

December 23, 2021

Mr. Jason & Henry Eng

10850 Concession Road 4
Uxbridge, Ontario
L0E 1T0

**Re: Legalization of Existing Soil Mixing Operation
10850 Concession Road 4, Township of Uxbridge, Region of Durham
Traffic Impact Study**

CGE Transportation Consulting is pleased to submit this Traffic Impact Study for the existing soil mixing operation located at 10850 Concession Road 4, in the Township of Uxbridge – Region of Durham.

Based on a comprehensive review, the study concludes that the low site traffic generated by the existing development can be accommodated by the existing transportation network, no roadway improvements are required. The site accesses can adequately support existing and future traffic operations.

Should you have any questions regarding this study, please do not hesitate to contact the undersigned.

Yours truly,

CGE TRANSPORTATION CONSULTING



Casey Ge, P.Eng.
President

TABLE OF CONTENTS

| | Page |
|---|------|
| 1.0 Introduction..... | 1 |
| 2.0 TRAFFIC OPERATIONS AND TRIP GENERATION..... | 4 |
| 2.1 Concession Road 4..... | 4 |
| 2.2 TRIP GENERATION..... | 4 |
| 2.3 Exclusive Turn Lanes..... | 6 |
| 2.4 Intersection/Decision Sight Distance..... | 6 |
| 2.5 Collisions..... | 8 |
| 2.6 Signage..... | 8 |
| 3.0 Conclusions..... | 9 |

LIST OF TABLES

| | Page |
|--|------|
| Table 1 Traffic Volumes – Concession Road 4..... | 4 |
| Table 2 Estimated Traffic Generation..... | 5 |
| Table 3 Left-Turn Lane Analysis..... | 6 |
| Table 4 Sightline Distance Review..... | 7 |

LIST OF FIGURES

| | Page |
|-----------------------------|------|
| Figure 1 Site Location..... | 2 |
| Figure 2 SitePlan..... | 3 |

TABLE OF APPENDICES

| | |
|--|--|
| Appendix A: Existing Traffic Data | |
| Appendix B: Growth Rate Calculations | |
| Appendix C: Trip Generation Calculations | |

1.0 INTRODUCTION

CGE Transportation Consulting was retained by Jason and Henry Eng to prepare a Traffic Impact Study in support of a Zoning By-Law Amendment application to legalize an existing soil mixing operation located at 10850 Concession Road 4 in the Township of Uxbridge, Region of Durham.

Existing Site Description:

The site is bounded by Concession Road 4 to the east, Concession Road 3 to the west and rural areas to the north and south. The site is currently zoned as Rural Zone (*RU*) and *Environmental Protection Zone*.

The location of the development is illustrated in **Figure 1**.

Description of Existing Use:

The existing operation imports compost and manure for the purpose of mixing the products. It also stockpiles the materials, exports, and delivers the finished product to local farms, greenhouses and a limited number of garden centers. It is our understanding that a proportion of the finished product is also utilized on the current farming operation on the subject property.

The operations comprise of approximately 1.7 hectares, or 4.2 acres, of the total land area of 38.5 hectares. Approximately 30,000 to a maximum of 40,000 cubic yards/year are delivered to and from the site. Vehicular access to the soil mixing site is via an existing full movement unimproved laneway entrance connection to Concession Road 4.

In addition to the soil mixing operations, the subject property includes a single detached dwelling unit with an ancillary barn. Access to this unit is via an existing unimproved driveway connection to Concession Road 4.

The site plan is provided in **Figure 2**.

Scope of Work:

The purpose of the study is to determine:

- The expected trips generation by the existing use at typical and maximum operations.
- The impacts of the trips generated on the adjacent Concession Road 4.
- Road functions, geometrics and design at the site access and adjacent Concession Road 4 roadway.

