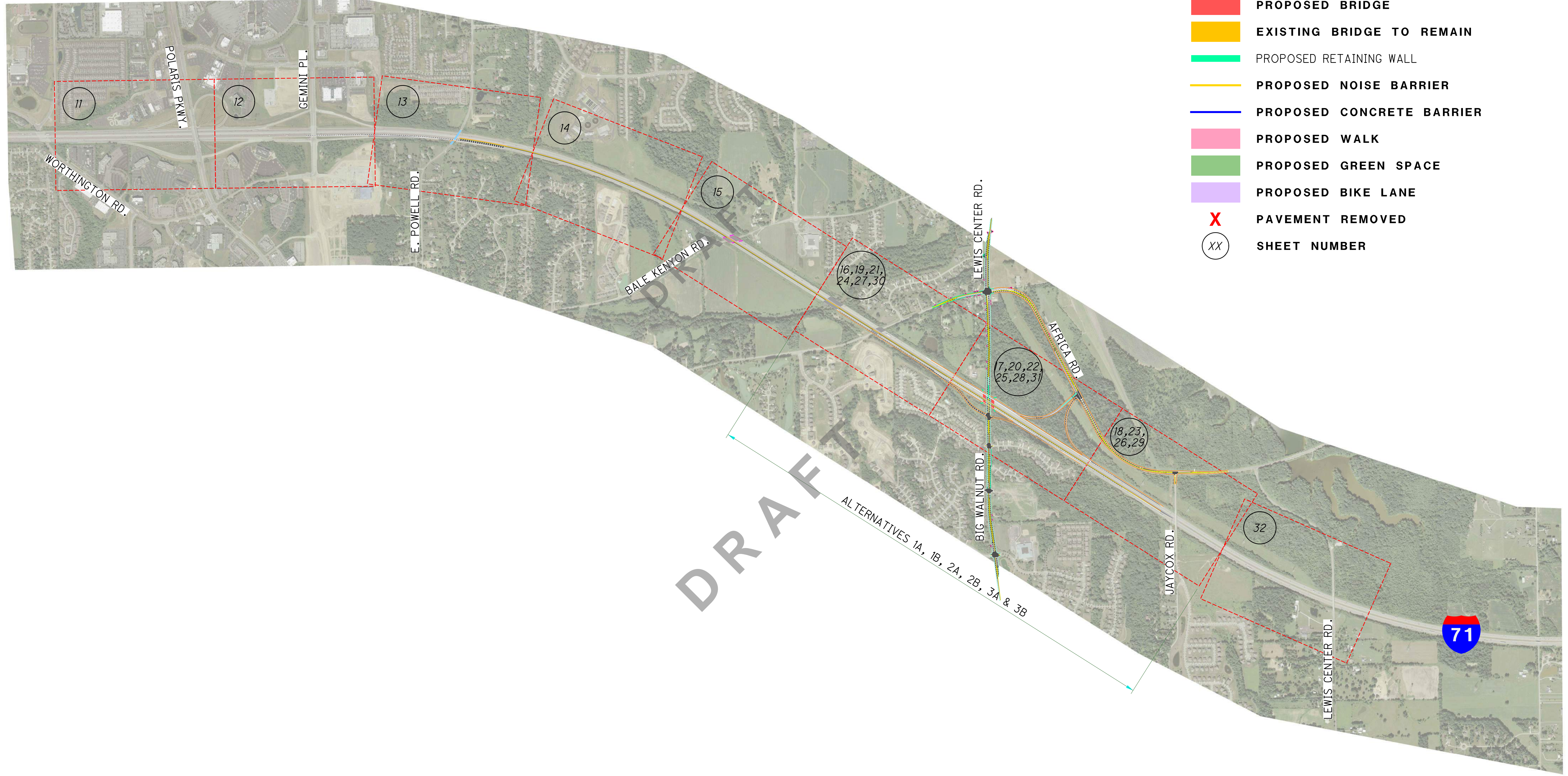










Appendix A
Conceptual Interchange Layouts

DRAFT

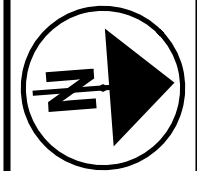


LEGEND

-  EXISTING RIGHT OF WAY / PROPERTY LINE
-  PROPOSED ROADWAY
-  PROPOSED SHOULDER OR MEDIAN
-  PROPOSED BRIDGE
-  EXISTING BRIDGE TO REMAIN
-  PROPOSED RETAINING WALL
-  PROPOSED NOISE BARRIER
-  PROPOSED CONCRETE BARRIER
-  PROPOSED WALK
-  PROPOSED GREEN SPACE
-  PROPOSED BIKE LANE
-  PAVEMENT REMOVED
-  SHEET NUMBER

CALCULATED BY: BLM
 CHECKED BY: PHF

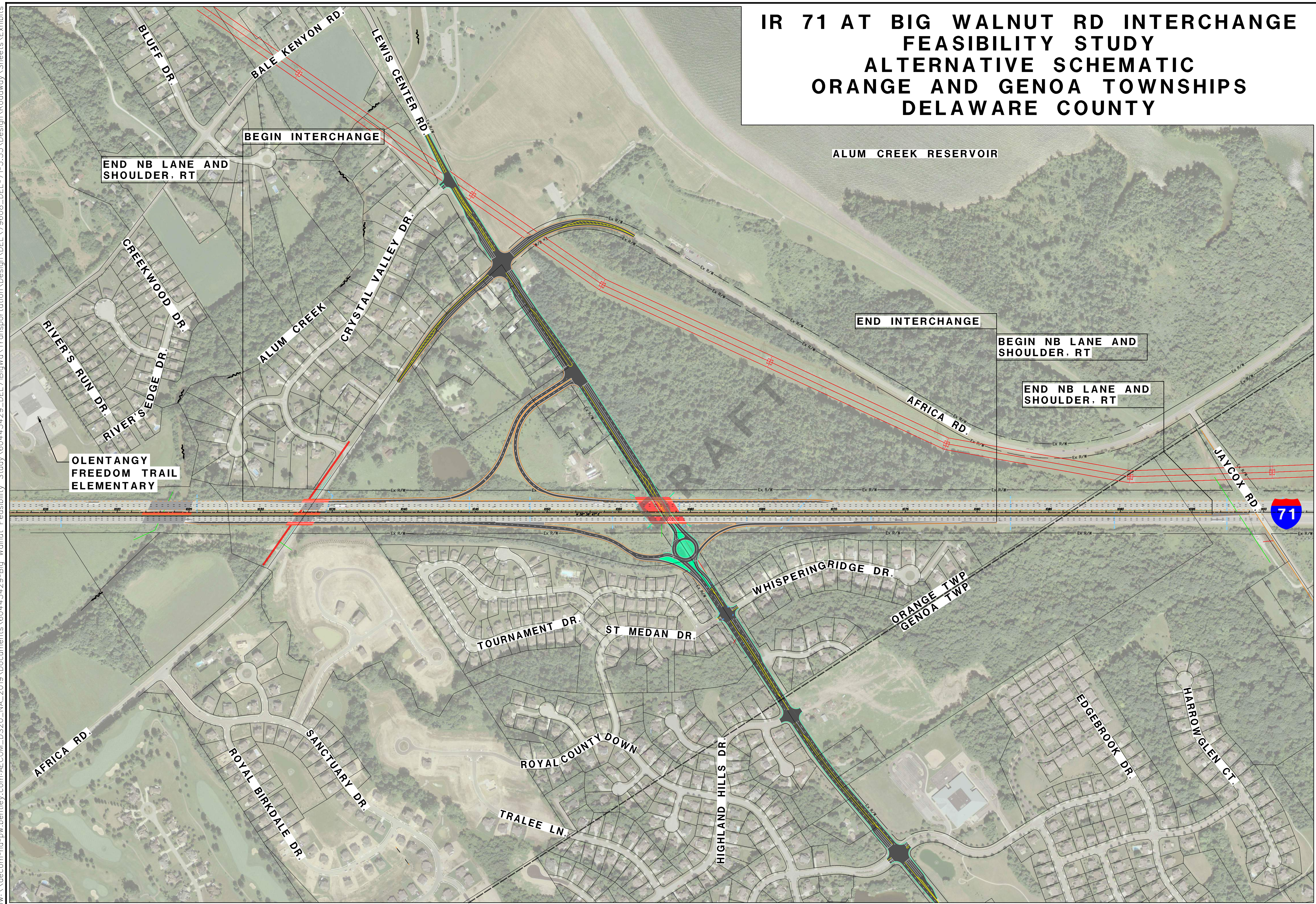
0 1000 2000
 HORIZONTAL SCALE IN FEET



**IR 71 AT BIG WALNUT ROAD INTERCHANGE
 FEASIBILITY STUDY**

DEL-71-03.55

IR 71 AT BIG WALNUT RD INTERCHANGE FEASIBILITY STUDY ALTERNATIVE SCHEMATIC ORANGE AND GENOA TOWNSHIPS DELAWARE COUNTY



CALCULATED BLM CHECKED PHF

0 300 600
HORIZONTAL SCALE IN FEET

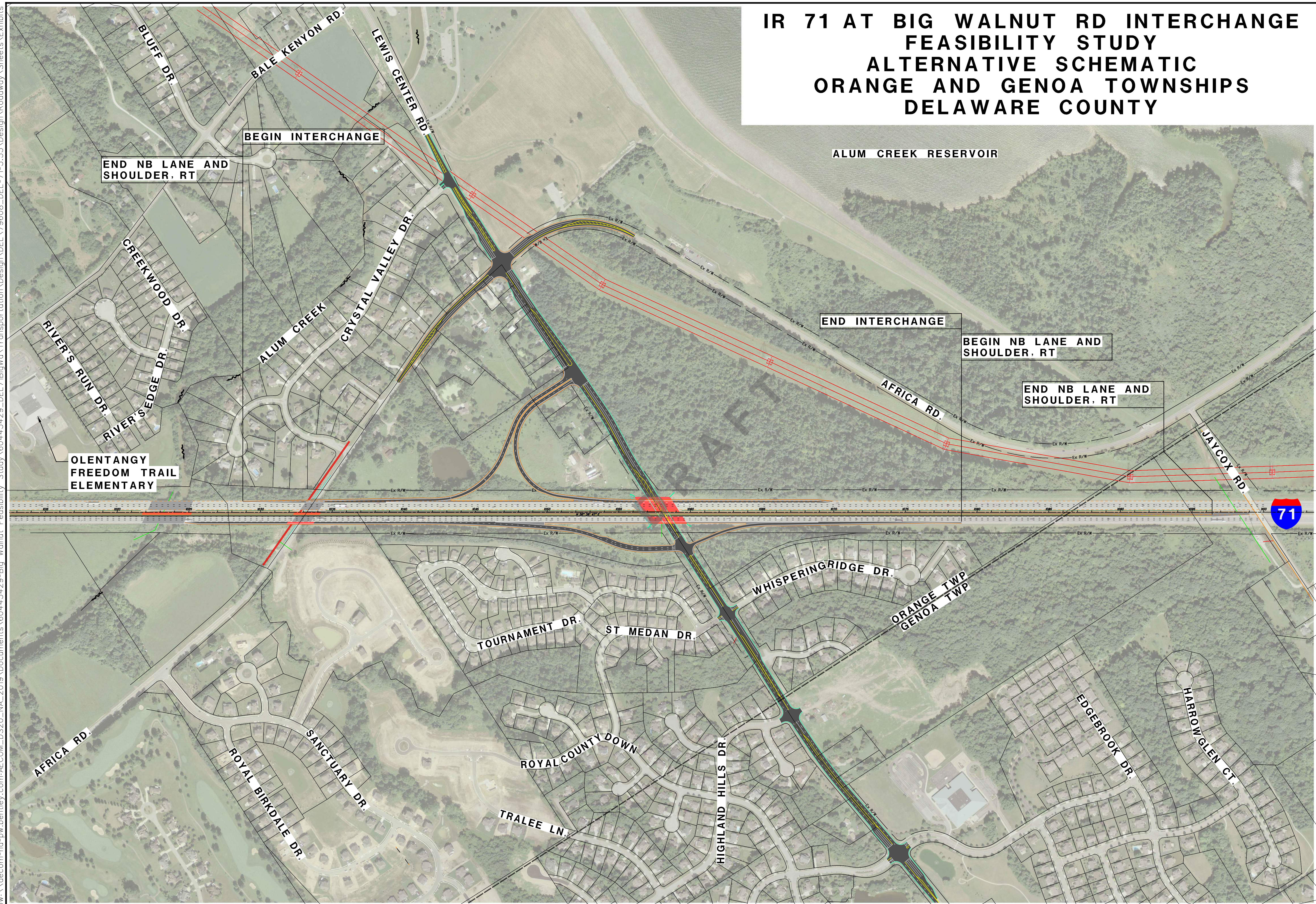
IR 71 AT BIG WALNUT ROAD INTERCHANGE
FEASIBILITY STUDY - ALTERNATE 1A

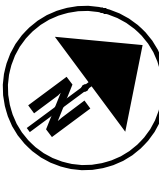

DEL-71-03.55 PID #: 79608

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56

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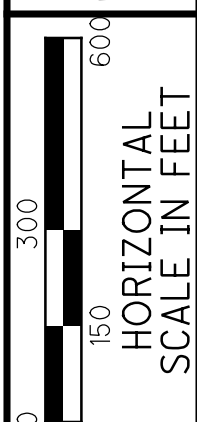
IR 71 AT BIG WALNUT RD INTERCHANGE FEASIBILITY STUDY ALTERNATIVE SCHEMATIC ORANGE AND GENOA TOWNSHIPS DELAWARE COUNTY



				
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CHECKED	PHF			
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DEL-71-03.55 PID #: 79608				
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3				
56				

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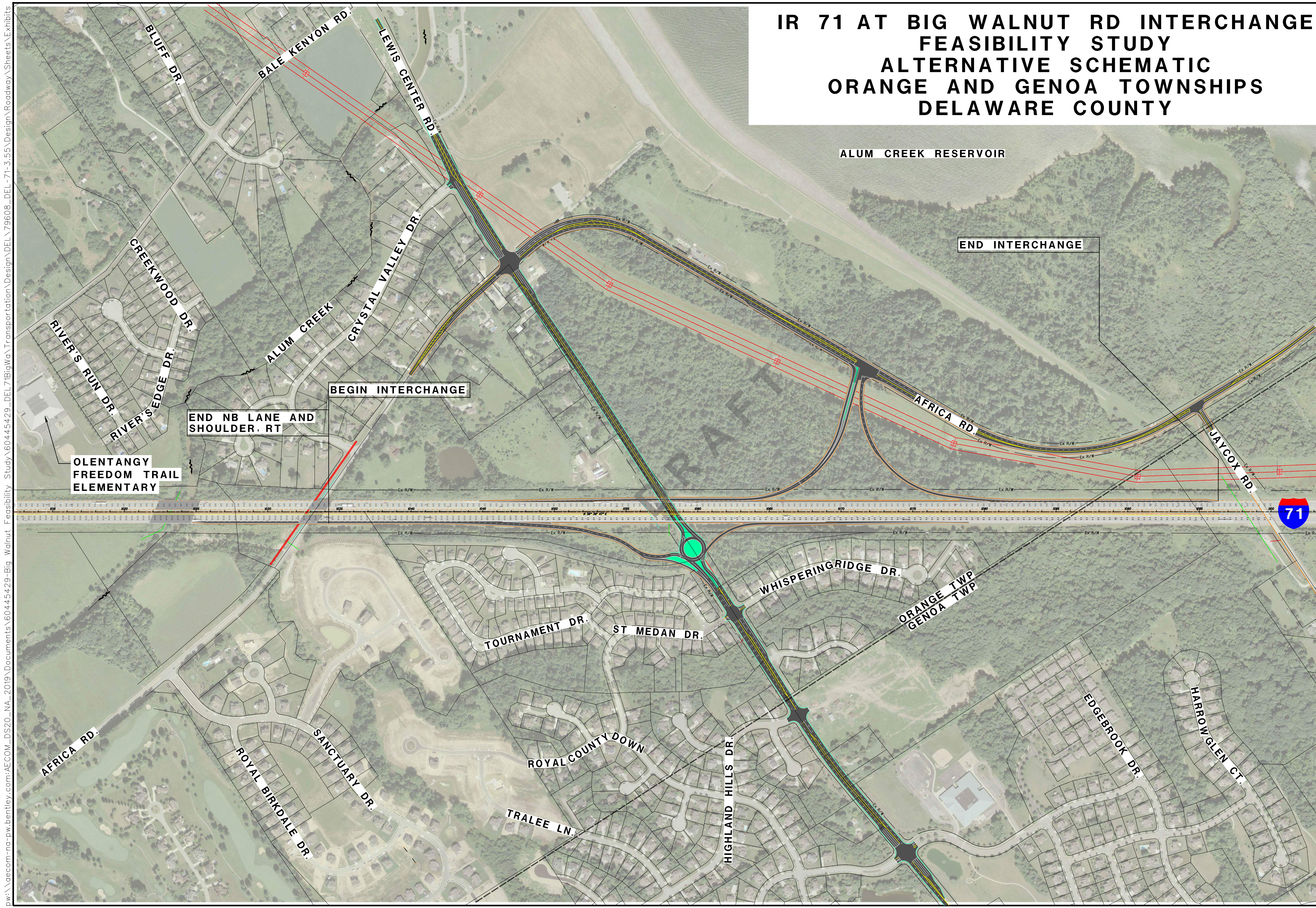


CALCULATED	BLM
CHECKED	PHF

IR 71 AT BIG WALNUT ROAD INTERCHANGE
FEASIBILITY STUDY - ALTERNATE 2A

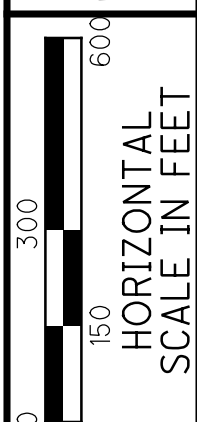
PID #: 79608

DEL-71-03.55



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IR 71 AT BIG WALNUT RD INTERCHANGE FEASIBILITY STUDY ALTERNATIVE SCHEMATIC ORANGE AND GENOA TOWNSHIPS DELAWARE COUNTY

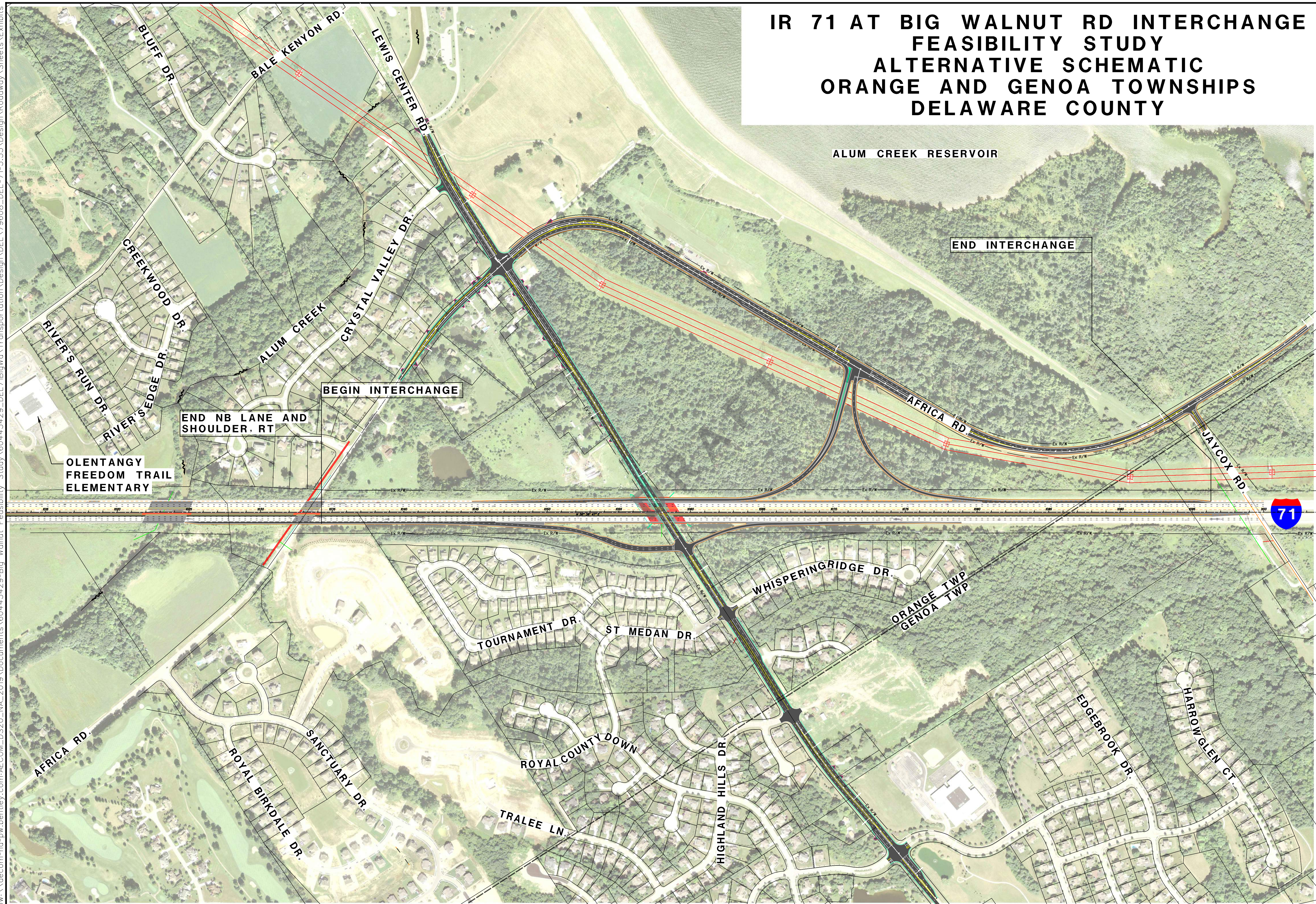


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FEASIBILITY STUDY - ALTERNATE 2B

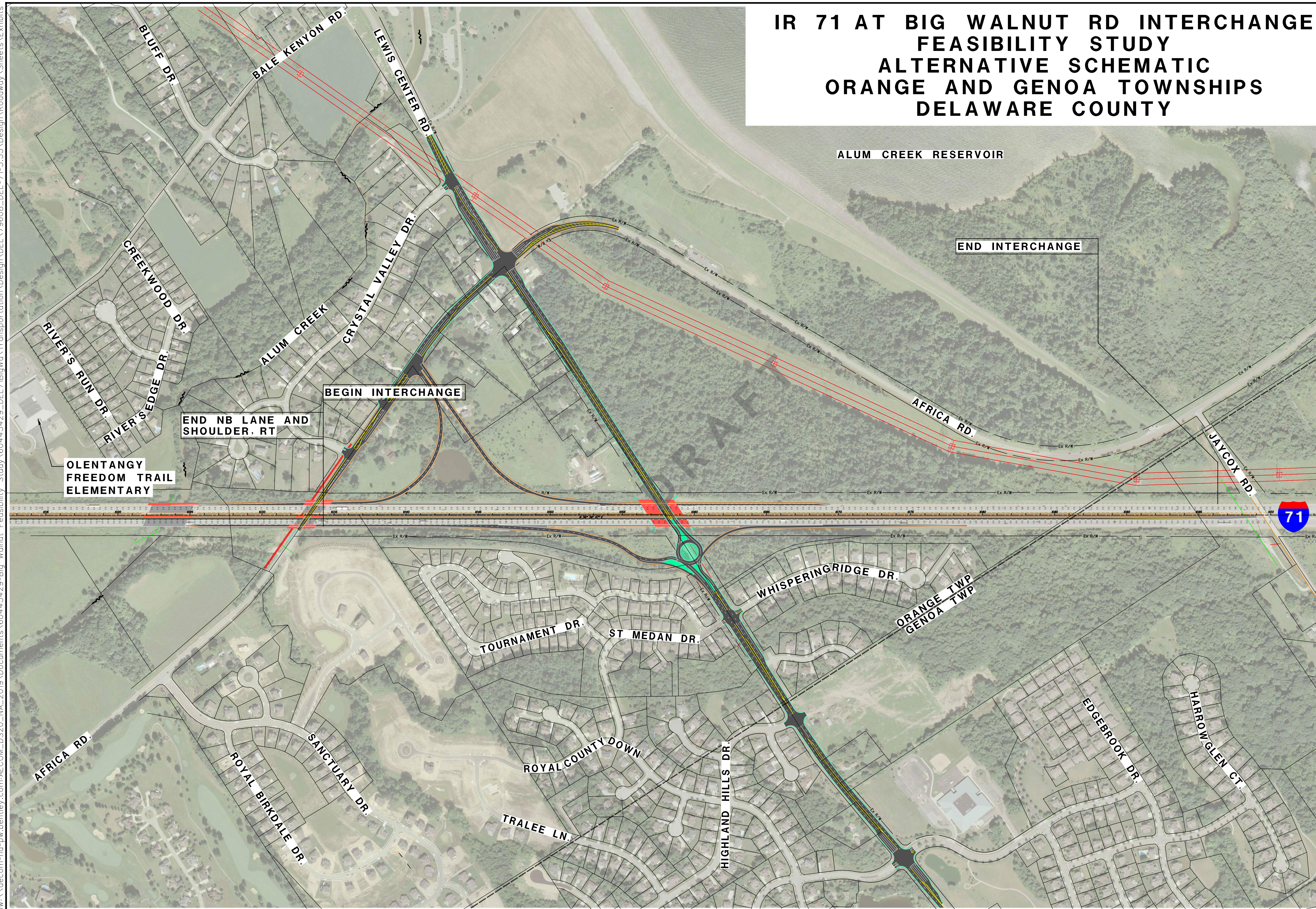
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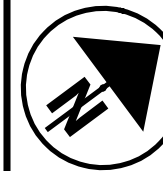
IR 71 AT BIG WALNUT RD INTERCHANGE FEASIBILITY STUDY ALTERNATIVE SCHEMATIC ORANGE AND GENOA TOWNSHIPS DELAWARE COUNTY




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IR 71 AT BIG WALNUT ROAD INTERCHANGE	
FEASIBILITY STUDY - ALTERNATE 3A	
DEL-71-03.55	PID #: 79608

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IR 71 AT BIG WALNUT RD INTERCHANGE FEASIBILITY STUDY ALTERNATIVE SCHEMATIC ORANGE AND GENOA TOWNSHIPS DELAWARE COUNTY



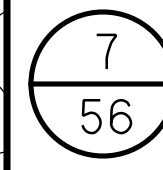


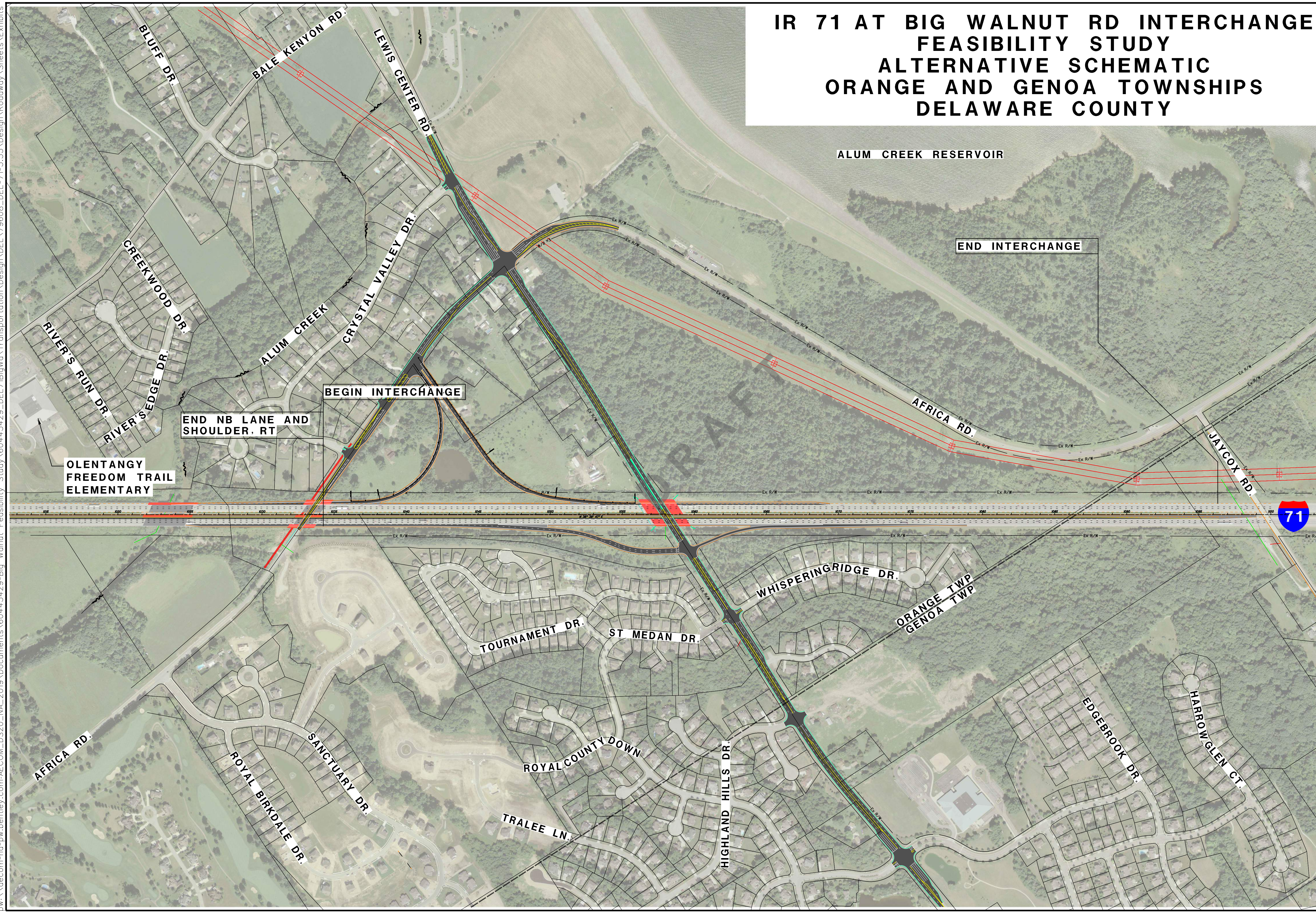
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IR 71 AT BIG WALNUT ROAD INTERCHANGE

FEASIBILITY STUDY - ALTERNATE 3B

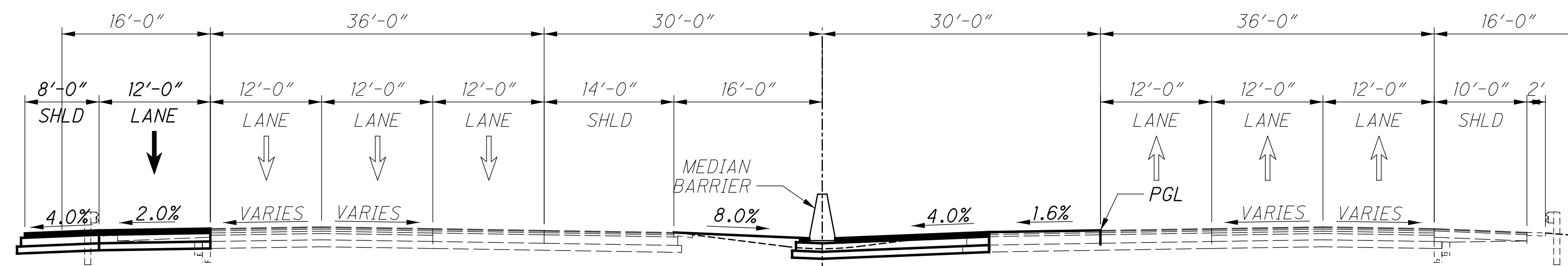
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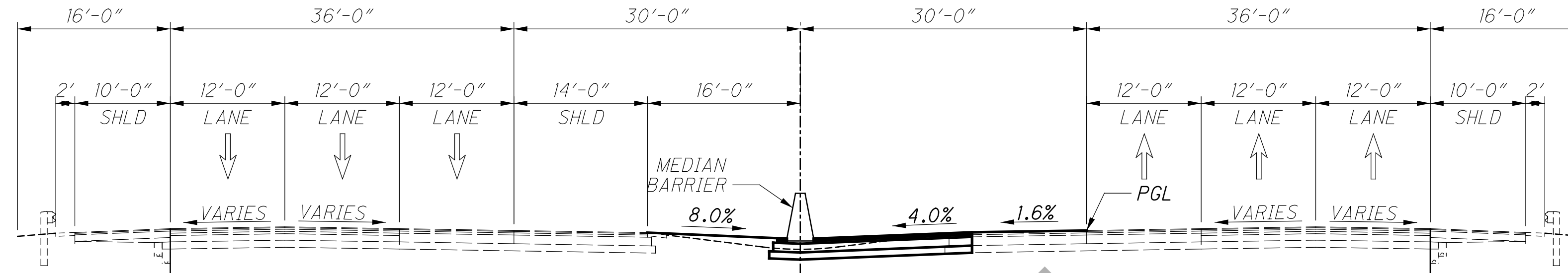


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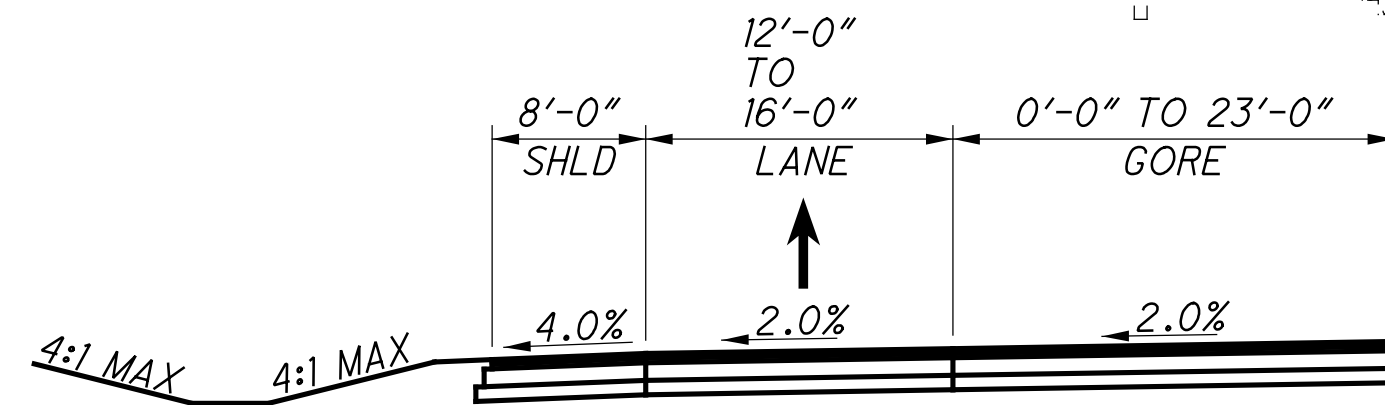
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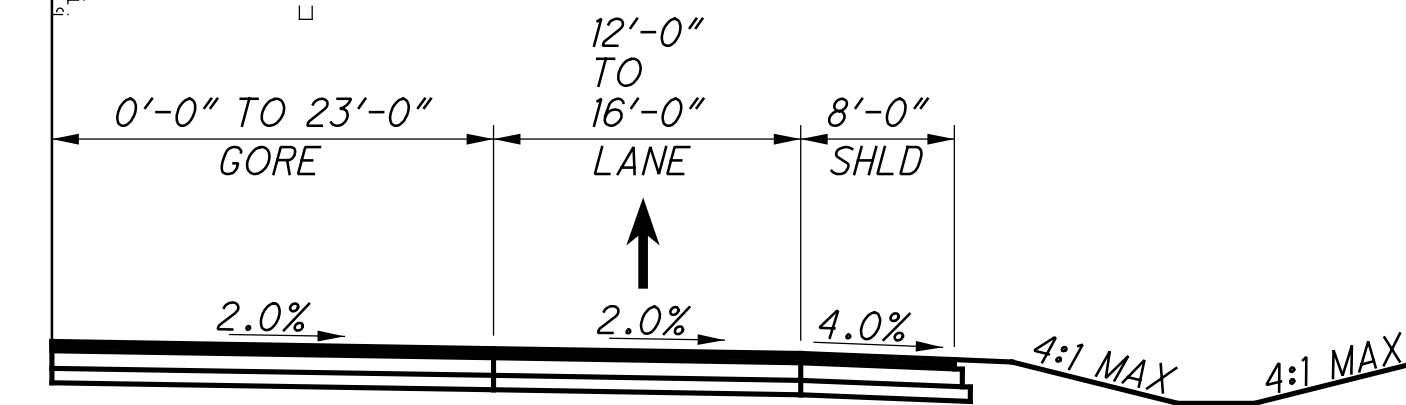
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(STA. 1085+00)



