



Assessing Labour Market Shortages in the City of Thunder Bay

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By: Alex Ross



North Superior
Workforce Planning Board



Local Employment
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About North Superior Workforce Planning Board, your Local Employment Planning Council:

The North Superior Workforce Planning Board (NSWPB) is one of twenty-six Workforce Planning zones across Ontario, mandated through the Ministry of Advanced Education and Skills Development to identify, assess and prioritize the skills and knowledge needs of community, employers and individual participants/learners in the local labour market through a collaborative, local labour market planning process.

Our vision is to ensure that our human resource pool will be strategically aligned, competitively positioned and progressively developed to meet future social and economic demands across Northwestern Ontario. Our mission is to connect community partners to improve the quality of life in our communities through workforce development.

NSWPB is the Local Employment Planning Council for the Thunder Bay area. The Local Employment Planning Council (LEPC) is one of the eight pilot project sites funded in part by the Government of Canada and the Government of Ontario. The LEPC will be working with 35 local communities to develop labour market information that is relevant to Northern stakeholders such as businesses, employers, employees and employment and training service providers. We will be working to develop and strengthen partnerships, foster integrated planning and coordinate services.



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About the Author

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Alex Ross is a former senior data analyst for Northern Policy Institute. He was born and raised in Sudbury Ontario, and currently works in Economic Development. After graduating from Laurentian University with a B.A. (Hons) in Economics in 2010, Alex completed a Masters Degree in Economic Policy from McMaster University. Alex's areas of interest include labour market analysis, community and economic development, cost-benefit analysis, and environmental sustainability.

