

Report
Economic Evaluation of the TŁJCHQ Road

Submitted to GNWT Department of Transportation

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Executive Summary

Fortune Minerals has asked the Government of the Northwest Territories (GNWT) to construct a two-lane 60 km posted speed standard all-weather road from Highway 3 to Whatì (Tłı̄chq̄ Road). The road is a precondition for the construction and operation of Fortune Minerals' NICO Project, and has an estimated construction cost of \$152 million. If built, the Tłı̄chq̄ Road will also convey benefits to Whatì, such as:

- increased access leading to increased efficiency for business and government work as well as reduced medical travel costs;
- increased travel costs incurred by residents due to more frequent travel; and
- reduced costs of living.

An economic cost benefit analysis (CBA) that quantifies the major community and industry costs and benefits indicates that the economic benefits associated with the Tłı̄chq̄ Road Project exceed its economic costs by \$12 million. Under base case assumptions and using a 7% real discount rate, the benefit/cost ratio is estimated to be 1.01. However, the result is sensitive to product prices; the combined NICO and community net economic benefits of the Tłı̄chq̄ Road are estimated to be \$122 million under a high product price and at minus \$98 million under a low product price scenario.

An economic impact analysis of the Tłı̄chq̄ Road indicates that it directs investment to a region with labour force participation and employment rates that are below those of the NWT as a whole, and unemployment rates that are much higher. The Tłı̄chq̄ region is home to several companies capable of providing services and equipment required for the on-site construction and maintenance of an all-weather road, making it plausible that a substantial part of the road investment accrues to local workers and companies.

1. Introduction

1.1 Background

- Fortune Minerals' NICO Gold-Cobalt-Bismuth-Copper project consists of a mine and mill northeast of Whatì and a smelter/refinery near Saskatoon.¹ The mine is located 160 km northwest of the City of Yellowknife and 50 km north of the community of Whatì. Both the mine and the smelter have the key required approvals to proceed.
- Fortune Minerals has asked the Government of the Northwest Territories (GNWT) to construct an all-weather road from Highway 3 to Whatì (Tłıchq Road). Fortune Minerals is proposing to build an access road from the all-weather road near Whatì to its NICO project.
- Fortune Minerals asserts that its NICO project is only commercially viable if the GNWT or another third party builds the all-weather road. It is a necessary pre-condition for its ability to raise the equity and debt necessary for final commercial sanction of the NICO project.
- GNWT Department of Finance has conducted an assessment of the request by Fortune Minerals, the results of which are documented in NWT Finance 2014: *Macroeconomic Policy Framework Lens: Application to the Fortune Minerals Limited Tłıchq Road Request for the NICO Project* (MPF Lens Analysis).

1.2 Scope

This paper presents analyses of the economic implications of the Tłıchq Road between Highway 3 and Whatì. The MPF Lens Analysis focuses on the benefits of the Tłıchq Road accruing to the NWT economy as well as the GNWT fiscal position of the NICO Project going ahead. The analysis presented in this paper addresses the economic impact of constructing the Tłıchq Road on the regional and NWT economy and the net benefits of having year-round access to Whatì.

1.3 Rationale

- The effect of constructing and maintaining the Tłıchq Road goes beyond those accruing from the NICO Project, which are the subject of the MPF Lens Analysis.
- In northern communities that have previously been isolated or serviced by short-season winter road networks, the introduction of an all-weather transportation corridor can bring substantial community changes. Year-round access to a northern community can provide both opportunities and challenges, including:

¹ All Project information is from Micon International 2014: *Fortune Minerals Limited. Technical Report on the Feasibility Study for the NICO Gold-Cobalt-Bismuth-Copper Project, Northwest Territories, Canada.*

- reduced transportation costs providing the opportunity to improve a community's level of food security through increasing both food availability and affordability;²
- improved access to education and health services as well as a greater ability to visit family in nearby communities and increased opportunities for sports; and
- increased exposure to non-Aboriginal culture, drugs and alcohol.

