

e. Annual Maintenance to Channel Markers

The U.S. Coast Guard maintains and services the navigation aides in these waterways. The proposed channel improvements will eliminate the need for 2 lighted and 1 unlighted buoys, thereby reducing Federal obligations and costs for this service by an estimated \$1,100 annually. Total benefits resulting from channel marker damage and maintenance reductions are estimated to be \$3,600 annually.

f. Log Towing Cost Reductions

(1) The proposed improvements would permit increased efficiency in log towing operations by increasing the average size of the individual tows and reducing the costs.

(2) In 1964 the principal log towing company for the pulp mill at Silver Bay near Sitka towed 110,000,000 board feet of logs through the 40 mile Narrows section in 140 tows limited to 2 rafts each at a total cost of \$275,000. Costs averaged \$0.0625 per thousand board feet per mile.

(3) With the Narrows improved as proposed this company estimates that this quantity could be moved in 70 tows of 4 rafts each at a rate of \$0.0398 per thousand board feet per mile; a total cost of \$175,000 or a saving of \$100,000 annually. Annual benefits are computed as follows:

(a) Existing conditions: 1964 towing cost of \$0.0625 per m.b.f./mile \times 110,000 m.b.f. \times 40 miles = \$275,000.

(b) Improved conditions: Towing cost of \$0.0398 per m.b.f./mile \times 110,000 m.b.f. \times 40 miles = \$175,000.

(c) Reduction in log towing cost: \$275,000 - \$175,000 = benefit of \$100,000 annually.

g. Growth

(1) As discussed previously the principal industries of the tributary area are anticipated to continue their present rapid rate of growth into the early future followed by a declining rate of increase in the more distant future. Over the 50 year period of analysis an average annual rate of growth of 1.5% is used to conservatively express the increase in industrial activity anticipated in the tributary area. Such a growth would result in approximately doubling the annual vessel traffic through Sergius and Whitestone Narrows.

(2) The average annual equivalent of future benefits growing at an annual rate of 1.5% is computed by using a predetermined composite capital recovery factor of 0.357 as shown below. This factor expresses the average annual equivalent growth with capital recovery based upon interest at $3\frac{1}{4}\%$ compounded annually.

Col. (1) multiplied by col. (2) equals col. (3)

	Annual benefit	Composite growth factor	Annual growth value
	(1)	(2)	(3)
Vessel delay time.....	\$143,300	0.357	\$51,158
Damage loss.....	50,000	.357	17,850
Extra unloading costs.....	7,100	.357	2,535
Log towing costs.....	100,000	.357	35,700
Total.....	300,400	.357	107,243
Total annual benefits from future growth.....			107,000

¹Rounded.

h. Summary of Tangible Benefits

Annual benefits for cost reductions and future growth are as follows:

	Cost reduction	Growth	Total
Vessel delay time.....	\$143,300	\$51,000	\$194,300
Damage loss.....	50,000	17,800	67,800
Extra unloading costs.....	7,100	2,500	9,600
Damage to channel markers.....	3,600	0	3,600
Log towing costs.....	100,000	35,700	135,700
Total.....	304,000	107,000	411,000