Contents

Executive Summary 5

Introduction 5

Estimating current labour market shortages..... 7

Estimating future labour market shortages 10

Combining Current and Future Estimates 12

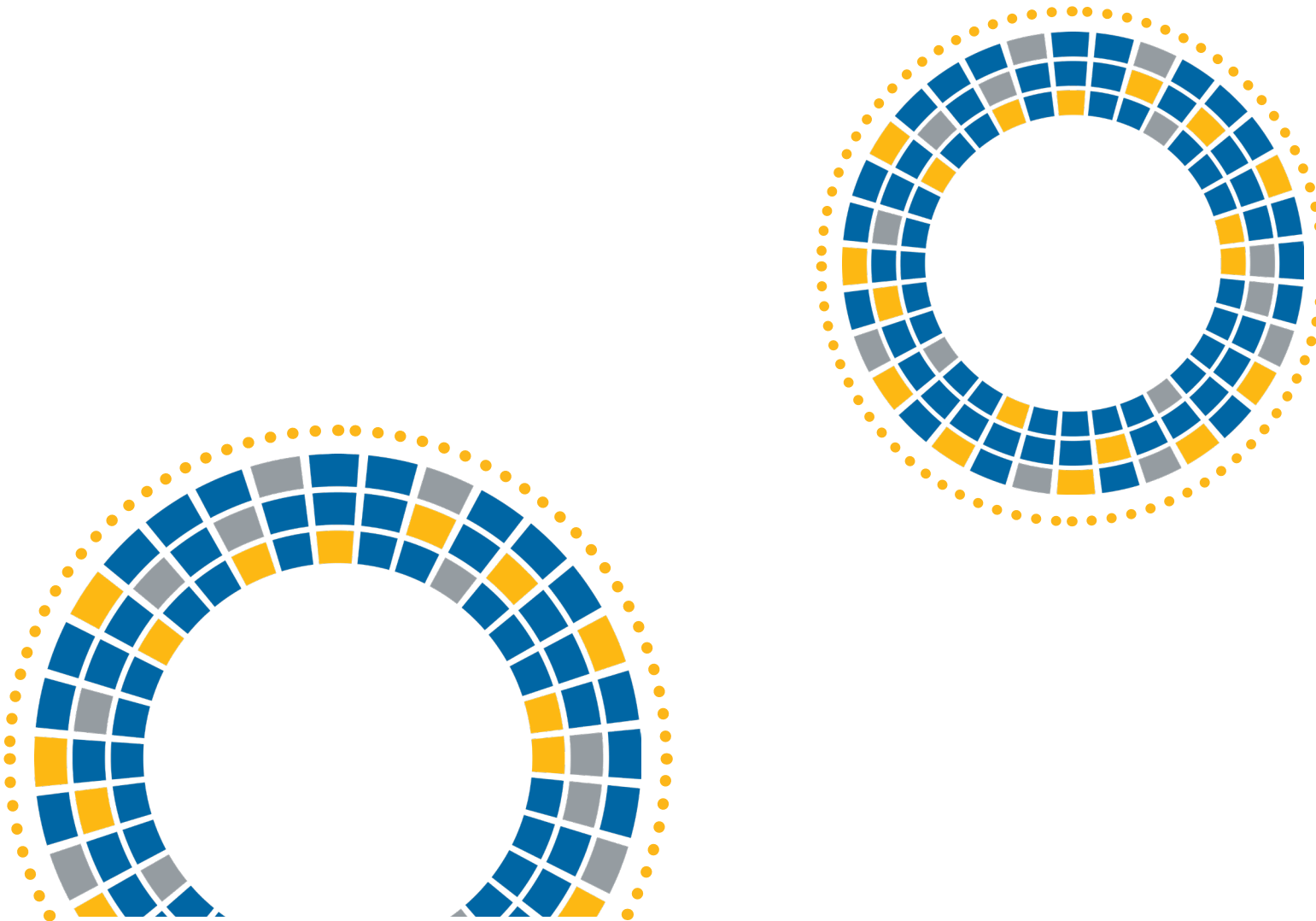
Limitations 14

Conclusion 14

References..... 15

Appendix A: Growth rate 16

Appendix B: Replacement Demand..... 17



Executive Summary

Northern Ontario is ageing. This is well known among decision makers within our communities, and multiple initiatives have been underway to counter the ageing demographic and focus on filling current and future labour force needs due to retirement and out-migration. The most recent initiative includes the Rural and Northern Immigration Pilot (RNIP), a community driven program which includes Northern Ontario's five largest cities and involves increasing immigration to these communities by creating a path to permanent residence for foreign skilled workers (Government of Canada, 2020).

With retirement and out-migration coupled with an already ageing population, it is important now more than ever to understand the occupations in which these shortages fall. This briefing note provides insight into current and potential future labour market shortages in Northern Ontario's five largest cities, in order to provide a better understanding to decision makers, potential migrants and youth on the labour market situation in Northern communities. These insights are important to ensure that skills shortages are met, in-migrants move to the North for the right jobs, and so that Northern Ontario's youth prepare themselves for careers that will allow them the option of remaining in their home cities after they graduate.

For the Thunder Bay Census Metropolitan Area, this paper finds that multiple highly skilled positions have been identified as in need, both based on current labour market indicators and potential future retirements. This includes optometrists, chiropractors, and other health diagnosing and treating professionals, which were identified across all three indicators as occupations that may be experiencing high current shortages and high future demand. Other health-related positions were also identified across multiple indicators, including physicians, dentists, pharmacists, and dieticians. In management, multiple positions were identified which were unique to Thunder Bay, including managers in finance and business, retail and wholesale trade, construction, sales, transportation, and customer services. Finally, computer and information systems professionals were also identified, which was unique to Thunder Bay and forms a relatively large proportion of labour market demand.

Introduction

Estimating labour market shortages is a struggle for governments and communities alike due to unavailability of data and variances in small datasets (Parkinson, 2019). However, determining labour market gaps is increasingly becoming a more important practice for policy planning, given projected future labour force declines in Northern Ontario (Moazzami, 2019). Gaining an understanding of occupational shortages is helpful for guiding immigration strategies, aligning future graduates with openings, and maximizing abilities of the current labour force.