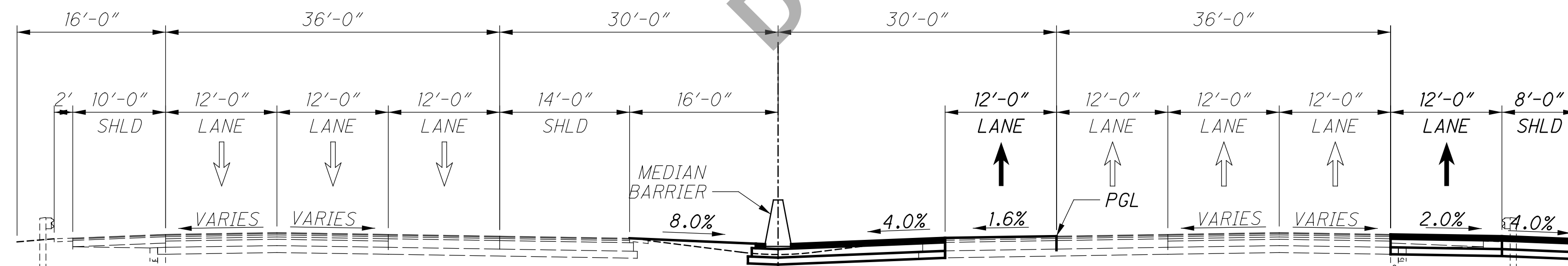
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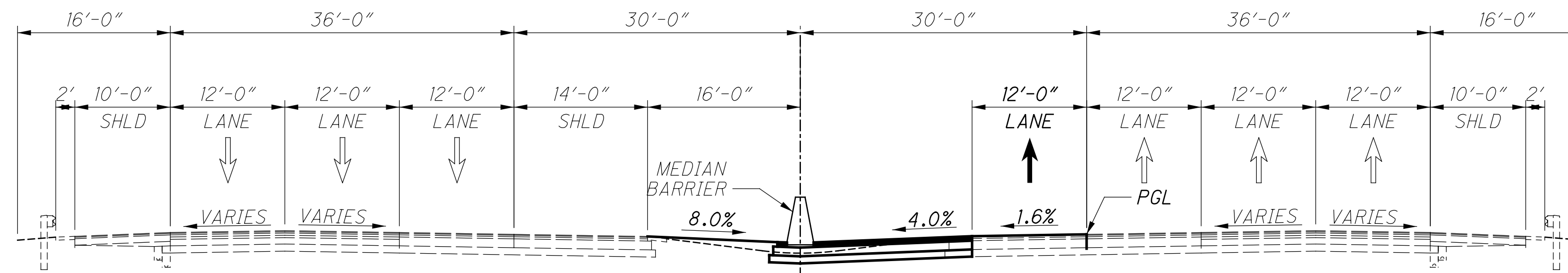
(STA. 1060+00)



(STA. 1067+00)



IR 71 PROPOSED TYPICAL SECTION - NB RAMP
(STA. 1040+00)

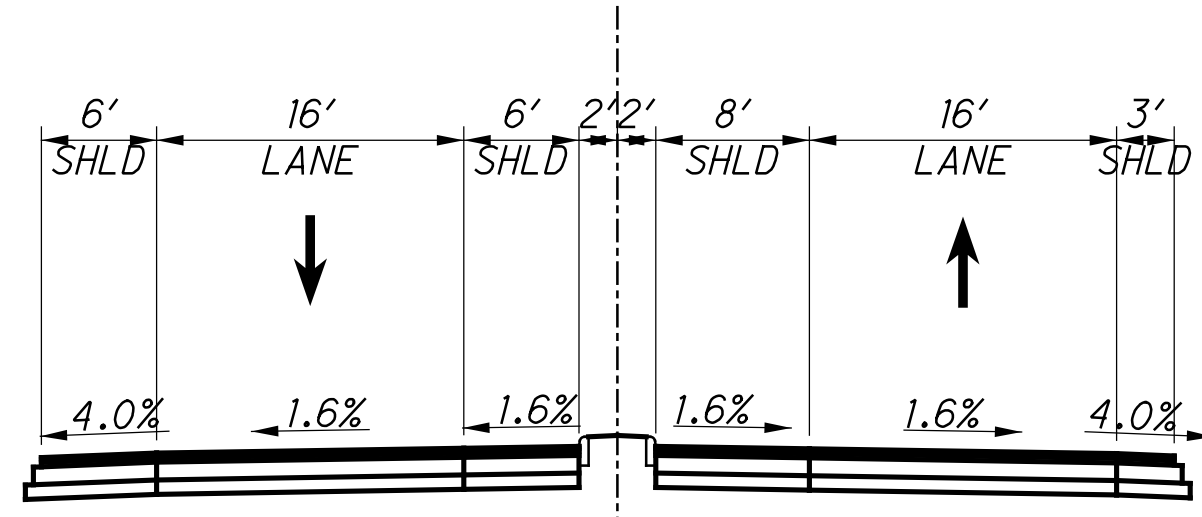


IR 71 PROPOSED TYPICAL SECTION
(STA. 955+20 to 1067+00)

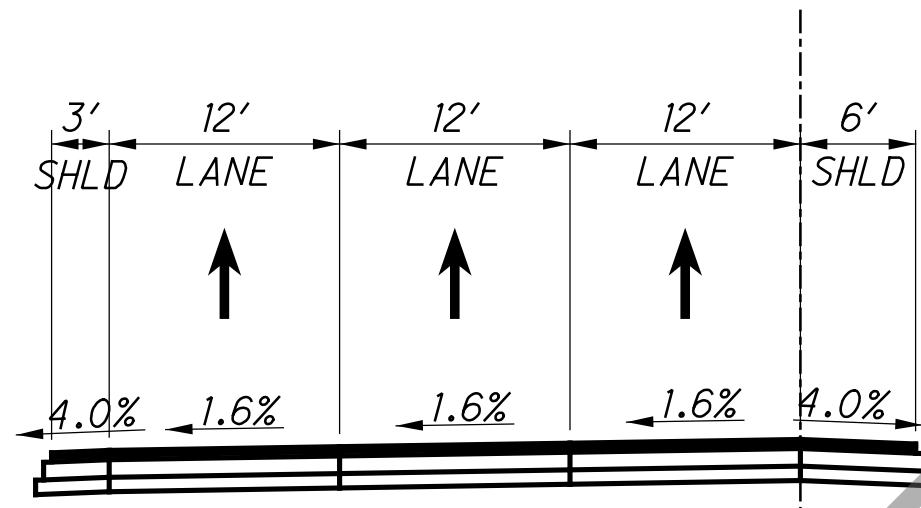
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PHF

TYPICAL SECTIONS - IR 71 MAINLINE

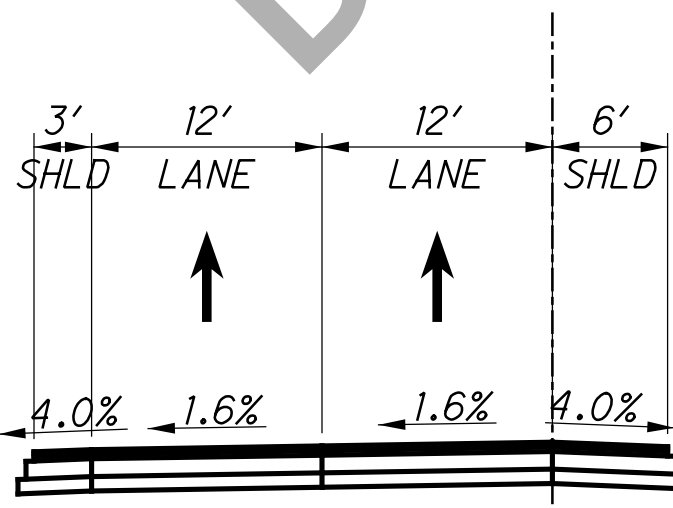
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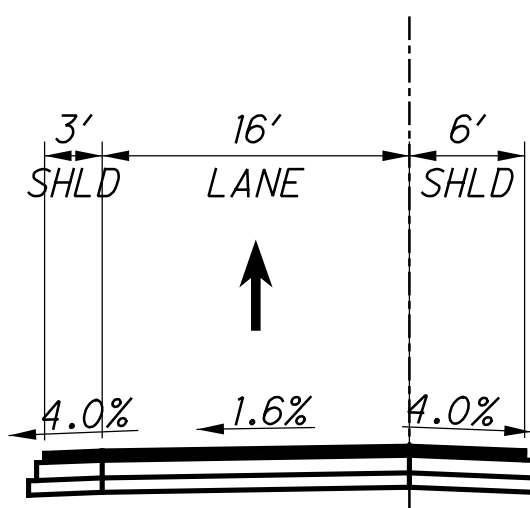
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3-LANE RAMP TYPICAL SECTION



2-LANE RAMP TYPICAL SECTION

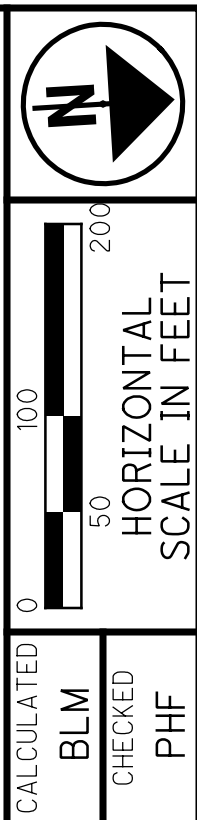


1-LANE RAMP TYPICAL SECTION

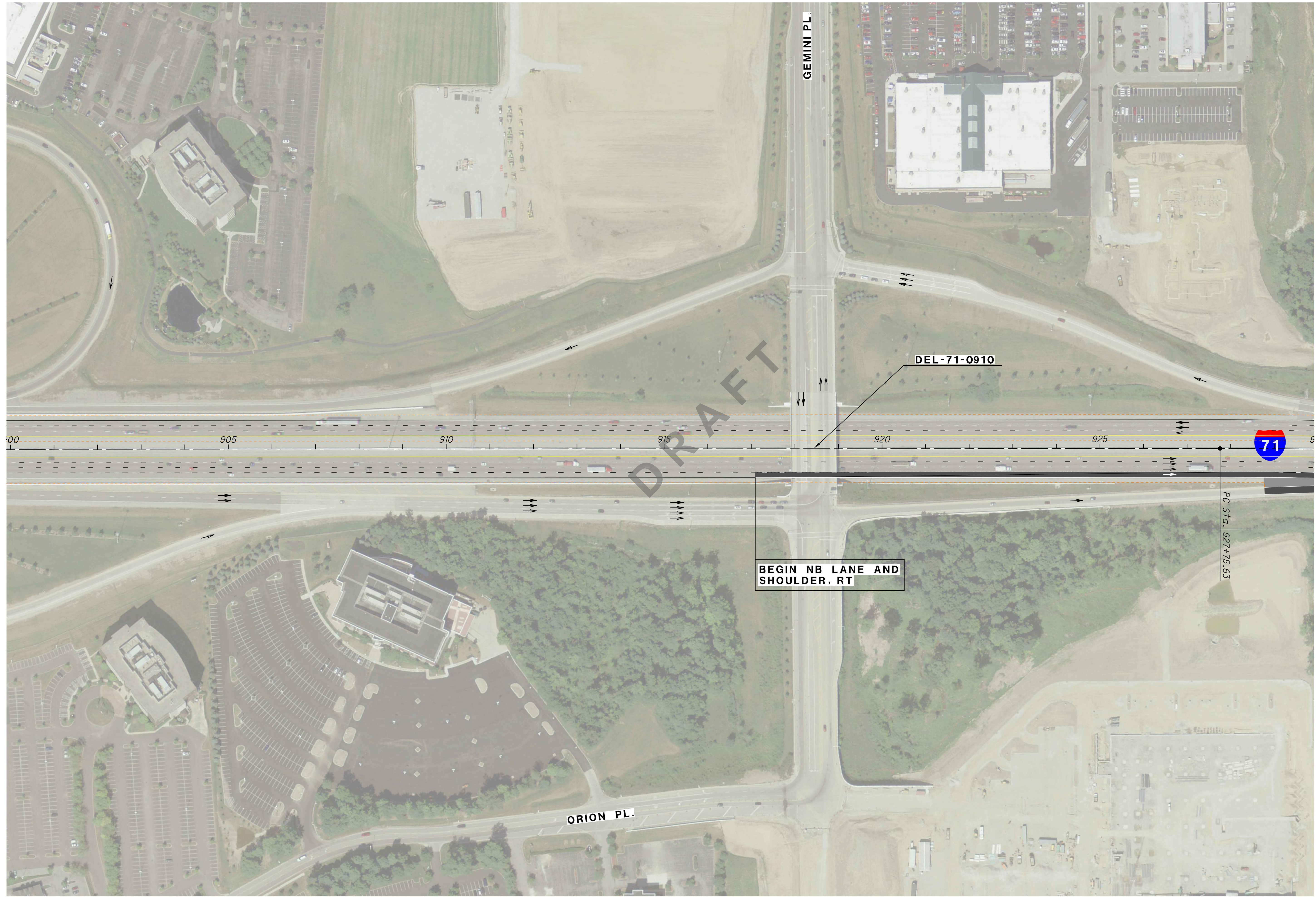
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IR 71 AT BIG WALNUT ROAD INTERCHANGE
FEASIBILITY STUDY





CALCULATED	BLM
CHECKED	PHF

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HORIZONTAL
SCALE IN FEET

**IR 71 AT BIG WALNUT ROAD INTERCHANGE
FEASIBILITY STUDY**

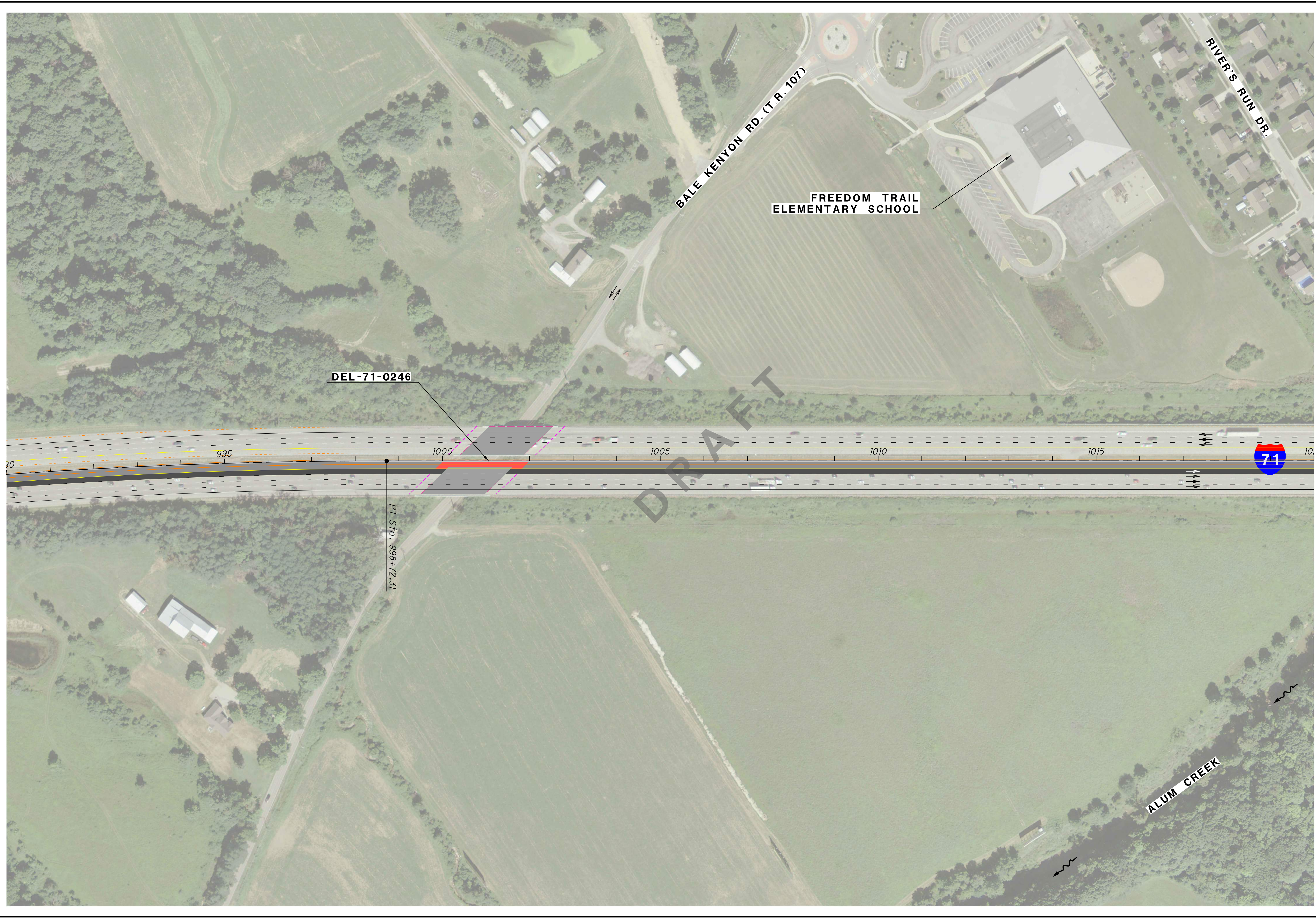
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CALCULATED	BLM
CHECKED	PHF

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FEASIBILITY STUDY**

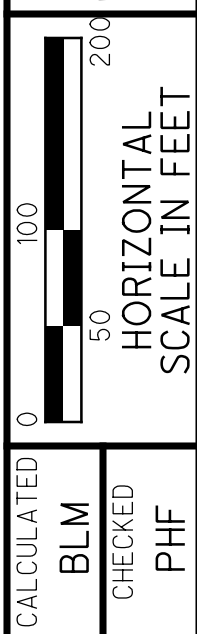
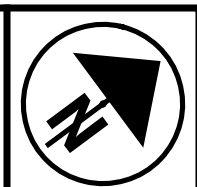
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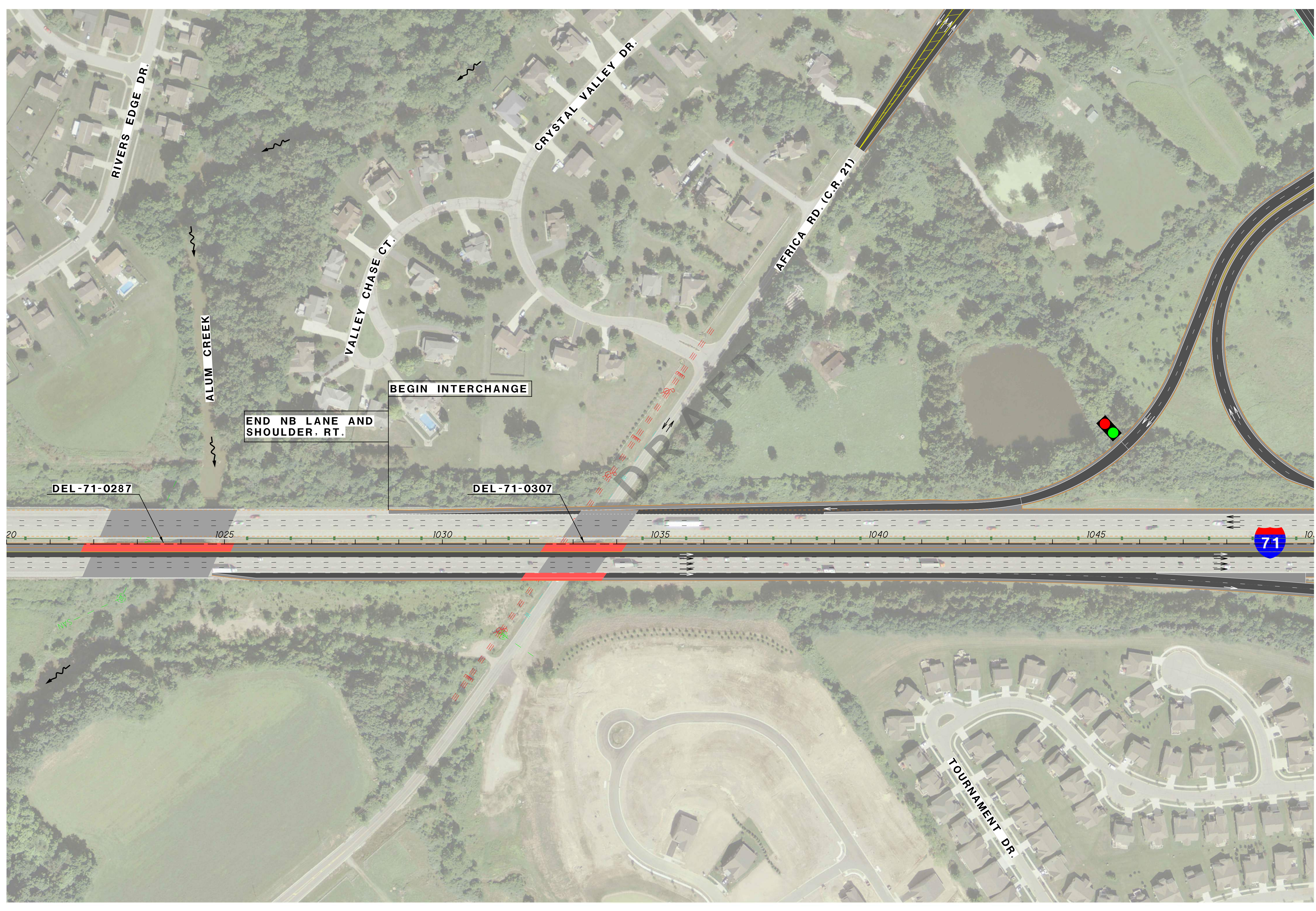


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CHECKED	PHF

IR 71 AT BIG WALNUT ROAD INTERCHANGE
FEASIBILITY STUDY

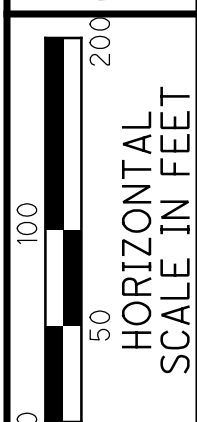
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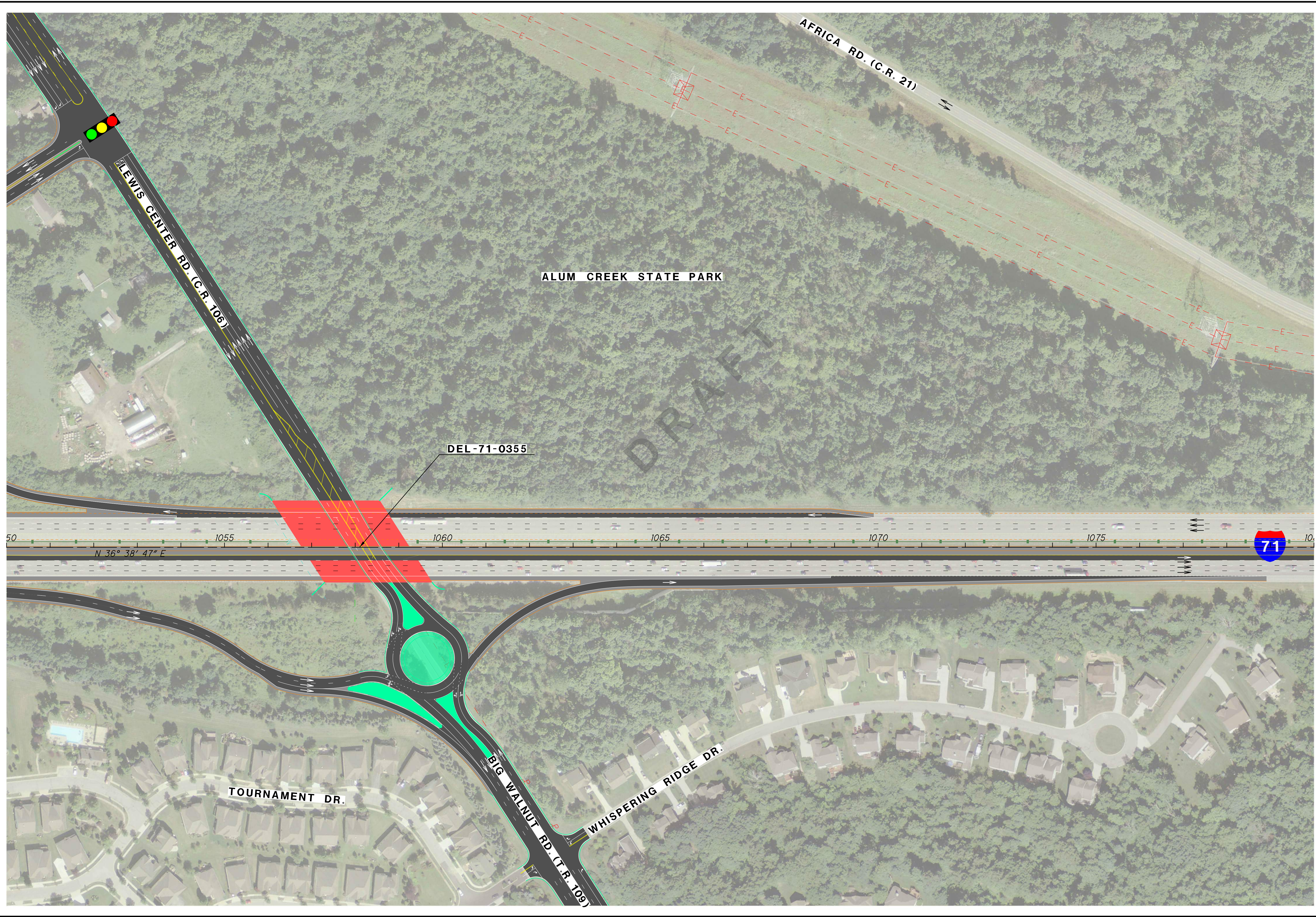


CALCULATED	BLM
CHECKED	PHF

**IR 71 AT BIG WALNUT ROAD INTERCHANGE
FEASIBILITY STUDY - ALTERNATE 1A**



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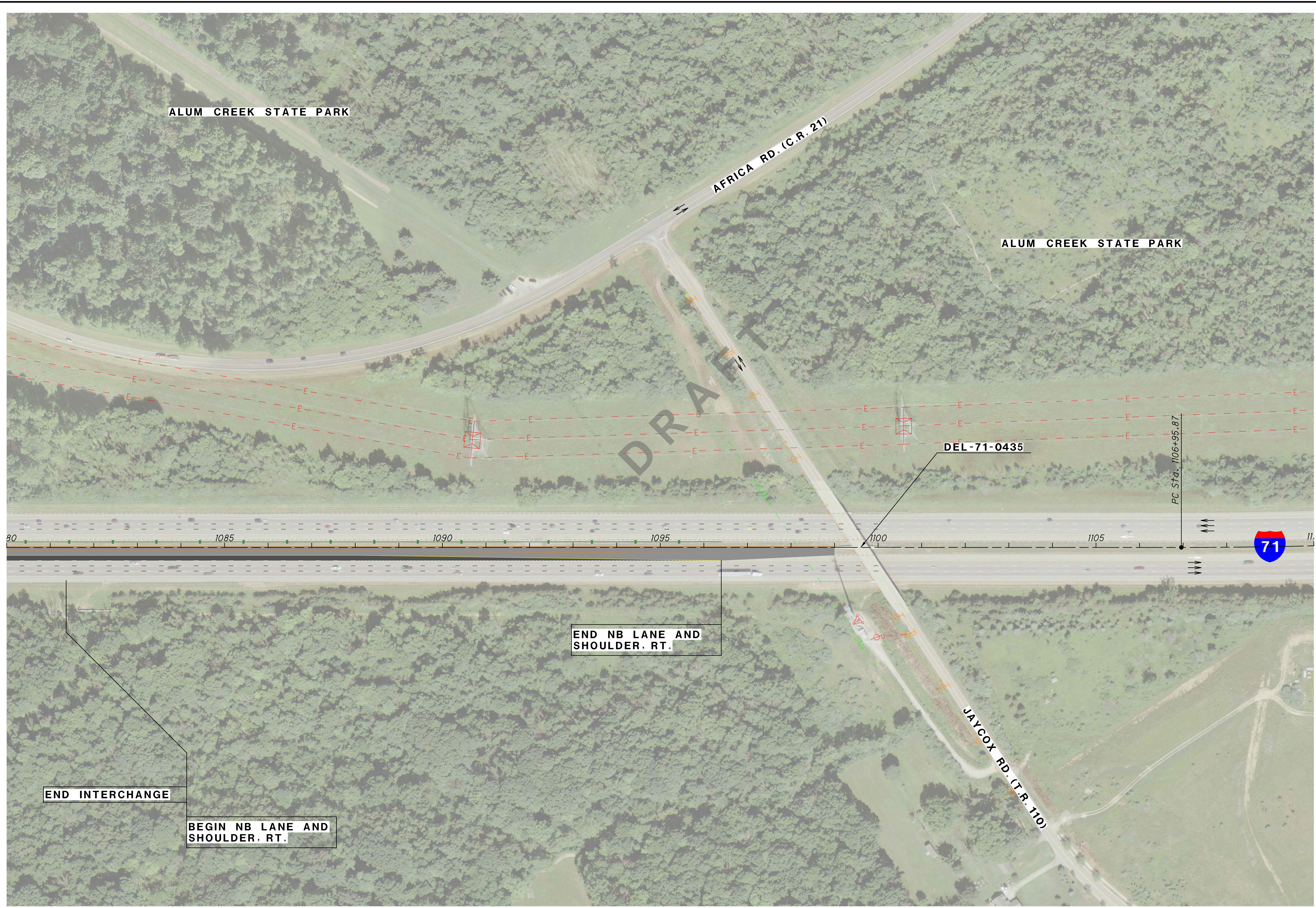
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CHECKED	PHF

IR 71 AT BIG WALNUT ROAD INTERCHANGE
 FEASIBILITY STUDY - ALTERNATE 1A

DEL-71-03.55

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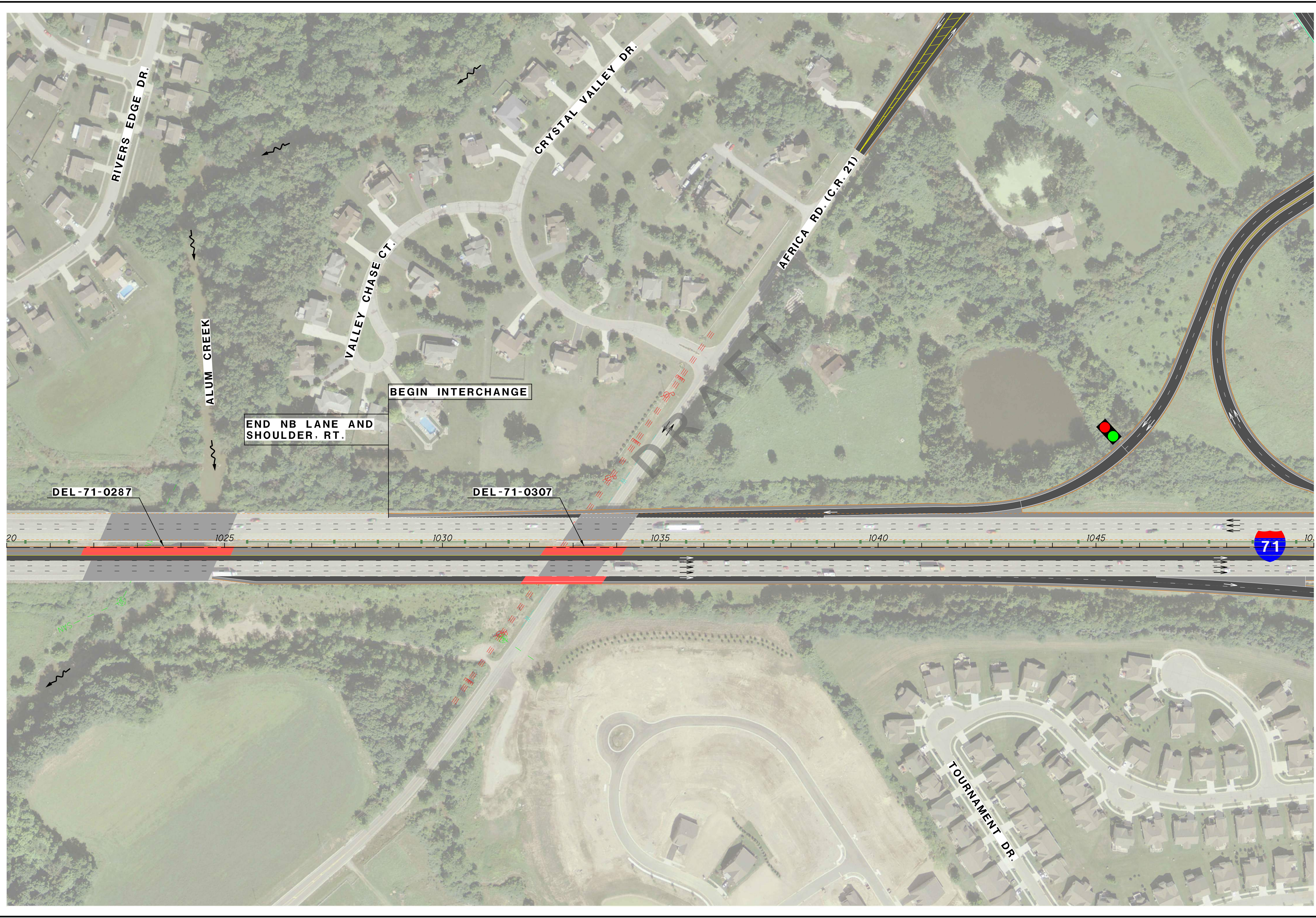


IR 71 AT BIG WALNUT ROAD INTERCHANGE

FEASIBILITY STUDY - ALTERNATE 1A

DEL-71-03.55

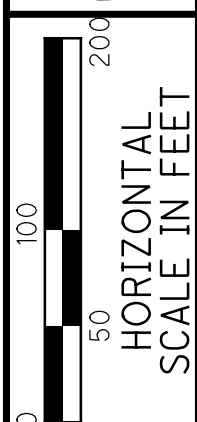
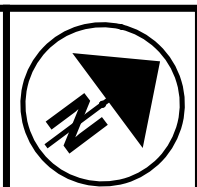
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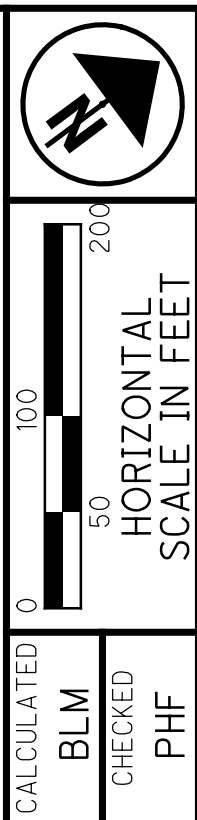
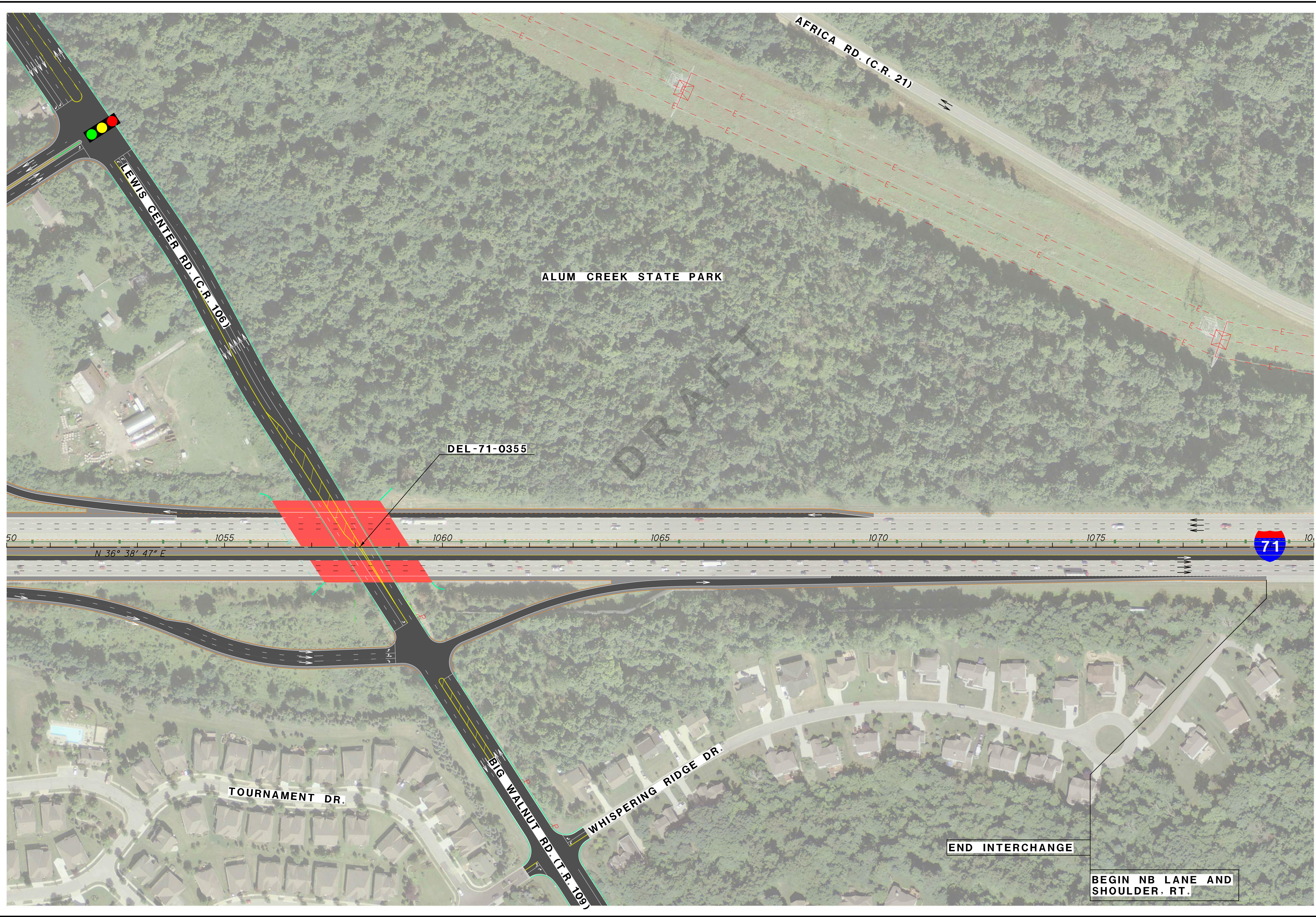
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IR 71 AT BIG WALNUT ROAD INTERCHANGE
 FEASIBILITY STUDY - ALTERNATE 1B

DEL-71-03.55



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CALCULATED BLM
 CHECKED PHF

IR 71 AT BIG WALNUT ROAD INTERCHANGE
FEASIBILITY STUDY - ALTERNATE 1B

DEL-71-03.55

20
 56

DEL-71-0355

ALUM CREEK STATE PARK

DRAFT



END INTERCHANGE

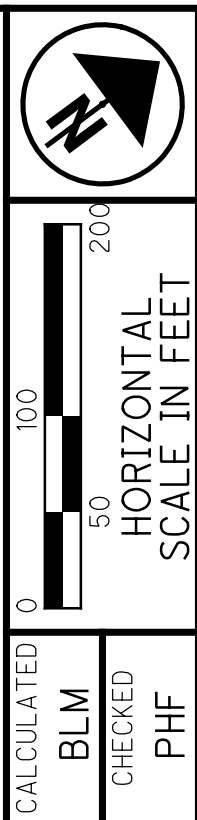
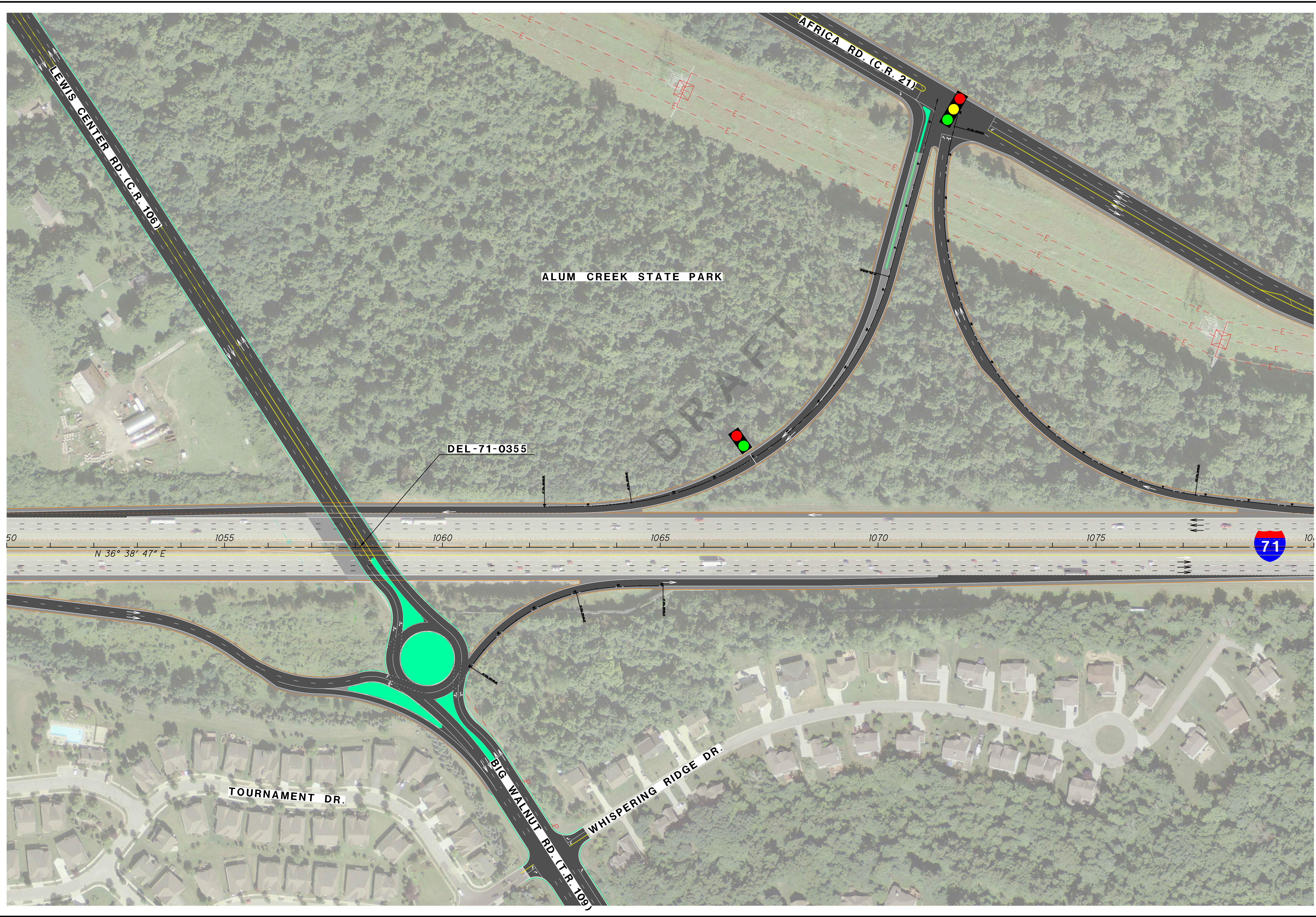
BEGIN NB LANE AND SHOULDER, RT.



