ALASKA LEGISLATURE COMMITTEE FILES, 1989-1990 8672
6186 HOUSE TRANSPORTATION

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WHEREAS, this international road connection would provide the opportunity for maximum utilization of the new United States-Canada Free Trade Agreement and foster social, cultural and economic relationships beneficial to both countries; and

WHEREAS, said international road would increase traffic flow efficiency for commerce and industry, provide a viable alternative land route for the traveler, improve national defense in the event of foreign hostilities and provide an evacuation route in the event of a coastal catastrophe.

NOW THEREFORE BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF PETERSBURG, ALASKA:

1. Governor Cowper is hereby requested to direct the Department of Transportation and Public Facilities to make an accurate determination of construction costs for the Bradfield-Craig River route to the Canadian Border and a deep water port facility on the Bradfield Canal.

2. Governor Cowper is further requested to join with the Alaska State Legislature to introduce legislation based upon the cost finding of AK DOT/PF, that will enable the Bradfield-Craig Road and Bradfield Deep Water Port projects to proceed in a timely and expeditious manner.

3. In the name of prudent economic development and the furtherance of a strong self-supporting economic base in Southeast Alaska, we ask all legislators of the State of Alaska to support the development of this road and port project.

4. The City Clerk is hereby directed to transmit copies of this resolution to:

Governor Steve Cowper
Commissioner Mark Hickey, AK DOT/PF
Commissioner Judith Brady, AK DNR
Commissioner Anthony Smith, AK DOC/ED
Colonel Wilber T. Gregory Jr., Army Corps of Engineers
All members of the Alaska State Legislature

PASSED and APPROVED this 2 day of May, 1988.

Mayor

ATTEST:

City Clerk

CITY OF WRANGELL, ALASKA

RESOLUTION NO. 4-88-295

A RESOLUTION OF THE COUNCIL OF THE CITY OF WRANGELL, ALASKA URGING THE GOVERNOR AND THE LEGISLATURE OF THE STATE OF ALASKA TO INITIATE LEGISLATION TO APPROPRIATE FUNDS TO ENABLE THE TIMELY CONSTRUCTION OF A ROAD FROM THE CANADIAN BORDER TO THE SEA VIA THE BRADFIELD-CRAIG RIVER CORRIDOR AND CONSTRUCTION OF A DEEP WATER PORT FACILITY ON THE BRADFIELD CANAL.

WHEREAS, for the past three decades the City of Wrangell has been asking for construction of a road from Canada through Central Southeast Alaska to the sea; and

WHEREAS, these requests have resulted in seemingly interminable reconnaissance studies by the Alaska Department of Transportation and Public Facilities to determine the most practicable route for such a road; and

WHEREAS, the reconnaissance studies have resulted in a number of designated route potentials for a road; and

WHEREAS, legislative actions by the governments of the United States and Canada have now designated roadless and wilderness areas that would discourage road construction on all but one of the routes proposed in the reconnaissance studies; and

WHEREAS, a twenty six mile segment of that one remaining alternate route is from the Canadian Border down the Bradfield-Craig River watersheds and is the shortest route to the sea and deep water port capability; and

WHEREAS, extensive mining activity in British Columbia fifteen miles from the border crossing of the proposed Bradfield-Craig route has created an immediate and legitimate long term demand for road access to the sea and deep water port facilities; and

WHEREAS, Canadian mining and other resource development interests have expressed a preference for the route through the Bradfield-Craig area because of its close proximity to the sea; and

WHEREAS, the mining interests already have a major capital investment in their operations and have assured us they will actively participate in road construction to link up with the Bradfield-Craig route; and

WHEREAS, construction of a twenty six mile segment of road now will ensure continuing trade relations with our Canadian neighbors, but to procrastinate will send them the message that we are not interested and force them to go inland with all of their business; and

WHEREAS, construction of twenty six miles of road in this centralized location lends itself to future expansion of hard surface transportation systems vital to the economic diversification and development of all Southeast Alaska; and

WHEREAS, this intercontinental road connection would provide the opportunity for maximum utilization of the new United States-Canada Free Trade Agreement and foster social, cultural and economic relationships beneficial to both countries; and

WHEREAS, said intercontinental road would increase traffic flow efficiency for commerce and industry, provide a viable alternative land route for the traveler, improve national defense in the event of foreign hostilities and provide an evacuation route in the event of a coastal catastrophe.

NOW THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF WRANGELL, ALASKA:

Section 1. Governor Cowper is hereby requested to direct the Department of Transportation and Public Facilities to make an accurate determination of construction costs for the Bradfield-Craig River route to the Canadian Border and a deep water port facility on the Bradfield Canal.

Section 2. Governor Cowper is further requested to join with the Alaska State Legislature to introduce legislation based upon the cost findings of AK DOT/PF, that will enable the Bradfield-Craig Road and Bradfield Deep Water Port projects to proceed in a timely and expeditious manner.

Section 3. In the name of prudent economic development and the furtherance of a strong self-supporting economic base in Southeast Alaska, we ask all legislators of the State of Alaska to support the development of this road and port project.

Section 4. The City Clerk is hereby directed to transmit copies of this resolution to:

Governor Steve Cowper
Commissioner Mark Hickey, AK DOT/PF
Commissioner Judith Brady, AK DNR
Commissioner Anthony Smith, AK DOC/ED
Colonel Wilbur T. Gregory Jr., Army Corps of Engineers
All members of the Alaska State Legislature

Section 5. This resolution shall become effective on approval.

PASSED AND APPROVED: April 12, 1988

Mayor

ATTEST: Jeanette Vincent
City Clerk (Acting)

I hereby certify that I have compared the foregoing copy with the original filed in my office.

Jeanette Vincent
City Clerk - Acting
City of Wrangell, Alaska

CHAMBER OF COMMERCE
CITY OF WRANGELL, ALASKA

A RESOLUTION OF THE CHAMBER OF COMMERCE OF THE CITY OF WRANGELL, ALASKA SUPPORTING CONSTRUCTION OF A ROAD FROM CENTRAL SOUTHEAST ALASKA TO BRITISH COLUMBIA VIA THE BRADFIELD-CRAIG RIVER CORRIDOR, AND THE ESTABLISHMENT OF DEEP WATER PORT FACILITIES AT AN ACCEPTABLE SITE. WE REQUEST THAT OUR LOCAL, STATE, AND FEDERAL OFFICIALS TAKE APPROPRIATE MEASURES TO INSTITUTE THE PLANNING, PERMITTING AND FINANCING NECESSARY TO COMPLETE THIS PROJECT IN A TIMELY MANNER.

WHEREAS, the Wrangell Chamber of Commerce has historically supported construction of a road system connecting Central Southeast Alaska with British Columbia; and

WHEREAS, a road between Central Southeast Alaska and British Columbia would generate industrial, commercial and recreational opportunities essential to the economic stability, diversification and future growth of the region; and

WHEREAS, recent mining activity in British Columbia has created a rapidly expanding demand for road access to the sea and deep water port facilities in Central Southeast Alaska; and

WHEREAS, the Alaska Department of Transportation and Public Facilities has conducted a series of reconnaissance studies during the past three decades, to determine the most feasible routes for road access from Central Southeast Alaska to Canada; and

WHEREAS, within the past ten years congressional action and other considerations in Canada and Alaska have created roadless and wilderness areas within the reconnaissance study area; and

WHEREAS, the wilderness and/or roadless designation adversely affects road construction on all routes proposed in the reconnaissance studies with the exception of the route through the Bradfield-Craig River watershed area; and

WHEREAS, the Bradfield-Craig route is geographically the shortest distance to deep water port potential from the mining operations and other proposed renewable resource (timber) harvest areas in British Columbia; and

WHEREAS, Canadian mining firms have expressed a preference for this road route to the sea for shipment of ore concentrates to outside refining facilities; and

WHEREAS, the Canadian timber industry would open new areas and utilize the road for timber shipments to the sea; and

WHEREAS, the route from deep water on the Bradfield Canal to the Canadian border (approx. 25 miles) will accommodate the demand for deep water access at a cost considerably less than heretofore proposed routes; and

WHEREAS, construction of this road will herald the beginnings of long term Canadian-American relationships mutually beneficial to the future growth, economic diversification and overall economic development programs for the citizens of both countries.

NOW THEREFORE, BE IT RESOLVED BY THE CHAMBER OF COMMERCE OF THE CITY OF WRANGELL, ALASKA:

Section 1. The City of Wrangell, The State of Alaska Office of the Governor, Departments of Transportation, Natural Resources, Commerce & Economic Development; The United States Forest Service and the United States Corps of Engineers are hereby rquested to jointly and cooperatively take appropriate measures to institute planning, permitting, financing, and diplomatic intercourse with Canada in order to expidite construction of a road from Central Southeast Alaska to British Columbia via the Bradfield-Craig River corridor and to establish a deep water port facility at an appropriate site.

Section 2. The Secretary of the Wrangell Chamber of Commerce is hereby directed to transmit a copy of this resolution to each of the following:

Mayor Fern Neimeyer, City of Wrangell
Paul Meyhoff II, Office of the Governor
Commissioner Mark Hickey, AK DOT/PF
Commissioner Judy Brady, AK DNR
Commissioner Anthony Smith, AK DOC/ED
Walt Sheridan, USFS ANILCA Coordinator
Colonel Wilbur T. Gregory Jr., U.S. Army Engineers, Alaska District
Senator Ted Stevens
Senator Frank Murkowski
Congressman Donald Young
Lloyd Jones, Alaska State Senator
Robin Taylor, Alaska State Representative
John Sund, Alaska State representative

Section 3. This Resolution shall become effective on approval.

PASSED AND APPROVED: February 13, 1988

Clifford Jones
President, Wrangell Chamber of Commerce

ATTEST: [signature]
Secretary

U.S.-CANADA FREE TRADE AGREEMENT

SYNOPSIS

THE WHITE HOUSE

Office of the Press Secretary

For Immediate Release January 2, 1988

FACT SHEET

U.S.-CANADA FREE TRADE AGREEMENT

The United States and Canada have entered into a free trade agreement that, if approved and implemented, will take effect on January 1, 1989. The agreement will:

- Eliminate all tariffs on bilateral goods trade within 10 years of implementation;
- Reduce nontariff trade barriers;
- Establish principles for the conduct of bilateral trade in services;
- Establish rules for the conduct of bilateral investment;
- Resolve many outstanding bilateral trade issues;
- Enhance the energy and national security of the two countries;
- Facilitate business travel; and
- Establish a timely bilateral dispute settlement mechanism.

Economic Implications

Each year the U.S. and Canada exchange more goods and services than any two countries in the world. Bilateral trade in goods and services exceeded $150 billion in 1986.

The elimination of tariffs and most other barriers to trade between the two countries will increase economic growth, lower prices, expand employment and enhance the competitiveness of both countries in the world marketplace.

Chronology of the Negotiation

- In March 1985, President Reagan and Prime Minister Mulroney asked their trade officials to explore ways to reduce and

MORE

eliminate existing barriers to trade between the U.S. and Canada.

- On September 26, 1985, Prime Minister Mulroney formally requested that the U.S. and Canada examine the potential for negotiating a comprehensive free trade agreement.

- On December 10, 1985, President Reagan notified the Congress of his intent to enter into bilateral negotiations with Canada using "fast track" procedures.

- On June 17, 1986, U.S. and Canadian negotiators on the free trade area met for the first time in Ottawa.

- On October 3, 1987, President Reagan notified Congress of his intent to enter into a free trade agreement with Canada.

- On December 9, 1987, U.S. and Canadian negotiators initialled a final text of the agreement.

- On January 2, 1988, President Reagan and Prime Minister Mulroney signed the final text of the agreement.

The Fast Track

Section 102 of the Trade Act of 1974 authorizes the President to enter into bilateral free trade agreements and to have the Congress approve them on a "fast track" basis. Section 102 authority expires at midnight on January 2, 1988.

In order for a bilateral agreement to qualify for fast track consideration, several conditions must be met:

- The negotiation must be requested by the foreign country;

- The President must notify the House Ways and Means and Senate Finance Committees of the negotiations, giving them 60 legislative days advance notice:

- The President must notify the Congress of his intent to enter into an agreement 90 days before doing so.

After entering into an agreement, the President must submit it to Congress, along with a draft implementing bill, a statement of any administrative action proposed to implement the agreement, an explanation of how the bill or statement changes or affects existing law and a statement of reasons why the agreement serves the interests of U.S. commerce and why the bill and proposed action are required and appropriate.

MORE

The implementing bill is introduced in both Houses of Congress on the day it is submitted and is referred to the committees of jurisdiction. House committees have 45 days in which the House is in session to report the bill; they are discharged automatically from further consideration after that period. The House votes within 15 days in session after the measure has been received from the House committees.

After receiving the bill from the House, the Senate committees have 15 days in which the Senate is in session to report the bill; they are discharged automatically from further consideration after that period. The Senate votes within 15 days in session after the measure has been received from the Senate committees.

Amendments to the bill are not in order. A simple majority of each House is required for approval.

# # #

(9) "revenue fund" means the International Airports Revenue Fund created by AS 37.15.430. (§ 1 ch 149 SLA 1972)

Revisor's notes. — Reorganized in 1988 to alphabetize the defined terms.

Article 4. Toll Facilities Revenue Bonds.

Section	Section
610. Bond authorization	690. Bond negotiability
620. Construction fund	700. Refunding
630. Revenue fund	710. Bonds as legal investments
640. Bond redemption fund	720. State toll facilities
650. Bond terms	730. Review of toll facility projects
660. Bond resolution	740. Toll facility charges
670. Enforcement by holder	750. Statutory construction
680. Amounts required for payments	760. Definitions

Sec. 37.15.610. Bond authorization. For the purpose of providing part or all of the money to be used, with or without any grants or other money that may become available, the issuance and sale of revenue bonds of the state in the total principal sum of not to exceed $500,000,000 is authorized to acquire, construct, equip, and install the additions, improvements, extensions, and facilities authorized in AS 37.15.720 and 37.15.730. The principal of and interest on these bonds are paid out of and secured by the gross revenue derived by the state from the ownership, use, and operation of the toll facilities, and out of any other revenue or money that the state legislature may provide exclusive of any state tax or license. Bonds may not be issued to assist in the acquisition, financing, or operation of projects without prior approval from the legislature. (§ 1 ch 162 SLA 1984)

Sec. 37.15.620. Construction fund. (a) The toll facilities construction fund is established for deposit of proceeds of the sale of the bonds authorized by AS 37.15.610 and any grant or other money that is legally provided for the same purposes for which the bonds are authorized except for any accrued interest paid on the bonds by the purchaser. The money in the construction fund is used to pay the cost of acquiring, constructing, and equipping facilities authorized in AS 37.15.720 and 37.15.730 and costs incidental to those activities, including costs of the authorization, issuance, and sale of the bonds. To the extent allowed in the bond resolution, money in the construction fund may also be used for the payment of interest on the bonds during the time of actual construction, and for any additional time, not exceeding one year after construction is completed. Money in the construction fund may also be transferred to the bond redemption fund, as permitted by the bond resolution, to establish a reserve for the payment of the principal and interest on the bonds.

(b) The bond resolution may provide for the investment of money in the construction fund as the committee determines. The interest earned upon or any profit derived from the sale of the investment is deposited in the construction fund. (§ 1 ch 162 SLA 1984)

Sec. 37.15.630. Revenue fund. (a) The toll facilities revenue fund is established and shall be set apart from all other money of the state. The toll facilities revenue fund is a trust fund for the purposes under AS 37.15.610 — 37.15.760, where all revenue, fees, tolls, charges, and rentals are deposited that are derived by the state from the ownership, lease, use, and operation of the facilities authorized by AS 37.15.720 and 37.15.730. The revenue, fees, tolls, charges, and rentals may not include the proceeds of any state tax or license. The money in the revenue fund may only be used to

(1) pay or secure the payment of the principal of and interest on the toll facilities bonds and principal of and interest on any other revenue bonds issued by authorization of the legislature to provide money to acquire, construct, and equip facilities authorized by AS 37.15.720 and 37.15.730 and to be payable out of the revenue fund;

(2) pay the normal and necessary costs of maintaining and operating the facilities acquired, constructed, or equipped under AS 37.15.610 — 37.15.760;

(3) pay the costs of renewals, replacements, and extraordinary repairs to facilities acquired, constructed, or equipped under AS 37.15.610 — 37.15.760;

(4) redeem before their fixed maturities any and all revenue bonds issued for the purpose of acquiring, constructing, and equipping facilities authorized by AS 37.15.720 and 37.15.730;

(5) provide money to acquire, construct, and equip necessary additions and improvements to facilities authorized by AS 37.15.720 and 37.15.730; and

(6) provide money to pay any and all other costs relating to the ownership, use, and operation of the facilities.

(b) The investment of money in the revenue fund may be made as the committee determines. The interest earned upon or any profits derived from the sale of an investment under this subsection shall be deposited in the revenue fund. (§ 1 ch 162 SLA 1984)

Sec. 37.15.640. Bond redemption fund. The toll facilities revenue bond redemption fund is established for deposit in trust of money for paying and securing the payment of principal of and interest and redemption premium, if any, on bonds and is set apart from all other money of the state. The committee, on behalf of the state, shall obligate the state to set aside and pay into the bond redemption fund from the revenue fund an amount of money sufficient to pay the principal of and interest and redemption premium, if any, on the bonds as the

payments become due and, if the committee considers it necessary, to set aside and maintain a reserve for this purpose. The bond redemption fund is drawn upon for the purpose of paying the principal of and interest and redemption premium, if any, on the bonds, and the bonds do not constitute a general obligation of the state. (§ 1 ch 162 SLA 1984)

Sec. 37.15.650. Bond terms. (a) The toll facilities bonds are sold in the amounts or series and at the time as determined by the committee. Before selling a series of bonds, the committee shall give notice inviting sealed bids. If satisfactory bids are received, the bonds offered for sale are awarded to the highest responsible bidder. If the committee determines that a bid received is not satisfactory as to price or responsibility of the bidder, the committee may reject the bid received. Bonds, or a series of bonds, may not be sold if the effective interest rate over the life of the bonds exceeds 11 percent per year or that rate of interest that is 125 percent of the rate of the Bond Buyer Index of 20 Municipal Bond Average Yields for the week previous to the date of sale of the bonds, whichever is higher. Interest is payable annually or semiannually.

(b) The bonds mature at the time fixed by the committee. The bonds may be subject to redemption before their fixed maturities as determined by the committee and with the premium fixed by the committee, but a bond may not be subject to redemption before its fixed maturity date unless the right to redeem that bond is expressly mentioned on the face of the bond. The bonds

(1) may be in denominations determined by the committee;

(2) may be issued in coupon form or in fully registered form, and may be registrable as to principal or both principal and interest, all under regulations and conditions the committee provides;

(3) are payable as to principal and interest at the place determined by the committee;

(4) shall be signed on behalf of the state by the governor and shall be attested to by the lieutenant governor, both of which signatures may be facsimile signatures, and each of the interest coupons attached to them shall be signed by the facsimile signatures of these officials;

(5) shall have the seal of the state impressed, printed, or lithographed on them; and

(6) shall be issued under and subject to the terms, conditions, and covenants, providing for the payment of the principal of and interest on the bonds and the other terms, conditions, covenants, and protective features safeguarding this payment and relating to the maintenance, operation, and improvement of the toll facilities as found necessary by the committee, which covenants may include a provision requiring the setting aside and maintenance of certain reserves to secure the payment of the principal and interest.