This paper attempts to provide a better understanding of local labour market needs, based on the best possible information available at the local level. The paper examines three different estimators of labour market needs; two estimate projected future needs, and one measures potential current labour market gaps.





**“...determining labour
market gaps is increasingly
becoming a more
important practice for
policy planning...”**

– Dr. Bakhtiar Moazzami, 2019

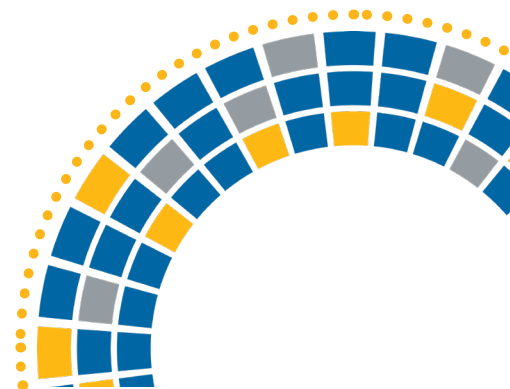


Estimating current labour market shortages:

To estimate current labour market shortages we use a variant of the job vacancy rate. This rate is a regular indicator used by Statistics Canada and is defined as “the number of job vacancies or vacant positions on the last business day of the month, expressed as a percentage of labour demand (occupied positions and vacant positions)” (Statistics Canada, 2015). A high job vacancy rate typically indicates a stronger labour market for job seekers, as it demonstrates that a higher proportion of the total labour market consists of vacant jobs needing to be filled (Lindzon, 2019). Also, generally a negative correlation exists between unemployment rate and job vacancies, suggesting that a high unemployment rate corresponds with a lower job vacancy rate, and thus a higher vacancy rate typically aligns with a lower unemployment rate (Drolet, 2017). Since unemployment rates by occupation are not available at the local geographic level between census years, the job vacancy rate is used to estimate labour market strengths across occupations.

Northern Policy Institute (NPI) conducted an occupation-specific job vacancy rate analysis of the Thunder Bay Census Metropolitan Area (CMA) to determine the vacancy rates across different National Occupational Classification (NOC) categories.¹ To calculate the average job vacancy rate, the author used data from Emsi Economic Modelling, which was provided through a partnership with the Ontario Ministry of Agriculture, Food and Rural Affairs. Emsi provides an analytical platform with labour market information at the community level. Data were retrieved from Emsi on occupation-specific average job postings in the community in 2018, based on monthly postings throughout the year, and average total jobs within each occupation category in 2018, based on quarterly totals throughout the year. Average jobs and job postings were summed together to arrive at total labour demand for each occupation category. The average job vacancy rate was then determined by dividing occupation-specific job postings by occupation-specific total labour market demand. The calculation used here varies from the standard job vacancy rate calculation used by Statistics Canada in that the author analyzes average postings and filled jobs rather than the number of postings and filled jobs at a specific point in time. The potential limitations of this approach are further discussed in the last section of this paper.²

Based on the above approach, Table 1 identifies the top 20 occupations with the highest average job vacancy rates in the Thunder Bay CMA in 2018. According to the below table, multiple management-related positions appear to have the highest job vacancy rates (Major NOC grouping ‘0’). However, three of the occupations listed are in skill level C. This includes customer and information service representatives, installers and repairers, and assembly-related occupations. Items identified in red include occupations which were identified as unique to this region when compared to the same top 20 list at the provincial level.



¹ As per Statistics Canada’s geographic hierarchy, the Thunder Bay Census Metropolitan Area consists of the following communities: Conmee, Fort William 52, Gillies, Neebing, O’Connor, Oliver Paipoonge, Shuniah, and the City of Thunder Bay.