CALCULATED	BLM
CHECKED	PHF

0 100 200
HORIZONTAL SCALE IN FEET

**IR 71 AT BIG WALNUT ROAD INTERCHANGE
FEASIBILITY STUDY - ALTERNATE 2A**



CALCULATED BLM
 CHECKED PHF

IR 71 AT BIG WALNUT ROAD INTERCHANGE
FEASIBILITY STUDY - ALTERNATE 2A

DEL-71-03.55

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 56

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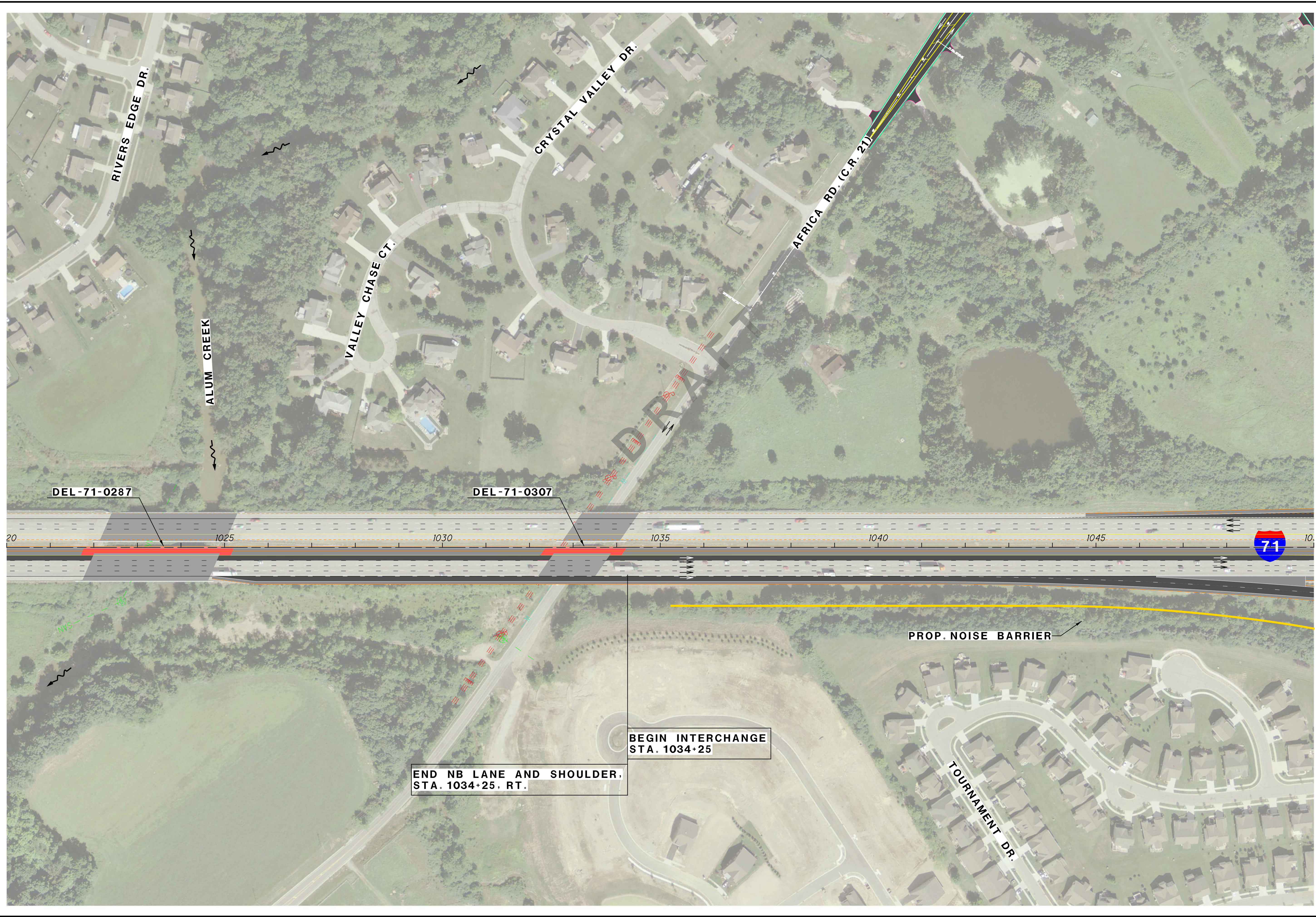


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CHECKED	PHF

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HORIZONTAL SCALE IN FEET

**IR 71 AT BIG WALNUT ROAD INTERCHANGE
FEASIBILITY STUDY - ALTERNATE 2A**

DEL-71-03.55



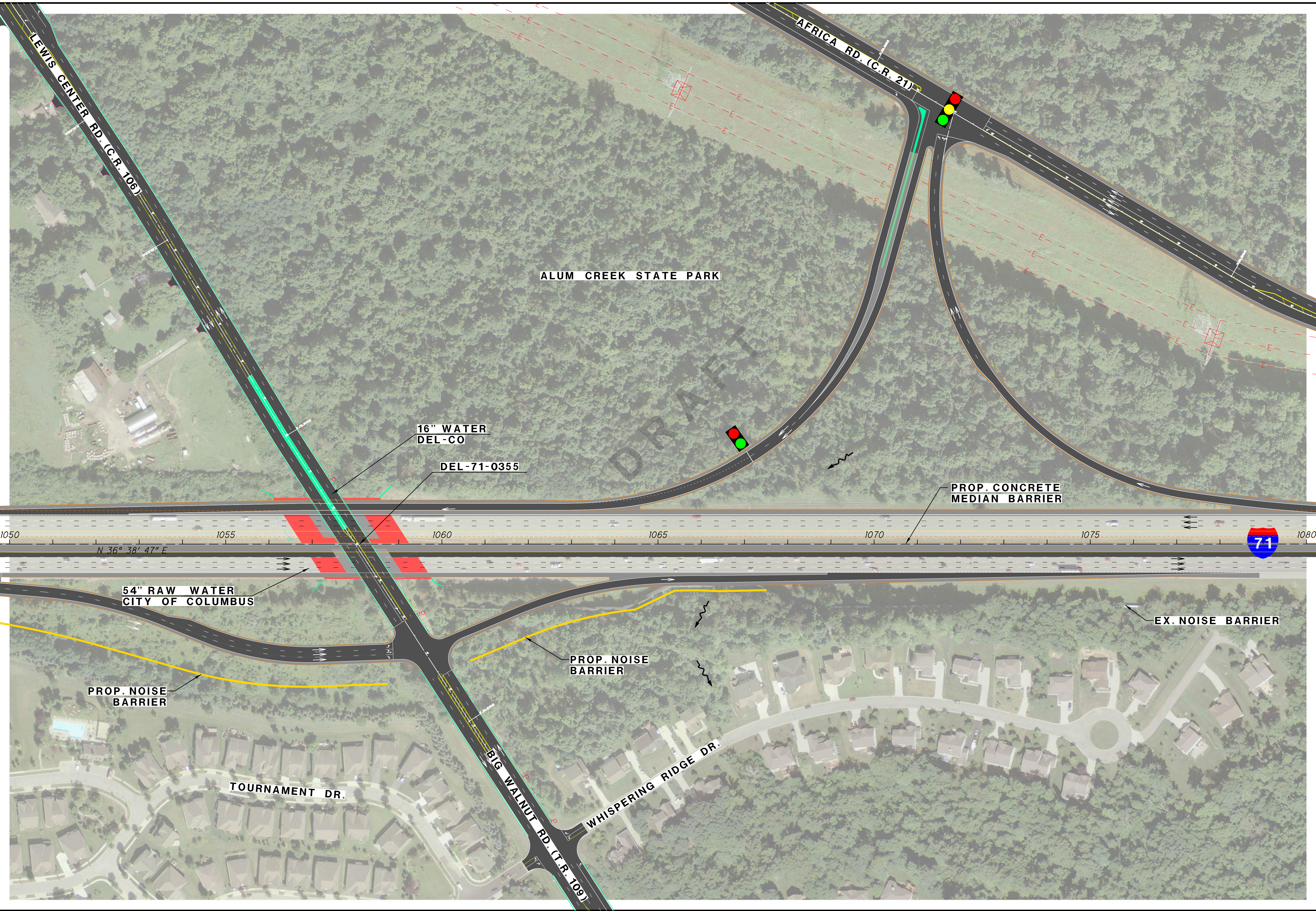
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BLM
CHECKED
PHF

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HORIZONTAL
SCALE IN FEET

**IR 71 AT BIG WALNUT ROAD INTERCHANGE
FEASIBILITY STUDY - ALTERNATE 2B**

DEL-71-03.55

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CHECKED	PHF

IR 71 AT BIG WALNUT ROAD INTERCHANGE
FEASIBILITY STUDY - ALTERNATE 2B

DEL-71-03.55

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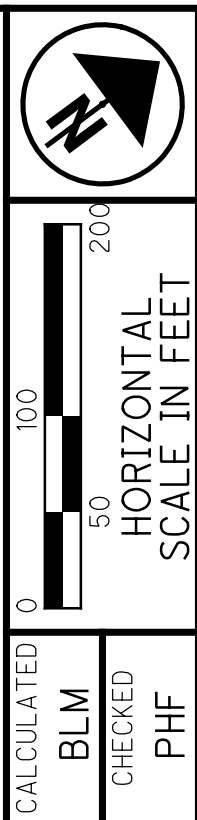
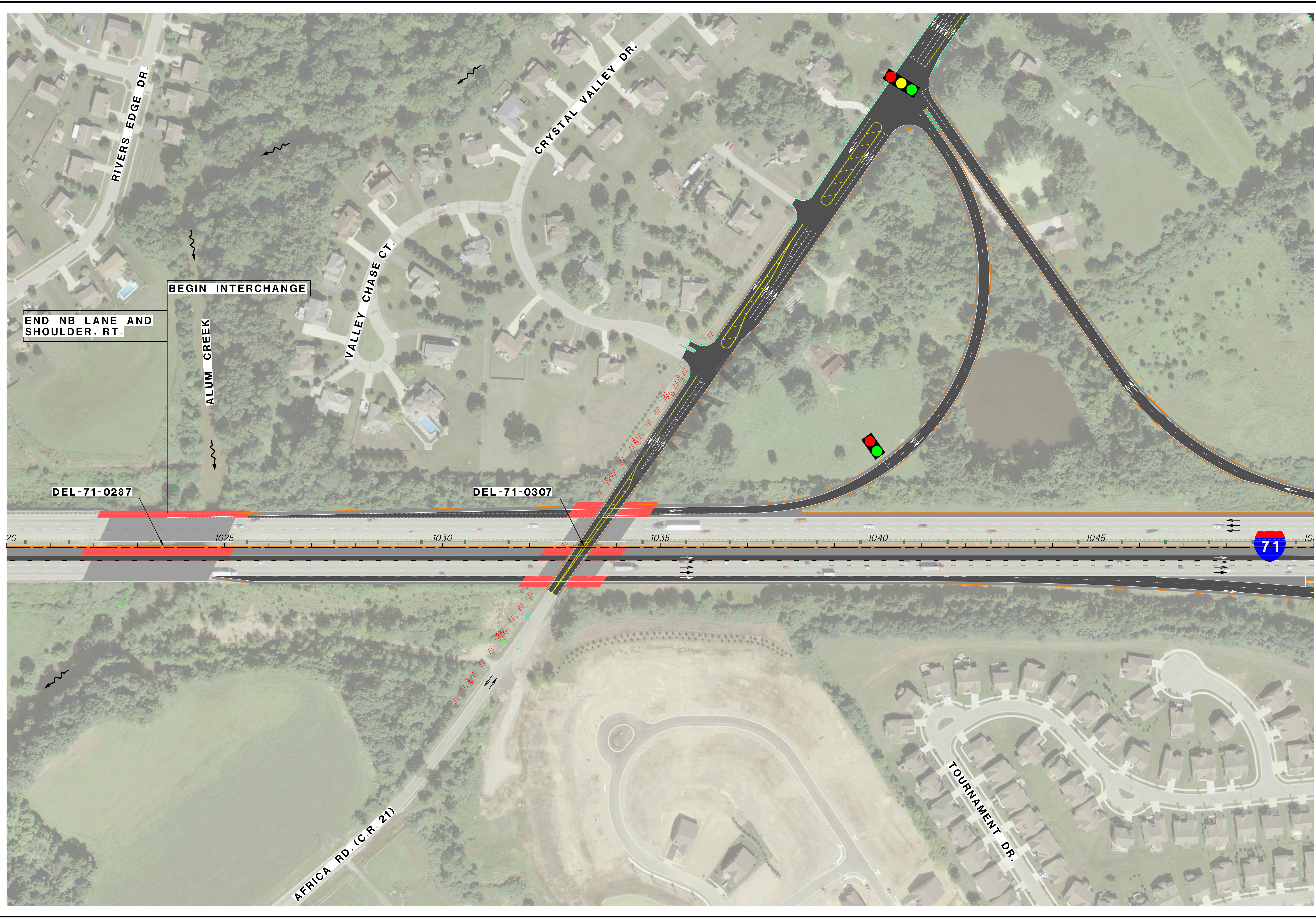


CALCULATED	BLM
CHECKED	PHF

0 100 200
HORIZONTAL SCALE IN FEET

**IR 71 AT BIG WALNUT ROAD INTERCHANGE
FEASIBILITY STUDY - ALTERNATE 2B**

DEL-71-03.55



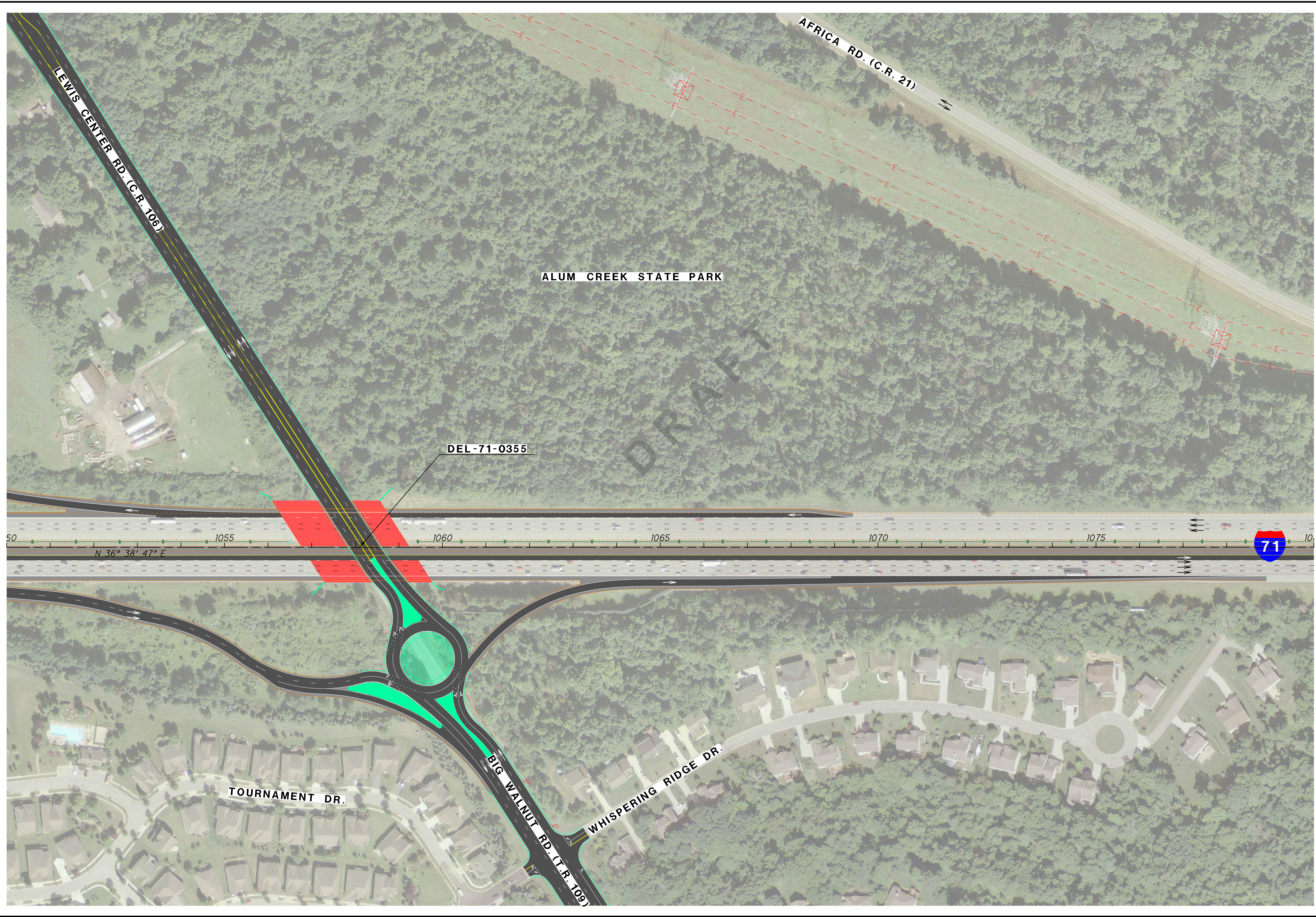
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**IR 71 AT BIG WALNUT ROAD INTERCHANGE
FEASIBILITY STUDY - ALTERNATE 3A**

DEL-71-03.55

27
56

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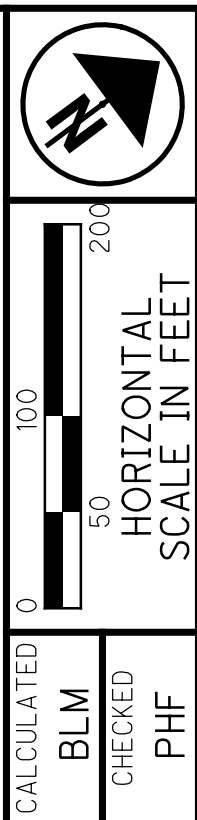
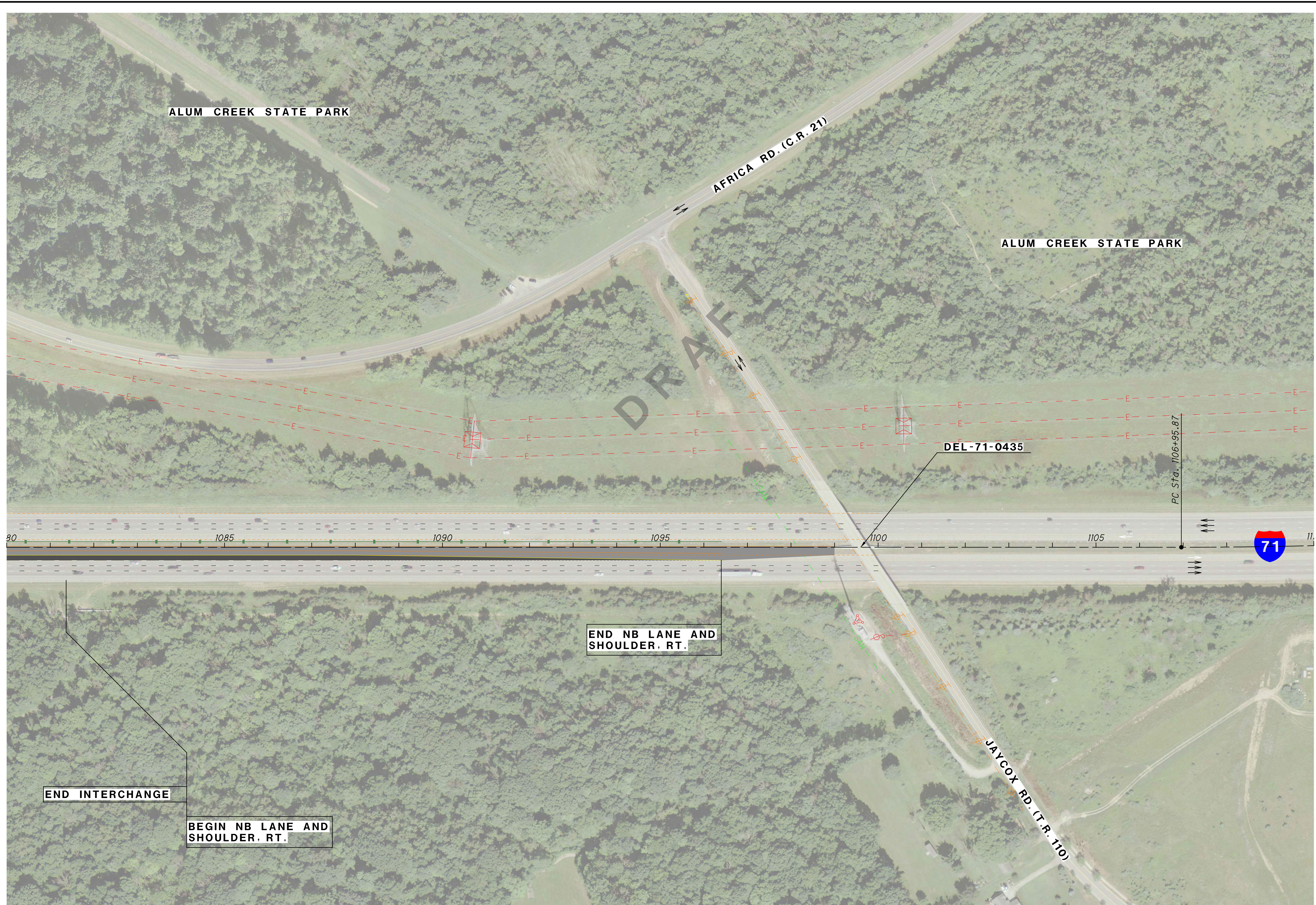


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CHECKED	PHF

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FEASIBILITY STUDY - ALTERNATE 3A

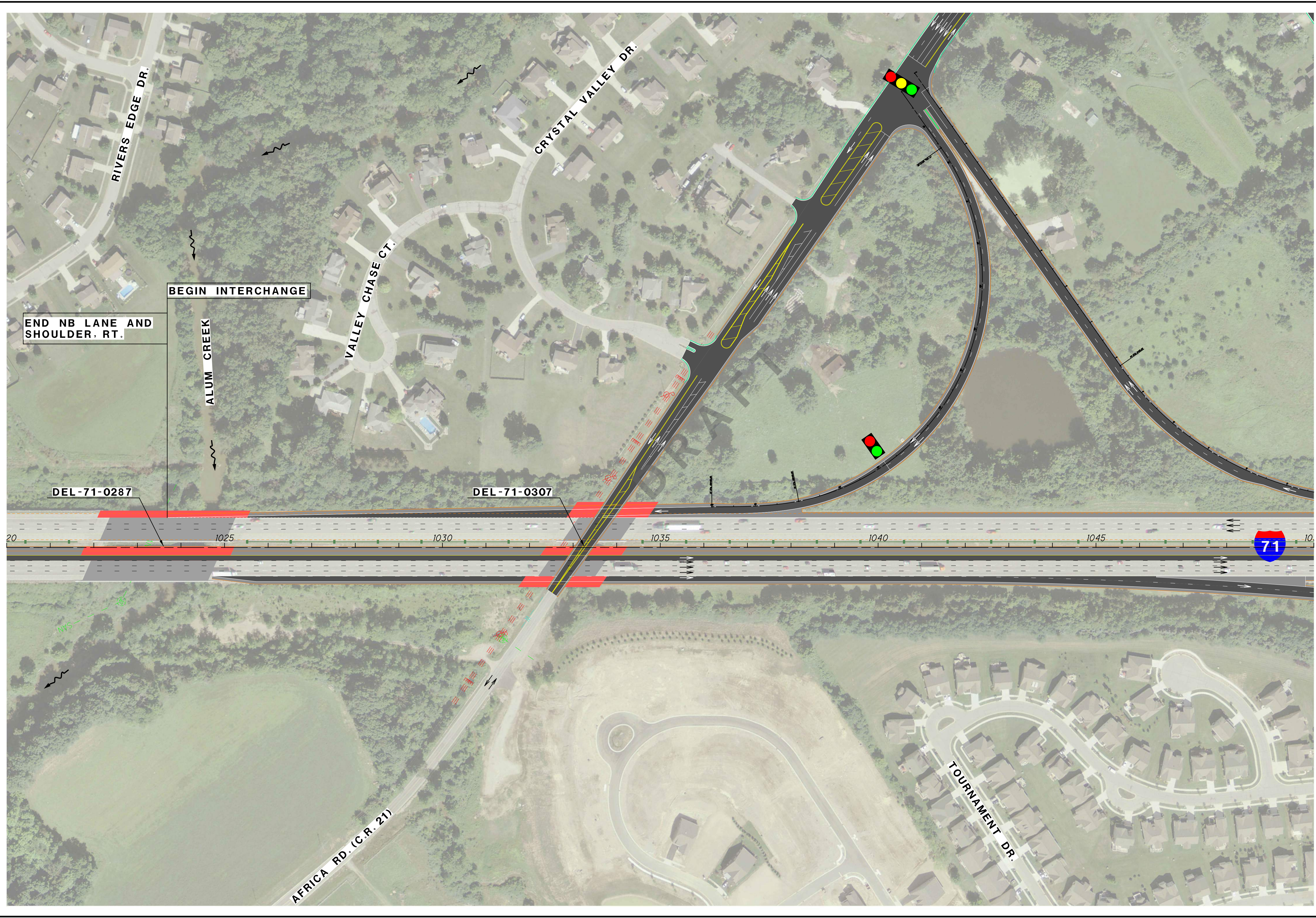
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**IR 71 AT BIG WALNUT ROAD INTERCHANGE
FEASIBILITY STUDY - ALTERNATE 3A**

DEL-71-03.55

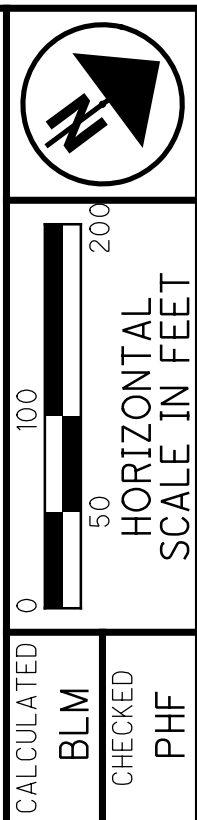


END NB LANE AND SHOULDER, RT.

BEGIN INTERCHANGE

DEL-71-0287

DEL-71-0307

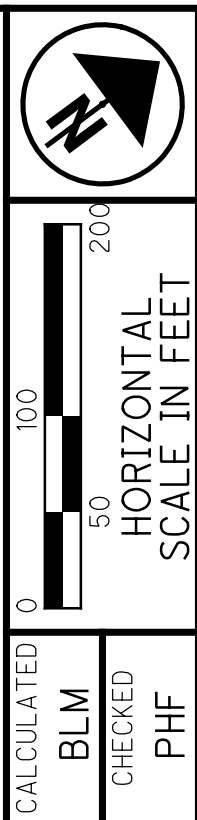
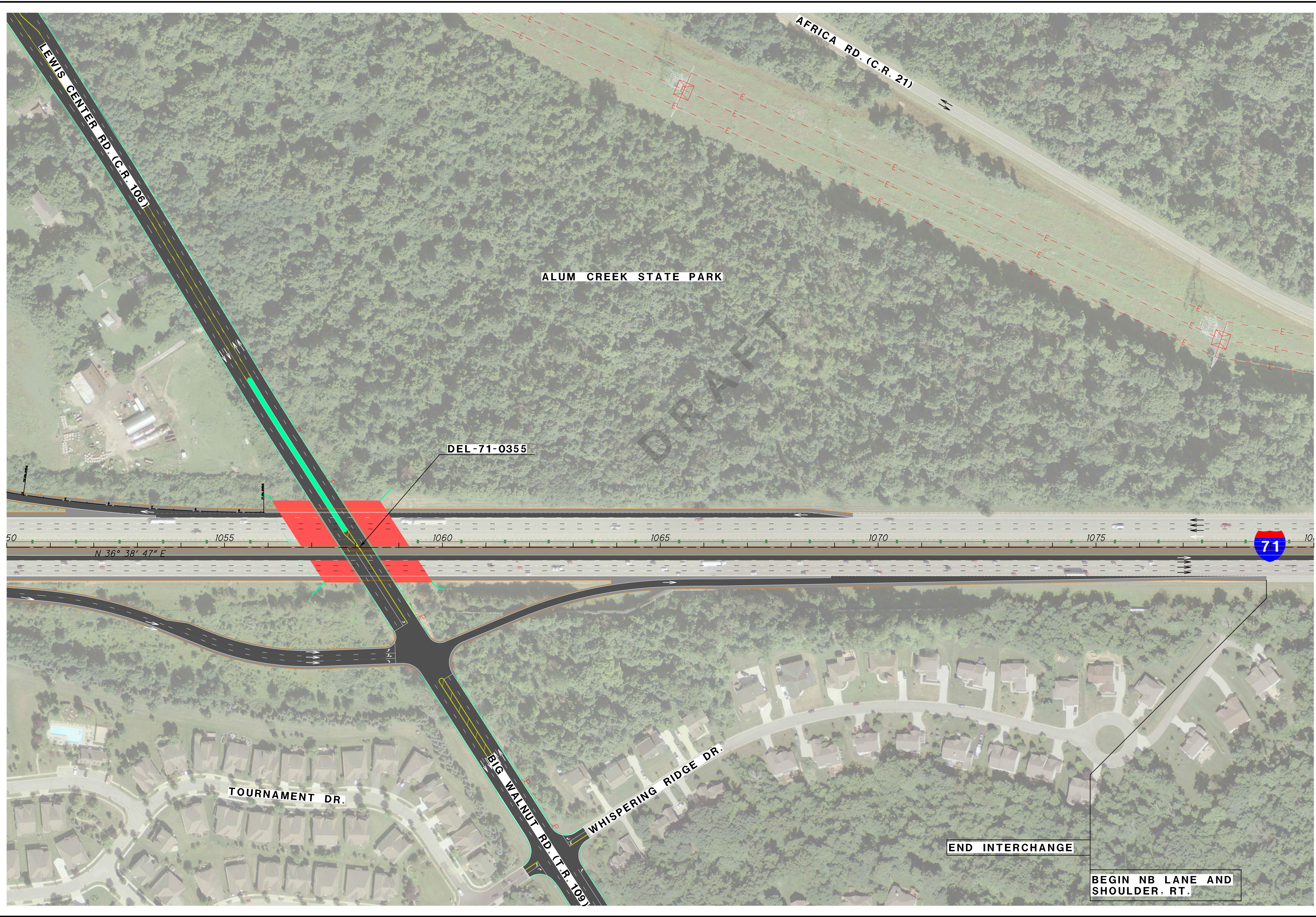


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IR 71 AT BIG WALNUT ROAD INTERCHANGE
FEASIBILITY STUDY - ALTERNATE 3B

DEL-71-03.55

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CALCULATED
 BLM
 CHECKED
 PHF

IR 71 AT BIG WALNUT ROAD INTERCHANGE
FEASIBILITY STUDY - ALTERNATE 3B

DEL-71-03.55

31
 56

ALUM CREEK STATE PARK

DEL-71-0355

N 36° 38' 47" E

1055

1060

1065

1070

1075

1080

TOURNAMENT DR.

BIG WALNUT RD. (C.R. 709)

WHISPERING RIDGE DR.

AFRICA RD. (C.R. 21)

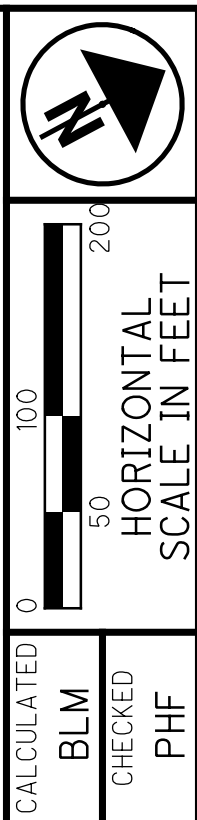
LEWIS CENTER RD. (C.R. 106)

END INTERCHANGE

BEGIN NB LANE AND SHOULDER, RT.

