



Haul Route Review Miller Boyington Pit #3

Miller Paving Ltd.

P/N 10-2412 | June, 2019

SBA Skelton Brumwell
& Associates Inc.

ENGINEERING PLANNING ENVIRONMENTAL CONSULTANTS

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Township of Uxbridge
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Appendix A

Region of Durham – Growth Trends

Appendix B

Site Generated Traffic

Haul Route Review
Miller Boyington Pit #3
Township of Uxbridge

P/N 10-2412

June, 2019

1.0 Introduction

Skelton, Brumwell & Associates Inc. (SBA) have been retained by Miller Paving Ltd. (Miller) to provide consulting engineering and planning services for Boyington Pit #3, located at the northeast corner of the intersection of Concession Road 7 and Reid Road in the Township of Uxbridge, and as shown on Figure #1. The property is legally described as Lot 18, Lot 19, and Part of Lot 20, Concession 20, Geographic Township of Uxbridge, now in the Township of Uxbridge, Region of Durham.

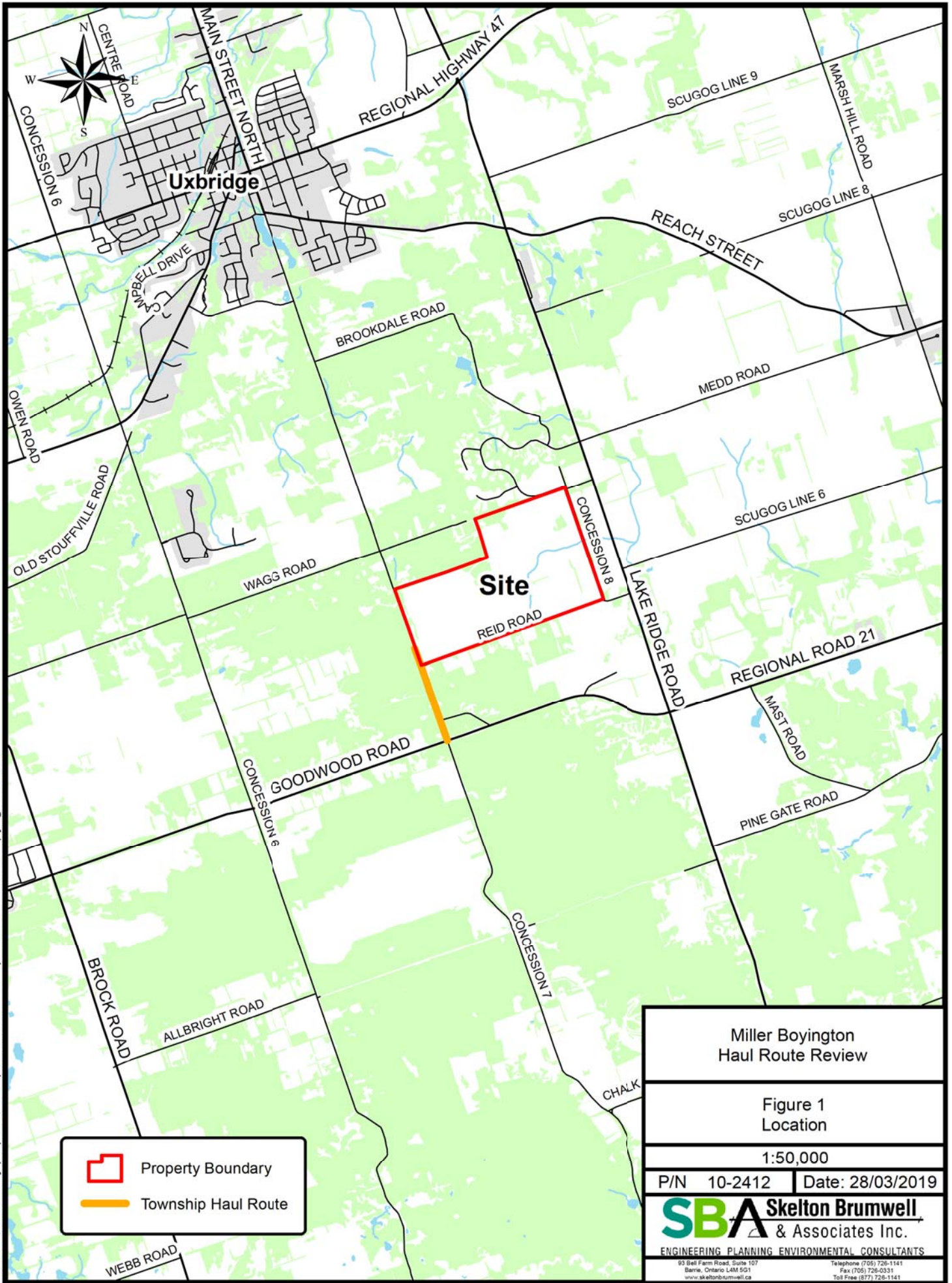
The property is currently licensed under the Aggregate Resources Act (ARA) as a Class "A" Pit, License #6578, with a total licensed area of +/- 196 hectares, and an annual extraction tonnage of 816,000 tonnes. The site is currently zoned M3, which permits use as a pit; M3-1, which permits uses including an asphalt plant; and M5-1, which permits uses including a contractors' yard. The M3 zone comprises an area of +/- 170 hectares, the M3-1 zone comprises an area of +/- 13.4 hectares, and the M5-1 zone comprises an area of +/- 12.6 hectares.