² To test this method, the author calculated the average job vacancy rates at the provincial level and compared this to another method to potentially estimate job shortages provincially—the length of job postings. Jobs that are posted for long periods of time often indicate that those occupations are more difficult to fill (Langevin, 2018). A list of three-digit NOCs was compiled based on occupations that have the highest ratios of jobs that were posted for 30 days or longer. The occupations with the top 20 highest ratios were compared to the top 20 positions based on highest average job vacancy rates, as outlined above. The two lists had an overlap of 40 per cent, meaning that eight out of 140 three-digit National Occupation Classifications appeared on both top 20 lists.

Table 1: Occupation Categories with the Highest Average Job Vacancy Rates, Thunder Bay CMA

NOC	Occupation	Average Unique Postings, 2018	2018 Jobs	Total Labour Market	Job Vacancy Rate
011	Administrative services managers	85	232	317	26.81%
060	Corporate sales managers	31	102	133	23.31%
065	Managers in customer and personal services, not elsewhere classified	17	59	76	22.07%
312	Optometrists, chiropractors, and other health diagnosing and treating professionals	20	96	116	17.31%
823	Underground miners, oil and gas drillers, and related occupations	3	16	19	14.39%
051	Managers in art, culture, recreation, and sport	7	42	49	14.04%
071	Managers in construction and facility operation and maintenance	18	121	139	12.91%
062	Retail and wholesale trade managers	52	385	437	11.93%
063	Managers in food service and accommodation	17	128	145	11.67%
655	Customer and information services representatives	80	628	708	11.28%
744	Other installers, repairers, and servicers	39	328	367	10.65%

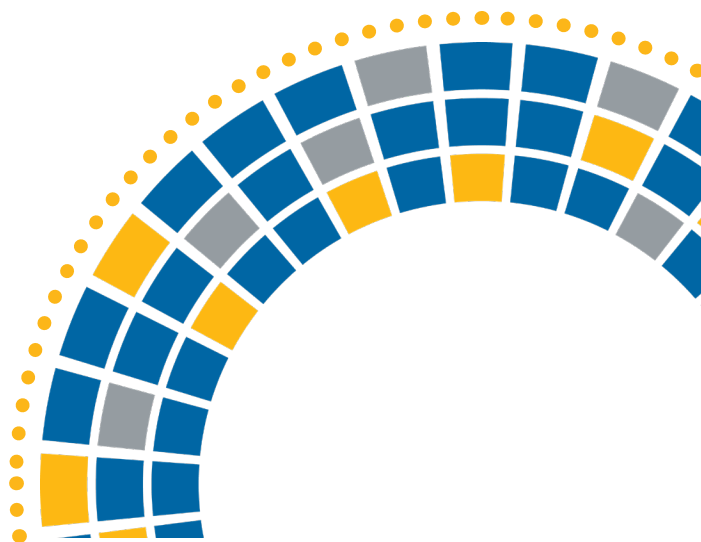
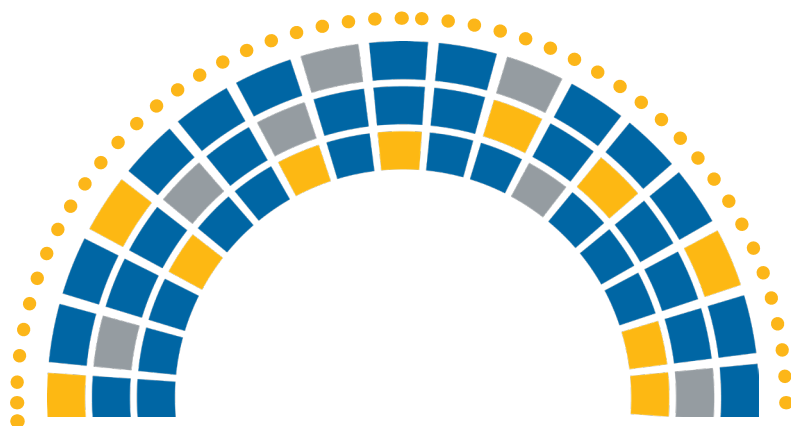
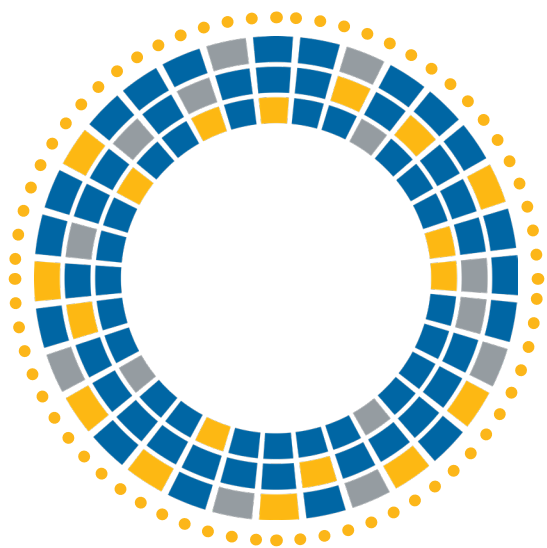


