

Appendix A: Traffic Forecast Technical Report



TRANSPORTATION CABINET

Frankfort, Kentucky 40622
www.transportation.ky.gov/

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TO: Kevin McClearn, P.E.
Chief District Engineer
District 2 - Madisonville

ATTN: Nick Hall

FROM: John Moore, P.E. *LWS*
Director *for*
Division of Planning

DATE: June 18, 2014

SUBJECT: Ohio County Traffic Forecast
Access Improvements to Bluegrass Crossings Business Centre
Item No. N/A

In response to your February 24, 2014 request, we are providing the following forecasts in the attached report:

- 2014 and 2040 Average Daily Traffic and Design Hour Volumes
- 2014 and 2040 Truck Percentages
- 2014 and 2040 Turning Movements
- 20-year ESALs

If you have any questions, please contact Jay Balaji of this Division at (502) 782-5045.

JM/JB /BC

Attachments

c/att: David Martin
John Rudd
Dan Hite
Paul Looney
Steve Ross
Shane McKenzie



Executive Summary

**Traffic Forecast Report
Ohio County
Access Improvements to Bluegrass Crossings
Business Centre
Item No. N/A**

Prepared for:



Prepared by:
Jayalakshmi Balaji, P.E.
Division of Planning
Kentucky Transportation Cabinet
June 18, 2014

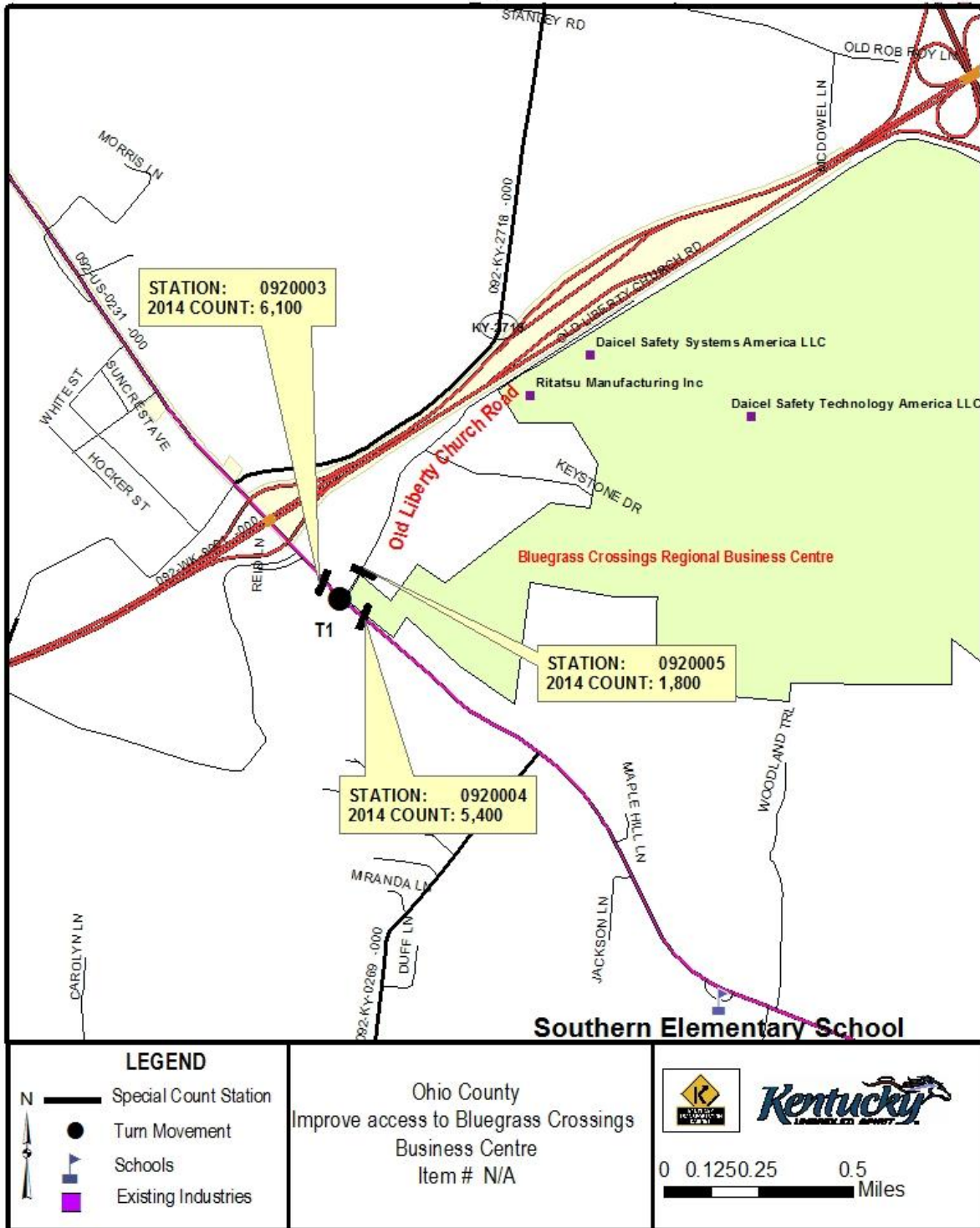
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Commonly Used Abbreviations and their Descriptions

ADT	Average Daily Traffic	Without any adjustment
DHV	Design Hour Volume	30 th highest hour of a <u>year</u>
ESAL	Equivalent Single Axle Load	A measure of traffic's impact on roadway
%T	Truck Percentage	The percentage of trucks to total volume
FC	Functional Class	Refers to a road's importance
GR	Growth Rate	A value normally compounded annually
PHF	Peak Hour Factor	Considers a 15 minute spike in an hourly count
K-Factor	K-30 th hour Factor	DHV divided by ADT (DHV/ADT)
D-Factor	Directional Factor	Percentage of dominant flow to total
MP	Mile Point	Miles increase easterly and northerly
ATR	Automatic Traffic Recorder	A permanent & continuous recording station
KYSTM	Kentucky Statewide Model	A computerized representation of KY roads

Vicinity Map



Traffic Forecast Executive Summary
Ohio County: Improvement of Access to Bluegrass Crossings
Business Center
Item No. N/A

FORECAST SUMMARY

The project calls for the improvement of access to the Bluegrass Crossings Industrial Park. The purpose of this report is to analyze current and future traffic utilizing existing Old Liberty Church Road and the new entrance to the Industrial Park. After the opening of the new entrance to the Industrial Park, Old Liberty Church Road will be open to local traffic only with no industrial park access. Four scenarios were developed for this forecast: scenario A, B, C, and D.

- Scenario A- new road with new tenants in the industrial park
- Scenario B- new road with no new tenants in the industrial park
- Scenario C- existing road with new tenants in the industrial park
- Scenario D- existing road with no new tenants in the industrial park

FORECAST TYPE

The following types of forecasts were developed for scenarios A, B, C, and D:

- 2014 and 2040 Average Daily and Design Hourly Truck Percent Forecasts
- 2014 and 2040 Turning Movements
- 2014 and 2040 DHV values
- Peak Hour Factor
- 20-year ESALs

CURRENT-YEAR VOLUMES

The 2014 ADT volume is based on a 2014 48-hour count collected at special count stations 0920003 (MP 6.5), 0920004 (MP 6.4) on US 231 and 0920005 (MP 0.1) on CR 1193 (see page 2).

DESIGN-YEAR/GROWTH FACTORS

Kentucky State Data Center suggests population for Ohio County to grow 0.27% annually. Exponential growth analyses performed on historical data at traffic stations 092274 (MP 1.6), 092250 (MP 4.8), and 092A02 (MP 7.1) on US 231 estimates a growth of 0.4% to 1.1% in traffic volumes.

The Bluegrass Crossings business centre has 1,134 acres of land available for industrial development. The first industrial building opened in the year 2004 and now in 2014 there are three industrial buildings with a total employment of 700. The ITE Trip Generation manual (8th edition) was used to arrive at trip generation rates based on several factors such as employment and area available for industrial development and combination of both.

The growth rates for scenarios A and C varies significantly due to the presence of a limiting factor, that the trucks has to enter/exit site through a residential zone in scenario C. The following growth rates were used for the purpose of this forecast.

*Traffic Forecast Technical Report
Ohio County: Improvement Of Access To Bluegrass Crossings Business Centre
Item No. N/A*

Scenario & Description	Road Name	Growth Rate	2014 ADT	2040 ADT	Truck volume 2014	Truck volume 2040
Scenario A : New Road New Tenants Ind PK	US 231	2.40%	6100	11300	620	1150
	New Entrance	5.00%	1500	5900	150	590
	Old Liberty Church Road	1.00%	300	400	30	40
Scenario B : New Road No New Tenants Ind PK	US 231	1.00%	6100	7900	620	810
	New Entrance	0.50%	1500	1700	150	170
	Old Liberty Church Road	1.00%	300	400	30	40
Scenario C : Existing Road New Tenants Ind PK	US 231	1.50%	6100	9000	620	920
	Old Liberty Church Road	2.00%	1700	2800	170	280
Scenario D : Existing Road No New Tenants Ind PK	US 231	1.00%	6100	7600	620	780
	Old Liberty Church Road	0.50%	1700	1900	170	190

DESIGN HOUR FACTORS

DHVs were estimated by analyzing the 2014 hourly volume data collected at special count stations 0920003, 0920004 on US 231, and 0920005 on CR 1193. The peak AM and PM volumes were derived by dividing the highest hourly volumes from these counts by the daily total. Functional class design hour factors based on the day and month of these counts were then applied. Finally, the calculated K-factors were used in combination with the ADT forecast to produce DHVs for 2014 and 2040.

TRUCK PERCENTAGE

The truck percentage was calculated using a 2014 vehicle classification count, conducted at the special count stations. These truck percentages are comparable to the functional class average for similar roads. A T% of 10.0 and 10.2 were used respectively for CR 1193 and US 231 and the truck volume for 2014 and 2040 were shown on page 4.

ESALs

Functional class averages from ATR data, traffic counts, and the 2040 ADT projections were used to estimate 20-year ESALs on the project road segment. The 2007 aggregated ESAL report, generated by the Kentucky Transportation Center in collaboration with the Kentucky Transportation Cabinet, was used to grow the important ESAL calculation variables. For more information, please see the attached ESAL calculation sheets prepared for scenarios A, B, C, and D.

TURNMOVEMENTS

A 4-hour turn movement count was conducted on US 231 at the intersection of US 231 at Old Liberty Church Road. The counts were then factored to determine current year DHV turn movements. The current year turn movements were grown using methods described above to determine future year turn movements.

BIKE-PED PLAN REVIEW

An analysis and recommendation for bicycle and pedestrian accommodations for this route have been provided separately.

HISTORICAL POPULATION SUMMARY

	1960	1970	1980	1990	2000	2010	60 - 70	70 - 80	80 - 90	90 - 00	00 - 10
	Population	Population	Population	Population	Population	Population	Change	Pct Change	Pct Change	Pct Change	Pct Change
Kentucky	3,038,156	3,220,711	3,660,334	3,686,892	4,041,769	4,339,367	6.0%	13.6%	0.7%	9.6%	7.4%
Ohio Co	-	18,790	21,765	21,105	22,916	23,842	-	15.8%	-3.0%	8.6%	4.0%

Sources: US Bureau of the Census; Kentucky State Data Center

FUTURE POPULATION PROJECTIONS SUMMARY

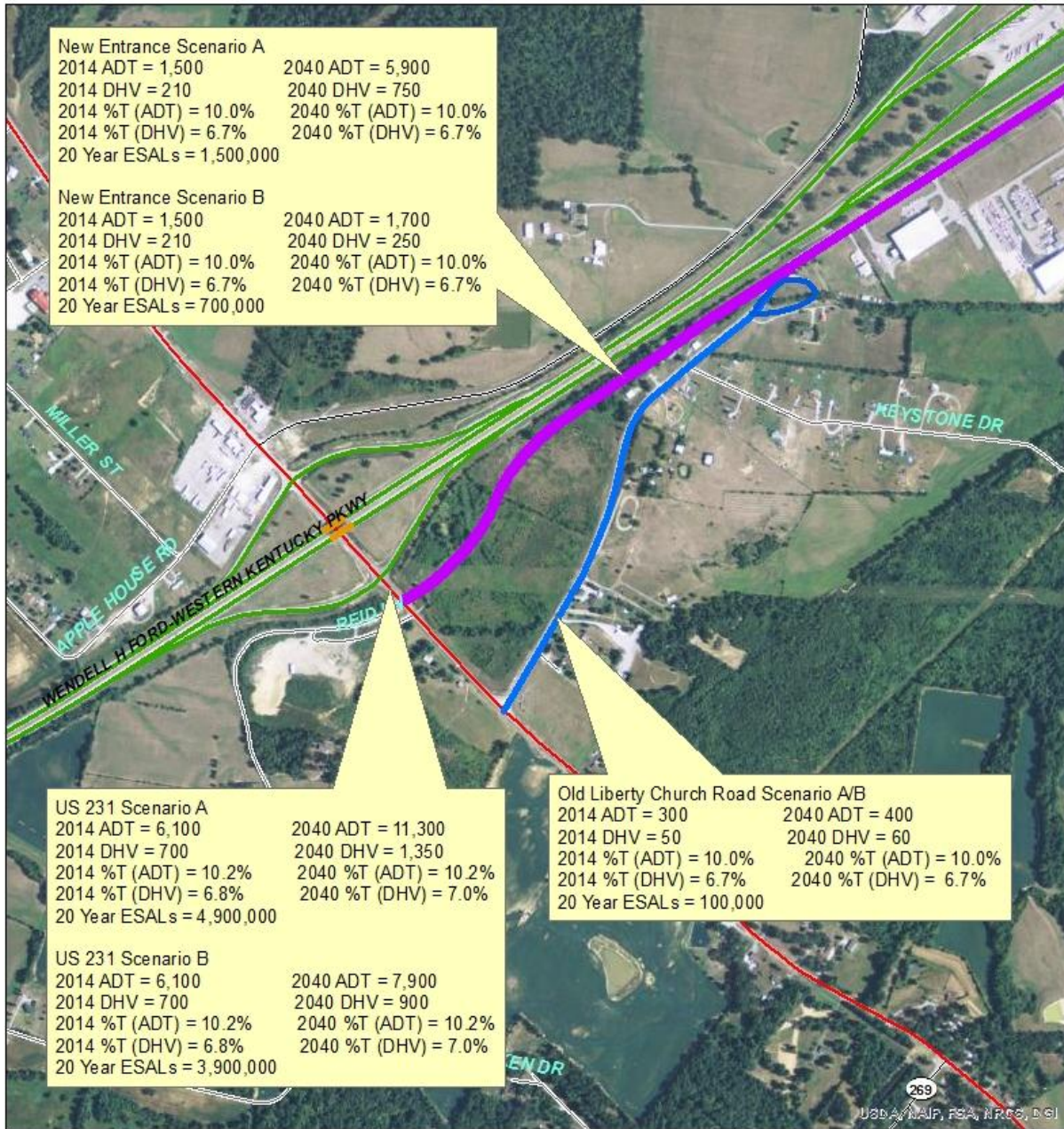
	2010	2015	2020	2025	2030	2035	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35
	Projection	Projection	Projection	Projection	Projection	Projection	Change	Pct Change	Pct Change	Pct Change	Pct Change
Kentucky	4,339,367	4,509,429	4,672,754	4,820,390	4,951,178	5,063,331	3.9%	3.6%	3.2%	2.7%	2.3%
Ohio Co	23,842	24,362	24,781	25,073	25,309	25,495	2.2%	1.7%	1.2%	0.9%	0.7%

