1946, consisted chiefly of wood and paper products, nonmetallic minerals, animal and animal products, and miscellaneous merchandise. A Federal project provides for the improvement and maintenance of two waterways.

38. Everett, having a population of about 35,000, is 60 nautical miles south of Anacortes by the deep water route through Admiralty Inlet and 44 nautical miles by way of Swinomish Slough. The commerce of Everett Harbor, amounting to 3,050,143 tons in 1946, consisted chiefly of wood and paper products, nonmetallic minerals, animals and animal products, and miscellaneous merchandise. A Federal project provides for a training dike and for channel and waterway improvement and maintenance.

39. *Bridges.*—There are no bridges across any portion of Anacortes Harbor. The Great Northern Railway is carried by trestle across the tideflats in the north arm of Fidalgo Bay and by another trestle across the south part of the bay, but these do not interfere with the requested improvements.

40. *Prior reports.*—All prior reports on Anacortes Harbor are listed and described in paragraph 3 hereof.

41. *Existing Corps of Engineers project.*—The existing project was authorized by the River and Harbor Act of March 2, 1919, in accordance with the plan printed in House Document No. 1117, 64th Congress, 1st session. It provides for a channel in Capsante Waterway 12 feet deep at mean lower low water, and 150 to 250 feet wide extending from deep water westward to Q Avenue, a distance of about 2,850 feet.

42. The project was completed in May 1930, except for the portion between R and Q Avenues which was omitted at the request of local interests. The cost of new work to June 30, 1948, is $69,565.35, of which $46,376.90 was expended from Federal funds and $23,188.45 from funds contributed by local interests. In addition, $7,188.42 of Federal funds have been expended on maintenance to June 30, 1948.

43. *Local cooperation on existing project.*—Under the terms of the authorization of the existing project, local interests were required to provide without cost to the United States suitable places for deposit of dredged material and necessary bulkheads for retention thereof, provide a suitable terminal open to the public on equal and reasonable terms, and to contribute the sum of $28,000, amounting to one-third of the original estimated cost of $84,000. However, local interests contributed $23,188.45 which is one-third of the total expenditure on new work, and is, accordingly, in conformance with the spirit of the law. All required conditions of local cooperation have been met. (See par. 47.)

44. *Other improvements.*—Except for terminal facilities other improvements by local interests consisted only in small expenditures for dredging to provide an 8-foot depth at the present small boat moorage, for log raft moorages, and minor aids to navigation.

45. *Terminal and transfer facilities.*—There are 30 piers, wharves, and other transfer facilities at Anacortes, all privately owned except two owned by the port of Anacortes. One wharf located in Burrows Bay is for lumber handling and shipping in foreign and domestic trade. The 18 wharves and piers along Guemes Channel include 8 for handling fish and fish products in Alaskan, Puget Sound, and local trade, 3 for petroleum products, 2 ferry terminals for passenger and vehicular traffic, 1 for sand and gravel, 3 for mooring and repair of boats and barges, and 1, owned and operated by port of Anacortes, for general cargo in foreign and domestic trade. The remaining 11 facilities are all located along Fidalgo Bay. Of these, 9 are used in connection with receipt and sorting of rafted logs, 1 is used for construction and repair of small commercial fishing vessels, and 1, owned and operated by the port of Anacortes, is used for receipt of petroleum products, for handling fish and fish products and for a small boat moorage. All of the terminals have adequate depths of water and facilities for the traffic utilizing them.

46. The port commission terminal on Guemes Channel is located at the foot of Commercial Avenue. Approximately 440 linear feet of berthing space for ships is available along the wharf. Six warehouses provide 67,285 square feet of storage space. The terminal has ade-

quate cargo handling equipment, and has a spur connection with the Great Northern Railway branch line. It is available to the public under State approved charges.

47. The port wharf on Capsante Waterway, located at the northwest corner of the waterway, is 40 feet wide and has about 100 feet of frontage on the waterway. The wharf is equipped for servicing small craft and for landing fish. A fish-processing plant is situated on the north side of this wharf. Another fish cannery is located at the shoreward end of the wharf approach. The port commission has dredged an area 900 feet by 80 feet to a depth of 8 feet at mean lower low water along the north boundary of the waterway just east of the wharf, for mooring fishing boats and pleasure craft. Facilities constructed therein by the port commission consist of 1 float 600 feet long and 15 finger floats, each 64 feet long, providing moorage space for about 65 boats. By tying several abreast, about 20 additional boats can be accommodated at the wharf. The appraised value of the port terminal on Capsante Waterway, including wharf and facilities thereon, and the boat moorage was $47,500 in 1947.

48. A floating seaplane hangar is maintained by private interests at the south boundary of the widened part of Capsante Waterway, opposite the boat moorage. The present installation accommodates two small planes. An additional hangar is under construction. Fueling facilities for aircraft are available.

