

**309A Electricians:
What is a Sustainable Apprentice Intake in Ontario?**

Prism Economics and Analysis

September 2020



309A Electricians:

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Executive Summary

- The composition of construction investment affects the employment outlook for trades differently. The surge in infrastructure spending, especially transit projects, will lead to shortages, but these shortages will be confined to the principal trades that sector relies on – heavy equipment operators, tunnel workers, concrete forming crews, and construction labourers. *The major infrastructure spending will not lead to shortages of 309A Electricians.*
- From 2014 to 2017, new apprentice registrations for 309A Electricians averaged 3,800 *per annum*. An apprentice intake of 3,800 persons *per annum* is more than 11% of the current Construction Electrician labour force. This is significantly above what is sustainable, even when retirements, mortality and expected growth are taken into account.
- Four conclusions emerge from the employment outlook for 309A Electricians through to the peak in demand in 2026:
 - on a provincial basis, the supply/demand outlook is in balance;
 - in residential construction, no shortages are expected in any region;
 - in non-residential construction, shortages are expected in Southwestern Ontario, Eastern Ontario and Northern Ontario, but these shortages will be temporary; and
 - in the GTA, there is a risk of shortages, but this supports a regional strategy not a provincial strategy.
- In 2018, that number of new 309A Electrician apprentices fell to just over 1,500. On a provincial basis, the sustainable intake for apprentices in the 309A Electrician trade is around 1,700 persons *per annum*. No effort should be made to return to the earlier, unsustainable intake level of 3,800 *per annum*.
- *Aside from addressing the GTA's specific regional needs, the focus of government policy should be to ensure that: (1) apprentices receive the best training possible, (2) successfully complete their training, (3) become Red Seal certified 309A Electricians and (4) have a reasonable expectation of employment as 309A Electricians.*



309A Electricians:

What is a Sustainable Apprentice Intake?

Is the Recent Drop in the Apprentice Intake for 309A Electricians a Problem?

From 2014 to 2017, new apprentice registrations for 309A Electricians averaged 3,800 *per annum*. In 2018, that number fell to just over 1,500.

Figure No. 1
New Registrations in Apprenticeships for 309A Electrician-Construction and Maintenance
OCOT Administrative Data

Year	New Registrations
2014	3,940
2015	3,705
2016	3,661
2017	3,892
2018	1,504

Was the decline in 2018 a necessary correction or does it pose a risk of causing a shortage of 309A Electricians in future years?¹

The view presented in this report is that an annual intake of 3,800 is not sustainable and no effort should be made to return to this intake level. The sustainable intake over the next several years is 1,700. The focus of government policy should be to ensure that these apprentices receive the best training possible, successfully complete that training and become Red Seal certified 309A Electricians with a reasonable expectation of employment as 309A Electricians.

¹ Prior to 2018, there appears to have been a ramping up of registrations. Anecdotal evidence suggests that, to some degree, this ramping up was prompted by the decision of some non-union contractors to register as apprentices, persons whom they would otherwise have employed as helpers. This was a result of increased enforcement of the scope of practice regulation and Reg. 213/91 of the *Occupational Health and safety Act*. Both of these regulations require electrical work to be performed by certified journeypersons or properly supervised and registered apprentices. After 2013, OCOT indicated its intention to strengthen its enforcement of the scope of practice regulation thereby prompting some non-union contractors to register these workers as apprentices.

What is a Sustainable Apprenticeship Intake?

An apprenticeship intake is sustainable:

- 1) when apprentices can obtain sufficient hours of work to complete their training;
- 2) when apprentices that complete their training have a reasonable prospect of securing long-term employment as journeypersons; and
- 3) when the number of apprentices who complete their training is sufficient to meet replacement demand (caused by mortality and retirements) and economic growth demand.

Apprenticeship Intakes are Cyclical

Apprenticeship intakes in the construction trades are cyclical. Periods of acceleration in apprenticeship intakes are inevitably followed by periods of consolidation when intakes decline. This cycle is inherent in the construction industry. It is a serious mistake to interfere in the operation of this cycle by trying to maintain intake levels at their cyclical peak or prematurely restore intakes to a prior cyclical peak.

The surge in apprenticeship intake, between 2014 and 2017, into the 309A Electrician trade reflected the cyclical nature of apprenticeship intakes. This surge reflected the cyclical nature of apprenticeship intakes. So also did the subsequent decline in registrations in 2018.

Why is It Important for Apprenticeship Intake to be Sustainable?

The need for apprentices in any trade is ultimately determined by the long-term demand for journeypersons in that trade.

