

***D.5 Executive Summary of the Benefit Cost
and Economic Impact Analysis
Mackenzie Valley Highway Extension***

FINAL REPORT

**BENEFIT-COST AND
REGIONAL ECONOMIC IMPACT ANALYSIS:
MACKENZIE HIGHWAY EXTENSION**

Submitted to

Department of Transportation

by

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EXECUTIVE SUMMARY

Extending the Mackenzie Highway north from Wrigley is a long-term objective of the Department of Transportation. This report discusses the findings of an economic evaluation and regional economic impact analysis of the construction and operation of a 482 km extension to Fort Good Hope and a 832 km extension all the way to the Dempster Highway. A 105 km spur from just south of Tulita to Deline is incorporated in the study as an option, recognizing the current opposition to the road in that community.

The study uses cost estimates developed by the Department of Transportation, assuming a conventional public tender construction approach (60 km/hour design standard, ten-year construction period). It also addresses a Community Construction Approach to the project in which the highway will be built in small increments over an extended period.

Study Methodology

The study, undertaken by Nichols Applied Management, relies on the following sources for inputs:

- key respondent interviews and a review of Department of Transportation files to identify the benefits and costs of the proposed project; and
- an analysis by the Department of Transportation of the estimated project costs.

It uses two related but distinct analyses to assess the project. They are:

- a benefit-cost analysis, which determines the economic viability of the project from the perspective of the territorial economy; and
- a regional economic impact analysis, which focuses on the economic benefits to the region.

The study's discussion of the organizational implications of the Community Construction Approach builds upon the results of a workshop conducted by the study team with northern-based education and community development experts.

Project Benefits

Key respondents identified a range of project benefits. They are listed below:

- Prices in the Mackenzie Valley communities of Tulita, Norman Wells, Fort Good Hope, and Deline are expected to decrease as transportation and storage costs are reduced.
- Tourism expenditures are expected to increase when the Mackenzie Highway forms a loop with the Dempster Highway, stimulating visitor numbers and causing visitors to stay longer in the Northwest Territories.
- People, businesses, and public sector organizations including the health system in the Mackenzie Valley communities will have increased access to Fort Simpson and points beyond. This will likely mean an increase in operating efficiencies. Individuals are expected to travel more frequently between the communities, reducing their isolation.
- The Department of Transportation will not have to maintain the winter road between Wrigley, Fort Good Hope, and Deline.
- Oil and gas companies exploring the region will face reduced transportation costs and avoid "stand-by" costs for equipment now barged up and idled until freeze-up.

Some identified benefits were not further quantified because no ready market value estimates were available. These include the anticipated increase in the quality and variety of goods available in Mackenzie Valley communities and the increased access for hunters and trappers.¹

¹ Since the release of this report, there has been a significant increase in oil and gas activities in the Sahtu and Mackenzie Delta. This development was not anticipated in this report. The reader is cautioned that the conclusions drawn in this report does not reflect this new development.

Project Costs

The Department of Transportation developed a preliminary construction cost estimate. Other costs are incurred as well because additional money will have to be spent to realize some of the benefits. The costs are listed below:

- The construction cost of the road between Wrigley and Fort Good Hope is estimated at \$220 million. The cost of extending it to the Dempster Highway and to Deline is estimated at \$160 million and \$40 million, respectively.
- Maintenance of the all-weather road is estimated at \$10,000 per kilometre or between \$2.2 million and \$4.4 million per year, depending on the project configuration.
- The tourism industry will need to spend money to supply the products desired by visitors. This includes the cost of restaurant meals, tour operator supplies, wholesale groceries, and bulk fuel.
- Increased mobility implies costs, including additional ground transportation costs and increased accidents.

Some costs were not quantified because no market values are available. These include the cost of increased hunting and trapping pressure and possible impacts of the road on wildlife migration patterns.

Benefit-Cost Analysis

The benefit-cost analysis compares the discounted benefits and costs of the Mackenzie Highway Extension. The discounted benefits need to be greater than the discounted costs for the project to be economically viable. A benefit-cost ratio of one or larger and a positive value of the net present value of the difference between the costs and benefits indicates economic viability.

The benefit-cost ratio of the project, assuming a 7.5% discount rate, is estimated at 0.16 for all scenarios. The estimates of the present value of the benefits (net of the present value of the costs) range from minus \$173 million to minus \$285 million.

