

Eastern Ontario Regional Network

The Economic Impacts of the Gig Project

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September 2020

INTRODUCTION

With the growing use of the internet and digital communications, reliable affordable access to the Internet has become an increasingly essential technology in our day-to-day lives. With the COVID-19 outbreak, the essential access to internet became even more significant to individuals, families, businesses, educators, and governments. This new perspective on the social value of internet access revealed inequalities regarding access to this increasingly essential technology. This is readily apparent for those living in rural communities, and those without the means to afford it.

While its social value of internet access had clearly increased after the COVID-19 outbreak, the incentives for the private-sector to respond to this increasing need had not significantly changed from the pre-COVID-19 conditions. The gap between this growing social need for reliable and affordable access to the internet and the inability of the private sector to profitably fulfil this need represents the failure of markets to respond to an obvious social and economic need. If markets do not account for the social value inherent in this gap and make the provision of the service profitable for the private sector, the gap can only be closed through governments' financial participation. The level of government participation must be, at least, to the point at which the private sector can participate profitably. Without this level of support, the private sector would not undertake this important communications infrastructure initiative.

The Gig Project that is being considered in this study is to build on the success of the Eastern Ontario Regional Network to expand access to reliable, high-speed (1 Gbps) service to 95% of eastern Ontario's homes and businesses. The total spending required by government and the private sector to accomplish this goal is estimated to be between \$1.2 billion to \$1.6 billion, over five years, between 2021 and 2026.

This analysis concentrates on the economic activity that will occur across the thirteen counties of the Eastern Ontario Regional Network (EORN) over the five years of the Gig Project. The economic impacts will be measured in terms of the overall economic activity that can reasonably be associated with the Gig Project. Six estimated outcomes – the \$1.2b Gig Project and the \$1.6b Gig Project, with three local spending scenarios in each – are considered in estimating the overall economic activity that would be undertaken in the region, the number of *job equivalents* that would be created, and the incomes associated with the creation of these

jobs. This is done to assess the economic viability of public and private investment in delivering all the technological and business-related goods and services that the Gig Project will require in eastern Ontario.

The Bases for Measuring the Economic Activity and Jobs Created from the Gig Projects¹

Estimating the economic activity that could be derived from public- and private-sector participation in this project draws on economic relationships that are evident from data on the Ontario economy and that of eastern Ontario.

Total Spending, Initial Expenditures, and Ultimate Impacts

The *total spending* undertaken to complete the Gig Project is the basis of this economic impact analysis. For the \$1.2b Gig Project there is total spending of \$240m in each of the five years; \$320m per year for the \$1.6b Gig Project. However, not all of the *total spending* will occur in eastern Ontario. The *initial expenditures* are the portion of the *total spending* that is spent in eastern Ontario – e.g., 40% of *total spending* stays in the region, and circulates in the regional economy. After the *initial expenditures* are made, some of this money continues to circulate in the region, creating subsequent economic effects.

To determine the nature of the subsequent effect, the proportion of *initial expenditures* that stay in the region must be taken into account. These effects are directly related to the ongoing spending in the region whereby one business' or person's spending becomes another business' or person's income. For example, if 50% of the subsequent, ongoing expenditures begun by the *initial expenditures* initiated by the project remain in eastern Ontario, and 50% is spent outside of the region, the ultimate impact in the region will be twice as large as the initial impact (i.e., a *multiplier* of 2). If the *initial expenditure* of the project were \$100m, and 50% of subsequent spending stayed in the region, the *ultimate impact* would be \$200m – representing a *multiplier* of 2.

The process from *total spending* to *initial expenditures* leading to the *ultimate impacts* through the application of the *multiplier* is used throughout this study, and leads to results for the two approaches – a \$1.2b or a \$1.6b Gig Project – and three scenarios within each approach that accounts for different proportions of the *total spending* remaining in the region.

¹ The analysis is done in constant 2019 dollars – i.e., the estimates for 2021 to 2025 are in 2019 dollars.

Jobs Analysis

Three observations regarding the Ontario and the eastern Ontario region are the bases of jobs analysis:

- By dividing the Gross Provincial Product of Ontario by the number of people in Ontario's Labour Force gives the amount of economic activity associated with each member of the labour force in Ontario. This provides insight into the economic activity required to create a job. For example, for 2019, calculating the ratio of the Gross Provincial Product for Ontario (approximately \$888,250 million) divided by the number of people in the Ontario Labour Force (7,890,600) gave a result of \$112,571. That is, on average, each worker is associated with \$112,571 of economic activity, or from a converse perspective, \$112,571 of economic activity was required to support one member of the labour force. As discussed immediately below, this does **not** imply that each member of the labour force earned an income of \$112,571.
- The income-based measure of Gross Domestic Product (GDP) over several years reveals that the share of GDP going to the "compensation of employees" (i.e., wages, salaries, benefits) is about 45% of total income, or total GDP. That is, 45% of total income is paid to employees the remainder goes to, for instance, spending required to run the businesses and profits to their owners, and governments in the form of taxes. Applying this to the information from the discussion immediately above suggests that the economic activity paid to each member person employed would be about 45% of \$112,571, or \$50,657.
- The average income in eastern Ontario has about 15% lower than the Ontario average. In 2018, the Ontario average was \$51,880; eastern Ontario's, \$43,740 – 15.7% below the Ontario average. Assuming a 2% increase in incomes eastern Ontario, over 2018, the average in eastern Ontario was about \$44,615 in 2019. With this being 45% of the economic activity associated with one-full time job, the amount economic activity associated, on average, with each job would be about \$99,144.

THE ECONOMIC IMPACTS

The economic impact of the Gig Project activities begins with determining the proportion of *total spending* that remains in eastern Ontario. That is, the Gig Project will spend a significant proportion of its *total spending* outside eastern Ontario for, for instance, the sophisticated equipment required and the expertise (e.g., engineering) required to ensure that the connectivity and capacity requirements are met. There is, however, another sizeable proportion that will be spent within the communities of eastern Ontario related to direct labour and the equipment and supplies required to build the network. For instance, the majority of the expenditures on labour to deploy the technology across eastern Ontario will, because of the locational requirements of such labour, be spent in the region. To get an estimate of the

economic impacts on the region, assumptions must be made regarding the spending that is undertaken in the region over the time of the Gig Project.

Regional Initial Expenditures Scenarios

Without knowing the exact proportion of total spending that will remain in eastern Ontario, three different scenarios have been used in this analysis.

The amount of labour required to complete the Gig Project is about 30% of total spending. While much of these labour costs will be incurred in eastern Ontario to build the network, it is reasonable to assume that some labour costs will go outside the region. Similarly, some portion of other spending will be incurred in eastern Ontario. Therefore, the lowest percentage of total spending undertaken in eastern Ontario is, for this analysis, assumed to be 30%. The proportion of *total spending* remaining in the region determines the *initial expenditures* in the region.

If the total spending on the Gig Project were \$1.2 billion, *total spending* in the region would be \$240m each year. If 30% of this spending were undertaken in eastern Ontario, \$72m would be spent in the region each year - *initial expenditures*. With 40% remaining in the region, *initial expenditures* would be \$96m per year; 50% remaining in the region, *initial expenditures* of \$120m per year.

Similarly, the 30%, 40% and 50% scenarios regarding the percentage of total spending remaining in the region can be applied to the Gig Project should it require \$1.6 billion over five years. Of the *total spending* of \$320 million in each of the five years, *initial expenditures* would be \$96 million per year with 30% remaining in the region; \$128 million per year with 40% remaining in the region; \$160m per year with 50% remaining in the region.

Table 1: *Total Spending and Initial Expenditures - \$1.2b and \$1.6b Gig Projects*

Total Spending - Percentage Remaining Regional	\$1.2b Gig Project - <i>Total Spending Annually</i>	\$1.2b Gig Project - <i>Initial Expenditures Annually</i>	\$1.6 Gig Project - <i>Total Spending Annually</i>	\$1.6b Gig Project - <i>Initial Expenditures Annually</i>
30%	\$240m	\$72m	\$320m	\$96m
40%	\$240m	\$96m	\$320m	\$128m
50%	\$240m	\$120m	\$320m	\$160m

Regional Ultimate Impact Scenarios

Ultimate impacts – the economic impact of the *initial expenditures* that stay in the region with the rollover, *multiplier* effect considered - a *multiplier* of 2. The *ultimate impacts* for the \$1.2 billion Gig Project, for the 30%, 40% and 50% of total spending remaining in the region are:

Table 2: *Ultimate Impacts*- \$1.2b Gig Project

Total Spending - Percentage Remaining <u>Regional</u>	<i>Ultimate Impacts</i> <u>Annually</u>	<i>Ultimate Impacts</i> <u>Over 5 Years</u>
30%	\$144m	\$720m
40%	\$192m	\$960m
50%	\$240m	\$1,200m

Should the Gig Project require \$1.6 billion, the annual, and five-year, *ultimate expenditures* are:

Table 3: *Ultimate Impacts*- \$1.6b Gig Project

Total Spending - Percentage Remaining <u>Regional</u>	<i>Ultimate Expenditures</i> <u>Annually</u>	<i>Ultimate Impacts</i> <u>Over 5 Years</u>
30%	\$192m	\$960m
40%	\$256m	\$1,280m
50%	\$320m	\$1,600m

In summary, the \$1.2 billion Gig Project, taking into account scenarios regarding the different proportions of total spending remaining in the region and applying the *multiplier* of 2, would generate between \$720 million and \$1.2 billion in economic activity in eastern Ontario over the five years of the project. The \$1.6 billion Gig Project would generate between between \$960 million and \$1.6 billion in economic activity in eastern Ontario over the five years of the project.