49. The land immediately south of Capsante Waterway is owned by a sawmill company. The waterway proper is not used for the lightering of lumber from the mill, but the bay north of the waterway is used for temporary log storage.

50. Except for the small-boat moorage, terminal and transfer facilities at Anacortes are considered adequate for the needs of present and prospective commerce. The port commission operates under a comprehensive plan that provides for acquisition of lands needed for future expansion and for financing and construction of units as the need for them develops.

51. *Improvement desired.*—A public hearing was held at Anacortes, Wash., on April 23, 1948, in connection with this review, to ascertain the desires of local interests. It was attended by 76 persons, representing Federal, State, and local government agencies, the port commission, lumber and logging interests, fishing interests, business, labor, and other community interests.

52. At the hearing, the port of Anacortes presented briefs supported by oral and written statements of other local interests requesting (*a*) enlargement of existing mooring basin in Capsante Waterway by dredging an area about 500 by 1,000 feet northward thereof to a depth of 12 feet at mean lower low water to provide moorage for an additional 240 boats, and (*b*) provision of an interlocking creosoted pile breakwater about 480 feet long located approximately 200 feet east of the mooring basin to provide protection against wave action from the east. No opposition to the requested improvement was expressed at the hearing.

53. In justification of the larger moorage basin and breakwater at Capsante Waterway, local interests stated that this improvement was needed to (*a*) provide mooring facilities and storage space to meet the greatly increased demand by pleasure boats and commercial craft operating in this area, (*b*) eliminate the present fire hazard resulting

from crowded conditions, (*c*) eliminate physical damage suffered by watercraft when compelled to moor abreast, (*d*) eliminate extra precautions necessary to safeguard vessels during storm periods.

54. In presenting their request for improvement, local interests cited the advantageous location of Anacortes Harbor with respect to the San Juan Islands as it is the nearest mainland basing point for the many pleasure boats and commercial craft that cruise in the waters around the islands. Local interests also stated that considerable impetus would be given to the fishing industry in Anacortes by providing mooring facilities for the many fishing boats that are now forced to moor elsewhere.

55. Local interests have expressed willingness to cooperate to the extent of (*a*) providing rights-of-way, easements, and any lands necessary for construction, (*b*) providing disposal areas for dredged material, (*c*) constructing necessary bulkheads to retain dredged material, (*d*) installing and maintaining mooring facilities including necessary piling, floats, wiring, harbor lights, and navigation aids.

56. *Commerce.*—A comparative statement of the annual waterborne traffic of Anacortes Harbor is given in table 3 for the years 1937 to 1946, inclusive. The section includes the waterfront of Fidalgo Island from north end of Burrows Bay to and including the westerly shore of Fidalgo Bay. No separate statistics are available for Capsante Waterway.

TABLE 3.—*Comparative statement of traffic—Anacortes Harbor*

Year	Vessel traffic (tons)	Rafted (tons)	Total (tons)	Additional traffic, general ferry	
				Passengers	Vehicles [1]
1937	128,673	376,726	505,399	42,631	16,561
1938	62,065	310,417	372,482	52,034	33,834
1939	86,333	315,141	401,474	61,809	23,293
1940	109,593	434,814	544,407	59,049	24,722
1941	116,343	723,246	839,589	63,913	28,600
1942	54,416	599,852	654,268	61,687	28,676
1943	52,470	488,777	541,247	69,419	29,771
1944	36,536	449,093	485,629	79,922	32,640
1945	65,478	328,917	394,395	112,599	71,683
1946	64,215	326,260	390,475	143,724	69,656

[1] Includes automobiles, trucks, and trailers.

57. The decrease in tonnage for 1938 was caused largely by lack of production resulting from labor and other difficulties in the logging and transportation industries. The trend in future commerce will depend largely on the trend in forest and forest-products industries, the fishing and other industries. The vessel traffic indicates a trend toward the prewar level. As future logging is expected to be stabilized on a sustained-yield basis under strict conservation regulations, no material increase in log traffic is foreseen.

58. Anacortes has comparatively little foreign and domestic deep sea commerce. Its foreign imports are mainly floated logs from British Columbia ports. In recent years there has been only a negligible amount of foreign exports. Domestic receipts include fresh and canned fish, food products, coal, gasoline, fuel oil, sulfur, and general merchandise. Shipments consist mainly of lumber, canned vegetables, animals and animal products, principally fresh and canned fish. Floated logs and

piles, fish, lime rock, sand and gravel form the bulk of local traffic. The commerce of Capsante Waterway consists mainly of fish and petroleum products. Detailed statistics are not available for the waterway. It is known, however, that about 186 tons of fish were received in a recent year by the 2 adjacent canneries. As this was a relatively high year, it is believed that fish landings on the waterway have probably averaged not more than 150 tons annually in recent years.

59. Distribution of tonnages by classes of commodities is shown for the years 1936, 1941, and 1946, in table 4 for Anacortes Harbor.