(c) If found reasonably necessary, the committee may select a trustee or trustees for the holders of the bonds or any series of the bonds, for the safeguarding and disbursement of any of the money in any of the funds created by AS 37.15.620, 37.15.630, and 37.15.640, or for the duties for authentication, delivery, and registration of the bonds as the committee may determine. The committee shall also fix the rights, duties, powers, and obligations of the trustee or trustees.

(d) In the committee's determination of all of the matters and questions relating to the issuance and sale of the bonds and the fixing of the maturities, terms, conditions, and covenants of the bonds as provided in (a) — (c) of this section, the decisions of the committee shall be those found to be reasonably necessary for the best interests of the state and its inhabitants, and those that will accomplish the most advantageous sale of the bonds, with due regard, however, (1) to necessary or normal costs of maintenance and operation; (2) to renewals and replacements of and repairs to the toll facilities; (3) to all improvements to toll facilities and property of toll facilities owned, used, operated, or leased in connection with toll facilities; and (4) to the future growth and expansion of all of the facilities and the possibility of additional revenue bond financing for toll facilities purposes. A decision of the committee, as expressed in any bond resolution, is final when any bonds have been issued under the bond resolution.

(e) A bond resolution may provide that the bonds issued contain a recital that they are issued under AS 37.15.610 — 37.15.760, and any bonds containing this recital are conclusively considered to be valid and to have been issued in conformity with AS 37.15.610 — 37.15.760.

(f) The validity of the authorization and issuance of bonds is not affected by any proceeding for the acquisition or construction of the additions, improvements, or facilities for which the bonds have been issued or by any contract in connection with the acquisition or construction. (§ 1 ch 162 SLA 1984)

Sec. 37.15.660. Bond resolution. The committee is authorized and directed to adopt the bond resolution and prepare all other documents and proceedings necessary for the issuance, sale, and delivery of the bonds or any part or series of them. The bond resolution shall fix the principal amount, denomination, date, maturities, place or places of payment, rights of redemption, if any, terms, form, conditions, and covenants of the bonds or each series of them. The committee shall also determine and provide for the date and manner of sale of the bonds, and shall provide whether the notice of sale is to be published elsewhere in addition to the publication required by AS 37.15.650. (§ 1 ch 162 SLA 1984)

Sec. 37.15.670. Enforcement by holder. The holder of any bonds or the trustee for the holders of the bonds or any series of them, may, by appropriate proceedings in the courts of record of the state, compel the transfer, setting aside, and payment of money and the enforcement of all of the terms, conditions, and covenants as required and provided in AS 37.15.610 — 37.15.760 and in the bond resolution. (§ 1 ch 162 SLA 1984)

Sec. 37.15.680. Amounts required for payments. The committee shall, before December 31 of each year, commencing with the year in which the bonds are issued, certify to the commissioner of revenue and the commissioner of transportation and public facilities the amounts required in the next ensuing calendar year by a bond resolution to be paid out of the revenue fund into the bond redemption fund and to be paid into and maintained in any reserve fund or account or any other fund or account created by a bond resolution. The committee shall also certify to the commissioners the last date upon which payments may be made. (§ 1 ch 162 SLA 1984)

Sec. 37.15.690. Bond negotiability. The bonds and the coupons attached to them are fully negotiable instruments under the laws of the state. (§ 1 ch 162 SLA 1984)

Sec. 37.15.700. Refunding. (a) The bonds or any part of them may be refunded at or before their maturity by the issuance of refunding revenue bonds of the state if in the opinion of the committee refunding is advantageous to and in the best interest of the state and its inhabitants.

(b) The issuance of refunding bonds need not be authorized by an act of the legislature, and the committee shall adopt the resolution and prepare all other documents and proceedings necessary for the issuance, exchange or sale, and delivery of the bonds. All provisions of AS 37.15.610 — 37.15.760 applicable to revenue bonds are applicable to the refunding bonds and to the issuance, sale, or exchange of the bonds, except as otherwise provided in this section.

(c) Refunding bonds may be issued in a principal amount sufficient to provide money for the payment of all bonds to be refunded by them, and, in addition, for the payment of all expenses incident to the calling, retiring, or paying of the outstanding bonds, and the issuance of the refunding bonds. These expenses include the difference in amount between the par value of the refunding bonds and any amount less than par for which the refunding bonds are sold, any amount necessary to be made available for the payment of interest on the refunding bonds from the date of sale of them to the date of payment of the bonds to be refunded or to the date upon which the bonds to be refunded will be paid under the call of the bonds or agreement with the holders of

them, and the premium, if any, necessary to be paid in order to call or retire the outstanding bonds and the interest accruing on the outstanding bonds to the date of the call or retirement. (§ 1 ch 162 SLA 1984)

Sec. 37.15.710. Bonds as legal investments. Toll facilities bonds are legal investments for all banks, trust companies, savings banks, savings and loan associations, and other persons carrying on a banking business, all insurance companies and other persons carrying on an insurance business, and all executors, administrators, trustees, and other fiduciaries. The bonds may be accepted as security for deposits of all money of the state and its political subdivisions. (§ 1 ch 162 SLA 1984)

Sec. 37.15.720. State toll facilities. The state is authorized to acquire, construct, equip, and maintain toll bridges, tunnels, highways, roads, crossings, and causeways found to be necessary by the commissioner of transportation and public facilities. (§ 1 ch 162 SLA 1984; am § 2 ch 165 SLA 1988)

Effect of amendments. — The 1988 amendment inserted "tunnels."

Sec. 37.15.730. Review of toll facility projects. A toll facility may be financed under AS 37.15.610 — 37.15.760 if the following conditions are met for that toll facility:

(1) the department submits to the governor and the legislature a feasibility study that finds that the toll facility is financially feasible and able to produce revenue adequate to repay the bonds with which it is financed;

(2) if financing in addition to revenue bonds is required to finance the toll facility, the department submits to the governor and legislature a finance plan that includes an estimate of the total cost of the toll facility and a description of the sources of money that will be used to finance the total cost of the toll facility; and

(3) the office of management and budget reviews the feasibility study and the finance plan, if required, and reports its findings and recommendations to the governor and legislature not later than 90 days after the study and plan are received by the office. (§ 1 ch 162 SLA 1984; am § 3 ch 165 SLA 1988)

Effect of amendments. — The 1988 amendment rewrote the catchline, which read "Knik Arm Crossing," rewrote the introductory language, which read "Notwithstanding the provisions of AS 37.15.720 the first state toll facility to be financed under AS 37.15.610 — 37.15.660 is the Knik Arm Crossing near Anchorage if the following conditions are met," substituted "toll facility" for "crossing" in paragraph (1) and, in paragraph (2), substituted "required to finance the toll facil-

ity" for "anticipated," "that includes" for "to include," and "cost of the toll facility" for "cost of the project" twice.

Sec. 37.15.740. Toll facility charges. The commissioner of transportation and public facilities shall fix and collect the fees, charges, tolls, and rentals derived by the state from the ownership, lease, use, and operation of the facilities authorized by AS 37.15.720 and 37.15.730 and improvements of the facilities as will provide revenue sufficient to comply with all of the covenants of the bond resolution. (§ 1 ch 162 SLA 1984)

Sec. 37.15.750. Statutory construction. AS 37.15.610 — 37.15.760 shall be liberally construed in order to carry out the purposes for which the provisions were enacted, and all existing laws in conflict with AS 37.15.610 — 37.15.760 are superseded as necessary to accomplish the purposes of AS 37.15.610 — 37.15.760. (§ 1 ch 162 SLA 1984)

Sec. 37.15.760. Definitions. In AS 37.15.610 — 37.15.760, unless the context requires otherwise

(1) "bond redemption fund" means the toll facilities revenue bond redemption fund created by AS 37.15.640, including any accounts that are created in that fund after October 4, 1984;

(2) "bond resolution" means the resolution authorizing the issuance of bonds, adopted by the committee under AS 37.15.660;

(3) "bonds" means the toll facilities revenue bonds authorized by AS 37.15.610 — 37.15.760;

(4) "committee" means the state bond committee created by AS 37.15.110, or any other committee, body, department, or officer of the state that or who succeeds to the rights, powers, duties, and obligations of the state bond committee by act of the legislature;

(5) "construction fund" means the toll facilities construction fund created by AS 37.15.620;

(6) "revenue fund" means the toll facilities revenue fund created by AS 37.15.630;

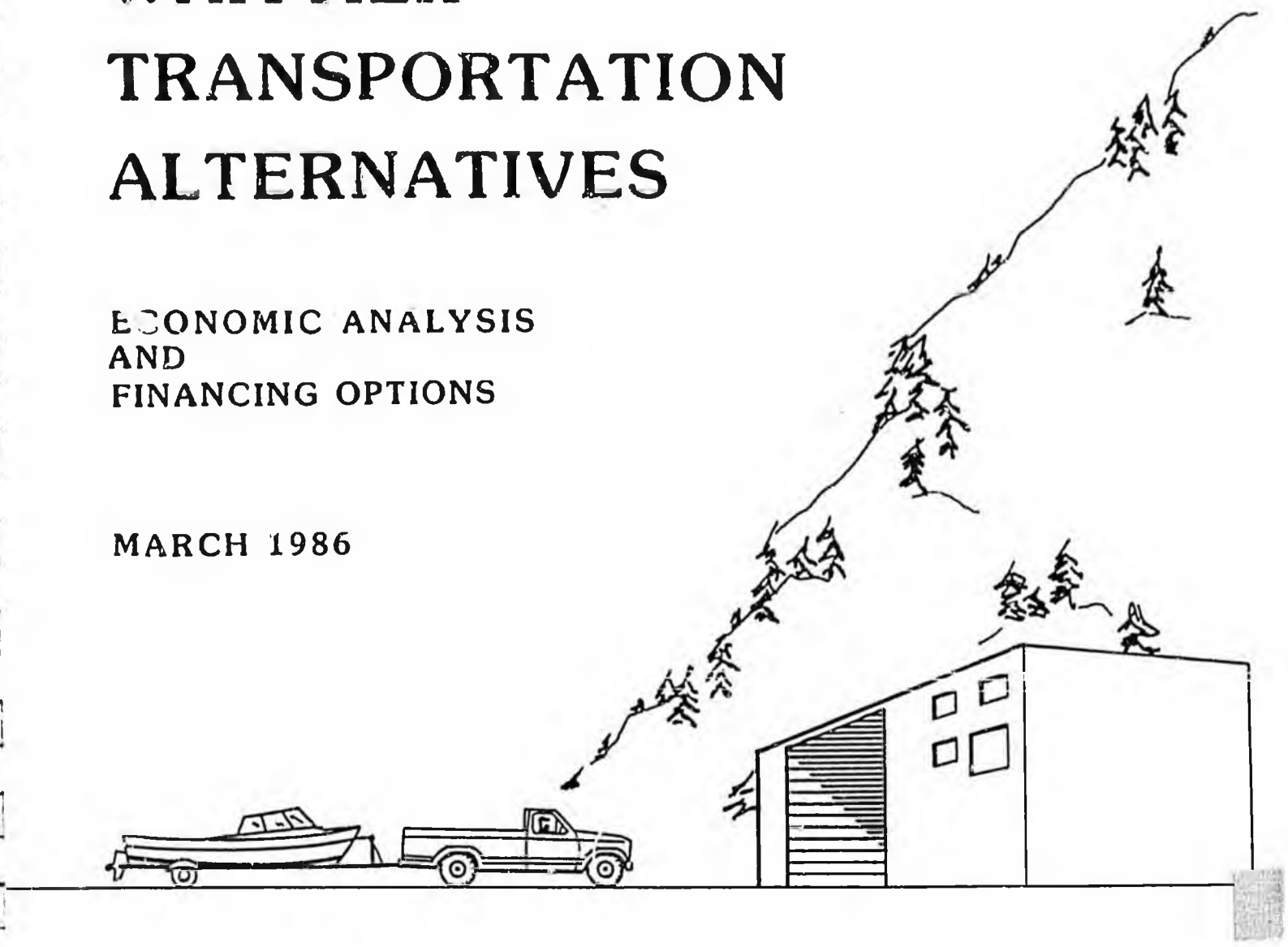
(7) "toll facilities" means highways, roads, bridges, tunnels, crossings, and causeways upon which tolls, charges, rentals, or other user fees are placed by the commissioner of transportation and public facilities. (§ 1 ch 162 SLA 1984; am § 4 ch 165 SLA 1988)

Effect of amendments. — The 1988 amendment inserted "tunnels" in paragraph (7).

WHITTIER TRANSPORTATION ALTERNATIVES

ECONOMIC ANALYSIS AND FINANCING OPTIONS

MARCH 1986



STATE OF ALASKA

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

TAMS

TIPPETTS-ABBETT-McCARTHY-STRATTON ■ ENGINEERS
A PROFESSIONAL CORPORATION
ALASKA

Alternative 2 - Single Lane Joint Use Tunnel, Bear Valley to Whittier

As illustrated in Figure 2-2, this alternative would provide direct vehicular access to Whittier through the construction of a road to Bear Valley and by improving the existing Passage rail tunnel. All passenger/vehicle movements would be carried out using automobiles and motorcoaches. Rail activity would be limited to freight transport.

Direct access via a joint use one lane tunnel has been evaluated several times in the past, most recently in the 1985 "Whittier Access Road Tunnel Feasibility Study" (ref. 22).

Major system elements required for this alternative include:

1. Construction of a roadway from Portage to Bear Valley.

2. Construction of a roadway within the Portage tunnel to accommodate rubber tired vehicles.

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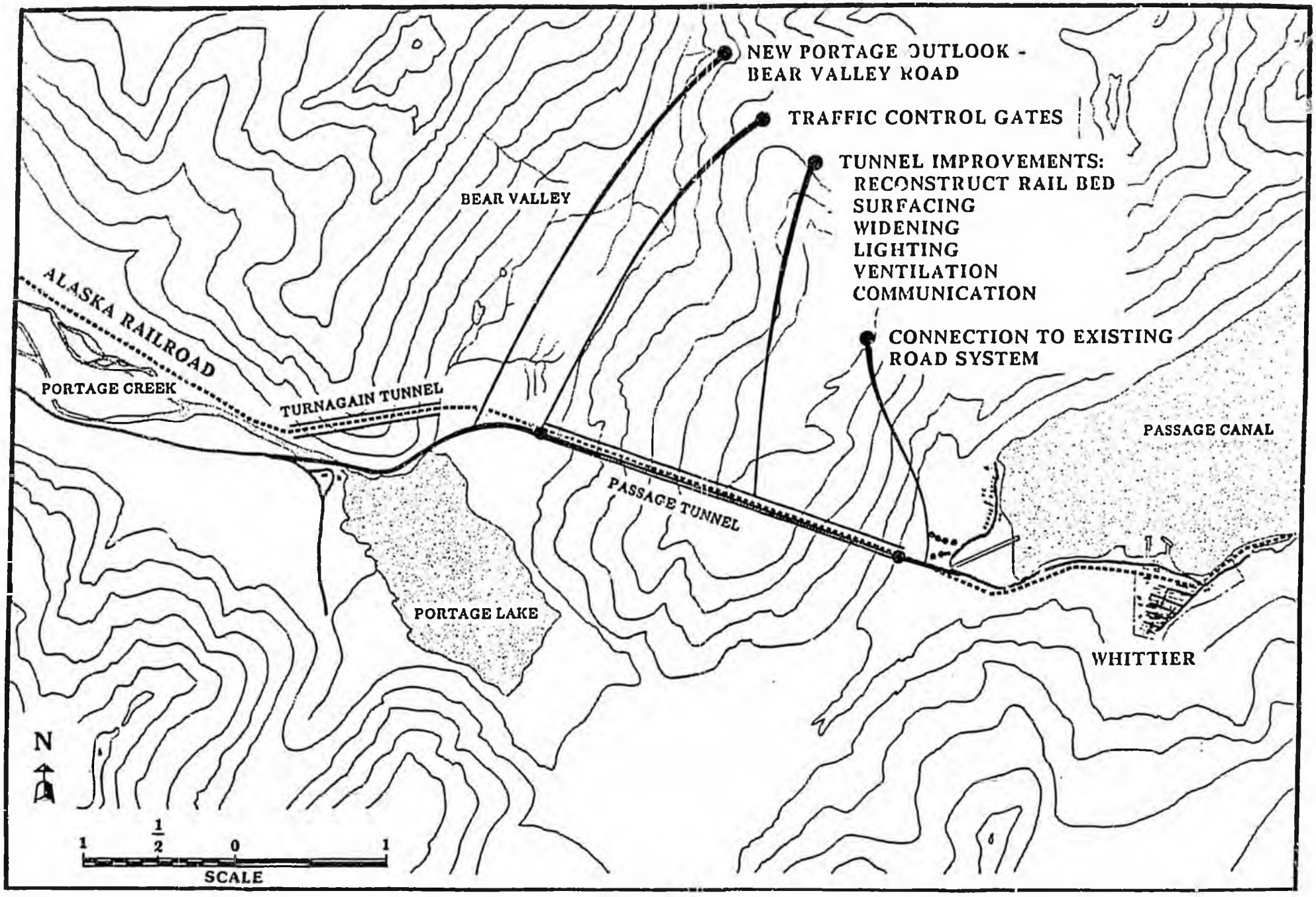
* Cost estimates provided by the Alaska Railroad.



ALTERNATIVE 2
One - Way Joint Use of Passage Tunnel,
New Road to Bear Valley

TAMS

FIGURE 2-2

3. Excavation of the Passage tunnel to accommodate necessary ventilation equipment and emergency turnout lanes.

4. Additional safety features such as lighting, signing, traffic signals and barriers, fire alarm and protection equipment, and emergency phones.

5. Grouting, lining, and insulating the tunnel to prevent water leakage and ice build-up during the winter months.

Road to Bear Valley. The Bear Valley road would extend vehicular access to Bear Valley from the current road serving the Portage Glacier Visitors Center. Several alignments were evaluated in the 1983 "Whittier Access Road Location Study Report" (ref. 2), traversing a route from approximately 3,600 feet west of the Portage Glacier Visitors Center to a new parking/staging area about 1,900 feet southwest of Portal Door No. 2 (the west portal of the Passage tunnel).

All alignments included crossings of both Portage and Placer creeks. The route segment between the creek crossings was the same for all alternatives evaluated, and included an alignment which parallels the shore of Portage Lake. Extensive rock cuts (up to a maximum of about 150 feet) would be required along that segment, which traverses a steep rock slope.