Regional Job Equivalent (JE) Scenarios

From the analysis above, \$99,144 in economic activity is required to support one job paying, on average, \$44,615 in eastern Ontario. Based on the *ultimate impacts*, estimates of the jobs the Gig Project will create can be made.

For \$1.2 billion and \$1.6 Gig Protect proposals, the Job Equivalents (JE) for each of the five years of the project are:

Table 4: Annual Job Equivalents - \$1.2b and \$1.6b Gig Projects

Total Spending - Percentage Remaining Regional	Annual Job Equivalents (\$1.2b Gig Project)	Annual Job Equivalents (\$1.6b Gig Project)
30%	1,452	1,937
40%	1,937	2,582
50%	2,421	3,228

Over all five years of the \$1.2 billion Gig Project, between 7,260 and 12,105 jobs would be created across eastern Ontario, and for the \$1.6 billion Gig Project, between 9,685 and 16,140 jobs would be created.

Regional Employment Earnings Scenarios

With the average employment earnings for a JE estimated to be \$44,615 (2019 dollars), the employment earnings in eastern Ontario based on the *job equivalent* estimates over each of the five years of the project for the \$1.2 billion and \$1.6 billion Gig Projects are:

Table 5: Employment Earnings - \$1.2b and \$1.6b Gig Projects

Total Spending - Percentage Remaining Regional	Estimated Annual Employment Earnings (\$1.2b Gig Project)	Estimated Annual Employment Earnings (\$1.6b Gig Project)
30%	\$64.8m	\$86.4m
40%	\$86.4	\$115.2m
50%	\$108m	\$114m

Given the JEs, the \$1.2 billion Gig Project is estimated to generate a total of between \$324m and \$540m in employment earnings for workers in eastern Ontario. For the \$1.6 billion Gig Project, the total employment earnings over all five years, in eastern Ontario, would be between \$432m and \$720m.

The Effective Multiplier

While the *multiplier* of 2 is applied to *initial expenditures* to determine *ultimate impacts*, it is also important to determine the relationship between *total spending* and the *ultimate impacts*. That is, the relationship between the *ultimate impacts* of the Gig Project in eastern Ontario, and the *total spending* on the Gig Project, inside and outside eastern Ontario. The ratio of *ultimate impacts* on *total spending* provides the *effective multiplier*.

The difference between the *multiplier* and the *effective multiplier* is determined by the proportion of *total spending* that is spent outside the regional. That is, the more that is spent inside the region, the closer the *effective multiplier* will be to the *multiplier*. Spending outside the region makes the *effective multiplier* smaller than the *multiplier* the greater the proportion of the total spending being spent outside eastern Ontario.

The *multiplier* and *effective multiplier* for both the \$1.2b and \$1.6b Gig Project across the three regional spending scenarios are:

Table 6: *Multiplier and Effective Multipliers*

Total Spending - Percentage Remaining Regional	<u>Multiplier</u>	<u>Effective Multiplier</u>
30%	2.0	0.6
40%	2.0	0.8
50%	2.0	1.0

These results show that when 30% of *total spending* occurs in eastern Ontario, the *ultimate impact* is 60% of the *total spending* – i.e., \$144m annually in the \$1.2b Gig Project; \$192m annually in the \$1.6b Gig Project. Similarly, when 40% of *total spending* remains in the region, the *effective multiplier* is 0.8, 80% of *total spending* remains in the region – i.e., \$192m annually in the \$1.2 Gig Project and \$256m annually in the \$1.6b Gig Project. When half – 50% - remains

in the region, the *effective multiplier* is 1.0 – i.e., *ultimate impact* in the region for the \$1.2b Gig Project is \$240m annually, and for the \$1.6b Gig Project, \$320m annually.

The difference between the *multiplier* and the *effective multiplier* provides insight into the economic impacts of the Gig Project outside eastern Ontario. Even though the Gig Project is designed to serve eastern Ontario, there are significant economic impacts outside the region over the five years. These economic impacts represent a more widespread impact in terms of *ultimate impacts* and the creation of jobs outside of eastern Ontario. The smaller the *effective multiplier* for eastern Ontario is, the larger the economic impacts from the Gig Project outside eastern Ontario.