TABLE 4.—*Comparative commercial statistics for Anacortes Harbor*

[All figures in short tons, 2,000 pounds]

Item	Year		
	1936	1941	1946
Foreign imports:			
Animals and animal products (fish)	478	348	187
Wood and paper	44,340	175,631	41,003
Nonmetallic minerals	232	245	
Subtotal	45,050	176,224	41,190
Foreign exports:			
Animals and animal products		150	
Wood and paper	24,701	4,792	
Ores, metals and manufactures of	993		
Unclassified		120	
Subtotal	25,694	5,062	
Domestic coastwise receipts:			
Animals and animal products (fish)	824	866	1,524
Vegetable food products	528	280	
Wood and paper	47,733	267,017	92,307
Nonmetallic minerals	22,378	11,172	13,761
Ores, metals, and manufactures of	275	462	
Unclassified	1,592	1,526	2,117
Subtotal	73,330	281,323	109,709
Domestic coastwise shipments:			
Animals and animal products (fish)	2,129	2,377	5,441
Vegetable food products	1,323	1,261	2,671
Wood and paper	56,228	123,799	60,776
Unclassified	191	82	186
Subtotal	59,871	127,519	69,074
Local receipts and shipments:			
Animals and animal products (fish)	838	9,467	14,767
Wood and paper	232,338	225,092	139,783
Nonmetallic minerals	4,577	14,150	12,921
Machinery	51		
Ice (frozen water)			1,507
Unclassified		752	1,524
Subtotal	238,053	249,461	170,502
Grand total	441,998	839,589	390,475
Additional traffic, general ferry:			
Automobiles, trucks, and trailers	14,174	28,600	69,656
Passengers	39,522	63,913	143,724

60. *Vessel traffic.*—A record of trips and drafts of vessels operating in Anacortes Harbor is given in table 5 for 1936, 1941, and 1946, exclusive of fishing and pleasure craft.

TABLE 5.—*Trips and drafts of vessels—Anacortes harbor* [1]

Standard full-load draft (in feet) for years shown	Inbound [2]				
	Steamers	Motor vessels	Sailing	Barges	Total [3]
1936:					
32 feet 8 inches	2				2
30 to 31		3			3
26 to 28	7	7			14
24 to 26	4	1			5
22 to 24	19				19
20 to 22			2		2
Under 18	217	1,459		70	1,746
Total	249	1,470	2	70	1,791
Net registered tonnage	139,688	270,751	1,666	23,575	435,680
1941:					
28 feet 6 inches	1				1
26 to 28	2	1			3
24 to 26	2	8			10
22 to 24	6				6
20 to 22	17				17
18 to 20	5				5
Under 18	2	1,323		83	1,408
Total	35	1,332		83	1,450
Net registered tonnage	61,664	127,188		9,717	198,569
1946:					
27 feet 6 inches	7				7
20 to 22	4				4
Under 18		1,673		246	1,919
Total	11	1,673		246	1,930
Net registered tonnage	39,842	112,416		49,965	202,223

[1] Commercial fishing and pleasure craft not included.
[2] Figures for outbound traffic are identical with those for inbound traffic.
[3] Includes 21 trips (98,626 net registered tons) by vessels of foreign registry in 1936; 11 trips (25,834 net registered tons) in 1941.

61. Records have not been kept of fishing and pleasure craft, but local sources state that at the present time about 180 small craft are permanently based at Anacortes, there being approximately an equal number of fishing vessels and pleasure boats. Of these boats approximately 90 moor at Capsante Waterway, these also being about equally divided between commercial and pleasure craft. In addition, there are approximately 285 boats that normally call at Anacortes during fishing and pleasure boat cruising season. If adequate facilities were provided, it is expected that the majority of boats now based elsewhere in Anacortes Harbor would moor at Capsante Waterway and that a considerable number of pleasure craft and fishing boats from other localities that normally cruise in the San Juan Islands area and adjacent waters would seek permanent moorage at Capsante Waterway.

62. *Difficulties attending navigation.*—The existing Capsante basin is inadequate to accommodate the boats now using it and those desiring to use it as a base of operations or as a harbor of refuge. The present normal condition of the basin is one of overcrowding. During storms when all small boats seek shelter, the number of boats desiring moorage exceeds the basin capacity and those boats unable to find shelter in the basin crowd into the westerly part of the waterway or against the wharves in Guemes Channel. This overcrowded condition causes much unavoidable damage to boats from chafing and colliding. Considerable damages, such as chipping of hulls and

breakage of structural parts, result also from the surge of boats against moorings and against each other during easterly storms. Similarly, boats moored at the wharves in Guemes Channel suffer damages from surging against other boats moored abreast or against the exposed moorings during westerly or easterly storms and during strong tidal flows. If adequate and protected moorage facilities for the entire fleet were available adjacent to Capsante Waterway, these damages could all be eliminated. The annual losses resulting from such damage are considered to be a function of the average annual costs for maintenance and repair as outlined in paragraph 75.

