Project: 161-17990-00
January 26, 2017

GM BluePlan Engineering Limited
1260-2nd Avenue East,
Owen Sound, ON N4K 2J3

Attention: Mr. Matthew Nelson, M.Sc., P.Eng., P.Geo
Senior Project Manager, Partner

Re: **Review of Englobe Corp.'s Haul Route Assessment Report (Ref. No. 124-B-0015261-1-CH-001-03, dated Oct. 27, 2016) at Side Road 60, Berkeley in the Township of Chatsworth, Ontario**

Dear Sir,

WSP Canada Inc. (WSP) was retained by GM BluePlan Engineering Limited to undertake a review of the Englobe Corp. (Englobe) Haul Route Assessment Report (Ref. No. 124-B-0015261-1-CH-001-03, dated Oct. 27, 2016) at of Side Road 60 (from Veterans Road South to Highway 10), Berkeley, Ontario. This review includes AASHTO pavement design analysis to evaluate Englobe's assessment and recommendations on the structural adequacy of the existing pavements, within the 4.7 km project limits, to support hauling of up to 150,000 tonnes of aggregates per year.

This assignment also reviewed the factual data, traffic load (ESALs), design parameters, pavement design and recommendations on the basis of the terms of reference presented above and on the assumption that the design will be in accordance with the applicable codes, standards and manuals including but not limited to AASHTO Guide for Design of Pavement Structures, MTO MI-183 'Adaptation and Verification of AASHTO Pavement Design Guide for Ontario Conditions', 'Procedures for Estimating Traffic Loads for Pavement Design, 1995', MTO's Manual for condition rating of flexible pavements (SP-024) and MTO's Pavement Design and Rehabilitation Manual, second edition 2013.

The following documents were also reviewed as part of this evaluation:

1. Road Assessment Report, Gamsby and Mannerow Ltd., May 2013 (File 210099)
2. Bumstead Pit TIS Update Letter, Paradigm Transportation Solutions Ltd., Sept. 21, 2015 (File 140780)
3. Supplemental Road Assessment Report, GM BluePlan Eng. Ltd., September 2015 (File 210099)
4. E-mail correspondences with GM BluePlan Engineering Limited.

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The specific project limits within Side Road 60 are presented in Table 1.

Table 1: Side Road 60 Project Limits

Section No.	Limits	Surface Type	Length (km)
Section 1	From West Back Line to Highway 10	Hot Mix Asphalt (HMA)	2.1
Section 2	Veterans Road South to West Back Line	Asphalt Surface Treatment	2.6

1. COMMENTS ON FACTUAL PART OF THE REPORT

1.1. Chainages (stationing)

- Chainages (stationing) on the road were randomly assigned by Englobe but were not defined on the report. It appears that chainages were assigned on the asphalt portion (Section 1) of Side Road 60 from Station 0+000 at Hwy 10 and increasing stations towards westerly along the WBL only up to W. Back Line, and then continuing the chainage, this time increasing towards easterly along the EBL from W. Back Line to Hwy 10, such that there are two stations at one point on the road.

- Similarly, chainages were randomly assigned on the surface treated portion (Section 2) of the road from 0+000 at Veterans Rd and increasing stations easterly along the EBL only up to W. Back Line, and then continuing the chainage, this time increasing towards westerly along the WBL from W. Back Line to Veterans Rd. This stationing method is not normally carried out in pavement investigation/assessment projects as these lead to confusion and error.

- Correction in Photograph 1-4 which should be Station 0+252

1.2. Pavement Condition Survey

Reference:
Page No. 2 of 6 – Table 2 "Summary of Distress"
Page No. 2 of 6 – 2nd paragraph
Page No. 3 of 6 – 1st and 2nd paragraphs

- Regarding general pavement condition of Sideroad 60 (Sections 1 and 2), the provided terminology for expressing the severity of the distresses (i.e. low and medium) are not in accordance with SP-024 (MTO's Manual for condition rating of flexible pavements). These descriptions are not normally used in pavement assessment and it is difficult to understand and evaluate based on applicable MTO manuals.

In order to assess the condition of the pavement (i.e. Fair for Section 1 and Good for Section 2), it is required to provide the proper class for the severity of distress based on MTO Guidelines and manuals.

- In the condition survey of Section 2, why is aggregate loss not noted, considering that Photograph 2-5 shows slight aggregate loss and low severity patching;

- In the Englobe Report, the condition of Section 2 was considered good, but on page 4 in 2013 Gamsby and Mannerow Report, it was considered fair to poor with areas of aggregate 'pop outs' and unravelling.