Miller is currently proposing to remove an area of +/- 36.8 hectares of land from the existing ARA license in order to allow the importation of fill to match the grade of the surrounding lands, allow for construction of a rehabilitation slope, and also to allow for the construction of an approximately 44,000 square foot (4,088 m²) building for equipment storage. This land includes the existing M3-1 and M5-1 lands, plus buffer lands to the north and east. It is estimated that the total volume of fill to be placed is about 1.039 million cubic metres, which would be completed over a period of about 10 years.

Preliminary consultation was undertaken between personnel from Skelton, Brumwell & Associates and staff from the Township of Uxbridge and Region of Durham. During the Pre-Consultation meeting, Township staff advised that they want to implement a monitoring program for the haul routes in order to monitor the road condition over the 10 year period for which the fill hauling is proposed to take place. This report has been prepared as a first step in the monitoring program.

The Haul Route Review was completed in support of the Site Plan Application submitted to the Township of Uxbridge.

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Miller Boyington
Haul Route Review

Figure 1
Location

1:50,000

P/N 10-2412 | Date: 28/03/2019

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2.0 Haul Route

It is expected that the fill being transported to the site will be from development sites generally in the G.T.A. and to the south of the property. Trucks would typically be coming north via Lakeridge Road (Regional Road 23) and Brock Road (Regional Road 1) and then across the Goodwood Road (Regional Road 21) to Uxbridge Concession 7 and north to the pit entrance (see Figure 1). Concession 7 is defined as a Collector Road in the Township of Uxbridge Official Plan.

Traffic signals exist at the intersection of Goodwood Road and Concession 7, and there are left turn lanes in both directions on Goodwood Road.

Unless fill is brought from local sites within the Township, it is unlikely that any other Uxbridge Township roads would be used for hauling materials. The distance to the pit entrance from the Goodwood Road is just under 1 km, so this section of road would be the haul route to be monitored.

A site visit was undertaken in May of 2018 to review the existing road conditions. The asphalt width was measured to be about 6.6 to 6.7 metres wide. Gravel shoulders are about 1.5 metres wide, although in the vicinity of the pit the shoulder on the west side is about 2.0 metres wide. No speed limit signs were observed so a limit of 80 km/hr is assumed.

At the time of the site visit, Concession 7 from Goodwood Road to the pit entrance was seen to be in an excellent condition along the entire length. Uxbridge's Road Operations Manager advised that Concession 7 had been repaved in 2008, and he recalled the work at that time consisted of 100 mm of base stabilization and 60 mm of HL3 asphalt. Google Streetview images from 2009 showed that the road had been recently repaved, which confirms the 2008 date stated by the Operations manager.

3.0 Travel Demand

3.1 Horizon Year and Time Period of Analysis

It is assumed for the purposes of this study that the importation of fill would commence later in 2019. A study horizon of 10 years to 2029 has been used.