63. During the peaks of the fishing season, many boats are forced to anchor in the fairway of Capsante Waterway, thereby impairing movements of vessels and seaplanes in the waterway. This crowded condition delays fishing boats in their unloading and servicing operations resulting in a corresponding loss of fishing time. The evaluation of this loss in terms of the increased fish catch is summarized in paragraph 77.

64. *Waterpower and other special subjects.*—None of the improvements proposed for Anacortes Harbor in the interest of navigation could be coordinated with any plan for flood control, development of waterpower, municipal or industrial water supply, abatement of pollution, irrigation, preservation of wildlife, or any other purpose involving the use and conservation of water resources.

65. *Plan of improvement.*—As shown on the accompanying map, the plan considered most practicable for the present and immediately foreseeable needs of navigation in Anacortes Harbor includes (*a*) dredging a basin 960 feet long, 570 feet wide, and 12 feet deep at mean lower low water adjacent to and north of Capsante Waterway and (*b*) constructing a treated pile breakwater 380 feet long at a location about 50 feet east of the mooring basin. The proposed basin is estimated to provide space for about 330 boats or 265 more than the number that can be accommodated by the present facilities without congestion. The breakwater would protect the mooring basin against wave action from the open waters to the east and southeast. Although local interests requested a length of 480 feet for the breakwater, studies indicate that 380 feet is sufficient.

66. The proposed basin would require dredging of about 225,000 cubic yards (including 1 foot overdepth) of material. Probings at the site show the bottom material to be predominantly silty sand. A log of probings is shown on the map accompanying this report. The material would be deposited on adjacent fill areas provided by local interests, such as those on the accompanying map. It is estimated that the cost of disposal on land would be less than the cost of deposition in deep water as the land areas would be closer to the basin than the deep water area.

67. The breakwater would consist of a row of treated piling, driven in contact, and with each adjacent pile staggered to provide lateral stability. Additional stability would be secured by suitable waling and brace piling. A seven-pile dolphin would be placed at each end of the breakwater. Of several types considered, this breakwater was found to be the most economical and of sufficient stability to withstand the relatively minor wave action encountered in the vicinity.

68. *Aids to navigation.*—The Thirteenth Coast Guard District was consulted regarding the improvements considered at Anacortes. That office approved the plan in general, stating, however, that a light installed on the south end of the breakwater marking the entrance to the basin would be required, at an approximate cost of $800.

69. *Shoreline changes.*—The improvements proposed at Anacortes are not expected to materially affect the configuration of the adjacent shorelines. At this locality the immediate shoreline and sea bottom are relatively stable under natural conditions.

70. *Estimate of first cost.*—Based on 1948 prices, the cost of the proposed improvement is estimated to be as follows:

(*a*) Federal first cost:		
(1) Mooring basin, 225,000 cubic yards, at $0.50	$112, 500	
(2) Breakwater, 380 linear feet (including dolphins), at $98.70	37, 500	
(3) Aids to navigation	800	
(4) Total Federal first cost		$150, 800
(*b*) Non-Federal first cost:		
(1) Lands and rights-of-way	$1, 000	
(2) Mooring facilities	65, 000	
(3) Total non-Federal first cost		66, 000
(*c*) Total first cost		216, 800

71. As shown in the foregoing, local interests have estimated the cost of providing berthing and mooring facilities as $65,000. This amount appears sufficient to provide adequate mooring facilities.

72. *Estimate of annual charges.*—The annual charges are estimated to be as follows:

(*a*) Federal annual charges:		
(1) Federal first cost		$150, 800
(2) Interest at 3 percent		4, 520
(3) Amortization (50-year life at 3 percent)		1, 340
(4) Maintenance of breakwater and approach channel		3, 500
(5) Total Federal annual charges		9, 360
(*b*) Non-Federal annual charges:		
(1) Non-Federal first cost		$66, 000
(2) Interest at 3½ percent	$2, 310	
(3) Amortization (50-year life at 3½ percent)	500	
(4) Maintenance and operation of facilities	8, 000	
(5) Maintenance dredging of berthing space	1, 000	
(6) Gross non-Federal annual charges	11, 810	
(7) Net returns from charges for use of facilities	10, 000	
(8) Net non-Federal annual charges		1, 810
(*c*) Total annual charges		11, 170

73. The estimated Federal annual charge for maintenance, $3,500, includes a regular maintenance item of $2,000 for the breakwater and approach channels to and within the basin and an annual charge of about $1,500 for replacement of the breakwater at the end of its estimated life of 20 years.

74. *Estimate of benefits.*—The improvements proposed herein would directly benefit small boat navigation and related activities in Anacortes Harbor. Items of benefit evaluated include savings from elimination of damages and savings in expenses for extra maintenance

and vigilance now required for pleasure boats and fishing boats, savings in time for fishing boats resulting from elimination of congestion in Capsante Waterway, recreational benefits accruing to pleasure-boat owners, and miscellaneous collateral benefits.