1.3. Existing Pavement Structure Thickness

Reference: Page No. 3 of 6 – 2nd paragraph

- The existing pavement structure thicknesses for each section were determined by Englobe using Gamsby and Mannerow's Report (210099- dated May 2013) borehole information (BH 1 to BH 7) only, while the recent boreholes (BH 8 through BH 17), on GM BluePlan Engineering Report (Supplemental Road Assessment Report, 210099- dated September 2015) were not considered by Englobe in their assessment.

  Based on our assessment, considering the seventeen (17) borehole information, the pavement structure for Section 1 consists of 50 to 100 mm of asphaltic concrete underlain by 660 mm to 1,470 mm of granular material while Section 2 has 30 to 35 mm asphalt surface treatment layer over 725 to 730 mm granular material.

  Based on the predominant and minimum layer thicknesses, the design values of the existing pavement (to be used in the analysis) are considered as follows:
  - Section 1: 50 mm HMA* over 710 mm granular materials.
  - Section 2: 30 mm AST** over 730 mm granular materials.

  * HMA: Hot Mix Asphalt

  ** AST: Asphalt Surface Treatment

  For details, please refer to the attached Table 6 in Appendix 1.

1.4. Peat section

- Englobe Report noted peat in BH 5 only but peat was also encountered in Boreholes 11, 12, 13, 14 and 18.

2. COMMENTS ON TRAFFIC VOLUME

We understand that the following existing traffic data were used by Englobe in their assessment, based on Bumstead Pit TIS Update Letter by Paradigm Transportation Solutions Ltd., (140780 dated Sept. 21, 2015).

Section 1 (Location 1):

Average Daily traffic:	419 vehicles (ref. page No. 15 of Paradigm's report)
Truck percentage:	4% (ref. page No. 15 of Paradigm's report)

Section 2 (Location 2):

Average Daily traffic:	242 vehicles (ref. page No. 15 of Paradigm's report)
Truck percentage:	6% (ref. page No. 15 of Paradigm's report)

It was noted that the above data were obtained over seven days traffic count and observations at two different locations in Sections 1 and 2 from June 28, 2015 to July 4, 2015 (including weekends).

We also understand that Englobe used 80 additional haul trucks per day in their analysis in accordance with Gamsby and Mannerow Ltd's Road Assessment Report (21009- dated May 2013). We further understand that Standard Dump Truck (four or more axle- single unit truck – vehicle Class 7 of FHWA) will be engaged along the haul route within Side Road 60 project limits over 170 working-day season.

2.1. Comments on Future Traffic Volume

Estimated Equivalent Single Axle Loads (ESALs) for design Lane – Normal traffic

2.1.1. Growth Rate for Normal Traffic

Based on page 5 of Paradigm Update letter , Sept. 21, 2015 (File 140780), we understand that 2.1 % growth rate of local traffic was provided, while Englobe used 1% growth rate in their calculation for normal ESALs for Section 1 and Section 2 (Table 2-1 and Table 2-2 in Appendix 2 of Englobe Report).

Explanation is warranted on the use of 1% traffic growth rate.

2.1.2. Days per Year for Normal Traffic

Three hundred (300) days per annum were used by Englobe for ESAL calculation in Table 2-1 and Table 2-2. We would like to know why 365 days per year were not considered for ESAL calculation. Explanation or reference to support the 300-day assumption should be provided.

2.1.3. Percent Trucks for ESALs Estimation, Normal Traffic Section 1

In Table 2-1 for Section 1, the estimated ESALs were based on 6% percent trucks while as per 4th paragraph in page 3 of Englobe report, 4% truck should be used.

If 6% trucks were used intentionally, we would like to know the reason why truck percentage needs to be increased.

2.1.4. Estimated Equivalent Single Axle Loads (ESALs) for design Lane Percent

We have no comments on ESAL estimation by Englobe for haul truck traffic, i.e. Table 2-3 and Table 2-4. The provided parameters and calculations are correct.

For normal traffic, considering our comments mentioned above (Section 2.1.1 to Section 2.1.3), we analyzed the ESALs for Sections 1 and 2 and the results are presented in Table 7 and Table 8 in Appendix 2 of this report.

Table 2 below shows a summary table for comparing the estimated ESALs provided by Englobe and reviewed by WSP.

