

An Independent Study
Commissioned by



RESIDENTIAL AND
CIVIL
CONSTRUCTION
ALLIANCE OF
ONTARIO

Constructing Ontario's Future



ONTARIO'S DOWNWARD TREND FOR FUEL TAX REVENUE: Will Road Pricing Fill the Gap?

NOVEMBER 2019



**ONTARIO'S
DOWNWARD TREND
FOR FUEL
TAX REVENUE:
Will Road Pricing
Fill the Gap?**

An investigative study commissioned by the
Residential and Civil Construction Alliance
of Ontario (RCCAO)

BY:

Harry Kitchen, Professor Emeritus
Department of Economics, Trent University

The author wishes to thank Ben Dachis,
Bern Grush, Andy Manahan and Phil Rubinoff
for their insightful and valuable comments.

NOVEMBER 2019



RCCAO

25 North Rivermede Road, Unit 13, Vaughan, Ontario L4K 5V4

Andy Manahan, Executive Director

e manahan@rccao.com p 905-760-7777 w rccao.com

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EXECUTIVE SUMMARY



Demand for motor and diesel fuel in Ontario is estimated to fall dramatically over the next 20 years. This will lead to a significant impact on provincial revenues, an impact that is almost certain to be much higher than any recent forecast. Decreasing demand will come from behavioural and technological shifts. The purchase of more fuel-efficient and hybrid vehicles, for example, is already a distinct trend. This suggests that the time has come to introduce new vehicle-related charges that will compensate for the expected decline in future fuel tax revenue. Specifically, new road pricing schemes and innovative and dynamic parking levies in highly urbanized areas must be on the agenda. Both of these could generate substantial funds for road and transit infrastructure, especially in the busy Greater Toronto and Hamilton Area (GTHA).¹

CONTEXT



A 2015 RCCAO report² made the case for raising the provincial motor gas and diesel fuel tax but only for the short term; specifically, from five to seven years or up to the year 2022. Beyond that, the report highlighted that higher fuel taxes would not generate sufficient revenue because of declining demand for motor and diesel fuel. This declining demand trend was also referenced in an earlier 2014 RCCAO report.³ A number of factors would contribute to this, it was noted – a growing demand for more fuel-efficient cars; an increased reliance on electric and hybrid vehicles; the growth in younger adults who live in highly urbanized areas (such as the GTHA) and drive less; and a growing number of retirees who generally drive less as they age. Of major importance here was the increase in more fuel-efficient, electric and hybrid vehicles. All of these combined, it was argued, would lead to lower provincial gas tax revenue without any perceptible reduction in congestion – there would be no incentive for drivers of alternate-energy vehicles to economize on road usage because each trip would be a free ride. What would be needed in the near future, the study concluded, would be the introduction of some form of road pricing as well as innovative and dynamic parking charges applied to all vehicles, especially in congested urbanized areas.

ESTIMATED DEMAND FOR MOTOR AND DIESEL FUEL

The objective of this short report is not to reproduce the charts and discussion in the 2015 RCCAO report but to examine whether the underlying data on estimated demand for motor and diesel fuel have changed over the past five years. The previous study used estimated demand data from 2013;⁴ this report uses estimated demand data from 2018.⁵ Figures 1 and 2 compare the demand in litres per capita for Ontario for motor gasoline and diesel fuel⁶ from each of these data sets. Each figure shows a similar trend, **but the estimates from the 2018 data indicate a much larger decrease in future demand when compared with the 2013 data.** Given this dramatic change over a relatively short period of time, one wonders if future estimates, say five years from now, will depict an even more dramatic decrease than is illustrated in the 2018 estimate. Such a change could be driven by a number of factors including more aggressive government policies to mitigate climate change along with unforeseen lifestyle changes that could accelerate a faster and more dramatic move to electric and hybrid vehicles along with the increased use of e-bikes and e-scooters as modes of getting to work, shopping and entertainment.

While a number of factors are behind the trend in the 2018 data, part of it is attributed to the expected increase in the demand for electric vehicles (EVs) – see Figure 3. The technology behind EVs has been improving so rapidly that within two years, it has been predicted that batteries will have the capacity to be fully charged within five minutes and within 10 years, “the average range of EVs will reach about 600 kilometres, matching the average distance gas-fueled vehicles can go on a full tank.”⁷

Note: In Figures 1, 2, 4 and 5, the dashed portion of each trend line represents estimates for the years following the release date. The solid portion is for years prior to the release date.