3.2 Historical Tonnages

As noted in Section 1.0, Miller Boyington Pit #3 is licensed for a maximum of 816,000 tonnes per year. Actual tonnages for the past 10 years were as follows:

| Year | Tonnes |
|-----------------------|---------|
| 2009 | 281,975 |
| 2010 | 191,916 |
| 2011 | 263,414 |
| 2012 | 395,599 |
| 2013 | 113,973 |
| 2014 | 15,384 |
| 2015 | 52,989 |
| 2016 | 2,037 |
| 2017 | 0 |
| 2018 | 0 |
| Average | 131,729 |
| Average (2009 – 2013) | 249,375 |

Although licensed for up to 816,000 tonnes per year, the highest amount removed was 395,599 tonnes in 2012. The 10 year average since 2009 was 131,729 tonnes, although nothing was extracted in 2017 and 2018, and the amounts in 2014 to 2016 were relatively small. For the peak years from 2009 to 2013 the annual average was 249,375 tonnes.

3.3 Background Traffic Volumes

The Town of Uxbridge Road Operations Manager advised that the Average Annual Daily Traffic (AADT) for Concession 7 was 2,055 vehicles per day in 2014 and 2,361 in 2017. Based on the writer's experience, the peak hour traffic volume could be expected to be up to about 10 to 11% of the AADT. For 2017, this would result in a peak hour volume of roughly 236 to 260 vehicles.

The Region of Durham undertakes regular traffic counts at the intersection of Concession 7 and Regional Road 21. For the morning peak hour, the measured volumes on the north leg of the intersection were 216, 232 and 221 vehicles for 2016, 2017 and 2018 respectively. The average volume for the three years is 223 vehicles. Afternoon peak hour counts were 266, 229 and 297 vehicles for the same three years, with the average being 264 vehicles.

3.4 Projected Background Traffic

The available historical background traffic data is too limited to be used to predict future background traffic volumes. Growth in the traffic volumes should be directly related to the growth in population of the surrounding area. On November 16, 2018 the Region of Durham published an Information Report regarding the Monitoring of Growth Trends which provides insight into the expected growth in the area. This report showed that from 2013 to 2018, the population in the Township of Uxbridge increased by about 0.6% per year, compared to 0.95% for Durham Region. Similarly, the number of households in Uxbridge increased by 1% per year in the same period, compared to 1.08% for the Region. The report is included in Appendix A.

The report projects that the population in Uxbridge will increase by about 0.2% per year from 2018 to 2023, with the Region increasing at a rate of 2.58% per year. Household increases are forecasted to be 0.55% per year for Uxbridge and 2.72% for the Region.

As Concession 7 is a local road which provides access to and from Uxbridge, it is expected that the traffic volumes will be a function of the population growth in Uxbridge and not the Region of Durham as a whole. Assuming a growth rate of 0.6% per year which is slightly higher than the projected 5 year household growth rate for Uxbridge, results in the traffic in 2019 being 7.44% higher than in 2017. Rounding this up to 8% means that the projected AADT for Concession 7 would be 2,550 vehicles per day, and the peak hour could be around 255 vehicles.

3.5 Site Generated Traffic

Traffic volumes for the Boyington gravel pit have been estimated based on the historical tonnages and in consideration of the operating hours and an assumed breakdown of the types of trucks which may be in use at this pit. Spreadsheets showing the calculations are included in Appendix B.

At the Maximum Licensed tonnage, it is estimated that the Boyington Pit could generate up to 318 truck trips per day or 27 trips per hour. For the maximum tonnage taken from the pit in 2012 of 395,599 tonnes, it is estimated that this would have generated around 154 trips per day or 13 trips per hour. The overall average tonnage from 2009 to 2018 of 131,729 tonnes would have resulted in roughly 51 trips per day or 4 trips per hour. The average in the 5 years from 2009 to 2013 of 242,175 tonnes would have generated roughly 94 trips per day or 8 trips per hour.

As noted in Section 1.0, a total of about 1.039 million cubic metres of fill is estimated to be imported over a period of about 10 years, which equates to average of roughly 100,000 cubic metres per year, which would be about 200,000 tonnes of material. Using a conservative assumption that all of the fill is being hauled using tri-axle trucks, and assuming the same

operating hours and days as the licensed pit, it is estimated that the fill operation could generate about 99 trips per day or 8 trips per hour.