Tunnel Improvements. A roadway must be built within the tunnel to allow passage of rubber-tired vehicles. Two basic tunnel configurations have been identified for development of the joint use facility. The least costly would be to leave the tunnel width essentially unchanged (14 1/2 feet), and to provide emergency turnouts at regular intervals (ref. 14). To further decrease the risk of tunnel blockage and to provide emergency

access a second option would be to enlarge the width of the tunnel to include a full width shoulder (ref. 22). Both options would require increasing the height of the tunnel to install ventilation equipment while at the same time providing the minimum clearances needed for train cargo.

Widening the tunnel to provide a continuous shoulder will add significantly to the initial construction cost. Prior to final selection of an alternative careful consideration must be given to the operational requirements and emergency response characteristics needed to ensure public safety.

The tunnel may require grouting and insulation to prevent potential groundwater and icing problems.

Safety items such as ventilation, lighting, and traffic control systems would be needed to ensure passenger comfort and safety, and to provide for smooth traffic flow within the tunnel system.

Potential negative impacts may include:

- Significant delays arising from disabled vehicles in the restricted-width tunnel.
- Hazardous situation due to one lane roadway and fire potential.
- Increased owner/operator liability when compared to other alternatives that do not incorporate single lane reversing traffic operations or joint rail/vehicle tunnel use.
- Train traffic would be disrupted or stopped during construction.
- Disruption of traffic flow for train movements.

Capital Costs. Alternative route alignments considered for the Portage-Bear Valley road range in cost from $10.6 to $17.8 million (August 1983 dollars, ref. 2). Cost differentials in the alignments considered were due primarily to the selection of location and type of bridge crossings over Portage and Placer creeks. All alignments provide essentially the same level of service, with only relatively minor differences in environmental impact. Consequently, for this analysis the least-cost alternative has been assumed to be acceptable.

As indicated above, substantial modifications to the tunnel will be required to provide for joint vehicle/rail use. The cost of tunnel improvements which included widening only for periodic turnouts, as previously described, were estimated in 1981 to be $20,000,000 (ref. 14). A more recent analysis (1985) recommended full-length widening of the tunnel, resulting in an estimated cost of $102.7 million (ref. 22).

An evaluation of the public safety considerations inherent in each of the design alternatives is beyond the scope of this study. Consequently, the range of development costs is presented, with the upper and lower figures representing the options as described above.

Another issue that has been recently discussed is the potential for using the existing pipeline tunnel as a plenum for the tunnel ventilation system. The pipeline tunnel parallels the rail tunnel, and it has been suggested that significant cost savings could be realized by eliminating the excavation needed to provide ventilation space in the rail tunnel. Since a detailed engineering analysis of the pipeline tunnel proposal would be required to ensure that it would provide a safe and effective means of ventilation, this study includes the cost of enlarging the rail tunnel and installing ventilation equipment as previously proposed.

Estimated construction costs for the system elements are summarized in Table 2-1.

TABLE 2-1
Estimated construction Costs, Alternative 2

Item	Estimated Cost ($)*	Source	Date	Updated Cost ($)
Low-cost tunnel improvement alternative:				
Portage-Bear Valley Rd.	$ 10,600,000	ref.2	Aug '83	$ 10,800,000
Tunnel improvements	$ 20,000,000	ref.14	Mar '81	$ 24,800,000
			TOTAL	$ 35,600,000
Full-length tunnel widening alternative:				
Portage-Bear Valley Rd.	$ 10,600,000	ref.2	Aug '83	$ 10,800,000
Tunnel improvements	$102,700,000	ref.22	July '81	$102,700,000
			TOTAL	$133,500,000

* Estimates include engineering, administration, and construction costs

Source: TAMS Engineers

Operating and Maintenance Costs. Operation of the joint use tunnel will require significant annual outlays for staffing, energy use, equipment maintenance, and spare parts and materials. Total annual costs are estimated at $1,450,000 (1985 dollars, ref. 22). Some additional expense will be required to maintain the Portage-Bear Valley road; this cost will be minimal in relation to the tunnel operating costs, and is neglected for this analysis.

CHAPTER 3
HISTORICAL AND PROJECTED TRAFFIC

CURRENT TRAFFIC

The Alaska Railroad keeps historical records of passenger and auto traffic between Portage and Whittier. As illustrated in Table 3-1, traffic counts between 1979 and 1985 have increased each year. The most drastic changes in passenger and auto ridership were in 1983 and 1985. The underlying cause of the recent jump in recorded ridership was that prior to 1985, cruise ship passengers were transferred from Whittier to Anchorage by chartered train service, and thus were not recorded with the shuttle service between Portage and Whittier.

TABLE 3-1
Portage to Whittier Shuttle Traffic
Historical Data

	Passengers	Annual % Change	Total Vehicles	Annual % Change	Total* Passengers	Annual % Change
1979	68,691		16,039		84,730	
1980	71,131	3.55%	16,226	1.17%	87,357	3.10%
1981	75,519	6.17%	17,879	10.19%	93,398	6.92%
1982	77,665	2.84%	17,784	-0.53%	95,449	2.20%
1983	98,224	26.47%	19,516	9.74%	117,571	23.18%
1984	100,351	2.17%	19,779	1.35%	120,130	2.18%
1985**	125,250	24.81%	21,878	10.61%	147,128	22.47%
Average Annual Traffic Growth '80-'85		11.98%		6.16%		10.99%

* Total Passengers means passengers plus vehicles. Vehicle drivers are not counted with passengers.
** Estimated. December 1984 ridership was used to calculate total 1985 ridership.
Source: Data: Alaska Railroad
Table: TAMS Engineers

FACTORS INFLUENCING FUTURE TRAFFIC

Future traffic levels to and from Whittier will be influenced by several factors including: community development plans by the City of Whittier; the possible construction of a new harbor facility at Shotgun Cove; a growing population base; increases in tourism and cruise ship activity; and the completion of the Begich, Boggs Visitor Center at Portage Lake. Each of these factors is discussed in more detail below.

Land Ownership Trends

Over the past 15 years, patterns of land ownership in Whittier have changed from a single landholding by the U.S. government to several major landowners. With the prospect of a number of land grants and a City land disposal program, land ownership trends can be expected to dramatically change in the years to come.

State of Alaska. The State of Alaska is presently the major landowner in Whittier. The federal government transferred title to 5,205 acres of land to the State through provisions of a 1983 National Forest Community Grant Selection. Most of this land is located in the Shotgun Cove area. One hundred acres of this land grant will be transferred to Chugach Alaska Corporation, and another unspecified amount will be transferred to the City of Whittier. With the January 1985 transfer of the Alaska Railroad from the Federal Government to the State of Alaska, the valuable railroad lands concentrated in the Whittier core area and the West Camp Delta also came under State ownership.

Chugach Alaska Corporation. In December 1982, Chugach Alaska Corporation received titlement lands through the Alaska Native Claims Settlement Act and became the third largest landowner in Whittier. The corporation made two selections, one for 400 acres at the east of the Whittier core area, and one for 100 acres near the site of the proposed Shotgun Cove Harbor.

City of Whittier. The City of Whittier has always been a minor landowner in Whittier. Currently, the only land the City has title to is a few small parcels in the Whittier cove area which were purchased when the U.S. Army deactivated its Whittier operations. Most of the federal land originally purchased by the city was subsequently sold following its incorporation in 1971, in an effort to raise revenues and encourage residential development.

In 1984, state legislation was enacted to transfer 600 acres of the lands received from the federal land grant to the City of Whittier. Consequently, the City of Whittier will receive 200 acres of land in the Whittier subdivision, and 400 acres from the Shotgun Cove area. A provision of the legislation is that lands not needed for public purposes must be disposed of by the City within ten years.

Private Landholdings. A total of 250 acres of land in Whittier are owned by private landholders, excluding Chugach Alaska Corporation. Most of these lands are located in the West Camp Delta, the Whittier Cove area, and near the Shotgun Cove area.

Although the City's lands at the Shotgun Cove harbor site will be used for public service use, much of the land from the 600-acre State land grant will probably not be retained for public use. The City is in the process of developing a land disposal program, and has developed general guidelines for the disposal of lands in the Whittier and Shotgun Cove Subdivisions. It is expected that a significant amount of these lands will become available for purchase by private owners for residential development.

Goals and Policies for Future Development

The City's general goals for community growth are to encourage a limited rate of growth that maintains and enhances Whittier's small-town, marine-oriented character, and to protect and enhance the natural features, environment, and scenic beauty of the community (ref. 11). The City also plans to encourage the expansion of marine/onshore recreation opportunities, the commercial fishing industry, tourism, commercial business, locally-preferred industries, residential development, and to work with state and federal agencies, and the Chugach Alaska Corporation to encourage community development.

Shotgun Cove Harbor Development Plans

One of the primary attractions of Whittier is its access to Passage Canal and Prince William Sound. Whittier has one small boat harbor which is predominantly used by recreational boaters. Currently, all existing slips at the harbor are permanently assigned to boat owners and there is an extensive waiting list.

The City has issued a funding request to the Alaska State Legislature for development of a small boat harbor at Shotgun Cove, and completion of the Shotgun Cove Road to provide access to the harbor site. The City regards construction of the harbor and access road as key to Whittier's economic future, and has made this project its highest-priority funding request.

The U.S. Army Corps of Engineers (COE) is currently examining alternative sites in Shotgun Cove for the proposed boat harbor. Projections of future demand for harbor facilities are summarized as follows:

Existing Harbor Demand. The existing Whittier Small Boat Harbor has a total of 332 permanent berthing slips. Essentially all

available harbor slips are rented to year-round berth holders, most of whom own private recreational craft, while a smaller portion own commercial fishing or charter vessels. Over 90 percent of the permanent berth holders reside within the boundaries of the Municipality of Anchorage, while the remaining 10 percent live in Palmer, Whittier, Soldotna, and various other locations.

There are currently 210 vessel owners on the waiting list for permanent harbor moorage space at the Whittier Small Boat Harbor. More than 85 percent of these wait-listed vessels are recreational boats, while the remaining 15 percent are commercial vessels.

An estimated waiting time of 5 to 7 years for permanent moorage space has served as a strong disincentive for prospective wait-listed boats. For this reason, the COE has estimated the actual number of vessel owners desiring moorage space at the harbor as 350 rather than the 210 on the wait-list.

The harbor is designed to accommodate 20 to 30 transient vessels, depending on size. However, as many as 250 vessels have been recorded at one time at the transient float.

In 1984, a total of 506 transient vessels were recorded to have used Whittier harbor facilities. Most of this use occurred from May to September during the summer recreational and salmon fishing season. Approximately 60 percent of the transient vessels were commercial fishing boats, while the remaining 40 percent were recreational boats.

Future Recreational Vessel Demand. The primary factor influencing future regional demand for recreational moorage was determined to be population growth in the Municipality of Anchorage, the Matanuska-Susitna Borough, and the Kenai Peninsula Borough. Population projections for these areas are summarized in Appendix A.

Preliminary COE studies of the proposed Shotgun Cove Boat Harbor indicate that only two harbors in the Anchorage-Kenai Peninsula area (Homer and Seward) compete with Whittier facilities. Using projected regional population growth, driving distances, and current or planned moorage at Homer, Seward, and Whittier, the COE study concluded that 672 new vessel slips would be needed in Whittier by the year 2000.

Because the Shotgun Cove Harbor site provides ample opportunity for future expansion, the COE recommendation is that only 50 percent of the long-term future demand (336 spaces) be considered for present near term development planning.

The fleet composition of future vessels and geographic distribution of owner's residences is assumed to be similar to present users of the Whittier Small Boat Harbor.

Charter and Commercial Fishing Vessel Demand. In addition to recreational vessel use, there are currently 18 marine charter boats and 18 commercial fishing vessels using the Whittier Small Boat Harbor. The COE study indicated that approximately 15 new charter boats would be expected to commence operation at the new harbor during its first year of operation, with another 10 vessels commencing operation during the following five-year period. Furthermore, approximately 25 additional commercial fishing vessels are expected to use harbor facilities if additional space becomes available.

Estimates of all existing and future vessel moorage demands in Whittier are summarized in Table 3-2.

Preliminary plans by the Corps for initial harbor design considerations thus are based on projected requirements for 826 new slips (the difference between the aggregate moorage demand of 1,158 and total existing moorage space of 332). The anticipated slip demand through the year 2010 includes an additional 336 slips for a total of 1,162 new slips.

TABLE 3-2

Summary of Vessel Moorage Demands

For Initial Phase of Shotgun Cove Harbor Development

1985-2010

	Recreational	Commercial	Charter	Total
Existing Full-Time	296	18	18	332
Existing Wait-Listed	302	48	--	350
Existing Transient	40	60	10	100
Future	336*	25	15	376
Total	974	141	43	1,158

* Figure shown is 50 percent of the total estimated recreational demand to be served in Whittier.

Source: U.S. Army Corps of Engineers

Population Needs

Whittier's population as of 1984 was 273 (ref. 11). Historically the resident population has fluctuated widely, mostly reflecting the extent of military involvement in the community. As is illustrated in Table 3-3, the community was established in the early 1940's and has fluctuated in population from 130 to 809 between census recording periods.

TABLE 3-3

Historical Whittier Population

Year	Population	
1939	0	
1950	627	
1960	809	
1970	130	
1980	198	
1982	211*	
1983	263*	24.6%
1984	273*	3.8%

* revenue sharing estimates

Source: City of Whittier Community Comprehensive Plan, Draft, Nov. 1984 with updated editing.

Currently, Whittier residents are primarily dependent upon access to Anchorage for groceries, medical care, and other consumer products and services. Although Whittier has some consumer service businesses including two hotels, two restaurants, seasonal eateries, and two small general stores, trips to Anchorage are required for major purchases of consumer goods.

Population projections for the community, shown in Table 3-4, have been recently prepared by the Alaska Department of Community and Regional Affairs. The projections are based on an assumed annual net growth rate of 7.5 percent.

TABLE 3-4

Projected population, City of Whittier

Year	Population	Year	Population
1986	363	1997	806
1987	390	1998	866
1988	419	1999	931
1989	450	2000	1,001
1990	484	2001	1,076
1991	520	2002	1,157
1992	559	2003	1,244
1993	601	2004	1,337
1994	649	2005	1,437
1995	698	2006	1,544
1996	750	2007	1,660

Source: State of Alaska, Department of Community & Regional Affairs, January 1986.

Projected Tourism Increases

Results of the Alaska Traveler Survey and Visitor Industry Analysis 1983, conducted by the State Division of Tourism, indicated that 649,960 visitors came to Alaska between October 1982 and September 1983. Two-thirds of these visitors spent some time in Anchorage.

The Division of Tourism estimates that the number of people visiting the state since the 1983 study has increased by 7 percent annually to approximately 691,200 in 1984 and 740,000 in 1985. Similarly, a 5 to 7 percent increase in the number of statewide visitors has been projected for 1986.

According to the Anchorage Convention and Visitor's Bureau (ACVB), the number of non-Anchorage residents visiting Anchorage increased by 5.5 percent from 787,400 in 1983 to 830,700 in 1984. A similar increase has been estimated by ACVB for 1985. The 1984 Anchorage Visitors Study conducted by ACVB indicated that 44 percent of the summer 1984 visitors went to Portage Glacier during their visit, and 32 percent visited the Kenai Peninsula area. However, only 9 percent of the summertime visitors went to Prince William Sound, an indication of Whittier's current role as a transfer point rather than a stopover destination for most visitors.

Although Whittier's existing facilities lack the capacity for much increased use, tourism is viewed as a major sector of the local economy. The City of Whittier has adopted policies to encourage increased tourism by: 1) having Whittier recognized as a short-term and overnight stopover point for cruise ship, ferry and railroad tourist passengers, and 2) expanding marine-oriented recreational opportunities through the construction of Shotgun Cove Harbor, the development of Decision Point as a Marine Park, and increasing the number of charter boat services.

Future tourism increases at Whittier, generated by the expansion of cruise ship activity and the completion of the Begich, Boggs Visitor Center at Portage, are discussed in the following sections.

Cruise Ship Activity

In June 1983, Whittier became the northern termination point for the Tour Alaska cruise ship, Cunard Princess. The cruise ship docks at Whittier following its voyage north from Seattle through southeast Alaska's inside passage. After disembarking in Whittier, passengers board the Alaska Railroad to tour Anchorage and make optional trips to Portage, Turnagain Arm, Mount McKinley, and Fairbanks. Since the Cunard Princess' first 9 landings in 1983, two new cruise ship lines have begun landing their ships in Whittier: French Pacquet's Rhapsody, and World Explorer Cruise's Universe, for a total of 26 cruise ship calls to Whittier in 1985 (a 188.8 percent increase over 1983). Each ship's ridership during 1985 is discussed in more detail below:

S/S Rhapsody. Discussion with marine operation personnel at Pacquet French Cruises, Inc. indicated that the Rhapsody's presence in the 1985 season generated a total of 9000 one way trips between Anchorage and Whittier. The company expects to be carrying 25 percent more passengers, generating approximately 11,200 one way trips between Anchorage and Whittier in 1986. The expected increase in passengers translates into 85 percent capacity ridership for the Rhapsody.

M/V Cunard Princess. During the 1985 summer season, the Cunard Princess generated roughly 1000 one-way transfers between Anchorage and Whittier per call, according to the Alaskan Maritime Agency in Whittier. In addition, it was noted that the M/V Cunard Princess was often near capacity (700 passengers with 800 capacity), but that on average 500 passengers left the boat and that roughly the same number of new passengers arrived from Anchorage.

S/S Universe. Marketing personnel with World Explorer Cruises indicated that 3,411 passengers from the Universe rode the Alaska Railroad between Portage and Whittier in 1985, indicating

that the Universe was operating on average at 88 percent capacity. Most Universe passengers ride the train to Anchorage with no stop over in Portage, although the cruise line does provide that option for passengers.

Regency. Traffic in 1986 will also be augmented by the addition of a new ship, the Regency, calling in Whittier. The Regency is a 708 passenger luxury liner that is expected to call in Whittier 9 times in the 1986 summer season. As with the M/V Cunard Princess and the S/S Rhapsody, Whittier will serve as a turnaround point, so that the Regency will be unloading 9 sets of passengers who will travel to Anchorage to fly home, and will be picking up 9 sets of passengers in Whittier to begin their trip. Transfers of these passengers between Whittier and Anchorage will be by the train to Portage and then by bus to Anchorage.

Begich, Boggs Visitor Center

Construction of the new Begich, Boggs Visitor Center in the Portage Glacier Recreation Area started in 1984 and is scheduled for completion in 1986. The 13,600 square foot center, which will accommodate up to 400 people at one time, is expected to attract a significant increase in visitors at Portage, with its 200-seat theater and enclosed observation platform facing the glacier. As the Visitor Center is in close proximity to all of the alternative access routes to Whittier, some carryover traffic to Whittier can be expected.

Currently, the Portage Glacier Recreation Area is considered the most frequently visited site of its kind in Alaska. Only 50 miles southeast of Anchorage via Seward Highway, the site provides easy, inexpensive access to Portage Glacier and nearby attractions. Visitation has increased steadily since the Portage Valley access road was constructed in 1954. Between

1966 and 1981, the number of people visiting the glacier more than tripled from 110,000 to 340,000. Visitation to the Portage Center for 1985 was estimated at 400,000.