	Wrigley to Ft Good Hope		Wrigley to Dempster Highway	
	With Deline	Without Deline	With Deline	Without Deline
	7.5% Discount Rate			
Net Present Value (\$'000)	(\$197,000)	(\$173,000)	(\$285,000)	(\$267,000)
Benefit-Cost Ratio	0.16	0.16	0.16	0.16

This result is in line with other assessments of the economics of the Mackenzie Highway and similar roads. A 1983 study of the completion of the Mackenzie Highway to Wrigley places the benefit-cost ratio at 0.2, using a 10% discount rate. A 1990 study of The Mackenzie Highway Extension to the Dempster Highway, conducted in support of the 1990 Transportation Strategy Update, calculates a benefit-cost ratio of 0.45, using a 3% discount rate. Finally, a recent study of the Inuvik to Tuktoyaktuk road estimates the benefit cost ratio of that road project at 0.26, using a 7.5% discount rate.

The results of the benefit-cost analysis indicate that the Mackenzie Highway Extension is not viable from a strictly economic perspective. This result is confirmed by an analysis of the sensitivity of the results to changes in the underlying assumptions. Increasing the benefits and reducing the cost by an arbitrary 25% and including potential cost savings associated with the production of as yet unfound oil reserves raise the benefit-cost ratio to 0.41.

However, many public investments in infrastructure and programs are made on the basis of social rather than economic considerations. The regional economic impact analysis looks at the project from a regional development perspective, focusing on redistributing economic activity and benefits among regions.

Regional Economic Impact Analysis

The project will generate employment and income benefits to the region in the following ways:

- local hiring of construction workers and project spending on wages, materials, and equipment during construction;

- increased local hiring of maintenance workers and spending on wages, materials, and equipment for the maintenance of the all-weather road as compared to annual spending on the ice road; and
- increased tourism spending accruing to local operators and their suppliers.

These regional construction impacts are related to project scope and are estimated at:

- between \$41 to \$85 million of business and labour income; and
- between 1,250 and 2,360 person-years of on-site labour.

These economic impacts accrue to the region over the 10-year construction period. The project could also provide additional training positions for persons interested in equipment operations and the heavy duty mechanics trade.

The ongoing road maintenance will also provide economic benefits. These depend on the project scope and are estimated at:

- between \$1.4 million and \$2.8 million per year in additional business and labour income; and
- between 26 and 55 additional person-years of employment per year.

The anticipated increase in tourism will increase the employment opportunities in the region.

Seen from a regional perspective, the project strengthens the local economy by providing additional business and labour income and by creating additional jobs. This is significant for the Mackenzie Valley communities, where unemployment levels are high.

Assuming that the project is financed from outside the study area, the employment and income benefits will be without cost to the region. This means that the project will lead to a redistribution of income within the Northwest Territories or, if financed by the federal government, within Canada. The redistributive effect of the project is reduced if it is financed in part by regionally-based organizations. In that case, the project would likely pre-empt other investment in the region.

Community Construction Approach

It is possible to construct the road not as a short-term construction project, but as a long-term regional development initiative. The Community Construction Approach, defined as \$1 million per year construction projects in each of the five Mackenzie Valley communities, shifts the focus from road building to long-term economic development. This approach has the following annual economic impacts:

- additional business and labour income estimated at \$1.8 million; and
- additional employment estimated at nine on-site person-years.

The Community Construction Approach would provide:

- a modest stimulus to the regional economy; and
- some training opportunities for local people, especially if a way can be found to deliver the appropriate trades training in the region.

The Community Construction Approach would not place any undue stress on the labour market of the region and would provide some training positions for equipment operators and heavy-duty mechanics.

Organizational Considerations

Constructing the road using a Community Construction Approach implies that the Department of Transportation (DOT) would need to extend its range of activities to include community consultation, education, and economic development, which are the focal points of this approach.

An alternative is for DOT to build a partnership with claims organizations and other government departments, and maybe other organizations, such as cultural institutes, industry, and literacy groups. This has several advantages, such as:

- increased ownership of the project by the affected communities;
- access to existing channels for community consultations; and

- increased likelihood for maximization of education and economic development benefits.

The recent experience with the Nunavut Unified Human Resources Development Strategy (NUHRDS) suggests that the partnership be formalized by the creation of an independent project office or secretariat, which brings together representatives of the participating claims organizations and government departments.

Conclusion

The construction of the Mackenzie Highway Extension road can be a tool for regional economic development. It provides income and employment opportunities during construction and operation and will contribute to the further development of the tourism industry in the region.

The project is not attractive from a strict economic perspective. Its strengths are in the redistribution of wealth rather than in creating it.