The annual tonnages to be extracted from the pit over the next 10 years will be a function of the market demand for specific aggregate products. If a maximum tonnage similar to 2012 is experienced again in conjunction with the fill importation, there could be up to about 253 trips per day (154 + 99) or 21 trips per hour. This is less than the 318 trips per day or 27 trips per hour that would be expected if materials are removed based on the licensed limit. If the 10 year average of 51 trips per day or 4 trips per hour is used, there could be 150 trips per day or 12 trips per hour with the fill importation. This is roughly equivalent to what would have been incurred at the highest production year in 2012.

4.0 Discussion

With an estimated daily traffic volume on Concession 7 of 2,550 vehicles in 2029, the 99 trips per day expected to be generated by the fill importing would represent an increase of only about 3.9%. From a traffic impact aspect, this will have a minimal impact and it is expected that the road system will continue to operate at a good level of service.

The 99 trips per day expected to be generated by the filling operation is far less than what would be expected to be generated by the pit operation if it gravel was to be removing at the licensed limit of 816,000 tonnes per year. Combining 99 trips per day for fill operations with the 51 trips per day that is the rough average based on the tonnages removed from 2009 to 2018 would total 150 trips per day, which is close to the 154 trips per day estimated from the peak tonnage year in 2012. If little or no gravel is removed from the pit as was the case in 2017 and 2018, the truck trips would be similar to what occurred between 2009 and 2013. Based on this consideration, it is evident that the impact on the structural integrity of the roadway from the trucks hauling fill will be far less than the impact if the pit was operating at full capacity, and roughly equal to the impact if the average tonnage is comparable to what it has been for the past ten years.

As noted previously, the road surface appears to be still in excellent shape, even though it was last re-surfaced over 10 years ago and there has been quite a bit of gravel truck traffic on it. This may be attributed to the nature of the underlying soils in this area. Soil Survey information shows the surface soils to be either Pontypool Sand or Brighton Gravelly Sandy Loam, both of which have good drainage characteristics. With these sandy materials below the road sub-base, the roadway would be far less susceptible to being damaged by frost action.

Even though it is unlikely, in our opinion, that the hauling of fill to the Miller Boyington Pit will cause any undue damage to Concession 7, we do recommend that a Condition Rating Evaluation be performed on the roadway prior to any fill being transported. This empirical evaluation

should be completed in accordance with Ministry of Transportation guidelines and would provide a baseline condition to which the condition in future years can be compared to. The road condition can be monitored in the coming years and if necessary, the Condition Rating Evaluation can be re-done to demonstrate whether or not there has been any impact.

5.0 Conclusions and Recommendations

Based on our research and analysis, we conclude the following:

- It is estimated that the proposed filling operation at the Miller Boyington Pit may generate up to 99 truck trips per day over a period of about 10 years. This is roughly equivalent to the background truck traffic over the past several years.
- The truck trips generated by the filling operation is far less that what would be generated by the gravel pit if materials were being removed at the licensed limit of 816,000 tonnes per year. Combined with the estimated truck trips based on the average tonnage from 2009 to 2018, the total number of trucks would be roughly equivalent to what would have been generated in 2012, which was the peak tonnage year.
- Concession 7 was last resurfaced in 2008 and appears to be still in excellent shape.
- In our opinion, it is unlikely that the hauling of fill to the Miller Boyington pit will cause any undue damage to Concession 7, and if there is any damage it would be less than what would occur if the gravel pit was operating at the maximum licensed capacity.
- We recommend that a Condition Rating Evaluation be performed on Concession 7 prior to any fill being transported. This will document the baseline condition to which future evaluations can be compared to in order to demonstrate whether or not there is any damage to the roadway.

All of which is respectfully submitted,
SKELTON, BRUMWELL & ASSOCIATES INC.

per:



Scott W. Brumwell, P.Eng.
President



Appendix A

Region of Durham – Growth Trends



The Regional Municipality of Durham Information Report

From: Commissioner of Planning and Economic Development
Report: #2018-INFO-149
Date: November 16, 2018

Subject:

Monitoring of Growth Trends, File: D01-02-01

Recommendation:

Receive for information.

Report:

1. Purpose

- 1.1 This report is the second of two biannual reports monitoring growth trends in Durham. It presents historical population and household data for the Region and area municipalities for the 2013 to 2018 period. It also includes short-term forecasts for the 2018 to 2023 period.
- 1.2 The data is provided for the end of May (to correspond with the timing of the Census) and for December (calendar year-end). Information presented in this report is intended for use in various Regional studies and programs including the upcoming Municipal Comprehensive Review (Regional Official Plan Update), Development Charges Studies, and the annual Five-year Servicing and Financing Study.