² Council of Canadian Academics. 2014. *Aboriginal Food Security in Northern Canada: An Assessment of the State of Knowledge*, Ottawa, ON. The Expert Panel on the State of Knowledge of Food Security in Northern Canada, Council of Canadian Academics.

2. Cost Benefit Analysis

2.1 Key Question

The Cost Benefit Analysis (CBA) addresses the question of whether the Project adds to or subtracts from the total consumption and investment opportunities in the NWT economy.

2.2 Methodology

The CBA discussed here:

- takes a broad, NWT-wide perspective;
- compares direct economic costs and benefits (in constant 2014 dollars) and does not include spin-off or indirect and induced effects;
- includes only real resources used or created by a project and ignores transfers, such as taxes and royalties, and financial flows, such as financing;
- includes a broad set of community benefits and costs between 2015 and 2044:
 - reduced costs of winter road construction and maintenance;
 - reduced cost of constructing and maintaining the all-weather road;
 - increased benefits accruing to the community associated with easier business and governmental travel between Whatì and Behchokq/Yellowknife, and reduced medical travel costs;
 - increased travel costs incurred by Whatì residents associated with more frequent travel between Whatì and Behchokq/Yellowknife;
 - reduced costs of living in Whatì due to year-round road access; and
 - a proxy for the non-market value accruing to Whatì residents of increased access to Behchokq/Yellowknife.
- includes the benefits and costs of building and operating Fortune Minerals NICO project, based on information from the NICO Project Cash Flow model reported on in Micon 2014; and
- uses a 7% real discount rate to compare benefits and costs that accrue over time.

2.3 Findings

- The economic costs of the Tłı̄chq Road Project exceed its economic benefits by \$135 million (in NPV 7% terms) if only road construction and maintenance benefits and costs are considered.
- The estimated net benefit of the Tłı̄chq Road improves but is not positive if community costs and benefits are considered in addition to the road construction and maintenance benefits and costs:
 - Without a contribution of the positive net benefit from industrial development, the net benefit of the Tłı̄chq Road Project is estimated at minus \$129 million and the B:C ratio is estimated at 0.10.
 - The result of a negative net benefit if only community costs and benefits are considered is in line with a 2006 study of all-weather roads in the Tłı̄chq Region.³
- Under base case product prices, capital and operating costs and under the assumption that the initial capital expenditure will be financed 30% by equity and 70% by debt, the NPV7% of the *pre-tax cash flow* is estimated at \$254 million (Micon 2014). The NPV7% of the *economic net benefits* of the NWT portion of the NICO project (i.e. excluding the contribution of the Saskatchewan smelter and refinery) is estimated at \$141 million. The net benefit of the NICO project is reduced to \$7 million if the Tłı̄chq Road construction and operations (excluding the community) costs and benefits are included.
- This estimate is derived from the cash flow model results presented in Micon 2014 and has been adjusted as follows:⁴
 - removal of taxes, royalties, and financing costs from the calculations;
 - allocation of the costs at the time they are realized, not when they are paid for through debt financing;
 - allocation of the adjusted NPV7% of the total project to the NWT on the basis of the ratio of mine capital and operations costs to total capital and operating costs.⁵
- Under base case assumptions, the NPV7% of the economic benefits of the Tłı̄chq Road Project exceed its economic costs if both community and NICO costs and benefits are considered. With a contribution of the positive net benefit from industrial development,

³ Nichols Applied Management 2006. *An Economic Evaluation of All-Weather Roads in the Tłı̄chq Region*.

⁴ The Nichols Applied Management Study team was unable to fully reproduce the \$254 million (in NPV7% terms) of the pre-tax cash flow from the information on the cash flow model in Micon 2014. The economic net benefit presented here is derived from a lower cash flow, which makes the results more conservative than if the net economic costs and benefits had been derived from the \$254 million reported in Micon 2014.

⁵ An alternative approach would be to establish transfer prices for the concentrates shipped from the mine to the smelter. Transfer price information was not available.

the net benefit of the Tłıchq Road Project is estimated at \$12 million (in NPV7% terms) and the B:C ratio is estimated at 1.01.