Table 2: ESAL's Analysis

ESAL Calculation	Englobe Estimation		WSP Estimation	
	SECTION 1	SECTION 2	SECTION 1	SECTION 2
Scenario-1: Estimated Total Design ESALs (10-Year)	373,800	357,800	368,900	364,500
Scenario-2: Estimated Total Design ESALs (20-Year)	381,000	350,100	375,300	366,300

Based on above table, there is no significant differences between WSP and Englobe estimations.

3. COMMENTS ON PAVEMENT DESIGN

3.1 Comments on ASSHTO Pavement Thickness Design and Design Parameters

For the purpose of assessing the structural adequacy of the existing pavement structure of Side Road 60 Section 1 and Section 2, we evaluated the AASHTO design parameters used by Englobe (Table 4 of their report) to calculate the Structural Number (SN). This evaluation is based on MTO publication MI-183 '*Adaptation and Verification of AASHTO Pavement Design Guide for Ontario Conditions, Pavement Design and Rehabilitation Manual of MTO second edition 2013 and AASHTO Guide for Design of Pavement Structures 1993.*

Table 3 below presents WSP and Englobe design parameters with notes to support our recommended design values.

Table 3: AASHTO Design Parameters

Design Parameters	Design Values		
	Englobe	WSP	Note
Initial Serviceability for Section 1	4.0	2~2.6*	The pavement condition is in fair condition with PCI about 50-65 Po =4 Initial (present) serviceability is for very much close to a newly constructed/rehabilitated road. It is not applicable for Side Road 60
Initial Serviceability for Section 2	4.0	2.6 ~ 3.5*	The pavement condition is in fairly good condition with PCI about 65-80 Po =4 Initial (present) serviceability is for very much close to a newly constructed/rehabilitated road. It is not applicable for Side Road 60
Terminal Serviceability for Section 1	2.0	2.0	No comments
Terminal Serviceability for Section 2	2.0	2.0	No comments
Reliability Level	75%	80%	Based on Table D-7 of MI 183, recommendations for collectors or local roads using the lowest range
Overall Standard Deviation	0.44	0.46	The existing traffic data and future traffic loads are based on limited information, observation and estimation are based on Table D-7 of MI 183
Estimated Resilient Modulus of Subgrade	40 MPa	40 MPa	Silty gravelly sand trace to some cobbles - SSM
Structural Coefficient – New HMA	0.42	0.42	No comments
Structural Coefficient – Existing HMA	0.30	0.22	Based on Table D-9 of MI 183- close to the average range for existing HMA
Structural Coefficient – Surface Treatment	0	0.15	Based on Table D-9 of MI 183 - assuming existing cold mix/existing bituminous treated Gran A – close to the average range

Structural Coefficient – Existing Granular Road Base	0.1 (0.75 m thick)	0.1 for granular base below HMA/AST layer to the depth of 0.3 m 0.08 for 450 mm granular material below granular base layer (from a depth of 0.3 to 0.76	<u>Granular Base Layer (to a depth of 0.3 m)</u> Based on two tested samples of granular base material (GAMSBY and MANNEROW on May 2013) i.e. BH1 @ 0.3 m and BH 5@ 0.15 m, laboratory test results and Grain Size Distribution graph indicate that the tested samples do not meet gradation requirements of OPSS Gran A for base material with about 25 % fines (silt/clay). Based on test results granular base layer (to depth a of 0.3 m) classified as crushed gravelly sand with silt/clay and crushed sand some gravel with silt/clay <u>Granular material (from 0.3 m to 0.76 m)</u> Based on four tested samples of granular subbase material (GAMSBY and MANNEROW on May 2013) i.e. BH3 @ 0.75 m, BH4 @ 0.75 m, BH 5@ 0.75 m and BH 6 @ 0.75 m, laboratory test results and Grain Size Distribution graph indicate that the tested samples generally do not meet gradation requirements of OPSS Gran A and marginally outside of OPSS Granular B Type I. Based on test results granular material (from 0.3 m to a depth a of 0.75 m) classified as gravelly sand some silt to sandy gravel with silt some cobbles and sand and gravel trace slit. It should be noted that crushed granular material was not observed in the lab test results.
Drainage Coefficient – All Layers	1.0	0.9	Based on six tested samples by GAMSBY and MANNEROW on May 2013 (BH1, BH 3, BH 4, BH 5 and BH 6) at different depths (0.3, 0.15 and 0.75 m), fines (silt/clay) % are higher than Gran A and Gran B Type I specification for granular base and subbase layers. And also drainage conditions of the road is questionable.