2. Historical population and household estimates (2013-2018)

- 2.1 The population and household estimates presented in Attachments 1 and 2, are based on:

-
- Statistics Canada Census information for 2011 and 2016 including an estimate for net undercoverage¹; and
 - Canada Mortgage and Housing Corporation (CMHC) monthly housing completion data for non-Census years.
- 2.2 The semi-annual population estimates presented in Attachment 1 indicate that the Region's mid-year population growth increased by 8,585 persons from 2017 to 2018, representing a growth rate of 1.27%. The population growth for the five-year period from May 2013 to May 2018 was 5.6%.
- 2.3 The semi-annual household estimates presented in Attachment 2, indicate that the Region's mid-year household growth increased by 3,255 households from 2017 to 2018, representing a growth rate of 1.41%. The household growth for the five-year period from May 2013 to May 2018 was 6.37%.
- 3. Short-term growth forecasts (2018-2023)**
- 3.1 The short-term growth forecasts for population and households presented in Attachments 3 and 4 are based on:
- housing production estimates provided by the area municipalities;
 - an analysis of past trends; and
 - estimates of the timing and anticipated annual housing occupancy across the Region.
- 3.2 The forecasts make no allowances for unpredictable factors such as changes in economic conditions affecting residential growth (e.g. significant increases in mortgage rates, building trade strikes, etc.).
- 3.3 The short-term forecasts indicate that in the next five years Durham's population is projected to increase from 685,710 (2018) to 778,900 in 2023 (refer to Attachment 3). This increase represents an average annual growth rate of 2.58% between May 2018 and May 2023.

1. Net undercoverage refers to the net population counts that are missed during the Census enumeration due to persons with no usual residence, incorrect questionnaires, missed dwellings, away from home, etc.

- 3.4 Similarly, the current number of households in Durham is projected to increase from 233,785 (2018) to approximately 267,380 in 2023 (refer to Attachment 4). This increase represents an average annual growth rate of 2.72% between May 2018 and May 2023.
- 3.5 These forecasts assume an increased rate of growth in Pickering towards the end of the period, adding approximately 9,130 households and 26,800 people to the forecast as the Seaton community develops.

4. Conclusion

- 4.1 Regional Council will continue to be kept apprised of emerging population and household data and trends through regular updates of this information.
- 4.2 A copy of this report will be forwarded to the Area Municipalities, the Durham Regional Police Services, the Local Health Integration Network and the School Boards in Durham.

5. Attachments

- Attachment 1: Semi-annual Population Estimates, 2013-2018.
- Attachment 2: Semi-annual Household Estimates, 2013-2018.
- Attachment 3: Semi-annual Population Forecasts, 2018-2023.
- Attachment 4: Semi-annual Household Forecasts, 2018-2023.

Respectfully submitted,

Original signed by

B.E. Bridgeman, MCIP, RPP
Commissioner of Planning and
Economic Development

Semi-annual Population Estimates, 2013-2018 (May and December)

| Year | Ajax | Brock | Clarington | Oshawa | Pickering | Scugog | Uxbridge | Whitby | Durham |
|---------------|---------|--------|------------|---------|-----------|--------|----------|---------|---------|
| 2013 (Dec) | 119,650 | 11,955 | 92,380 | 160,175 | 94,510 | 22,380 | 21,665 | 131,425 | 654,140 |
| 2014 (May) | 120,295 | 11,970 | 92,580 | 160,760 | 94,245 | 22,505 | 21,740 | 131,610 | 655,700 |
| 2014 (Dec) | 121,670 | 12,020 | 93,805 | 161,840 | 94,780 | 22,400 | 21,785 | 132,365 | 660,665 |
| 2015 (May) | 122,895 | 12,030 | 94,210 | 162,730 | 94,810 | 22,475 | 21,830 | 132,370 | 663,345 |
| 2015 (Dec) | 123,740 | 12,045 | 94,860 | 163,925 | 95,115 | 22,380 | 21,930 | 132,765 | 666,755 |
| 2016 (May) | 124,230 | 12,085 | 95,515 | 165,525 | 95,265 | 22,440 | 21,980 | 133,265 | 670,310 |
| 2016 (Dec) | 124,805 | 12,065 | 96,490 | 166,535 | 95,220 | 22,370 | 22,045 | 133,515 | 673,040 |
| 2017 (May) | 125,505 | 12,050 | 97,395 | 167,430 | 95,765 | 22,320 | 22,265 | 134,400 | 677,125 |
| 2017 (Dec) | 126,445 | 12,140 | 98,550 | 169,320 | 96,255 | 22,245 | 22,245 | 135,050 | 682,250 |
| 2018 (May) | 127,840 | 12,130 | 99,215 | 170,120 | 96,585 | 22,195 | 22,345 | 135,280 | 685,710 |