75. The improvements would benefit boats presently basing at the Capsante moorage and on Guemes Channel by reducing or eliminating repair and maintenance expenses caused by losses arising from chipping of hulls and breakage of structural parts, by the surge of boats against wharves and against each other in the exposed moorages now used. From information furnished by local sources, it is estimated that the average boatowner at Anacortes, including both commercial and pleasure classes, expends about $300 annually on boat maintenance and repairs under existing harbor conditions, of which about 12 percent, or $36, could be saved if suitable facilities were available. For the 180 boats based permanently at Anacortes, the aggregate saving would be $6,480. It is estimated that 150 boats base seasonally there for an average period of 4 months. On a proportionate basis these boats would realize a savings of $1,800, making a total annual savings of $8,280 in maintenance and repair costs.

76. During the fishing season, the cannery located at the port wharf experiences a considerable loss through the crowding of boats into Capsante Basin and waterway in such a way that fish deliveries are frequently delayed. Under normal full-time operating conditions, fish are delivered daily to the cannery for processing while fresh. Existing State regulations allow fishing from Monday through Thursday each week of the season. Consequently, fishing boats crowd into the waterway and basin for the closed period, frequently filling them to such an extent during the late hours of Thursday that delivery of the Thursday-caught fish at the port wharf is prevented entirely. At such times the fish must be transferred from the cannery tenders to small skiffs and delivered to the cannery by way of the shallow water north of the port wharf and boat moorage. This process usually results in a slowing down, or even a temporary stoppage, of the canning operation with consequent extra expense from nonproductive time for which workers must be paid but from which no returns are realized. It is estimated that this nonproductive time averages about 2 hours a week over the 12-week fishing period, which at an hourly rate of $1.25 amounts to a total of $900 for 30 persons employed by the company. Elimination of these delays would result in lowered production costs which could be passed on to the public through lower prices for the product.

77. The crowding of Capsante Waterway and Basin also entails a loss of fishing time because the fishing boats are forced to stand by while waiting to unload, and because frequently they must leave the fishing grounds early on Thursday in an effort to avoid the weekend crowding that usually commences late Thursday. It is estimated that an average of 26 fishing vessels make regular crab and fish deliveries in Capsante Waterway during the 12-week fishing period, and that the time loss aggregates about 3 percent of the time spent in fishing. Fishermen assert that this lost time could well be devoted to fishing whereby they could increase their fish catch accordingly. With an average crew of 2 men to a boat, the time loss totals about 749 man-hours annually which, if devoted to fishing, would result in an additional catch of about 8,990 pounds of fish having a total net

value of $1,260. Fishing vessels now basing at the various facilities on Guemes Channel, and that would transfer to the Capsante Waterway moorage when enlarged, would probably not benefit materially from increased fish catches, as the time saved from relief of congestion in Capsante would be offset largely by the additional distance these boats would have to travel between the fish wharves and the new moorage.

78. Provision of adequate and safe moorage in the Capsante basin would correspondingly increase the recreational benefits enjoyed by pleasure craft owners who presently use this basin or the scattered inadequate moorages along Guemes Channel. In order to evaluate in monetary terms the recreational benefits derived from ownership and operation of a pleasure boat, it is assumed herein that the recreational value of boating is a function of the capital investment and the maintenance and operating charges, and further that the net benefits must exceed the costs or the recreationalist would not pay them. It is therefore assumed that the net recreational benefits are comparable to the normal net return or profit from an investment in a small-business venture, taking annual charges to the boatowner as his investment in recreation or "tangible net worth" of his enterprise, from which he realizes a net profit in the form of recreational benefits and thus justifies the expenditure.

79. A comparison of small-business enterprises in several Puget Sound localities indicates that a net return of 18 percent of their tangible net worth would be conservative. The capital investment in pleasure boats in Anacortes is estimated to average about $5,000 each. The average annual expenditure for normal maintenance, repairs, fuel, lubricants, taxes, insurance, stall rental, and incidentals for a boat is estimated at about $530. Assuming a life of 20 years with no remaining salvage value, and an interest rate of 3½ percent, the average annual expenditure for capital recovery would be about $350. Assuming further that the boatowner contracts and pays for all services and supplies at the beginning of the boating year, the annual investment would then be $530 plus $350, or $880 a boat, from which a net annual return at 18 percent would be $158.40. For the 90 pleasure craft permanently moored in Anacortes Harbor, the total annual investment would be $79,200 and the net annual return would be $14,256 which would be the measure of recreation returns enjoyed by the boatowners under existing conditions. It is estimated that the greater convenience provided by the proposed improvements would result in an increase of about 10 percent, or $1,425, in these recreation returns, which would amount to about $15.80 a boat. In addition to local boats, it is estimated that about 75 transient pleasure boats base seasonally at Anacortes for an average period of 4 months. During this period these transient boatowners would also enjoy additional recreational benefits similar to benefits enjoyed by the local owners. At the annual unit rate of $15.80, each transient boatowner would receive a benefit for the 4-month period equivalent to about $5.25. The total for the 75 would be $390. The value of recreational benefit to pleasure-craft owners would thus total $1,815 annually, which is considered to be conservative as it does not account for probable future increases in the number of pleasure craft. There is no present indication that the improvement would directly influence the acquisition of new pleasure craft.