*To simplify the design parameters and based on our preliminary assessment, we used Initial Serviceability Index in the order of 3 for Section 1 and 3.2 for Section 2.

Based on the above design values (Table 3) and estimated ESALs (Table 2 above), pavement structure thickness design for the design lane was determined using the AASHTO design methodology. The required structure number and existing structural number for the main lane of Side Road 60 Section 1 and Section 2 are shown in Table 4 below.

The Existing pavement structure thicknesses (Design Values) for the purpose of pavement design analyses are present as follows:

Design Review Option 1:
Two types of granular materials under the asphaltic layer

Considering two different types of granular material (Granular Base and Granular Subbase) under the asphaltic layer, Design Values for Section 1 and Section 2 are presented as follows:

Side Road 60, Section 1
For a total of thickness of 710 mm granular materials

50 mm	Existing Hot mix Asphalt
250 mm	Existing Granular Base
460 mm	Existing Granular Subbase
760 mm	Total Existing Pavement Structure

Side Road 60, Section 2
For a total of thickness of 730 mm granular materials

30 mm	Existing Asphalt Surface Treated
270 mm	Existing Granular Base
460 mm	Existing Granular Subbase
760 mm	Total Existing Pavement Structure

Table 4: Assessment of Required Strengthening Using Option 1

Route	Design Period	Calculated Design Structural Number (For existing condition)		Required Design Structural Number (For design period)		Required Overlay	
		Englobe	WSP	Englobe	WSP	Englobe	WSP
Side Road 60 Section 1 (Asphalt Concrete)	10 years of full haul truck volume	105	67	73	84	Not required	Required
Side Road 60 Section 2 (Surface Treated)	10 years of full haul truck volume	75	62	72	81	Not required	Required

Based on pavement thickness design as summarized in the above table, the existing pavement structure is inadequate to support the 10- year haul truck traffic and therefore requires strengthening.

Design Review Option 2:
One type of granular material under the asphaltic layer (Englobe assumption)

However we performed additional analyses to assess if only one type of granular material (Gran Base) was presented under the asphaltic layer for both sections of Side Road 60 based on Englobe assumption.

Based on the Borehole logs and Summary Table 6 Existing Pavement Structure presented in Appendix 1, the Design Values for existing pavement structures are summarized as follows:

Side Road 60, Section 1
For a total of thickness of 710 mm granular material

50 mm	Existing Hot mix Asphalt
710 mm	Existing Granular Base
760 mm	Total Existing Pavement Structure

Side Road 60, Section 2
For a total of thickness of 730 mm granular material

30 mm	Existing Asphalt Surface Treated
730 mm	Existing Granular Base
760 mm	Total Existing Pavement Structure

The required structural number and existing structural number for the main lane of Side Road 60 Section 1 and Section 2, for design review Option 2, are shown in Table 5 below.

Table 5: Assessment of Required Strengthening Using Option 2

Route	Design Period	Calculated Design Structural Number (For existing condition)		Required Design Structural Number (For design period)		Required Overlay	
		Englobe	WSP	Englobe	WSP	Englobe	WSP
Side Road 60 Section 1 (Asphalt Concrete)	10 years of full haul truck volume	105	75	73	84	Not required	Required
Side Road 60 Section 2 (Surface Treated)	10 years of full haul truck volume	75	70	72	81	Not required	Required

Based on Table 5 above, the minimum required structural Number for Side Road 60 Section 1 and Section 2 are 84 and 81 mm, respectively, while the existing pavement structure of Sections 1 and 2 have only 75 and 72 mm Structural Number. This analysis indicates that the existing pavement structure is inadequate to support the 10-year haul truck traffic load and therefore requires strengthening.

3.2. Comments on asphalt surface treatment

It should be noted that according to page 2 of Gamsby and Mannerow report, as per the Town's requirement, any haul route for new gravel pits should have a hard surface. The AST (Asphalt Surface Treatment) in Section 2 is not considered as a hard surface.

4. RECOMMNADATION

Based on the above analyses, both Sections 1 and 2 of Side Road 60 are recommended to be rehabilitated and strengthened to support 10-Yr haul truck traffic.

A separate design assessment and recommendations will be required within Section 1 of Side Road 60 for the areas where peat layer and weak subgrade were encountered.