Figure 1: Estimated Demand for Motor Fuel Gasoline in Litres Per Capita in Ontario (2000 to 2040)

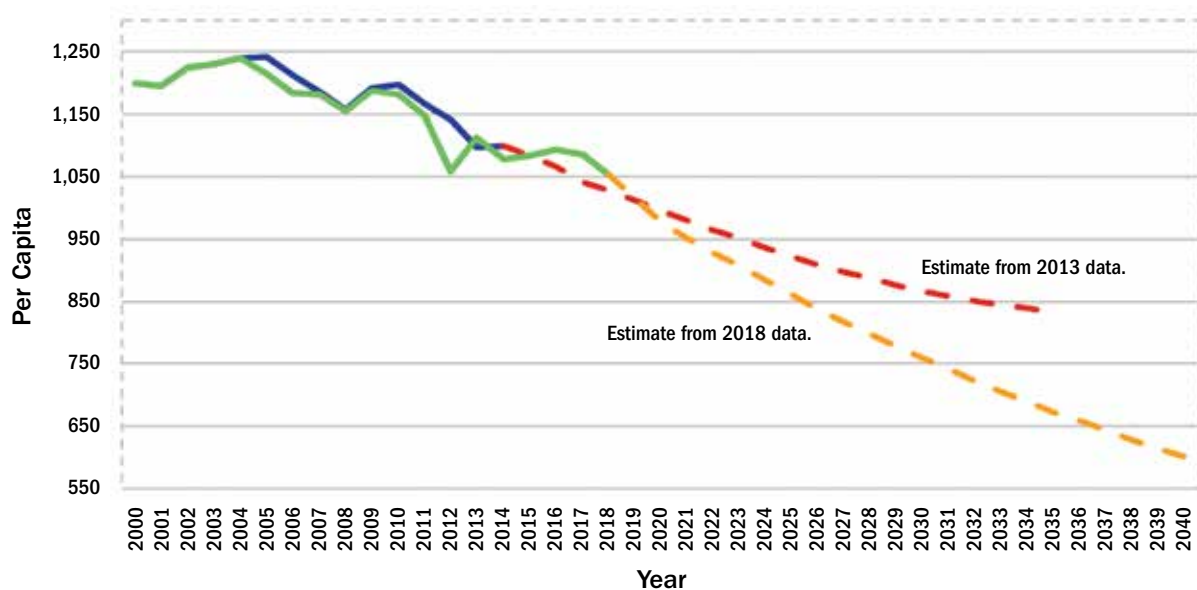


Figure 2: Estimated Demand for Diesel Fuel in Litres Per Capita in Ontario (2000 to 2040)