Figure 1 Site Location

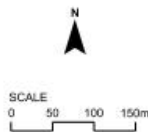


Source: Durham Region Maps (N.T.S)

Figure 2 SitePlan



Date: 2021-12-08
File: 10745 Existing Conditions 2021_12_08.dgn



LEGEND

- SUBJECT LANDS (LOT AREA = 40.5 ha)
- SOIL MIXING AREA
- PROPOSED RESTORATION AREA
- SWM OVERFLOW POND (CONCEPTUAL ALTERNATIVES)
- - - STONE RETAINING WALLS (CONCEPTUAL LOCATION)

Source: A/r photography from First Base Solutions Inc., 2019 Image
Digitized from: Fig 4 - Mitigation Birks Natural Heritage Consultants

EXISTING CONDITIONS
& CONCEPT PLAN
10850 CONCESSION 4
UXBRIDGE TOWNSHIP
REGIONAL MUNICIPALITY OF DURHAM

(Not to Scale)

2.0 TRAFFIC OPERATIONS AND TRIP GENERATION

2.1 Concession Road 4

Concession Road 4 is a two-lane Municipal Road with a posted speed limit of 50 km/h.

It is noted that current traffic patterns have been affected by COVID-19 and “social distancing” measures. This analysis examined the historical AADT in the vicinity of the site and applied the growth rate to the most recent and available pre-pandemic turning movement counts at the Concession Road 4 and Sandford Road (R.R. 11).

Traffic data for the Concession Road 4 and Sandford Road (R.R. 11) intersection obtained from the Region of Durham was performed on November 5th, 2013. The roadway AM peak hour and PM peak hour occurred at 7:30 a.m. and 5:15 p.m., respectively. The volumes can be found in the appendix.

The average annual background growth calculated using historical AADT along Sandford Road (R.R. 11) is 1.33%. These calculations can be found in the appendix. For a conservative analysis, a 2% p.a. growth rate was applied to the turning movement counts to estimate existing 2021 conditions as well as ultimate 2031 conditions. The volumes coming from and towards north have been conservatively carried through to the subject site frontage along Concession Road 4 to establish the volumes for analysis. The northbound and southbound peak hour traffic volumes are summarized below.

Table 1 Traffic Volumes – Concession Road 4

| Concession Road 4 | | | | | |
|-------------------------------|-------------|-------------------|-----------|-------------------|-----------|
| Location | Year | Northbound | | Southbound | |
| | | AM | PM | AM | PM |
| Operation Laneway Entrance | 2013 | 21 | 64 | 62 | 24 |
| | 2021 | 25 | 75 | 72 | 28 |
| | 2031 | 30 | 91 | 88 | 35 |

2.2 TRIP GENERATION

The Institute of Transportation Engineers (ITE) publishes trip-generation information in the authoritative reference *Trip Generation Manual*. This information is based on empirical data for a variety of land uses that do not include soil mixing operations. Accordingly, trip-generation calculations reflect the operational information provided by the owner, Jason and Henry Eng Works as below.

Annual Average Production: The amount of material shipped to/from the site vary from year to year depending on market demand. The annual typical production is estimated to be 30,000 cubic yards with a maximum/peak production of 40,000 cubic yards.

Vehicle Composition: The traffic generated by the operation is comprised primarily of trucks transporting the products to/from the site, with only 4 employees (drivers). The truck fleet is mostly triaxle fleet and a tractor trailer.

Hours of Operation: Discussions with the owner note that the existing facility hours of operation are generally from 7:00 a.m. to 5:00 p.m. The owner indicated that very little is done after 4:00 p.m. It is noted that the adjacent Concession Road 4 PM peak hour occurred at 5:30 p.m. However, for a conservative analysis, this report assumes similar PM peak hour as the adjacent roadway.

Truck traffic generated by the soil mixing operation is distributed evenly during the course of the day. For the purpose of the study, it was assumed that 100% of the daily production volume will be shipped during the 10-hour business operation period.

Months of Operation: Production and output levels are lower at times of low demand, such as winter months (December to April).

Trip Distribution: Haul routes utilize Concession Road 4 with 50% to/from south on Sanford Road (R.R. 11) and 50% to/from north on Zephyr Road (R.R. 13).

Based on the foregoing information, **Table 2** summarizes the trip generations estimates. Calculations for both the typical and maximum/peak production are included in the appendices.