- The positive net benefits if both community and NICO costs and benefits are considered is in line with, but smaller than, the results of the 2006 study. This difference is attributed in part to the movement of the downstream components of the NICO project to Saskatchewan.⁶

Table 2.1 Summary of Economic Benefits and Costs

Economic Variable	Tłıchq Road	Community	NICO	Combined
	Thousand \$2014 NPV7% \$2014			
Benefit				
Avoided Winter Road Costs	8,066			8,066
Community Access		2,688		2,688
Cost of Living		3,626		3,626
NICO Benefit			1,008,174	1,008,174
Total Benefits	8,066	6,313	1,008,174	1,022,553
Costs				
Tłıcho Road	142,694			142,694
Community Access		1,158		1,158
NICO Costs			866,719	866,719
Total Costs	142,694	1,158	866,719	1,010,570
Net Benefit	(134,628)	5,155	141,456	11,983

2.4 Sensitivity

- If both community and NICO project benefits are taken into account, the net economic benefit of building the Tłıchq Road is \$12 million (in NPV7% terms). This result is sensitive to the assumptions used.
- Following Micon 2014, the prices presented in Table 2.2 were used in a sensitivity analysis of the economic costs and benefits of the NICO project.

⁶ Fortune Minerals 2010, *Annual Information Form*.

Table 2.2 Product Price Ranges

Commodity	Product Prices		
	Low	Base Case	High
Gold US\$/ounce	1,200	1,350	1,500
Cobalt US\$/pound	13	16	19

- Table 2.3 shows the results of the analysis using the low, base case, and high prices on the NICO net economic benefits estimate. The NICO net economic benefits, which assume the Tłıchq Road is constructed, are estimated at \$251 million, \$141 million, and \$31 million under high, base case and low product price scenarios, respectively. The combined NICO and community net economic benefits of the Tłıchq Road are estimated at \$122 million, \$12 million and minus \$98 million under the high, base case, and low product price scenarios, respectively.
- The information in the table also addresses the uncertainty that the NICO project will proceed even if the NWT builds the road. The shaded cells show the combination of pricing assumptions and likelihood that the NICO project proceeds that result in expected net economic benefits from NICO that are larger than the negative net economic effect of building the road when only the community economic effects are considered.

Table 2.3 Net Benefits NICO

Likelihood	Product Prices		
	Low	Base Case	High
	\$2014 NPV7%		
100%	31,408,911	141,455,547	251,502,183
90%	28,268,020	127,309,992	226,351,965
80%	25,127,129	113,164,438	201,201,746
70%	21,986,238	99,018,883	176,051,528
60%	18,845,347	84,873,328	150,901,310
50%	15,704,456	70,727,774	125,751,091
40%	12,563,565	56,582,219	100,600,873
30%	9,422,673	42,436,664	75,450,655
20%	6,281,782	28,291,109	50,300,437
10%	3,140,891	14,145,555	25,150,218
0%	0	0	0
Note: NPV7% results do not include the costs of the Tłıchq Road. In other words, the analysis assumes that the Tłıchq Road is built by the GNWT.			

- Under Base Case assumptions, the Tłıchq Road will yield positive net economic effects if it claims roughly 90% of the net economic benefits associated with the NICO Project. In other words, the total economic net benefits are positive if the Tłıchq Road increases the likelihood of the NICO project proceeding by 90%.
 - Under high price assumptions, the total economic net benefits are positive if the Tłıchq Road increases the likelihood of the NICO project proceeding by 60%;
 - Under low price assumptions, the total economic net benefits are not expected to be positive even if the Tłıchq Road increases the likelihood of the NICO project proceeding by 100%.