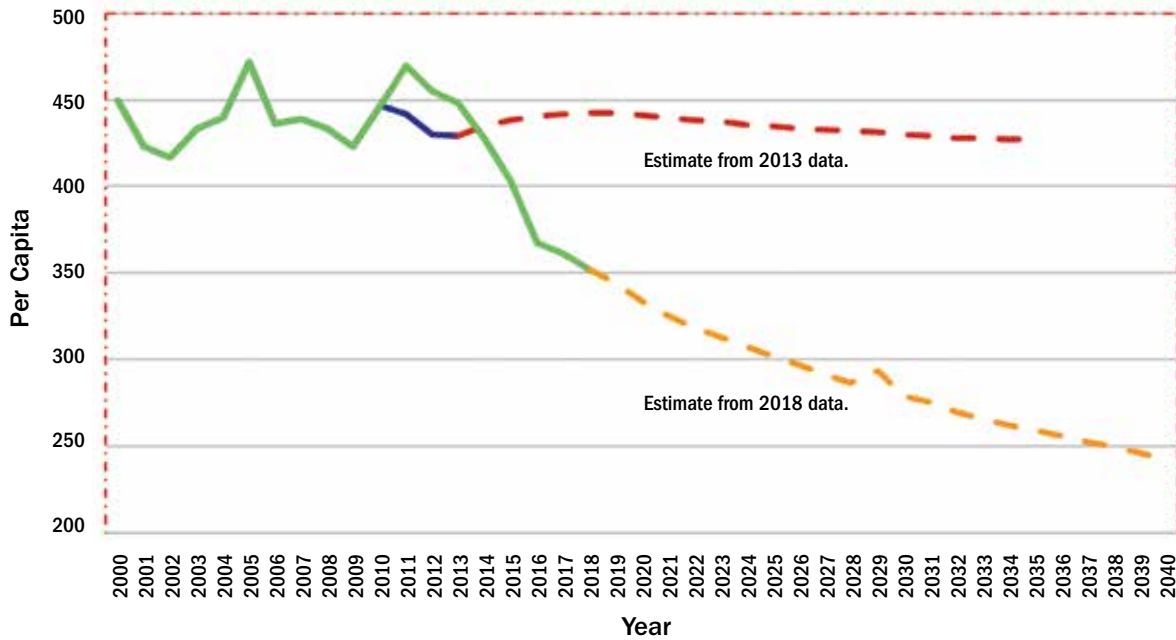
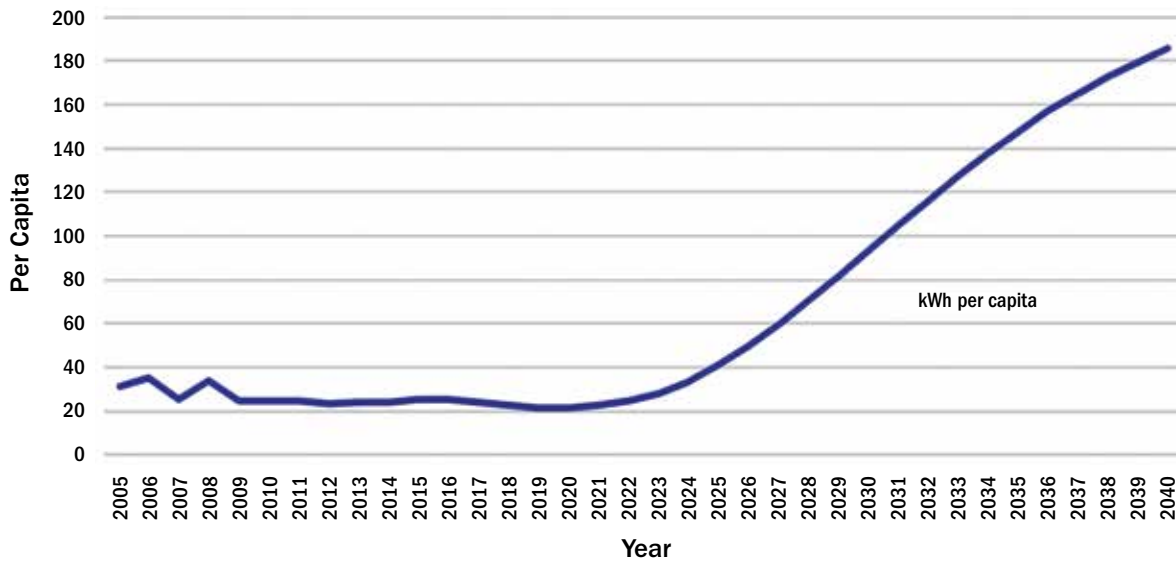


Figure 3: Estimated Demand in Kilowatt Hours Per Capita for Electric Vehicles (2005 to 2040)



Source: National Energy Board - Data Hub. Click on Appendices, Ontario, End - Use Demand, and Transportation Sector.

ESTIMATED PROVINCIAL MOTOR AND DIESEL FUEL TAX REVENUE

A recent report⁸ commissioned by the Federation of Canadian Municipalities (FCM) requested that the federal government dedicate a higher proportion of federal gas tax revenues to municipalities. This request, if agreed to by the federal government, is almost certain to generate much less revenue than expected as long as the federal transfer is tied to federal gas tax revenues collected. At the same time, this declining demand for motor fuel will impact provincial fuel tax revenues. Figures 4 and 5 illustrate the estimated impact on provincial revenues per capita from the province's motor fuel tax of 14.7 cents per litre and its diesel fuel tax of 14.3 cents per litre. These figures do not include revenue from the federal gas tax, the HST on fuel and the carbon tax.