Note: All figures rounded

Source: Statistics Canada 2016 Census and CMHC monthly housing completions data.

Semi-annual Household Estimates, 2013-2018 (May and December)

| Year | Ajax | Brock | Clarington | Oshawa | Pickering | Scugog | Uxbridge | Whitby | Durham |
|---------------|--------|-------|------------|--------|-----------|--------|----------|--------|---------|
| 2013 (Dec) | 36,440 | 4,445 | 31,565 | 60,520 | 30,350 | 8,070 | 7,485 | 42,690 | 221,565 |
| 2014 (May) | 36,585 | 4,460 | 31,700 | 60,680 | 30,390 | 8,095 | 7,510 | 42,815 | 222,235 |
| 2014 (Dec) | 36,940 | 4,490 | 32,135 | 61,170 | 30,570 | 8,130 | 7,555 | 43,095 | 224,090 |
| 2015 (May) | 37,225 | 4,500 | 32,335 | 61,470 | 30,685 | 8,150 | 7,565 | 43,175 | 225,105 |
| 2015 (Dec) | 37,450 | 4,520 | 32,580 | 61,980 | 30,815 | 8,175 | 7,635 | 43,325 | 226,480 |
| 2016 (May) | 37,550 | 4,545 | 32,840 | 62,595 | 30,920 | 8,220 | 7,665 | 43,530 | 227,865 |
| 2016 (Dec) | 37,655 | 4,550 | 33,225 | 62,990 | 30,985 | 8,225 | 7,705 | 43,670 | 229,005 |
| 2017 (May) | 37,815 | 4,555 | 33,570 | 63,340 | 31,220 | 8,230 | 7,795 | 44,005 | 230,530 |
| 2017 (Dec) | 38,030 | 4,600 | 34,020 | 64,065 | 31,465 | 8,235 | 7,805 | 44,275 | 232,495 |
| 2018 (May) | 38,400 | 4,605 | 34,290 | 64,375 | 31,630 | 8,240 | 7,850 | 44,395 | 233,785 |

Note: All figures rounded

Source: Statistics Canada Census and CMHC monthly housing completions data.

Semi-annual Population Forecasts, 2018-2023 (May and December)

| Year | Ajax | Brock | Clarington | Oshawa | Pickering | Scugog | Uxbridge | Whitby | Durham |
|---------------|---------|--------|------------|---------|-----------|--------|----------|---------|---------|
| 2018 (Dec) | 127,900 | 12,200 | 101,500 | 171,000 | 98,000 | 22,200 | 22,300 | 137,300 | 692,500 |
| 2019 (May) | 128,600 | 12,200 | 102,500 | 172,200 | 99,400 | 22,300 | 22,300 | 138,300 | 697,800 |
| 2019 (Dec) | 129,600 | 12,200 | 104,200 | 174,300 | 101,900 | 22,500 | 22,300 | 140,200 | 707,400 |
| 2020 (May) | 130,600 | 12,300 | 105,200 | 175,400 | 104,300 | 22,600 | 22,300 | 141,400 | 714,200 |
| 2020 (Dec) | 132,400 | 12,400 | 106,900 | 177,300 | 108,700 | 22,800 | 22,400 | 143,400 | 726,400 |
| 2021 (May) | 133,800 | 12,400 | 107,800 | 178,400 | 111,600 | 22,900 | 22,400 | 144,800 | 734,000 |
| 2021 (Dec) | 136,400 | 12,400 | 109,500 | 180,500 | 116,600 | 23,100 | 22,400 | 147,100 | 747,700 |
| 2022 (May) | 137,900 | 12,400 | 110,500 | 181,500 | 119,900 | 23,200 | 22,500 | 148,500 | 755,800 |
| 2022 (Dec) | 140,400 | 12,500 | 112,300 | 183,400 | 125,700 | 23,300 | 22,500 | 150,900 | 770,400 |
| 2023 (May) | 143,000 | 12,500 | 113,400 | 184,500 | 128,300 | 23,400 | 22,500 | 152,300 | 778,900 |

Note: All figures rounded

Source: Statistics Canada 2016 Census and CMHC monthly housing completions data.