DRAFT





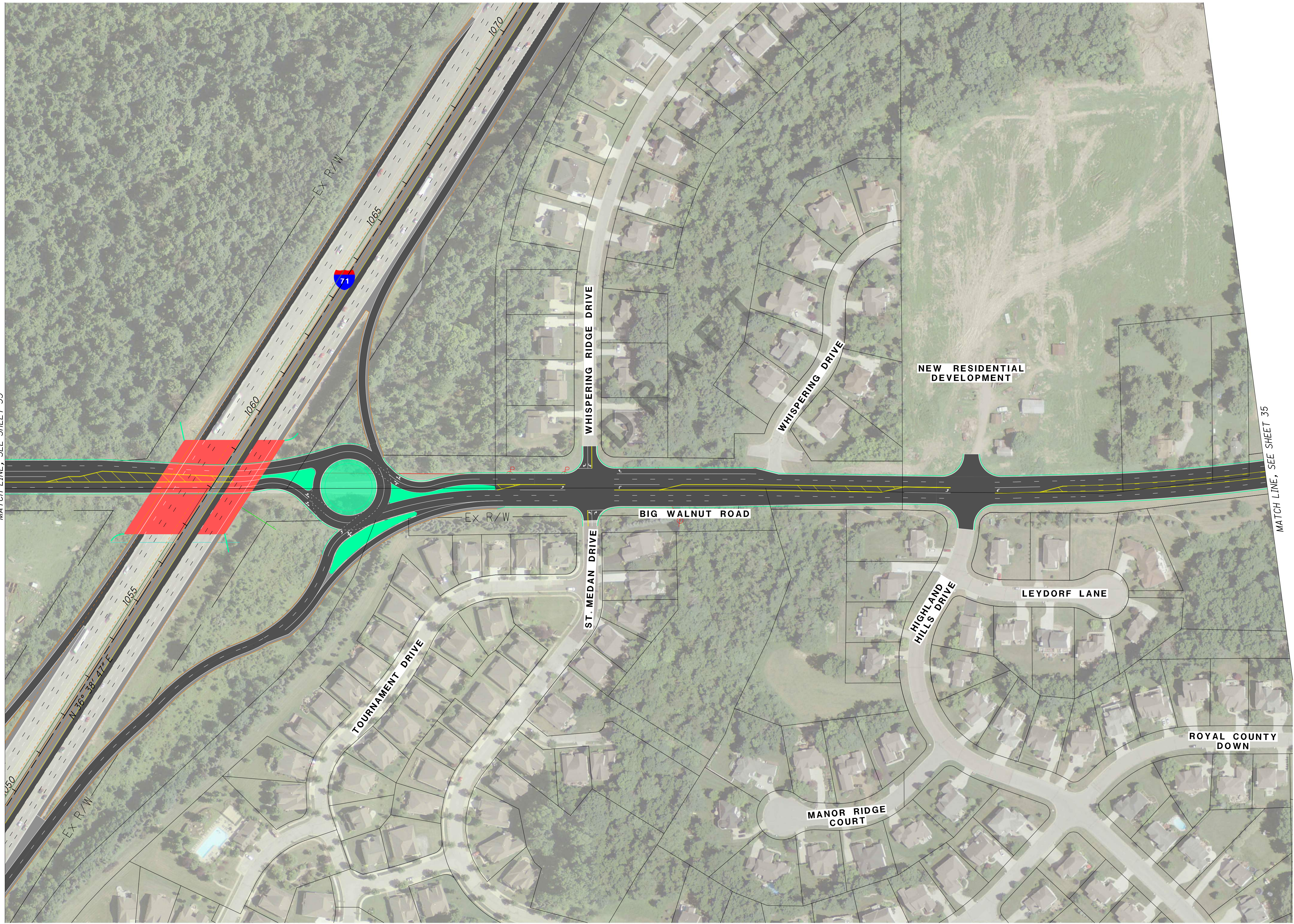
**IR 71 AT BIG WALNUT ROAD INTERCHANGE
FEASIBILITY STUDY**

DEL-71-03.55



MATCH LINE, SEE SHEET 34

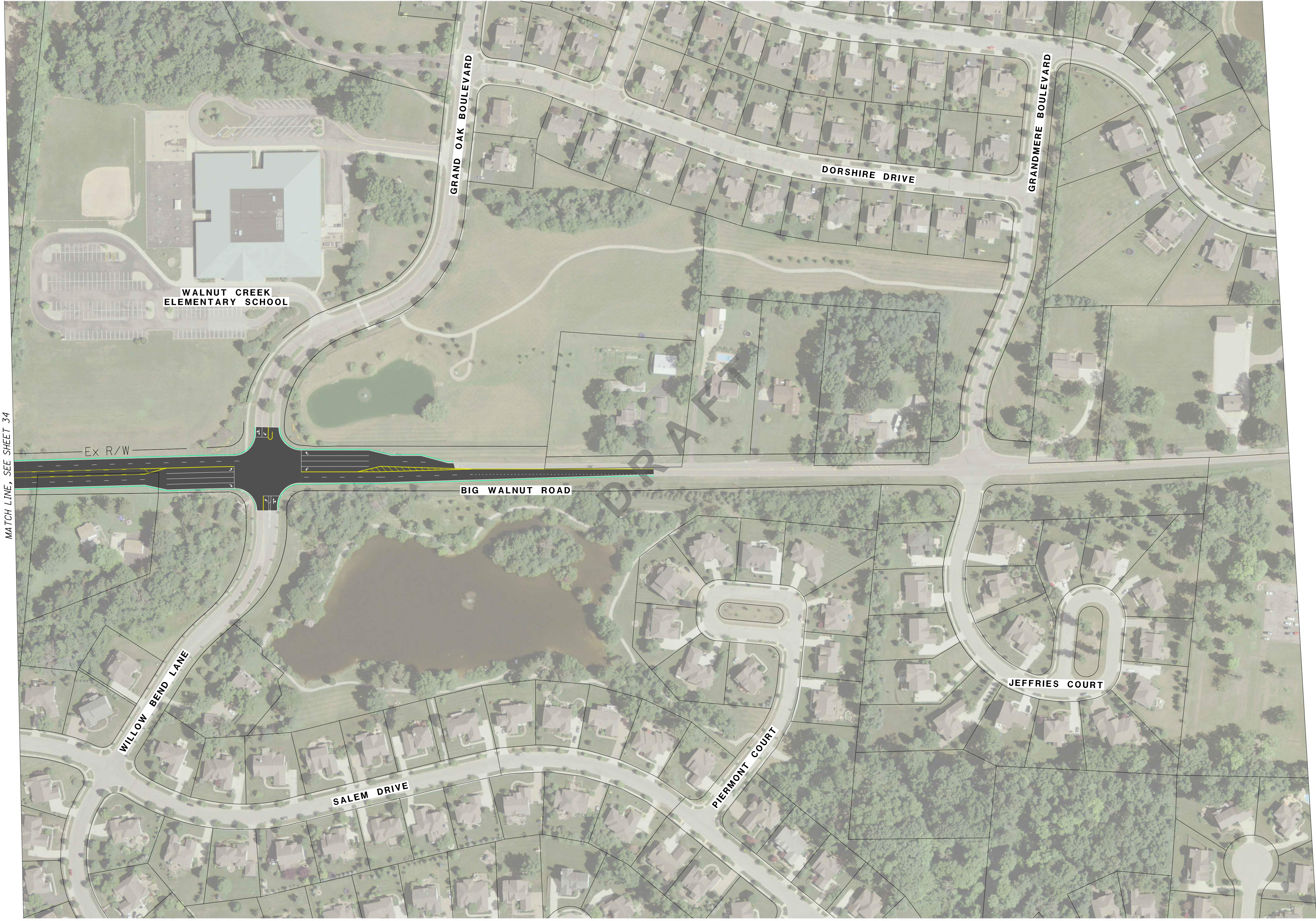
MATCH LINE, SEE SHEET 33



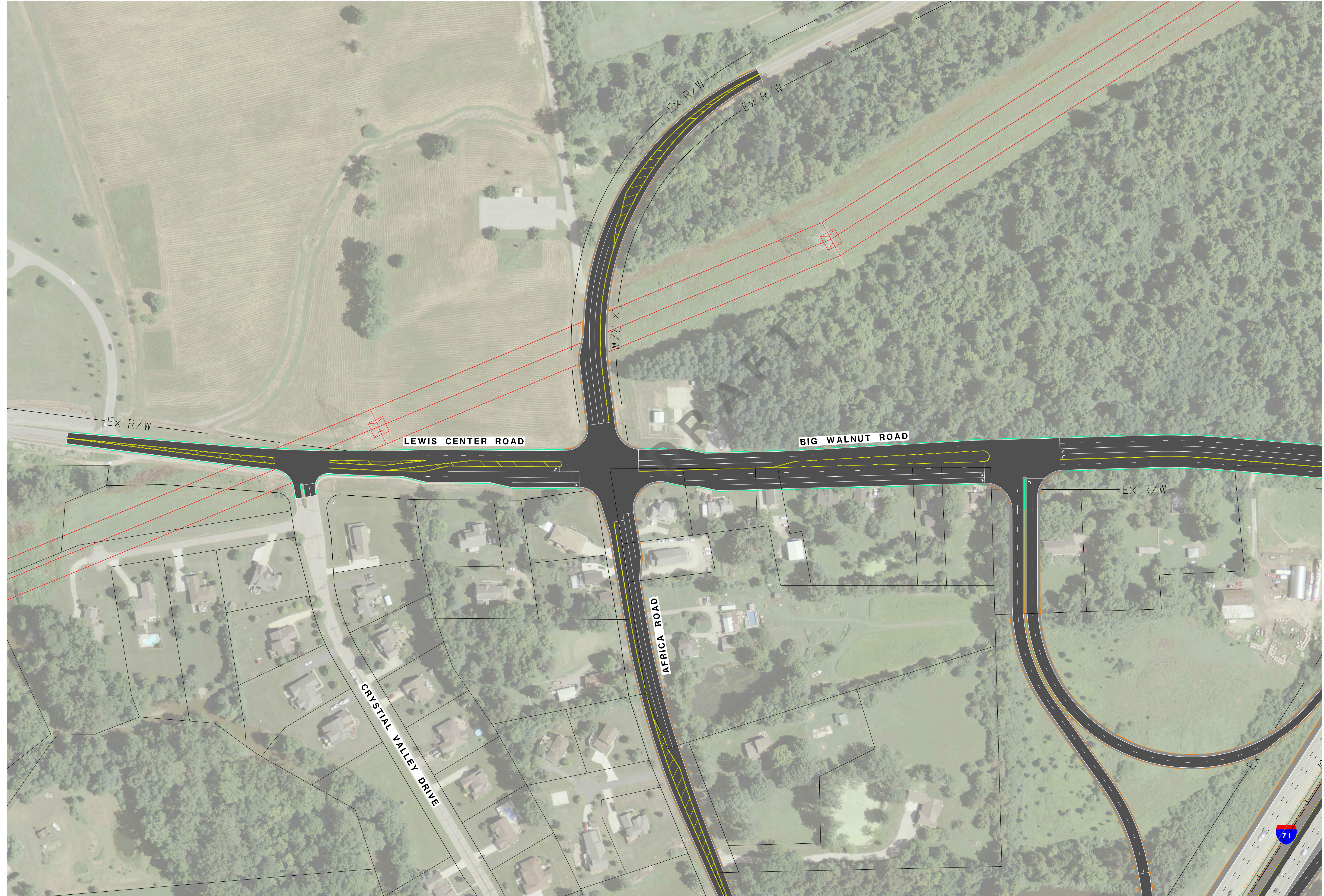
MATCH LINE, SEE SHEET 35



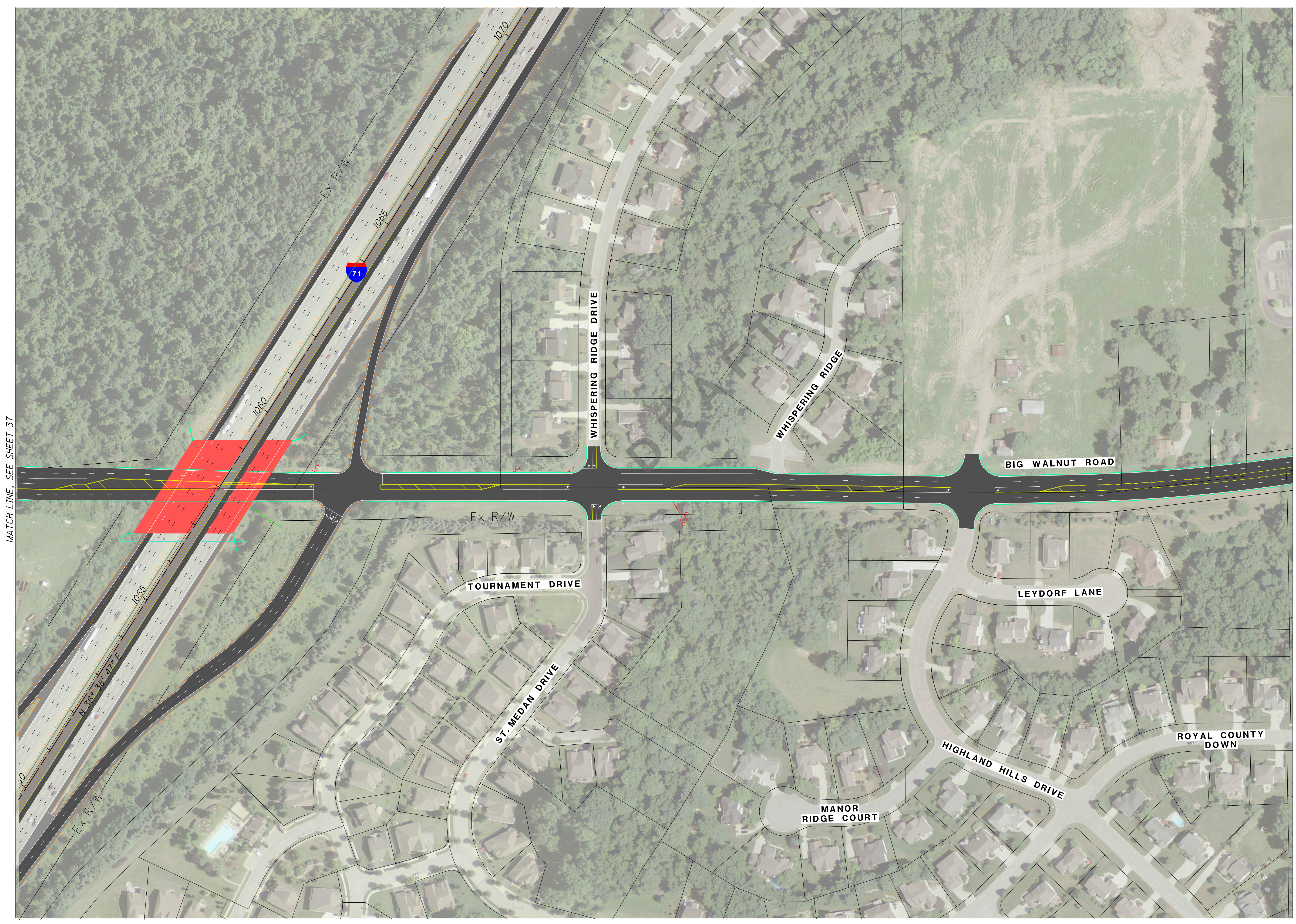
MATCH LINE, SEE SHEET 34





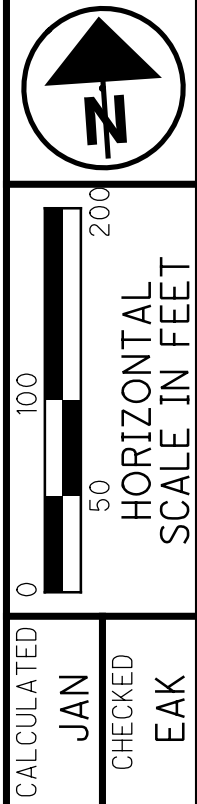


MATCH LINE, SEE SHEET 38



MATCH LINE, SEE SHEET 37

MATCH LINE, SEE SHEET 35



IR 71 AT BIG WALNUT ROAD INTERCHANGE
FEASIBILITY STUDY - ALTERNATIVE 1B

DEL-71-03.55

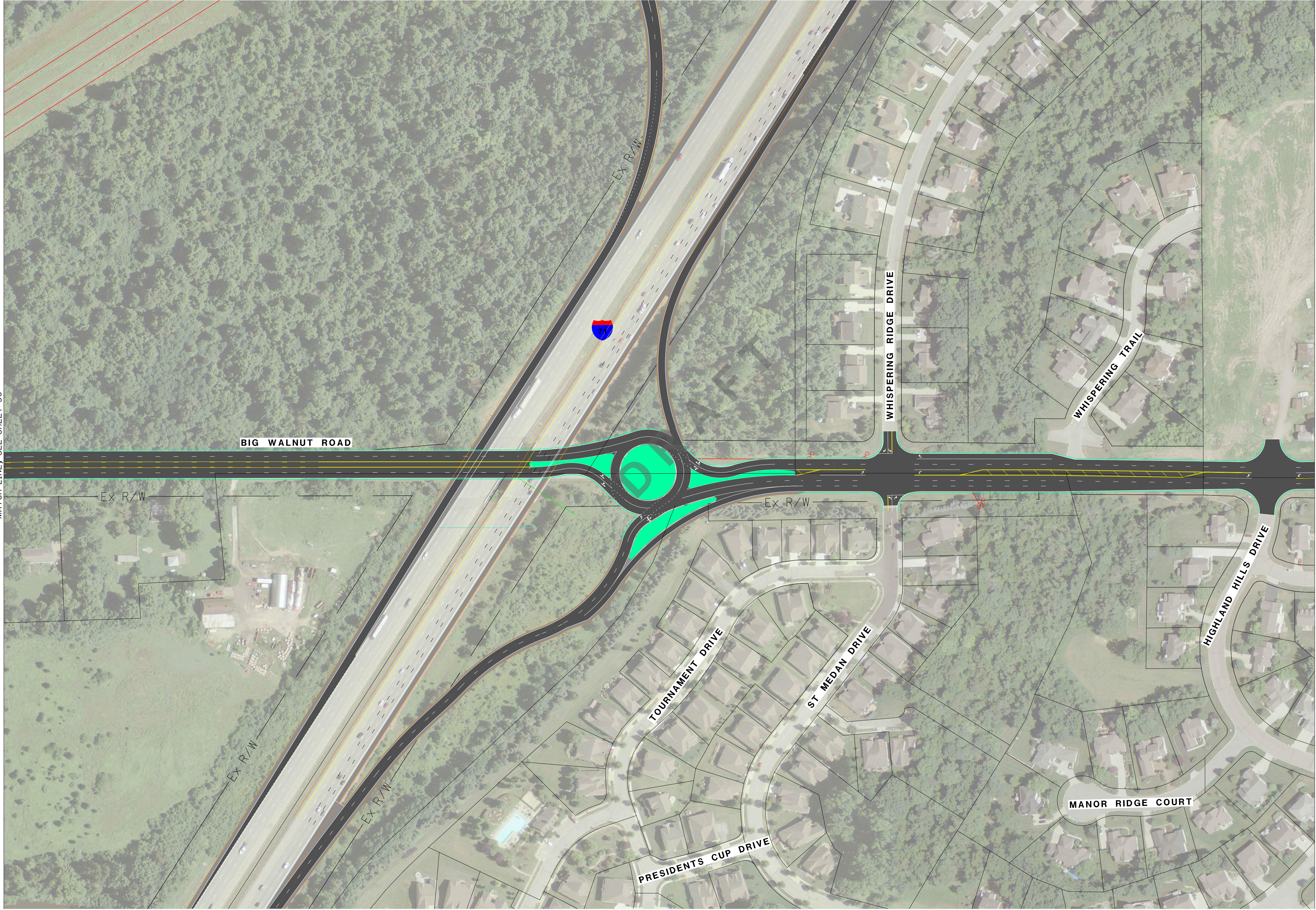
CALCULATED
JAN
CHECKED
EAK



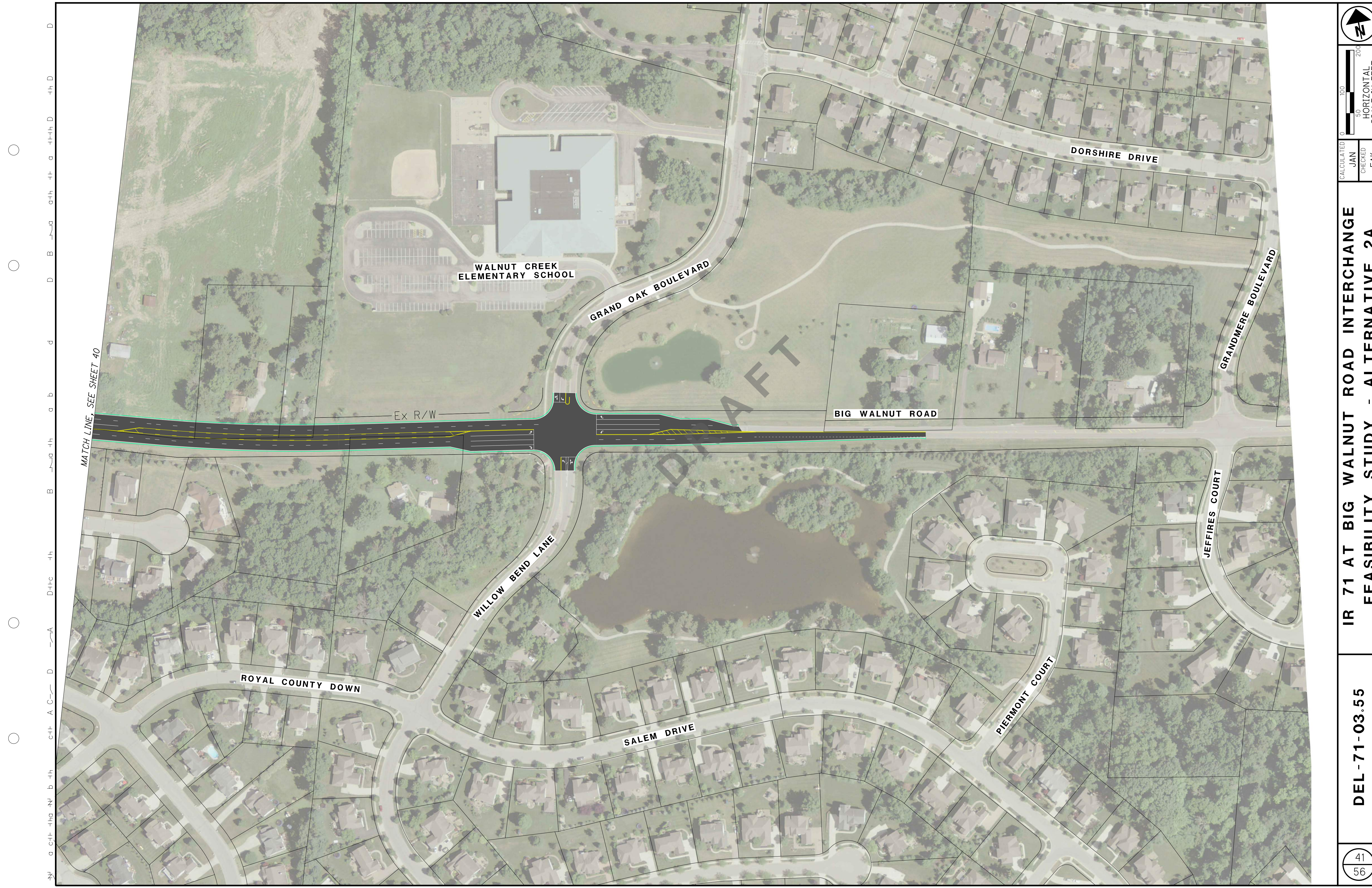
MATCH LINE, SEE SHEET 40



MATCH LINE, SEE SHEET 39

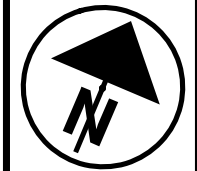
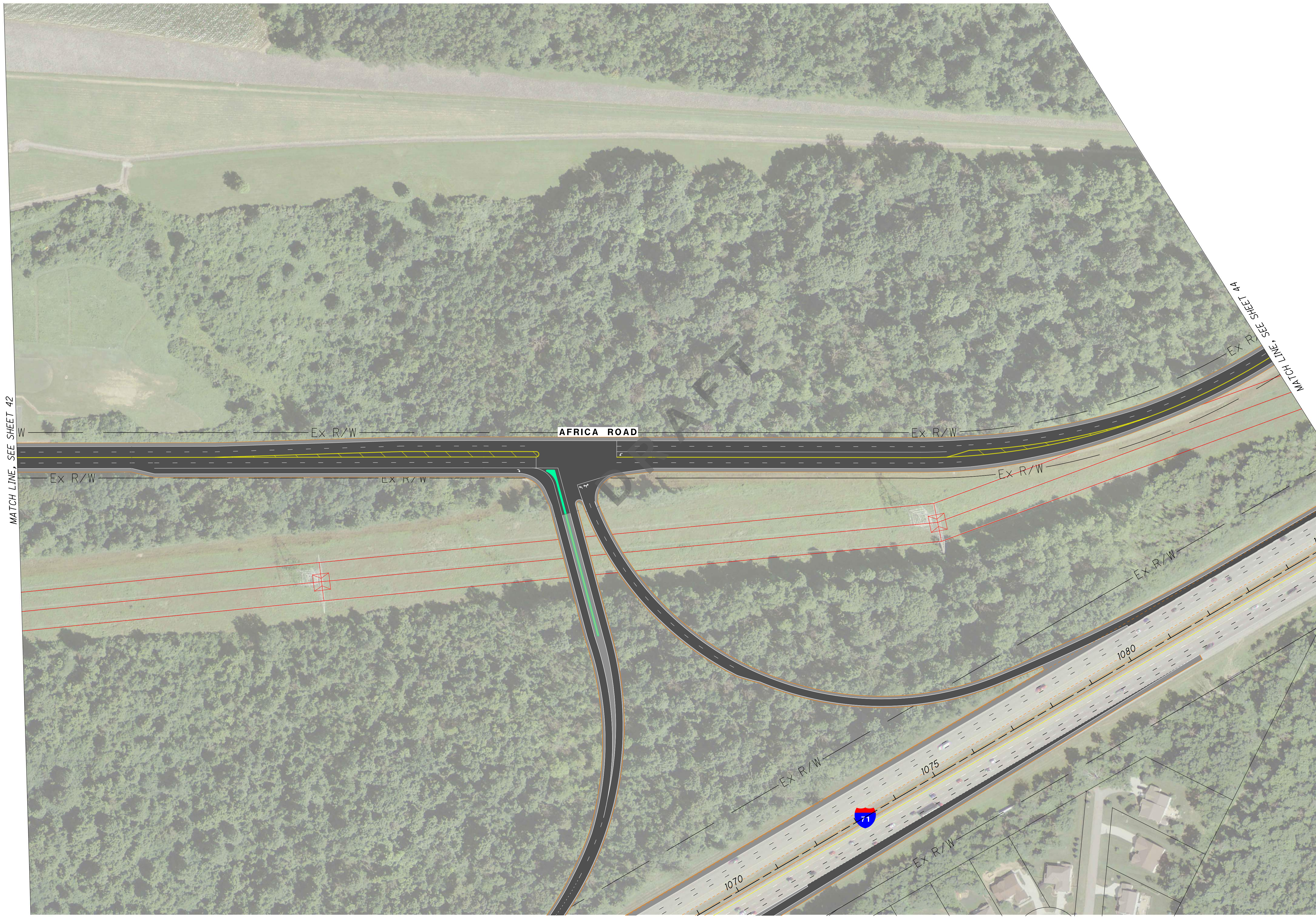