2.5 Interpretation

- From a CBA perspective, which addresses the maximization of consumption and investment opportunities in the NWT economy, the Tłıchq Road should be built. Under base case assumptions, the economic benefits to the community and the NICO project outweigh the economic costs by \$12 million (in NPV7% terms).
- This conclusion holds if the NICO project does not proceed with certainty, but if the likelihood of it proceeding improves by 90% under high and base case pricing assumptions, respectively.
- This conclusion does not hold if the NICO project does not proceed or if it proceeds but low product prices prevail during the operations period of the NICO project.

2.6 Other Costs and Benefits

- The CBA results presented here quantify a number of community economic benefits and costs. However, community costs and benefits not quantified include:
 - The opportunity for Whatì residents currently commuting to the diamond mines to work closer to home and on their own lands;
 - The increased operating season of the winter roads to Gamètì and Wekweètì given the more northern starting point; and
 - The potential costs of more exposure to non-Aboriginal culture, drugs and alcohol.
- The CBA includes a proxy for better access to education and health services, a greater ability to visit family in nearby communities and increased opportunities for sports.
- The CBA results presented quantify the NICO economic benefits and costs. Industry economic costs and benefits not quantified include the uncertain but plausible industrial development of other resources in the region. One additional project is Fortune

Minerals' Sue Dianne deposit, which would take advantage of NICO access and milling infrastructure.

3. Economic Impact Analysis

3.1 Key Question

- An Economic Impact Analysis (EIA) assumes that the investment decision has been made and addresses the question of how the economy of the NWT reacts to the proposed investment.
- Economic Impact Analysis is a useful adjunct to CBA in that it can highlight which sectors of the economy benefit from the investment. Economic Impact Analysis provides some insight into the distributional effects of the investment, a subject on which CBA is largely silent.
- The focus is on the economic impacts of the Tłıchq Road construction and maintenance. The GNWT Finance's MPF Lens Analysis addresses the economic impact of the NICO project.

3.2 NWT

3.2.1 Methodology

- The Economic Impact Assessment of the Tłıchq Road project discussed here:
 - takes a broad, NWT-wide perspective;
 - looks at the net impact on road construction and maintenance, thus taking into account the cessation of winter road construction and maintenance once the Tłıchq Road is built;
 - includes both the direct investment and the spin-off or indirect effects; and
 - provides an estimate of total labour income that can, in turn, be the basis of an estimate of personal income taxes.
- The Economic Impact Assessment is based on published intensity ratios for the NWT economy (NWT Bureau of Statistics 2012, *NWT Economic Multipliers, Overview and Results*⁷).
 - The published intensity ratios are derived from the NWT Input-Output model (I-O model) and provide an estimate of the direct and indirect (or supplier) effects. They do not include the induced effects, or the effects of the re-spending of income by the workers on the Tłıchq Road project and its suppliers.

⁷ An alternative approach would be to do a special run on the NWT Input-Output model to get more detailed results, especially on the distribution of effects across sectors of the NWT economy.

- The I-O model of the NWT economy and the published intensity ratios do not identify a separate intensity ratio for road building. However, there are published ratios for construction and for linear infrastructure (natural gas distribution, water, sewage and other systems).
- The analysis here uses the construction intensity ratio for road construction and a simple average of the construction and utilities (electric power generation, transmission, and distribution; natural gas distribution, water, sewage and other systems) intensity ratios as a proxy for road maintenance.

3.2.2 Findings

- The direct and indirect GDP effect of building the Tłıchq Road is estimated at \$35 million in each of the first and second year of construction. The annual direct and indirect GDP effect of road maintenance is estimated at minus \$174,000, reflecting the lower costs of maintaining the Tłıchq Road as compared to the costs of constructing and maintaining the winter road.
- In terms of labour income, the Tłıchq Road is estimated to generate \$25 million direct and indirect labour income in each of the first and second year of construction. The annual direct and indirect labour income effect of road maintenance is estimated at minus \$62,000.
- In terms of employment, the Tłıchq Road is estimated to generate 266 person-years of direct and indirect employment in each of the first and second year of construction. The annual direct and indirect employment effect of road maintenance is estimated to be minus 0.7 person-years.
- The estimated economic effects of the Tłıchq Road construction are higher than those derived by Fortune Minerals for the NICO project on the NWT economy and reported in GNWT Finance's MPF Lens Analysis.
 - The Nichols Applied Management study team did not have access to the detailed calculations used by Fortune Minerals to derive its estimates of the economic impact of the NICO project. The smaller effect attributed to the NICO Project may be related to the fact that much of its capital expenditure for goods and services are made outside the NWT. These purchases include the capital costs of the smelter/refinery in Saskatchewan and the purchase of the Hemlo Mine milling equipment in Ontario.
 - The investment in the Tłıchq Road, in contrast, is made fully within the NWT economy, which has capacity for this type of economic activity. There will be leakage outside the NWT economy and the intensity ratios are sensitive to this phenomenon.