Table 2 Estimated Traffic Generation

| Operations Capacity | Daily Trips | AM Peak Hour | | | PM Peak Hour | | |
|---------------------|-------------|--------------|------|-------|--------------|------|-------|
| | | Enter | Exit | Total | Enter | Exit | Total |
| Typical | 11 | 1 | 1 | 2 | 1 | 1 | 2 |
| Maximum/Peak | 15 | 1 | 1 | 2 | 1 | 1 | 2 |

Calculations show that at typical operations, the soil mixing plan will generate 11 daily truck trips and only 2 peak hour trips. At peak or maximum operations, the soil mixing plan will generate 15 daily truck trips and only 2 peak hour trips.

Discussions with the owner shows that the existing site generates approximately 7-12 daily truck trips, this is within the typical daily trip generation calculations shown in Table 1. Since the projected trips are much less than 100 vehicles trips per peak hour, a full TIS is not required for this application.

With low peak hour trip volumes of no more than 2 vehicles per hour, the existing usedoes not have significant impact on the site and adjacent roadway operations.

2.3 Exclusive Turn Lanes

The need for exclusive turn lanes at the site driveway connection to Concession Road 4 was investigated based on the MTO publication entitled *Geometric Design Standards for Ontario Highways* (GDSOH). **Table 3** shows the volumes used for analysis.

Table 3 Left-Turn Lane Analysis

| Driveway | AM/PM | Approach | Posted Speed | Advancing Volume | Opposing Volume | Left-Turn Volume | % Left Turns | Turn Lane? |
|-------------------------------|-------|----------|--------------|------------------|-----------------|------------------|--------------|------------|
| Concession Rd 4 / Site Access | AM | NB | 50 | 30 | 88 | 1 | 3% | No |
| | PM | | | 91 | 35 | 1 | 1% | No |

A review completed using the MTO guideline at 5% left turn warrants and a 70 km/h design speed (20 km/h + posted speed limit) for a two-lane roadway shows that a left-turn lane would not be required for the soil mixing laneway entrance connection to Concession Road 4 under projected 2031 volumes along the municipal roadway.

Generally, an exclusive right turn lane is required when there will be 100 or more right turning volumes. According to the trip generation estimates, entering site trips are below the threshold for a right-turn lane.

Additionally, the Region of Durham provides right-turn lane guidelines for roadways based on the operating speeds and approach volumes. The right-turn lane threshold for a two-lane roadway is 40 vph. According to the trip generation estimates, entering site trips are below the threshold for a right-turn lane.

2.4 Intersection/Decision Sight Distance

Minimum sight distance requirements were evaluated based on the guidelines provided in the Transportation Association of Canada’s *Geometric Design Guide for Canadian Roads, Chapter 9, Intersections (2017)*. The sight distance evaluation was conducted using a design speed of

$$ISD = 0.278 V_{major} t_g \quad (9.9.1)$$

Where:

ISD = intersection sight distance (length of the leg of sight triangle along the major road) (m)

V_{major} = design speed of the major road (km/h)

t_g = time gap for minor road vehicle to enter the major road (s)

70 km/h and was calculated using the following formula.

| Design Vehicle | Time Gap (t_g)(s) at Design Speed of Major Road |
|--------------------------------------|---|
| Passenger car | 7.5 |
| Single-unit truck | 9.5 |
| Combination truck (WB 19 and WB 20) | 11.5 |
| Longer truck | To be established by road authority |

The calculated intersection sight distance using the above formula and parameters results in the following:

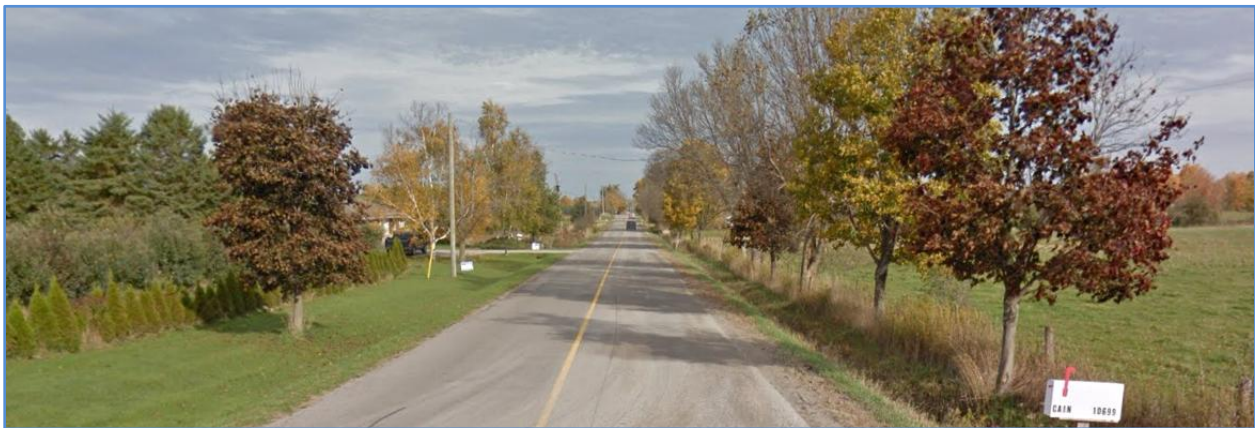
- Passenger vehicle: $0.278 \times 50 \times 7.5 = 146$ meters
- Delivery vehicle: $0.278 \times 70 \times 9.5 = 185$ meters
- Combined truck: $0.278 \times 70 \times 11.5 = 224$ meters

Table 4 summarizes the minimum sightline requirements for trucks and the existing sightline distance.

Table 4 Sightline Distance Review

| Intersection | Speed | | Decision Sightline | | |
|---|---------|---------|--------------------|----------|--------|
| | Posted | Design | Required | Provided | |
| | | | | North | South |
| Concession Rd 4 and Laneway Entrance Driveway | 50 km/h | 70 km/h | 224 m | >250 m | >250 m |

Based on the table above, the decision sight distance requirements are met at the existing site access. There are no sight distance obstructions that obscure the view of vehicles at the access location along Concession Road 4.



Concession Road 4 at Laneway Entrance Access – looking north



Concession Road 4 at Laneway Entrance Access – looking south

2.5 Collisions

Based on the collision frequency data presented in the *Vision Zero – A strategic Road Safety Action Plan for Durham Region* stakeholder workshop, there have been no collisions within the vicinity of the subject site.

2.6 Signage

It is recommended that signage be provided in both directions warning of both entrance locations and the presence of trucks entering and exiting the laneway entrance connection to Concession Road 4. Signage shall conform to the Ontario Traffic Manual (OTM) and Town By-laws.

3.0 CONCLUSIONS

This Traffic Impact Study was prepared for the Zoning By-Law Amendment application to legalize an existing soil mixing operation located at 10850 Concession Road 4. The site is bounded by Concession Road 4 to the east, Concession Road 3 to the west and rural areas to the north and south.

The existing operation imports compost and manure for the purpose of mixing the products. Approximately 30,000 to a maximum of 40,000 cubic yards/year are delivered to and from the site. Vehicular access to the soil mixing site is via an existing full movement unimproved laneway connection to Concession Road 4.

In addition to the soil mixing operations, the subject property includes a single detached dwelling unit with an ancillary barn. Access to this unit is via an existing unimproved driveway connection to Concession Road 4.

The key findings are summarized below:

- Calculations show that at typical operations, the soil mixing plan will generate 11 daily truck trips and only 2 peak hour trips. At peak or maximum operations, the soil mixing plan will generate 15 daily truck trips and only 2 peak hour trips. Discussions with the owner shows that the existing site generates approximately 7-12 daily truck trips which is within the typical daily trip generation calculations. A full TIS is not required for this application as the existing use is estimated to generate much less than 100 vehicles trips per peak hour.
- Exclusive left-turn and right-turn lanes at the existing laneway entrance connection to Concession Road 4 is not warranted with 2031 traffic projections along the municipal roadway.
- There are no sight distance obstructions that obscure the view of vehicles at the access connection to Concession Road 4.
- It is recommended that signage be provided in both direction warning of both entrance location and the presence of trucks entering and exiting the laneway entrance connection to Concession Road 4.