Table 1: Continued

NOC	Occupation	Average Unique Postings, 2018	2018 Jobs	Total Labour Market	Job Vacancy Rate
313	Pharmacists, dietitians, and nutritionists	15	159	174	8.67%
311	Physicians, dentists, and veterinarians	10	117	128	8.15%
012	Managers in financial and business services	22	250	272	8.06%
953	Other assembly and related occupations	16	186	202	7.88%
031	Managers in health care	13	158	171	7.59%
111	Auditors, accountants, and investment professionals	46	573	618	7.36%
112	Human resources and business service professionals	37	479	516	7.09%
073	Managers in transportation	7	95	102	6.86%
217	Computer and information systems professionals	27	369	396	6.76%

Source: Author's calculations based on Emsi – economicmodeling.com



Estimating future labour market shortages

The above section focused on an estimate for current vacancies broken down by three-digit NOC. The next section examines future labour market needs based on occupations that are projected to experience a high rate of growth in the coming years and those that will encounter higher comparative rates of retirement in the future. To start, the growth projections are again based on data obtained from Emsi. These estimates are projected based on historical trends and derived from "industry data, regional occupation data from the Labour Force Survey (LFS), and regional staffing patterns taken from the Census" (Emsi, 2019). Table 2 summarizes the top five occupations as identified by Emsi based on job growth from 2018 to 2026. As we can see, two of the top five occupations are health-related and two are science-related. The occupation group with the highest rate of growth is architects, urban planners, and land surveyors at 37 per cent. The top 20 occupations based on job growth rates are listed in Appendix A.

Table 2: Top Five Occupational Categories Based on Highest Projected Growth Rates, 2018 to 2026, Thunder Bay CMA

NOC	Description	2018 Jobs	2026 Jobs	2018 - 2026 Change	2018 - 2026 % Change
215	Architects, urban planners, and land surveyors	124	170	46	37%
222	Technical occupations in life sciences	180	238	58	32%
312	Optometrists, chiropractors, and other health diagnosing and treating professionals	96	119	23	24%
311	Physicians, dentists, and veterinarians	117	142	25	21%
211	Physical science professionals	88	106	18	20%

Source: Emsi – economicmodeling.com

The second method used to estimate future labour market shortages includes assessing potential upcoming retirements in order to determine future replacement demand. This methodology follows a similar report published by the Far Northeast Training Board, which examines the proportion of workers 45 years and over in various occupations across Community Futures Development Corporation boundaries in the region. To do this, NPI purchased customized Statistics Canada 2016 census datasets broken down by age and occupation. An analysis of the data was conducted in order to determine the approximate number of individuals that are estimated to reach retirement age in future years based on their age in the 2016 Census of Population. The results identify several occupational groups that may experience high retirement rates in the next 10 years. Retirement rate is determined by dividing the 55 to 64 age group by the total labour force within each occupational category. A higher retirement rate indicates which occupations may require greater focus due to higher future workforce shortages. For example, a retirement rate of 40 per cent would indicate that 40 per cent of all workers in that occupation could potentially retire within the selected time frame.