The economic impacts Gig Project spending undertaken outside eastern Ontario will be determined by where the spending occurs. For instance, the JE impacts in areas outside eastern Ontario would depend upon the level of economic activity required to support a job will be different across areas of Ontario.

Applying the same approach used here to estimate the *ultimate impacts* in eastern Ontario, the impacts of total spending undertaken outside eastern Ontario can also be estimated.

Table 7: *Ultimate Impacts* Outside Eastern Ontario - \$1.2b and \$1.6b Gig Projects

Total Spending - Percentage Remaining Regional	\$1.2b Gig Project <i>Ultimate Impacts</i> Outside Eastern Ontario	\$1.6b Gig Project <i>Ultimate Impacts</i> Outside Eastern Ontario
30%	\$336m	\$448m
40%	\$288m	\$384m
50%	\$240m	\$320m

Data Summary

A summary of the economic impact analysis for eastern Ontario presented above for the \$1.2b and \$1.6b Gig Project appear below.

The \$1.2b Gig Project

Table 8: Summary of Eastern Ontario Analysis - \$1.2b Gig Project

	Annual	Annual	Total (5 year)			Total Annual	Total (5 year)	
Percentage	Initial	Ultimate	Ultimate		Total	Employment	Employment	
Remaining	Expenditures	Impacts	Impacts	<u>Annual</u>	<u>(5 year)</u>	Earnings	Earnings	<u>Effective</u>
In Region	(millions)	(millions)	(millions)	JE	JE	(millions)	(millions)	Multiplier
30%	\$ 72.00	\$ 144.00	\$ 720.00	1,452.4	7262.2	\$ 64.80	\$ 324.00	0.6
40%	\$ 96.00	\$ 192.00	\$ 960.00	1,936.6	9682.9	\$ 86.40	\$ 432.00	0.8
50%	\$ 120.00	\$ 240.00	\$ 1,200.00	2,420.7	12103.6	\$ 108.00	\$ 540.00	1

The \$1.6b Gig Project

Table 9: Summary of Eastern Ontario Analysis - \$1.6b Gig Project

	Annual	Annual	Total (5 year)			Total Annual	Total (5 year)	
Percentage	Initial	Ultimate	Ultimate		Total	Employment	Employment	
Remaining	Expenditures	Impacts	Impacts	<u>Annual</u>	<u>(5 year)</u>	Earnings	Earnings	<u>Effective</u>
In Region	(millions)	(millions)	(millions)	JE	JE	(millions)	(millions)	Multiplier
30%	\$ 96.00	\$ 192.00	\$ 960.00	1,936.6	9,683.0	\$ 86.40	\$ 432.00	0.6
40%	\$ 128.00	\$ 256.00	\$ 1,280.00	2,582.1	12,910.5	\$ 115.20	\$ 576.00	0.8
50%	\$ 160.00	\$ 320.00	\$ 1,600.00	3,227.6	16,138.0	\$ 144.00	\$ 720.00	1

Conclusions

The Eastern Ontario Regional Network (EORN), Gig Project addresses the increasing need for high-speed, reliable, broadband internet access across the thirteen counties of eastern Ontario. EORN's Gig Project proposal builds on its accomplishments in building broadband access. With the growing social and economic value of internet access, this proposal addresses the market failure that continues to prevent the private sector from being able to profitably meet the growing needs.

EORN's Gig Project proposal offers a public-private partnership that can establish a new economic foundation for eastern Ontario that can meet the needs of the post-COVID-19 era, and beyond. The Gig Project offers an opportunity to transform eastern Ontario into a model of rural economic growth for other rural communities across Canada.

This report assesses the economic impacts of the Gig Project. It considers each of the two project approaches – a \$1.2b or \$1.6b Gig Project – and three scenarios regarding spending undertaken in the region. That is, the scenarios address the proportion of total project

spending that is initially spent in eastern Ontario and investigates their potential economic impacts. Each scenario represents an assumption about the percentage of the total project spending that is initially spent in eastern Ontario – 30%, 40%, and 50%.

The results of this assessment of economic impacts across eastern Ontario include:

- *total spending* is of between \$240m and \$320m per year for five years – 2021 to 2026
- the *initial spending* that remains in eastern Ontario - \$72m and \$160m per year
- *ultimate economic impacts* of between \$144m and \$320m per year, or between \$720m and \$1.6b over the five years of the Project
- creating between 1,452 and 3,228 jobs per year for each of the five years of the Project, which generates between \$65m and \$114m in employment earning, annually in eastern Ontario
- with not all spending occurring in eastern Ontario, \$240m and \$480m will stimulate economies, incomes, and employment outside eastern Ontario, annually.

With the Gig Project complete, eastern Ontario will enjoy the legacy of a state-of-the-art technological foundation upon which to build a growing and prosperous rural economy for the next generation.