Sources: US Bureau of the Census; Kentucky State Data Center

ANNUAL POPULATION GROWTH RATES FROM HISTORICAL DATA AND PROJECTIONS

	60 - 70	70 - 80	80 - 90	90 - 00	05 - 10	10 - 15	15 - 20	20 - 25	25 - 30	10 - 35
	GR	GR	GR	GR	GR	GR	GR	GR	GR	GR
Kentucky	0.59%	1.29%	0.07%	0.92%	0.77%	0.71%	0.62%	0.54%	0.45%	0.62%
Ohio Co	-	1.48%	-0.31%	0.83%	0.43%	0.34%	0.23%	0.19%	0.15%	0.27%

Summary Map Scenario A and B



Ohio County
 Improve access to Bluegrass
 Crossings Business Centre
 Item # N/A

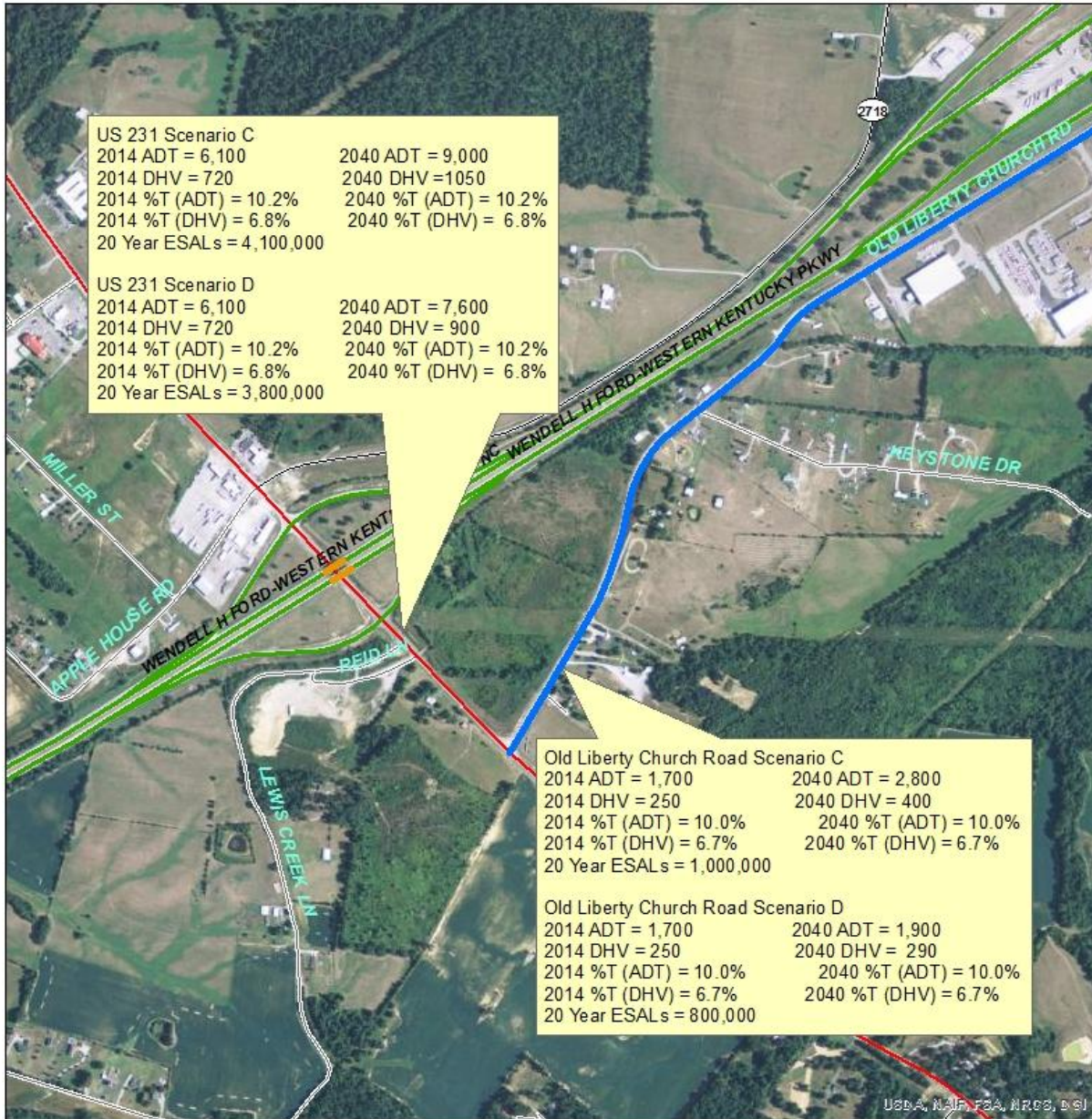


Legend

- Old Liberty Church Road
- New Entrance

0 0.075 0.15 Miles

Summary Map Scenario C and D



Ohio County
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Legend

Old Liberty Church Road

0 0.075 0.15 Miles

TURN MOVEMENT

Scenario A- New Road New Tenants
US 231@ New Entrance (2014/2040)

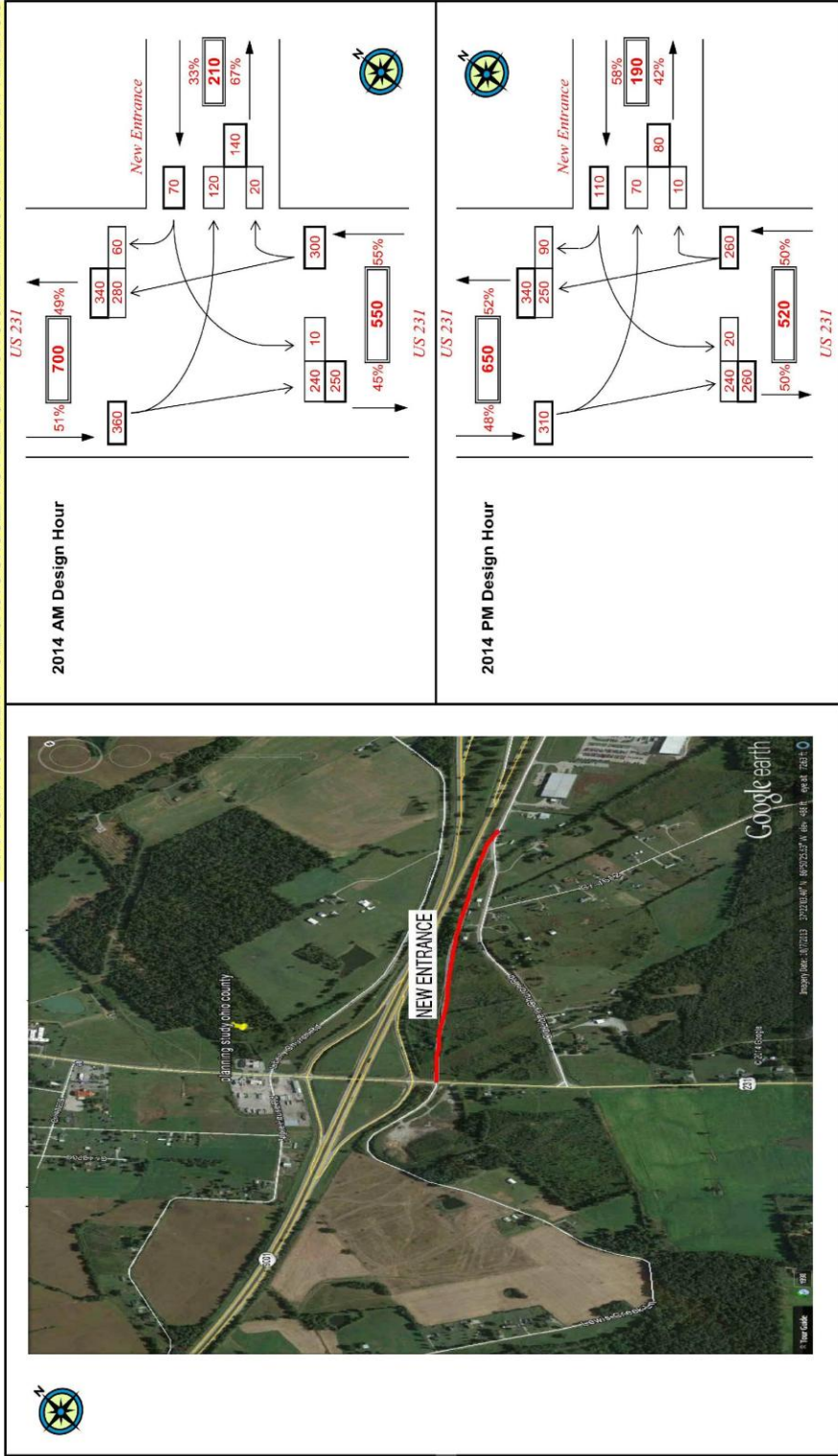
Scenario B- New Road no New Tenants
US 231@ New Entrance (2014/2040)

Scenario A/B
US 231@ Old Liberty Church Road (2014/2040)

Traffic Forecast Technical Report
 Ohio County: Improvement Of Access To Bluegrass Crossings Business Centre
 Item No. N/A

PROJECT: Planning Study to improve access to Bluegrass Crossing Business Center
 ITEM NUMBER: N/A
 MARS NUMBER:
 REQUEST DATE: 2/24/2014
 ANALYST: J.BALAJI
 SCENARIO: 2014 Design Hour Volumes scenario A
 INTERSECTION: T1: US 231 @ New Entrance to Industrial Park

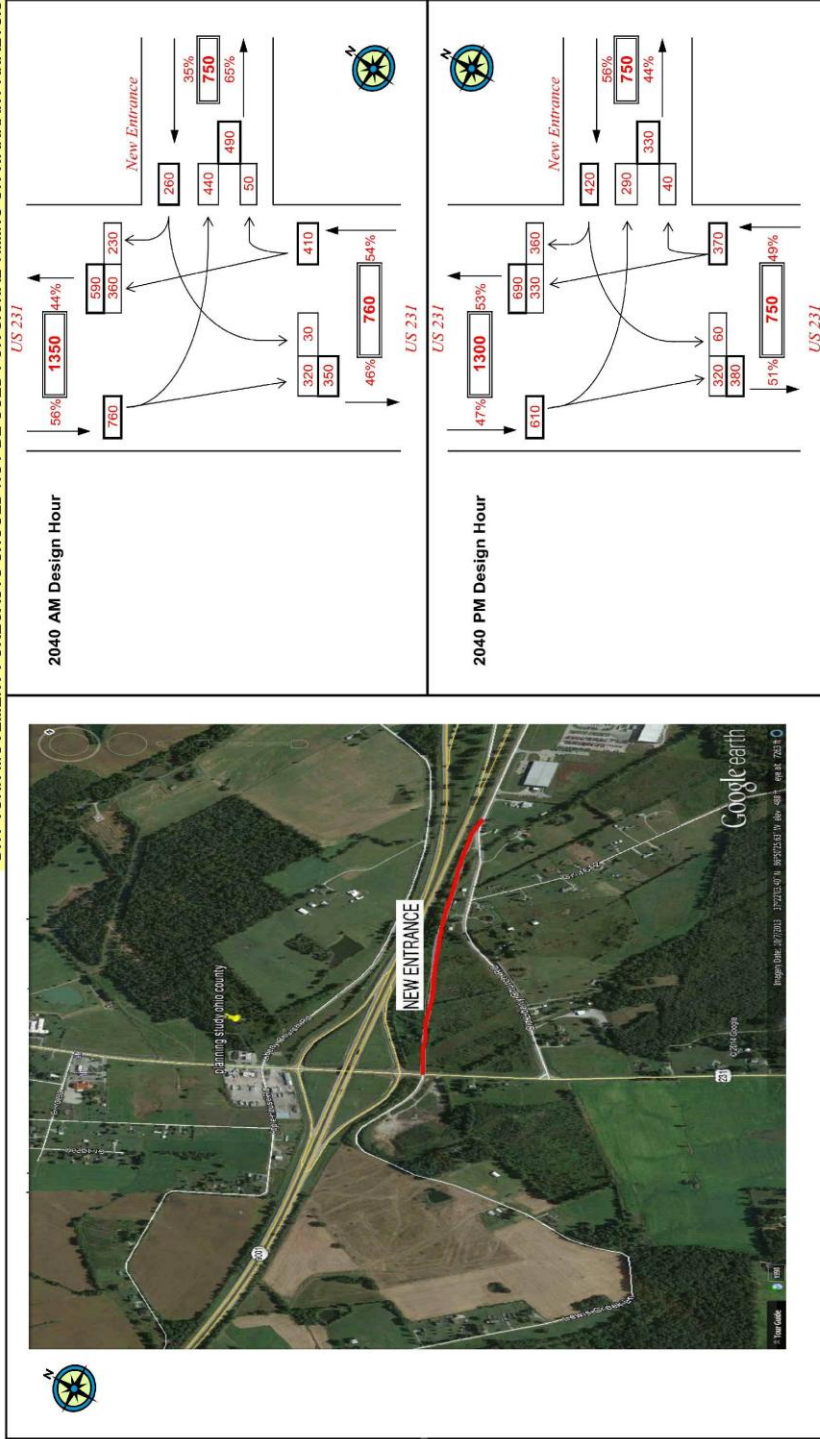
*DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS



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 MARS NUMBER:
 REQUEST DATE: 2/24/2014
 ANALYST: J.BALAJI
 SCENARIO: 2040 Design Hour Volumes scenario A
 INTERSECTION: T1: US 231 @ New Entrance to Industrial Park

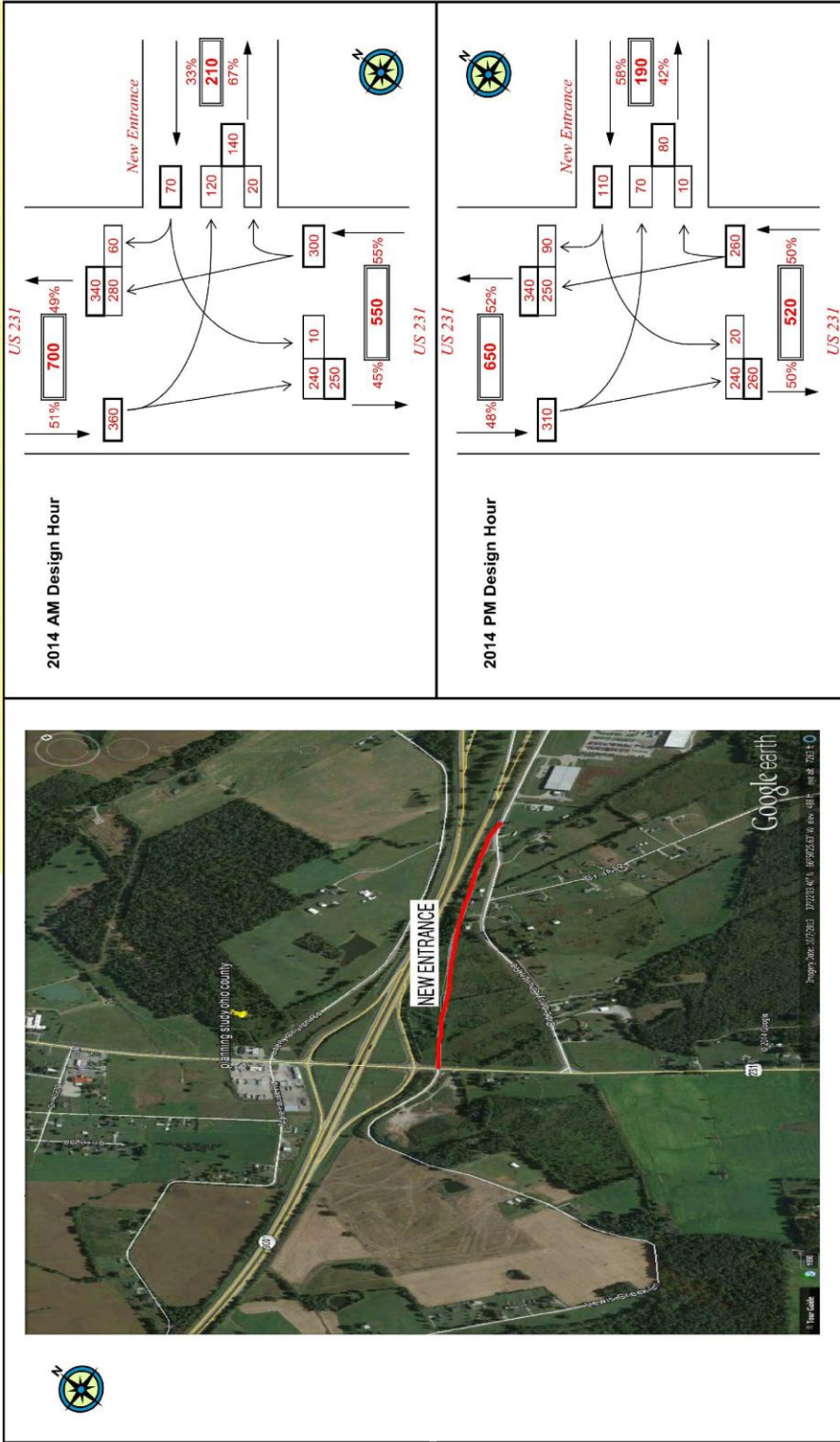
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 ITEM NUMBER: N/A
 MARS NUMBER:
 REQUEST DATE: 2/24/2014
 ANALYST: J.BALAJI
 SCENARIO: 2014 Design Hour Volumes scenario B
 INTERSECTION: T1: US 231 @ New Entrance to Industrial Park

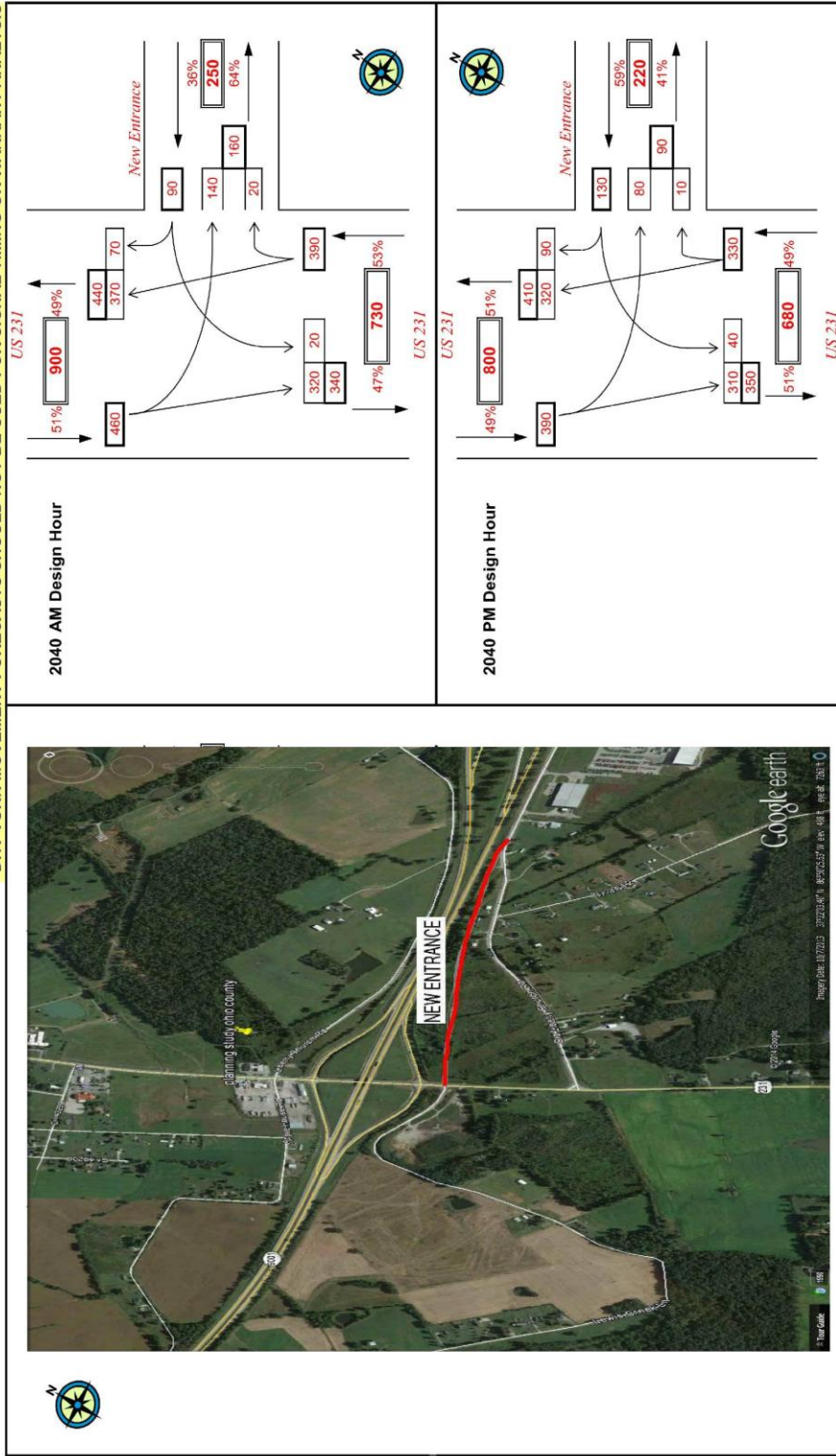
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 MARS NUMBER:
 REQUEST DATE: 2/24/2014
 ANALYST: J.BALAJI
 SCENARIO: 2040 Design Hour Volumes scenario B
 INTERSECTION: T1: US 231 @ New Entrance to Industrial Park