We trust that this report addresses all the requirements of the Pavement Engineering component of the assignment set by GM BluePlan Engineering Limited.

Thank you for the opportunity to be of service to you. Should you have any questions or require further clarification on any aspect of this report, please do not hesitate to contact this office.

Yours very truly,

WSP Canada Inc.

Siamak Gholamin, B. Eng., EIT
Pavement Specialist/Pavement Designer

Ramon Miranda, P. Eng.
Principal Pavement/Geotechnical Engineer

Attachments:

Appendix 1: Existing pavement structure and subgrade soil type (Table 6)

Appendix 2: Traffic Data and Estimated ESALs for Normal Traffic (Table 7 and Table 8)

APPENDIX 1

EXISTING PAVEMENT STRUCTURE AND SUBGRADE SOIL TYPE

Appendix 1

Table No. 6 Existing Pavement Structure and subgrade soil type along Side Road 60, Berkeley, ON

From Veterans Road to Highway 10

Section	Borehole No.	Asphalt thickness: thickness (mm)	Asphalt thickness: Type	Elevation: surface	Elevation: bottom of base	Granular Base and Subbase: Thickness	Granular Base and Subbase: Type	Pavement Structure Thickness	Subgrade: Subgrade soil type	Subgrade: State	Subgrade: N value	WSP Observations	WSP Design Values
Section 2: from Veterans Rd to W Back Line	BH 1	30	AST	398.13	397.37	730	Crushed sand and gravel, cobbles encountered with depth	760	Brown sand and gravel with cobbles, trace silt	very dense	100	Asphalt Surface Treatment Thickness: 30-35 mm over 725-730 mm crushed sand and gravel	30 mm AST over 730 mm sand and gravel
	BH 2	35	AST	396.54	395.78	725	Crushed sand and gravel, cobbles encountered with depth	760	Dark brown sand and gravel with cobbles, trace silt	Compact	19		
	BH 3	35	AST	396.71	395.95	725	Crushed sand and gravel, cobbles encountered with depth	760	Dark brown sand and gravel with cobbles, trace silt	very dense	61		
	BH 17	30	AST	400.11	399.35	730	Crushed sand and gravel, cobbles encountered with depth	760	Dark brown silty sand and gravel	very dense	45		
	BH 4	35	AST	401.33	400.57	725	Crushed sand and gravel, cobbles encountered with depth	760	Brown sand and gravel with cobbles, trace silt	compact	29		
Section 1: From W Back Line to Highway 10	BH 16	50	HMA	399.24	398.48	710	Crushed sand and gravel, cobbles encountered with depth	760	Dark brown silty sand and gravel	compact	27	50-100 mm Hot Mix Asphalt over 660 to 1470 mm crushed sand and gravel	50 mm HMA over 710 mm sand and gravel
	BH 15	50	HMA	396.91	396.15	710	Crushed sand and gravel, cobbles encountered with depth	760	Brown and grey silty sand and gravel	compact	10		
	BH 5	100	HMA	396.3	395.54	660	Crushed sand and gravel, cobbles encountered with depth	760	Brown sand and gravel with cobbles. At a depth of 1.5 m changes to black organics and fibrous peat	wet -firm	100-6		
	BH 14	50	HMA	396.02	394.5	1470	Crushed sand and gravel, cobbles encountered with depth	1520	Brown sand and gravel changing to organic peat and wood	moist to wet	4-8		
	BH 13	50	HMA	396.31	394.79	1470	Crushed sand and gravel, cobbles encountered with depth	1520	Black Organic peat	moist to wet and soft	3		
	BH 12	50	HMA	397.42	396.66	710	Crushed sand and gravel, cobbles encountered with depth	760	Brown sand and gravel with cobbles	compact to dense	30-54		
	BH 11	60	HMA	396.53	395.77	700	Crushed sand and gravel	760	Brown and grey silty sand and gravel	moist to wet-compact	26-30		
	BH 10	50	HMA	395.79	395.03	710	Crushed sand and gravel	760	Brown and grey silty sand and gravel	Moist to wet - Compact	25		
	BH 6	100	HMA	395.47	394.71	660	Crushed sand and gravel, cobbles encountered with depth	760	Brown sand and gravel with cobbles, trace silt	wet - compact	27		
	BH 9	50	HMA	396.07	395.31	710	Crushed sand and gravel, cobbles encountered with depth	760	Brown sand and gravel with cobbles	compact	27-15		
	BH 8	80	HMA	396.12	395.36	680	Crushed sand and gravel, cobbles encountered with depth	760	Brown sand and gravel with cobbles. At about 1.8 m changes to black organic and peat	moist to wet - dense to soft	34- 4		
	BH 7	80	HMA	403.31	402.55	680	Crushed sand and gravel, cobbles encountered with depth	760	Brown sand and gravel with cobbles	very dense	100		