Systemically over-shooting the sustainability level has two negative effects:

- First, some apprentices will have difficulty in obtaining the employment hours they need to complete their training. As a result, they will have no choice but to drop out of their training, wasting their own time as well as scarce and costly training resources.
- Second, if efforts to retain apprentices in the system above the sustainability level are successful, the resultant over-supply of journeypersons will subsequently force some of those journeypersons out of the trade. Neither those workers nor society will derive the benefit that should have been realized by the sizeable investment in training.

Faced with these conditions, both employers and young workers may over-react. If this happens, the over-supply soon turns into shortages.

Rational apprenticeship planning means managing annual apprentice intakes so that those intakes are sustainable. When shortages are anticipated, apprenticeship planners need to ask when the shortages will arise, how long they will persist and whether the shortages will be province-wide or regional.

Is 3,800 New Apprentices a Sustainable, Annual Intake?

The 2016 Census estimated that there were 31,590 Construction Electricians (NOC 7241) in Ontario's labour force. Ontario's Ministry of Finance estimates, in its reference case, that population will increase at a rate of 1.4% *per annum*. Applying this growth rate to the labour force suggests that the number of Electricians in 2020 is likely around 33,400. An intake of 3,800 new apprentice Electricians would represent around 11.4% of the labour force in that trade. This is patently unsustainable.

We can look to two forecasting models for guidance: the BuildForce model and the more conservative Canadian Occupational Projection System (COPS) which is maintained by Employment and Social Development Canada (ESDC). The BuildForce model anticipates peak employment for Electricians in 2026. Between 2020 and 2026, employment of Electricians is projected to increase by 1.8% per year. BuildForce further projects retirements and mortality around 1.6% per year. This implies a total demand for new apprentices equal to around 3.4% of the labour force in the Electrician trade.

The Canadian Occupational Projection System (COPS) suggests an even more conservative estimate of future needs for new apprentices in the Electrician trade. On a national basis, COPS forecasts total demand (the sum of both growth demand and replacement demand) will be equal to only around 2.6% of the labour force in the Electrician trade.

Both the BuildForce estimate of projected demand – 3.4% of the Electrician labour force- and the COPS estimate – 2.6% of the Electrician labour force – are substantially less than the 11.4% of the Electrician labour force that would result if the apprentice intake were artificially pumped up to the pre-2018 levels.

The evidence-based conclusion is unavoidable. *The pre-2018 intake levels were a cyclical high. It would be a serious human resources planning error to force-feed the apprenticeship system in the Electrician trade with an intake level that is a multiple of the sustainable long-term trend.*

What is the Short-Term Outlook for 309A Electricians?

The federal government maintains a Job Bank that lists posted vacancies and describes the overall employment outlook. The current profile for Construction Electricians in Ontario characterizes the employment outlook over the next three years as “fair”, *i.e.*, intermediate on a three-point scale.²

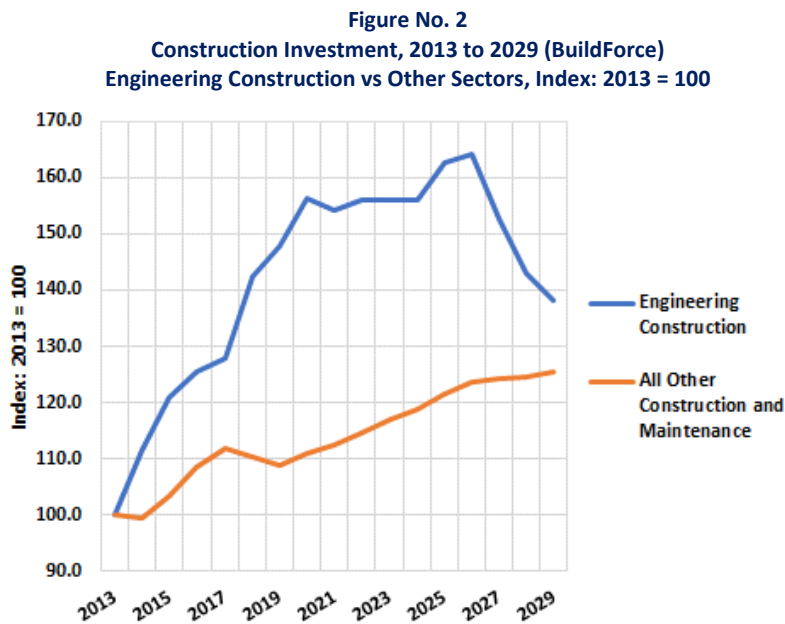
² <https://www.jobbank.gc.ca/marketreport/outlook-occupation/20684/ON>

The private job board, Indeed.ca, lists only 133 openings for Construction Electricians in Ontario as of August 27, 2020. The site also lists openings for 45 apprentice electricians, although some of these overlap with postings for electricians.