3.3 Tłıchọ Region

3.3.1 Methodology

- The regional economic discussion:
 - takes a Tłıchọ regional perspective; and
 - investigates the current regional capacity to support the construction and maintenance of the all-weather road.

3.3.2 Findings

3.3.2.1 Regional Capacity to Support Road Construction and Maintenance

- The all-weather road, as currently proposed, is expected to cost \$152 million. As shown in Table 3.1, a preliminary breakdown of the capital costs estimate indicates that:
 - approximately 96% (\$146 million) of the total construction costs are likely spent in the Tłıchọ region and the balance in the rest of the NWT, most likely in Yellowknife; and
 - approximately 28% of the construction costs are on-site labour, 49% are on-site equipment and 16% are on-site fuel and parts.

Table 3.1 Capital Expenditure by Geography

Expenditure	Local	Other NWT	Total	As % of Total
	\$000's			
Labour	42,610		42,610	28%
Equipment and Materials	74,570	-	74,570	49%
Fuel and Parts	24,350		24,350	16%
Engineering and Design	<u>4,570</u>	<u>6,090</u>	<u>10,650</u>	<u>7%</u>
Total	146,100	6,090	152,190	100%
As % of Total	96%	4%	100%	

- Spending in the region does not necessarily mean that it accrues to workers or companies in the region. Some spending (e.g., on fuel and parts) will accrue mostly to suppliers from outside the region. However, depending on the execution model, much of the spending on labour and equipment are expected to accrue to regional workers and companies:

- While the current NWT labour market can be described as ‘tight’ with a labour force participation rate of 74.6 % and employment rate of 68.0%, the Tłicho regional labour market does not parallel the NWT market. As shown in Table 3.2, the regional labour force participation and employment rates are below those of the NWT as a whole, and unemployment rates are much higher.⁸

Table 3.2 Regional and NWT Labour Force Statistics

Geography	Labour Force Participation Rate	Unemployment Rate	Employment Rate
Behchokò	53.3%	26.5%	39.6%
Gamètì	73.0%	33.3%	43.2%
Wekweètì	68.4%	23.1%	52.6%
Whatì	65.7%	45.7%	34.3%
Tłicho Region	58.4%	31.5%	39.7%
NWT Total	75.4%	11.4%	66.8%

Source: Statistics Canada National Household Survey, 2011

- The Tłicho region is home to several companies capable of providing services and equipment required for the on-site construction and maintenance of an all-weather road. Some regional companies have requirements to ensure a set proportion of the project crew is made up of Aboriginal workers. For example, Aboriginal Engineering Ltd. maintains approximately 85% Aboriginal employment during project work and also has a commitment to training and building capacity among the local workforce.⁹

⁸ Northwest Territories Bureau of Statistics, April 2014: Labour Force Activity. <http://www.statsnwt.ca/labour-income/labour-force-activity/>

⁹ Information available on the Tłicho Government webpage at <http://www.tlıcho.ca/businesses/tlıcho-investment-corporation/construction>