Note :

All above data and thickness are provided from borehole logs
BH1 through BH 7 were drilled by Gamsby and Mannerow Limited on march 7, 2013
BH 8 through BH 17 were drilled by GM BluePlan Engineering Limited in July 30, 2015
HMA: Hot Mix Asphalt
AST: Asphalt Surface Treatment

APPENDIX 2

TRAFFIC DATA AND ESTIMATED ESALs FOR NORMAL TRAFFIC

Table 7

TRAFFIC DATA AND ESTIMATED ESALS

Side Road 60, Section 1 (Asphalt Concrete Road) - Normal Traffic

Comments on Englobe Table 2-1 TRAFFIC DATA AND ESTIMATED ESALS

Year	Englobe Estimation		WSP Estimation	
	Average Annual Daily Traffic	Estimated Cumulative Annual ESALs	Average Annual Daily Traffic	Estimated Cumulative Annual ESALs
2015	419	-	419	-
2016	419	3,000	428	2,436
2017	423	6,000	437	4,923
2018	427	9,000	446	7,462
2019	432	12,100	455	10,055
2020	436	15,200	465	12,702
2021	440	18,300	475	15,404
2022	445	21,500	485	18,164
2023	449	24,700	495	20,981
2024	454	27,900	505	23,858
2025	458	31,200	516	26,795
2026	463	34,500	527	29,793
2027	467	37,800	538	32,855
2028	472	41,200	549	35,981
2029	477	44,600	560	39,172
2030	482	48,000	572	42,430
2031	486	51,500	584	45,757
2032	491	55,000	597	49,154
2033	496	58,500	609	52,622
2034	501	62,100	622	56,163
2035	506	65,700	635	59,779
2036	511	69,300	648	63,470
2037	516	73,000	662	67,239

ESAL Parameters	Englobe	WSP
Directional Factor (DF) =	0.5	0.5
No. of Lanes	2	2
Lane Distribution Factor (LDF) =	1.0	1.0
Combined Truck Factor (CTF) =	0.79	0.78
Percent Trucks =	6.0%	4.0%
Traffic Growth Rate =	1.0%	2.1%
Days Per Year For Truck Traffic =	300	365
Number of Lanes in one Direction =	1	1

Table 8

TRAFFIC DATA AND ESTIMATED ESALS

Side Road 60, Section 2 (Surface Treated Road) - Normal Traffic

Comments on Englobe Table 2-2 TRAFFIC DATA AND ESTIMATED ESALS

Year	Englobe Estimation		WSP Estimation	
	Average Annual Daily Traffic	Estimated Cumulative Annual ESALs	Average Annual Daily Traffic	Estimated Cumulative Annual ESALs
2015	242	-	242	-
2016	242	1,700	247	2,110
2017	244	3,400	252	4,265
2018	247	5,200	258	6,465
2019	249	7,000	263	8,711
2020	252	8,800	268	11,004
2021	254	10,600	274	13,346
2022	257	12,400	280	15,736
2023	259	14,200	286	18,177
2024	262	16,100	292	20,669
2025	265	18,000	298	23,213
2026	267	19,900	304	25,811
2027	270	21,800	311	28,464
2028	273	23,700	317	31,172
2029	275	25,700	324	33,937
2030	278	27,700	331	36,760
2031	281	29,700	337	39,642
2032	284	31,700	345	42,585
2033	287	33,700	352	45,589
2034	289	35,800	359	48,657
2035	292	37,900	367	51,789
2036	295	40,000	374	54,987
2037	298	42,100	382	58,252

ESAL Parameters	Englobe	WSP
Directional Factor (DF) =	0.5	0.5
No. of Lanes	2	2
Lane Distribution Factor (LDF) =	1.0	1.0
Combined Truck Factor (CTF) =	0.79	0.78
Percent Trucks =	6.0%	6.0%
Traffic Growth Rate =	1.0%	2.1%
Days Per Year For Truck Traffic =	300	365
Number of Lanes in one Direction =	1	1