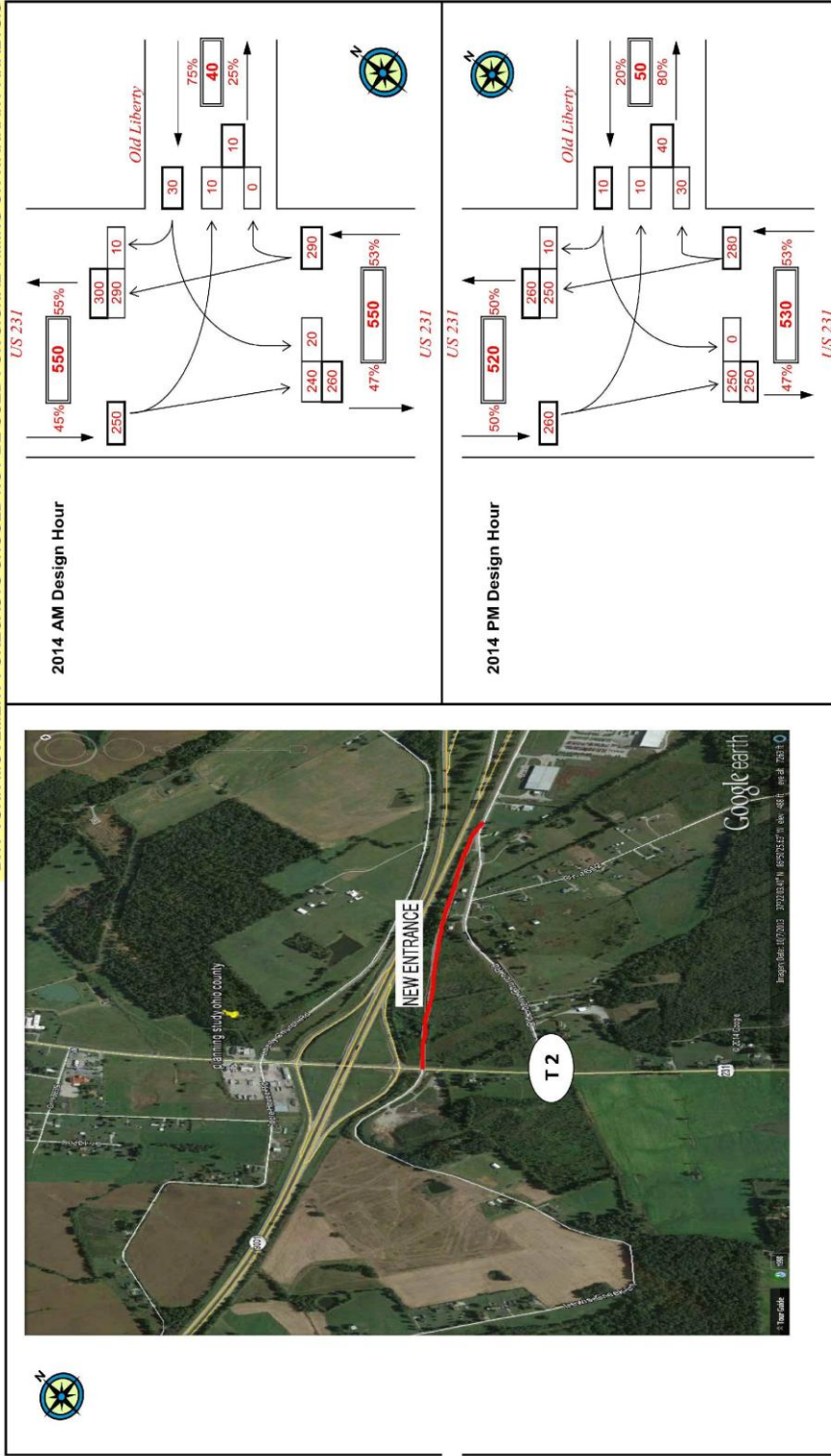
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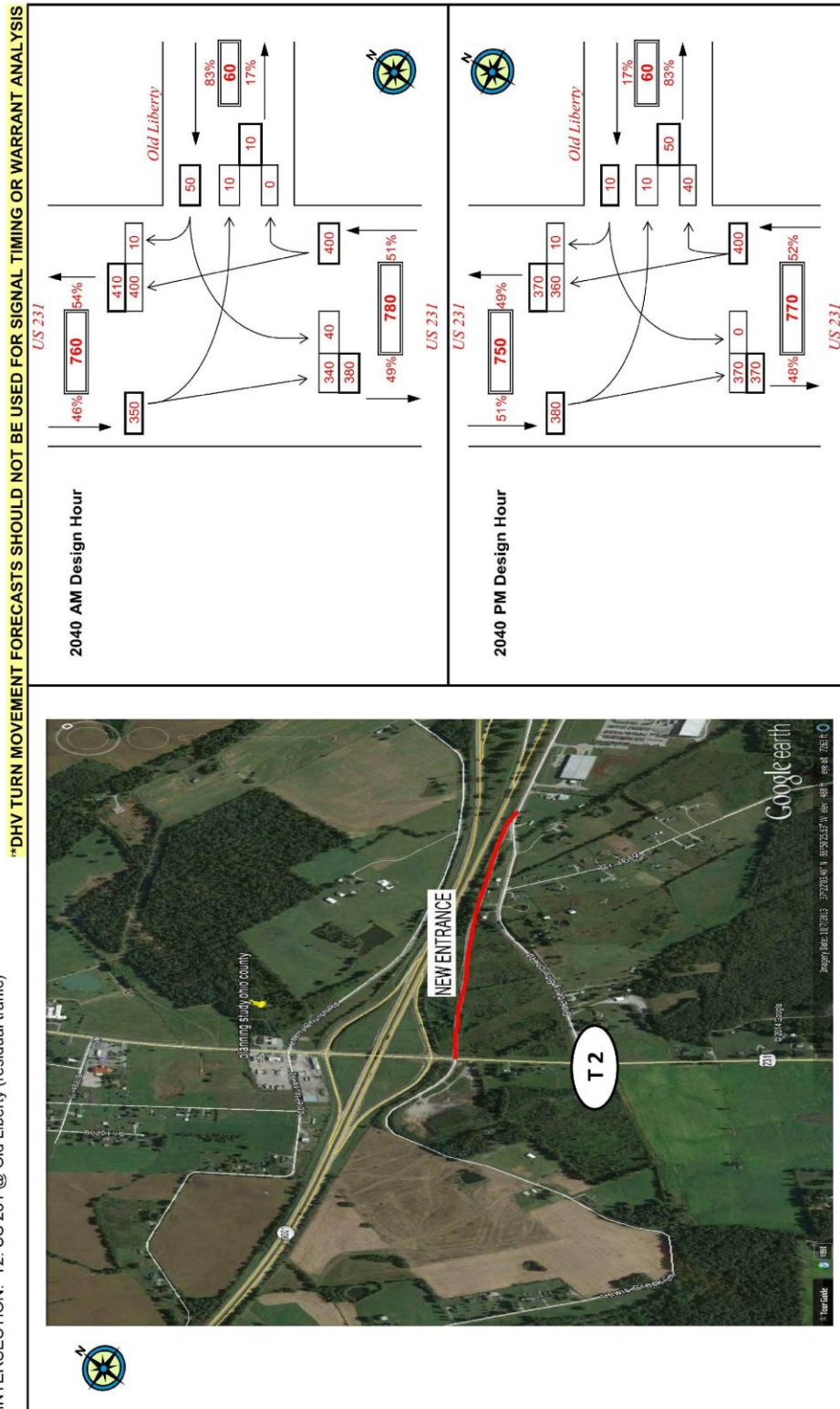
PROJECT: Planning Study to improve access to Bluegrass Crossing Business Center
 ITEM NUMBER: N/A
 MARKS NUMBER:
 REQUEST DATE: 2/24/2014
 ANALYST: J.BALAJI
 SCENARIO: 2014 Design Hour Volumes
 INTERSECTION: T2: US 231 @ Old Liberty (residual traffic)

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 ITEM NUMBER: N/A
 MARS NUMBER:
 REQUEST DATE: 2/24/2014
 ANALYST: J.BALAJI
 SCENARIO: 2040 Design Hour Volumes
 INTERSECTION: T2: US 231 @ Old Liberty (residual traffic)

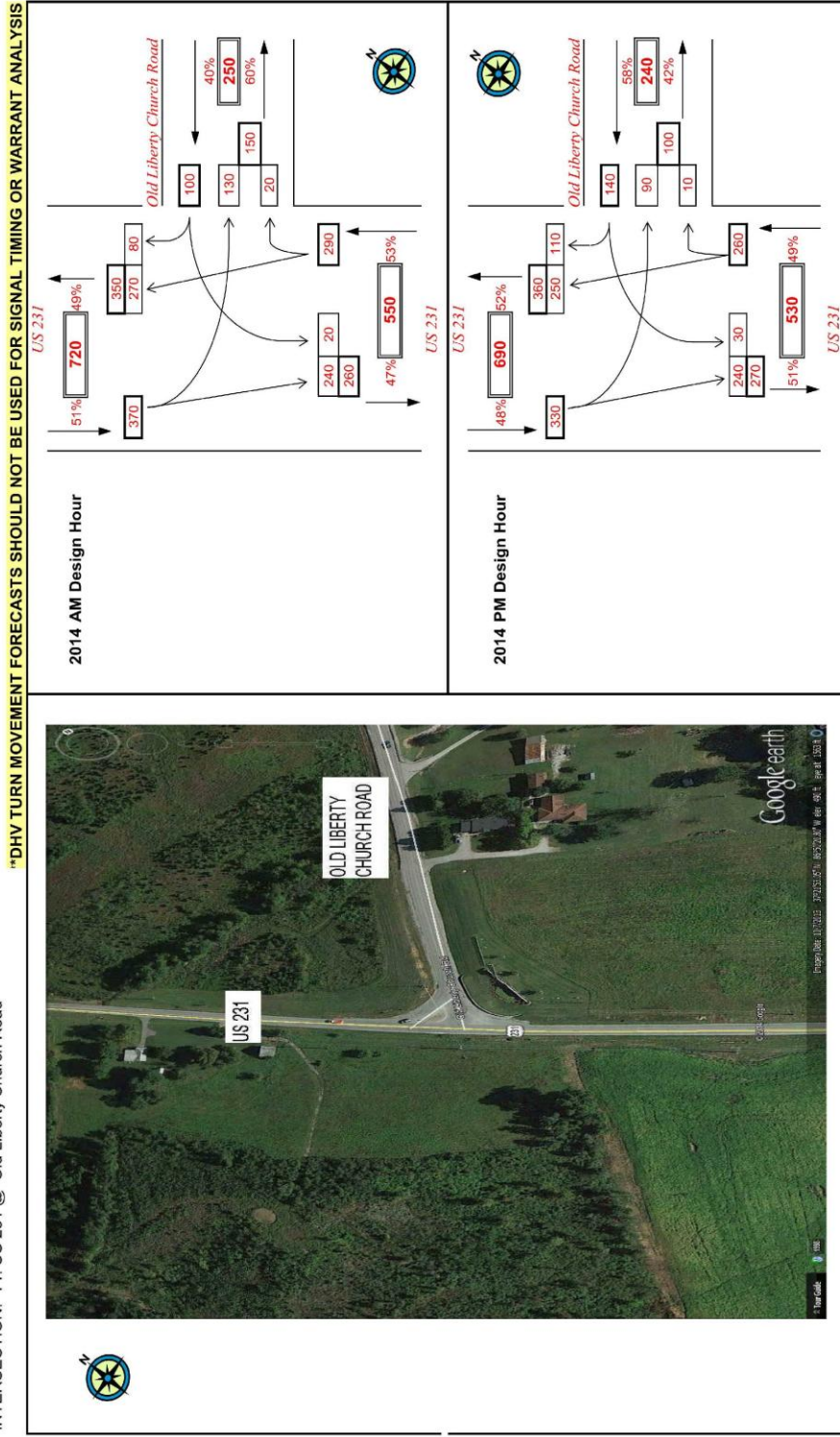


Scenario C- Existing Road New Tenants
US 231@ Old Liberty Church Road (2014/2040)

Scenario D- Existing Road no New Tenants
US 231@ Old Liberty Church Road (2014/2040)

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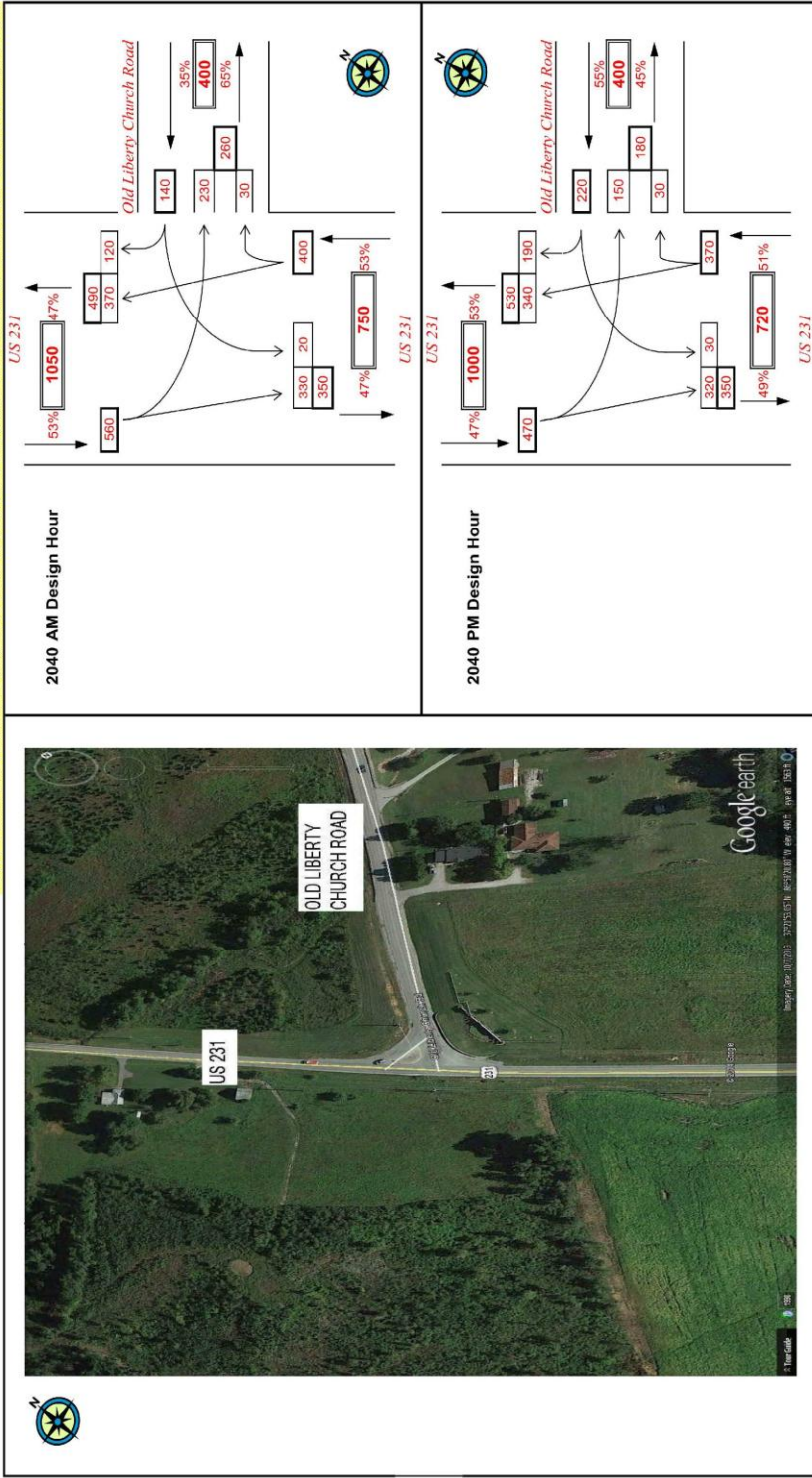
PROJECT: Planning Study to improve access to Bluegrass Crossing Business Center
 ITEM NUMBER: N/A
 MARS NUMBER:
 REQUEST DATE: 2/24/2014
 ANALYST: J.BALAJI
 SCENARIO: 2014 Design Hour Volumes for scenario C
 INTERSECTION: T1: US 231 @ Old Liberty Church Road



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 MARS NUMBER:
 REQUEST DATE: 2/24/2014
 ANALYST: J.BALAJI
 SCENARIO: 2040 Design Hour Volumes for scenario C
 INTERSECTION: T: US 231 @ Old Liberty Church Road