Table 3.3 Tłicho Region Construction and Development Companies

Company Name	Services Provided	Location	Ownership
Aboriginal Engineering Ltd.	Technical, professional and logistical experience with Northern industrial projects.	Behchokò Yellowknife	Tłicho Investment Corporation
Lac La Martre Development Corporation	Heavy equipment rental and winter road construction	Whatì	Tłicho Investment Corporation
Nishi Khon Forestry	Slashing and clearing brush, and clearing rights of way	Behchokò	Tłicho Investment Corporation
Nishi Khon Freeway	Land development, freight hauling, gravel sales and delivery, heavy equipment services, and civil construction projects	Behchokò	Tłicho Investment Corporation
Tłicho Road Constructors	Winter road construction	Behchokò Yellowknife	Behchokò Development Corporation
Tłicho Landtran Transport Ltd.	Freight hauling and truck transport	Yellowknife	Tłicho Investment Corporation

Source: Tłicho Investment Corporation profile, Tłicho Government webpage,¹⁰ Accessed May 2014.

3.3.3 Interpretation

- The Tłıchq Road project directs investment to a region with both high unemployment relative to the NWT overall and contractor capacity to undertake substantial parts of the work. If executed with local forces, the construction and maintenance of the Tłıchq Road would have a positive economic impact to the regional economy.
- The direct stimulative nature of the Tłıchq Road investment is larger than that of the NICO project construction. Road construction will likely be executed by contractors in the NWT or even the region. This contrasts with the NICO project, whose economic impact is mostly felt outside the NWT because the majority of its mining and milling equipment and all of the smelter and refinery capital expenditure will occur outside the NWT.

¹⁰ Information available at <http://www.tlıcho.ca/businesses/tlıcho-investment-corporation/construction>

A. Technical Appendix

Cost Benefit Analysis

- The derivation of the benefit and costs estimates is discussed below. All estimates are in constant \$2014.

Avoided Winter Costs

- Currently GNWT Department of Transportation builds and maintains a winter road from the Highway to Whatì. Table A-1 shows the approximate annual costs of building and maintaining the winter road to Whatì. The estimated \$635,000 annual costs will be avoided if the Tłjchq Road is built.

Table A-1 Winter Road Costs

Highway	Length (km)	Construction \$/km.	Maintenance \$/km.	Total Annual Costs
Highway to Whatì	101	5,038	1,250	635,088
Source: DOT				

Community Access

- The quantified benefits of year-round access to Whatì is estimated at \$208,800 per year. It includes a proxy for the non-market value to Whatì residents of increased access to Behchokq and Yellowknife, plus the sum of estimates for avoided costs of:
 - weather-induced flight delays;
 - charters/flights during the winter;
 - medical travel during the winter.

Table A-2 Access Benefits

Benefit	Avoided Costs/Realized Value
Reduced Delay ¹	3,000
Reduced Charter Costs ²	156,500
Reduced Medical Travel ³	52,014
Increased Mobility ⁴	42,000
Total	253,514
Notes:	
1 Professional time associated with cancelled/delayed air travel of representatives of eight organizations (Whatì/Tłjchq governments, NWT Health, MACA, Justice and Education, two private sector businesses): 13 person-days at \$225/day.	
2 Assumes number of flights into Whatì reduced from 10 to 6.5 per week. 130 avoided flights at an average cost per flight of \$860.	
3 Shift of a portion of medical travel from air to road. Assumed cost saving of 25% of medical travel budget for Whatì. The latter is estimated on the basis of population and the total medical travel budget.	
4 Assumed increase of trips out of Whatì from once a year to four times a year with a non-market value of \$40/person/trip value.	