80. Disposal of the dredged material in the areas designated on the accompanying map would result in incidental enhancement of land values. The present low elevation of these areas makes them unattractive as commercial or industrial building sites. Filling of these tracts (which aggregate about 14 acres) would increase their rental value for commercial development by an estimated $560 annually.

81. In addition to the benefits evaluated in the foregoing paragraphs, certain miscellaneous benefits would accrue from the contemplated improvements. An improved harbor would provide more adequate refuge for nonresident small craft caught in storms while cruising in the nearby waters and would stimulate visits to the locality by transient craft. Salt water sports fishing and other water recreation activities, such as power yacht and sailboat racing, would be enhanced. The increased commercial fishing and recreational activities would aid materially in further stabilizing the economy of the locality and improving the general health of the populace. Although evaluation of these benefits on a monetary basis is not possible, they would increase the value of the project to the community and to the general public.

82. The benefits outlined in the foregoing paragraphs are summarized as follows:

(*a*) Elimination of damages to boats and consequent reduction in repair and maintenance costs	$8, 280
(*b*) Elimination of lost time in operating cannery on Capsante Waterway	900
(*c*) Increased fish catch accruing from savings in time	1, 260
(*d*) Increased benefits to pleasure craft	1, 815
(*e*) Increase in land rental	560
(*f*) Total benefits	12, 815

83. *Comparison of benefits and costs.*—The annual benefits and costs of the proposed improvements at Anacortes are summarized and compared as follows:

(*a*) Annual benefits	$12, 815
(*b*) Annual costs	$11, 170
(*c*) Ratio of benefits to costs	1. 15

84. *Proposed local cooperation.*—At the public hearing held April 23, 1948, local interests publicly expressed their willingness to provide the necessary lands and rights-of-way and to build and maintain the necessary floats, spur piers, and other terminal facilities. As an essential feature of Federal participation in the proposed improvement at Anacortes, local interests should be required to—

(*a*) Provide without cost to the United States all necessary lands, easements, rights-of-way, and suitable disposal areas, bulkheaded if necessary, for the construction and maintenance of the proposed improvements.

(*b*) Hold and save the United States free from property damages that may result from the construction and maintenance of the project.

(*c*) Provide and maintain without cost to the United States adequate terminal and mooring facilities and utilities, open to all on equal and reasonable terms.

(*d*) Maintain the berthing space to project dimensions.

85. *Coordination with other agencies.*—Local interests have indicated the possibility of future construction of an airstrip, 400 feet by 2,880 feet, at Anacortes, extending from Capsante Waterway northwesterly to Fourth Street along the western edge of Capsante. This airstrip would be constructed in conjunction with the Civil Aeronautics Administration which would pay 50 percent of the cost thereof, the balance to be paid by local interests. Officials of the Civil Aeronautics Administration state that although this project is listed in their files, it is not on the present authorized program, but that it will be given full consideration if and when requested by local interests. If Civil Aeronautics Administration assistance can be obtained in financing a bulkhead parallel to Capsante, it would be possible to pump dredged material for part of the airstrip.

86. *Discussion.*—To relieve the congestion and eliminate the resulting damages and delays to vessels, local interests have requested enlargement of the existing basin by dredging and breakwater protection therefor. Accordingly, a plan is outlined herein, providing for dredging an area of some 547,000 square feet north of Capsante Waterway to a depth of 12 feet and provision of a protecting pile breakwater approximately 380 feet long, at a Corps of Engineers first cost of $150,000, and $800 for navigation aids to be installed by the United States Coast Guard. The proposed plan conforms approximately with the plan requested by local interests. Local interests have agreed to construct and maintain moorage facilities as required and provide any lands and rights-of-way necessary for the construction. The estimated cost of construction of moorage facilities is $65,000. The proposed plan contemplates disposal of dredged material on adjacent shore areas designated by local interests. An estimate reveals that this plan is more economical than disposal in deep water.

87. There exists an increasing demand for moorage of fishing craft and pleasure boats many of which at present have inadequate and unsafe moorage at Anacortes. A large demand exists for safe moorage at Anacortes to be used transiently by pleasure craft which spend a large amount of their cruising time in the nearby San Juan Islands. In order to alleviate the crowded condition, it has been requested that moorage facilities be provided for 330 boats based on an estimated increase in requirements of 265 from the present capacity of 65 boats. This request is considered reasonable by this office.