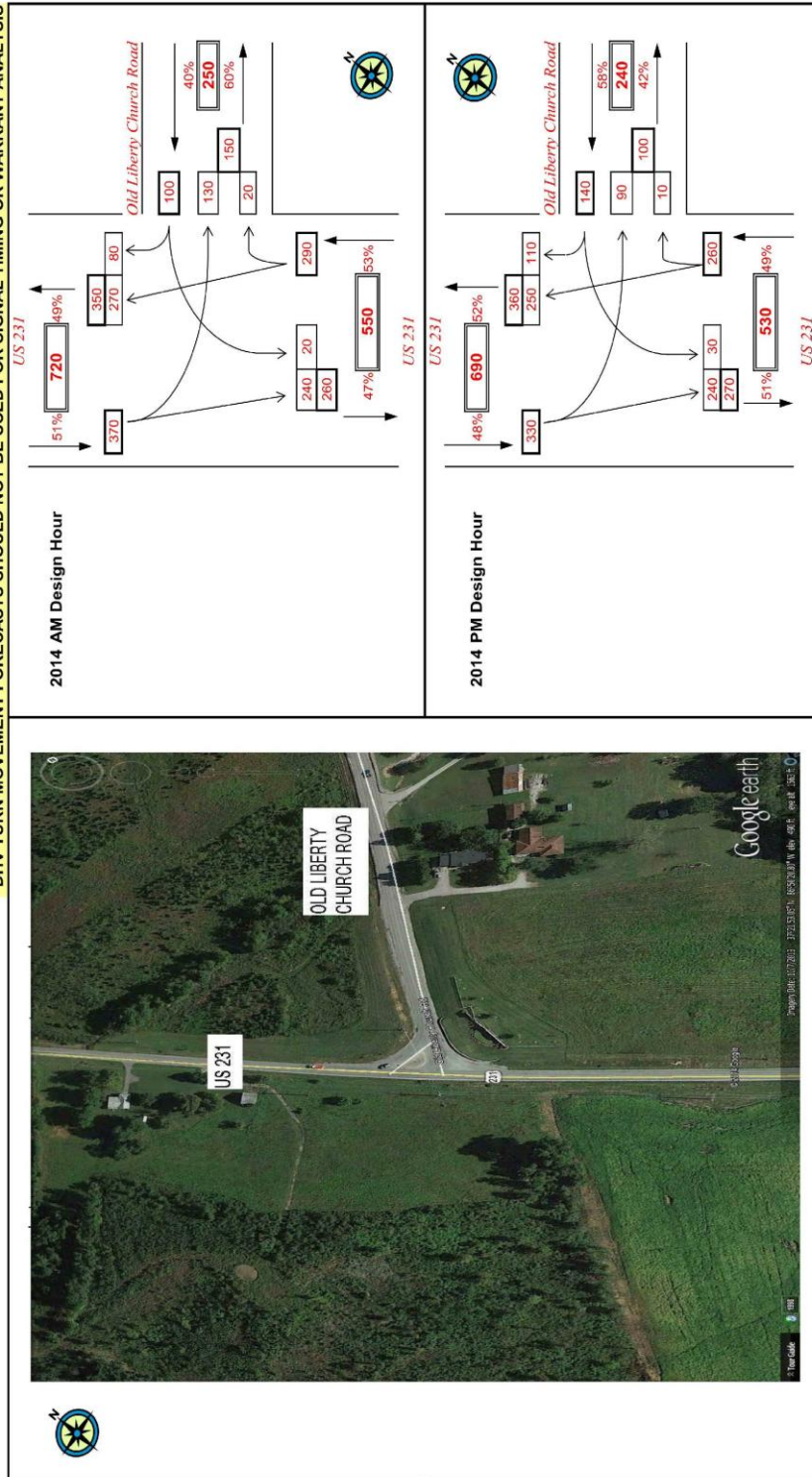
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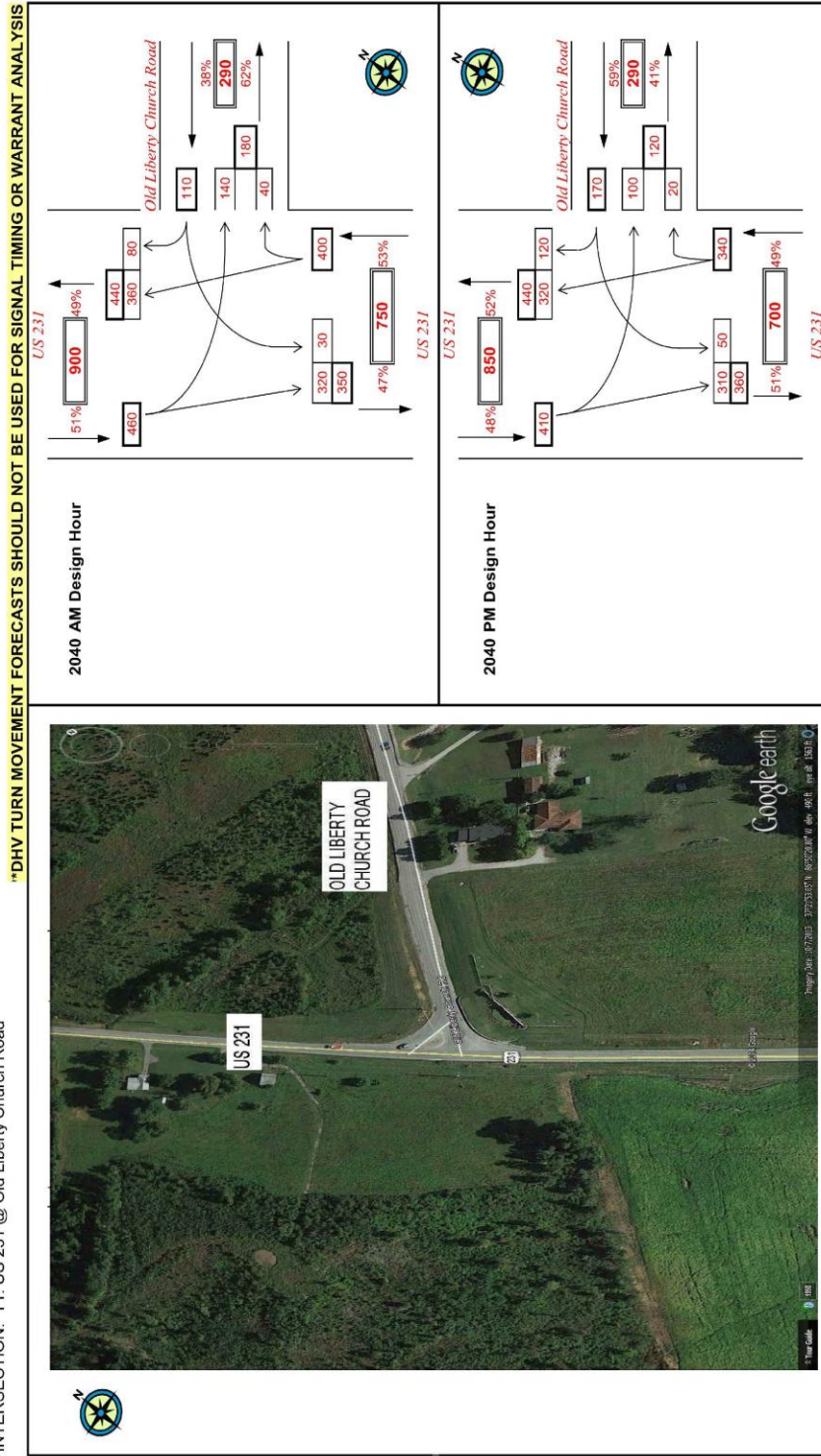
PROJECT: Planning Study to improve access to Bluegrass Crossing Business Center
 ITEM NUMBER: N/A
 MARS NUMBER: N/A
 REQUEST DATE: 2/24/2014
 ANALYST: J.BALAJI
 SCENARIO: 2014 Design Hour Volumes for scenario D
 INTERSECTION: T1: US 231 @ Old Liberty Church Road

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PROJECT: Planning Study to improve access to Bluegrass Crossing Business Center
 ITEM NUMBER: N/A
 MARS NUMBER: N/A
 REQUEST DATE: 2/24/2014
 ANALYST: J.BALAJI
 SCENARIO: 2040 Design Hour Volumes for scenario D
 INTERSECTION: T1: US 231 @ Old Liberty Church Road



ESAL
SCENARIO A/B
US 231
NEW ENTRANCE
OLD LIBERTY CHURCH ROAD

*Traffic Forecast Technical Report
Ohio County: Improvement Of Access To Bluegrass Crossings Business Centre
Item No. N/A*

FORECAST OF EQUIVALENT SINGLE AXLE LOAD ACCUMULATIONS (20-year)

ROUTE ID:

County	Ohio	Date	06/05/14
Road Name	US 231	Forecaster	Jay Balaji
Functional Class	7 - Rural Major Collector	MARS No.	N/A
Project Description	Study to improve access to Bluegrass Crossings Business Centre	Item No.	N/A
Scenario	A	Route No.	US 231
Segment Description	US 231	Beg. MP	-
		End MP	-
		T.F. No.	TF14-004
		No. of Lanes	2
		1 or 2 way	2

REFERENCES:

Previous Forecasts	N/A	K- Factor Value	11.9%
Traffic Volume	0920003	K-Factor Source	0920003
Milepoint	6.5	PHF	0.91
Truck Percent	0920003	Full Route Unique Identifier	092-US-231 -000
Milepoint	0.1		
ESAL Information	0920003		
Growth Rate	2.40%		

TRAFFIC PARAMETERS:

		Present Year	Growth Rate	Construction Year	Median Year	Design Year
		2014		2020	2030	2040
Volume	(AADT)	6100	2.40%	7000	8900	11300
Percent Trucks	(%T)	10.2%	0.1%	10%	10%	10.2%
Number of Trucks		620	2.5%	700	890	1150
Percent Trucks Hauling Coal	(%CT)	0%	0.0%	0%	0%	0%
<i>Non-Coal Trucks:</i>						
Axles/Truck	(A/T)	3.790	0.70%	3.952	4.238	4.544
ESALs/Axle	(ESAL/A)	0.245	1.60%	0.269	0.316	0.370
<i>Coal Trucks:</i>						
Axles/Truck	(A/CT)	0	0.00%	0.000	0.000	0.000
ESALs/Axle	(ESAL/CA)	0	0.00%	0.000	0.000	0.000

ESAL CALCULATIONS: SEE ATTACHED ESAL CALCULATION SHEET

Design ESALs in Critical Lane 4,900,000

General Comments:

Traffic Forecast Technical Report
 Ohio County: Improvement Of Access To Bluegrass Crossings Business Centre
 Item No. N/A

Study to improve access to Bluegrass Crossings Business Centre(US 231 Scenario A)

Year	ADT	Car %	Truck %	Cars	Trucks	CT%	AX/T	ESAL/AX	AX/CT	ESAL/CA	LDF	ESALS
2020	7,033	89.7%	10.3%	6311	722	0.00%	3.95	0.27	0	0	0.500	146,021
2021	7,202	89.7%	10.3%	6462	740	0.00%	3.98	0.27	0	0	0.500	152,992
2022	7,374	89.7%	10.3%	6616	758	0.00%	4.01	0.28	0	0	0.500	160,298
2023	7,551	89.7%	10.3%	6774	777	0.00%	4.04	0.28	0	0	0.500	167,957
2024	7,733	89.7%	10.3%	6936	797	0.00%	4.06	0.29	0	0	0.500	175,986
2025	7,918	89.7%	10.3%	7102	817	0.00%	4.09	0.29	0	0	0.500	184,401
2026	8,108	89.7%	10.3%	7271	837	0.00%	4.12	0.30	0	0	0.500	193,223
2027	8,303	89.7%	10.3%	7445	858	0.00%	4.15	0.30	0	0	0.500	202,471
2028	8,502	89.7%	10.3%	7623	879	0.00%	4.18	0.31	0	0	0.500	212,166
2029	8,706	89.6%	10.4%	7805	901	0.00%	4.21	0.31	0	0	0.500	222,329
2030	8,915	89.6%	10.4%	7991	924	0.00%	4.24	0.32	0	0	0.500	232,983
2031	9,129	89.6%	10.4%	8182	947	0.00%	4.27	0.32	0	0	0.500	244,151
2032	9,348	89.6%	10.4%	8377	971	0.00%	4.30	0.33	0	0	0.500	255,859
2033	9,573	89.6%	10.4%	8577	995	0.00%	4.33	0.33	0	0	0.500	268,134
2034	9,802	89.6%	10.4%	8782	1020	0.00%	4.36	0.34	0	0	0.500	281,001
2035	10,038	89.6%	10.4%	8992	1046	0.00%	4.39	0.34	0	0	0.500	294,491
2036	10,278	89.6%	10.4%	9207	1072	0.00%	4.42	0.35	0	0	0.500	308,633
2037	10,525	89.6%	10.4%	9427	1099	0.00%	4.45	0.35	0	0	0.500	323,459
2038	10,778	89.6%	10.4%	9652	1126	0.00%	4.48	0.36	0	0	0.500	339,003
2039	11,036	89.5%	10.5%	9882	1154	0.00%	4.50	0.36	0	0	0.500	354,372
2040	11,301	89.5%	10.5%	10118	1183	0.00%	4.50	0.37	0	0	0.500	368,893

5-yr ESALS
800,000

10-yr ESALS
1,900,000

15-yr ESALS
3,200,000

20-yr ESALS
4,900,000

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Ohio County: Improvement Of Access To Bluegrass Crossings Business Centre
Item No. N/A*