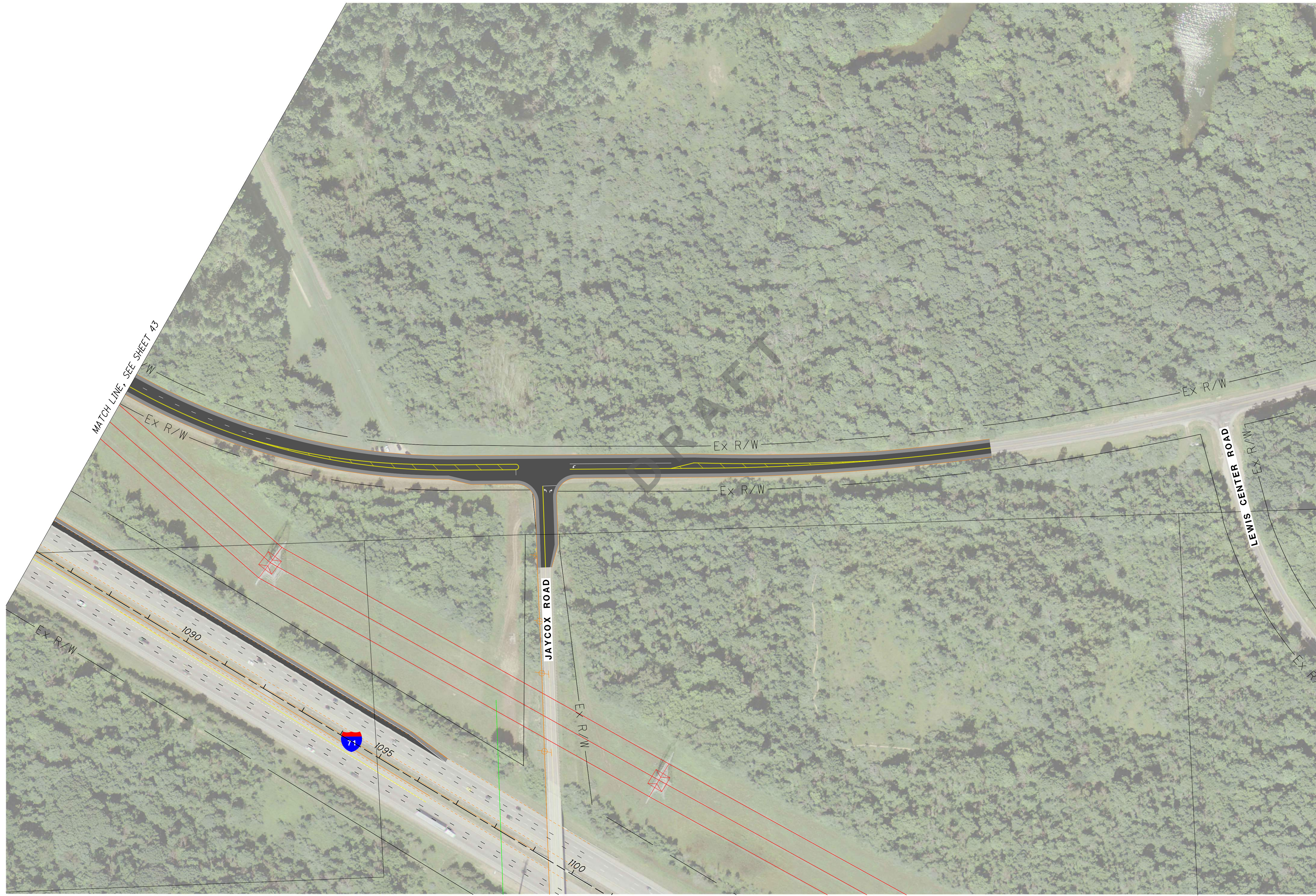
MATCH LINE, SEE SHEET 41

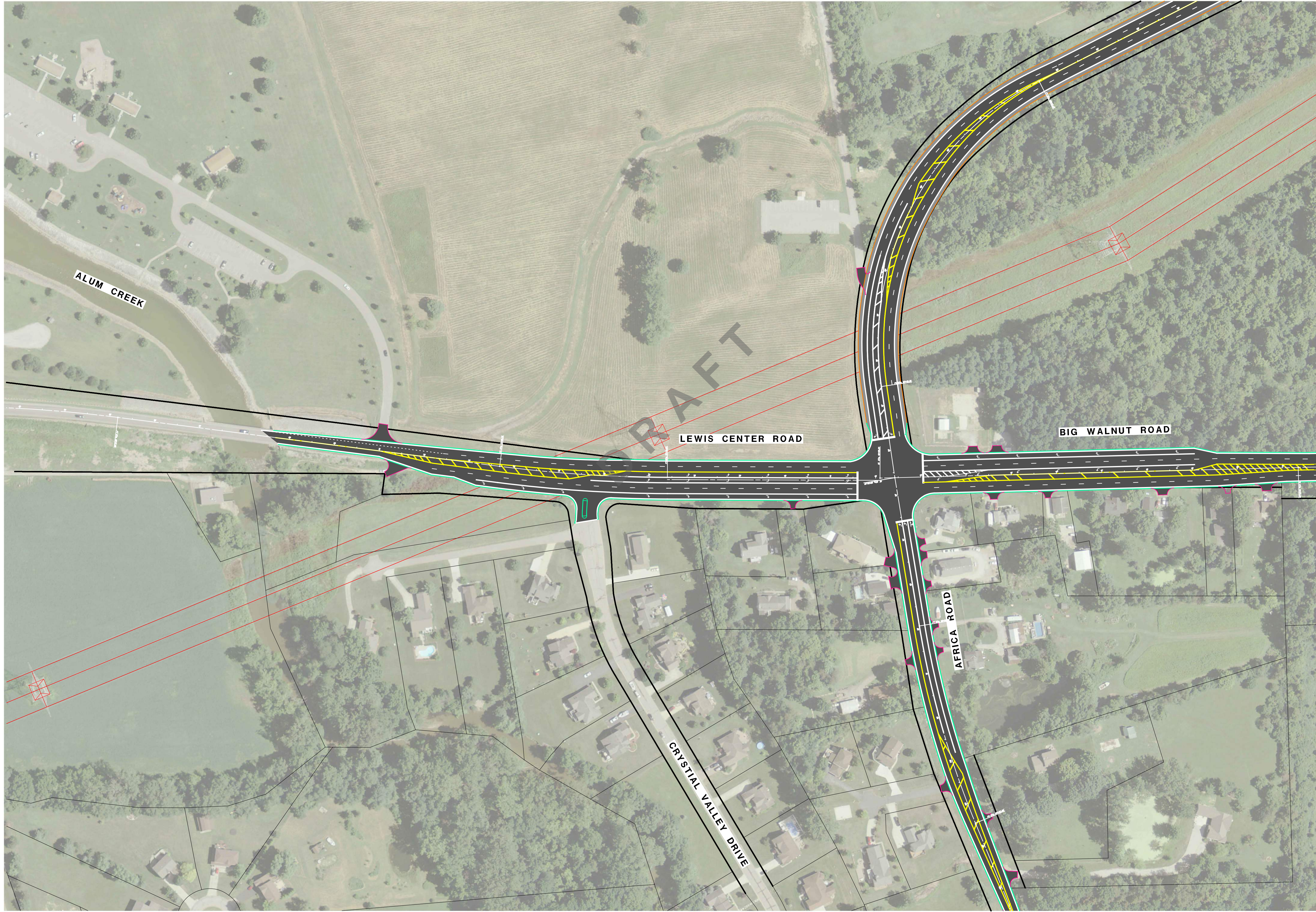


1/4" = 100' 1/8" = 50' 1/4" = 25' 1/2" = 12.5' 3/4" = 6.25' 1" = 3.125' 1 1/4" = 2.5' 1 1/2" = 1.875' 1 3/4" = 1.5' 2" = 1.25' 2 1/4" = 1.125' 2 1/2" = 1' 2 3/4" = 0.875' 3" = 0.75' 3 1/4" = 0.625' 3 1/2" = 0.5625' 3 3/4" = 0.5' 4" = 0.4375' 4 1/4" = 0.375' 4 1/2" = 0.34375' 4 3/4" = 0.3125' 5" = 0.28125' 5 1/4" = 0.25' 5 1/2" = 0.229167' 5 3/4" = 0.208333' 6" = 0.1875' 6 1/4" = 0.166667' 6 1/2" = 0.15' 6 3/4" = 0.132653' 7" = 0.119' 7 1/4" = 0.107143' 7 1/2" = 0.1' 7 3/4" = 0.09375' 8" = 0.083333' 8 1/4" = 0.075' 8 1/2" = 0.069231' 8 3/4" = 0.064516' 9" = 0.059259' 9 1/4" = 0.054545' 9 1/2" = 0.05' 9 3/4" = 0.045833' 10" = 0.041667' 10 1/4" = 0.0375' 10 1/2" = 0.034375' 10 3/4" = 0.03125' 11" = 0.028125' 11 1/4" = 0.025' 11 1/2" = 0.0229167' 11 3/4" = 0.0208333' 12" = 0.01875' 12 1/4" = 0.0166667' 12 1/2" = 0.015' 12 3/4" = 0.0132653' 13" = 0.0119' 13 1/4" = 0.0107143' 13 1/2" = 0.01' 13 3/4" = 0.009375' 14" = 0.0083333' 14 1/4" = 0.0075' 14 1/2" = 0.0069231' 14 3/4" = 0.0064516' 15" = 0.0059259' 15 1/4" = 0.0054545' 15 1/2" = 0.005' 15 3/4" = 0.0045833' 16" = 0.0041667' 16 1/4" = 0.00375' 16 1/2" = 0.0034375' 16 3/4" = 0.003125' 17" = 0.0028125' 17 1/4" = 0.0025' 17 1/2" = 0.00229167' 17 3/4" = 0.00208333' 18" = 0.001875' 18 1/4" = 0.00166667' 18 1/2" = 0.0015' 18 3/4" = 0.00132653' 19" = 0.00119' 19 1/4" = 0.00107143' 19 1/2" = 0.001' 19 3/4" = 0.0009375' 20" = 0.00083333' 20 1/4" = 0.00075' 20 1/2" = 0.00069231' 20 3/4" = 0.00064516' 21" = 0.00059259' 21 1/4" = 0.00054545' 21 1/2" = 0.0005' 21 3/4" = 0.00045833' 22" = 0.00041667' 22 1/4" = 0.000375' 22 1/2" = 0.00034375' 22 3/4" = 0.0003125' 23" = 0.00028125' 23 1/4" = 0.00025' 23 1/2" = 0.000229167' 23 3/4" = 0.000208333' 24" = 0.0001875' 24 1/4" = 0.000166667' 24 1/2" = 0.00015' 24 3/4" = 0.000132653' 25" = 0.000119' 25 1/4" = 0.000107143' 25 1/2" = 0.0001' 25 3/4" = 0.00009375' 26" = 0.000083333' 26 1/4" = 0.000075' 26 1/2" = 0.000069231' 26 3/4" = 0.000064516' 27" = 0.000059259' 27 1/4" = 0.000054545' 27 1/2" = 0.00005' 27 3/4" = 0.000045833' 28" = 0.000041667' 28 1/4" = 0.0000375' 28 1/2" = 0.000034375' 28 3/4" = 0.00003125' 29" = 0.000028125' 29 1/4" = 0.000025' 29 1/2" = 0.0000229167' 29 3/4" = 0.0000208333' 30" = 0.00001875' 30 1/4" = 0.0000166667' 30 1/2" = 0.000015' 30 3/4" = 0.0000132653' 31" = 0.0000119' 31 1/4" = 0.0000107143' 31 1/2" = 0.00001' 31 3/4" = 0.000009375' 32" = 0.0000083333' 32 1/4" = 0.0000075' 32 1/2" = 0.0000069231' 32 3/4" = 0.0000064516' 33" = 0.0000059259' 33 1/4" = 0.0000054545' 33 1/2" = 0.000005' 33 3/4" = 0.0000045833' 34" = 0.0000041667' 34 1/4" = 0.00000375' 34 1/2" = 0.0000034375' 34 3/4" = 0.000003125' 35" = 0.0000028125' 35 1/4" = 0.0000025' 35 1/2" = 0.00000229167' 35 3/4" = 0.00000208333' 36" = 0.000001875' 36 1/4" = 0.00000166667' 36 1/2" = 0.0000015' 36 3/4" = 0.00000132653' 37" = 0.00000119' 37 1/4" = 0.00000107143' 37 1/2" = 0.000001' 37 3/4" = 0.0000009375' 38" = 0.00000083333' 38 1/4" = 0.00000075' 38 1/2" = 0.00000069231' 38 3/4" = 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0.00000000028125' 59 1/4" = 0.00000000025' 59 1/2" = 0.000000000229167' 59 3/4" = 0.000000000208333' 60" = 0.0000000001875' 60 1/4" = 0.000000000166667' 60 1/2" = 0.00000000015' 60 3/4" = 0.000000000132653' 61" = 0.000000000119' 61 1/4" = 0.000000000107143' 61 1/2" = 0.0000000001' 61 3/4" = 0.00000000009375' 62" = 0.000000000083333' 62 1/4" = 0.000000000075' 62 1/2" = 0.000000000069231' 62 3/4" = 0.000000000064516' 63" = 0.000000000059259' 63 1/4" = 0.000000000054545' 63 1/2" = 0.00000000005' 63 3/4" = 0.000000000045833' 64" = 0.000000000041667' 64 1/4" = 0.0000000000375' 64 1/2" = 0.000000000034375' 64 3/4" = 0.00000000003125' 65" = 0.000000000028125' 65 1/4" = 0.000000000025' 65 1/2" = 0.0000000000229167' 65 3/4" = 0.0000000000208333' 66" = 0.00000000001875' 66 1/4" = 0.0000000000166667' 66 1/2" = 0.000000000015' 66 3/4" = 0.0000000000132653' 67" = 0.0000000000119' 67 1/4" = 0.0000000000107143' 67 1/2" = 0.00000000001' 67 3/4" = 0.000000000009375' 68" = 0.0000000000083333' 68 1/4" = 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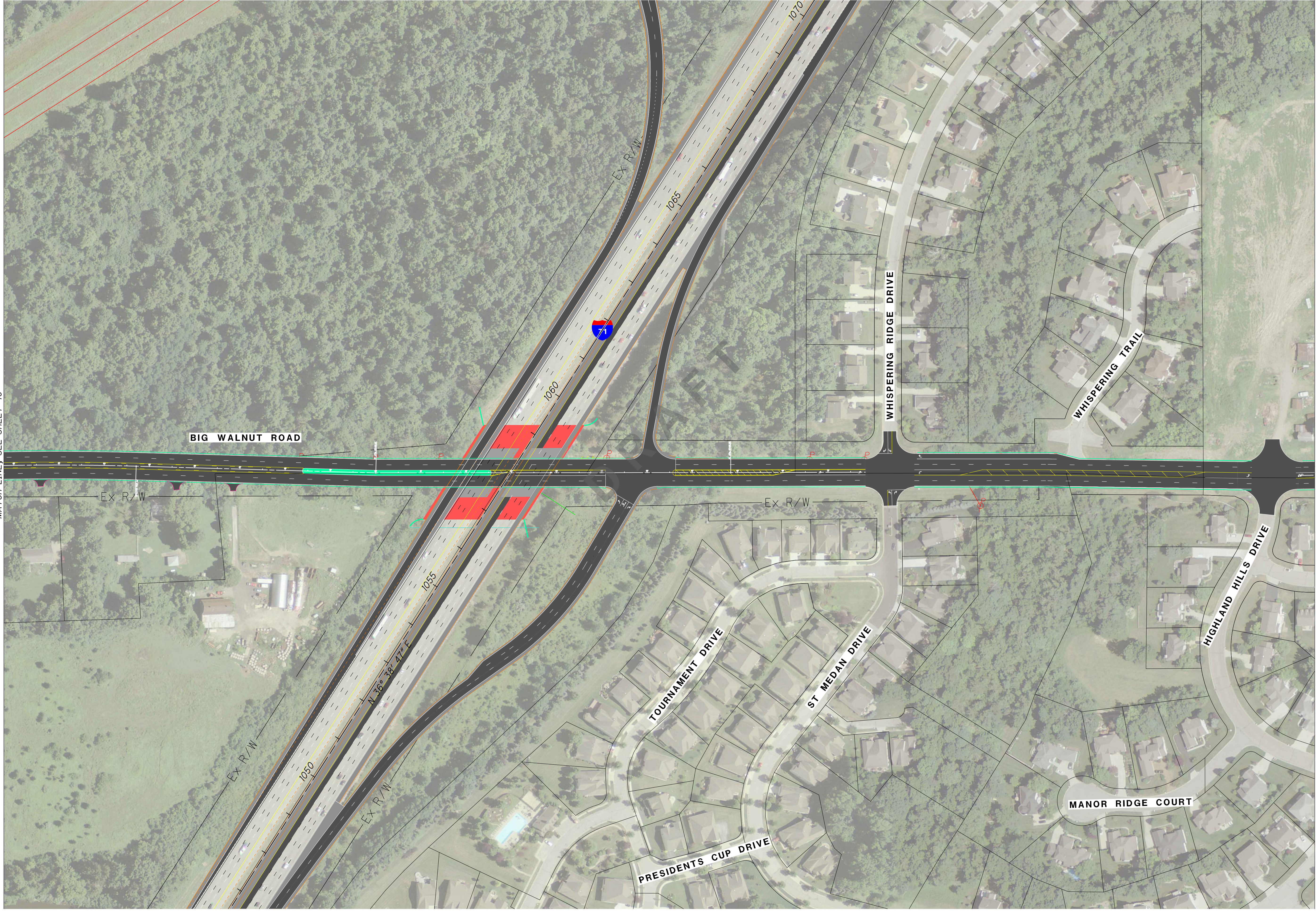




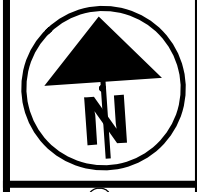


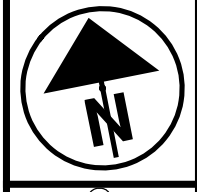
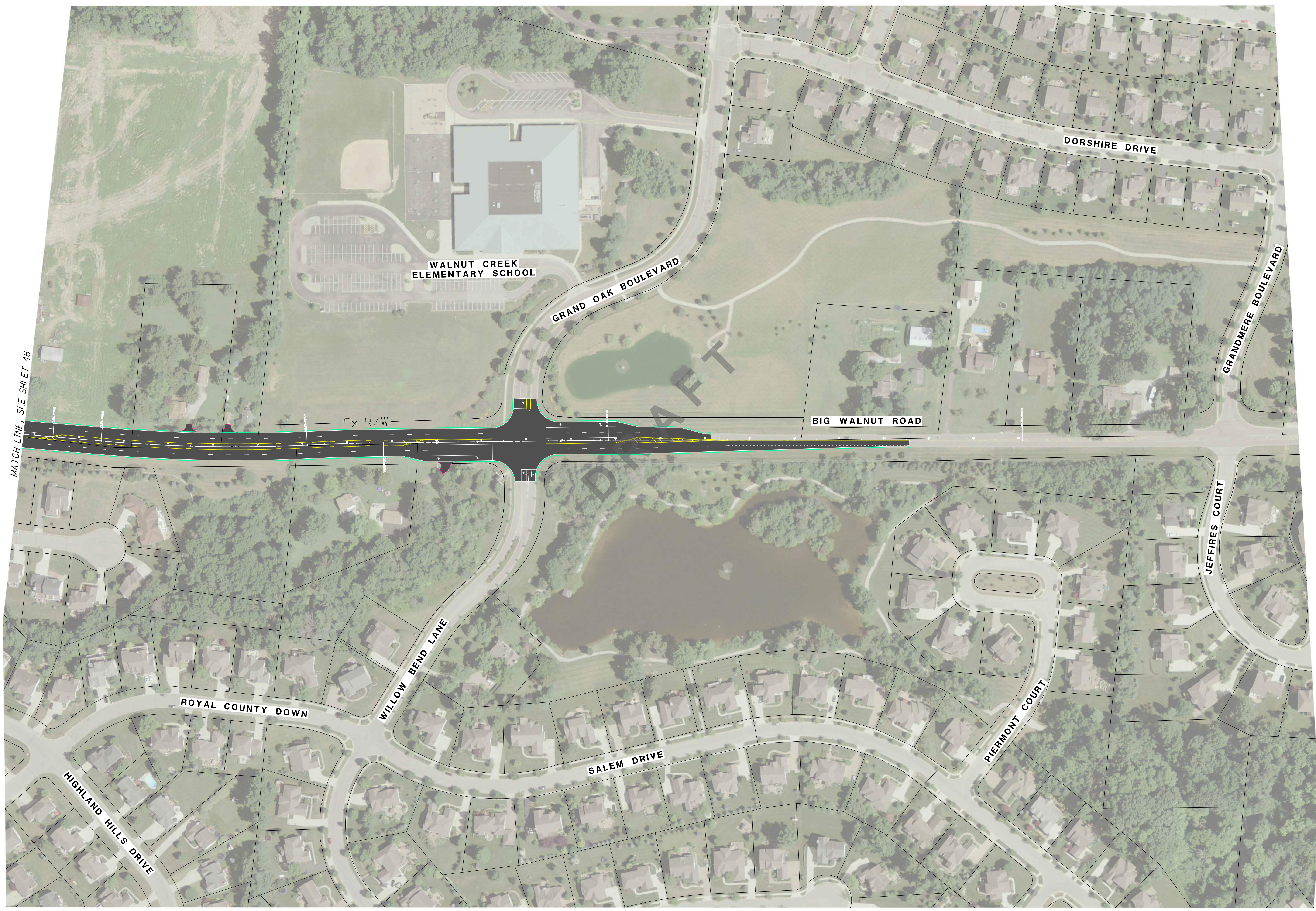
MATCH LINE, SEE SHEET 46

MATCH LINE, SEE SHEET 45



MATCH LINE, SEE SHEET 47

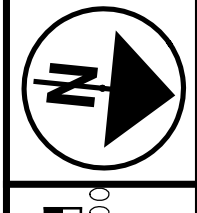




CALCULATED 0 100 200
 JAN
 CHECKED EAK

**IR 71 AT BIG WALNUT ROAD INTERCHANGE
 FEASIBILITY STUDY - ALTERNATIVE 2B**

DEL-71-03.55



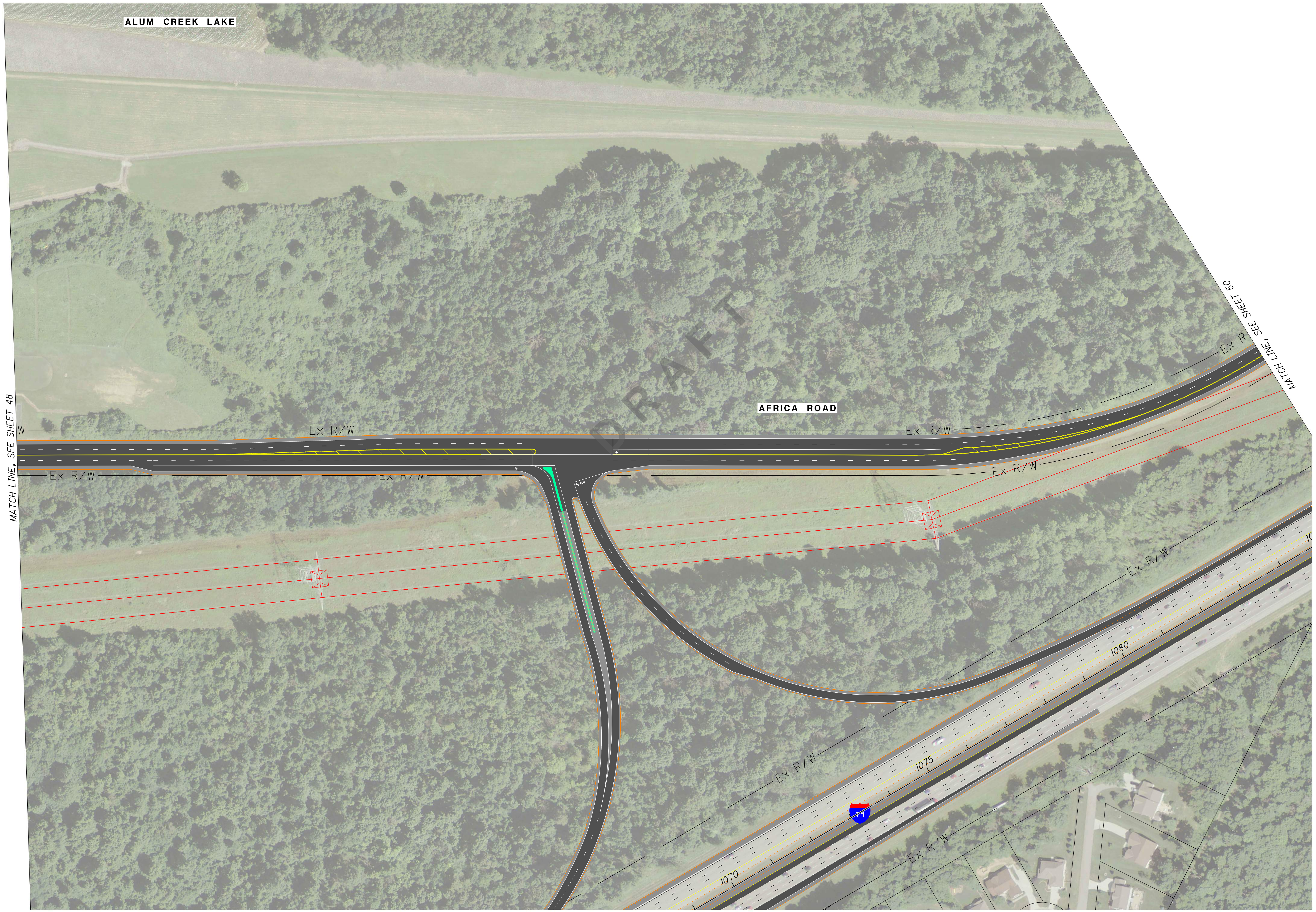
CALCULATED
JAN
CHECKED
EAK

0 100 200
50
HORIZONTAL
SCALE IN FEET

**IR 71 AT BIG WALNUT ROAD INTERCHANGE
FEASIBILITY STUDY - ALTERNATIVE 2B**

DEL-71-03.55

pw:\gecom-ne-pw.bentley.com\AECOM_DS20_NA_2019\Documents\60445429-Big Walnut Feasibility Study\60445429_DEL71\BigWa\Transportation\Design\DEL\79608_DEL-71-3.55\Design\Roadway\Sheets\Exhibits AEC

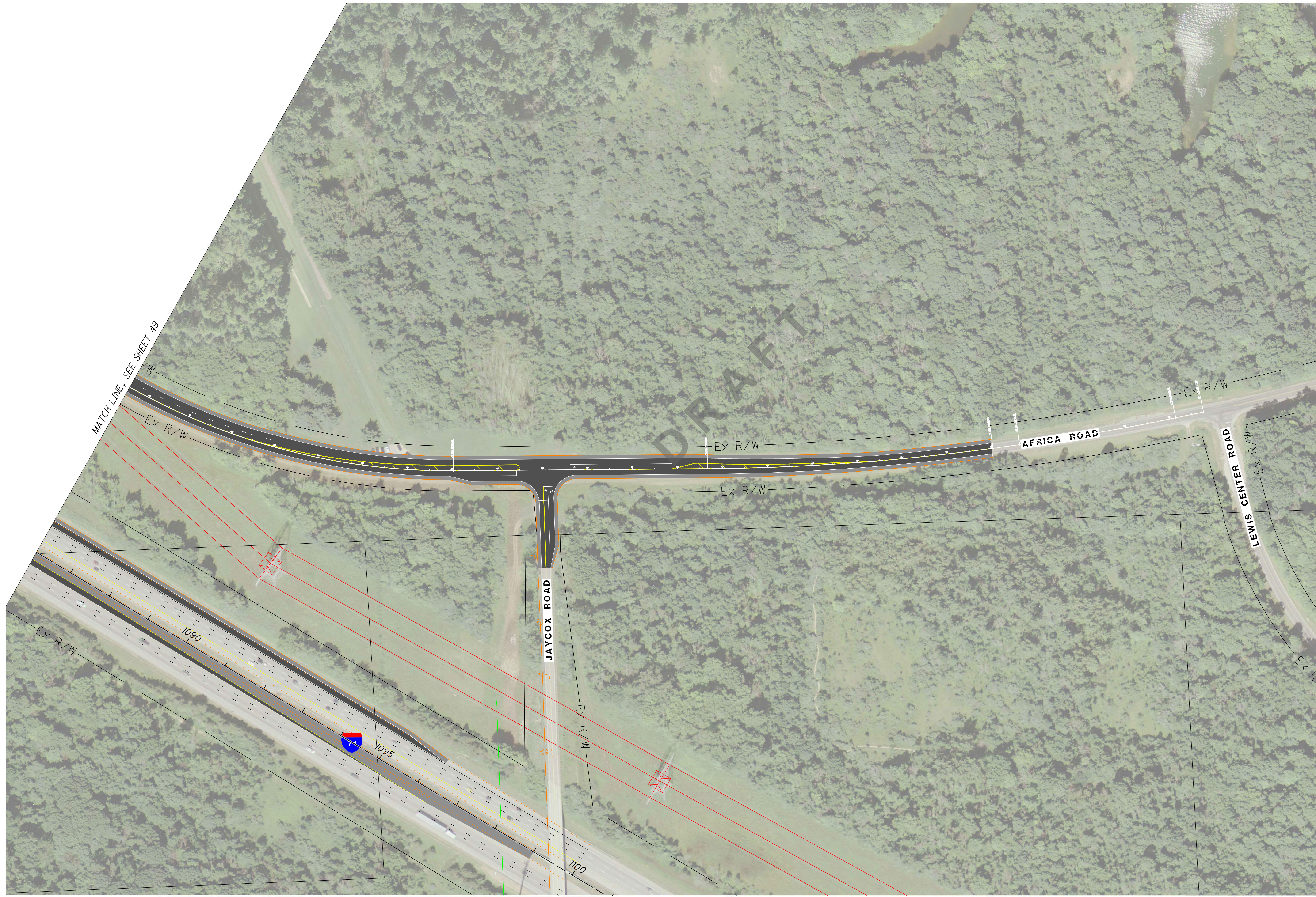


CALCULATED	JAN
CHECKED	EAK

0 100 200
HORIZONTAL SCALE IN FEET

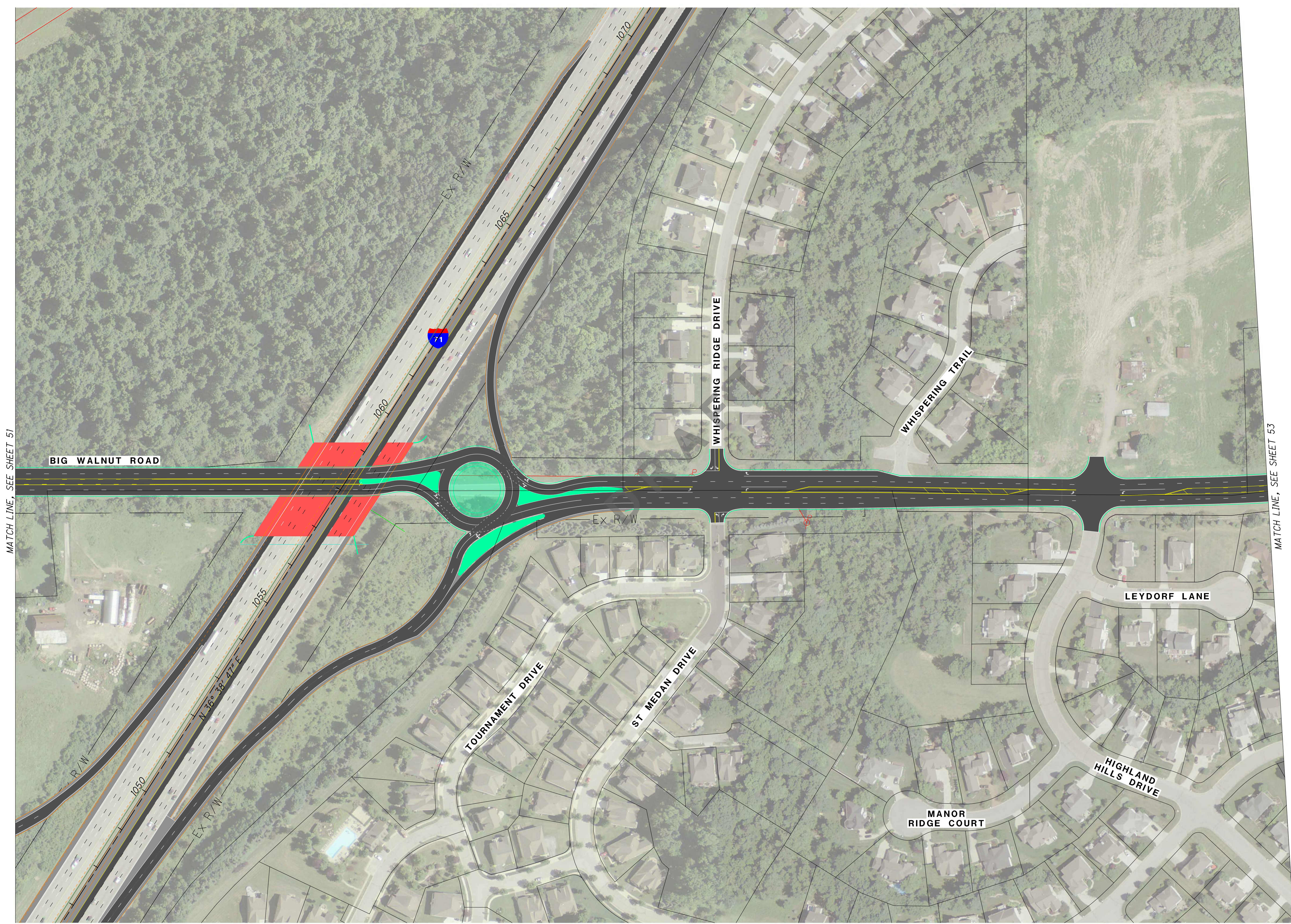
**IR 71 AT BIG WALNUT ROAD INTERCHANGE
FEASIBILITY STUDY - ALTERNATIVE 2B**

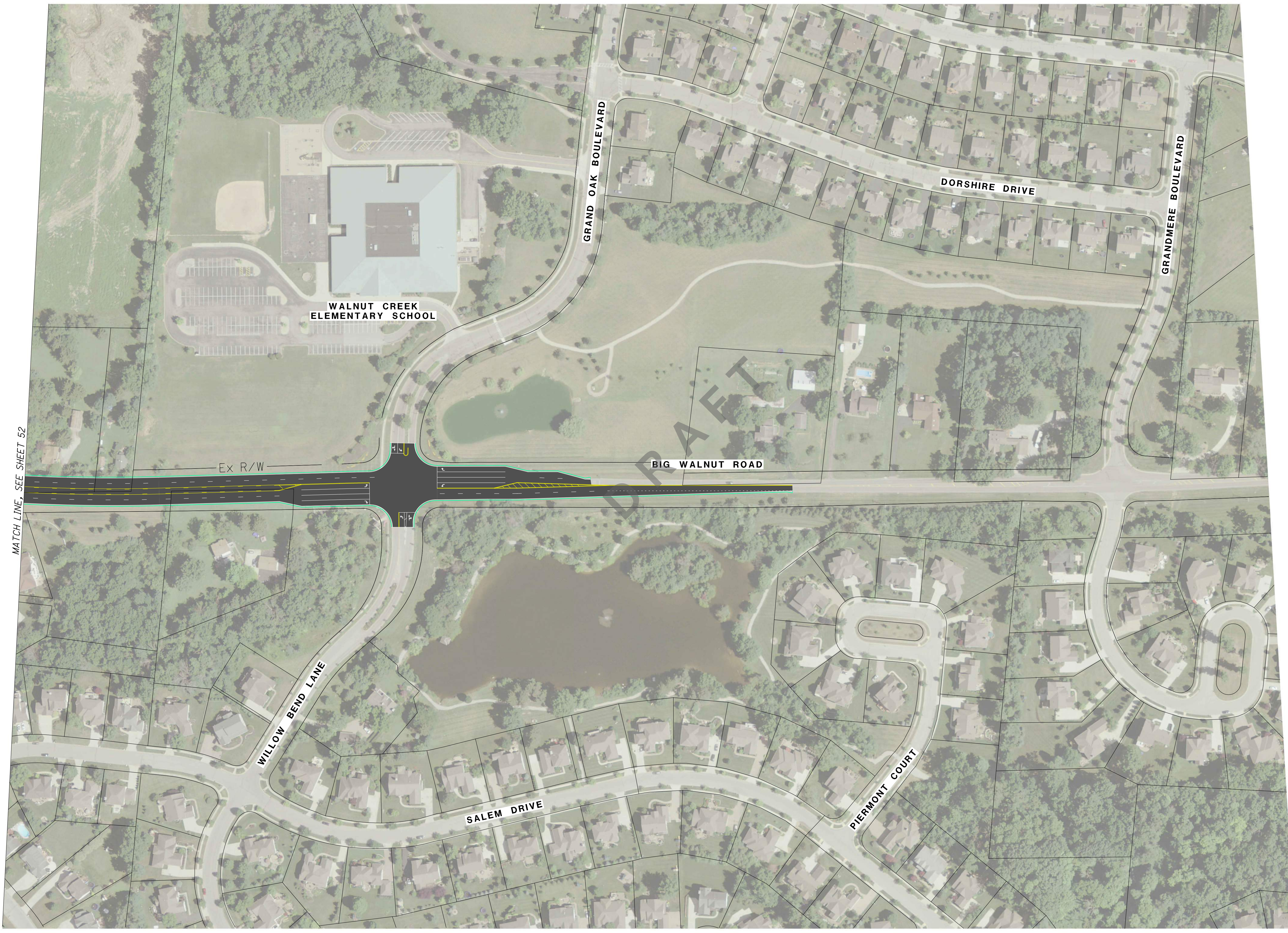
DEL-71-03.55





MATCH LINE, SEE SHEET 52





MATCH LINE, SEE SHEET 52

Ex R/W

WALNUT CREEK
ELEMENTARY SCHOOL

GRAND OAK BOULEVARD

DORSHIRE DRIVE

GRANDMERE BOULEVARD

WILLOW BEND LANE

SALEM DRIVE

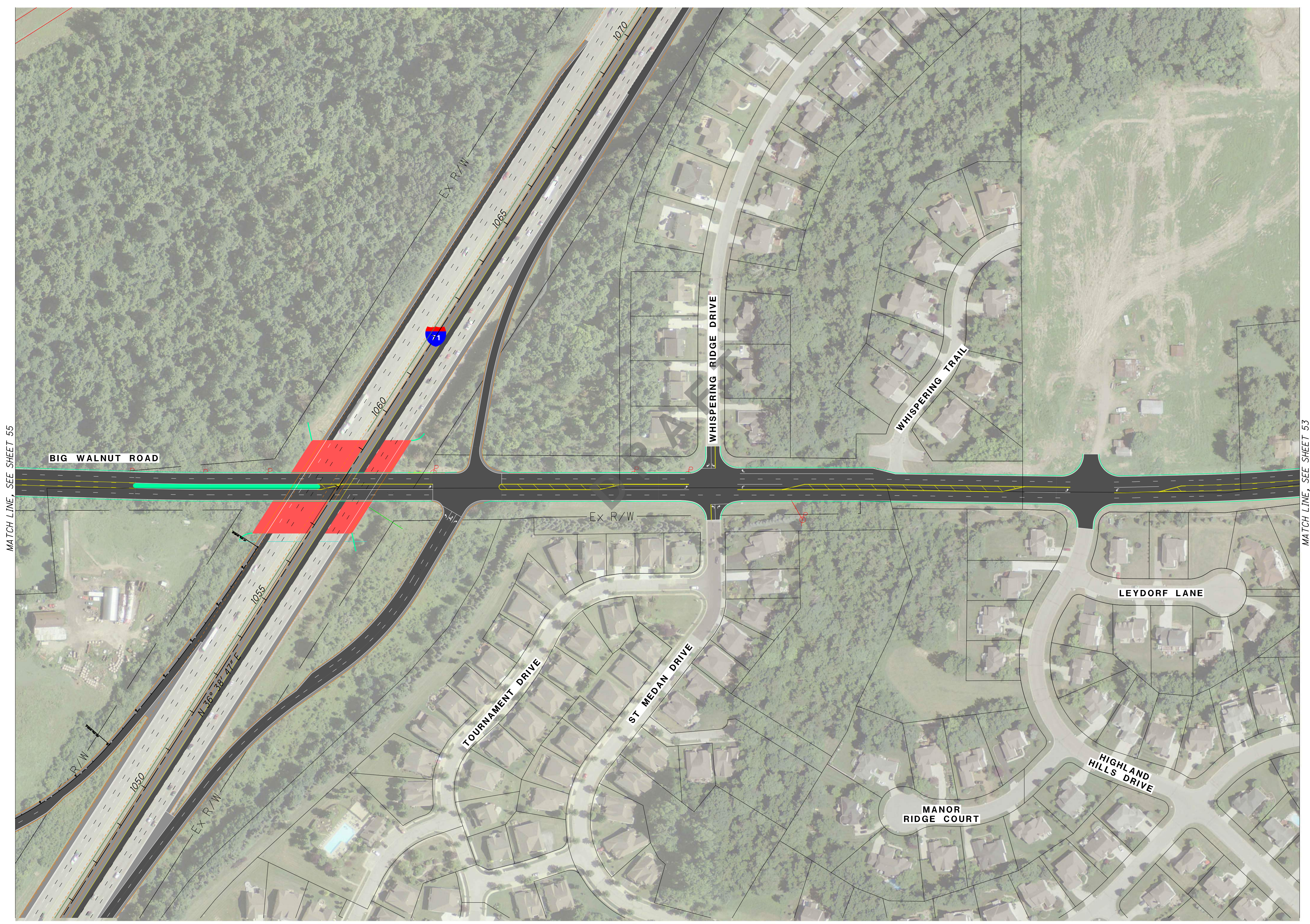
PIERMONT COURT

BIG WALNUT ROAD





MATCH LINE, SEE SHEET 56



MATCH LINE, SEE SHEET 55

MATCH LINE, SEE SHEET 53

Appendix B
Certified Traffic & Intersection Traffic Volumes

DRAFT

INTER-OFFICE COMMUNICATION

TO: Steve Fellenger, District 6
Drew Hurst, District 6
Dirk Gross, District 6

FROM: Rebekah Anderson, Statewide Planning and Research

SUBJECT: DEL-71-3.55 – IR 71 at Big Walnut IIS – PID 79608

DATE: December 1, 2016

Changes from the November 30, 2016 include volumes on IR 71 SB on plates 35 and 37.

Design Traffic is provided and certified for use in design for the following alternatives:

- 2020 Build – Alternatives 1, 2, and 3 – ADT, AM, PM
- 2040 No Build – ADT, AM, PM
- 2040 Build – Alternatives 1, 2, and 3 – ADT, AM, PM
- Table of Truck Percentages

The NB interchange for all alternatives is located at Big Walnut Rd. east of Africa Rd. The SB interchange is located on Big Walnut Rd in Alternative 1, on Africa Rd. north of Big Walnut Rd. in Alternative 2, and on Africa Rd. south of Big Walnut Rd. in Alternative 3. The through volumes on IR 71 on all other plates assume Alternative 2.

Figure 1, developed by ms consultants, shows the 36/37 interchange phasing. It is assumed that Phase 1 is complete for the 2020 alternatives and the full interchange is complete for the 2040 alternatives.

Tables 1 and 2 show the truck percentages.

Table 3 shows traffic forecasts for highway segments.

Plates 1-38 show the design traffic volumes.

If you have any questions, please contact me at 614-752-5735.