Current labour market conditions for 309A Electricians do not provide any support for an aggressive apprentice intake similar to the intakes prior to 2018.

Why are there Shortages in Some Trades but not Others?

The key to understanding why broad shortages emerge in some trades, but not others, is differences in the composition of construction investment. Figure No. 2 shows that at the peak in 2026, investment in “engineering construction” (*i.e.*, infrastructure) will be almost 65% higher than it was in 2013. By contrast, investment in all other types of construction will be only 24% higher.



The surge of investment in “engineering construction” will lead to systemic shortages, but these shortages will be confined to the principal trades that sector relies on – heavy equipment operators, tunnel workers, concrete forming crews, and construction labourers. The pressure on the supply of other trades will be much more moderate. The exception will be the GTA where the continuing boom in condo and apartment construction may result in pressure on the supply of a number of trades, including Electricians.

What is the Medium and Long-Term Outlook for 309A Electricians?

In the construction industry, the most widely used forecast for human resources planning is the BuildForce Outlook. The BuildForce Outlook projects supply and demand for 26 construction

occupations. It is updated annually. The forecasting model incorporates a forecast of investment spending on construction and maintenance, estimates of mortality and retirement rates, projections for international and inter-regional migration, estimates of mobility between construction and non-construction, and an overall macro-economic forecast. The forecast is reviewed and validated by regional stakeholder committees.

The BuildForce Model translates the supply/demand outlook for each occupation into a five-point scale. A '3' represents a balanced outlook, while '4' and '5' indicate shortages and '1' and '2' point to surplus supply. Figure No. 3 shows the supply/demand outlook for Electricians.

Figure No. 2
Supply/Demand Outlook for Electricians, 2020 to 2029 (BuildForce)
Five-Point Scale
1= Acute Surplus/ 3 = Balance / 5 = Acute Shortage

Electricians (NOC 7241, 7242, 7243)		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Ontario Average	Residential	3	3	3	3	3	3	3	3	3	3
Ontario Average	Non-Residential	4	3	3	3	3	3	3	3	2	3
GTA	Residential	3	3	3	3	3	3	3	3	3	3
GTA	Non-Residential	5	4	4	3	3	4	4	3	2	3
Southwest	Residential	3	3	3	3	3	3	3	3	3	3
Southwest	Non-Residential	4	2	3	4	3	3	4	3	3	3
Central	Residential	3	3	3	3	3	3	3	3	3	3
Central	Non-Residential	3	3	3	3	3	3	3	3	3	3
Eastern	Residential	3	3	3	3	3	3	3	3	3	3
Eastern	Non-Residential	3	3	3	4	4	3	3	3	2	3
North	Residential	3	3	3	3	3	3	3	3	3	3
North	Non-Residential	3	4	3	3	3	3	3	3	3	3

Four conclusions can be drawn from the BuildForce Outlook for Ontario:

- on a provincial basis, the supply/demand outlook is in balance for both residential and non-residential construction, except in the current year when some shortages are projected. The shortages that were seen earlier this year will ease in 2021 when the overall supply/demand outlook returns to balance;
- in residential construction, which employs around 30% of Construction Electricians, no shortages are expected in any region;
- in non-residential construction, temporary shortages are expected in Southwestern Ontario, Eastern Ontario and Northern Ontario. These shortages are clearly temporary, not systemic; and
- in the GTA, the risk of shortages will persist until 2026. A regional strategy to deal with this is needed.

What is the Sustainable Apprentices Intake for 309A Electricians?

The sustainable target for the next few years is determined by five factors:

1. Growth demand: the projected increase in employment for 309A Electricians;
2. Replacement demand: the projected need to replace Electricians as a result of mortality and retirements;
3. Net Inter-Industry Mobility: the net movement of Electricians into or out of the construction industry
4. Net Inter-Provincial Mobility: the net movement of Electricians into or out of Ontario from other provinces – most of whom will be Red Seal certified.
5. Net International Mobility: the net immigration of Electricians into Ontario from outside Canada – most of whom will be trade qualifiers, i.e., persons who obtain a C of Q by challenging the trade examination without completing an apprenticeship.
6. Apprentice Attrition Rate: the estimated drop-out rate of apprentices before completing their training.