88. It has been shown that Anacortes is a growing center of the fish-processing industry, that further growth is anticipated, and that provision of adequate moorage facilities will help in permitting such expansion.

89. Benefits accruing from this improvement justify the necessary expenditures therefor. Comparison of benefits totaling $12,815 with annual charges of $11,170, gives a benefit-to-cost ratio of 1.15. The principal benefit, $8,280, would result from the elimination of damages to boats and reduction in repair and maintenance costs.

90. *Conclusion.*—The plan of improvement found most suitable consists in enlarging the small boat basin by dredging to a depth of 12 feet below mean lower low water and providing a protecting pile breakwater 380 feet long. The enlarged mooring basin will be rectangular in shape extending 570 feet north from Capsante Waterway and 960 feet parallel to the waterway. The estimated first cost to the Corps of Engineers for the entire project is $150,000, and the annual maintenace cost is estimated to be $3,500 for the breakwater and approach channel to and within the basin. It is estimated that the

entire project could be accomplished in less than 1 year. Accordingly, the entire allotment should be made at one time.

91. From the data presented and discussed in this report, it is concluded that the enlargement of the mooring basin and provision of a protecting breakwater would be of sufficient benefit to small boat navigation to warrant its accomplishment by the Federal Government.

92. *Recommendations.*—It is recommended that the existing project at Anacortes Harbor, Wash., be modified to provide for (*a*) dredging a mooring basin, 960 feet long, 570 feet wide, and 12 feet deep at mean lower low water, adjacent to and north of Capsante Waterway; (*b*) a treated pile breakwater, 380 feet long, at a location about 50 feet east of the mooring basin; all at an estimated first cost to the Corps of Engineers of $150,000, with $3,500 annually for maintenance in addition to that required for the existing project. Before any Federal expenditures at this location is made, local interest should be required to furnish assurances satisfactory to the Secretary of the Army that they will (*a*) furnish without cost to the United States all necsesary lands, easements, suitable disposal areas, bulkheaded if necessary, and rights-of-way; (*b*) hold and save the United States freee from all damages arising from the construction and maintenance of the improvements; (*c*) construct, in accordance with plans approved by the Secretary of the Army, maintain, and operate without profit adequate mooring facilities within the basin, utilities, and a public landing with suitable service and supply facilities open to all on equal and reasonable terms; and (*d*) maintain the berthing space to project dimensions.

L. H. HEWITT,
Colonel, Corps of Engineers,
District Engineer.

[First endorsement]

OFFICE, DIVISION ENGINEER,
NORTH PACIFIC DIVISION,
CORPS OF ENGINEERS,
Portland, Oreg., January 28, 1949.

Subject: Review of Reports on Anacortes Harbor, Wash.
To: The Chief of Engineers, Corps of Engineers, Department of the Army, Washington 25, D. C.

I concur with the views and recommendations of the District Engineer.

THERON D. WEAVER,
Colonel, Corps of Engineers,
Division Engineer.

APPENDIX MADE IN CONNECTION WITH REPORT OF THE DISTRICT ENGINEER

(Not printed)

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LETTER OF TRANSMITTAL

DEPARTMENT OF THE ARMY,
Washington 25, D. C., March 1, 1954.

Hon. EDWARD MARTIN,
Chairman, Committee on Public Works,
United States Senate, Washington, D. C.

DEAR MR. CHAIRMAN: I am transmitting herewith a report dated June 26, 1953, from the Chief of Engineers, United States Army, together with accompanying papers and an illustration, on a review of report on Anacortes Harbor, in the State of Washington, with a view to making improvements in the harbor facilities at Anacortes, Wash., requested by a resolution of the Committee on Public Works, United States Senate, adopted on June 17, 1947.

In accordance with section 1 of Public Law 14, 79th Congress, the views of the State of Washington and the Department of the Interior are set forth in the enclosed communications.

Although the Bureau of the Budget advises that there is no objection to the submission of the report to the Congress, it states that no commitment can be made at this time as to when any estimate of appropriation would be submitted for construction of the project, if authorized by the Congress, since this would be governed by the President's budgetary objectives as determined by the then prevailing fiscal situation. The complete views of the Bureau of the Budget are contained in the attached copy of its letter.

Sincerely yours,

ROBERT T. STEVENS,
Secretary of the Army.

COMMENTS OF THE BUREAU OF THE BUDGET

EXECUTIVE OFFICE OF THE PRESIDENT,
BUREAU OF THE BUDGET,
Washington 25, D. C., February 23, 1954.

The honorable the SECRETARY OF THE ARMY.

MY DEAR MR. SECRETARY: This will acknowledge receipt of your letter of July 23, 1953, submitting the proposed report of the Chief of Engineers on Anacortes Harbor, Wash., requested by resolution of the Committee on Public Works, United States Senate, adopted June 17, 1947.