Table 3 summarizes the top five occupations that will experience the highest estimated retirement rates between 2016 and 2026. Further, the top 20 occupations based on retirement rates are listed in Appendix B.

Table 3: Replacement Demand by Highest Retirement Rates, 2016 to 2026, Thunder Bay CMA³

NOC	Description	Total Labor Force 15 +	Labour Force Aged 55-64	Retirements %
073	Managers in transportation	95	35	36.84%
060	Corporate sales managers	95	35	36.84%
720	Contractors and supervisors, industrial, electrical and construction trades, and related workers	340	120	35.29%
751	Motor vehicle and transit drivers	2000	690	34.50%
674	Other service support and related occupations, not elsewhere classified	150	50	33.33%

Source: Author's calculations, Statistics Canada, 2016 Census of Population, Custom Tabulation



³ Occupational categories with fewer than 15 people were excluded from the retirement rate analysis, due to random rounding resulting in less accurate retirement rates.

Combining Current and Future Estimates

The above tables attempt to separately estimate both current and future labour market needs. Table 1 identifies potential current labour market gaps, based on job vacancy rates, and Tables 2 and 3 demonstrate potential future labour market requirements based on occupations with either higher projected growth rates (i.e., increase in labour market demand) or a higher need for workers to replace retirees (i.e., decrease in labour market supply).

The next portion of this analysis will focus on combining the top 20 occupations as identified by the three above methods to determine where the most overlap exists among all three labour market indicators. Table 4 highlights occupational categories that were identified either in all three indicators (high job vacancy rate, high projected growth rates, and high replacement demand), or two out of three indicators, based on the top 20 occupations identified by each indicator.

In Thunder Bay, optometrists, chiropractors, and other health diagnosing and treating professionals (NOC 312) are flagged in all three indicators as an occupational group that is estimated to experience higher future growth and potential retirement, as well as higher current shortages. Therefore, for these occupations, we estimate that there will be both a decrease in labour market supply and an increase in labour market demand. The high job vacancy rates for these positions potentially indicate an existing high need for these occupations.

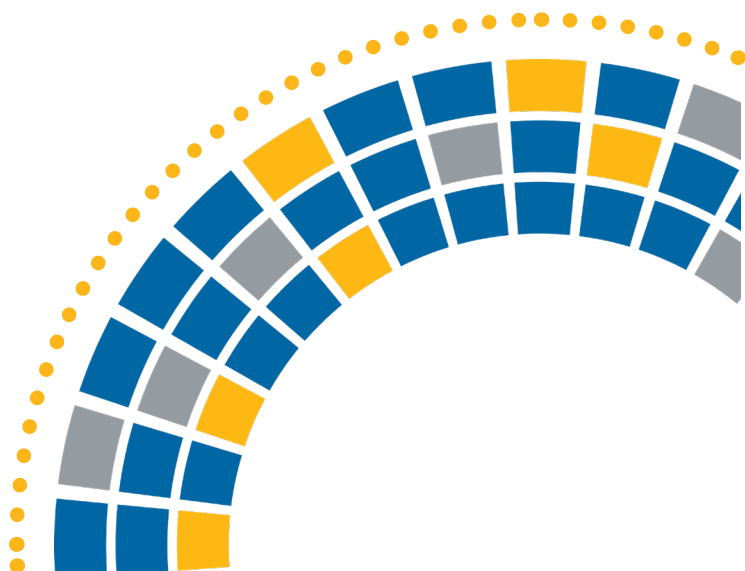
Further, multiple management-related occupations were identified across two of the three indicators (retirement rates and vacancy rates). It is estimated that these occupations are experiencing higher current shortages, indicating potentially insufficient labour supply, and a high need for future replacement demand, indicating shrinking labour supply in the future, which could exacerbate the effects of the current shortage. Finally, four occupations were identified as having high current vacancies, indicating potentially low current labour supply, and high projected job growth from 2018 to 2026, indicating a projected increase in labour demand. Two of those four occupational categories were in health-related fields.