Growth Demand

BuildForce estimates that between 2020 and 2026, the employment of Electricians will increase by an annual average of 1.8%. This implies average annual growth demand of around 600 Electricians.

Replacement Demand

It is important to note that there has been considerable renewal of the Electrician workforce in recent years. A recent survey of IBEW pension plans indicates an average age of only 41.3 among active members. On a national basis, ESDC's Canadian Occupational Projection System forecasts a retirement rate for Electricians of 1.3% through to 2028. This compares with 2.0% for the "all occupations" forecast. BuildForce estimates that between 2020 and 2026, mortality and retirements will average around 1.6% of the Electrician labour force. The BuildForce estimate of replacement demand implies an annual replacement requirement of around 535 Electricians.

Net Inter-Industry Mobility

BuildForce anticipates the average annual movement out of the construction industry at around 525 Electricians.

Net Inter-Provincial Mobility

BuildForce anticipates the average annual movement into Ontario of qualified Electricians will be around 245 persons.

Net International Immigration

BuildForce anticipates the average annual movement into Ontario of international immigrants who enter the Electrician trade will be around 760 persons. This includes individuals who will enter an apprenticeship as well as persons who will obtain their C of Q by challenging the trade examination. Between 2014 and 2018, on average, OCOT annually granted 309A Electrician C of Q's to 544 persons who had a Trade Equivalency Assessment, but no Ontario apprenticeship. Conservatively, we can estimate that half of these individuals were immigrants to Ontario, i.e., around 270. In light of Covid-19, an allowance should be made for the risk of reduced international immigration.

Apprentice Attrition Rate

A liberal estimate of the apprentice drop-out rate is 30% of the first-year intake. This is a high estimate and efforts should be made to achieve a significantly lower drop-out rate.

Estimate of Sustainable Apprentice Intake

The table below applies the above estimates to generate a target annual intake. The sustainable apprentice intake into the 309A Electrician trade over through to 2026 is approximately 1,700 persons. Intakes above this amount will likely lead to higher drop-out rates as those apprentices cannot be absorbed by the industry. Intakes below 1,700 persons would risk triggering shortages.

Sustainable Intake Estimate

	Annual Average 2020 to 2026
Est. Electrician Labour Force (2020)	33,400
Demand	
Growth Demand (1.8% pa)	600
Replacement Demand (1.6%)	535
Net Movement Out of Construction	525
Total Demand	1,660
Supply	
Net Inter-Provincial Mobility into Ontario	245
International Immigration - Trade Qualifiers	270
Supply excluding Apprenticeship	515
Apprentice Intake	
Required Completions	1,145
Non-completion Rate (30%)	344
Allowance for Reduce Immigration	200
Required Intake	1,689
Target Intake	1,700
Target Intake as a Percentage of Estimated Labour Force	5.1%

On a provincial basis, the target apprentice intake for 309A Electricians should be around 1,700 persons. This is approximately 5.1% of the estimated labour force in the 309A Electrician trade. This is moderately, but not significantly, above the 1,504 persons admitted into apprenticeship in 2018.

What are the Implications for Government?

1. On a provincial basis, for the next several years, **the target for new apprentice intakes into the 309A Electricians trade should be 1,700 persons.**
2. **The province's priority should be on increasing apprentice intakes in those trades where Ontario's infrastructure spending will lead to significant risks of skills shortages, i.e.,** equipment operators, tunnel workers, concrete forming crews (carpenters, cement masons, rod-workers) and construction labourers.
3. **The province should address regional shortages with regional, not provincial, strategies.** In the case of 309A Electricians this means paying particular attention to the GTA, but not allowing the GTA's needs to drive planning decisions elsewhere in Ontario.
4. **The province needs to pay close attention to the "trade qualifier" trend, i.e.,** the number of persons who are granted a C of Q as 309A Electricians, having completed their training and experience outside of Ontario. An increase in the trade qualifier trend above 540 could imply that the sustainable intake for apprentices would be lower than 1,700 persons.
5. **The province needs to focus on improving completion rates.** All incentives in the system should be geared to rewarding completion. Employers that churn apprentices (i.e., discard them after one or two years) should not receive incentives. Employers and joint apprenticeship committees that contribute to high completion rates should be recognized and supported by incentives.
6. **The province should continue to protect the employability of 309A apprentices by ensuring that:**
 - a. **the roles and tasks set out in the scope of practice for 309A Electricians are restricted to journeyperson Electricians and properly supervised apprentices**
 - b. **these standards are suitably enforced, and**
 - c. **there is continuing enforcement of the comparable requirements in the regulations to the *Occupational Health and Safety Act*.**