The U.S. Forest Service projects annual increases of 17 percent in non-resident visitors and 10 percent in resident visitors to Portage until the first year of operation of the new visitor center in 1986. A 15 percent increase is projected for both non-resident and resident visitation during the center's first year of operation. Thereafter, annual increases of 13 percent in non-resident visitation and 10 percent in resident visitation are expected until a maximum capacity of 2,300,000 total visitors (1,771,800 non-resident and 529,000 resident) is reached in 1997 (ref. 21).

TRAFFIC FORECASTS 1986-2007

Methodology

Traffic projections were prepared by estimating the number of trips generated annually by each of the user groups described in the preceding sections. The assumptions used in developing high, medium and low forecasts were based on current practices and anticipated community changes. It was also assumed that access improvements under each of the transportation alternatives would be operational beginning in 1988.

High Forecast Assumptions

Local Population. As previously described Whittier's population is expected to increase 7.5 percent annually. For the high forecast scenario it was assumed that 26 percent of the Whittier population, representing 40 percent of the working age

population would commute to work in Anchorage.* Each of the commuters was assumed to generate 500 one-way trips per year.

It was also assumed that the non-commuting balance of the Whittier community would still make trips for recreational, shopping, and medical purposes. Trips generated by the remaining 74 percent of the Whittier population were derived by assuming that on average each individual would generate trips according to the following schedule:

Prior to improved access

1 trip per month, September - May.
9 trips per month, June, July, August.
Total annual one-way trips per person: 72

With improved access

1 trip per month, October - April.
2 trips per month, September, May.
9 trips per month, June, July, August.
Total annual one-way trips per person: 76

The trip generation assumptions were based on the local resident survey prepared for the Whittier Transportation Options Study, March 1981 (ref. 14).

* The percentage of working age adults, age 20 to 64, in the Whittier community was assumed to remain the same as determined by the 1980 census data as recorded in the City of Whittier Master Plan (ref. 11).

According to the Mat-Su Borough Planning Dept. approximately 40 percent of the working age adults living in the borough work in Anchorage. As travel time from Whittier to Anchorage would be comparable, the same proportion was used.

Population projections for the surrounding areas, including the Municipality of Anchorage, the Mat-Su Borough, and the Kenai Peninsula Borough are incorporated into traffic projections by their effect on moorage demand and charter boat usage in Whittier, as described in subsequent sections.

Cruise ships. Cruise ship activity for the high forecast scenario was assumed to grow at an annual average rate of approximately 7 percent, equivalent to the upper bound of non-resident tourist growth anticipated for the state as indicated by the Alaska State Division of Tourism.* This rate of growth would require the addition of a new cruise ship at intervals of 3 years beginning in 1988. In accordance with current practices each new ship would call approximately 9 times per season.

The maximum capacity of the new ships was assumed to be 720 (the average size of the ships presently calling in Whittier). It was also assumed that the new vessels would operate at 85 percent of passenger capacity, since the ships now serving the area are operating at about this level.

Total trips generated were derived assuming that Whittier would be used as a turn around point and thus would service 18 sets of passengers, as is typically the case with existing cruise ship service.

According to these assumptions each additional cruise ship can be expected to generate approximately 11,000 annual one-way trips between Whittier and Portage.

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* Alaska State Division of Tourism, Telephone conversation with personnel in the Marketing Research Department, Dec. 18, 1985. The expected annual growth in non-resident tourism in southcentral Alaska is between 3 and 7 percent.

Chartered boats. The high forecast for chartered boat usage assumes that the proposed Shotgun Cove harbor will begin operating in 1991. According to the current harbor development study by the Corps of Engineers, the 18 chartered craft currently operating will be supplemented by 15 new craft the first year of the new harbor's operation and 10 additional boats by 1995. These vessels typically offer half day to several day excursions. The high forecast assumes an average of one excursion offered daily by each vessel, and that each charter vessel operates at approximately 85 percent capacity for the May to September season. Each vessel is assumed to carry an average of 5 passengers per excursion, and each passenger is expected to generate two, one-way trips.

Boat Owners. Recreational boat owners with permanently assigned slips typically make one round trip per month during September to May, and two round trips per week during the summer months, resulting in an average for non-Whittier residents of 72 one-way trips annually (ref. 14). For the high forecast improved access was assumed to increase the annual total to approximately 100 one-way trips per year.

It was also assumed that on average each trip generated by a boat owner would generate at least one additional passenger trip.

As with the forecasts for charter boat traffic, it was assumed that the harbor at Shotgun Cove would be completed and operating in 1991. Under current planning by the Corps of Engineers 678 slips are projected to be used for recreational purposes. The equivalent of approximately 40 slips will be demanded for transient use (ref. 8).

Currently, approximately 97 percent of recreational and chartered boat owners who permanently moor their boats in

Whittier's small boat harbor live outside of Whittier, and it was assumed that this percentage would remain the same following development of the new harbor.

As discussed previously, initial harbor development at Shotgun Cove is assumed to be 50 percent of the anticipated recreational moorage demand for the year 2010 (ref. 8). For the high forecast scenario it was assumed that harbor expansion to meet the remaining demand (336 slips) would be completed by the year 2000.

Currently there are 18 commercial vessels moored in the Whittier small boat harbor, and approximately 70 percent of these vessels' owners reside outside of Whittier (ref. 8). By the year 2000, 141 total commercial moorage slips will be required in Whittier. Sixty of these slips are projected to be demanded by transient vessels (ref. 8). Of the 63 total commercial vessels owners expecting to demand permanent moorage space, approximately 92 percent will reside outside of Whittier. The decline in the proportion of Whittier-based commercial vessel owners is derived from the residential composition of commercial boat owners currently on the waiting list for permanent moorage space (ref. 8). It was assumed that commercial boat owners would generate travel demands at the same rate as recreational boat operators.

It was also assumed that available transient slips would generate trips to and from Whittier on an equivalent basis to permanent slips. In addition, transient boat owner traffic was estimated to increase at a rate proportional to the projected growth in Anchorage area population.

Ferry Traffic. It is a goal of the City of Whittier to pursue increased ferry service to Whittier (ref. 11). For this analysis, it was assumed that Alaska Marine Highway ferry access

to and from Whittier would be extended to year round service by 1990. Currently the M/V Bartlett, which services Whittier from mid-May through mid-September, transports 22,000 passengers and 4,500 vehicles on average each year, operating near capacity (ref. 11). It was assumed that when service is extended throughout the year that the system on average would operate at 80 percent capacity. Total traffic to and from Whittier generated by 12 month ferry service was estimated to be 52,800 passengers and 10,800 vehicles annually.

The Glacier Queen was estimated to generate 6,800 trips to and from Whittier based on a 17 week summer season, making 4 calls a week to Whittier, and servicing 100 passengers each call.

Begich, Boggs Visitor Center. As a major tourist attraction for both residents and non-residents, the Begich, Boggs Visitor Center can be expected to generate some additional traffic to Whittier. With improved access to Whittier travelers who are in the vicinity may decide to take the additional trip. As currently 1.5 percent of the visitors complete a trip to Whittier, the high forecast assumes that with improved access five percent of the net visitors to the visitor center (e.g., those who would not otherwise be expected to travel to Whittier) would be induced to take the additional trip to Whittier.

Traffic projections based on the high forecast scenario assumptions are summarized in Table 3-5.

TABLE 3-5

FORECASTED TRIPS GENERATED BETWEEN PORTAGE AND WHITTIER
BY SOURCE
HIGH

	RESIDENTIAL POPULATION	CRUISE SHIP TOURIST	CHARTERED BOATS	RECREATIONAL BOAT OWNERS	CHARTER BOAT OWNERS	COMMERCIAL BOAT OWNERS	FERRY	BEGICH-BOGGS VISITOR'S CENTER	HIGH FORECAST TOTAL	HIGH FORECAST AVERAGE DAILY TRAFFIC
1986	26,136	39,772	27,540	41,345	1,257	907	33,300	5804	176,062	482
1987	28,080	39,772	27,540	41,453	1,257	907	33,300	6639	178,948	490
*1988	78,035	50,788	27,540	56,850	1,729	1,247	33,300	24703	274,191	751
1989	83,808	50,788	27,540	56,998	1,729	1,247	33,300	28210	283,620	777
1990	90,140	50,788	27,540	57,146	1,729	1,247	70,400	30294	329,283	902
1991	96,845	61,804	50,490	186,912	3,169	4,008	70,400	34166	507,793	1,391
1992	104,108	61,804	53,550	187,398	3,361	6,376	70,400	39133	526,130	1,441
1993	111,930	61,804	56,610	187,885	3,553	8,744	70,400	44713	545,639	1,495
1994	120,870	72,820	59,670	188,374	3,745	11,112	70,400	50431	577,421	1,582
1995	129,996	72,820	62,730	188,863	3,937	13,753	70,400	57474	599,973	1,644
1996	139,680	72,820	65,790	189,355	4,129	13,753	70,400	65388	621,315	1,702
1997	150,109	83,836	65,790	189,847	4,129	13,753	70,400	73732	651,597	1,785
1998	161,284	83,836	65,790	190,340	4,129	13,753	70,400	83729	673,262	1,845
1999	173,389	83,836	65,790	190,835	4,129	13,753	70,400	94967	697,100	1,910
2000	186,426	94,852	65,790	251,460	4,129	13,753	70,400	106737	793,548	2,174
2001	200,394	94,852	65,790	252,114	4,129	13,753	70,400	106737	808,170	2,214
2002	215,480	94,852	65,790	252,769	4,129	13,753	70,400	106737	823,911	2,257
2003	231,683	105,868	65,790	253,426	4,129	13,753	70,400	106187	851,236	2,332
2004	249,003	105,868	65,790	254,085	4,129	13,753	70,400	106187	869,215	2,381
2005	267,627	105,868	65,790	254,746	4,129	13,753	70,400	106187	888,500	2,434
2006	287,555	116,884	65,790	255,408	4,129	13,753	70,400	105636	919,555	2,519
2007	309,158	116,884	65,790	256,072	4,129	13,753	70,400	105636	941,823	2,580

SOURCE: TAMS ENGINEERS
Note: *1988 - first year of new service

assumption, the high, medium and low forecasts incorporate an 8.8 percent, 7.0 percent, and 3.4 percent average annual growth rate, respectively.

Sharp increases in traffic for the medium and high scenarios are projected to occur in 1991 and 2000, due to the assumption that the first phase of the Shotgun Cove small boat harbor development will be completed in 1991, and that additional recreational harbor space will be completed by 2000.

Alternative 2

Under this development scenario all passenger traffic will be transported by private vehicles or motorcoaches. It was assumed that on average each vehicle would transport 2.5 passengers, as this was considered to be a representative number of occupants per vehicle for the primary groups traveling to and from Whittier (e.g., private residents, boat owners, charter boat users, and ferry passengers) (ref.14).

Alternative 2a

Alternative 2a assumes both direct vehicular traffic and Budd car shuttle access to Whittier. To estimate a split between rail and drive-through traffic it was assumed that the Budd car shuttle would be given priority use of the tunnel during peak (daytime) traffic hours. Consequently tour operators would to a large extent utilize the train service options for transportation between Portage and Whittier, to avoid the travel restrictions applied to motorists.

Recreational boaters, on the other hand, are expected to drive directly through to Whittier because of the convenience of hauling recreational gear and availability of access in the early morning and evening hours.

Charter boat users and ferry riders were assumed to use both forms of access to Whittier. These categories of travelers include both regional residents and out-of-state tourists, indicating that a significant proportions of each group will demand access by private vehicle as well as by public transport.

Local population traffic to and from Whittier was also assumed to be split between the two transportation options, with the largest proportion assumed to travel by private vehicle.

Table 3-8 summarizes the percentages of each traffic category assumed to travel by train and by vehicles.

TABLE 3-8

Transport Mode	Percent of category
Autos/Buses:	60% of local population traffic
	90% of recreational boating
	40% of charter boating
	20% of Begich, Boggs incidental
	50% of ferry traffic
	20% of cruise ship passengers
Trains:	40% of local population traffic
	10% of recreational boating
	60% of charter boating
	80% of Begich, Boggs incidental
	50% of ferry traffic
	80% of cruise ship passengers

Source: TAMS Engineers

TABLE 3-10

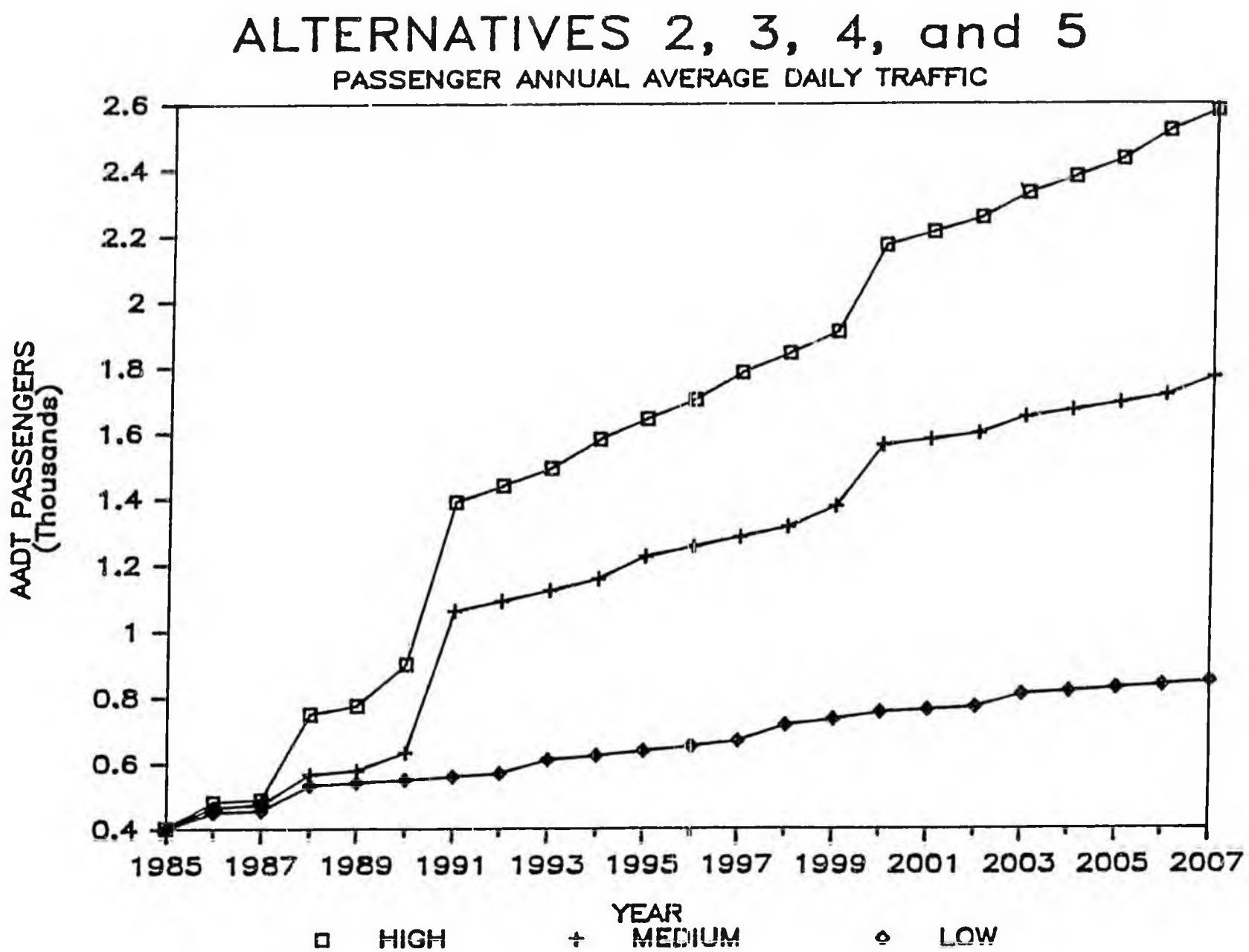
ALTERNATIVES 2, 3, 4, and 5

ANNUAL AVERAGE DAILY TRAFFIC

	HIGH		MEDIUM		LOW	
	TOTAL PASSENGERS	TOTAL VEHICLES	TOTAL PASSENGERS	TOTAL VEHICLES	TOTAL PASSENGERS	TOTAL VEHICLES
1985	403	60	403	60	403	60
1986	482	72	467	69	451	67
1987	490	73	475	71	457	68
*1988	751	300	568	227	533	213
1989	777	311	580	232	542	217
1990	902	361	655	264	551	220
1991	1,391	556	1,064	425	560	224
1992	1,441	577	1,093	437	571	228
1993	1,495	598	1,125	450	612	245
1994	1,582	633	1,160	464	624	250
1995	1,644	658	1,227	491	638	255
1996	1,702	681	1,258	503	653	261
1997	1,785	714	1,286	514	669	268
1998	1,845	738	1,316	526	716	286
1999	1,910	764	1,379	552	735	294
2000	2,174	870	1,564	626	756	303
2001	2,214	886	1,582	633	764	306
2002	2,257	903	1,600	640	772	309
2003	2,332	933	1,650	660	810	324
2004	2,381	953	1,670	668	819	328
2005	2,434	974	1,693	677	828	331
2006	2,519	1,008	1,716	687	838	335
2007	2,580	1,032	1,772	709	848	339
Average Annual Growth	8.80%	*6.72%	6.96%	*6.18%	3.44%	*2.48%

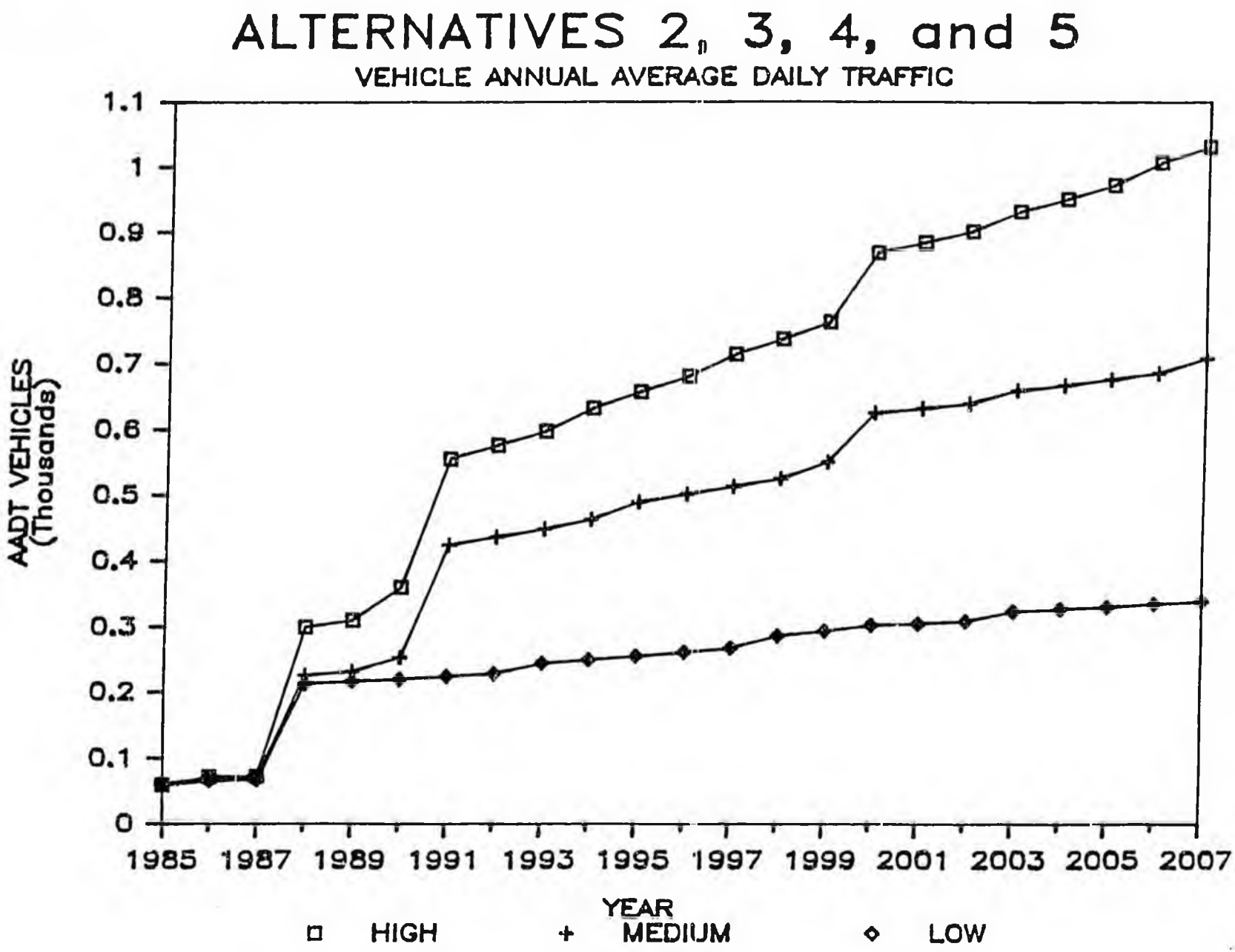
Source: TAMS Engineers
Note: *1988 - first year of new service.
1986 and 1987 figures are based on current service.
Percentage growth is derived with base year 1986.