A carbon tax may impact both driving behaviour and government fuel tax revenue. As well, it has stirred up considerable political controversy across Canada. A handful of provinces, as well as the Conservative Party of Canada in the recent federal election, have opposed the federal carbon tax claiming, amongst other arguments, that it is a job killer, it inhibits economic activity, and is ineffective at fighting greenhouse gas emissions. The evidence, however, does not support these assertions.⁹

In British Columbia – where the carbon tax is nine cents per litre – per-capita emissions are lower than in Ontario. As well, the B.C. tax has induced a relatively small change in driving behaviour. The average B.C. driver, when compared with Ontario, drives a bit less and/or uses a more fuel-efficient car.¹⁰ As for the impact on the economy and jobs, there is no evidence in either B.C. or Quebec, where carbon taxes are in place, that it has hurt the economy. In fact, the tax appears to have fostered an increase in green technology and both provincial economies have experienced higher growth rates than most other provinces.

Figure 4: Estimated Provincial Motor Fuel Tax Revenue (\$) Per Capita for Ontario at Current Fuel Tax Rate (2000 to 2040)

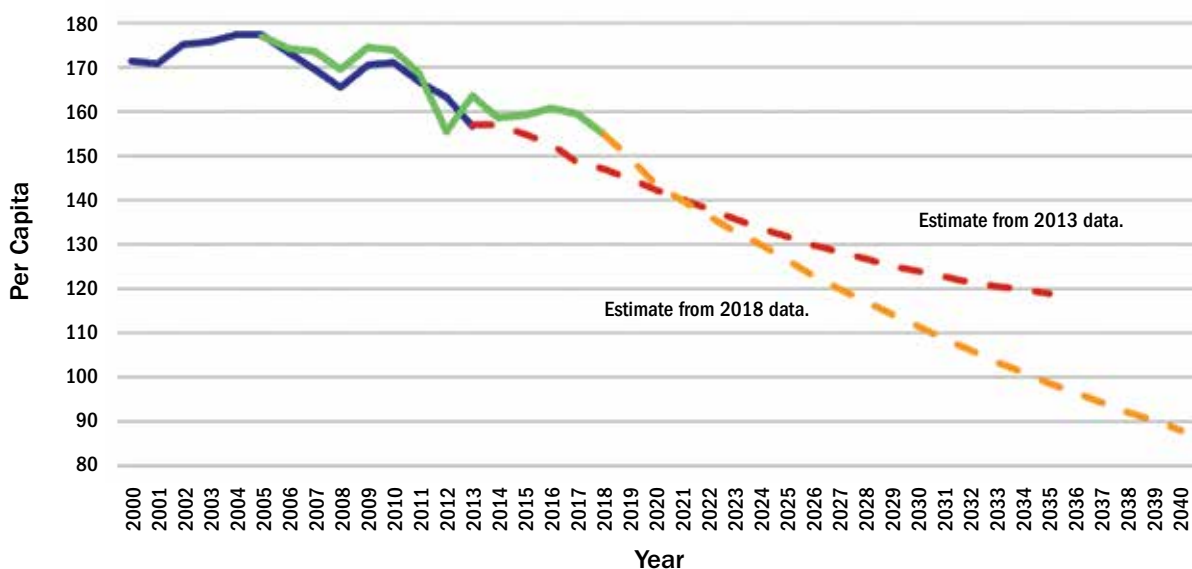
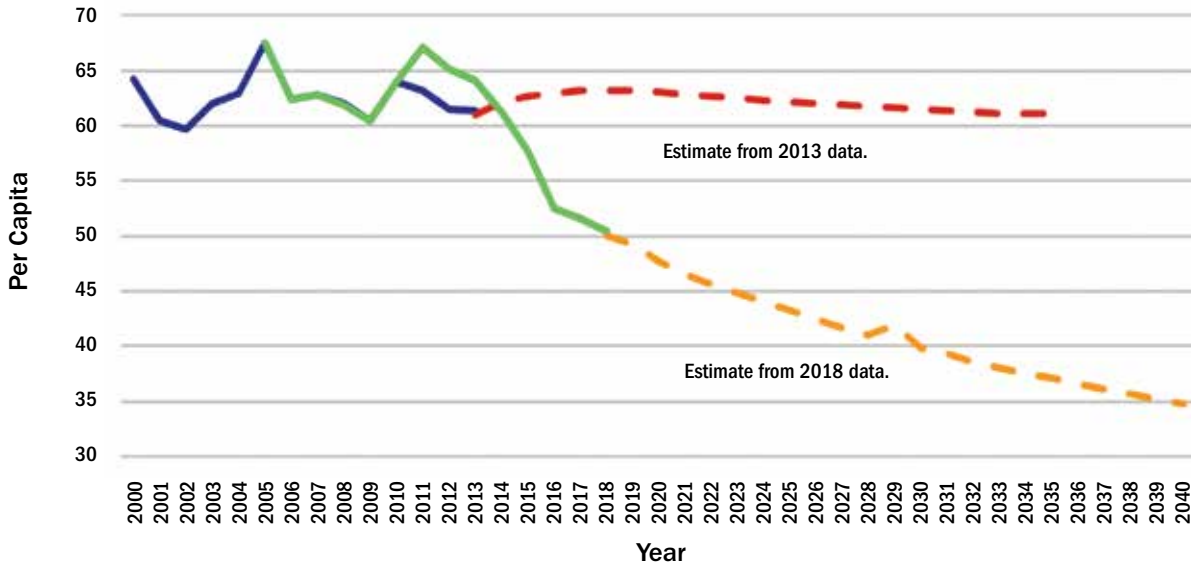