FORECAST OF EQUIVALENT SINGLE AXLE LOAD ACCUMULATIONS (20-year)

ROUTE ID:

County	Ohio	Date	06/05/14
Road Name	US 231	Forecaster	Jay Balaji
Functional Class	7 - Rural Major Collector	MARS No.	N/A
Project Description	Study to improve access to Bluegrass Crossings Business Centre	Item No.	N/A
Scenario	B	Route No.	US 231
Segment Description	US 231	Beg. MP	-
		End MP	-
		T.F. No.	TF14-004
		No. of Lanes	2
		1 or 2 way	2

REFERENCES:

Previous Forecasts	N/A	K- Factor Value	11.9%
Traffic Volume	0920003	K-Factor Source	0920003
Milepoint	6.5	PHF	0.91
Truck Percent	0920003	Full Route Unique Identifier	092-US-231 -000
Milepoint	0.1		
ESAL Information	0920003		
Growth Rate	1.00%		

TRAFFIC PARAMETERS:

	Present Year	Growth Rate	Construction Year	Median Year	Design Year
	2014		2020	2030	2040
Volume (AADT)	6100	1.00%	6500	7200	7900
Percent Trucks (%T)	10.2%	0.1%	10%	10%	10.2%
Number of Trucks	620	1.1%	650	720	810
Percent Trucks Hauling Coal (%CT)	0%	0.0%	0%	0%	0%
<i>Non-Coal Trucks:</i>					
Axles/Truck (A/T)	3.790	0.70%	3.952	4.238	4.544
ESALs/Axle (ESAL/A)	0.245	1.60%	0.269	0.316	0.370
<i>Coal Trucks:</i>					
Axles/Truck (A/CT)	0	0.00%	0.000	0.000	0.000
ESALs/Axle (ESAL/CA)	0	0.00%	0.000	0.000	0.000

ESAL CALCULATIONS: SEE ATTACHED ESAL CALCULATION SHEET

Design ESALs in Critical Lane 3,900,000

General Comments:

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Study to improve access to Bluegrass Crossings Business Centre(US 231 Scenario B)

Year	ADT	Car %	Truck %	Cars	Trucks	CT%	AX/T	ESAL/AX	AX/CT	ESAL/CA	LDF	ESALS
2020	6,475	89.7%	10.3%	5811	664	0.00%	3.95	0.27	0	0	0.500	134,445
2021	6,540	89.7%	10.3%	5868	672	0.00%	3.98	0.27	0	0	0.500	138,937
2022	6,605	89.7%	10.3%	5926	679	0.00%	4.01	0.28	0	0	0.500	143,582
2023	6,671	89.7%	10.3%	5985	687	0.00%	4.04	0.28	0	0	0.500	148,385
2024	6,738	89.7%	10.3%	6044	694	0.00%	4.06	0.29	0	0	0.500	153,353
2025	6,806	89.7%	10.3%	6104	702	0.00%	4.09	0.29	0	0	0.500	158,489
2026	6,874	89.7%	10.3%	6164	710	0.00%	4.12	0.30	0	0	0.500	163,801
2027	6,942	89.7%	10.3%	6225	717	0.00%	4.15	0.30	0	0	0.500	169,294
2028	7,012	89.7%	10.3%	6287	725	0.00%	4.18	0.31	0	0	0.500	174,975
2029	7,082	89.6%	10.4%	6349	733	0.00%	4.21	0.31	0	0	0.500	180,849
2030	7,153	89.6%	10.4%	6411	741	0.00%	4.24	0.32	0	0	0.500	186,924
2031	7,224	89.6%	10.4%	6475	750	0.00%	4.27	0.32	0	0	0.500	193,207
2032	7,296	89.6%	10.4%	6539	758	0.00%	4.30	0.33	0	0	0.500	199,704
2033	7,369	89.6%	10.4%	6603	766	0.00%	4.33	0.33	0	0	0.500	206,423
2034	7,443	89.6%	10.4%	6669	775	0.00%	4.36	0.34	0	0	0.500	213,372
2035	7,518	89.6%	10.4%	6735	783	0.00%	4.39	0.34	0	0	0.500	220,557
2036	7,593	89.6%	10.4%	6801	792	0.00%	4.42	0.35	0	0	0.500	227,989
2037	7,669	89.6%	10.4%	6868	800	0.00%	4.45	0.35	0	0	0.500	235,674
2038	7,745	89.6%	10.4%	6936	809	0.00%	4.48	0.36	0	0	0.500	243,622
2039	7,823	89.5%	10.5%	7005	818	0.00%	4.50	0.36	0	0	0.500	251,186
2040	7,901	89.5%	10.5%	7074	827	0.00%	4.50	0.37	0	0	0.500	257,904

5-yr ESALS
700,000

10-yr ESALS
1,600,000

15-yr ESALS
2,700,000

20-yr ESALS
3,900,000

*Traffic Forecast Technical Report
Ohio County: Improvement Of Access To Bluegrass Crossings Business Centre
Item No. N/A*

FORECAST OF EQUIVALENT SINGLE AXLE LOAD ACCUMULATIONS (20-year)

ROUTE ID:

County	Ohio	Date	05/30/14
Road Name	N/A	Forecaster	Jay Balaji
Functional Class	9 - Rural Local	MARS No.	N/A
Project Description	Study to improve access to Bluegrass Crossings Business Centre	Item No.	N/A
Scenario	A	Route No.	N/A
Segment Description	New Entrance	Beg. MP	-
		End MP	-
		T.F. No.	TF14-004
		No. of Lanes	2
		1 or 2 way	2

REFERENCES:

Previous Forecasts	N/A	K-Factor Value	13.0%
Traffic Volume	0920005	K-Factor Source	'0920005
Milepoint	0.1	PHF	0.91
Truck Percent	0920005	Full Route Unique Identifier	N/A
Milepoint	0.1		
ESAL Information	0920005		
Growth Rate	5.00%		

TRAFFIC PARAMETERS:

	Present Year	Growth Rate	Construction Year	Median Year	Design Year
	2014		2020	2030	2040
Volume (AADT)	1500	5.00%	2000	3300	5900
Percent Trucks (%T)	10.0%	0.0%	10%	10%	10%
Number of Trucks	150	5.0%	200	330	590
Percent Trucks Hauling Coal (%CT)	0%	0.0%	0%	0%	0%
<i>Non-Coal Trucks:</i>					
Axles/Truck (A/T)	2.885	0.70%	3.008	3.226	3.459
ESALs/Axle (ESAL/A)	0.254	1.60%	0.279	0.327	0.384
<i>Coal Trucks:</i>					
Axles/Truck (A/CT)	0	0.00%	0.000	0.000	0.000
ESALs/Axle (ESAL/CA)	0	0.00%	0.000	0.000	0.000

ESAL CALCULATIONS: SEE ATTACHED ESAL CALCULATION SHEET

Design ESALs in Critical Lane 1,500,000

General Comments:

Traffic Forecast Technical Report
 Ohio County: Improvement Of Access To Bluegrass Crossings Business Centre
 Item No. N/A

Study to improve access to Bluegrass Crossings Business Centre(New Entrance Scenario A)													
Year	ADT	Car %	Truck %	Cars	Trucks	CT%	AX/T	ESAL/AX	AX/CT	ESAL/CA	LDF	ESALS	
2020	2,010	90.0%	10.0%	1809	201	0.00%	3.01	0.28	0	0	0.500	32,545	
2021	2,111	90.0%	10.0%	1899	211	0.00%	3.03	0.28	0	0	0.500	34,922	
2022	2,216	90.0%	10.0%	1994	222	0.00%	3.05	0.29	0	0	0.500	37,473	
2023	2,327	90.0%	10.0%	2094	233	0.00%	3.07	0.29	0	0	0.500	40,212	
2024	2,443	90.0%	10.0%	2199	245	0.00%	3.09	0.30	0	0	0.500	43,152	5-yr ESALS
2025	2,566	90.0%	10.0%	2308	257	0.00%	3.12	0.30	0	0	0.500	46,308	200,000
2026	2,694	90.0%	10.0%	2424	270	0.00%	3.14	0.31	0	0	0.500	49,696	
2027	2,828	90.0%	10.0%	2545	283	0.00%	3.16	0.31	0	0	0.500	53,333	
2028	2,970	90.0%	10.0%	2672	298	0.00%	3.18	0.32	0	0	0.500	57,238	
2029	3,118	90.0%	10.0%	2806	312	0.00%	3.20	0.32	0	0	0.500	61,430	10-yr ESALS
2030	3,274	90.0%	10.0%	2946	328	0.00%	3.23	0.33	0	0	0.500	65,930	500,000
2031	3,438	90.0%	10.0%	3094	344	0.00%	3.25	0.33	0	0	0.500	70,761	
2032	3,610	90.0%	10.0%	3248	362	0.00%	3.27	0.34	0	0	0.500	75,948	
2033	3,790	90.0%	10.0%	3411	380	0.00%	3.29	0.34	0	0	0.500	81,516	
2034	3,980	90.0%	10.0%	3581	399	0.00%	3.32	0.35	0	0	0.500	87,495	15-yr ESALS
2035	4,179	90.0%	10.0%	3760	419	0.00%	3.34	0.35	0	0	0.500	93,913	900,000
2036	4,388	90.0%	10.0%	3948	440	0.00%	3.36	0.36	0	0	0.500	100,805	
2037	4,607	90.0%	10.0%	4146	462	0.00%	3.39	0.37	0	0	0.500	108,204	
2038	4,838	90.0%	10.0%	4353	485	0.00%	3.41	0.37	0	0	0.500	116,148	
2039	5,080	90.0%	10.0%	4571	509	0.00%	3.43	0.38	0	0	0.500	124,678	20-yr ESALS
2040	5,334	90.0%	10.0%	4799	534	0.00%	3.46	0.38	0	0	0.500	133,836	1,500,000

*Traffic Forecast Technical Report
Ohio County: Improvement Of Access To Bluegrass Crossings Business Centre
Item No. N/A*

FORECAST OF EQUIVALENT SINGLE AXLE LOAD ACCUMULATIONS (20-year)

ROUTE ID:

County	Ohio	Date	05/30/14
Road Name	N/A	Forecaster	Jay Balaji
Functional Class	9 - Rural Local	MARS No.	N/A
Project Description	Study to improve access to Bluegrass Crossings Business Centre	Item No.	N/A
Scenario	B	Route No.	N/A
Segment Description	New Entrance	Beg. MP	-
		End MP	-
		T.F. No.	TF14-004
		No. of Lanes	2
		1 or 2 way	2

REFERENCES:

Previous Forecasts	N/A	K- Factor Value	14.0%
Traffic Volume	0920005	K-Factor Source	'0920005
Milepoint	0.1	PHF	0.91
Truck Percent	0920005	Full Route Unique Identifier	N/A
Milepoint	0.1		
ESAL Information	0920005		
Growth Rate	0.50%		

TRAFFIC PARAMETERS:

	Present Year	Growth Rate	Construction Year	Median Year	Design Year
	2014		2020	2030	2040
Volume (AADT)	1500	0.50%	1500	1600	1700
Percent Trucks (%T)	10.0%	0.0%	10%	10%	10%
Number of Trucks	150	0.5%	150	160	170
Percent Trucks Hauling Coal (%CT)	0%	0.0%	0%	0%	0%
<i>Non-Coal Trucks:</i>					
Axles/Truck (A/T)	2.885	0.70%	3.008	3.226	3.459
ESALs/Axle (ESAL/A)	0.254	1.60%	0.279	0.327	0.384
<i>Coal Trucks:</i>					
Axles/Truck (A/CT)	0	0.00%	0.000	0.000	0.000
ESALs/Axle (ESAL/CA)	0	0.00%	0.000	0.000	0.000

ESAL CALCULATIONS: SEE ATTACHED ESAL CALCULATION SHEET

Design ESALs in Critical Lane 700,000

General Comments:

Traffic Forecast Technical Report
 Ohio County: Improvement Of Access To Bluegrass Crossings Business Centre
 Item No. N/A

Study to improve access to Bluegrass Crossings Business Centre(New Entrance Scenario B)

Year	ADT	Car %	Truck %	Cars	Trucks	CT%	AX/T	ESAL/AX	AX/CT	ESAL/CA	LDF	ESALS
2020	1,592	90.0%	10.0%	1433	160	0.00%	3.01	0.28	0	0	0.500	25,779
2021	1,608	90.0%	10.0%	1447	161	0.00%	3.03	0.28	0	0	0.500	26,608
2022	1,624	90.0%	10.0%	1462	163	0.00%	3.05	0.29	0	0	0.500	27,465
2023	1,641	90.0%	10.0%	1476	164	0.00%	3.07	0.29	0	0	0.500	28,349
2024	1,657	90.0%	10.0%	1491	166	0.00%	3.09	0.30	0	0	0.500	29,263
2025	1,674	90.0%	10.0%	1506	168	0.00%	3.12	0.30	0	0	0.500	30,207
2026	1,690	90.0%	10.0%	1521	169	0.00%	3.14	0.31	0	0	0.500	31,182
2027	1,707	90.0%	10.0%	1536	171	0.00%	3.16	0.31	0	0	0.500	32,190
2028	1,724	90.0%	10.0%	1551	173	0.00%	3.18	0.32	0	0	0.500	33,230
2029	1,741	90.0%	10.0%	1567	174	0.00%	3.20	0.32	0	0	0.500	34,305
2030	1,759	90.0%	10.0%	1583	176	0.00%	3.23	0.33	0	0	0.500	35,416
2031	1,776	90.0%	10.0%	1598	178	0.00%	3.25	0.33	0	0	0.500	36,563
2032	1,794	90.0%	10.0%	1614	180	0.00%	3.27	0.34	0	0	0.500	37,748
2033	1,812	90.0%	10.0%	1631	182	0.00%	3.29	0.34	0	0	0.500	38,972
2034	1,830	90.0%	10.0%	1647	183	0.00%	3.32	0.35	0	0	0.500	40,237
2035	1,849	90.0%	10.0%	1663	185	0.00%	3.34	0.35	0	0	0.500	41,543
2036	1,867	90.0%	10.0%	1680	187	0.00%	3.36	0.36	0	0	0.500	42,893
2037	1,886	90.0%	10.0%	1697	189	0.00%	3.39	0.37	0	0	0.500	44,287
2038	1,905	90.0%	10.0%	1714	191	0.00%	3.41	0.37	0	0	0.500	45,728
2039	1,924	90.0%	10.0%	1731	193	0.00%	3.43	0.38	0	0	0.500	47,216
2040	1,943	90.0%	10.0%	1748	195	0.00%	3.46	0.38	0	0	0.500	48,754