Semi-annual Household Forecasts, 2018-2023 (May and December)

| Year | Ajax | Brock | Clarington | Oshawa | Pickering | Scugog | Uxbridge | Whitby | Durham |
|---------------|--------|-------|------------|--------|-----------|--------|----------|--------|---------|
| 2018 (Dec) | 38,360 | 4,640 | 35,140 | 64,710 | 32,180 | 8,270 | 7,850 | 45,130 | 236,260 |
| 2019 (May) | 38,500 | 4,660 | 35,510 | 65,170 | 32,690 | 8,320 | 7,860 | 45,510 | 238,220 |
| 2019 (Dec) | 38,750 | 4,680 | 36,160 | 65,990 | 33,610 | 8,430 | 7,890 | 46,180 | 241,690 |
| 2020 (May) | 39,000 | 4,710 | 36,540 | 66,410 | 34,480 | 8,490 | 7,910 | 46,610 | 244,140 |
| 2020 (Dec) | 39,450 | 4,750 | 37,210 | 67,150 | 36,030 | 8,610 | 7,940 | 47,360 | 248,500 |
| 2021 (May) | 39,830 | 4,770 | 37,560 | 67,590 | 37,030 | 8,670 | 7,960 | 47,840 | 251,250 |
| 2021 (Dec) | 40,510 | 4,800 | 38,180 | 68,380 | 38,800 | 8,800 | 8,000 | 48,690 | 256,160 |
| 2022 (May) | 40,900 | 4,810 | 38,580 | 68,780 | 39,970 | 8,850 | 8,020 | 49,180 | 259,080 |
| 2022 (Dec) | 41,590 | 4,840 | 39,280 | 69,500 | 42,040 | 8,940 | 8,050 | 50,060 | 264,290 |
| 2023 (May) | 42,290 | 4,860 | 39,720 | 69,940 | 42,980 | 8,970 | 8,070 | 50,560 | 267,380 |

Note: All figures rounded

Source: Statistics Canada Census and CMHC monthly housing completions data.

APPENDIX B

Site Generated Traffic

**APPENDIX B
SITE GENERATED TRAFFIC
Miller Boyington Pit**

PIT AGGREGATE - Potential Maximum Tonnages

Production

| | | |
|-----------------|---------|--------|
| Typical Maximum | 396,000 | tonnes |
| Maximum | 816,000 | tonnes |

Fleet Usage

| | Tonnes Per Load | % of Trips |
|--|-----------------|------------|
| Triaxle | 23 | 50% |
| Tractor with Trailer/ Triaxle with Pony | 37 | 50% |

Average per Load 30 tonnes

Annual Trip Generation

| | Total Annual Tonnage | Tonnes Per Load | Trips Per Year |
|---------------------------------|----------------------|------------------------|----------------|
| Average Year | 396,000 | 30 | 13,200 |
| | | Total Trips Out | 13,200 |
| | | Total Trips In | 13,200 |
| | | Total Trips (Out + In) | 26,400 |
| Maximum Year (Licence Limit) | 816,000 | 30 | 27,200 |
| | | Total Trips Out | 27,200 |
| | | Total Trips In | 27,200 |
| | | Total Trips (Out + In) | 54,400 |

Daily Trip Generation

| | |
|---|-----|
| Percentage (%) shipped in peak months | 90% |
| Peak Months: May to November | 7 |
| Average number of working days per month: | 22 |
| Daily Peak Traffic Factor: | 1 |

| Total Annual Tonnage | Total Trips Per Year | Total Working Days in Peak Months | Trips Per Day in Peak Months |
|----------------------|----------------------|-----------------------------------|------------------------------|
| 396,000 | 26,400 | 154 | 154 |
| 816,000 | 54,400 | 154 | 318 |