Figure 5: Estimated Provincial Diesel Fuel Tax Revenue (\$) Per Capita for Ontario at Current Fuel Tax Rate (2000 to 2040)



Note: In Figure 4 and 5, revenues do not include the federal gas tax, the HST or the carbon tax.

Source: See Appendix Table on page 16.

The projected trend of a decrease in the demand for gasoline and diesel fuel does not mean, however, that we will see a decrease in highway usage and congestion. Staying with the existing taxes will not generate enough revenue and it will not lead to less congestion which is a hindrance to improving productivity, a critical factor in economic growth. To compensate for these deficiencies, it is important that planning begin immediately for some form of road pricing and innovative and dynamic parking levies.¹¹ Efficiently set prices¹² for roads and parking are critical if both are to be well used but not congested. In addition to being efficient and fair, properly calibrated pricing could provide sufficient revenue for both roads and transit, especially when road supply is short which it often is in urbanized areas such as the GTHA.

ROAD PRICING



Efficiently set road prices offer a number of advantages¹³ and there are a variety in use around the world. Tolls on selected major roads and bridges exist in many countries; cordon tolls¹⁴ are used in Stockholm and Gothenburg, Sweden, in the central business district of Singapore, and planned for New York City in 2021; and zonal schemes¹⁵ are in place in London and Milan. Carefully designed tolls or prices can be set according to distance driven (kilometres) and can serve as an effective travel demand management tool to internalize congestion, pollution and other external costs of driving. All dimensions of travel choice can be influenced: trip frequency, destination, travel mode, time of day or week, route and so on. To the extent that traffic demand is managed, cost pressures on government budgets will lessen because traffic-related costs will be reduced. Furthermore, if revenues are dedicated to public transit and roads, this report's author believes there will be higher public acceptance.

In the short term, the most likely pricing scheme for Ontario, particularly in the more urbanized and congested areas, includes a network of High Occupancy Toll (HOT) lanes on major arterial roads and highways running into or through cities. A HOT lane is a variant of a High Occupancy Vehicle lane (HOV), some of which are in place in selected urban areas

in Ontario. Here, tolling is applied only to vehicles that are below a minimum occupancy requirement – typically two people (HOV2) or three people (HOV3). Tolls can vary by time of day in order to maintain high speeds on the HOT lanes. The tolled infrastructure would be new, and it would offer drivers a choice of paying for a quicker trip or using the existing toll-free lanes. HOT lanes could be applied to all of Ontario’s HOV lanes as well as major municipal and arterial roads and highways that go into or pass through large cities, especially in the GTHA.