FIGURE 3-3



SOURCE: TAMS Engineers

FIGURE 3-4



SOURCE: TAMS Engineers

CHAPTER 4
FINANCING ALTERNATIVES

The use of local revenues to fund capital as well as operating and maintenance costs will be critical to the economic viability of improving access to Whittier. This chapter presents an analysis of a number of local financing options, including the use of revenues derived from access tolls; local taxes; and potential revenues derived from transporting by truck a portion of the rail freight projected to be shipped through Whittier.

CONSTRUCTION FINANCING USING NET REVENUES

A central element of this study effort is to determine the proportion of construction costs for transportation access improvements that could be financed through annual net revenues (the balance of gross toll receipts less operating and maintenance costs). In this section annual operating and maintenance (O&M) costs are determined using previously described cost components and projected traffic volumes. Based on a review of appropriate tariff levels, gross and net annual revenues are estimated, leading to estimates of potential revenue bonding capacity for each alternative.

Key assumptions used in determining the bonding capacity of each alternative include:

- Passenger and vehicle tolls, as well as O & M expenses, are assumed to increase at the rate of inflation, taken for this analysis to be 5 percent per annum.

- Revenue bonds are based on the net revenues of the project. Typically, a debt service coverage factor of at least 1.35 is required to satisfy the financial safety requirements of potential bond buyers. This factor implies that for every $1.00 borrowed in the form of revenue bonds $1.35 must be available to repay the debt from net revenues.

- The Bond Buyer's Index of Municipal Bond Interest Rates, which is an indicator of bond interest trends for the United States published by the Daily Bond Buyer, indicated a range of interest rates from 8.85 to 10.31 percent for revenue bond issues nationwide in 1985. Bond rates in Alaska are generally on the high end of the scale, due to the relatively volatile nature of the state economy. For this analysis revenue bonds are assumed to be issued at a tax free market interest rate of 10 percent per annum.

- Revenue bonds are typically issued for a period of twenty to thirty years following completion of capital construction. For this analysis a twenty year period has been used.

- Eighty five percent of projected bonding capacity was assumed to be available to pay for the costs of construction, including outlays for engineering design and construction administration. The remaining 15 percent was assumed to be required to offset bond sales costs, reserve requirements, and other up-front expenses.

- Bonding capacities were based on the net revenue streams for the period 1988 to 2007. For each alternative, the net present value of the revenue streams was deflated to represent 1986 dollars.

Potential Tolls

To identify a reasonable range of potential tolls for passenger/vehicle access to Whittier, comparable tolls at facilities in the state and elsewhere (both planned and currently operating) were reviewed.

Alaska Railroad Portage-Whittier Fares. The current toll structure for the Alaskan Railroad shuttle service between Portage and Whittier has eleven fare categories, as shown in Table 4-1. The railroad also offers commuter, multi-trip tickets for passengers and vehicles traveling between Portage and Whittier at a thirty percent discount.

TABLE 4-1

Current Alaska Railroad Fares: Portage - Whittier

User Class	Toll (One-way)
Adult vehicle occupants, other than driver	$ 6.00
Foot passengers	$ 6.00
Children, 5 - 11 years old (on foot or in vehicles)	$ 3.00
Kayaks or canoes	$ 5.00
Motorcycles	$13.00
Motorcycles with one trailer, not > 5 feet in length	$18.00
Vehicles or vehicles with trailers, not > 24 feet	$29.00
Vehicles or vehicles with trailers, > 24 ft. and < 32 ft	$38.00
Vehicles or vehicles with trailers, > 32 ft. and < 40 ft	$48.00
Vehicles or vehicles with trailers, > 40 ft. (by special arrangement)	$48.00
Tour buses (includes fare of driver only)	$58.00

Source: Alaska Railroad, Anchorage-Portage-Whittier 1985-1986 Fall-Winter Schedule (Nov. 1 - April 1).

Proposed Knik Arm Crossing. The Knik Arm Crossing Economic Feasibility Report examined a potential range of tolls ranging from $1.00 to $3.00 per vehicle-trip in 1983, and assumed that tolls would increase at a rate of 5 percent annually up to $4.00 to $12.00 by the year 2010 (ref. 3).

The study indicated that a $2.00 per direction toll (1983 dollars) to cross the proposed bridge was the optimum toll that would maximize "revenue generation without sacrificing significant benefit".

Tongass Narrows Crossing Cost Benefit Study. Access to Gravina Island (where the Ketchikan airport is located, as well as a significant amount of the potentially developable land) is a major issue for Ketchikan residents. A recent study of access alternatives, including several bridge alignments and potential ferry service improvements, indicated that a reasonable upper limit for current fares would be approximately $1.75 per passenger, and $3.50 per automobile for a one-way crossing of Tongass Narrows (ref. 20).

Hood Canal Bridge. The Hood Canal Bridge in the Puget Sound region of Washington state serves as a direct link between the recreational opportunities of the Olympic Peninsula (including the Olympic National Park) and the Seattle metropolitan area. Although a recent court action has eliminated all tolls to cross the bridge, prior to that action typical tariffs were on the order of $2.50 per trip for a conventional passenger vehicle.

Suggested Tolls For Revenue Analysis. As can be seen from the above examples, the unique nature of the existing and potential demand for access to Whittier makes direct comparisons difficult. Most of the facilities cited serve (or are intended to serve) relatively large traffic volumes when compared to the projected Whittier access demand, and involve a significant proportion of daily commuter activity.

Most services must also be priced to be competitive with alternative access options. The proposed Knik Arm Crossing, and the Hood Canal Bridge, for example, compete with drive-around alternatives. There is no convenient or practical alternative for vehicle or passenger access to Whittier from the Anchorage area.

As described previously, the most significant components of existing and projected demand for access to Whittier are tourism and recreational boating opportunities in Prince William Sound. Development as a bedroom community, with the resulting daily Anchorage-Whittier traffic, is not in conformance with long range development plans by the city (ref. 11). For this analysis daily commuter traffic has been assumed to occur at a significant level only for the high range traffic forecast.

Users will typically have to pay the toll at a frequency ranging from one time only (for tourists) up to 2 - 3 round trips per week for local residents and boaters during the summer. Consequently user-acceptable toll levels will be somewhat higher than for the above examples.

The amount of traffic traveling to or from Whittier will, of course, be influenced by the level of fares adopted. Given the projected types of demand for access, current Alaska Railroad fares are assumed to be the upper limit of acceptable fares for the improved access alternatives. At the same time, it is a desirable goal in improving access to the community to reduce the cost to the user, as well as providing an improved level of service.

For the analysis of potential revenues an average realized vehicle fare (assuming a mix of trailered- and non-trailered vehicles, buses, commercial trucks, and frequent user discounts) is therefore set at $20.00 per one-way trip. Passenger car tolls would be somewhat lower than the average, while fares for buses and commercial trucks would be significantly higher. An average realized fare of $4.00 per one-way trip is assumed for passengers (both walk-ons and vehicle occupants).

under the high projections for [illegible].

ALTERNATIVES 2 AND 5

Under these alternatives direct vehicle access would be provided by extending the road from Portage Outlook to Bear Valley and by providing a single lane tunnel through Maynard Mountain. For Alternative 2 the existing rail tunnel would be upgraded to accommodate joint rail and vehicle travel; under Alternative 5 a separate highway tunnel would be constructed.

Preliminary traffic data obtained from the Alaska Railroad indicates a peak to average daily traffic ratio of 5 to 1 for 1985 traffic. For this analysis it is assumed that future movements will have a similar ratio of peak to average daily traffic.

As illustrated in Table 3-10, projected vehicle traffic increases steadily to a projected range of 339 to 1,032 annual average daily trips by the year 2007. With a peak to average traffic ratio of 5:1, peak daily traffic is estimated at a range of 1,695 to 5,160 vehicles requiring access to or from Whittier.

Assuming one cycle per hour the practical daily capacity of a one-lane tunnel has been estimated at 4,800 vehicles per day, assuming the tunnel would be available 24 hours each day (ref. 14). For Alternative 2 the estimated capacity would be reduced to 4,400 vehicles per day, allowing two hours per day to clear the tunnel and to pass a daily freight train.

Both alternatives would therefore not be able to meet the peak day projected traffic under the high growth scenario. The practical result would be that demand would be deferred to non-peak days, and that congestion and delays would be common.

Operating and Maintenance Costs. Initial annual costs to operate and maintain a single lane tunnel have been estimated at $1,450,000 per year (ref 22). Costs for each year thereafter are assumed to increase at a 5 percent annual rate of inflation.

Alternative 2 Construction Financing. Gross revenues, annual O & M expenses, and revenue bonding capacity for Alternatives 2 and 5 are illustrated in Table 4-5. Internal construction financing capacity estimates include $8.2 million for the low forecast, $23.1 million for the medium forecast, and $35.3 million for the high traffic scenario.

Two estimates of initial construction cost have been included, which vary primarily in assumptions regarding the amount of tunnel widening needed for safe vehicular passage. Costs range from $35.6 million for the least expensive estimate, up to $133.5 million for an estimate which includes the provision of a full width shoulder the length of the Passage tunnel.

TABLE 4-5

ALTERNATIVES 2 AND 5

PROJECTED NET REVENUES AND BONDING CAPACITY

	ANNUAL O&M COSTS	NET REVENUES HIGH FORECAST	MEDIUM FORECAST	LOW FORECAST
1988	$1,598,625	$1,691,666	$887,446	$737,440
1989	$1,678,556	$1,895,051	$989,714	$812,835
1990	$1,762,484	$2,593,935	$1,302,007	$896,210
1991	$1,850,608	$5,203,396	$3,541,873	$990,699
1992	$1,943,139	$5,731,030	$3,876,952	$1,096,688
1993	$2,040,296	$6,316,374	$4,250,882	$1,381,061
1994	$2,142,310	$7,143,284	$4,666,509	$1,523,180
1995	$2,249,426	$7,081,245	$5,312,424	$1,682,579
1996	$2,361,897	$8,653,690	$5,780,856	$1,862,990
1997	$2,479,992	$9,650.093	$6,256,808	$2,065,954
1998	$2,603,992	$10,556,079	$6,784,799	$2,505,692
1999	$2,734,191	$11,573,139	$7,599,141	$2,774,419
2000	$2,870,901	$14,230,278	$9,433,648	$3,078,017
2001	$3,014,446	$15,272,651	$10,047,758	$3,295,244
2002	$3,165,168	$16,410,275	$10,710,565	$3,530,119
2003	$3,323,427	$17,912,476	$11,700,766	$4,053,366
2004	$3,489,598	$19,279,057	$12,477,981	$4,341,316
2005	$3,664,078	$20,773,418	$13,327,431	$4,652,119
2006	$3,847,282	$22,708,946	$14,246,039	$4,987,548
2007	$4,039,646	$24,519,632	$15,578,020	$5,349,510
NET PRESENT VALUE (1988-2005, 10%)		$56,801,591	$36,665,031	$13,108,230
BONDING CAPACITY (NPV/1.35, ROUNDED TO NEAREST 0.1 MILLION)		$42,100,000	$27,200,000	$9,700,000
AMOUNT AVAILABLE FOR CONSTRUCTION		$35,785,000	$23,120,000	$8,245,000

ASSUMPTIONS:

AVERAGE REALIZED REVENUES, INITIAL YEAR -
$20.00 PER VEHICLE
$4.00 PER PASSENGER

TARIFFS AND EXPENSES ESCALATED AT 5 PERCENT PER YEAR

CONSTRUCTION FUNDING CAPACITY EQUAL TO 85% OF BONDING CAPACITY

SOURCE: TAMS ENGINEERS

of 87 percent of the annual costs.

Direct Access Options (Alternatives 2, 4, and 5)

Alternatives 2, 4 and 5 each provide for direct drive-through access to Whittier. As Alternative 5 includes the construction of a new tunnel through Maynard Mountain and consequently does not have to share time with freight trains, it provides slightly greater daily traffic capacity than Alternatives 2 and 4. Similarly, as the transit length is longest for Alternative 4, the dual-tunnel scheme provides the least daily capacity of the three direct-access options.

Total estimated construction costs, and projected bonding capacity, are summarized as follows for each of the three alternatives:

	Capital Cost ($ millions)	Bonding Capacity ($ millions)
Alternative 2	$35.6 - $133.5	$8.2 - $35.8
Alternative 4	$47.6 - $159.7	$7.1 - $34.6
Alternative 5	$121.0	$8.2 - $35.8

None of the direct access alternatives offer a strong potential for financing a large proportion of the estimated construction costs through revenue bonds. Only for Alternative 2 under the high traffic and revenue forecasts would internal financing be sufficient, and then only if construction costs can be held to the lower end of the projected range.

BRADFIELD INDUSTRIAL ROAD FEASIBILITY STUDY

DRAFT REPORT

APRIL 1989

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Alaska Department of Transportation and Public Facilities
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BRADFIELD INDUSTRIAL ROAD
FEASIBILITY STUDY

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BRADFIELD INDUSTRIAL ROAD
FEASIBILITY STUDY

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1.0 INTRODUCTION

During October 1988, the Alaska Department of Transportation and Public Facilities requested proposals for a study to determine the economic feasibility of building an industrial road from the head of the Bradfield Canal, via the Bradfield and Craig River drainages to the Canadian border -- a distance of 31 miles. The principal focus of the road, routing and destination would be to serve the transportational needs of Canadian mining interests in the lower Iskut River region by providing "straight-through" trucking to deep water at the Bradfield Canal.

In late October, a contract was awarded to Stephen C. Jacoby & Associates in conjunction with Baxandall Associates, P.E., and Mr. Phil R. Holdsworth, E.M., and a scope of work agreed on.

2.0 OBJECTIVES

The Bradfield Industrial Road feasibility study undertaken over the last several months has focused on a host of resource, economic, and policy issues relating to the feasibility of this project. The project objectives relate to three principal areas of input data;

1) Resource Assessment
Identification of the principal mining interests in the Iskut River area and surrounding mineral districts possibly affected by a port destination resource road. Assessment of present mine production and mine development forecasting for various mineral deposit classes. Similarly a timber resource analysis was performed assessing present inventory volume within the region and annual allowable cut estimates determined. The mineral and timber resource assessment would provide the basis for 1) prospective in-haul and out-haul relationships related to road access development and 2) unit haul cost analysis for route alternatives.

2) Bradfield Route - Engineering and Cost Analysis
An analysis of the Bradfield Route clearly defined two design alternatives, 1) continuous surface road, point to point and 2) road/tunnel point to point. Construction costs estimates were developed for both alterntatives and incorporated into comprehensive cost equations, for road development, and operation and maintenance along this route. It is understood all cost estimating will undergo final refinement following nominal route reconnaissance post scheduled for early summer, June-July 1989.

An on-going Iskut Valley Route alternative study, joint-funded by the British Columbia Ministry of Energy, Mines & Petroleum Resources and cooperators within the

B.C. mining industry, will provide construction cost estimates based on preferred alignments for Iskut River Road development from the Cassiar Hwy. (Highway 37) at Bob Quinn Lake to the Johnny Mountain mine area. Two tributary roads will additionally be evaluated, one up the Craig River to the international boundary, interfacing with the Bradfield Route at the common border, and another tributary link to the lower Unuk River. Review of this study will be incorporated in final report documentation, scheduled July 1989.

3) Economic Analysis of the Bradfield Route Alternatives

The analysis looked at the various alternatives and a comparative evaluation performed to determine the estimated expense in the development and operation of an access road to and through the Iskut Region. The construction, maintenance and operation and haul costs developed within the Engineering and Cost Analysis section were used in developing the route comparisons.

3.0 SUMMARY

The reported findings contained in this Bradfield Industrial Road analysis provide a certain measure of insight as to the economic feasibility of more direct and shorter road access for the mineral and timber resources within the Iskut Region of Northwestern British Columbia. The task of reliably assessing mineral resource potential is predicated on numerous assumptions relating to current exploration data, driven by strong base metal and precious metal pricing. A number of qualifications deserve recognition; for example, if the public sector were to absorb an increased percentage of infrastructure costs, the financial viability of the regional mineral properties would be vastly improved. Also, further exploration activities at major properties may define greater ore reserves or improved ore grades which could substantially change the viability of the prospects by increasing projected revenues, increasing the scale of operations while reducing unit costs of operation, or extending projected mine life. Similarly, through exploration, a number of apparently minor properties, based on present knowledge, could reach a higher potential. In short, there is considerable uncertainty regarding the timing and extent of development which cannot be avoided.

It should also be noted that this study recognizes that as a result of resource depletion and changing economic conditions, potential mines, once in production, could inevitably close over the course of the study period(twenty year life). The implications of such closures would have to be dealt with on a case by case basis.