Table 4: Summary of Overlap of the Top Occupations Based on Each Method, Thunder Bay CMA

NOC	Description	Retirement Rate	Job Vacancy Rate	Future Job Growth	# of Jobs, 2018
312	Optometrists, chiropractors, and other health diagnosing and treating professionals	X	x	x	96
311	Physicians, dentists, and veterinarians		x	x	117
065	Managers in customer and personal services, n.e.c.		x	x	59
217	Computer and information systems professionals		x	x	369
313	Pharmacists, dietitians, and nutritionists		x	x	159
073	Managers in transportation	x	x		95
060	Corporate sales managers	x	x		102
071	Managers in construction and facility operation and maintenance	x	x		121
062	Retail and wholesale trade managers	x	x		385
012	Managers in financial and business services	x	x		250
725	Plumbers, pipefitters, and gas fitters	x		x	456

Source: Author's calculations based on Emsi – economicmodeling.com; Author's calculations based on Statistics Canada, 2016 Census of Population, Custom Tabulation.



Limitations

There are several limitations that should be noted, such as those related to the average job vacancy rate method. Since the method uses both average filled jobs in 2018 as well as average job postings in 2018, there will inevitably be overlap due to the fact that some positions that form 'average job postings' would have been posted earlier in the year and subsequently filled at some point during that year. Therefore, in some cases they will be included under both 'average job postings' and 'average filled jobs' in 2018. However, for highly seasonal positions, using 'average postings' and 'average filled jobs' may reduce the inflated effects of seasonality in certain occupations when compared to the typical job vacancy rate indicator, which is based on open positions and filled jobs on the last business day of the month. The average job vacancy rates for seasonal occupations would likely be much lower based on yearly average when compared to the same vacancy rates at specific points throughout the year when those occupations are in higher demand.

Further, estimates of replacement demand are based on a retirement age of 65. One could argue that retirement ages vary, with some individuals retiring in their late 60s or early 70s and others retiring earlier. Due to the inability to gather average retirement ages by specific occupation, NPI used the age of 65 as an approximate indicator of retirement for the purposes of this analysis. Secondly, the projections are based on the total labour force in 2016, as well as the labour force ages 55 to 64 in 2016, rather than the total number of employed in 2016. Therefore, there seemingly would be a small proportion of individuals within each occupational category that are in the labour force but unemployed. This could cause the projected future retirement numbers to be slightly overstated. Finally, users of these data are encouraged to consider future technological change, future demand, and the potential for automation and its impact on specific occupations. Certain occupations may have more potential retirees but depending on new technology, automation, and industry changes, a portion of those retirees may not be replaced. The above analysis is therefore not short of limitations but aims to provide some indication of current and future labour market needs. This analysis should be used in conjunction with qualitative data and community input to help guide future labour market planning.