A second larger scale possibility and one that may be more contentious to implement in Ontario would be the levying of tolls on *all* roads. This could be a flat rate charge or it could vary by time of day just like Hwy. 407 across the Toronto region. Tolling all lanes at time-varying rates is more efficient than tolling only some lanes because it is easier to control the total number of vehicles using the road as well as the distribution of traffic across lanes on the road.

Finally, tolls can generate significant sums of revenue as a number of studies have noted:

- In 2011, 407 International earned gross revenues of \$675 million (net income \$128.3 million) from tolls on Hwy. 407, with an average revenue per trip of \$5.89.¹⁶
- Dachis (2011) estimated revenues from two potential toll-lane schemes in the GTHA. Estimates for the scheme that includes construction of HOT lanes on the western part of the Gardiner Expressway as well as express toll lanes on the eastern part of the Gardiner Expressway and the inside express lanes on Hwy. 401 yielded annual gross toll revenues of \$632 million. The second scheme – converting existing HOV lanes on 400-series highways in the GTHA¹⁷ to HOT and building out the remainder of Ontario’s 450-kilometre HOV plan as HOT rather than HOV lanes – was estimated to yield gross toll revenues of \$294 million.¹⁸
- Hemson Consulting (2007) considered tolling the Don Valley Parkway and Gardiner Expressway. It assumed weekday tolls of \$0.10/km during peak periods and \$0.05/km during non-peak periods. Estimated annual revenues were \$120 million if there was no traffic diversion, and \$74 million with a diversion rate of 40 per cent.¹⁹
- A study for the Toronto City Summit Alliance (2007) considered a toll of \$0.07/km on all 400-series highways in the GTHA. This plan yielded estimated revenues of \$700 million per year.²⁰
- A 2012 City of Toronto report estimated that a charge of \$0.10/km on all highways would generate \$1.5 billion in annual revenues.²¹
- A 2016 City of Toronto staff report estimated that a \$2 toll per trip on the Don Valley Parkway and Gardiner Expressway would generate \$200 million annually.²²

PARKING LEVIES



While parking charges are not a provincial responsibility, cities should re-examine their current practices with the intent of introducing dynamic and innovative parking charges. Revenues would be collected locally and used for local roads and public transit. Currently, parking is inefficiently priced almost everywhere. On-street parking in high-demand areas tends to be priced well below its scarcity value; consequently, drivers spend a lot of time looking for a vacant spot. Excessive cruising leads to considerable traffic congestion, pollution, as well as inefficiencies and lost productivity.²³ In the United States, for example, it has been estimated that cruising for parking accounts for roughly 30 per cent of traffic in some cities at certain times of day.²⁴

While not as efficient or effective as tolls in controlling congestion and raising revenue, modern technology now permits cities to set parking rates that automatically vary by time of day, duration and average parking occupancy rates. The increasing use of apps, the availability of electronic signs and other media can help drivers find parking spaces while informing them of the price. Fees can be set to encourage motorists to use parking garages, thus reducing time spent cruising for curbside spots. All of this would help to reduce congestion. In fact, it has been argued that “underpriced parking does more to promote automobile use than good transit does to discourage it. Working tirelessly to build and promote transit that too few elect to use, struggling to find ways to have people pay for roads in ways they don’t wish to pay for, and then subsidize parking ... is self-defeating,” according to a leading expert on parking.²⁵

CONCLUSION



Three major points emerge from this analysis.

- 1 Future demand for motor gas and diesel fuel will fall much more dramatically than was previously estimated on a per-capita basis. The current reliance on combustion engines will be replaced by more fuel-efficient vehicles along with the growth in hybrid and electric vehicles.
- 2 Behavioural and technological shifts will result in a downward trend in provincial gas and diesel fuel tax revenues over the next 10-20 years. Traffic volume and road congestion, however, is not expected to fall due to population growth which will have an influence on total vehicle kilometres travelled across the GTHA.
- 3 The estimated revenue shortfall from the provincial fuel tax should be offset by more resilient revenue sources. To ensure that all road users, including those who drive EVs, pay for the public cost of road usage, the Province should develop a plan to implement road pricing charges on major highways, starting with a network of HOT lanes. As well, the Province should encourage and assist cities in the implementation of innovative and dynamic parking levies – especially in highly urbanized jurisdictions.