RSA:rsa

c: M. Byram-OSPR, N. Gill-MORPC, H. McColeman-OES, G. Harrington-ORE, D. Becker – AECOM, R. Riley – Delaware County, File

Figure 1 – IR 71 at US36 IMS Phasing Diagram

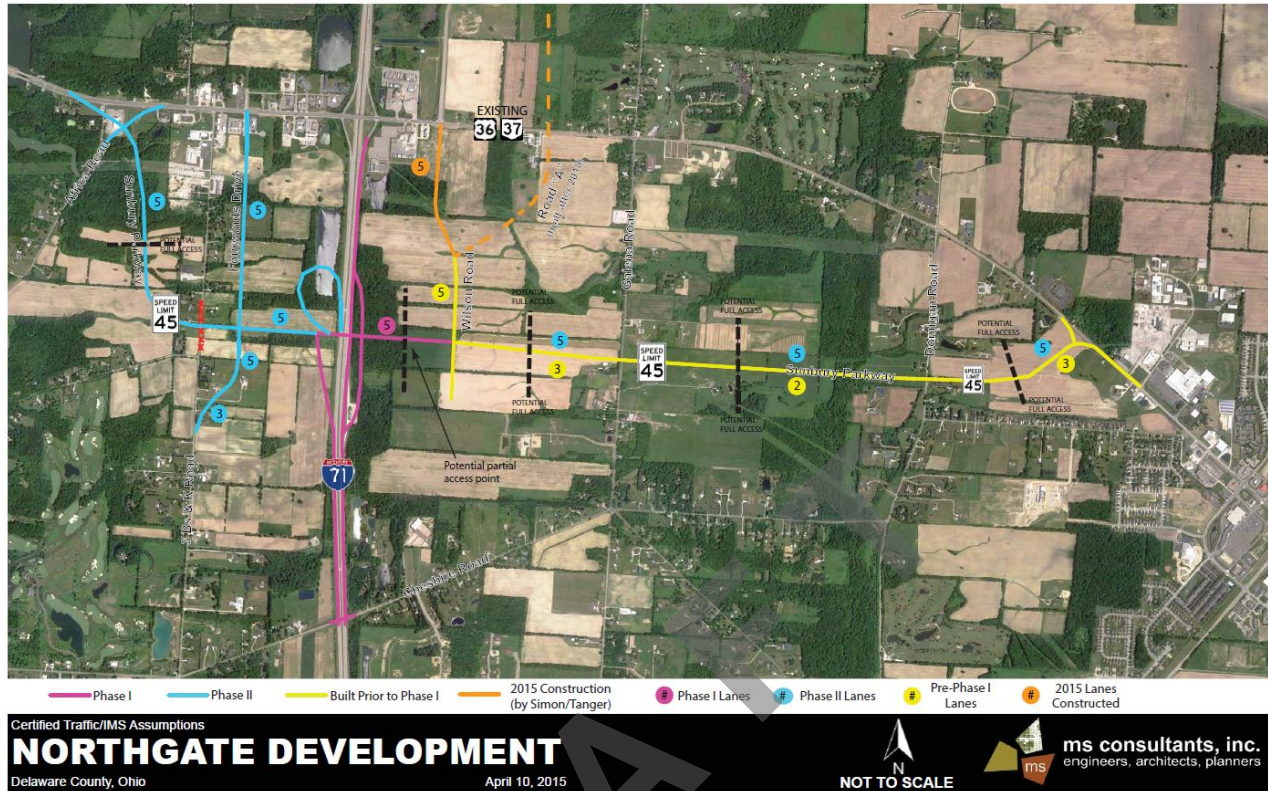


Table 1 – Truck Percentages – T24, TD

Location	T24	TDPM
IR 71		
N of SR 61	0.21	0.08
N of US 36	0.18	0.09
N of Big Walnut	0.17	0.08
N of Gemini Pkwy	0.17	0.07
N of IR 270	0.13	0.07
Carters Corners	0.08	0.08
Domigan	0.15	0.16
Road A	0.08	0.15
McDonald's Entrance	0.02	0.02
Bob Evan's Entrance	0.05	0.13
Big Walnut	0.04	0.01
Africa N of Big Walnut	0.06	0.01
Africa S of Big Walnut	0.03	0.01

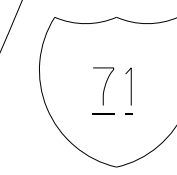
Table 2 – Truck Percentages – T24, TD

Location	2038 NO Build		2038 BUILD (NO Big Walnut)		2040 BUILD (Big Walnut Alt 2)		
	TD	T24	TD	T24	TD	T24	
SR-61 Interchange							
Ramp From IR-71 NB To SR-61	9%	16%	9%	16%	9%	16%	
Ramp From SR-61 To IR-71 NB	17%	22%	11%	16%	11%	16%	
Ramp From IR-71 SB To SR-61	21%	31%	21%	31%	21%	31%	
Ramp From SR-61 To IR-71 SB	16%	11%	16%	11%	17%	11%	
US-36/ SR-37							
Ramp From IR-71 SB To US 36-37	24%	25%	24%	25%	25%	26%	
Ramp From US 36-37 To IR-71 SB	10%	13%	6%	10%	6%	10%	
Ramp From IR-71 NB To US 36-37	5%	13%	5%	13%	5%	13%	
Ramp From US 36-37 To IR-71 NB	14%	25%	14%	25%	14%	25%	
Sunbury Parkway Interchange							
Ramp From Sunbury WB To IR-71 SB			5%	7%	4%	7%	
Ramp From Sunbury EB To IR-71 SB			6%	4%	4%	7%	
Ramp From IR-71 NB To Sunbury			4%	6%	4%	6%	
Ramp From Sunbury To IR-71 NB			4%	6%	4%	6%	
Big Walnut Interchange							
Ramp From IR-71 NB To Big Walnut					2%	2%	
Ramp To IR-71 NB From Big Walnut					8%	9%	
Ramp From IR-71 SB To Africa					8%	9%	
Ramp To IR-71 SB From Africa					3%	2%	
Gemini and Polaris Interchanges							
Ramp From Polaris EB To IR-71 SB Access Road	2%	3%	2%	3%	2%	3%	
Ramp From IR-71 NB Access Road To Polaris	2%	4%	2%	4%	2%	4%	
Ramp From Polaris WB To IR-71 SB Access Road	3%	4%	3%	4%	3%	4%	
Ramp From IR-71 NB Access Road To Gemini	2%	3%	2%	3%	2%	3%	
Ramp From Gemini To IR-71 NB	4%	5%	4%	5%	3%	3%	
Ramp From IR-71 SB To Gemini	4%	4%	4%	4%	3%	3%	
Ramp From Gemini To IR-71 SB Access Road	4%	3%	3%	3%	3%	2%	
Ramp From Polaris To IR-71 NB Access Road	5%	11%	5%	10%	4%	8%	
I-270 Interchange							
Ramp From IR-270 WB To IR-71 NB	6%	8%	6%	8%	6%	8%	
Ramp From IR-270 WB To IR-71 SB	2%	2%	2%	2%	2%	2%	
Ramp From IR-270 EB To IR-71 SB	3%	4%	3%	4%	4%	4%	
Ramp From IR-71 NB To IR-270 EB	2%	2%	2%	2%	2%	2%	
Ramp From IR-71 SB To IR-270 EB	6%	9%	6%	9%	6%	8%	
Ramp From IR-71 NB To IR-270 WB	3%	4%	3%	4%	3%	4%	
Ramp From IR-71 SB To IR-270 WB	10%	16%	10%	16%	10%	16%	
Ramp From IR-270 EB To IR-71 NB	10%	14%	10%	14%	10%	14%	
US-36/SR-37							
West of Africa	6%	9%	12%	14%	12%	14%	
Between Africa & IR 71	6%	9%	8%	11%	8%	12%	
Between IR 71 & Galena	5%	8%	12%	17%	12%	18%	
East of Galena	4%	7%	6%	12%	6%	12%	
Africa	15%	2%	15%	3%	17%	19%	
N. 3Bs & K	2%	2%	4%	2%	4%	2%	
S. 3Bs & K	3%	3%	2%	2%	2%	2%	
Fourwinds	2%	3%	2%	3%	3%	3%	
Wilson	8%	15%	8%	15%	8%	15%	
Galena North Leg	4%	6%	4%	7%	3%	7%	
Galena South Leg	4%	7%	4%	7%	3%	6%	
Sunbury Parkway							
West of I-71 interchange			12%	12%	12%	12%	
East of I-71 interchange			6%	8%	6%	8%	

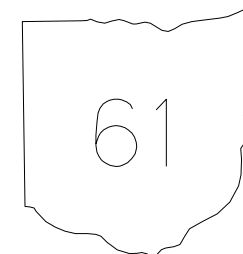
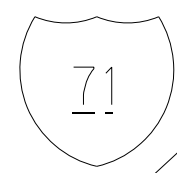
Table 3 – Highway Segment Traffic Forecasts

Road/Link	count year	count data	2020NB	2020Build	2040NB	2040Build	K	D
US 36 - Old State to Africa	2016	24650	28100	28470	49580	49070	0.1	0.53
US 36 - Africa to IR 71	2016	23950	28070	28590	34350	33550	0.1	0.63
US 36 - IR 71 to Sunbury Pkwy	2016	22410	18810	18170	36720	25000	0.1	0.51
US 36 - Sunbury to SR 3	2016	13610	15810	11750	25790	23360	0.11	0.53
Old State - US 36 to Cheshire	2016	4990	5450	5490	7940	8100	0.1	0.63
Africa - US 36 to Cheshire	2016	3020	4420	2930	9520	7380	0.1	0.5
Rome Corners Rd. - Lewis Center to US 36	2016	1080	1410	550	4480	3030	0.1	0.61
Lewis Center - Africa to Worthington Rd.	2016	3000	2830	6890	3330	7650	0.1	0.79
Cheshire - Old State to Africa	2016	6600	8270	8760	24540	25590	0.1	0.56
Old State - Cheshire to Lewis Center	2016	6990	8670	8300	16900	16390	0.1	0.63
Africa - Cheshire to Lewis Center Rd. (North)	2016	6960	6780	7140	9590	11060	0.1	0.84
SR 3 - US 36 to Big Walnut	2016	12570	12220	17040	17290	21310	0.1	0.61
IR 71 - US 36 to Gemini (S of Big Walnut)	2016	78244	87500	108100	124300	143420	0.08	0.65
Lewis Center - Old State to Bale Kenyon	2016	7160	9610	11840	20940	23470	0.1	0.58
Lewis Center - Bale Kenyon to Africa	2016	11250	12380	15260	25540	30170	0.11	0.6
Old State - Lewis Center to Orange	2016	11600	13210	15650	27410	24510	0.1	0.64
Bale Kenyon - Lewis Center to Orange	2016	4400	4330	3570	9000	8060	0.1	0.61
Big Walnut - IR 71 to Worthington Rd.	2016	5820	6360	13860	14830	22140	0.1	0.72
Big Walnut - Worthington Rd. to SR 3	2016	6930	7150	8860	14150	15550	0.1	0.56
Orange Rd. - Old State to Bale Kenyon Rd.	2016	3840	4090	3880	11000	12240	0.1	0.56
Old State - Orange to Powell	2016	19880	20990	19020	33370	31020	0.1	0.63
Old State - Powell to Polaris	2016	26700	27370	25530	38930	37040	0.1	0.81
Powell - Old State to IR 71	2016	8230	9830	9030	12830	12180	0.1	0.57
SR 750 Polaris - Old State to IR 71	2016	54540	54910	54930	70270	70950	0.1	0.59
Powell - IR 71 to Bale Kenyon	2016	8410	7790	8410	10880	11950	0.1	0.57
Powell - Bale Kenyon to Worthington	2016	13990	13680	14840	21830	23810	0.1	0.6
Worthington - Polaris to Powell	2016	23070	22150	20980	27670	26710	0.1	0.66
Polaris - IR 71 to Worthington Rd.	2016	53340	52150	49110	59500	55070	0.1	0.6
Worthington Rd. - Powell to Africa	2016	15850	16730	11570	22310	16910	0.1	0.6
Bale Kenyon - Lewis Center to Powell	2016	4340	5620	4880	11760	11280	0.1	0.61
Africa - Lewis Center to Worthington	2016	8530	8970	6880	14820	12690	0.1	0.6
Worthington Rd. - Africa to Big Walnut	2016	5850	6590	4840	8830	6170	0.1	0.69
SR 3 - Polaris to Big Walnut	2016	22760	22760	19560	33030	28320	0.1	0.69
Africa - Polaris to Worthington Rd.	2016	6700	7350	7160	13540	13490	0.1	0.69
Polaris - Worthington to Africa	2016	36520	34030	33720	41030	40540	0.1	0.58
Polaris - Africa to SR 3	2016	21610	21160	20190	27440	26150	0.1	0.62
Big Walnut - Africa to IR 71	2016	6500	6950	12310	19850	21930	0.1	0.65
Africa - Big Walnut to Lewis Center	2016	6960	6780	12780	9100	16560	0.13	0.91
Jaycox - Africa to Worthington Rd.	2016	970	900	1490	1050	1940	0.2	0.77
Worthington Rd - Big Walnut to Lewis Center	2016	4520	4520	8810	7400	11460	0.1	0.66
SR 3 - Big Walnut to Lewis Center	2016	12450	12460	9580	19110	15620	0.1	0.7
Gemini - IR 71 to Orion	2013	9357	9890	7560	14200	11300	0.1	0.72
Gemini - IR 71 to Lyra	2013	34998	39180	39520	43300	43430	0.1	0.58
Polaris - IR 71 to Lyra	2013	49868	49290	48220	61830	61040	0.1	0.67
Polaris - IR 71 to Orion	2013	50469	52290	49260	58890	54490	0.1	0.56

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34000

33710

5810

6750

2390

2280

29530

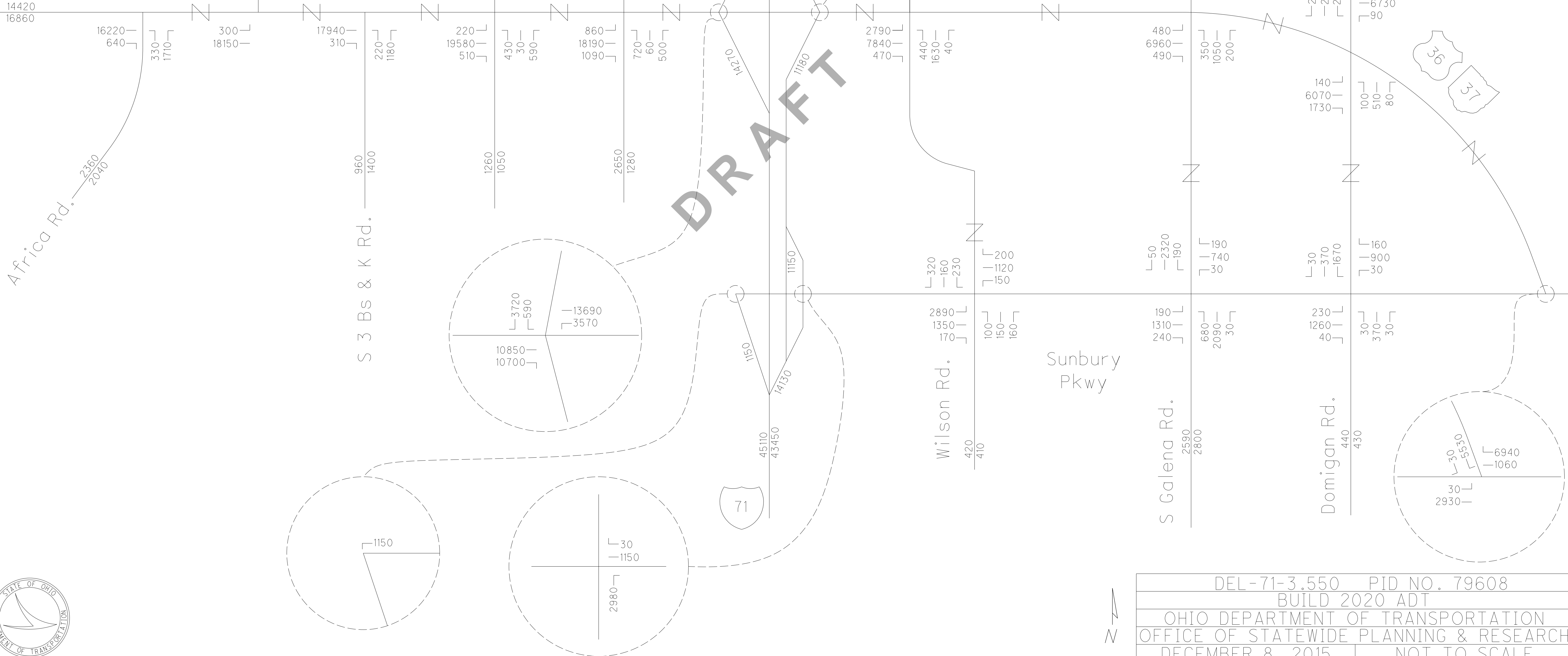
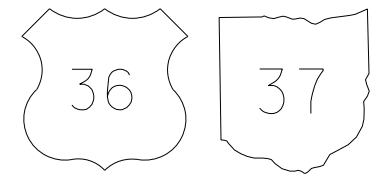
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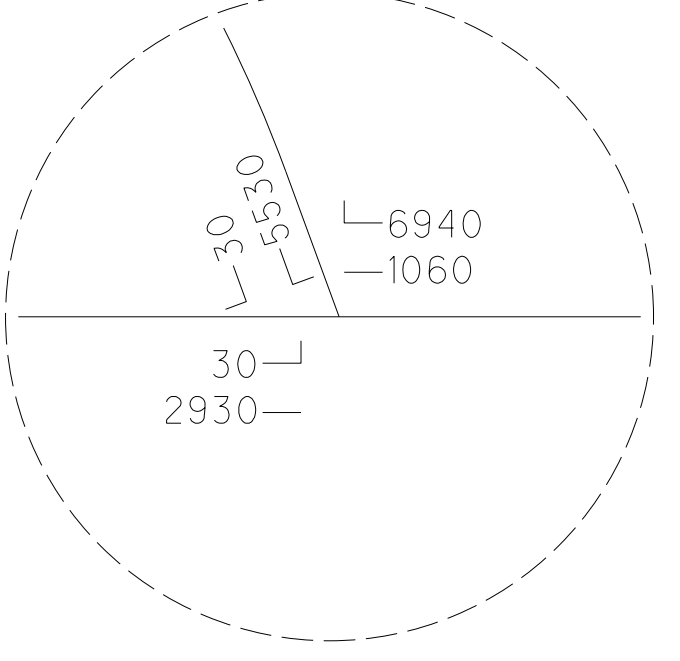
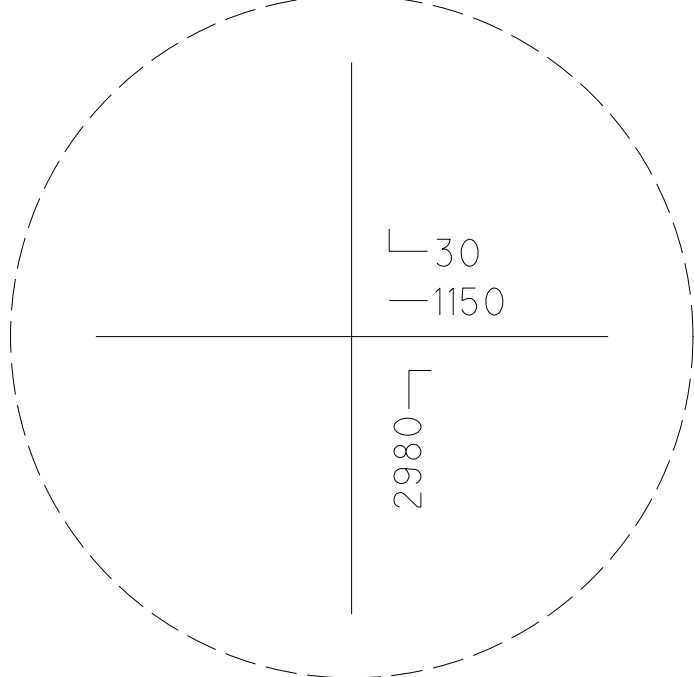
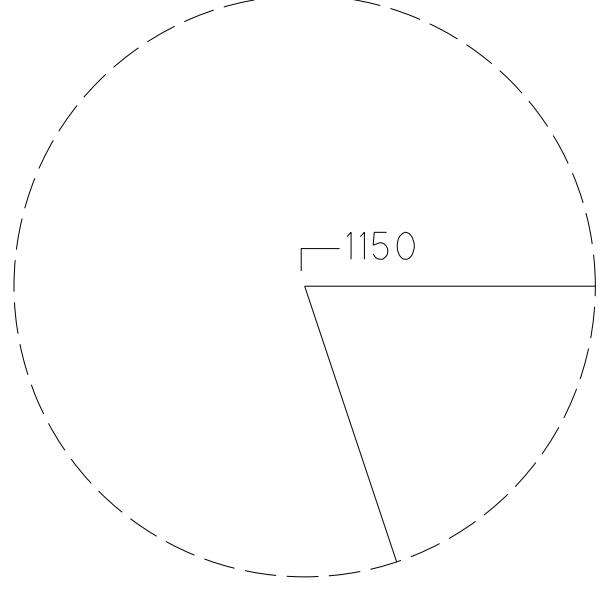
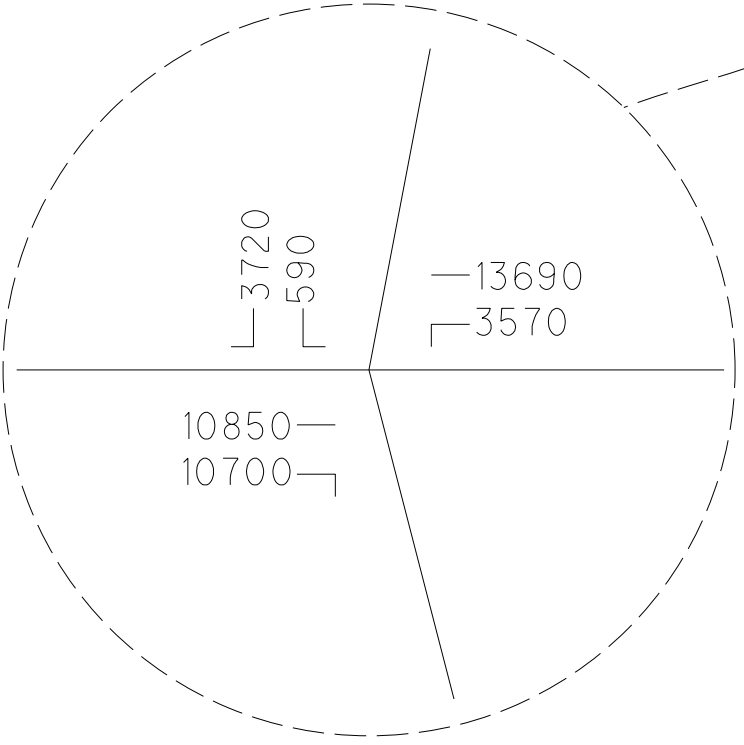
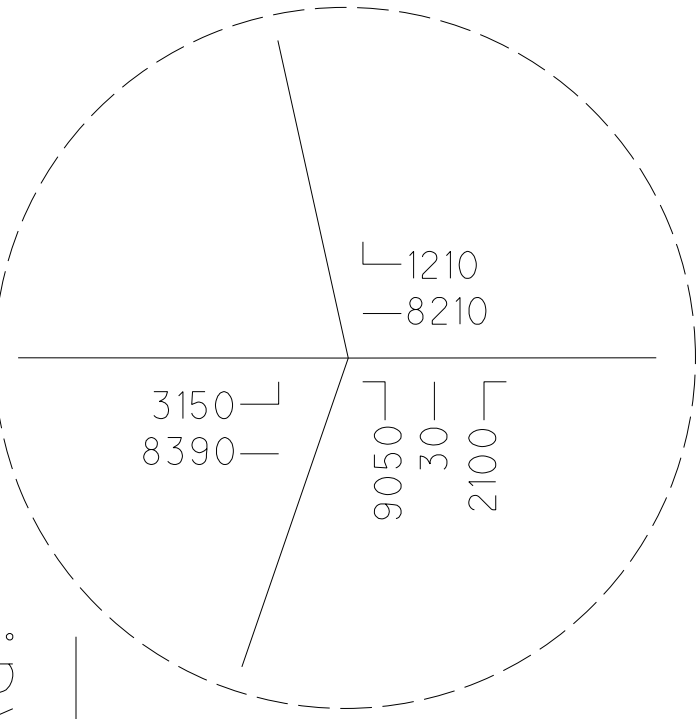


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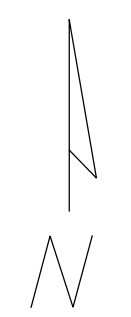
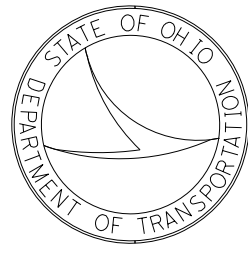
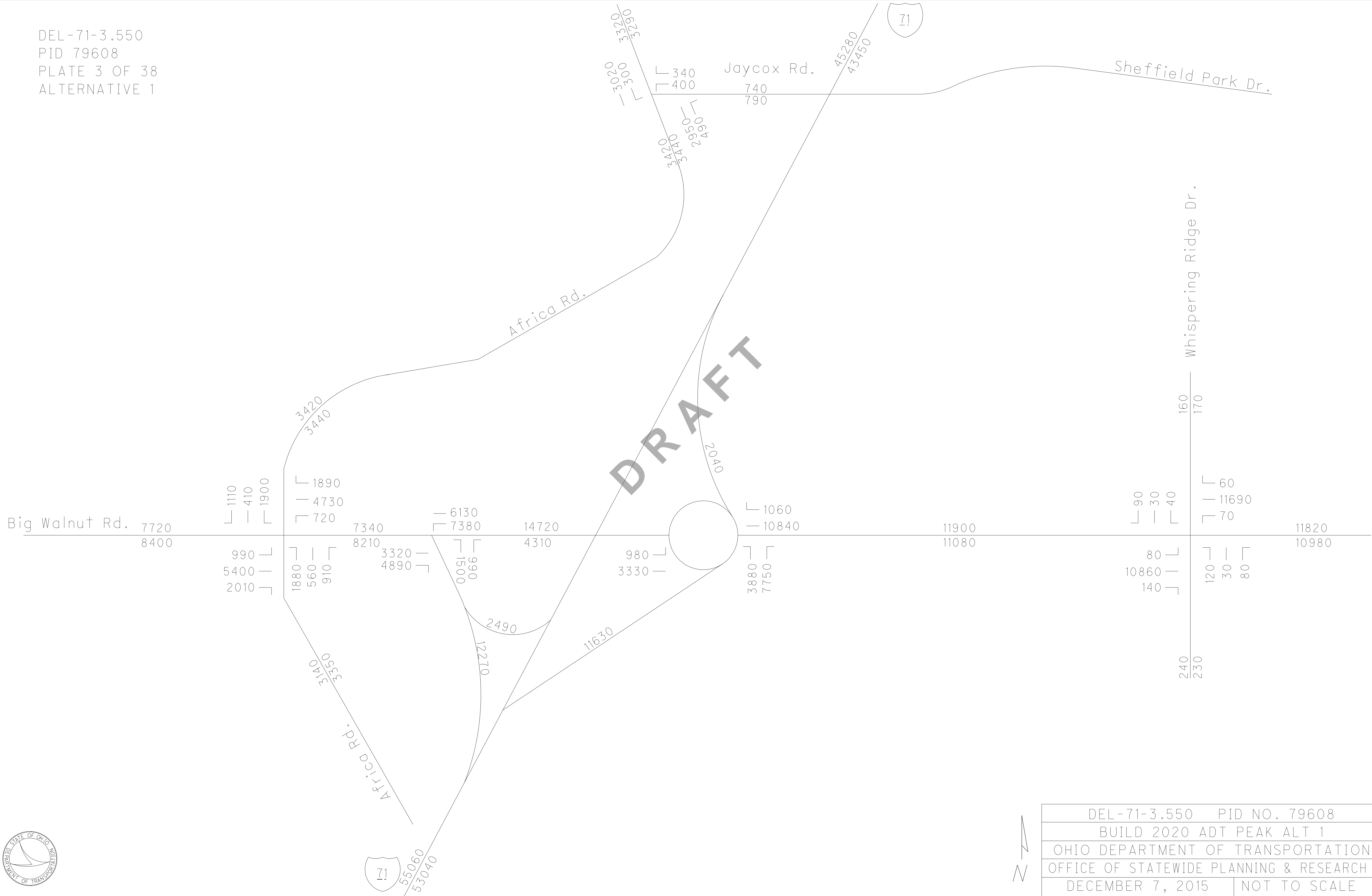


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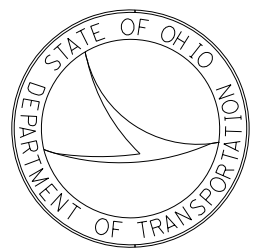
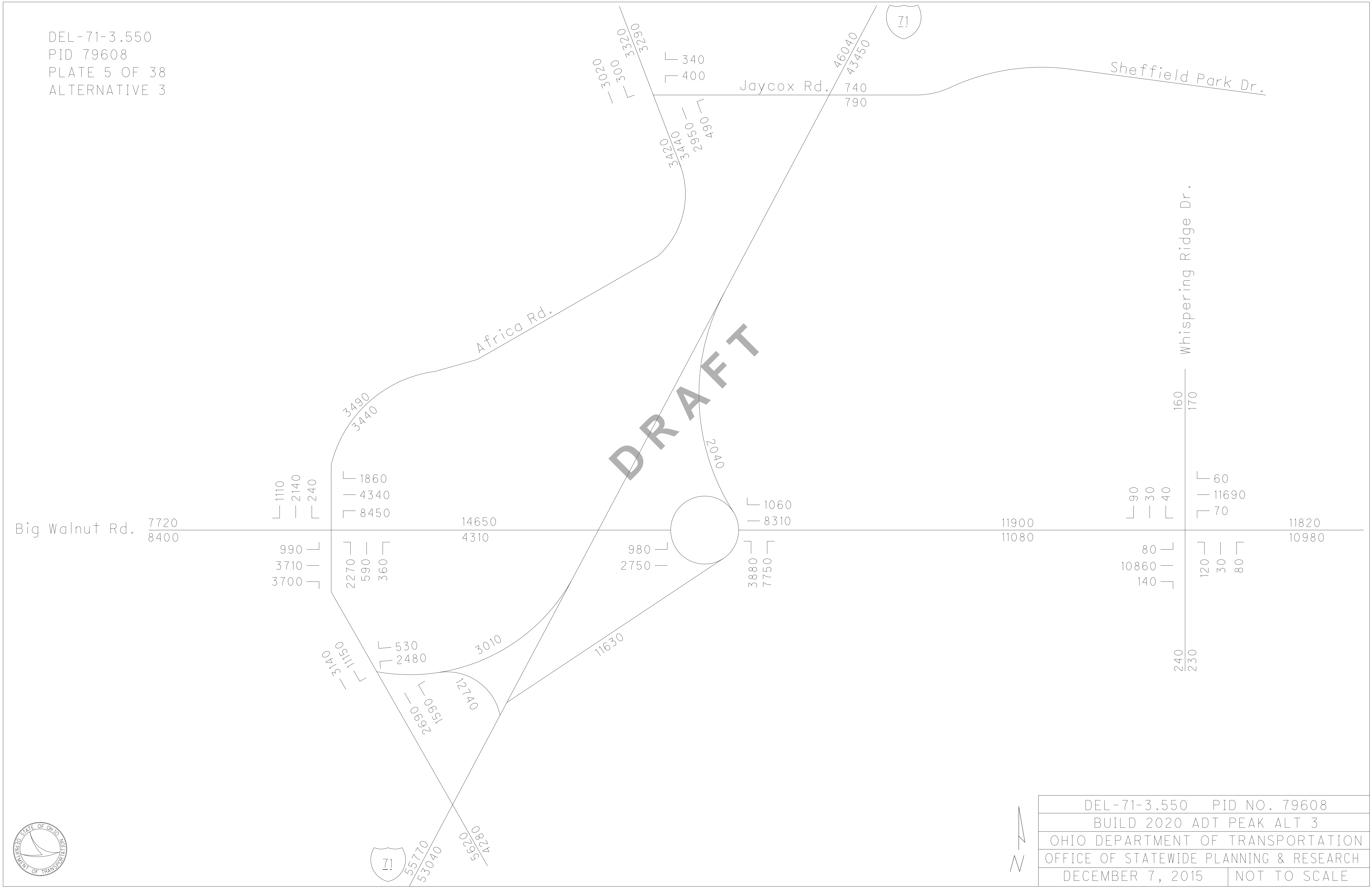
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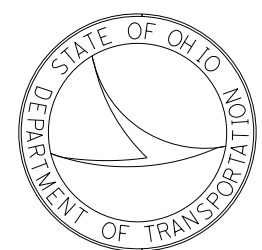
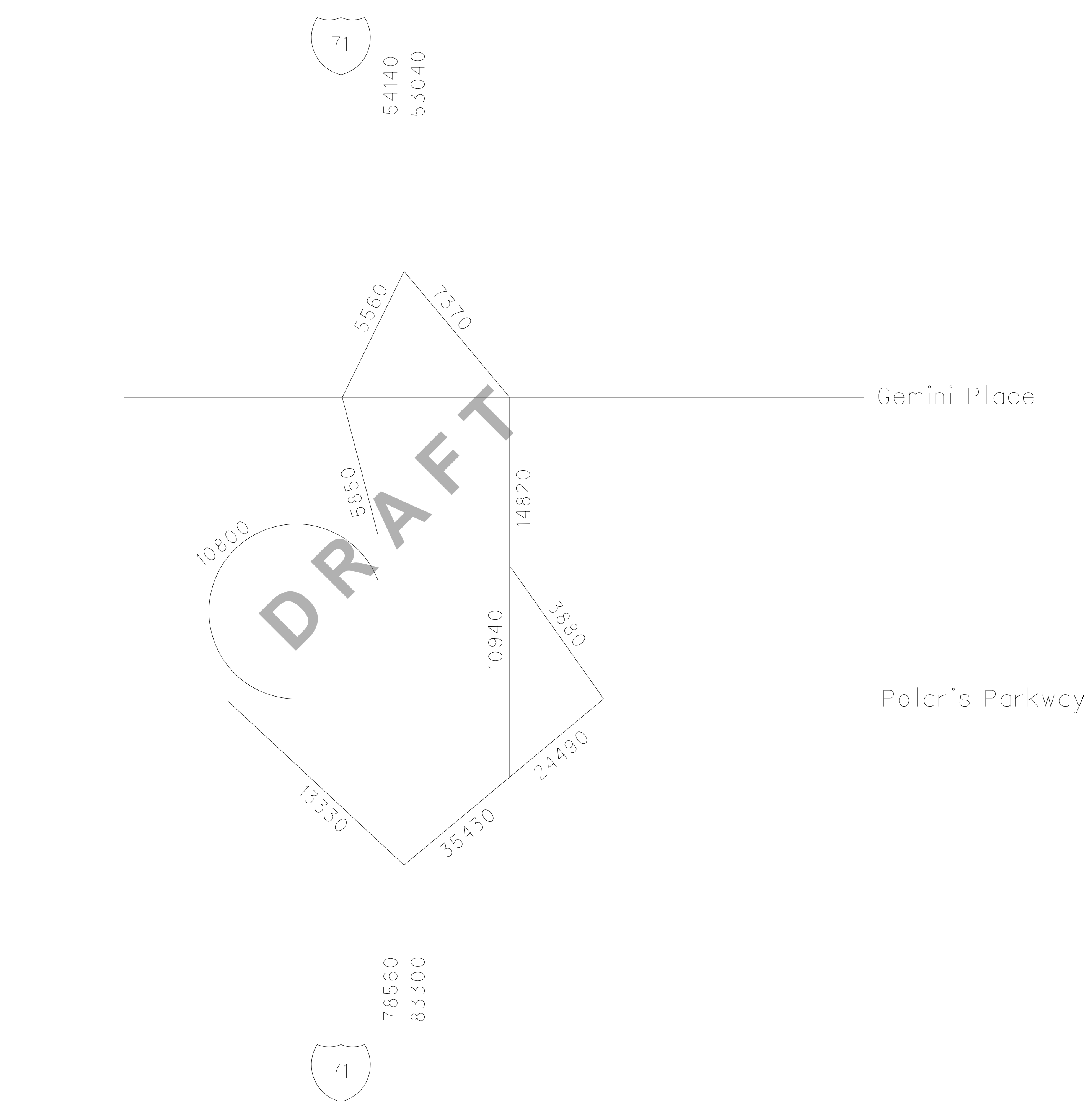
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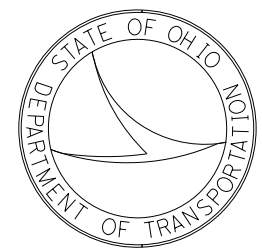
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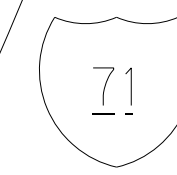
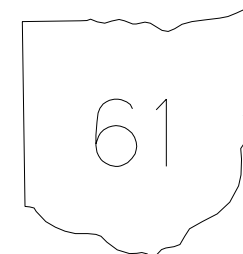
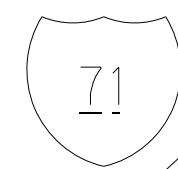
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2870/2270

1580/3400

250/870

960/360

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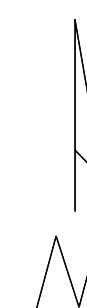
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170/170

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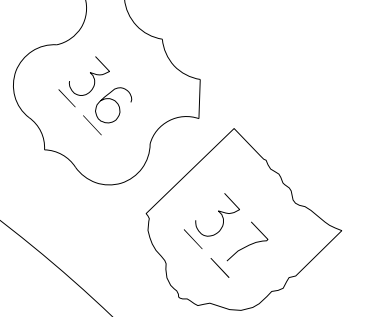
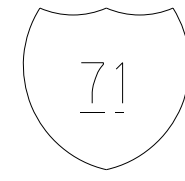
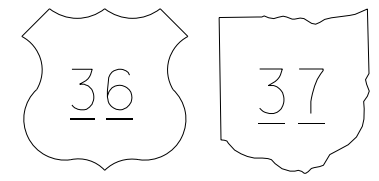
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1490/2700