The cost benefit analysis of the Bradfield route, incorporating construction cost and comparative haul cost analysis indicate the Bradfield route is economically viable in light of assumptions regarding commodity movement and the potential for increased

mine development activity within the Iskut Region. Construction costs for the various alternate routes were closely related. The key factor identified is the savings that would be realized in the cost of out-haul transport of resource commodities to a marine terminal and in-haul volume for mine development and annual operation.

BRADFIELD INDUSTRIAL ROAD

FEASIBILITY STUDY

LOCATION MAP

Scale 1:2 000 000	Date MARCH 1989
Ref.	FIGURE 1

4.0 REGIONAL RESOURCES

4.1 MINERAL POTENTIAL

It has long been recognized that mining development would be the key growth sector in northwest British Columbia (Economic Development in northwest British Columbia: Challenges and Opportunities, May 1982). The Iskut region of northwest British Columbia has been the focus of a vigorous exploration program by the Canadian mining industry resulting in an unprecedented number of submissions to the Canadian government mine development review process for stage 1 and stage 2 reviews. During 1988 more than 30 companies engaged in exploration and drilling programs, spending in excess of $15 million. The main focus continues to be on gold and silver.

The assessment of the mineral potential of the Iskut region, as in any area, requires the review of available best data and the use of certain assumptions as to the likelihood of advancement to mine development. For this study, the Iskut region was divided into 3 distinct districts for mineral potential review. These districts are;

- The Iskut River District
- Unuk/Sulphurets District
- Stikine District

Each of these districts are positioned as potential beneficiaries from road access in the Iskut Region and to date have suffered erratic development because of the lack of easy access, high costs, and difficult weather conditions. If the suggested Bradfield Road system were followed, all noted deposits from these districts will use that portion of the road system on the Alaskan side of the border. There would be common useage of many segments of the road system on the Canadian side.

Within each district, the mineral properties were reviewed and significant properties identified on the basis of the following mineral deposit classes:

Class: 1) Producing mine
2) Production facilities under way
3) Current exploration and development, including drilling
4) Recent exploration, including drilling

Those deposits identified as Class 3 and 4 are active prospects which have generally received advanced exploration in recent years with annual expenditures in the million dollar range. There is a possibility that they might develop into small scale producers. See Mineral Claim Map, Figure 2.

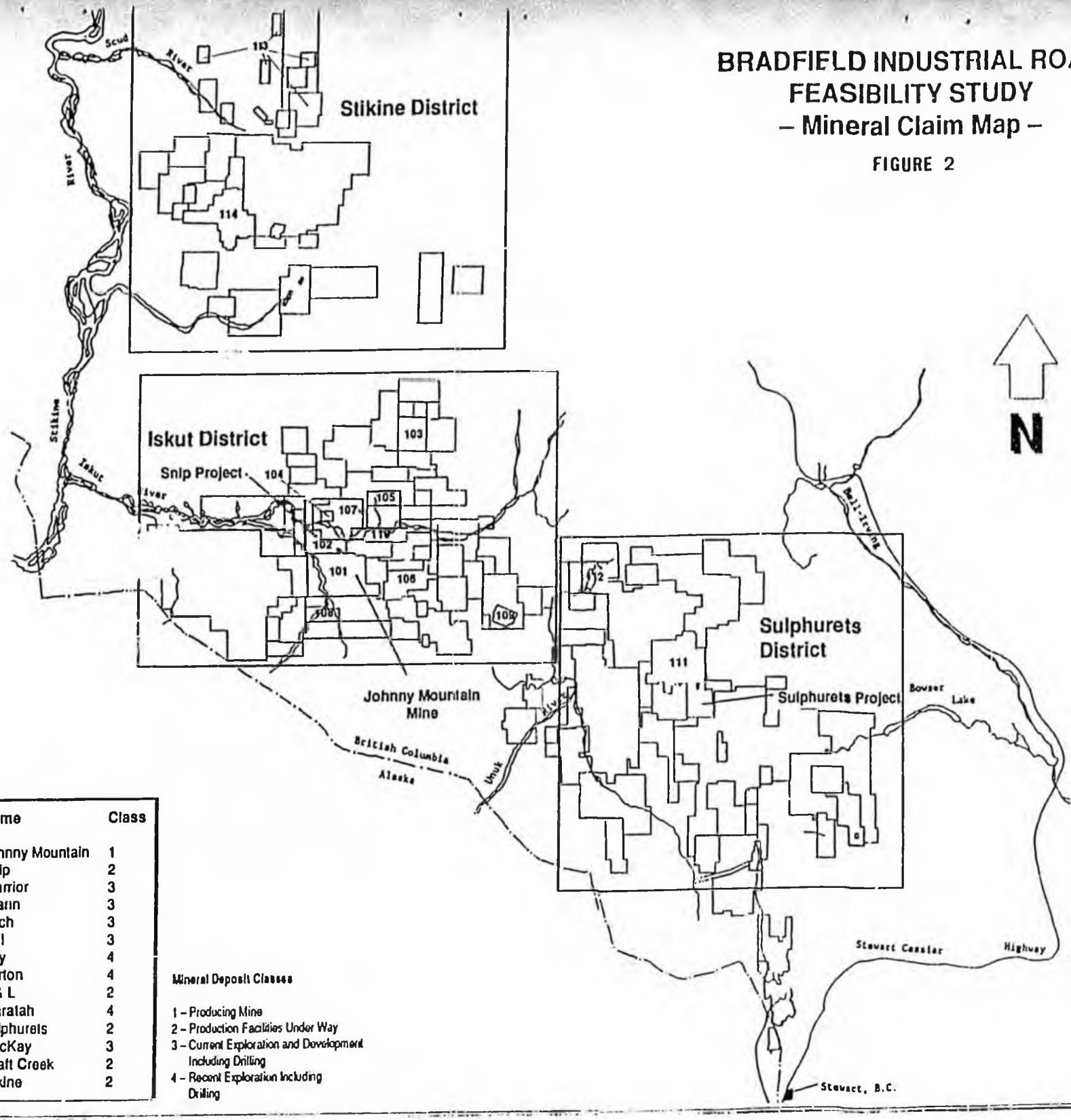
Fourteen mineral properties were carried forward to the mineral property listing to provide assumed production data. Forecasting of mineral production, both volume

and timing, is extremely difficult due to the range of unforeseen development parameters. However, best-estimate production volumes were developed from reserve data to support in-haul/out-haul tonnage estimates and applied unit haul cost analysis.

Significant data for projects identified from this review, for each of the three districts, are summarized in Table 1.

BRADFIELD INDUSTRIAL ROAD FEASIBILITY STUDY
– Mineral Claim Map –

FIGURE 2



Map #	Name	Class
101	Johnny Mountain	1
102	Snip	2
103	Warrior	3
104	Joann	3
105	Bach	3
106	Inel	3
107	Ray	4
108	Burton	4
109	E & L	2
110	Waratah	4
111	Sulphurets	2
112	MacKay	3
113	Shaft Creek	2
114	Stikine	2

Mineral Deposit Classes

1 – Producing Mine
2 – Production Facilities Under Way
3 – Current Exploration and Development Including Drilling
4 – Recent Exploration Including Drilling

BRADFIELD INDUSTRIAL ROAD FEASIBILITY STUDY
Mineral Property Analysis

TABLE I

	Map #	Name	Operator	Class	Commodities	Potential Reserves	Tons/day Milled	Tons Concentrate per year	Mine Life	Probable on-line Production	Miles to Bradfield	Miles to Stewart	Ratio
ISKUT DISTRICT	101	Johnny Mountain	Skyline, Ltd	1	Au, Ag, Cu	1,000,000 Tons	400	14,000	8 yrs	Now producing	43	160	3.7:1
	102	Snip	Cominco	2	Au, Ag, Cu	1,570,000 Tons	500	Potential future Cu Concentrate	8 yrs	1990	43	160	3.7:1
	103	Warrior	Gulf International	3	Au, Ag	Unknown	–	None Dore bullion	–	1995?	69	174	2.5:1
	104	Joann	Merridor Res	3	Fe/Cu, Au, Ag	Unknown	Possible 200	Possible 8,000	–	1995?	47	179	3.8:1
	105	Bach	International Wildcat	3	Au, Ag	Unknown	Possible 200	Dore Bullion	–	1995?	53	179	3.4:1
	106	Inel	Inel Resources	3	Au, Ag, Cu, Zn	Unknown	Possible 200	Possible 8,000	–	1995?	62	178	2.9:1
	107	Ray	Delaware Resources	4	Ag, Au, Zn, Pb, Cu	Unknown	Possible 200	Possible 8,000	–	1995?	47	179	3.8:1
	108	Burton	NW/Iskut Gold Syndacite	4	Ag, Au, Cu, Pb, Zn	Unknown	Possible 200	Possible 8,000	–	1995?	40	184	4.1:1
	109	E & L	Consolidated Silver	2	Ni,Cu	3,200,000 Tons	Possible 1,000	Possible 3,200	9 yrs	2000?	53	165	3:1
	110	Waratah	Tungco Resources	4	Au	Unknown	–	Dore Bullion	–	1995?	46	174	3.8:1
SULPHERETS DISTRICT	111	Sulphurets	Newhawk Gold Mines	2	Au, Ag, Cu, Cu, Pb, Zn	Lode 1,500,000 Heap Leach 20,000,000	500	Possible 15,000 Dore bullion	8 yrs	1991	95	189	2:1
	112	MacKay	Consolidated Stikine Silver	3	Au, Ag, Pb, Zn	Unknown	–	Possible 8,000	–	1995?	73	167	2.3:1
STIKINE DISTRICT	113	Shaft Creek	Teck Corporation	2	Cu, Mo, Ag, Au	900,000,000 Tons	100,000 open pit	318,000	25 yrs	2000?	87	178	2:1
	114	Stikine	Stikine Silver, Ltd.	2	Cu, Ag, Au	151,000,000 Tons	30,000 open pit	303,000	14 yrs	2000?	98	216	2.2:1

4.1.1 ISKUT RIVER DISTRICT

Most recent exploration and development expenditures in NW British Columbia were for precious metals and most were located in the rugged northwestern part of the province where the Iskut Gold Camp, site of the Reg (Johnny Mtn. - Class 1) and Snip (Class 2) deposits are found. This district has attained a very significant status with greater than 1.75 million ounces of gold identified between these two deposits alone. Over 75 mineral properties are located north and south along the lower to mid Iskut River axis.

The Johnny Mountain Mine, B.C.'s newest gold mine, shows reserves of 1.08 million tons grading 0.70 oz./T AU, 0.73 oz./T AG, and 0.75% CU. This is presently regarded a 250 ton per day operation, supplied entirely by air and employing 115 people. Official opening of the mine was August 17, 1988. Capital expenditures on this project are reported at $41 million.

Present in-haul transport requirements for the Johnny Mountain mine are estimated at 5,000 tons per year. Fuel for on-site power supply generation is the leading in-haul cargo volume component, representing over sixty percent of annual shipping volume. Concentrate out-haul is estimated at 14,000 tons per year.

The adjacent Snip deposit has reserves of 1.57 million tons grading 0.64 oz./T AU, and is on a fast track to production at a planned 300 tons per day in 1990. Anticipated capital costs are in excess of $30 million with a projected employment of 115.

Seven other properties in the Iskut River District were identified as having significant current or recent exploration programs, including drilling. These properties and related production data are listed in Table 1.

4.1.2. UNUK/SULPHURETS DISTRICT

The Unuk/Sulphurets District is formed around the axis of the Unuk River drainage, approximately 24 miles southeast of the Iskut - Johnny Mtn. area, and one of two districts (Unuk/Sulphurets and Stikine) periphery to the core Iskut River District. A total of over 40 properties are found in this district.

The Sulphurets property (Property #111 - Class 2) is a significant property within this district with reserves of 1.5 million tons grading 0.50 oz./T AU and 20.18 oz./T AG. The property has seen continued exploration with an extensive drilling and underground drifting program, scheduled for stage 1 review approval in mid 1989.

4.1.3. STIKINE DISTRICT

Peripheral to the deposits in the Sulphurets - Iskut mineral belt are two large copper deposits in the Stikine River area, both of which could benefit from the development of the Bradfield Road.

The Schaft Creek deposit (property #113 - Class 2) is basically a copper/molybdenum orebody with minor amounts of silver and gold. Access would require construction of 44 miles of road from the deposit to Bob Quinn Lake; and then the choice of one of the two alternate routes to tidewater, 134 miles via Highway 37 to Stewart or 87 miles to the Bradfield Terminal. Much of this latter route would service the majority of listed deposits in both the Iskut and Unuk districts.

The Stikine Deposit(property # 114- Class 2) is a relatively highgrade copper ore body with minor amounts of silver and gold. Final development is expected to be delayed because of difficult access involving a 3.3 mile tunnel, and the difficulty of permitting a 25-mile road down the Stikine River corridor to the Iskut River and then 28 miles up the Iskut to Bronson Creek, junction point for Stewart or the Bradfield Canal destination.

4.1.4. OTHER PROPERTIES

In 1983, a Canadian inter-ministry task force, directed by the Cabinet Committee on Economic Development, completed a series of studies on the scale and timing of potential mineral developments in northwest British Columbia (Northwest Economic Development Studies - Mineral Resources, 1983). This study identified nine "cornerstone" properties over a list of 23 known significant, but undeveloped mineral properties in the region. The Schaft Creek and Stikine copper deposits (as listed in 4.1.3.) were 2 of these 9 properties.

The Mt. Klappan deposit was also among the 9 properties listed which has, perhaps, regional proximity to the Bradfield Project. Mt. Klappan is a deposit of anthracite coal having undergone extensive exploration, determining that the deposit could be mined by low cost, open pit methods. A major constraint to this large project is the limited size of the world market for anthracite coal. Logistically, this deposit lies 62 air miles to the east of Cassiar Highway and it is unlikely that the Bradfield Route would be of any value for coal export to foreign markets. The report concludes a road route to Stewart would be most cost effective, aligned south from the mine site down the Skeena and Nass Rivers to Meziadin Junction and then 39 miles west to Stewart on the existing highway.

Another significant mineral deposit which might utilize the Bradfield Route is the

Cassiar Asbestos (McDame Extension) property located 70 miles north of Dease Lake on the existing road system. This former open-pit operation is now being converted to an underground operation, and has developed reserves of 178 million tons containing 5.57% fibre (equivalent to 10 million tons of marketable product). This indicates a mine life of over 100 years. Over 50 million dollars have been spent so far on mine development, and with the existing mill would treat 1.6 million tons per year -- equivalent to 90,000 tons per year of marketable fibre. Estimated employment is 150 people, and production is scheduled for 1990.

If the movement of this tonnage per year was planned to be trucked to Stewart via the Cassiar Hwy., and the Iskut River/Bradfield River Road from Bob Quinn Lake Junction to the Bradfield Terminal was available, the mileage would be 65 miles shorter by use of the latter.

4.2 TIMBER RESOURCES

4.2.1 ISKUT SUPPLY BLOCK

An analysis of the timber supply in the region of Norhtwestern British Columbia was undertaken to provide reliable estimates as to the acreage, type, volume, and accessibility of timber resources as a contributor to commodity movement in this region. Forest inventory data from the Ministry of Forests, Smithers office provided the base inventory data from which to describe the timber resource and develop estimates of a long-term annual allowable cut (AAC) - an indicator of potential timber supply and annual transport volume component.

The results of the first timber supply analysis performed by the British Columbia Ministry of Forests (April, 1984) describes the region of Norhtwestern B.C. as the Cassiar Timber Supply Area (TSA). Past harvesting patterns and proposed development plans show that in the Cassiar TSA only a very limited area of the forest is economically accessible, and in this area, only the best stands are merchantable.

The Iskut Supply Block, located in the southern region of the Cassiar TSA is the principle focus of the timber supply analysis. Forest inventory area and volume summaries, based on mature forest stands within the gross productive crown forest land base of the Iskut Supply Block, are estimated at 435,357 acres and a total inventory volume of 69,928,020 cubic meters(m^3). The majority of the Iskut Supply Block is mountainous, innaccessible and non-productive (with respect to timber) but there is a corridor of forest land along Highway 37 and the Lower Iskut Rivers axis which support sufficient, good quality stands to be considered economically accessible. Additional timber volume is conceptually described in the Craig River and the Unuk River drainages. Several small Timber Sale Licences have been

awarded in the Iskut Supply Block over recent times, however there are currently no active forest tenure licences in this area. The Iskut Supply Block has been a source of logs for export via the port of Stewart.

4.2.2 TIMBER TYPE AND VOLUME

The forest cover of the Lower Iskut River area comprises mainly mature and overmature hemlock, spruce, balsam, cottonwood, and pine (Forest Cover Map-Inventory Branch, Cassiar Timber Supply Area Report, September, 1988). The predominant species is hemlock, making up 85 percent of the total volume. Spruce occupies 10 percent of the total volume strata, balsam, cottonwood, and pine making up the remaining five percent.

Fifteen operable engineering units, totaling 107,484 acres, have been conceptually laid out in the Lower Iskut-Craig River area . Table 2 shows the acreage, volume, and species composition for each individual unit. As reported, a total volume of approximatley 14,878,000 cubic meters (m^3) is found on these units. The Unuk River drainage, south of the Iskut River axis to the U.S. border, has reported timber inventory acreage within six engineering units of 21,688 acres and volume estimated at 4,229,000m^3. Together, total estimated operable timber volumes in the lower Iskut-Craig River and Unuk River system is 19,107,000m^3. An annual allowable cut (AAC) estimated at 300 000m^3 per year is suggested by the Ministry of Forests for the Iskut-Craig area if the entire operable area, once accessed, proceeded under a forest license development plan providing a maximum and intense harvest level. The Unuk River system, currently with no allowable cut estimates, could presumably yield an additional 84,500m^3 per year. A total annual allowable cut of 384,500m^3 for the Isukut-Craig River and Unuk River systems equates to approximatley 365,000 tons of annual log volume as a potential contributor to transport volume from this region. The AAC figure was arrived at using the following productivity factors, based on the preliminary operability mapping of the area:

Daily Output:	250m^3/shift/crew
Number of crews	6
Annual Working Period	200 days
Harvesting Cycle:	50 years
Operable acres:	129,172
Reported Net Volume:	19,107,000m^3
Estimated Annual Allowable Cut:	384,500m3 per year or 365,000T/yr

The Long/short term needs for these drainage systems involve other resource users, hence some level of operational constraint is anticipated from an otherwise maximum harvest level.

TIMBER RESOURCE ANALYSIS
Lower Iskut River Area, Cassiar T.S.A.