Cost of Living

- The analysis derives two estimates of the impact to the cost of living from the Tłıchq Road, both driven off an estimate of total spending in Whatı. Total spending in Whatı is estimated at \$11.9 million per year. This estimate is based on the total income in Whatı of \$10.7 million (GNWT Bureau of Statistics, Community Profile), adjusted for a) leakage of private spending out of Whatı and b) non-wage spending by the public and private sector in Whatı.
- One cost-of-living benefit estimate is based on a reduction in transportation costs as a percentage of total spending from an assumed 6% to an economy-wide average of 3.4% (Statistics Canada 2006: *The Economic Importance of Transportation*. Daily May 19, 2006). This methodology suggests a cost of living reduction in Whatı of \$342,000 per year.
- Another cost-of-living benefit estimate is based on living costs differentials between various communities in the NWT (GNWT Bureau of Statistics). The midpoint of the range in the cost of living index for Whatı is at 152.5 (Edmonton=100). The corresponding index estimate for Behchokq is 127.5 and Yellowknife 122.5. These estimates suggest that the nearby communities with year-round access have a cost of living that is roughly 22% lower than Whatı with only winter road access. If the Tłıchq Road reduces this discrepancy by half, the resulting cost of living estimate is \$453,925. The CBA analysis uses the more conservative estimate of \$342,000.

Tłıchq Road Costs

- The Tłıchq road has an estimated capital cost of \$152 million and an annual operating cost of \$474,600.

Table A-3 All-Weather Road Costs

Road Segment	Length (km)	Construction \$	Annual Maintenance \$
Highway to Turnoff	95	127,949,800	399,000
Turnoff to Whatı	<u>18</u>	<u>24,243,120</u>	<u>75,600</u>
Total Tłıchq Road	113	152,190,000	474,600
Source: DOT			

Increased Access Costs

- Increased travel by community members implies costs (gas, tires, wear and tear on vehicles). The estimate of the cost of increased road traffic is based on 780 trips of 200 km and an average per kilometer cost of \$0.50.

Table A-4 CBA Results, Community

Year	Benefit				Cost			Net Benefits (\$)
	Avoided Winter Road Costs (\$)	Community Access (\$)	Cost of Living (\$)	Total Benefits (\$)	All Weather Road (\$)	Community Access (\$)	Total Costs (\$)	
2014	-	-	-	-	-	-	-	-
2015	-	-	-	-	35,500,000	-	35,500,000	-35,000,000
2016	-	-	-	-	35,500,000	-	35,500,000	-35,000,000
2017	760,848	208,814	342,000	1,311,662	474,600	78,000	552,600	759,062
2018	760,848	208,814	342,000	1,311,662	474,600	78,000	552,600	759,062
2019	760,848	208,814	342,000	1,311,662	474,600	78,000	552,600	759,062
2020	760,848	208,814	342,000	1,311,662	474,600	78,000	552,600	759,062
2021	760,848	208,814	342,000	1,311,662	474,600	78,000	552,600	759,062
2022	760,848	208,814	342,000	1,311,662	474,600	78,000	552,600	759,062
2023	760,848	208,814	342,000	1,311,662	474,600	78,000	552,600	759,062
2024	760,848	208,814	342,000	1,311,662	474,600	78,000	552,600	759,062
2025	760,848	208,814	342,000	1,311,662	474,600	78,000	552,600	759,062
2026	760,848	208,814	342,000	1,311,662	474,600	78,000	552,600	759,062
2027	760,848	208,814	342,000	1,311,662	474,600	78,000	552,600	759,062
2028	760,848	208,814	342,000	1,311,662	474,600	78,000	552,600	759,062
2029	760,848	208,814	342,000	1,311,662	474,600	78,000	552,600	759,062
2030	760,848	208,814	342,000	1,311,662	474,600	78,000	552,600	759,062
2031	760,848	208,814	342,000	1,311,662	474,600	78,000	552,600	759,062
2032	760,848	208,814	342,000	1,311,662	474,600	78,000	552,600	759,062
2033	760,848	208,814	342,000	1,311,662	474,600	78,000	552,600	759,062
2034	760,848	208,814	342,000	1,311,662	474,600	78,000	552,600	759,062
2035	760,848	208,814	342,000	1,311,662	474,600	78,000	552,600	759,062
2036	760,848	208,814	342,000	1,311,662	474,600	78,000	552,600	759,062
2037	760,848	208,814	342,000	1,311,662	474,600	78,000	552,600	759,062
2038	760,848	208,814	342,000	1,311,662	474,600	78,000	552,600	759,062
2039	760,848	208,814	342,000	1,311,662	558,600	78,000	636,600	675,062
2040	760,848	208,814	342,000	1,311,662	558,600	78,000	636,600	675,062
2041	760,848	208,814	342,000	1,311,662	558,600	78,000	636,600	675,062
2042	760,848	208,814	342,000	1,311,662	558,600	78,000	636,600	675,062
2043	760,848	208,814	342,000	1,311,662	558,600	78,000	636,600	675,062
2044	760,848	208,814	342,000	1,311,662	558,600	78,000	636,600	675,062
Total	8,065,767	2,213,639	3,625,550	13,904,956	69,294,826	826,880	70,121,706	-56,216,750