The Chief of Engineers recommends, subject to certain conditions of local cooperation, modification of the existing project for Anacortes Harbor, Wash., to provide for a mooring basin adjacent to the north side of Capsante Waterway. The mooring basin would be 12 feet deep, 570 feet wide, and 960 feet long, and would be protected by a pile breakwater 380 feet long. The Federal cost, based on 1953

prices, is estimated at $147,400 for construction and $980 for navigation aids. On the same basis, the non-Federal cost to meet the stipulated conditions of local cooperation is estimated at $114,000, including a cash contribution or equivalent work to the extent of 14.5 percent of the cost of dredging the mooring basin and constructing the breakwater, presently estimated at $25,000. The annual benefits are estimated at $17,010, of which $12,520 are classified as general and $4,490 as local. The net annual carrying charges are estimated at $13,250, of which $9,535 are Federal, including $4,300 for maintenance in addition to that now required, and $3,715 are non-Federal. The stated benefit-cost ratio is 1.28.

I am authorized by the Director of the Bureau of the Budget to advise you that there would be no objection to the submission of the report to the Congress. No commitment, however, can be made at this time as to when any estimate of appropriation would be submitted for construction of the project, if authorized by the Congress, since this would be governed by the President's budgetary objectives as determined by the then prevailing fiscal situation.

Sincerely yours,

CARL H. SCHWARTZ, Jr.,
Chief, Resources and Civil Works Division.

COMMENTS OF THE STATE OF WASHINGTON

DEPARTMENT OF CONSERVATION AND DEVELOPMENT,
Olympia, April 25, 1950.

Maj. Gen. LEWIS A. PICK,
Chief of Engineers,
Department of the Army, Washington, D. C.

DEAR GENERAL PICK: Referring to your letter of April 18 sending your review report on Anacortes Harbor in the State of Washington, we find the works contemplated by this report will in no way affect the water resources or influence flood control in our State, therefore, have no objection to register concerning the proposal.

Sincerely yours,

J. V. ROGERS, *Director.*

RESOLUTION OF THE PORT OF ANACORTES

PORT OF ANACORTES—RESOLUTION No. 186

Be it resolved that—

SECTION 1. Port of Anacortes contribute toward the proposed improvement of the dredging of Capsante Waterway as per plan submitted to the United States Army engineers in an amount not to exceed $30,000, which contribution will be made when called upon by the proper authorities and be in the form of cash or a combination of cash and dredging performed at the cost of the port to the satisfaction of the United States Army engineers.

SEC. 2. As and when said improvements are completed in the said Capsante Waterway that the port of Anacortes then proceed as and when possible to placing adequate mooring facilities upon and in connection with the said improvement.

SEC. 3. A certified copy of this resolution be forthwith forwarded to the United States Army engineers.

STATE OF WASHINGTON,
County of Skagit, ss:

I, Jesse R. Lewis, secretary of the Port Commission of the Port of Anacortes, do hereby certify that the foregoing is a full, true and correct copy of Resolution No. 186 duly and unanimously proposed and adopted by the Port Commission of the Port of Anacortes on regular form on the 28th day of January 1953, all as the same appears upon my records of the minutes of said meeting.

Witness my hand and official seal this 6th day of February 1953.

JESSE R. LEWIS,
Secretary, Port Commission of the Port of Anacortes.

COMMENTS OF THE DEPARTMENT OF THE INTERIOR

UNITED STATES DEPARTMENT OF THE INTERIOR,
OFFICE OF THE SECRETARY,
Washington 25, D. C., July 24, 1950.

Maj. Gen. LEWIS A. PICK,
Chief of Engineers,
Department of the Army, Washington, D. C.

MY DEAR GENERAL PICK: By letter dated April 18, 1950 (ENGWD), you transmitted for the information and comments of the Department copies of your proposed report on a review of Anacortes Harbor, Wash., together with the reports of the Board of Engineers for Rivers and Harbors and of the district and division engineers.

Based upon the report of the district engineer that small-boat traffic in Anacortes Harbor, Wash., has increased substantially in recent years and that the existing harbor is too small to accommodate the large fleet and provide for its safety, your proposed report recommends modification of the existing navigation project to provide for a new mooring basin adjacent to and north of Capsante Waterway.

The proposed project has been reviewed in the field by regional representatives of the Fish and Wildlife Service, and by letter dated January 7, 1949, the regional office of the Fish and Wildlife Service advised the district engineer at Seattle that dredging operations and construction of a breakwater should not affect the fishery or wildlife resources which are of negligible value in the immediate vicinity of the project. In the event, however, that methods of operation or disposal of spoil are altered, the Fish and Wildlife Service would appreciate being notified so that the project can be inspected for possible hazards to fish and wildlife resources that may arise.

The interests of other agencies of the Department will not be adversely affected by your proposed recommendations.

Sincerely yours,

DALE E. DOTY,
Assistant Secretary of the Interior.