TABLE 2

Lower Iskut River Engineering Units–Volume Summary

Unit #	Acres	Total Volume (1000 Cu.Meters)	Total Volume (1000 Tons)	Volume by Species (1000 cubic meters and %) Hemlock	Balsam	Spruce	Pine	Cot
1	8,580	951	934	858 (91)	51(5)	–	42(4)	–
2	3,900	426	421	426 (100)	–	–	–	–
3	7,332	1,063	1,024	899 (84)	–	164 (15)	–	1
4	9,048	1,080	1,059	1,023 (95)	–	48(4)		9
5	10,140	1,006	996	1,006 (100)	–	–	–	
6	15,288	1,822	1,794	1,767 (97)	–	47(2)	–	8
7	4,368	631	616	584 (94)	–	47(7)	–	
8	2,340	56	45	–	–	–	–	56 (100)
9	3,588	513	508	513 (100)	–	–	–	–
10	6,552	1,310	1,204	1,147 (88)	–	163 (12)	–	–
11	9,828	1,369	1,171	326 (24)	691 (50)	352 (26)	–	–
12	2,964	638	619	563 (88)	–	75 (12)	–	–
13	7,644	1,485	1,456	1,412 (95)	–	67(4)	–	5
14	6,240	750	708	557 (74)	–	177 (24)	–	16
15	9,672	1,778	1,700	1,442 (81)	–	311 (18)	–	25
Sub–Total	107,484	14,878	14,255	12,523 (84)	742 (5)	1,451 (10)	42	120

Unuk River Engineering Units–Volume Summary

1	642	151	148	37(24)	114(76)	–	–	–
2	1,537	269	265	172(64)	67(25)	30(1)	–	–
3	2,108	363	357	363(100)	–	–	–	–
4	6,704	1,208	1,189	1,153(95)	1	51(4)	–	3
5	5,520	1,212	1,194	1,171(97)	–	38(3)	–	3
6	5,177	1,026	1,010	1,016(99)	–	10(1)	–	–
Sub-Total	21,688	4,229	4,165	3,913(92)	182(4)	130(3)	–	7(1)

Grand Total	129,172	19,107	18,420	16,436(86)	924(4)	1,581(8)	42	1,27(1)

CUBIC CONVERSIONS

Hemlock: 1.01 cubic meters/ton
36 cu. ft/ton
180 board feet (Scribner)/ton

Spruce/Balsam/Pine: 1.23 cubic meter/ton
43 cubic ft/ton
210 board feet/ton

5.0 BRADFIELD ROUTE ANALYSIS

5.1 GENERAL

The objective of the study is the evaluation of both the feasibility and the cost of constructing a ground transportation facility to provide additional access from Southeast Alaska to the adjoining transportation facilities within Canada. The facility in turn would provide a more direct and shorter access route to salt water for the mineral and timber resources within the Iskut River region of British Columbia.

Recognizing the initial facility need and transport volumes as well as the availability of construction funding, the utilization of phase construction was chosen as the most viable approach. Initial construction would be a minimal facility with a basic alignment and gradient that could be upgraded to at least a Federal secondary standard as increased traffic volumes and types demanded.

Source data for review and analysis of the routes and standards included the Department of Transportation and Public Facilities, Southeast Region's Route Feasibility Study, Wrangell to Canada Border, November 1974, Supplemental Reconnaissance Study, Bradfield Canal Route, January, 1986, and the video tapes of their aerial reconnaissance of the Bradfield Canal Route initially flown September 26, 1985 with a follow-up flight on February 2, 1988. Additionally, Skyline Exploration LTD's Stage 1 Report for a Proposed Mineral Access Road, Iskut River Area, B.C., April 1982.

5.1.1. LAND STATUS

At the present time, the entire route corridor is Tongass National Forest land, and there are no active mining claims, withdrawls or easements within the corridor. Mining claims that were staked in the past and had land common to the corridor have expired. Two special use permits are issued by the U.S. Forest Service in the project area; 1) to the Alaska Power Authority for the Tyee Hydroelectric Project, and 2) to Bradfield Electric for the planned construction, operation and maintenance of a 69 KV power transmission line, extending from the Tyee Powerhouse to the Canadian border.

The State of Alaska has filed a National Forest Community Grant(NFCG) Nomination for a tentative land selection of 5,020 acres at the east end of Bradfield Canal. The application covers the area of deep water staging uplands, and approximately the lower 3 miles of the proposed road route.

5.2 ENGINEERING AND COSTS

5.2.1. ROAD STANDARDS

Initial construction would be a 16' wide, single lane roadway with intervisible turnouts. Vertical alignment would be limited to 8 percent maximum with maximum horizontal curvature of 15 degrees. This standard of road has been used extensively throughout Southeast Alaska and within most National Forests and has shown that it can readily handle an ADT of 100 vehicles. With reasonable traffic control measures, this number could be increased.

The road subgrade should be constructed of shot rock or other materials which would be capable of supporting "off highway" vehicle loadings. Roadway surfaces would be a crushed gravel surfacing material.

The majority of the road traverses moderate to flat terrain. The DOT/PF studies considered keeping the entire road on the west side of the Bradfield river. This study suggests moving the route to the east side to take advantage of the existing roadbed where possible. The first few miles of terrain along the west side of the river is fairly steep and provides minimal opportunity to place the roadway up, off the river flats. It is likely that the route would encounter extensive side hill cuts in locating the roadway in this area.

Major drainage structures would be initially constructed as a double lane facility. The structure would be capable of supporting a single off highway vehicle or normal two way traffic with standard highway loadings. This approach has been used within the Tongass National Forest on routes where future upgrading is anticipated and has shown to be a cost effective alternative.

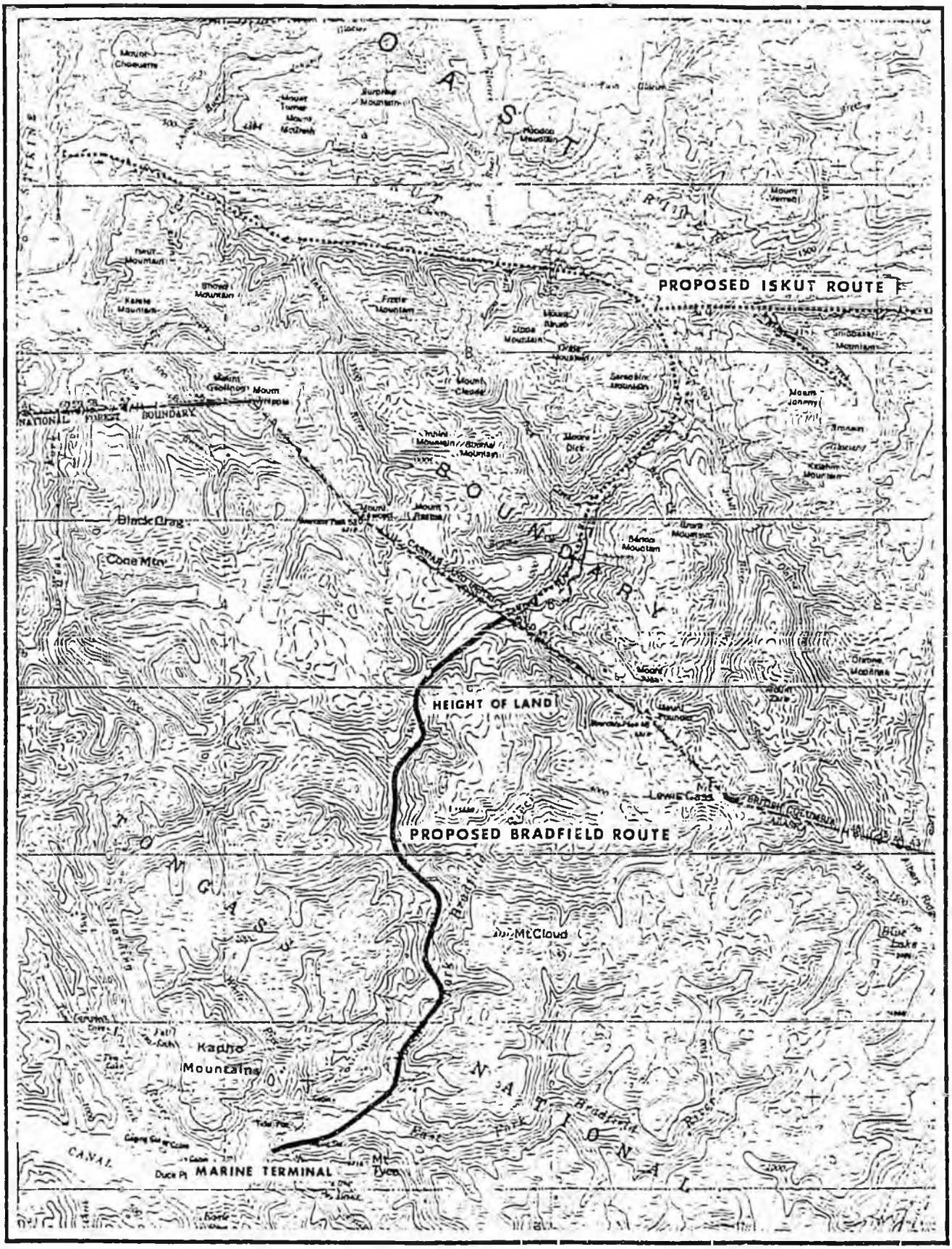
The initial tunnel construction standards are based on a 20 feet wide by 15 feet high bore. The tunnel would be self ventilating with lighting throughout. Based on our discussions with DOT/PF personnel, a 30 feet wide by 20 feet high bore was also evaluated for a measure to Federal Highway standards.

The assumptions used for marine terminal analysis provide for a 300 foot long steel sheetpile cell bulkhead with mooring dolphins at either end to allow tying up large draft open going vessels. There would be a 200' by 500' gravel surface staging area adjacent to the bulkhead. A wooden float with gangway would be provided to allow landing of small vessels and float planes. The terminal was placed on the east side of the canal as it appears that this location provides more protection from prevailing southeast winds.

5.2.2. ROUTE DESCRIPTION

The planned route would commence at a marine terminal located on the east side of the head of Bradfield Canal, approximately two miles west of the Tyee Lake Powerhouse(See figure 3). The route would then proceed along the south side of the Bradfield River, passing the powerhouse and continuing along the old timber access road. This would allow utilization of the existing roadbed. The route would cross the East Fork of the Bradfield at approximately M.P. 4.1 and continue up the east side of the North Fork crossing to the west side at approximately M.P. 11.3. The crossing would require fairly major drainage structures at M.P. 11.4 and 12.2. The route would then proceed up the west side of the drainage to approximately M.P. 21.2. At this point the route would either continue up the west side or cross to the east side of the drainage depending on the route alternative selected. The route would cross the height of land between the Bradfield River Drainage and the Craig River Drainage at approximately M.P. 25. The route would then proceed down the Craig River along its southeast side to approximately M.P. 29.5 where it would continue down the drainage to the Canadian Border. From there is would continue on down the Craig River drainage to the Iskut River and along the Iskut, intersecting the Cassiar Highway at Bob Quinn Lake. The route would also access the planned Canadian roads that extend on down the Iskut drainage to the Stikine River and those extending up the Snippaker and Coulter drainages, providing access to the lower Unuk River and Sulphurets Camp.

See Map Pocket inside back cover for a 1"=1mile route alignment map.



Bradfield Industrial Road Feasibility Study

ROUTE LOCATION MAP

FIGURE 3

5.2.3. ROUTE ALTERNATIVES

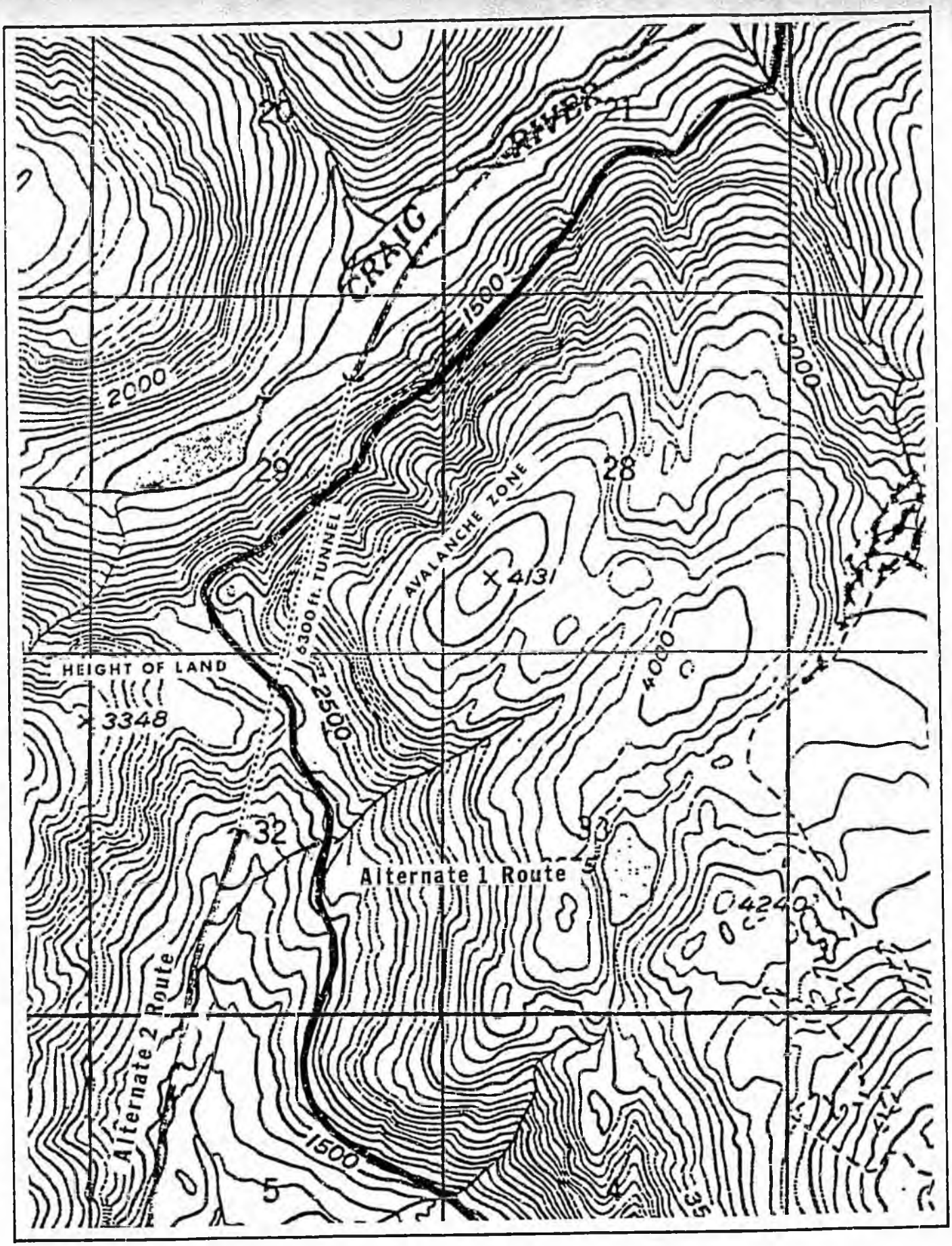
5.2.3.1. *Alternative 1.- Continuous Surface Road*

This alternative would involve construction of a continuous surface road from the marine terminal site to the Canadian border. The routing would require construction of 31.0 miles of road which will have basically a sustained gradient of 8% from M.P. 21 to M.P. 25.0 at the height of land, then a continued sustained 8% down to the Craig River at M.P. 29.4. The route also traverses excessively steep side slopes between M.P. 25 and M.P. 27 where a full bench roadway section as well as numerous avalanche sheds to protect the road users during winter travel will be required.

5.2.3.2. *Alternative 2.- Road/Tunnel*

This alternative uses a surface road with a 6300 foot long tunnel that allows the route to pass through the most adverse terrain area at the height of land between the two river drainages. It reduces the extended adverse road gradients as well as allowing the route to avoid the high avalanche zones. This routing would result in an overall route length of 30.2 miles between the marine terminal and the border. See figure 4, Height of Land Crossing.

An alternative that utilized an aerial tramway for crossing the adverse terrain at the height of land between the two river drainages was considered, but dropped. Though initial construction costs for this alternative were the least expensive of the three considered, the requirement for transfer of goods and materials between the tramway and ground transport vehicles and the expense of operation and upkeep, resulted in the alternative appearing to be uneconomical.



Bradfield Industrial Road Feasibility Study

HEIGHT OF LAND CROSSING

FIGURE 4

SCALE 1" = 2000 FEET

5.2.4. CONSTRUCTION COST ESTIMATES

Based on location of the planned road and its construction standards, the U.S. Forest Service Cost Estimating Guide for the Tongass National Forest was used as the base for estimating the road and drainage structure construction costs. The estimated costs were also evaluated against State of Alaska construction costs as well as other cost estimate data to help assure reasonableness.

Costs for the tunneling are based primarily on data from the contractor who constructed the tunnels for the Snettisham Powerhouse tap of Crater Lake and those of a recent access tunnel at the Kensington Mine just north of Juneau. The Crater Lake bore was a 11' high, horseshoe bore while the Kensington access was a 15' high by 20' wide bore. Tunneling cost figures from past DOT/PF cost estimates and from Canadian construction projects were also analyzed. The tunneling costs reported below are estimated for a 30 feet wide by 20 feet high bore, design standards meeting Federal Highway standards. Costs for reducing to a 20 feet by 15 feet bore are estimated to be 40 percent lower than that reported for the larger bore. Based on information gathered, it appears that if the larger tunnel is needed at some future date, it would be most cost effective to do the larger bore initially.

	CONTINUOUS SURFACE ROAD	ROAD/TUNNEL
Road Mileage	31.0 mi.	29.0 mi.
Tunnel		6300 ft.
Road Construction	$6,168,000	$4,807,000
Bridges	2,850,000	2,715,000
Snow Sheds	4,840,000	
Tunnel		9,261,000
Subtotal	13,858,000	16,783,000
Mobilization	416,000	424,000
Construction Camp Costs	439,000	488,000
Construction Staking	191,000	229,000
Contingency (20%)	2,772,000	3,357,000
Preliminary Engineering	768,000	722,000
TOTAL	$18,444,000	$ 22,003,000

*Construction of a Bradfield Canal marine terminal is estimated at $3,000,000.00

5.2.5. MAINTENANCE AND OPERATION COSTS

Costs for both summer and winter maintenance of road are based on Department of Transportation and Public Facilities estimates. Data collected form the British Columbia Ministry of Transportation personnel indicate lower costs might likely be experienced, but based on discussions with those involved with this project and the costs being experienced on the road between Skagway and Carcross, it was felt that the best approach would be to use the higher cost figures.

	CONTINUOUS SURFACE ROAD	ROAD/TUNNEL
Summer Mtc.	$404,000	$348,000
Winter Mtc.	402,000	335,000
Avalanche Control	80,000	20,000
TUNNEL Mtc. & Operation	–	120,000
TOTAL M&O	$886,400	$823,000

* Mtc. & Operation of Marine Terminal - $30,000

5.2.6. HAUL COST ESTIMATES

Two sets of haul cost data were generated to allow doing two separate cost benefit analysis. The first is to look at the differences in cost between the two Bradfield road alternatives. This was done to allow expanding the overall cost benefit analysis to recognize the haul costs savings in that the road/tunnel route does help minimize adverse haul gradients. The second set of data was generated to do a cost benefit analysis of the Bradfield Route versus hauling of the resource material to the marine terminal at Stewart, British Columbia.