Table A-5 CBA Results, NICO

Year	Total Benefits (\$)	Total Costs (\$)	Net Benefits (\$)
2014	-	-	-
2015	-	114,733,000	-114,733,000
2016	-	158,961,500	-158,961,500
2017	4,402,216	65,203,000	-60,800,784
2018	127,423,329	85,067,000	42,356,329
2019	119,562,187	88,390,000	31,172,187
2020	89,145,021	63,808,500	25,336,521
2021	96,065,277	62,694,500	33,370,403
2022	110,207,403	62,837,000	47,370,403
2023	137,637,888	57,133,500	80,504,388
2024	133,176,191	60,033,000	73,143,191
2025	141,912,129	61,159,500	80,752,629
2026	139,555,709	62,801,000	76,754,709
2027	104,380,641	61,312,500	43,068,141
2028	110,004,926	60,169,500	49,835,426
2029	108,197,657	63,542,500	44,655,157
2030	106,213,746	60,605,000	45,608,746
2031	105,425,468	60,577,500	44,847,968
2032	109,592,763	59,520,500	50,072,263
2033	117,183,536	59,538,000	57,645,536
2034	168,357,267	61,380,000	33,878,375
2035	134,767,766	57,855,500	76,912,266
2036	49,780,427	65,384,500	-15,604,073
2037	-	-	-
2038	-	-	-
2039	-	-	-
2040	-	-	-
2041	-	-	-
2042	-	-	-
2043	-	-	-
2044	-	-	-
Total	1,008,174,193	866,718,646	141,455,547

Table A-6 CBA Results, Combined NICO and Community

Year	Total Benefits (\$)	Total Costs (\$)	Net Benefits (\$)
2014	-	-	-
2015	-	150,233,000	-150,233,000
2016	-	194,461,500	-194,461,500
2017	5,713,878	65,755,600	-60,041,722
2018	128,734,991	85,619,600	43,115,391
2019	120,873,849	88,942,600	31,931,249
2020	90,456,682	64,361,100	26,095,582
2021	97,376,939	63,247,100	34,129,839
2022	111,519,065	63,389,600	48,129,465
2023	138,949,550	57,686,100	81,263,450
2024	134,487,853	60,585,600	73,902,253
2025	143,223,791	61,712,100	81,511,691
2026	140,867,371	63,353,600	77,513,771
2027	105,692,302	61,865,100	43,827,202
2028	111,316,588	60,722,100	50,594,488
2029	109,509,318	64,095,100	45,414,218
2030	107,525,407	61,157,600	46,367,807
2031	106,737,130	61,130,100	45,607,030
2032	110,904,425	60,073,100	50,831,325
2033	118,495,198	60,090,600	58,404,598
2034	169,668,929	60,820,600	108,848,329
2035	96,570,036	61,932,600	34,637,436
2036	136,079,428	58,408,100	77,671,328
2037	51,092,089	65,937,100	-14,845,011
2038	1,311,662	552,600	759,062
2039	1,311,662	636,600	675,062
2040	1,311,662	636,600	675,062
2041	1,311,662	636,600	675,062
2042	1,311,662	636,600	675,062
2043	1,311,662	636,600	675,062
2044	<u>1,311,662</u>	<u>636,600</u>	<u>675,062</u>
Total	1,022,079,148	936,840,351	85,238,797