Appendix Table: Motor Fuel and Diesel Fuel Demand and Tax Revenue Per Capita in Ontario (2000 to 2040)

Year	Motor gas demand in litres per capita 2013 data	Motor gas demand in litres per capita 2018 data	Diesel fuel demand in petajoules 2013 data per capita	Diesel fuel demand in petajoules 2018 data per capita	Provincial Gas tax revenue (\$) 2013 data per capita	Provincial Gas tax revenue (\$) 2018 data per capita	Provincial Diesel fuel tax revenue (\$) 2013 data per capita	Provincial Diesel fuel tax revenue (\$) 2018 data per capita
2000	1,199	-	450	-	171	-	64	-
2001	1,195	-	423	-	171	-	61	-
2002	1,225	-	417	-	175	-	60	-
2003	1,230	-	434	-	176	-	62	-
2004	1,240	-	440	-	177	-	63	-
2005	1,241	1,215	472	472	177	177	67	67
2006	1,212	1,184	436	436	173	174	62	62
2007	1,185	1,182	439	439	169	174	63	63
2008	1,157	1,154	433	433	165	170	62	62
2009	1,192	1,188	423	423	170	175	61	61
2010	1,197	1,183	447	447	171	174	64	64
2011	1,167	1,148	442	469	167	169	63	67
2012	1,141	1,058	430	455	163	155	61	65
2013	1,097	1,113	429	448	157	164	61	64
2014	1,099	1,078	434	428	157	158	62	61
2015	1,083	1,083	438	403	155	159	63	58
2016	1,067	1,093	440	367	153	161	63	52
2017	1,040	1,086	442	361	149	160	63	52
2018	1,028	1,054	442	352	147	155	63	50
2019	1,013	1,017	442	344	145	149	63	49
2020	996	977	441	334	142	144	63	48
2021	979	951	440	325	140	140	63	47
2022	964	928	438	319	138	136	63	46
2023	950	906	437	313	136	133	63	45
2024	935	883	436	307	134	130	62	44
2025	921	860	435	302	132	126	62	43
2026	908	838	434	297	130	123	62	42
2027	897	816	433	292	128	120	62	42
2028	886	796	432	287	127	117	62	41
2029	876	777	431	293	125	114	62	42
2030	867	758	430	279	124	111	61	40
2031	858	740	429	275	123	109	61	39
2032	850	722	428	270	122	106	61	39
2033	844	704	428	266	121	103	61	38
2034	838	687	427	262	120	101	61	37
2035	833	672	427	260	119	99	61	37
2036	-	657	-	256	-	97	-	37
2037	-	642	-	253	-	94	-	36
2038	-	627	-	249	-	92	-	36
2039	-	613	-	246	-	90	-	35
2040	-	599	-	243	-	88	-	35

Demand data are from the National Energy Board and are reported in Petajoules. These were converted to megajoules (1 petajoule = 1,000,000,000 megajoules) and further converted to litres (34.8 megajoules per litre for motor gasoline and 38.6 megajoules per litre for diesel fuel). Population data come from provincial statistics.