The haul cost estimates for the Canadian resources are estimated from that point on the transportation route where the alternative between using the Bradfield Route or going to the Cassiar Highway and down to Stewart could be made. There was no attempt made to try to estimate costs for the other portions of the Canadian routes. The costs used for these routes are general in nature as data for the actual road

gradients is not readily available. This data would certainly need further expansion before one could make any actual haul direction determinations.

HAUL COSTS BY ROUTE

Bradfield River Alternative 1. (Continuous Surface Road)

Terminal to Border

Highway Vehicles	$24.69/ton
Off-Highway Vehicles	$21.85/ton

Border to Terminal

Highway Vehicles	$24.55/ton
Off-Highway Vehicles	$21.97/ton

Bradfield River Alternative 2. (Road/Tunnel)

Terminal to Border

Highway Vehicles	$22.47/ton
Off-Highway Vehicles	$19.65/ton

Border to Terminal

Highway Vehicles	$22.31/ton
Off-Highway Vehicles	$19.46/ton

6.0 ECONOMIC ANALYSIS OF ALTERNATIVES

The evaluation of alternatives was initiated with a comparison between the two route alternatives(road vs. road/tunnel) for the Bradfield Road. It is concluded the primary difference between the two Bradfield alternatives is the additional costs in construction of the tunnel. In the initial analysis, a smaller tunnel bore(20' x 15') was considered and indicated the road/tunnel alternative to be the preferred alternative. When the larger bore(30' x 20') was incorporated in the analysis, for reasons of addressing Federal Highway standards, the road became the better alternative, but with less than 2% rate of return over the road/tunnel alternative. Considering the haul cost savings and the likelihood of being better able to maintain a transportation corridor year around through use of the tunnel, the remainder of the economic analysis was run using the road/tunnel alternative for the Bradfield route.

Three comparisons were then evaluated between the Bradfield Route, using the road/tunnel alternative, and the Iskut/Stewart Route. For these comparisons, the construction and haul costs analysis used the mineral and timber properties as point of origin with contrasting destination of Bradfield terminal site vs. Stewart port.

The first of the three Bradfield-Iskut route comparisons looked at the relationship between the two routes considering just construction and maintenance and operation costs. The second comparison included the haul cost expense, but did not include the marine terminal at Bradfield Canal. This was done to provide a comparison of costs recognizing that if Stewart is to be used as the shipping point, there would most likely be similar costs in improving the terminal facilities there. In light of the rate of return found in the second comparative analysis, a third analysis was done to compare the alternatives with inclusion of the marine terminal costs at Bradfield Canal alone. The haul cost relationship proves to be the significant cost parameter throughout this evaluation. The haul cost saving associated with the shorter Bradfield route identifies this route as the preferred alternative.

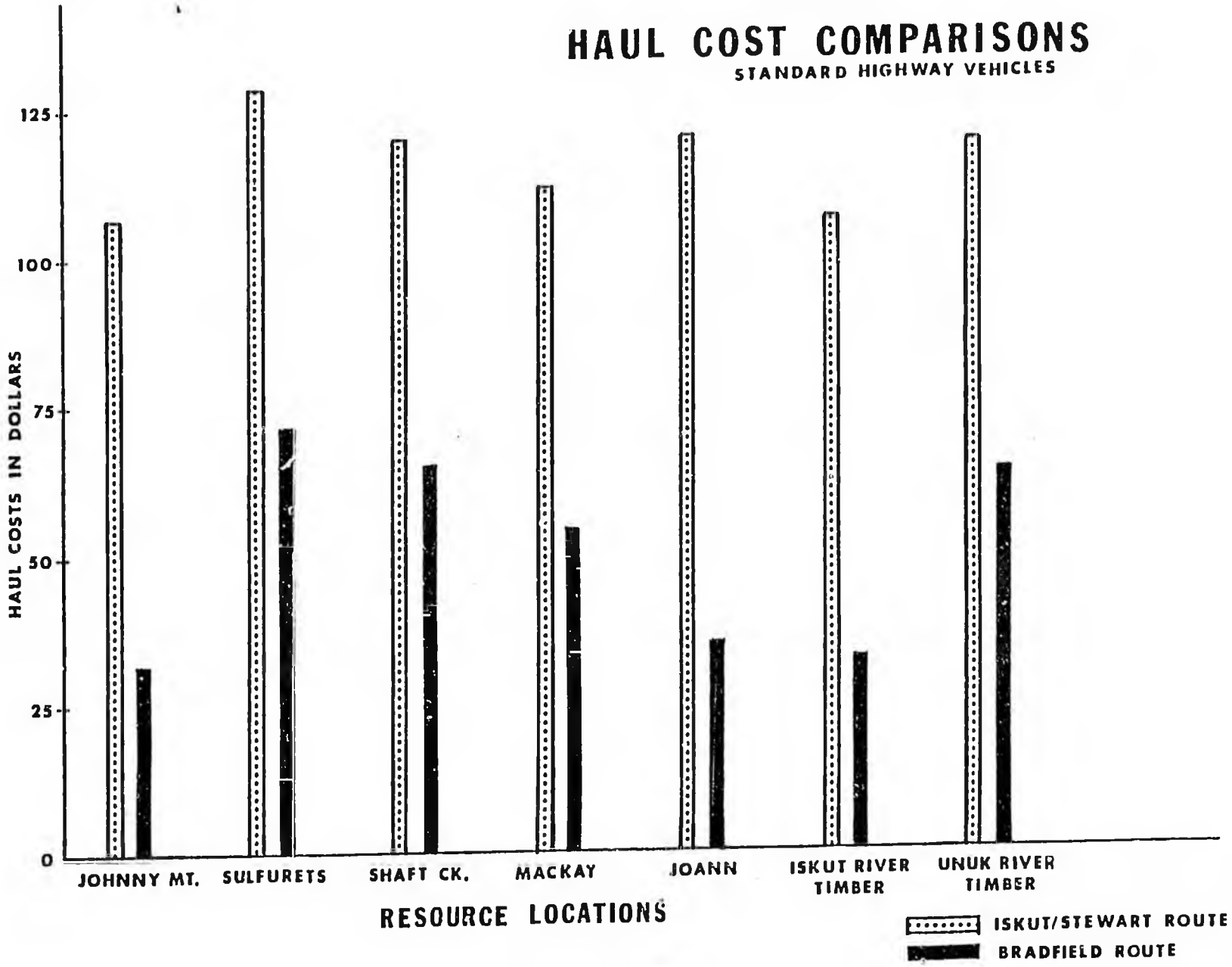
The analysis of the alternatives used a 20 year life, a minimum rate of return of 10% and a 5% per year increase in annual expense costs. The evaluation of the two Bradfield routes and the Bradfield - Iskut/Stewart alternatives assumed an initial haul volume of 30,000 tons with an annual increase of 5%. As the reduction in haul costs by use of the Bradfield is significant, any increase in annual haul volume results in an increase in the rate of return for the Bradfield Route. The construction, M&O and haul costs for the three evaluations was based on an average of mileage and costs associated with seven of the properties accessed. (See Figure 5)

The costs associated with use of both off highway and on highway vehicles were analyzed. As it is unlikely that off highway vehicles would be allowed on the Cassiar Highway, the cost benefit analysis were done using on highway vehicle costs only.

FIGURE 5

HAUL COST COMPARISONS

STANDARD HIGHWAY VEHICLES



6.1 BRADFIELD ROUTE ALTERNATIVES EVALUATION

Alternative 1- Continuous Surface Road
Alternative 2- Road/Tunnel
*includes Construction, Operation and Maintenance, and Haul cost

MRRR (%): 10
Study period (years): 20
Tax status: Before-tax analysis

	ROAD	ROAD/TUNNEL
Investment value ($):	1.8444E+07	2.2003E+07
Salvage value ($):	0	0
Economic life (years):	20	20
Present worth ($):	-3.711962E+07	-3.904228E+07
Annual worth ($):	-4360056	-4585891
Rate of return (%):	1.944441	

The better alternative is: ROAD

	ROAD			ROAD/TUNNEL		
Year	Annual Income	Annual Expense	Annual Tax	Annual Income	Annual Expense	Annual Tax
1	$0.	$1,541,900.	$0.	$0.	$1,406,800.	$0.
2	$0.	$1,618,995.	$0.	$0.	$1,477,140.	$0.
3	$0.	$1,699,945.	$0.	$0.	$1,550,997.	$0.
4	$0.	$1,784,942.	$0.	$0.	$1,628,547.	$0.
5	$0.	$1,874,189.	$0.	$0.	$1,709,974.	$0.
6	$0.	$1,967,898.	$0.	$0.	$1,795,472.	$0.
7	$0.	$2,066,293.	$0.	$0.	$1,885,246.	$0.
8	$0.	$2,169,607.	$0.	$0.	$1,979,508.	$0.
9	$0.	$2,278,088.	$0.	$0.	$2,078,483.	$0.
10	$0.	$2,391,992.	$0.	$0.	$2,182,408.	$0.
11	$0.	$2,511,591.	$0.	$0.	$2,291,528.	$0.
12	$0.	$2,637,171.	$0.	$0.	$2,406,104.	$0.
13	$0.	$2,769,029.	$0.	$0.	$2,526,409.	$0.
14	$0.	$2,907,481.	$0.	$0.	$2,652,729.	$0.
15	$0.	$3,052,855.	$0.	$0.	$2,785,366.	$0.
16	$0.	$3,205,497.	$0.	$0.	$2,924,634.	$0.
17	$0.	$3,365,772.	$0.	$0.	$3,070,865.	$0.
18	$0.	$3,534,060.	$0.	$0.	$3,224,408.	$0.
19	$0.	$3,710,763.	$0.	$0.	$3,385,629.	$0.
20	$0.	$3,896,301.	$0.	$0.	$3,554,910.	$0.

6.2 BRADFIELD ROUTE vs ISKUT-STEWART ROUTE EVALUATION 1

*Includes Construction , Maintenace and Operation Cost

MRRR (%): 10
Study period (years): 20
Tax status: Before-tax analysis

	BRADFIELD ROUTE	ISKUT\STEWART ROUTE
Investment value ($):	2.88516E+07	1.66268E+07
Salvage value ($):	0	0
Economic life (years):	20	20
Present worth ($):	-4.589087E+07	-4.267262E+07
Annual worth ($):	-5390325	-5012309
Rate of return (%):	6.508346	

The better alternative is: ISKUT\STEWART ROUTE

	BRADFIELD ROUTE			ISKUT\STEWART ROUTE		
Year	Annual Income	Annual Expense	Annual Tax	Annual Income	Annual Expense	Annual Tax
1	$0.	$1,406,800.	$0.	$0.	$2,150,400.	$0.
2	$0.	$1,477,140.	$0.	$0.	$2,257,920.	$0.
3	$0.	$1,550,997.	$0.	$0.	$2,370,816.	$0.
4	$0.	$1,628,547.	$0.	$0.	$2,489,357.	$0.
5	$0.	$1,709,974.	$0.	$0.	$2,613,825.	$0.
6	$0.	$1,795,472.	$0.	$0.	$2,744,516.	$0.
7	$0.	$1,885,246.	$0.	$0.	$2,881,741.	$0.
8	$0.	$1,979,508.	$0.	$0.	$3,025,828.	$0.
9	$0.	$2,078,483.	$0.	$0.	$3,177,120.	$0.
10	$0.	$2,182,408.	$0.	$0.	$3,335,975.	$0.
11	$0.	$2,291,528.	$0.	$0.	$3,502,774.	$0.
12	$0.	$2,406,104.	$0.	$0.	$3,677,912.	$0.
13	$0.	$2,526,409.	$0.	$0.	$3,861,808.	$0.
14	$0.	$2,652,729.	$0.	$0.	$4,054,898.	$0.
15	$0.	$2,785,366.	$0.	$0.	$4,257,643.	$0.
16	$0.	$2,924,634.	$0.	$0.	$4,470,525.	$0.
17	$0.	$3,070,865.	$0.	$0.	$4,694,051.	$0.
18	$0.	$3,224,408.	$0.	$0.	$4,928,753.	$0.
19	$0.	$3,385,629.	$0.	$0.	$5,175,191.	$0.
20	$0.	$3,554,910.	$0.	$0.	$5,433,950.	$0.

6.3 BRADFIELD ROUTE vs ISKUT-STEWART ROUTE EVALUATION 2

*Includes Construction , Maintenace and Operation Cost, and Haul Cost

MRRR (%): 10
Study period (years): 20
Tax status: Before-tax analysis

	BRADFIELD ROUTE	ISKUT/STEWART ROUTE
Investment value ($):	2.88516E+07	1.66268E+07
Salvage value ($):	0	0
Economic life (years):	20	20
Present worth ($):	-5.58034E+07	-8.48299E+07
Annual worth ($):	-6554647	-9964087
Rate of return (%):	32.60027	

The better alternative is: BRADFIELD ROUTE

	BRADFIELD ROUTE			ISKUT/STEWART ROUTE		
Year	Annual Income	Annual Expense	Annual Tax	Annual Income	Annual Expense	Annual Tax
1	$0.	$2,225,200.	$0.	$0.	$5,631,000.	$0.
2	$0.	$2,336,460.	$0.	$0.	$5,912,550.	$0.
3	$0.	$2,453,283.	$0.	$0.	$6,208,177.	$0.
4	$0.	$2,575,947.	$0.	$0.	$6,518,585.	$0.
5	$0.	$2,704,744.	$0.	$0.	$6,844,514.	$0.
6	$0.	$2,839,981.	$0.	$0.	$7,186,740.	$0.
7	$0.	$2,981,980.	$0.	$0.	$7,546,076.	$0.
8	$0.	$3,131,079.	$0.	$0.	$7,923,380.	$0.
9	$0.	$3,287,633.	$0.	$0.	$8,319,548.	$0.
10	$0.	$3,452,014.	$0.	$0.	$8,735,525.	$0.
11	$0.	$3,624,615.	$0.	$0.	$9,172,301.	$0.
12	$0.	$3,805,845.	$0.	$0.	$9,630,916.	$0.
13	$0.	$3,996,137.	$0.	$0.	%$10,112,461.	
14	$0.	$4,195,944.	$0.	$0.	%$10,618,084.	
15	$0.	$4,405,741.	$0.	$0.	%$11,148,988.	
16	$0.	$4,626,028.	$0.	$0.	%$11,706,437.	
17	$0.	$4,857,329.	$0.	$0.	%$12,291,758.	
18	$0.	$5,100,195.	$0.	$0.	%$12,906,345.	
19	$0.	$5,355,205.	$0.	$0.	%$13,551,662.	
20	$0.	$5,622,965.	$0.	$0.	%$14,229,244.	

6.4 BRADFIELD ROUTE vs ISKUT-STEWART ROUTE EVALUATION 3

*includes Construction, Operation and Maintenance, Haul Cost, and Marine Terminal Cost

MRRR (%): 10
Study period (years): 20
Tax status: Before-tax analysis

	BRADFIELD ROUTE	ISKUT/STEWART ROUTE
Investment value ($):	3.18516E+07	1.66268E+07
Salvage value ($):	0	0
Economic life (years):	20	20
Present worth ($):	-5.916676E+07	-8.48299E+07
Annual worth ($):	-6949705	-9964087
Rate of return (%):	26.65364	

The better alternative is: BRADFIELD ROUTE

	BRADFIELD ROUTE			ISKUT/STEWART ROUTE		
Year	Annual Income	Annual Expense	Annual Tax	Annual Income	Annual Expense	Annual Tax
1	$0.	$2,255,200.	$0.	$0.	$5,631,000.	$0.
2	$0.	$2,367,960.	$0.	$0.	$5,912,550.	$0.
3	$0.	$2,486,358.	$0.	$0.	$6,208,177.	$0.
4	$0.	$2,610,676.	$0.	$0.	$6,518,585.	$0.
5	$0.	$2,741,210.	$0.	$0.	$6,844,514.	$0.
6	$0.	$2,878,270.	$0.	$0.	$7,186,740.	$0.
7	$0.	$3,022,183.	$0.	$0.	$7,546,076.	$0.
8	$0.	$3,173,292.	$0.	$0.	$7,923,380.	$0.
9	$0.	$3,331,957.	$0.	$0.	$8,319,548.	$0.
10	$0.	$3,498,554.	$0.	$0.	$8,735,525.	$0.
11	$0.	$3,673,482.	$0.	$0.	$9,172,301.	$0.
12	$0.	$3,857,156.	$0.	$0.	$9,630,916.	$0.
13	$0.	$4,050,013.	$0.	$0.	%$10,112,461.	
14	$0.	$4,252,514.	$0.	$0.	%$10,618,084.	
15	$0.	$4,465,139.	$0.	$0.	%$11,148,988.	
16	$0.	$4,688,396.	$0.	$0.	%$11,706,437.	
17	$0.	$4,922,815.	$0.	$0.	%$12,291,758.	
18	$0.	$5,168,956.	$0.	$0.	%$12,906,345.	
19	$0.	$5,427,403.	$0.	$0.	%$13,551,662.	
20	$0.	$5,698,773.	$0.	$0.	%$14,229,244.	

7.0 OTHER CONSIDERATIONS

7.1 POWER SUPPLY OPTIONS

Power supply options have been examined by B.C. Hydro for supplying regional power to the existing mine at Johnny Mountain as well as other potential mine developments throughout Northwest British Columbia. In all cases, the results were subject to unforseeable start-up dates for mine development and general uncertainties relating to the potential Stikine/Iskut hydro electric project.

Four power supply options are considered:

1) Extension from British Columbia Hydro's grid.
2) Hydro generation near mine sites (more creek for Shaft Creek and/or Stikine Copper, and small hydro, where identified, for other mines.
3) Diesel generators at mine sites
4) Extension from Tyee Lake Hydro at Bradfield Canal.

Option 1 Is contingent on the Stikine/Iskut Power Project, a forseeably delayed opportunity due to many environmental and political considerations.

Options 2 and 3 Suggest, in most cases, diesel operation is preferred to small hydro as an on-site source of electricity.

Option 4 The average energy costs from the Tyee Project should provide more efficient operation, improve power reliability, and is compatible with Regional Intertie System Development.

Power supply options 1 and 4 are biased upward for mines and potential mines where supplemental diesel operation is required because of the start-up date of the mine precedes the earliest, feasible, in-service date for another source of power such as the potential Stikine/Iskut power project or Tyee Power. Thus, if mine start-up is sensitive to power costs, it may be advantageous for some potential mines to delay production until after a network power project proceeds.

This is not to suggest that a decision on the Stikine/Iskut or Tyee extension can be based on mine development in the region. Such a decision must be based on future regional energy demand, possible energy export demand and the successful negotiation of international agreements.

Extension of Tyee Hydroelectric Project power via the Bradfield Corridor is supported by the Alaska Power Authority consistent with Federal Law providing for the export and sale of electricity and electric power lines crossing international borders