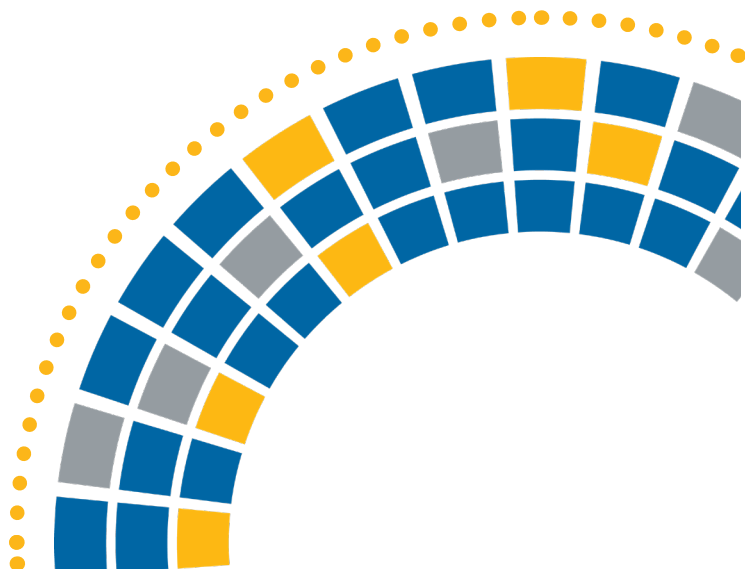
Conclusion

The above analysis is one of multiple ways to estimate labour market needs. For the Thunder Bay Census Metropolitan Area, the analysis estimates that there is both current and future need for occupations in optometry, as well as chiropractors and other health diagnosing / treating professionals. Further, a number of the occupations identified above are in health-related fields, which is important when considering that communities in Northern Ontario will experience a higher proportion of elderly people than the province, therefore increasing projected healthcare demand in the future (Moazzami, 2019).



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Appendix A: Growth rate

NOC	Description	2018 Jobs	2026 Jobs	2018 - 2026 Change	2018 - 2026 % Change
215	Architects, urban planners and land surveyors	124	170	46	37%
222	Technical occupations in life sciences	180	238	58	32%
312	Optometrists, chiropractors and other health diagnosing and treating professionals	96	119	23	24%
311	Physicians, dentists and veterinarians	117	142	25	21%
211	Physical science professionals	88	106	18	20%
411	Judges, lawyers and Quebec notaries	236	284	48	20%
944	Machine operators and related workers in textile, fabric, fur and leather products processing and manufacturing	51	61	10	20%
633	Butchers and bakers	492	587	95	19%
065	Managers in customer and personal services, n.e.c.	59	70	11	19%
217	Computer and information systems professionals	369	437	68	18%
525	Athletes, coaches, referees and related occupations	241	285	44	18%
314	Therapy and assessment professionals	207	244	37	18%
946	Machine operators and related workers in food, beverage and associated products processing	124	146	22	18%
313	Pharmacists, dietitians and nutritionists	159	186	27	17%
301	Professional occupations in nursing	1,787	2,081	294	16%
671	Food counter attendants, kitchen helpers and related support occupations	1,675	1,948	273	16%
322	Technical occupations in dental health care	302	351	49	16%
725	Plumbers, pipefitters and gas fitters	456	528	72	16%
621	Retail sales supervisors	718	829	111	15%
942	Machine operators and related workers in chemical, plastic and rubber processing	78	90	12	15%

Source: Author's calculations

Appendix B: Replacement Demand

NOC	Description	Total Labour Force	55-64	Replacement Demand
73	Managers in transportation	95	35	36.84%
60	Corporate sales managers	95	35	36.84%
720	Contractors and supervisors, industrial, electrical and construction trades and related workers	340	120	35.29%
751	Motor vehicle and transit drivers	2000	690	34.50%
674	Other service support and related occupations, n.e.c.	150	50	33.33%
312	Optometrists, chiropractors and other health diagnosing and treating professionals	150	50	33.33%
1	Legislators and senior management	465	155	33.33%
402	College and other vocational instructors	230	75	32.61%
71	Managers in construction and facility operation and maintenance	555	180	32.43%
131	Finance, insurance and related business administrative occupations	670	215	32.09%
124	Office administrative assistants - general, legal and medical	1280	385	30.08%
923	Central control and process operators in processing and manufacturing	70	20	28.57%
145	Library, correspondence and other clerks	195	55	28.21%
62	Retail and wholesale trade managers	1245	340	27.31%
513	Creative and performing artists	265	70	26.42%
12	Managers in financial and business services	285	75	26.32%
42	Managers in education and social and community services	350	90	25.71%
731	Machinery and transportation equipment mechanics (except motor vehicles)	740	190	25.68%
673	Cleaners	2090	535	25.60%
725	Plumbers, pipefitters and gas fitters	335	85	25.37%

Source: Author's calculations

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