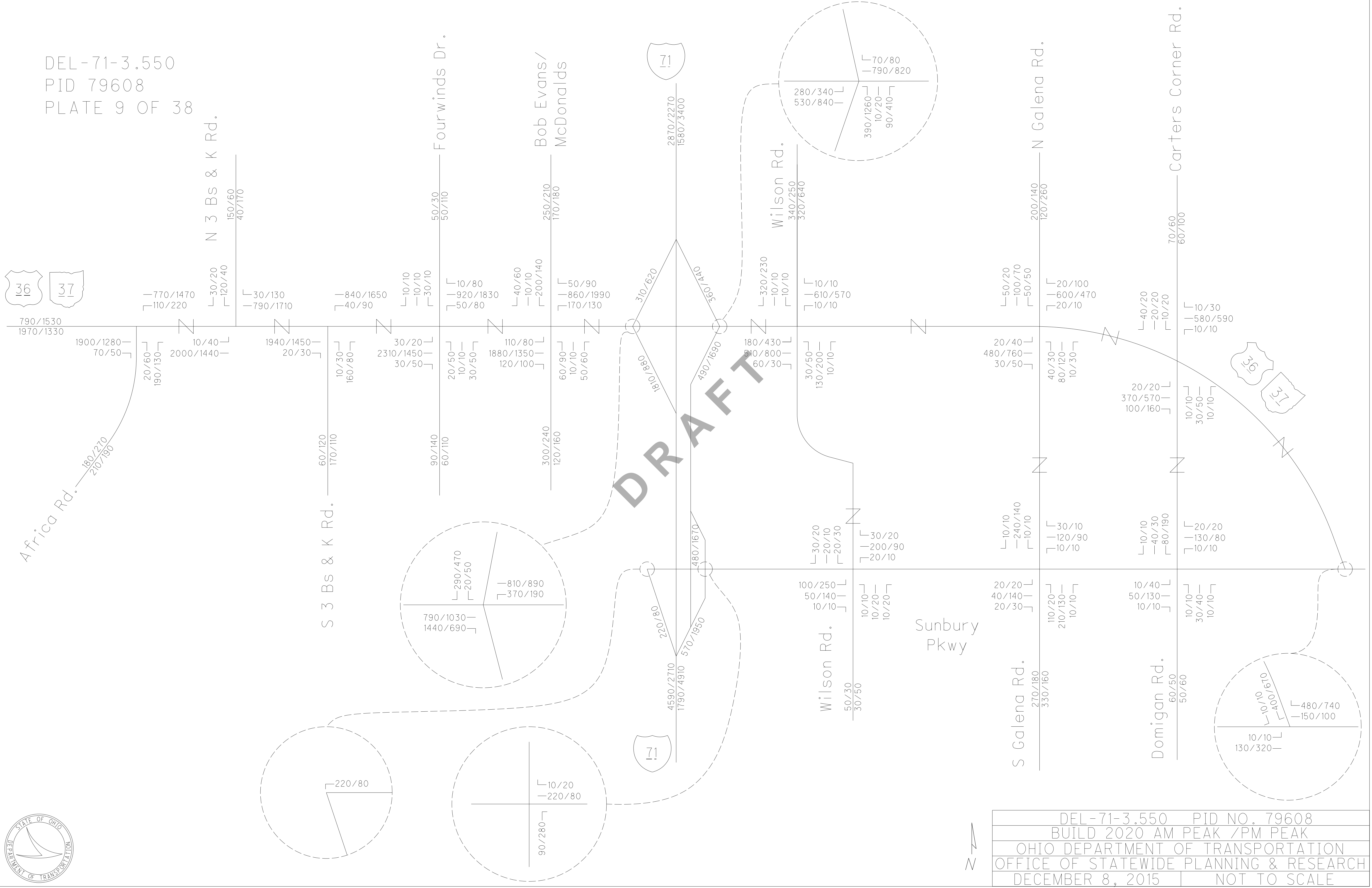


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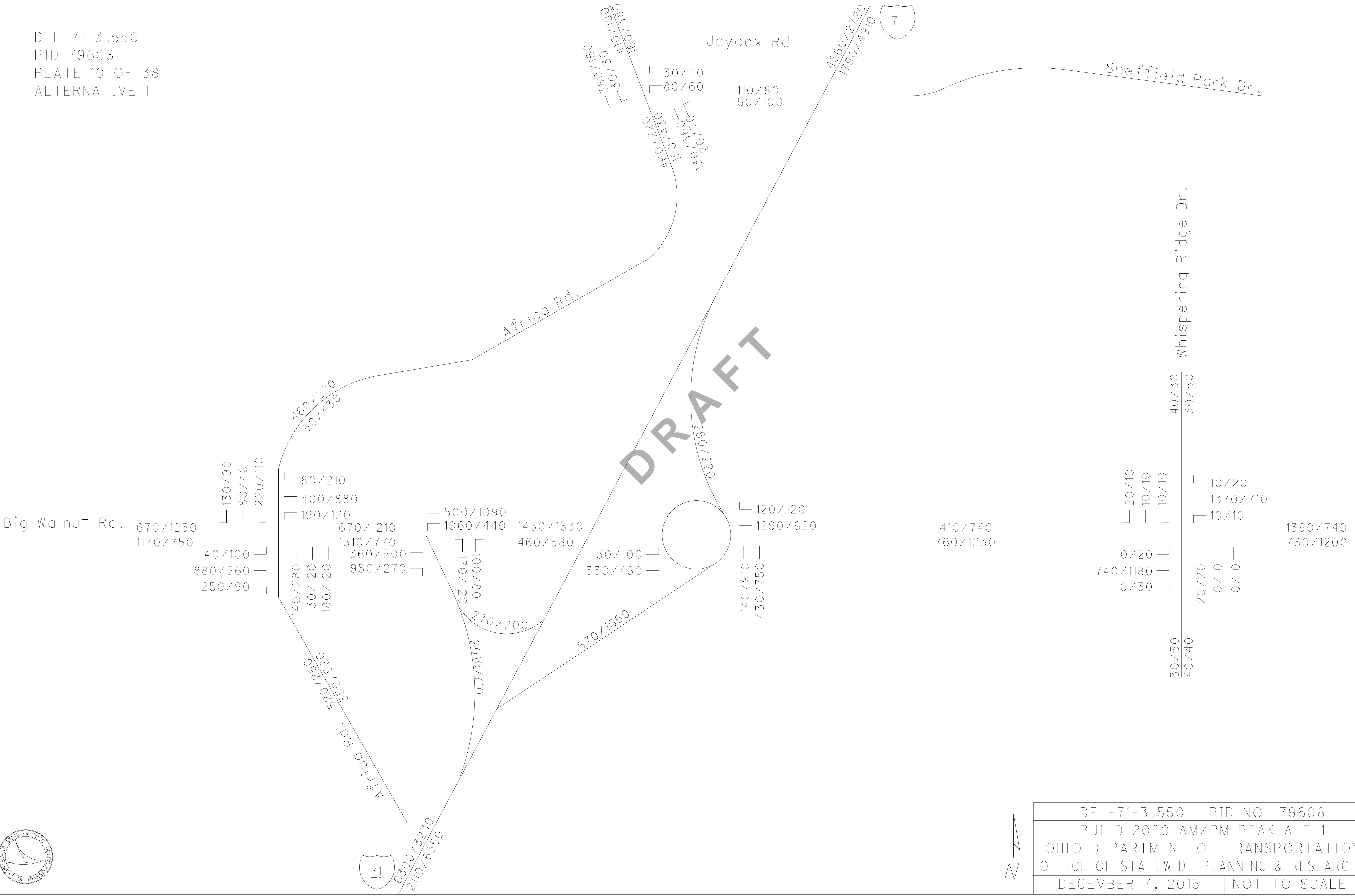


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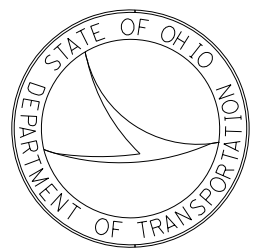


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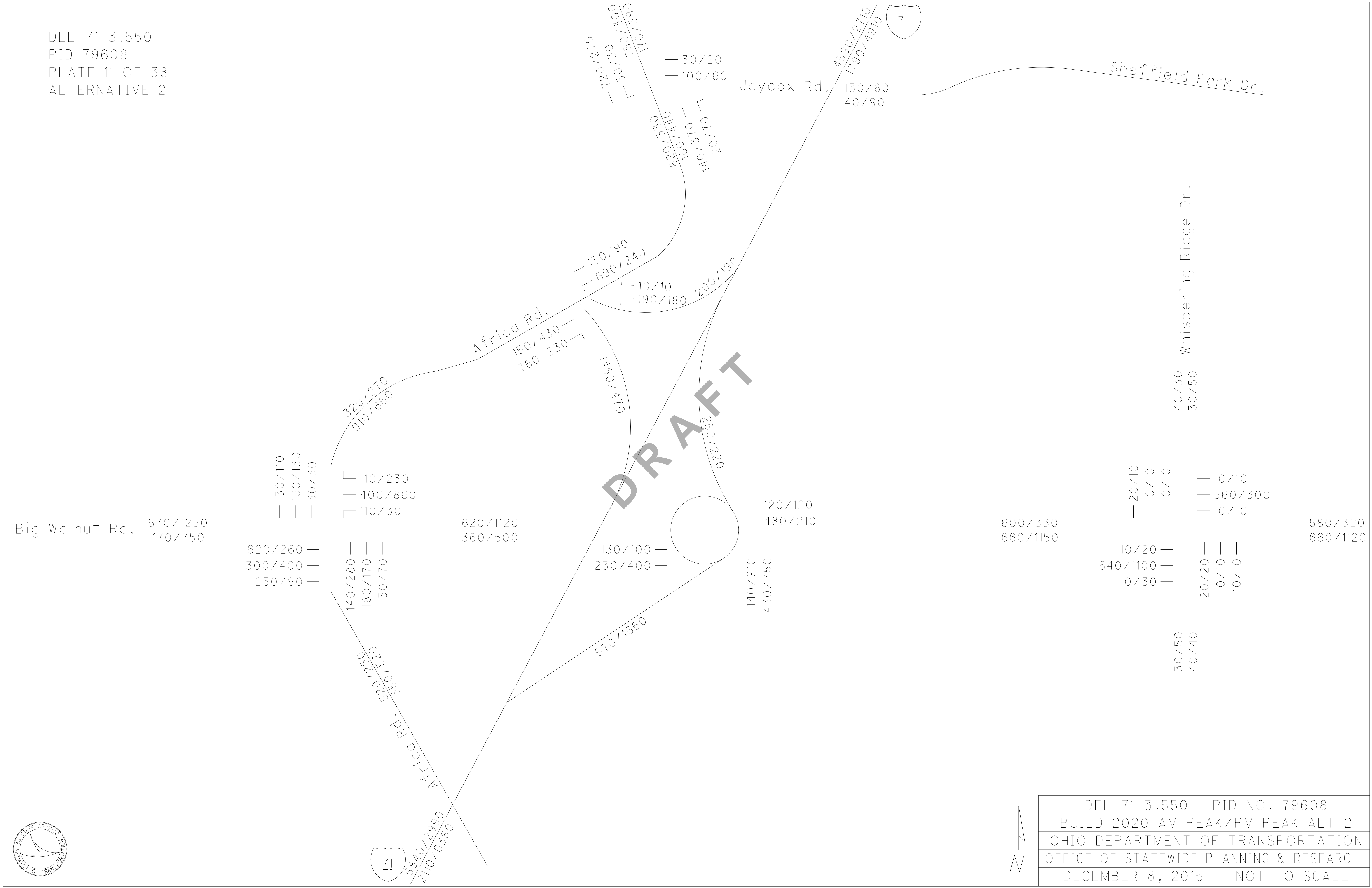


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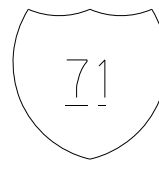
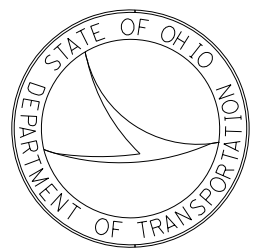


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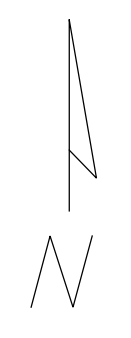
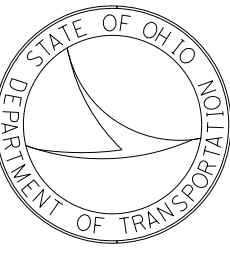
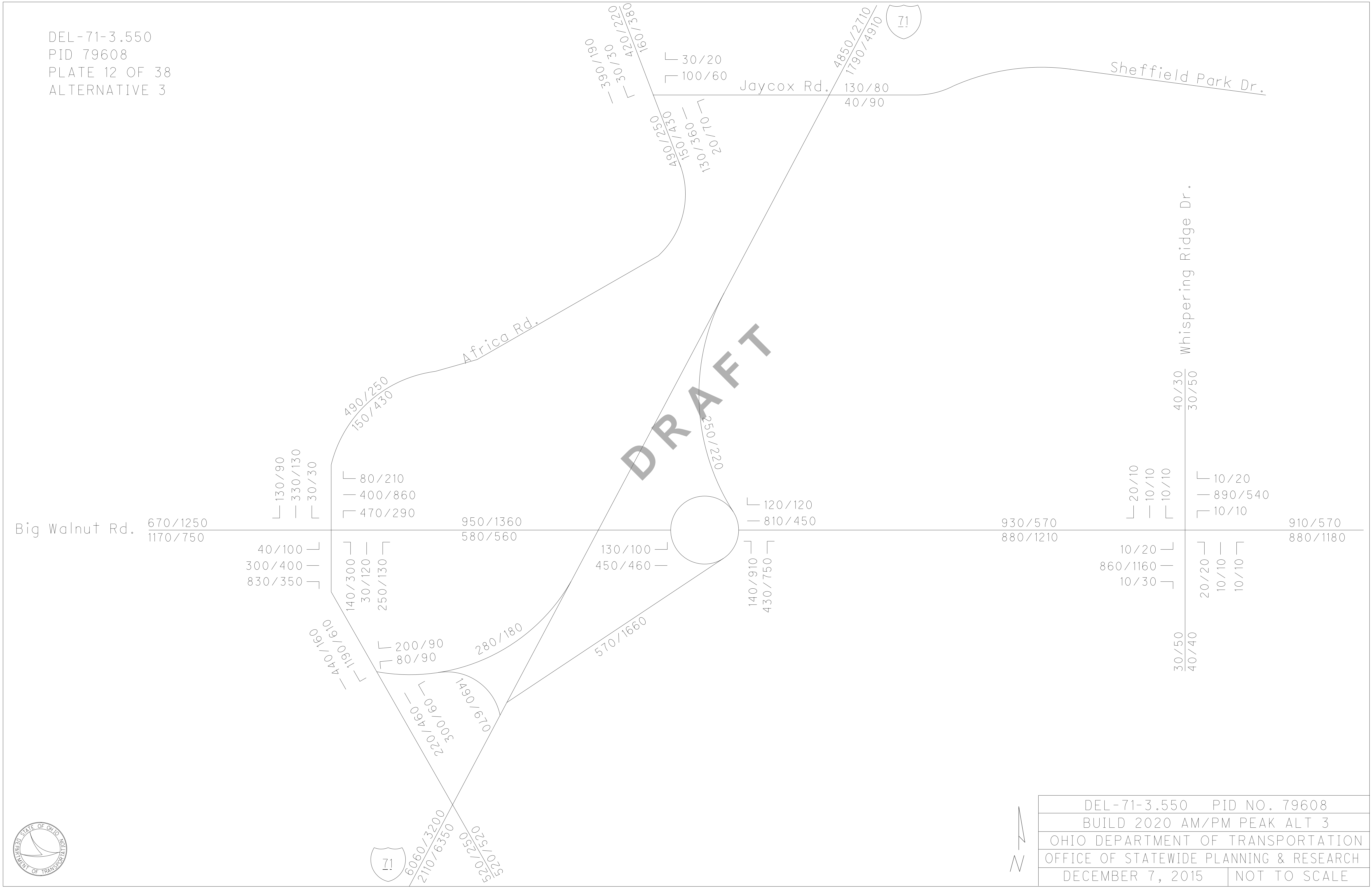


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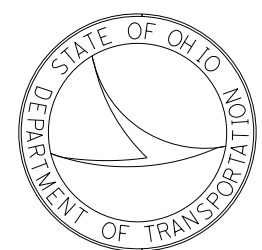
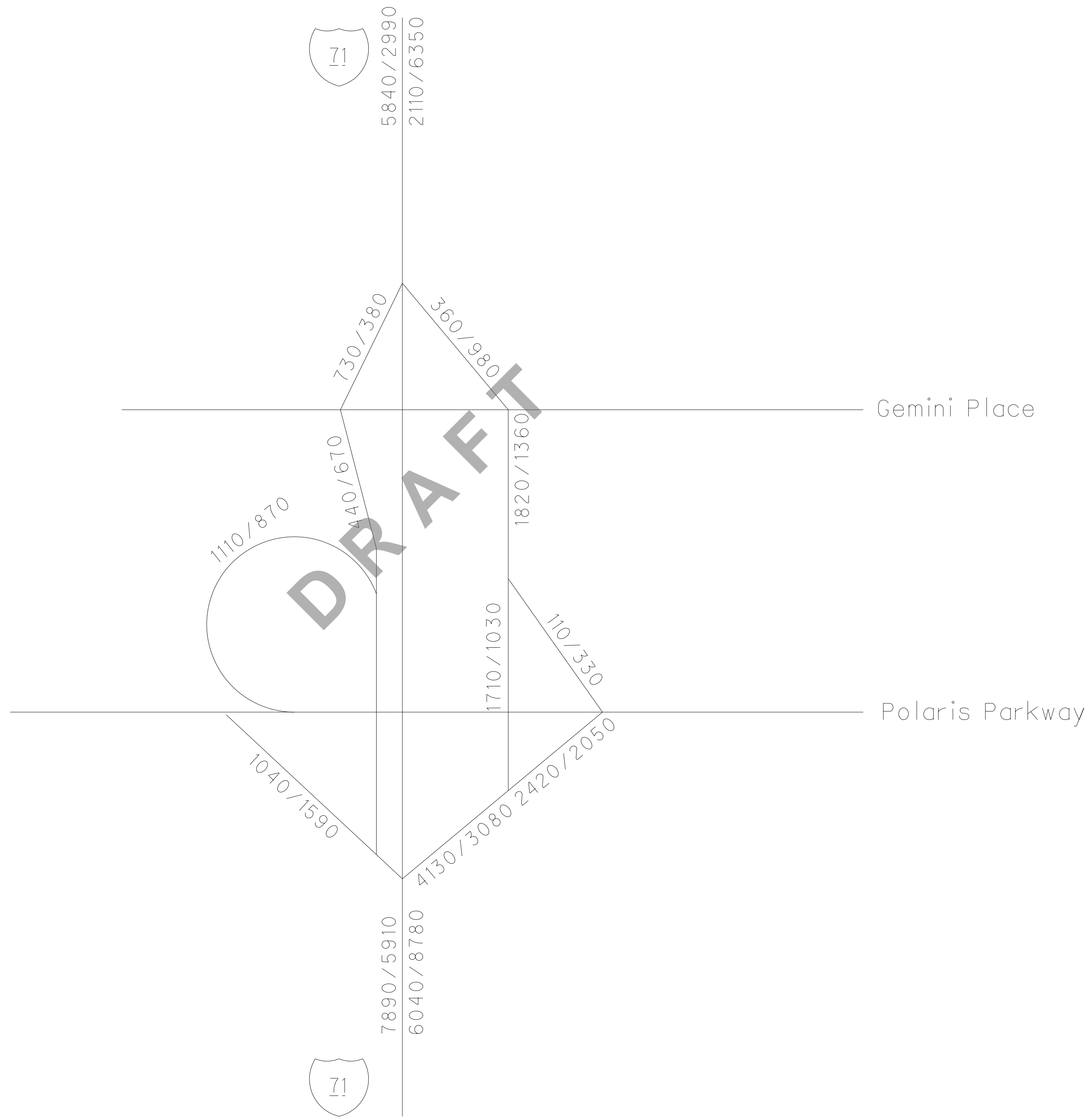
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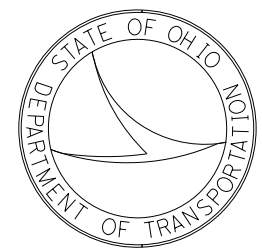
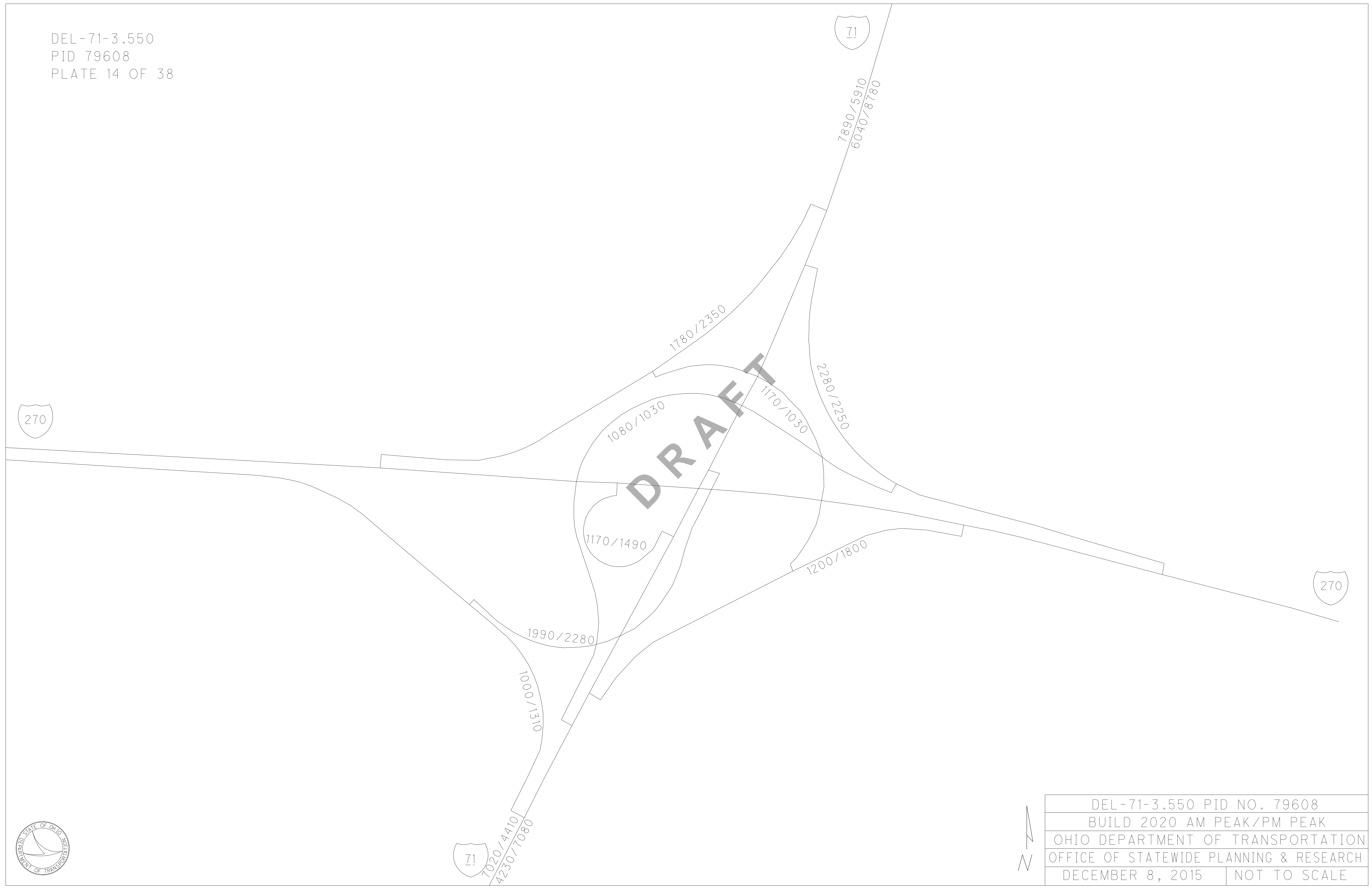
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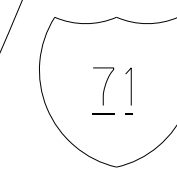
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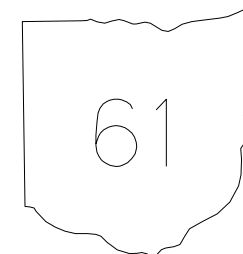
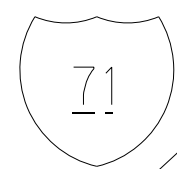


DEL-71-3.550 PID NO. 79608	
BUILD 2020 AM PEAK/PM PEAK	
OHIO DEPARTMENT OF TRANSPORTATION	
OFFICE OF STATEWIDE PLANNING & RESEARCH	
DECEMBER 8, 2015	NOT TO SCALE

DEL-71-3.550
PID 79608
PLATE 15 OF 38



DRAFT



46550

46330

6940

8060

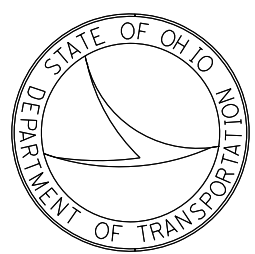
2850

2720

41210

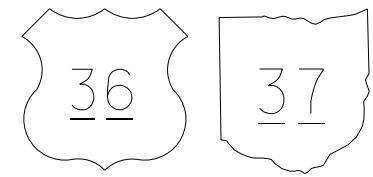
42240

Bennington Way

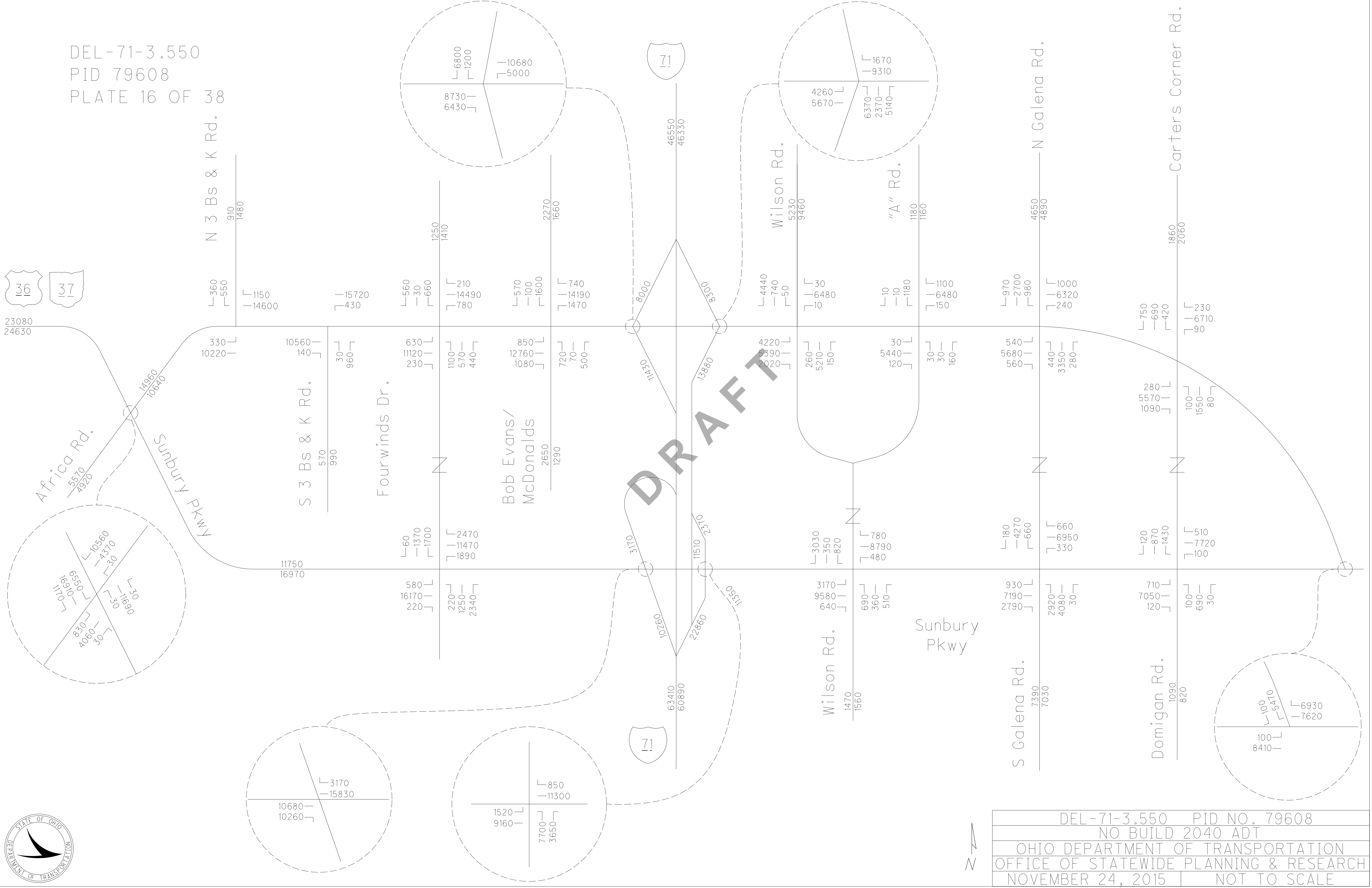


DEL-71-3.550 PID NO. 79608	
NO BUILD 2040 ADT	
OHIO DEPARTMENT OF TRANSPORTATION	
OFFICE OF STATEWIDE PLANNING & RESEARCH	
NOVEMBER 24, 2015	NOT TO SCALE

DEL-71-3.550
 PID 79608
 PLATE 16 OF 38



23080
24630



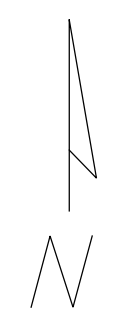
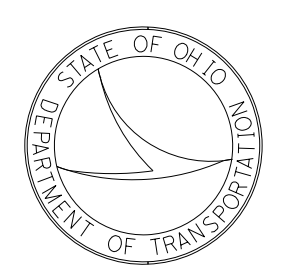
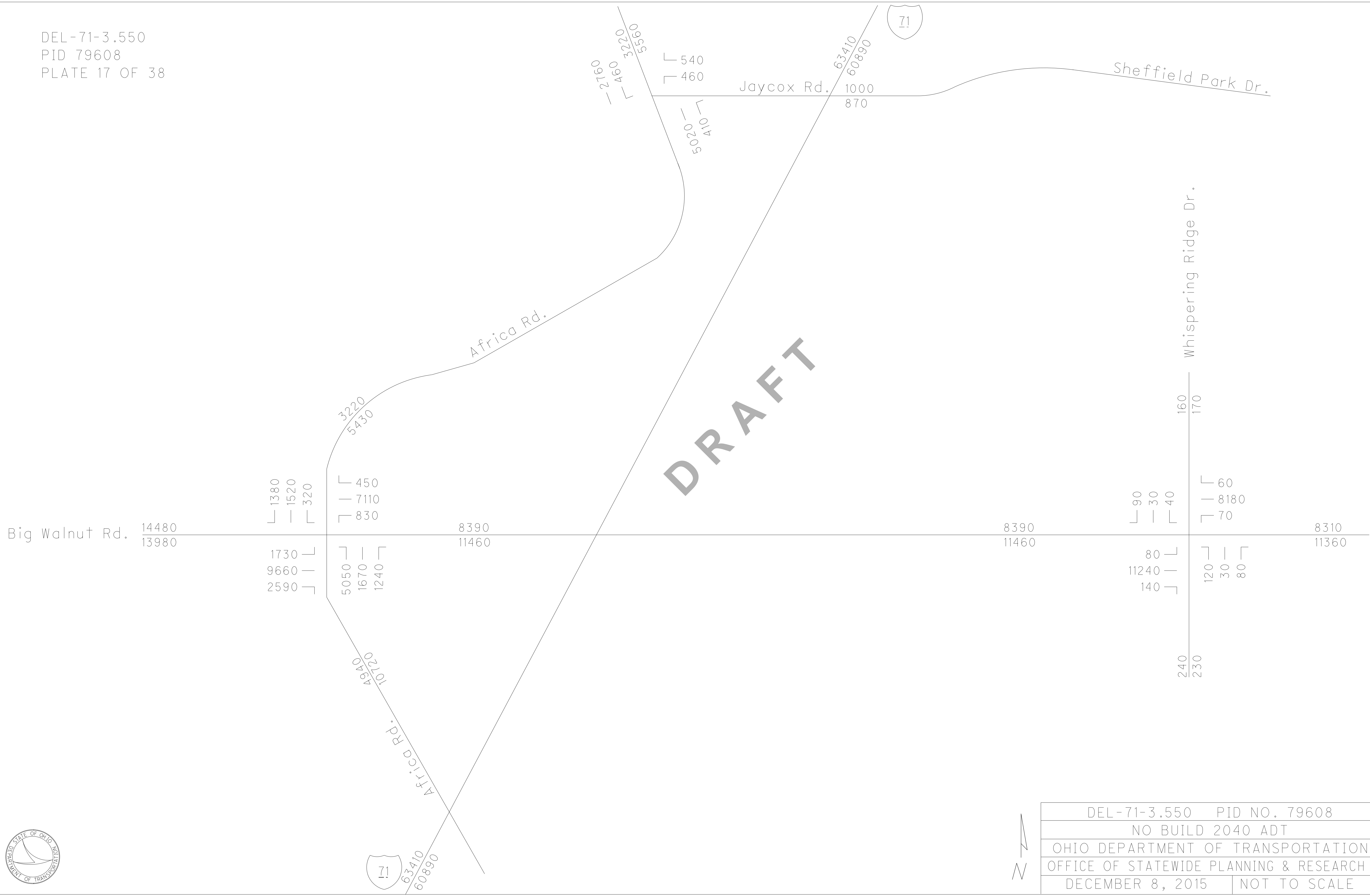
DRAFT



DEL-71-3.550 PID NO. 79608	
NO BUILD 2040 ADT	
OHIO DEPARTMENT OF TRANSPORTATION	
OFFICE OF STATEWIDE PLANNING & RESEARCH	
NOVEMBER 24, 2015	NOT TO SCALE

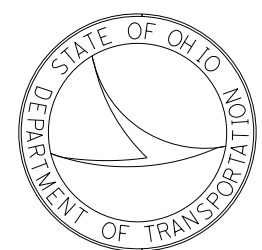
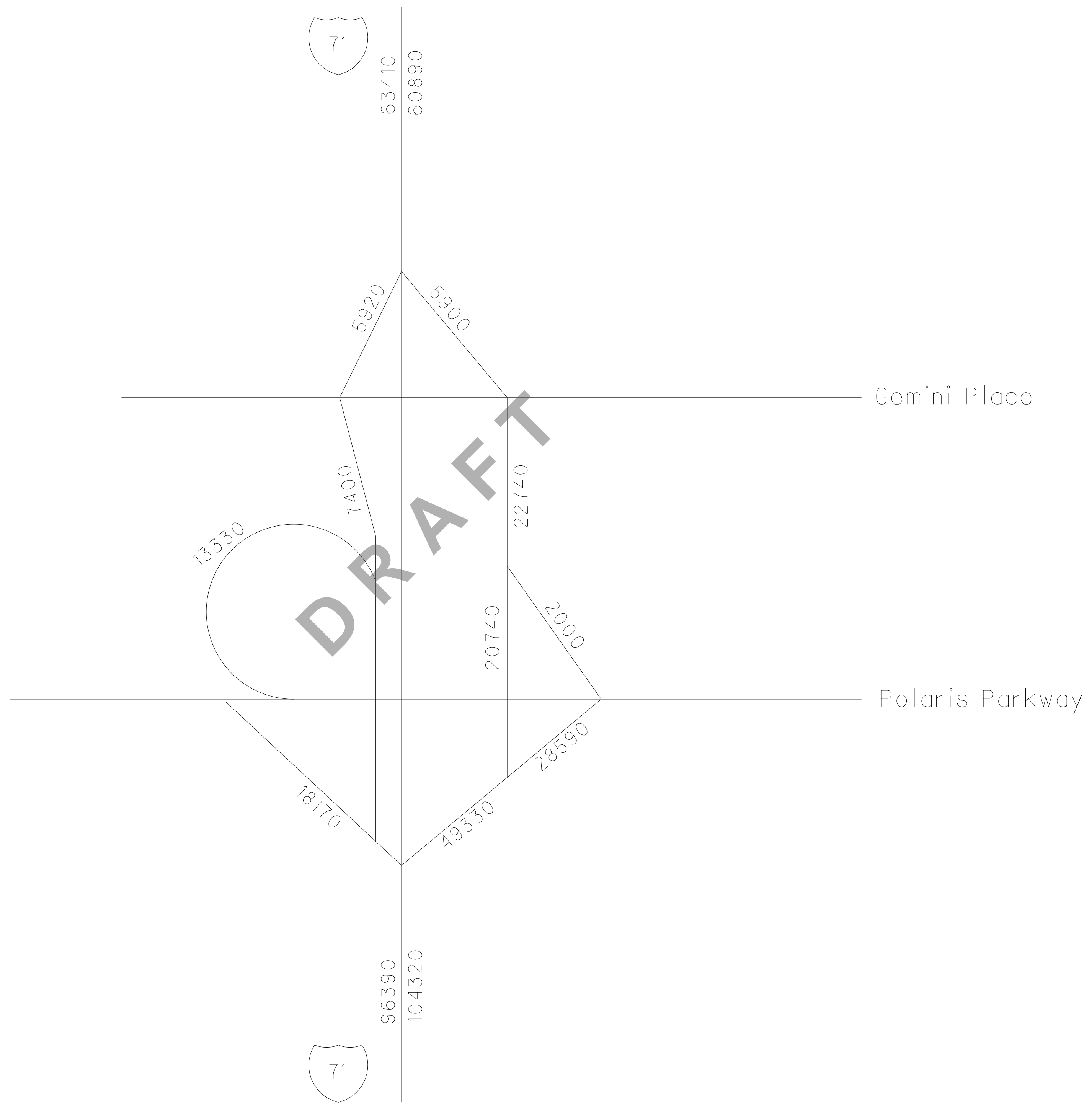
DEL-71-3.550
 PID 79608
 PLATE 17 OF 38

DRAFT



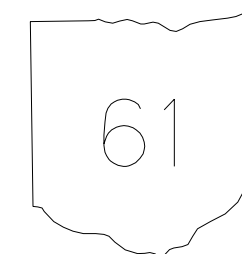
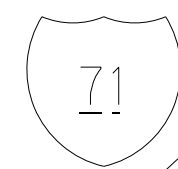
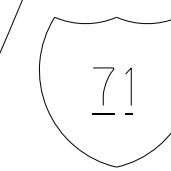
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NO BUILD 2040 ADT	
OHIO DEPARTMENT OF TRANSPORTATION	
OFFICE OF STATEWIDE PLANNING & RESEARCH	
DECEMBER 8, 2015	NOT TO SCALE