5-yr ESALS 100,000
 10-yr ESALS 300,000
 15-yr ESALS 500,000
 20-yr ESALS 700,000

*Traffic Forecast Technical Report
Ohio County: Improvement Of Access To Bluegrass Crossings Business Centre
Item No. N/A*

FORECAST OF EQUIVALENT SINGLE AXLE LOAD ACCUMULATIONS (20-year)

ROUTE ID:

County	Ohio	Date	06/05/14
County		Forecaster	Jay Balaji
Route Name	Old Liberty Church Road	MARS No.	N/A
Functional Class	9 - Rural Local	Item No.	N/A
Project Description	Study to improve access to Bluegrass Crossings Business Centre	Route No.	CR-1193
Scenario	A/B	Beg. MP	-
Segment Description	Old Liberty Church Road	End MP	-
		T.F. No.	TF14-004
		No. of Lanes	2
		1 or 2 way	2

REFERENCES:

Previous Forecasts	N/A	K- Factor Value	15.0%
Traffic Volume	0920005	K-Factor Source	'0920005
Milepoint	0.1	PHF	0.91
Truck Percent	2007 aggregated ESALS	Full Route Unique Identifier	
Milepoint	N/A		092-CR-1193 -000
ESAL Information	N/A		
Growth Rate	1.00%		

TRAFFIC PARAMETERS:

	Present Year	Growth Rate	Construction Year	Median Year	Design Year
	2014		2020	2030	2040
Volume (AADT)	300	1.00%	320	350	400
Percent Trucks (%T)	10.0%	0.0%	10%	10%	10.0%
Number of Trucks	30	1.0%	30	40	40
Percent Trucks Hauling Coal (%CT)	0%	0.0%	0%	0%	0%
<i>Non-Coal Trucks:</i>					
Axles/Truck (A/T)	2.885	0.70%	3.008	3.226	3.459
ESALs/Axle (ESAL/A)	0.254	1.60%	0.279	0.327	0.384
<i>Coal Trucks:</i>					
Axles/Truck (A/CT)	0	0.00%	0.000	0.000	0.000
ESALs/Axle (ESAL/CA)	0	0.00%	0.000	0.000	0.000

ESAL CALCULATIONS: SEE ATTACHED ESAL CALCULATION SHEET

Design ESALs in Critical Lane

General Comments:

Traffic Forecast Technical Report
 Ohio County: Improvement Of Access To Bluegrass Crossings Business Centre
 Item No. N/A

Study to improve access to Bluegrass Crossings Business Centre(CR 1193 Scenario A/B)													
Year	ADT	Car %	Truck %	Cars	Trucks	CT%	AXT	ESAL/AX	AX/CT	ESAL/CA	LDF	ESALS	
2020	318	90.0%	10.0%	287	32	0.00%	3.01	0.28	0	0	0.500	5,156	
2021	322	90.0%	10.0%	289	33	0.00%	3.03	0.28	0	0	0.500	5,322	
2022	325	90.0%	10.0%	292	33	0.00%	3.05	0.29	0	0	0.500	5,493	
2023	328	90.0%	10.0%	295	33	0.00%	3.07	0.29	0	0	0.500	5,670	
2024	331	90.0%	10.0%	298	33	0.00%	3.09	0.30	0	0	0.500	5,853	5-yr ESALS
2025	335	90.0%	10.0%	301	34	0.00%	3.12	0.30	0	0	0.500	6,041	-
2026	338	90.0%	10.0%	304	34	0.00%	3.14	0.31	0	0	0.500	6,236	
2027	341	90.0%	10.0%	307	34	0.00%	3.16	0.31	0	0	0.500	6,438	
2028	345	90.0%	10.0%	310	35	0.00%	3.18	0.32	0	0	0.500	6,646	
2029	348	90.0%	10.0%	313	35	0.00%	3.20	0.32	0	0	0.500	6,861	10-yr ESALS
2030	352	90.0%	10.0%	317	35	0.00%	3.23	0.33	0	0	0.500	7,083	100,000
2031	355	90.0%	10.0%	320	36	0.00%	3.25	0.33	0	0	0.500	7,313	
2032	359	90.0%	10.0%	323	36	0.00%	3.27	0.34	0	0	0.500	7,550	
2033	362	90.0%	10.0%	326	36	0.00%	3.29	0.34	0	0	0.500	7,794	
2034	366	90.0%	10.0%	329	37	0.00%	3.32	0.35	0	0	0.500	8,047	15-yr ESALS
2035	370	90.0%	10.0%	333	37	0.00%	3.34	0.35	0	0	0.500	8,309	100,000
2036	373	90.0%	10.0%	336	37	0.00%	3.36	0.36	0	0	0.500	8,579	
2037	377	90.0%	10.0%	339	38	0.00%	3.39	0.37	0	0	0.500	8,857	
2038	381	90.0%	10.0%	343	38	0.00%	3.41	0.37	0	0	0.500	9,146	
2039	385	90.0%	10.0%	346	39	0.00%	3.43	0.38	0	0	0.500	9,443	20-yr ESALS
2040	389	90.0%	10.0%	350	39	0.00%	3.46	0.38	0	0	0.500	9,751	100,000

ESAL
SCENARIO C/D
US 231
OLD LIBERTY CHURCH ROAD

*Traffic Forecast Technical Report
Ohio County: Improvement Of Access To Bluegrass Crossings Business Centre
Item No. N/A*

FORECAST OF EQUIVALENT SINGLE AXLE LOAD ACCUMULATIONS (20-year)

ROUTE ID:

County	Ohio	Date	06/05/14
Road Name	US 231	Forecaster	Jay Balaji
Functional Class	7 - Rural Major Collector	MARS No.	N/A
Project Description	Study to improve access to Bluegrass Crossings Business Centre	Item No.	N/A
Scenario	C	Route No.	US 231
Segment Description	US 231	Beg. MP	-
		End MP	-
		T.F. No.	TF14-004
		No. of Lanes	2
		1 or 2 way	2

REFERENCES:

Previous Forecasts	N/A	K- Factor Value	11.8%
Traffic Volume	0920003	K-Factor Source	0920003
Milepoint	6.5	PHF	0.91
Truck Percent	0920003	Full Route Unique Identifier	092-US-231 -000
Milepoint	0.1		
ESAL Information	0920003		
Growth Rate	1.50%		

TRAFFIC PARAMETERS:

	Present Year	Growth Rate	Construction Year	Median Year	Design Year
	2014		2020	2030	2040
Volume (AADT)	6100	1.50%	6700	7700	9000
Percent Trucks (%T)	10.2%	0.0%	10%	10%	10.2%
Number of Trucks	620	1.5%	670	770	920
Percent Trucks Hauling Coal (%CT)	0%	0.0%	0%	0%	0%
<i>Non-Coal Trucks:</i>					
Axles/Truck (A/T)	3.790	0.70%	3.952	4.238	4.544
ESALs/Axle (ESAL/A)	0.245	1.60%	0.269	0.316	0.370
<i>Coal Trucks:</i>					
Axles/Truck (A/CT)	0	0.00%	0.000	0.000	0.000
ESALs/Axle (ESAL/CA)	0	0.00%	0.000	0.000	0.000

ESAL CALCULATIONS: SEE ATTACHED ESAL CALCULATION SHEET

Design ESALs in Critical Lane 4,100,000

General Comments:

Traffic Forecast Technical Report
 Ohio County: Improvement Of Access To Bluegrass Crossings Business Centre
 Item No. N/A

Study to improve access to Bluegrass Crossings Business Centre(US 231 Scenario C)													
Year	ADT	Car %	Truck %	Cars	Trucks	CT%	AXT	ESAL/AX	AX/CT	ESAL/CA	LDf	ESALS	
2020	6,670	89.8%	10.2%	5990	680	0.00%	3.95	0.27	0	0	0.500	137,697	
2021	6,770	89.8%	10.2%	6080	691	0.00%	3.98	0.27	0	0	0.500	142,864	
2022	6,872	89.8%	10.2%	6171	701	0.00%	4.01	0.28	0	0	0.500	148,228	
2023	6,975	89.8%	10.2%	6263	711	0.00%	4.04	0.28	0	0	0.500	153,797	
2024	7,079	89.8%	10.2%	6357	722	0.00%	4.06	0.29	0	0	0.500	159,578	5-yr ESALS
2025	7,185	89.8%	10.2%	6453	733	0.00%	4.09	0.29	0	0	0.500	165,579	800,000
2026	7,293	89.8%	10.2%	6549	744	0.00%	4.12	0.30	0	0	0.500	171,808	
2027	7,403	89.8%	10.2%	6648	755	0.00%	4.15	0.30	0	0	0.500	178,276	
2028	7,514	89.8%	10.2%	6747	766	0.00%	4.18	0.31	0	0	0.500	184,990	
2029	7,626	89.8%	10.2%	6849	778	0.00%	4.21	0.31	0	0	0.500	191,960	
2030	7,741	89.8%	10.2%	6951	790	0.00%	4.24	0.32	0	0	0.500	199,196	10-yr ESALS
2031	7,857	89.8%	10.2%	7056	801	0.00%	4.27	0.32	0	0	0.500	206,708	1,700,000
2032	7,975	89.8%	10.2%	7161	813	0.00%	4.30	0.33	0	0	0.500	214,506	
2033	8,094	89.8%	10.2%	7269	826	0.00%	4.33	0.33	0	0	0.500	222,603	
2034	8,216	89.8%	10.2%	7378	838	0.00%	4.36	0.34	0	0	0.500	231,008	15-yr ESALS
2035	8,339	89.8%	10.2%	7488	851	0.00%	4.39	0.34	0	0	0.500	239,734	2,800,000
2036	8,464	89.8%	10.2%	7601	863	0.00%	4.42	0.35	0	0	0.500	248,794	
2037	8,591	89.8%	10.2%	7715	876	0.00%	4.45	0.35	0	0	0.500	258,200	
2038	8,720	89.8%	10.2%	7831	889	0.00%	4.48	0.36	0	0	0.500	267,965	
2039	8,851	89.8%	10.2%	7948	903	0.00%	4.50	0.36	0	0	0.500	277,378	20-yr ESALS
2040	8,984	89.8%	10.2%	8067	916	0.00%	4.50	0.37	0	0	0.500	285,925	4,100,000

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FORECAST OF EQUIVALENT SINGLE AXLE LOAD ACCUMULATIONS (20-year)

ROUTE ID:

County	Ohio	Date	06/05/14
Road Name	US 231	Forecaster	Jay Balaji
Functional Class	7 - Rural Major Collector	MARS No.	N/A
Project Description	Study to improve access to Bluegrass Crossings Business Centre	Item No.	N/A
Scenario	D	Route No.	US 231
Segment Description	US 231	Beg. MP	-
		End MP	-
		T.F. No.	TF14-004
		No. of Lanes	2
		1 or 2 way	2

REFERENCES:

Previous Forecasts	N/A	K-Factor Value	12.0%
Traffic Volume	0920003	K-Factor Source	0920003
Milepoint	6.5	PHF	0.91
Truck Percent	0920003	Full Route Unique Identifier	092-US-231 -000
Milepoint	0.1		
ESAL Information	0920003		
Growth Rate	1.00%		

TRAFFIC PARAMETERS:

		Present Year	Growth Rate	Construction Year	Median Year	Design Year
		2014		2020	2030	2040
Volume	(AADT)	6100	1.00%	6500	7200	7600
Percent Trucks	(%T)	10.2%	0.0%	10%	10%	10.2%
Number of Trucks		620	1.0%	650	720	780
Percent Trucks Hauling Coal	(%CT)	0%	0.0%	0%	0%	0%
<i>Non-Coal Trucks:</i>						
Axles/Truck	(A/T)	3.790	0.70%	3.952	4.238	4.544
ESALs/Axle	(ESAL/A)	0.245	1.60%	0.269	0.316	0.370
<i>Coal Trucks:</i>						
Axles/Truck	(A/CT)	0	0.00%	0.000	0.000	0.000
ESALs/Axle	(ESAL/CA)	0	0.00%	0.000	0.000	0.000

ESAL CALCULATIONS: SEE ATTACHED ESAL CALCULATION SHEET

Design ESALs in Critical Lane 3,800,000

General Comments:

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 Ohio County: Improvement Of Access To Bluegrass Crossings Business Centre
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Study to improve access to Bluegrass Crossings Business Centre(US 231 Scenario D)

Year	ADT	Car %	Truck %	Cars	Trucks	CT%	AX/T	ESAL/AX	AX/CT	ESAL/CA	LDF	ESALS
2020	6,475	89.8%	10.2%	5815	660	0.00%	3.95	0.27	0	0	0.500	133,677
2021	6,540	89.8%	10.2%	5873	667	0.00%	3.98	0.27	0	0	0.500	138,010
2022	6,605	89.8%	10.2%	5932	674	0.00%	4.01	0.28	0	0	0.500	142,486
2023	6,671	89.8%	10.2%	5991	680	0.00%	4.04	0.28	0	0	0.500	147,111
2024	6,738	89.8%	10.2%	6051	687	0.00%	4.06	0.29	0	0	0.500	151,889
2025	6,806	89.8%	10.2%	6111	694	0.00%	4.09	0.29	0	0	0.500	156,824
2026	6,874	89.8%	10.2%	6173	701	0.00%	4.12	0.30	0	0	0.500	161,923
2027	6,942	89.8%	10.2%	6234	708	0.00%	4.15	0.30	0	0	0.500	167,191
2028	7,012	89.8%	10.2%	6297	715	0.00%	4.18	0.31	0	0	0.500	172,632
2029	7,082	89.8%	10.2%	6360	722	0.00%	4.21	0.31	0	0	0.500	178,254
2030	7,153	89.8%	10.2%	6423	730	0.00%	4.24	0.32	0	0	0.500	184,062
2031	7,224	89.8%	10.2%	6487	737	0.00%	4.27	0.32	0	0	0.500	190,063
2032	7,296	89.8%	10.2%	6552	744	0.00%	4.30	0.33	0	0	0.500	196,262
2033	7,369	89.8%	10.2%	6618	752	0.00%	4.33	0.33	0	0	0.500	202,666
2034	7,443	89.8%	10.2%	6684	759	0.00%	4.36	0.34	0	0	0.500	209,283
2035	7,518	89.8%	10.2%	6751	767	0.00%	4.39	0.34	0	0	0.500	216,119
2036	7,593	89.8%	10.2%	6818	774	0.00%	4.42	0.35	0	0	0.500	223,181
2037	7,669	89.8%	10.2%	6886	782	0.00%	4.45	0.35	0	0	0.500	230,477
2038	7,745	89.8%	10.2%	6955	790	0.00%	4.48	0.36	0	0	0.500	238,015
2039	7,823	89.8%	10.2%	7025	798	0.00%	4.50	0.36	0	0	0.500	245,163
2040	7,901	89.8%	10.2%	7095	806	0.00%	4.50	0.37	0	0	0.500	251,473

5-yr ESALS
700,000

10-yr ESALS
1,600,000

15-yr ESALS
2,600,000

20-yr ESALS
3,800,000

*Traffic Forecast Technical Report
Ohio County: Improvement Of Access To Bluegrass Crossings Business Centre
Item No. N/A*

FORECAST OF EQUIVALENT SINGLE AXLE LOAD ACCUMULATIONS (20-year)

ROUTE ID:

County	Ohio	Date	05/30/14
Road Name	Old Liberty Church Road	Forecaster	Jay Balaji
Functional Class	9 - Rural Local	MARS No.	N/A
Project Description	Study to improve access to Bluegrass Crossings Business Centre	Item No.	N/A
Scenario	C	Route No.	CR-1193
Segment Description	Old Liberty Church Road	Beg. MP	-
		End MP	-
		T.F. No.	TF14-004
		No. of Lanes	2
		1 or 2 way	2

REFERENCES:

Previous Forecasts	N/A	K- Factor Value	15.0%
Traffic Volume	0920005	K-Factor Source	'0920005
Milepoint	0.1	PHF	0.91
Truck Percent	0920005	Full Route Unique Identifier	092-CR-1193 -000
Milepoint	0.1		
ESAL Information	0920005		
Growth Rate	2.00%		

TRAFFIC PARAMETERS:

	Present Year	Growth Rate	Construction Year	Median Year	Design Year
	2014		2020	2030	2040
Volume (AADT)	1700	2.00%	1900	2300	2800
Percent Trucks (%T)	10.0%	0.0%	10%	10%	10%
Number of Trucks	170	2.0%	190	230	280
Percent Trucks Hauling Coal (%CT)	0%	0.0%	0%	0%	0%
<i>Non-Coal Trucks:</i>					
Axles/Truck (A/T)	2.885	0.70%	3.008	3.226	3.459
ESALs/Axle (ESAL/A)	0.254	1.60%	0.279	0.327	0.384
<i>Coal Trucks:</i>					
Axles/Truck (A/CT)	0	0.00%	0.000	0.000	0.000
ESALs/Axle (ESAL/CA)	0	0.00%	0.000	0.000	0.000

ESAL CALCULATIONS: SEE ATTACHED ESAL CALCULATION SHEET

Design ESALs in Critical Lane 1,000,000

General Comments:

Traffic Forecast Technical Report
 Ohio County: Improvement Of Access To Bluegrass Crossings Business Centre
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Study to improve access to Bluegrass Crossings Business Centre(Old Liberty Church Road Scenario C)													
Year	ADT	Car %	Truck %	Cars	Trucks	CT%	AX/T	ESAL/AX	AX/CT	ESAL/CA	LDF	ESALS	
2020	1,914	90.0%	10.0%	1723	192	0.00%	3.01	0.28	0	0	0.500	30,996	
2021	1,953	90.0%	10.0%	1757	196	0.00%	3.03	0.28	0	0	0.500	32,309	
2022	1,992	90.0%	10.0%	1792	200	0.00%	3.05	0.29	0	0	0.500	33,679	
2023	2,032	90.0%	10.0%	1828	204	0.00%	3.07	0.29	0	0	0.500	35,108	
2024	2,072	90.0%	10.0%	1865	208	0.00%	3.09	0.30	0	0	0.500	36,599	5-yr ESALS 200,000
2025	2,114	90.0%	10.0%	1902	212	0.00%	3.12	0.30	0	0	0.500	38,154	
2026	2,156	90.0%	10.0%	1940	216	0.00%	3.14	0.31	0	0	0.500	39,775	
2027	2,199	90.0%	10.0%	1979	220	0.00%	3.16	0.31	0	0	0.500	41,467	
2028	2,243	90.0%	10.0%	2018	225	0.00%	3.18	0.32	0	0	0.500	43,231	
2029	2,288	90.0%	10.0%	2059	229	0.00%	3.20	0.32	0	0	0.500	45,071	
2030	2,334	90.0%	10.0%	2100	234	0.00%	3.23	0.33	0	0	0.500	46,991	10-yr ESALS 400,000
2031	2,380	90.0%	10.0%	2142	239	0.00%	3.25	0.33	0	0	0.500	48,993	
2032	2,428	90.0%	10.0%	2185	243	0.00%	3.27	0.34	0	0	0.500	51,082	
2033	2,477	90.0%	10.0%	2228	248	0.00%	3.29	0.34	0	0	0.500	53,261	
2034	2,526	90.0%	10.0%	2273	253	0.00%	3.32	0.35	0	0	0.500	55,534	15-yr ESALS 700,000
2035	2,577	90.0%	10.0%	2318	258	0.00%	3.34	0.35	0	0	0.500	57,905	
2036	2,628	90.0%	10.0%	2365	263	0.00%	3.36	0.36	0	0	0.500	60,378	
2037	2,681	90.0%	10.0%	2412	269	0.00%	3.39	0.37	0	0	0.500	62,958	
2038	2,734	90.0%	10.0%	2460	274	0.00%	3.41	0.37	0	0	0.500	65,649	
2039	2,789	90.0%	10.0%	2510	279	0.00%	3.43	0.38	0	0	0.500	68,457	20-yr ESALS 1,000,000
2040	2,845	90.0%	10.0%	2560	285	0.00%	3.46	0.38	0	0	0.500	71,386	

*Traffic Forecast Technical Report
Ohio County: Improvement Of Access To Bluegrass Crossings Business Centre
Item No. N/A*

FORECAST OF EQUIVALENT SINGLE AXLE LOAD ACCUMULATIONS (20-year)

ROUTE ID:

County	Ohio	Date	05/30/14
Road Name	Old Liberty Church Road	Forecaster	Jay Balaji
Functional Class	9 - Rural Local	MARS No.	N/A
Project Description	Study to improve access to Bluegrass Crossings Business Centre	Item No.	N/A
Scenario	D	Route No.	CR-1193
Segment Description	Old Liberty Church Road	Beg. MP	-
		End MP	-
		T.F. No.	TF14-004
		No. of Lanes	2
		1 or 2 way	2

REFERENCES:

Previous Forecasts	N/A	K- Factor Value	15.0%
Traffic Volume	0920005	K-Factor Source	'0920005
Milepoint	0.1	PHF	0.91
Truck Percent	0920005	Full Route Unique Identifier	092-CR-1193 -000
Milepoint	0.1		
ESAL Information	0920005		
Growth Rate	0.50%		

TRAFFIC PARAMETERS:

	Present Year	Growth Rate	Construction Year	Median Year	Design Year
	2014		2020	2030	2040
Volume (AADT)	1700	0.50%	1800	1800	1900
Percent Trucks (%T)	10.0%	0.0%	10%	10%	10%
Number of Trucks	170	0.5%	180	180	190
Percent Trucks Hauling Coal (%CT)	0%	0.0%	0%	0%	0%
<i>Non-Coal Trucks:</i>					
Axles/Truck (A/T)	2.885	0.70%	3.008	3.226	3.459
ESALs/Axle (ESAL/A)	0.254	1.60%	0.279	0.327	0.384
<i>Coal Trucks:</i>					
Axles/Truck (A/CT)	0	0.00%	0.000	0.000	0.000
ESALs/Axle (ESAL/CA)	0	0.00%	0.000	0.000	0.000

ESAL CALCULATIONS: SEE ATTACHED ESAL CALCULATION SHEET

Design ESALs in Critical Lane 800,000

General Comments:

Traffic Forecast Technical Report
 Ohio County: Improvement Of Access To Bluegrass Crossings Business Centre
 Item No. N/A

Study to improve access to Bluegrass Crossings Business Centre(Old Liberty Church Road Scenario D)

Year	ADT	Car %	Truck %	Cars	Trucks	CT%	AX/T	ESAL/AX	AX/CT	ESAL/CA	LDF	ESALS
2020	1,752	90.0%	10.0%	1576	176	0.00%	3.01	0.28	0	0	0.500	28,359
2021	1,760	90.0%	10.0%	1584	176	0.00%	3.03	0.28	0	0	0.500	29,127
2022	1,769	90.0%	10.0%	1592	177	0.00%	3.05	0.29	0	0	0.500	29,915
2023	1,778	90.0%	10.0%	1600	178	0.00%	3.07	0.29	0	0	0.500	30,726
2024	1,787	90.0%	10.0%	1608	179	0.00%	3.09	0.30	0	0	0.500	31,559
2025	1,796	90.0%	10.0%	1616	180	0.00%	3.12	0.30	0	0	0.500	32,416
2026	1,805	90.0%	10.0%	1624	181	0.00%	3.14	0.31	0	0	0.500	33,297
2027	1,814	90.0%	10.0%	1632	182	0.00%	3.16	0.31	0	0	0.500	34,202
2028	1,823	90.0%	10.0%	1640	183	0.00%	3.18	0.32	0	0	0.500	35,133
2029	1,832	90.0%	10.0%	1648	184	0.00%	3.20	0.32	0	0	0.500	36,090
2030	1,841	90.0%	10.0%	1657	184	0.00%	3.23	0.33	0	0	0.500	37,074
2031	1,850	90.0%	10.0%	1665	185	0.00%	3.25	0.33	0	0	0.500	38,085
2032	1,860	90.0%	10.0%	1673	186	0.00%	3.27	0.34	0	0	0.500	39,125
2033	1,869	90.0%	10.0%	1682	187	0.00%	3.29	0.34	0	0	0.500	40,194
2034	1,878	90.0%	10.0%	1690	188	0.00%	3.32	0.35	0	0	0.500	41,293
2035	1,888	90.0%	10.0%	1699	189	0.00%	3.34	0.35	0	0	0.500	42,423
2036	1,897	90.0%	10.0%	1707	190	0.00%	3.36	0.36	0	0	0.500	43,584
2037	1,907	90.0%	10.0%	1716	191	0.00%	3.39	0.37	0	0	0.500	44,778
2038	1,916	90.0%	10.0%	1724	192	0.00%	3.41	0.37	0	0	0.500	46,006
2039	1,926	90.0%	10.0%	1733	193	0.00%	3.43	0.38	0	0	0.500	47,268
2040	1,935	90.0%	10.0%	1741	194	0.00%	3.46	0.38	0	0	0.500	48,565

5-yr ESALS
200,000
10-yr ESALS
300,000
15-yr ESALS
500,000
20-yr ESALS
800,000

Bicycle and pedestrian review for access improvement to Bluegrass Crossings Business Centre

Project Overview: Improving access to the Bluegrass Crossings Industrial Park on Old Liberty Church Road in Ohio County

Existing conditions:

- No known bicycle & pedestrian plan or projects in this area
- Residential housing along the east side of Old Liberty Church Road

The Bicycle and Pedestrian recommendations are:

- If new access to the industrial park is implemented or if the existing facility is maintained, then provided pedestrian facilities (sidewalk) along the east side of the residential section of Old Liberty Church Road.