TOTAL TRIP GENERATION

Hours of Operation

| | |
|-------------------------|---------|
| From: | 7:00 AM |
| To: | 7:00 PM |
| Total Hours: | 12 |
| % Shipped in Peak Hours | 100% |

| Total Annual Tonnage | Trips Per Day | Average Trips Per Peak Hour | Minutes Between Trips |
|----------------------|---------------|-----------------------------|-----------------------|
| 396,000 | 154 | 13 | 5 |
| 816,000 | 318 | 27 | 2 |

**APPENDIX B
SITE GENERATED TRAFFIC
Miller Boyington Pit**

PIT AGGREGATE - Historical Average Tonnages

Production

| | | |
|-----------------------|---------|--------|
| Overall Average | 132,000 | tonnes |
| Average (2009 - 2013) | 242,000 | tonnes |

Fleet Usage

| | Tonnes Per Load | % of Trips |
|--|-----------------|------------|
| Triaxle | 23 | 50% |
| Tractor with Trailer/ Triaxle with Pony | 37 | 50% |

Average per Load 30 tonnes

Annual Trip Generation

| | Total Annual Tonnage | Tonnes Per Load | Trips Per Year |
|---------------------------------|----------------------|------------------------|----------------|
| Average Year | 132,000 | 30 | 4,400 |
| | | Total Trips Out | 4,400 |
| | | Total Trips In | 4,400 |
| | | Total Trips (Out + In) | 8,800 |
| Maximum Year (Licence Limit) | 242,000 | 30 | 8,067 |
| | | Total Trips Out | 8,067 |
| | | Total Trips In | 8,067 |
| | | Total Trips (Out + In) | 16,133 |

Daily Trip Generation

| | |
|---|-----------------|
| Percentage (%) shipped in peak months | 90% |
| Peak Months: | May to November |
| Average number of working days per month: | 22 |
| Daily Peak Traffic Factor: | 1 |

| Total Annual Tonnage | Total Trips Per Year | Total Working Days in Peak Months | Trips Per Day in Peak Months |
|----------------------|----------------------|-----------------------------------|------------------------------|
| 132,000 | 8,800 | 154 | 51 |
| 242,000 | 16,133 | 154 | 94 |

TOTAL TRIP GENERATION

Hours of Operation

| | |
|-------------------------|---------|
| From: | 7:00 AM |
| To: | 7:00 PM |
| Total Hours: | 12 |
| % Shipped in Peak Hours | 100% |

| Total Annual Tonnage | Trips Per Day | Average Trips Per Peak Hour | Minutes Between Trips |
|----------------------|---------------|-----------------------------|-----------------------|
| 132,000 | 51 | 4 | 14 |
| 242,000 | 94 | 8 | 8 |

**APPENDIX B
SITE GENERATED TRAFFIC
Miller Boyington Pit**

Imported Fill

Production

Maximum 200,000 tonnes

Fleet Usage

| | | |
|--|-----------------|------------|
| | Tonnes Per Load | % of Trips |
| Triaxle | 23 | 100% |
| Tractor with Trailer/ Triaxle with Pony | | |

Average per Load 23 tonnes

Annual Trip Generation

| | Total Annual Tonnage | Tonnes Per Load | Trips Per Year |
|---------------------------------|-------------------------|------------------------|----------------|
| Maximum Year (Licence Limit) | 200,000 | 23 | 8,696 |
| | | Total Trips Out | 8,696 |
| | | Total Trips In | 8,696 |
| | | Total Trips (Out + In) | 17,391 |

Daily Trip Generation

| | |
|---|------|
| Percentage (%) shipped in peak months | 100% |
| Peak Months: May to November | 8 |
| Average number of working days per month: | 22 |
| Daily Peak Traffic Factor: | 1 |

| Total Annual Tonnage | Total Trips Per Year | Total Working Days in Peak Months | Trips Per Day in Peak Months |
|----------------------|-------------------------|--------------------------------------|---------------------------------|
| 200,000 | 17,391 | 176 | 99 |

TOTAL TRIP GENERATION

Peak Hours of Operation

| | |
|-------------------------|---------|
| From: | 7:00 AM |
| To: | 7:00 PM |
| Total Hours: | 12 |
| % Shipped in Peak Hours | 100% |

| Total Annual Tonnage | Trips Per Day | Average Trips Per Peak Hour | Minutes Between Trips |
|----------------------|---------------|--------------------------------|--------------------------|
| 200,000 | 99 | 8 | 7 |