Appendix A:

Existing Traffic Data

TMC 15 Min Report

SANDFORD RD (R.R.11)@ CONCESSION 4

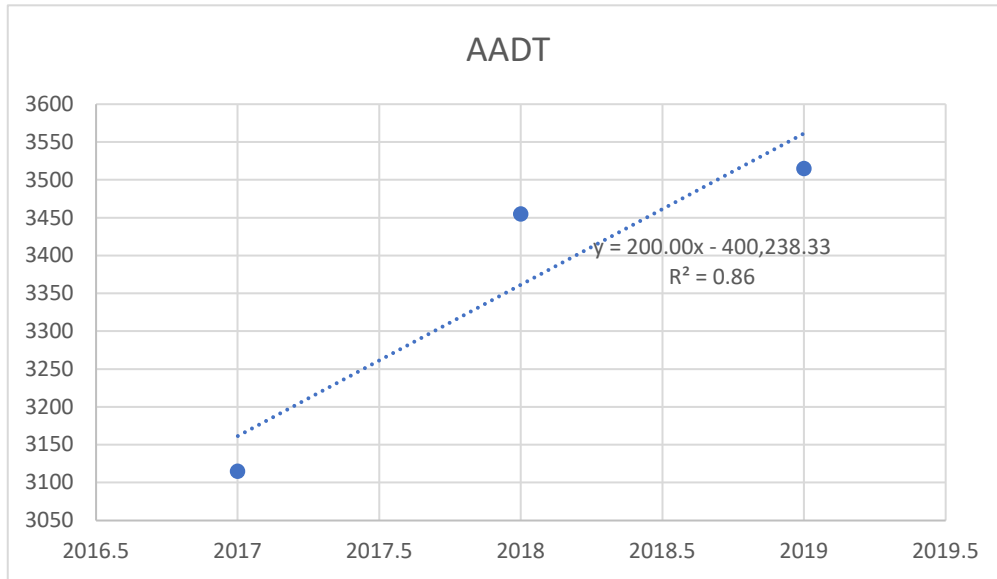
| Time | NORTH APPROACH | | | | | | | | | EAST APPROACH | | | | | | | | | SOUTH APPROACH | | | | | | | | | WEST APPROACH | | | | | | | | | Total | | | |
|----------|----------------|------|-------|--------|------|-------|---------|------|-------|---------------|------|------|-------|--------|------|-------|---------|------|----------------|-----|------|------|-------|--------|------|-------|---------|---------------|-------|-----|------|------|-------|---|---|---|-------|---|---|---|
| | Cars | | | Trucks | | | Heavies | | | Ped | Cars | | | Trucks | | | Heavies | | | Ped | Cars | | | Trucks | | | Heavies | | | Ped | | | | | | | | | | |
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | | Left | Thru | Right | | | | | | | |
| Period 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6:15 | 1 | 0 | 4 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 36 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:30 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 41 | 1 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:45 | 0 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 27 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:00 | 2 | 2 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 31 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15 | 2 | 4 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 40 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 7 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 7:30 | 0 | 9 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 27 | 4 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 16 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 |
| 7:45 | 1 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 37 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 20 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 | 8 | 8 | 4 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 34 | 1 | 0 | 3 | 2 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 21 | 0 | 0 | 6 | 1 | 0 | 0 | 0 | 0 |
| 8:15 | 10 | 4 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 6 | 43 | 3 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 8:30 | 3 | 1 | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 27 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 12 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 8:45 | 4 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 16 | 3 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 16 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 9:00 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 15 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 10 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| Period 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11:45 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 2 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 10 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 12:00 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| 12:15 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 8 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 2 | 9 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12:30 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 17 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 4 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 11 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 |
| 12:45 | 1 | 2 | 3 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 10 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 5 | 2 | 0 | 8 | 0 | 0 | 0 | 0 | 0 |
| 13:00 | 2 | 5 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 8 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 |
| 13:15 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 5 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 5 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 17 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 |
| 13:30 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 9 | 2 | 0 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 11 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| Period 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15:15 | 0 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 26 | 3 | 2 | 5 | 0 | 0 | 0 | 0 | 0 |
| 15:30 | 2 | 1 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 4 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 21 | 1 | 1 | 3 | 0 | 0 | 0 | 0 | 0 |
| 15:45 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 9 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 35 | 4 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| 16:00 | 4 | 2 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 18 | 6 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 26 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 16:15 | 5 | 7 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 5 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 5 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 2 | 38 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 16:30 | 3 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 25 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 4 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 43 | 4 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| 16:45 | 2 | 2 | 2 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 18 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 29 | 4 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 17:00 | 2 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 19 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 42 | 4 | 1 | 3 | 0 | 0 | 0 | 0 | 0 |
| 17:15 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 14 | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 31 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 17:30 | 2 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 7 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 10 | 56 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| 17:45 | 1 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 10 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 6 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 37 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 18:00 | 1 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 19 | 4 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 2 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 35 | 7 | 2 | 4 | 1 | 0 | 0 | 0 | 0 |
| 18:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Appendix B:

Growth Rate Calculations

Sanford Road (R.R. 11)

| Year | AADT |
|------|------|
| 2019 | 3515 |
| 2018 | 3455 |
| 2017 | 3115 |



Calculated 2017 3161.67

Calculated 2019 3561.67

Growth Rate 1.33%

Appendix C:

Trip Generation Calculations

**SITE GENERATED TRAFFIC
ENG PROPERTY WORKS
SOIL MIXING PLANT**

| Production | | |
|-------------------|--------|-------------|
| Typical Average | 30,000 | Cubic Yards |
| Maximum | 40,000 | Cubic Yards |

| Fleet Usage | Cubic Yards Per Load | % of Trips |
|----------------------|-----------------------------|-------------------|
| Triaxle | 30 | 90% |
| Tractor with Trailer | 50 | 10% |

Annual Trip Generation

| | | Total Annual Cu Yd | Cu Yd Per Load | Trips Per Year | |
|----------------------|----------------------|---------------------------|-----------------------|------------------------|--------------|
| Typical Average Year | Triaxle | 27,000 | 30 | Total Trips Out | 900 |
| | | | | Total Trips In | 900 |
| | | | | Total Trips (Out + In) | 1,800 |
| | Tractor with Trailer | 3,000 | 50 | Total Trips Out | 60 |
| | | | | Total Trips In | 60 |
| | | | | Total Trips (Out + In) | 120 |
| Total | | | | | 1,920 |
| Maxumum Year | Triaxle | 36,000 | 30 | Total Trips Out | 1,200 |
| | | | | Total Trips In | 1,200 |
| | | | | Total Trips (Out + In) | 2,400 |
| | Tractor with Trailer | 4,000 | 50 | Total Trips Out | 80 |
| | | | | Total Trips In | 80 |
| | | | | Total Trips (Out + In) | 160 |
| Total | | | | | 2,560 |

Daily Trip Generation

Percentage (%) Shipped in peak months 90%
Peak Months (May to November) 7
Average number of working days per month 22

| Annual Cu Yd | Total Annual Cu Yd | Total Trips per Year | Total Trips in Peak Months | Total Working Days in Peak Months | Trips per Day in Peak Months |
|----------------------|---------------------------|-----------------------------|-----------------------------------|--|-------------------------------------|
| Typical Average Year | 30,000 | 1,920 | 1,728 | 154 | 11 |
| Maxumum Year | 40,000 | 2,560 | 2,304 | 154 | 15 |

Total Trip Generation

Hours of Operation 7:00 a.m. to 5:00 p.m.
Total Hours 10

| Annual Cu Yd | Total Annual Cu Yd | Trips per day | Average Trips Per Hour |
|---------------------|---------------------------|----------------------|-------------------------------|
| Average Year | 30,000 | 11 | 1 |
| Maxumum Year | 40,000 | 15 | 1 |