ENDNOTES

- 1 For a detailed discussion of the GTHA, see Harry Kitchen and Robin Lindsey, “Financing Roads and Public Transit in the Greater Toronto and Hamilton Area”, a report for the Residential and Civil Construction Alliance of Ontario, January 2013, available at www.rccao.com.
- 2 Harry Kitchen, “A Case for Increasing Provincial Fuel Taxes (on a Temporary Basis)”, a report for the Residential and Civil Construction Alliance of Ontario, July 2015, available at www.rccao.com.
- 3 Harry Kitchen, “Taxing Motor Gas and Diesel Fuel in the GTHA. Will This Generate Sufficient Revenue?” a report for the Residential and Civil Construction Alliance of Ontario, June 2014, available at www.rccao.com.
- 4 Data for the years 2000 to 2035. National Energy Board data used in reports cited in footnotes 2 and 3.
- 5 Data for the years 2005 to 2040 – available from the National Energy Board - Data Hub. Click on Appendices, Ontario, End – Use Demand, and Transportation Sector.
- 6 The National Energy Board reports demand data in petajoules. These are converted to megajoules (1 petajoule = 1,000,000,000 megajoules) and further converted to litres (34.8 megajoules per litre for motor gasoline and 38.6 megajoules per litre for diesel fuel) for presentation purposes. Per capita figures were calculated by dividing total litres by the Ontario population. Population data are from Ontario provincial statistics.
- 7 Tyler Hamilton, “Electric vehicles are in the driver’s seat now”, *Globe and Mail*, B4, October 1, 2019.
- 8 Johal Sunil, “The case for growing the Gas Tax Fund”, a report commissioned by the Federation of Canadian Municipalities, September 2019.
- 9 Editorial, “Trudeau, his cabinet and climate change”, *Globe and Mail*, wrote that “A tax on the gas in the family car to encourage you to drive less or switch to a more fuel-efficient vehicle, and with the tax rebated to taxpayers, doesn’t reduce our economic competitiveness.” Nov. 19, 2019.
- 10 Editorial, “A climate change lesson, made in B.C.”, *Globe and Mail*, September 30, 2019.
- 11 For a more detailed discussion, see Kitchen and Lindsey (2013) cited in footnote 1; and Robin Lindsey (2019), “User Fees for Transportation: Road Tolls & Congestion Pricing” Enid Slack, Lisa Philipps, Lindsay M. Tedds, and Heather L. Evans (eds.), *Funding the Canadian City*, pp. 123-153. Toronto: Canadian Tax Foundation and Institute on Municipal Finance and Governance.

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- 12 Efficiently set prices are based on marginal cost pricing – for a detailed discussion, see references cited in endnote 11.
 - 13 It is interesting how road pricing makes so much sense fiscally and economically yet gets dismissed so often by politicians. Surely, it is time for politicians to stand up and defend road pricing as a fair and efficient way of funding road expenditures rather than criticizing or avoiding this controversial option. See “The high cost of Canada’s ‘free’ roads”, editorial in *Globe and Mail*, August 26, 2019; and DJ Gribbin, “Congestion pricing is all around us. Why is it taboo on our roads?” Brookings.edu, October 16, 2019.
 - 14 Tolls can be imposed on each entry or exit or both.
 - 15 Fees are paid once daily and are levied for driving within the zone or for crossing the boundary.
 - 16 <https://canada.constructconnect.com/dcn/news/others/2012/02/407-international-reports-earnings-increase-from-ontario-toll-highway-dcn048825w>
 - 17 HOV lanes with an occupancy requirement of at least two people (HOV2+) are operating on highways 403, 404 and 417, and the QEW. (<http://www.mto.gov.on.ca/english/traveller/hov/>)
 - 18 Ben Dachis, Congestive Traffic Failure: The Case for High-Occupancy and Express Toll Lanes in Canadian Cities, C.D. Howe Institute, e-brief, (<https://www.cdhowe.org/public-policy-research/congestive-traffic-failure-case-high-occupancy-and-express-toll-lanes-canadian-cities?page=6>), August 2011.
 - 19 Hemson Consulting, “New Taxation Measures: City of Toronto Act”, a report prepared for the City of Toronto, 2007.
 - 20 Toronto City Summit Alliance, “Transit and Transportation Infrastructure Discussion Paper for Toronto Summit.”, 2007.
 - 21 City of Toronto, “Transportation Funding Strategy”, Appendix B, (<http://www.toronto.ca/legdocs/mmis/2012/ex/bgrd/backgroundfile-50609.pdf>), 2012.
 - 22 City of Toronto staff report, “Tolling Options for the Gardner Expressway and Don Valley Parkway”, December 2016.
 - 23 Bern Grush, “Reduce, rethink, reform” in *Thinking Cities*, pp. 132-137”, 2013.
 - 24 Donald Shoup (2006) “Cruising for parking”, *Transport Policy* 13, pp. 479-486; Donald Shoup (2007) “Cruising for parking”, *Access* 30, Spring, pp. 16-22. (<http://shoup.bol.ucla.edu/CruisingForParkingAccess.pdf>)
 - 25 Bern Grush, cited in endnote 23, p. 132, 2013.



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