DEL-71-3.550
PID 79608
PLATE 18 OF 38



DEL-71-3.550 PID NO. 79608	
NO BUILD 2040 ADT	
OHIO DEPARTMENT OF TRANSPORTATION	
OFFICE OF STATEWIDE PLANNING & RESEARCH	
NOVEMBER 24, 2015	NOT TO SCALE

DEL-71-3.550
PID 79608
PLATE 20 OF 38



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Bennington Way

3720/3260

2170/4680

290/1040

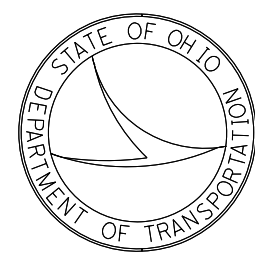
1150/430

200/210

210/210

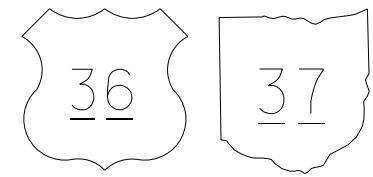
2780/3040

2080/3850

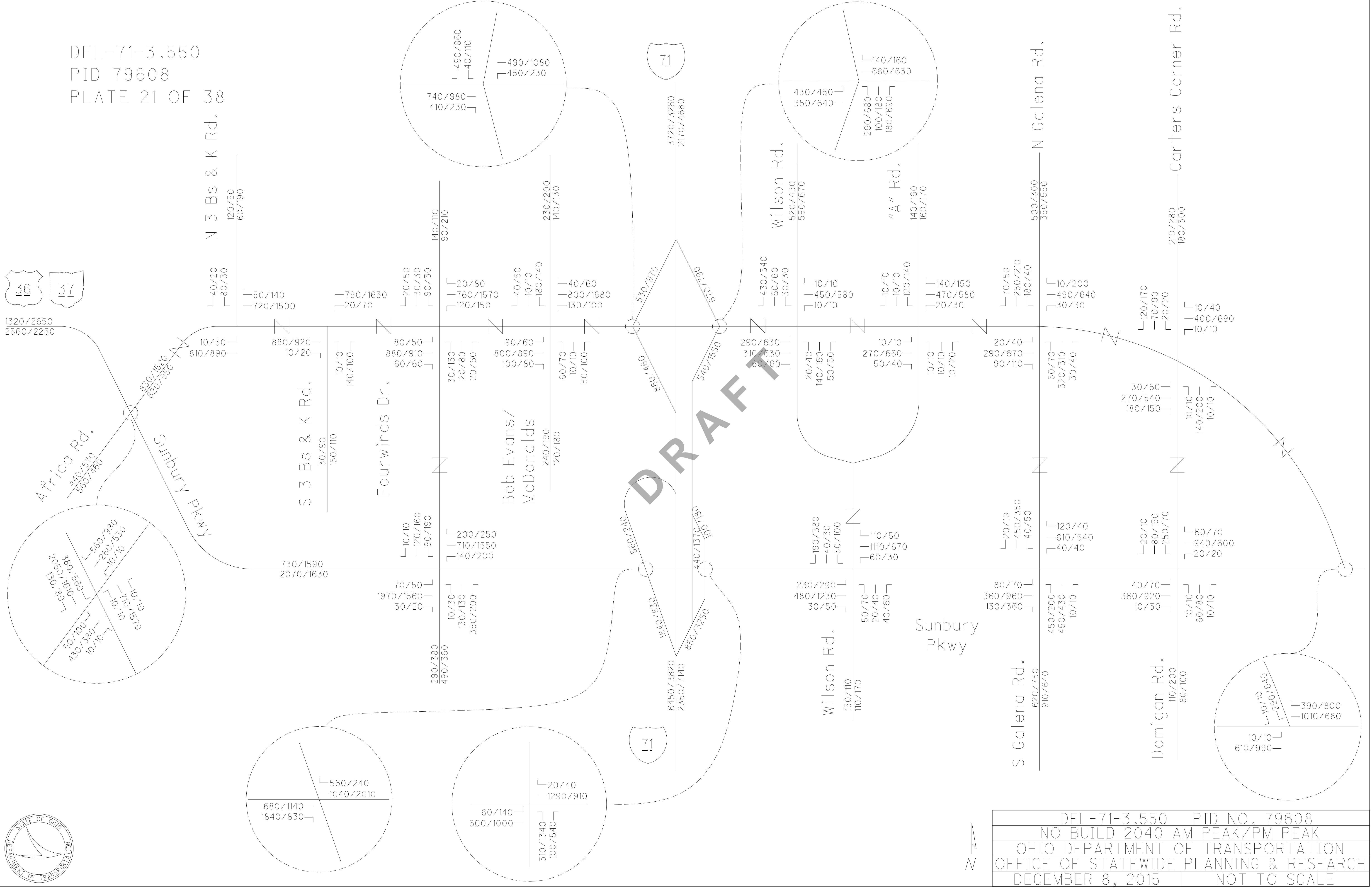


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OHIO DEPARTMENT OF TRANSPORTATION	
OFFICE OF STATEWIDE PLANNING & RESEARCH	
NOVEMBER 27, 2015	NOT TO SCALE

DEL-71-3.550
 PID 79608
 PLATE 21 OF 38



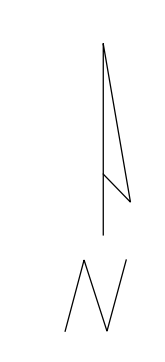
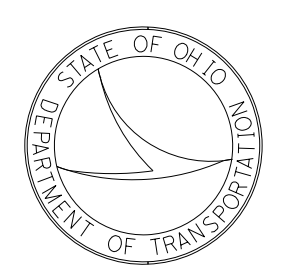
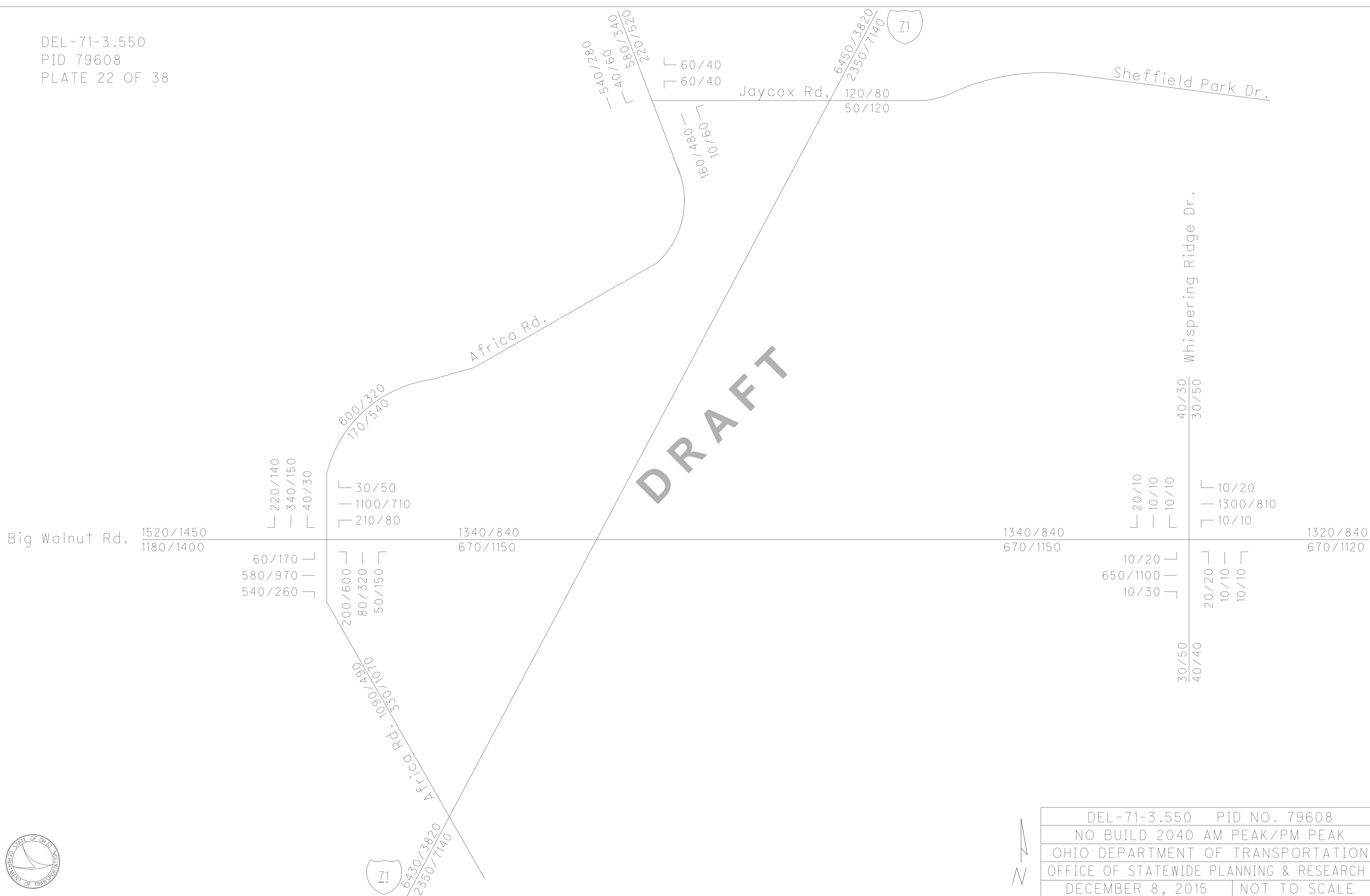
1320/2650
 2560/2250



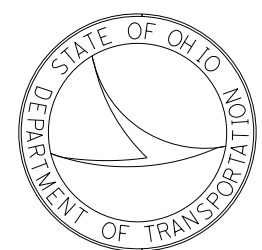
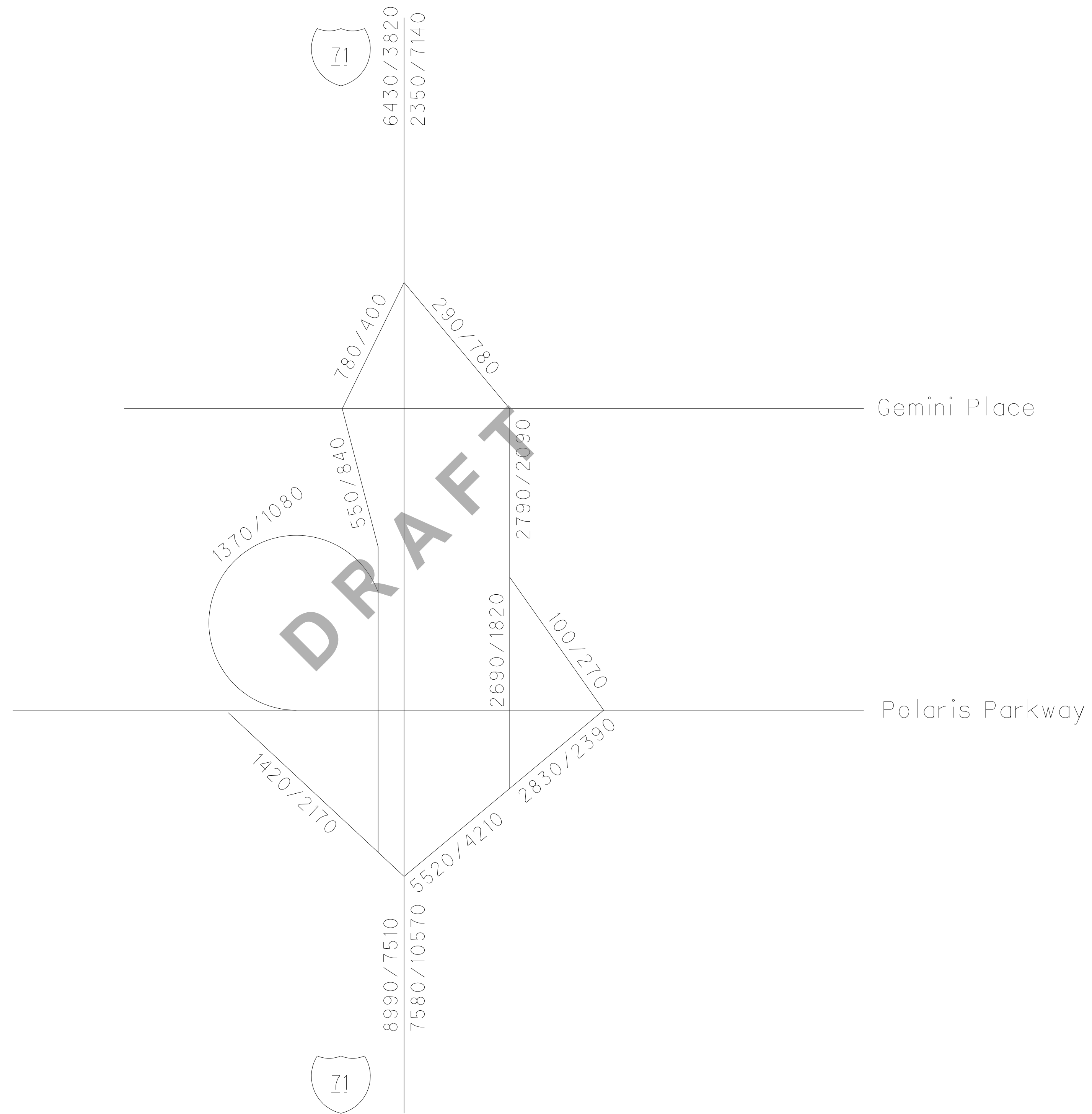
DEL-71-3.550 PID NO. 79608	
NO BUILD 2040 AM PEAK/PM PEAK	
OHIO DEPARTMENT OF TRANSPORTATION	
OFFICE OF STATEWIDE PLANNING & RESEARCH	
DECEMBER 8, 2015	NOT TO SCALE

DEL-71-3.550
PID 79608
PLATE 22 OF 38

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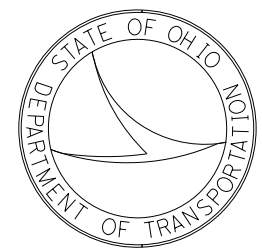
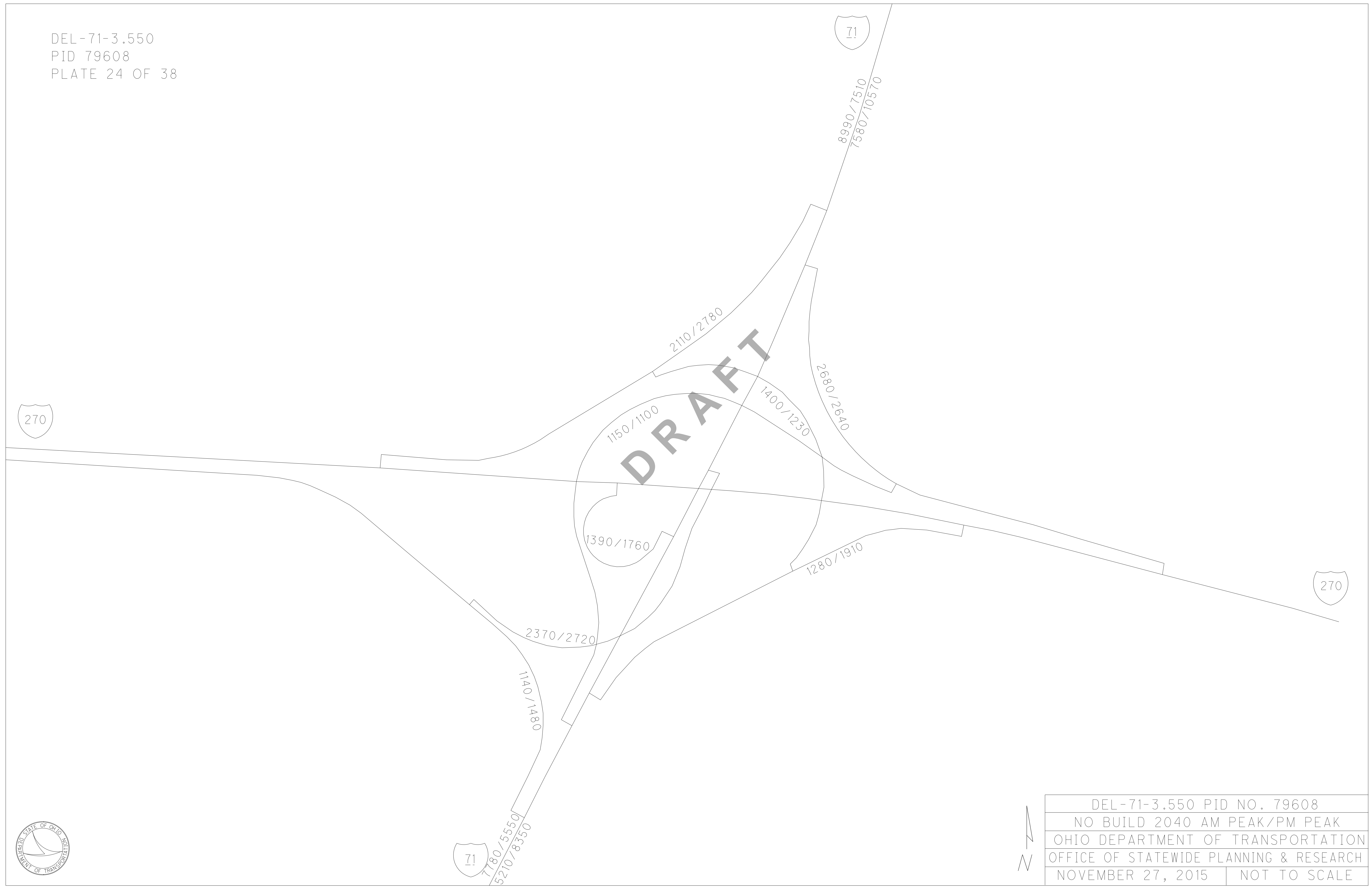


DEL-71-3.550 PID NO. 79608	
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OHIO DEPARTMENT OF TRANSPORTATION	
OFFICE OF STATEWIDE PLANNING & RESEARCH	
DECEMBER 8, 2015	NOT TO SCALE



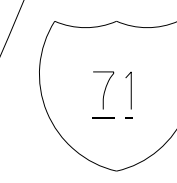
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OHIO DEPARTMENT OF TRANSPORTATION	
OFFICE OF STATEWIDE PLANNING & RESEARCH	
NOVEMBER 27, 2015	NOT TO SCALE

DEL-71-3.550
PID 79608
PLATE 24 OF 38

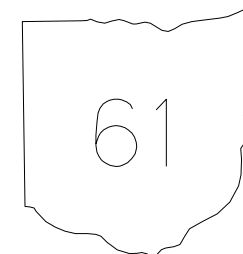
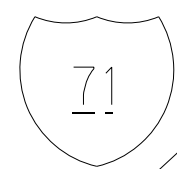


DEL-71-3.550 PID NO. 79608	
NO BUILD 2040 AM PEAK/PM PEAK	
OHIO DEPARTMENT OF TRANSPORTATION	
OFFICE OF STATEWIDE PLANNING & RESEARCH	
NOVEMBER 27, 2015	NOT TO SCALE

DEL-71-3.550
PID 79608
PLATE 25 OF 38



DRAFT



46600

46490

7100

8240

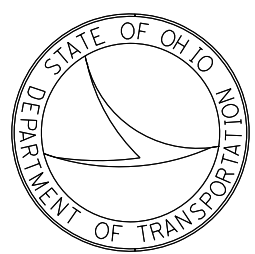
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2780

41140

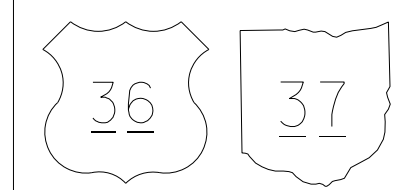
42310

Bennington Way

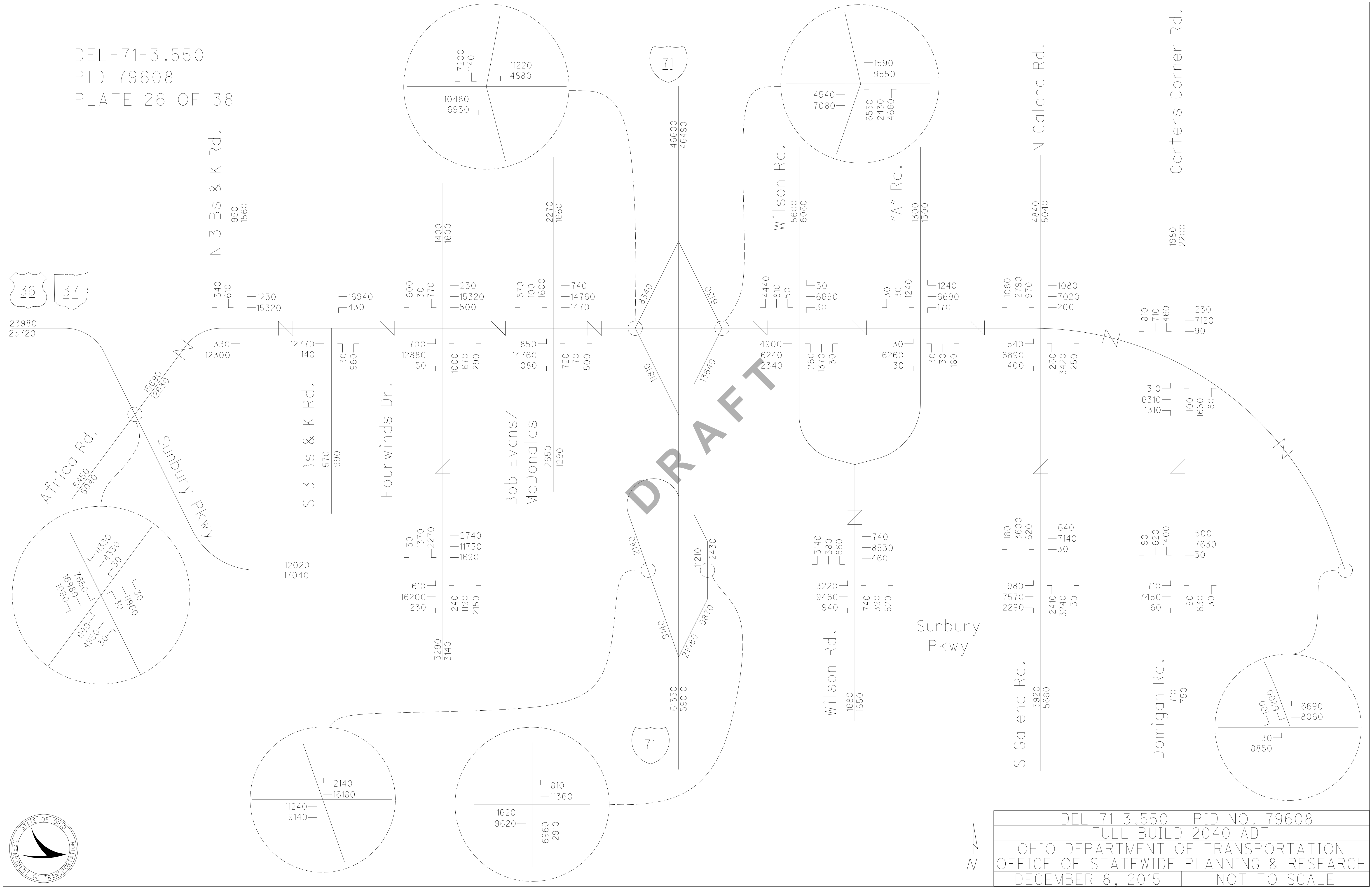


DEL-71-3.550 PID NO. 79608	
FULL BUILD 2040 ADT	
OHIO DEPARTMENT OF TRANSPORTATION	
OFFICE OF STATEWIDE PLANNING & RESEARCH	
DECEMBER 8, 2015	NOT TO SCALE

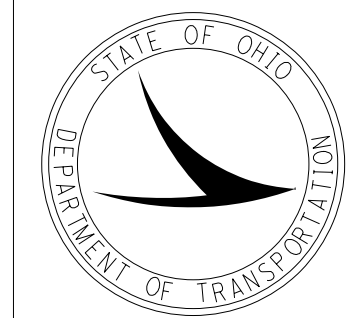
DEL-71-3.550
 PID 79608
 PLATE 26 OF 38



23980
25720

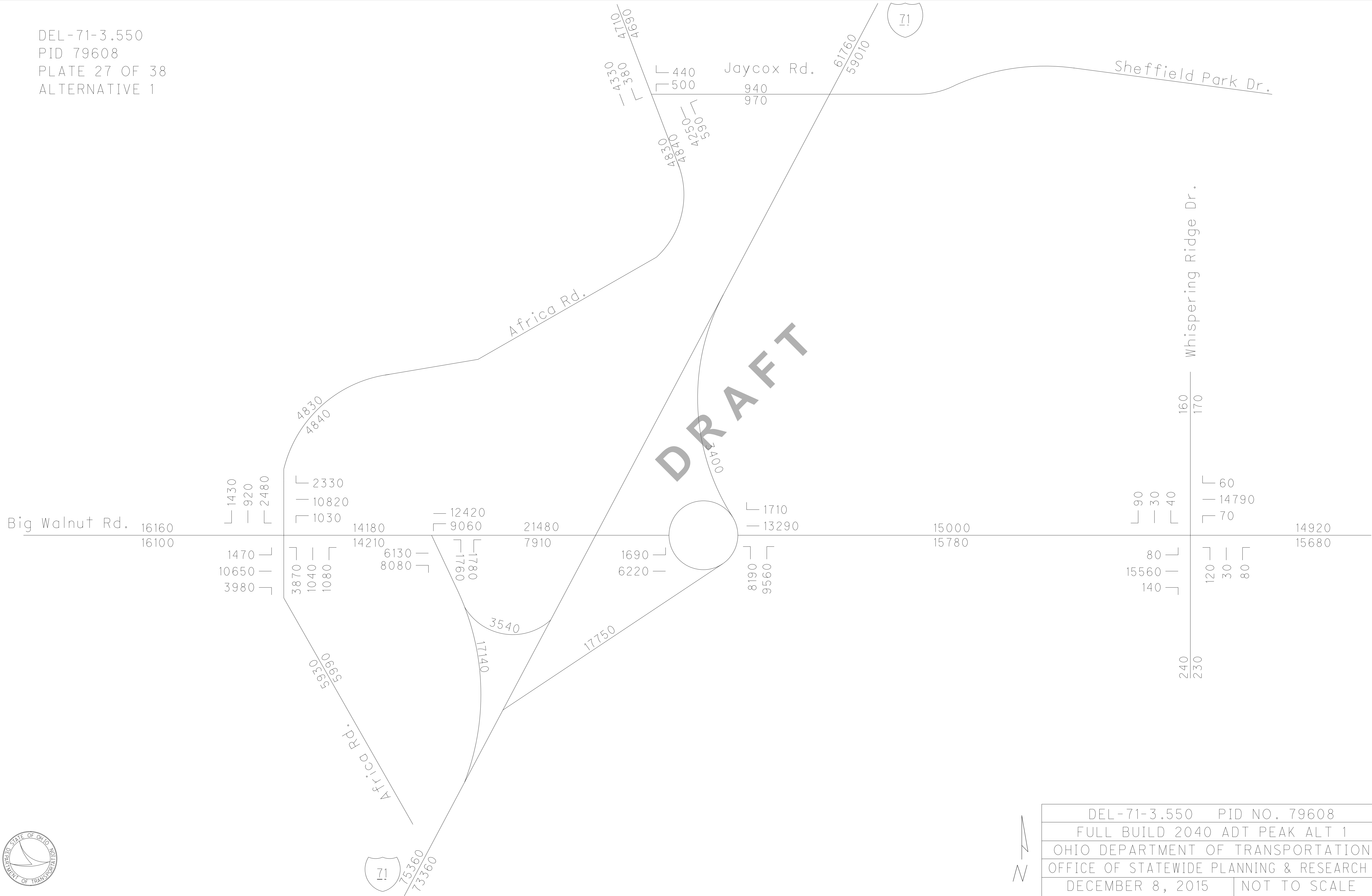


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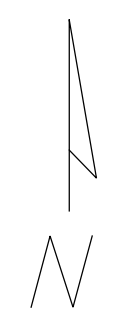


DEL-71-3.550 PID NO. 79608	
FULL BUILD 2040 ADT	
OHIO DEPARTMENT OF TRANSPORTATION	
OFFICE OF STATEWIDE PLANNING & RESEARCH	
DECEMBER 8, 2015	NOT TO SCALE

DEL-71-3.550
 PID 79608
 PLATE 27 OF 38
 ALTERNATIVE 1



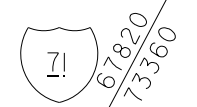
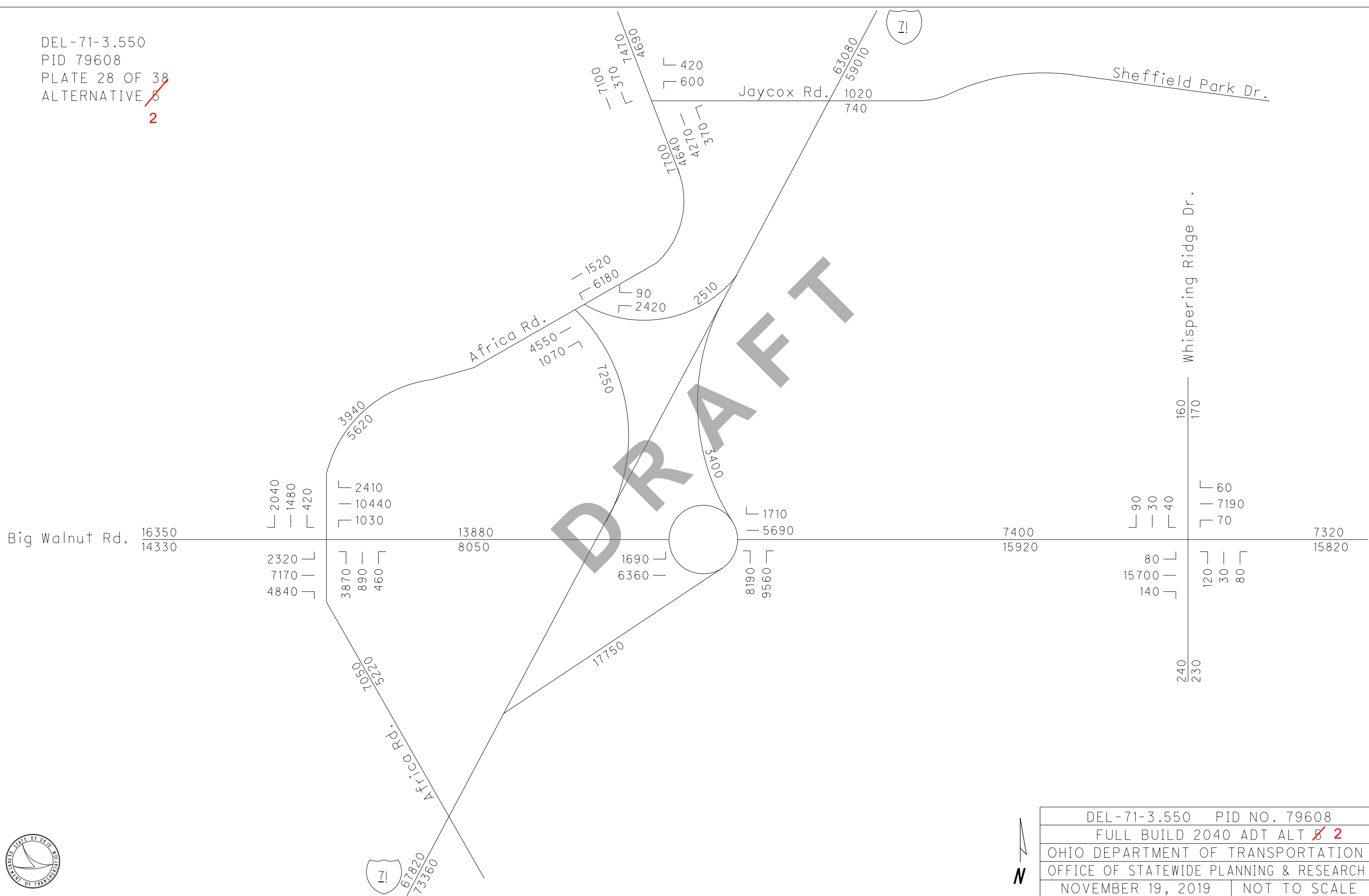
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DEL-71-3.550 PID NO. 79608	
FULL BUILD 2040 ADT PEAK ALT 1	
OHIO DEPARTMENT OF TRANSPORTATION	
OFFICE OF STATEWIDE PLANNING & RESEARCH	
DECEMBER 8, 2015	NOT TO SCALE

DEL-71-3.550
 PID 79608
 PLATE 28 OF 38
 ALTERNATIVE ~~5~~

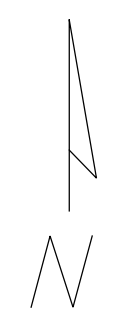
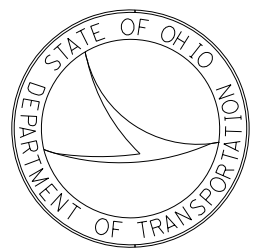
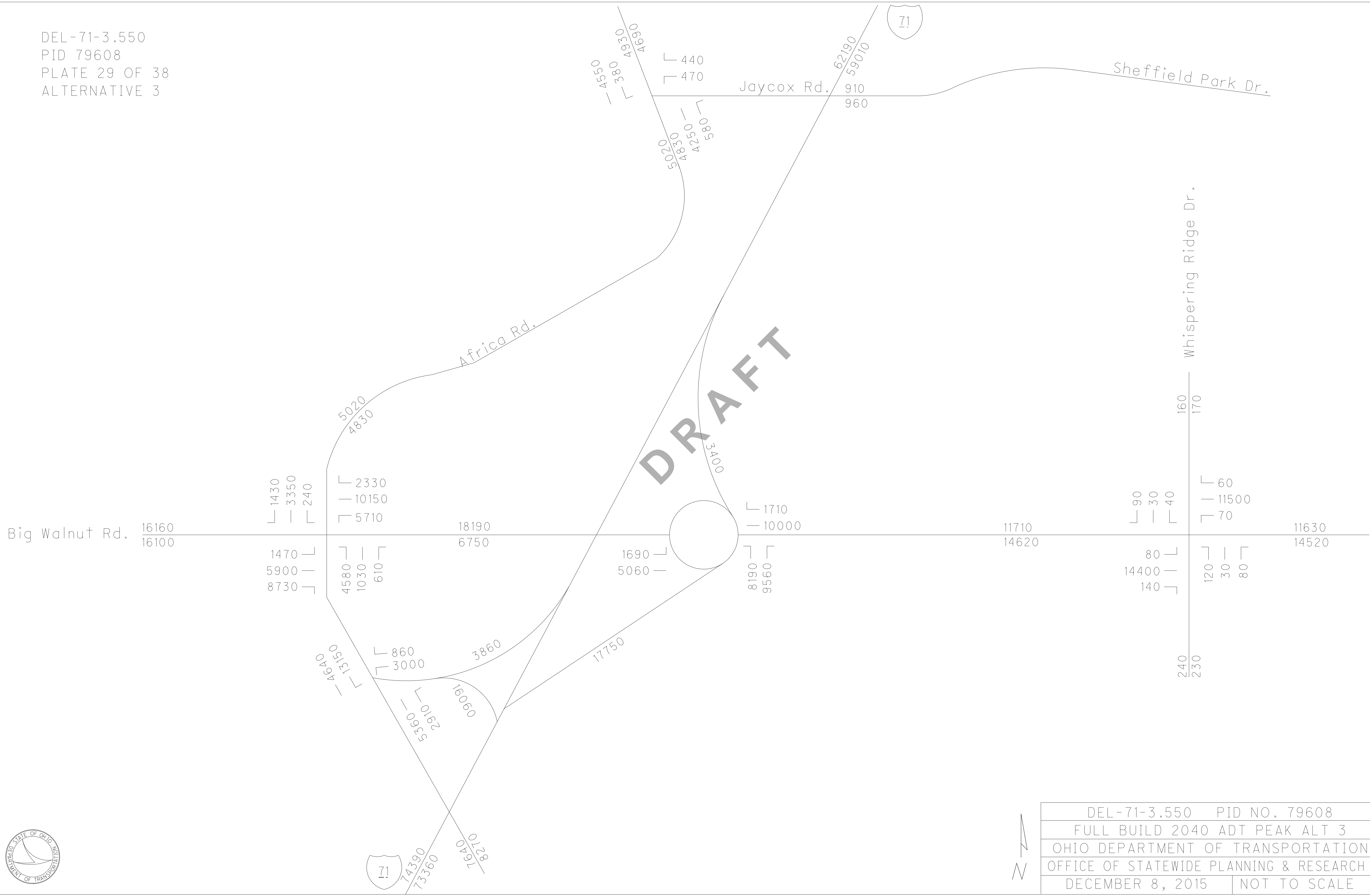
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DEL-71-3.550 PID NO. 79608	
FULL BUILD 2040 ADT ALT 5 2	
OHIO DEPARTMENT OF TRANSPORTATION	
OFFICE OF STATEWIDE PLANNING & RESEARCH	
NOVEMBER 19, 2019	NOT TO SCALE

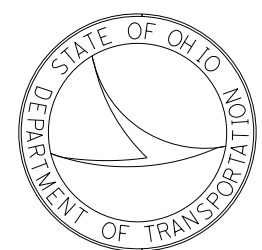
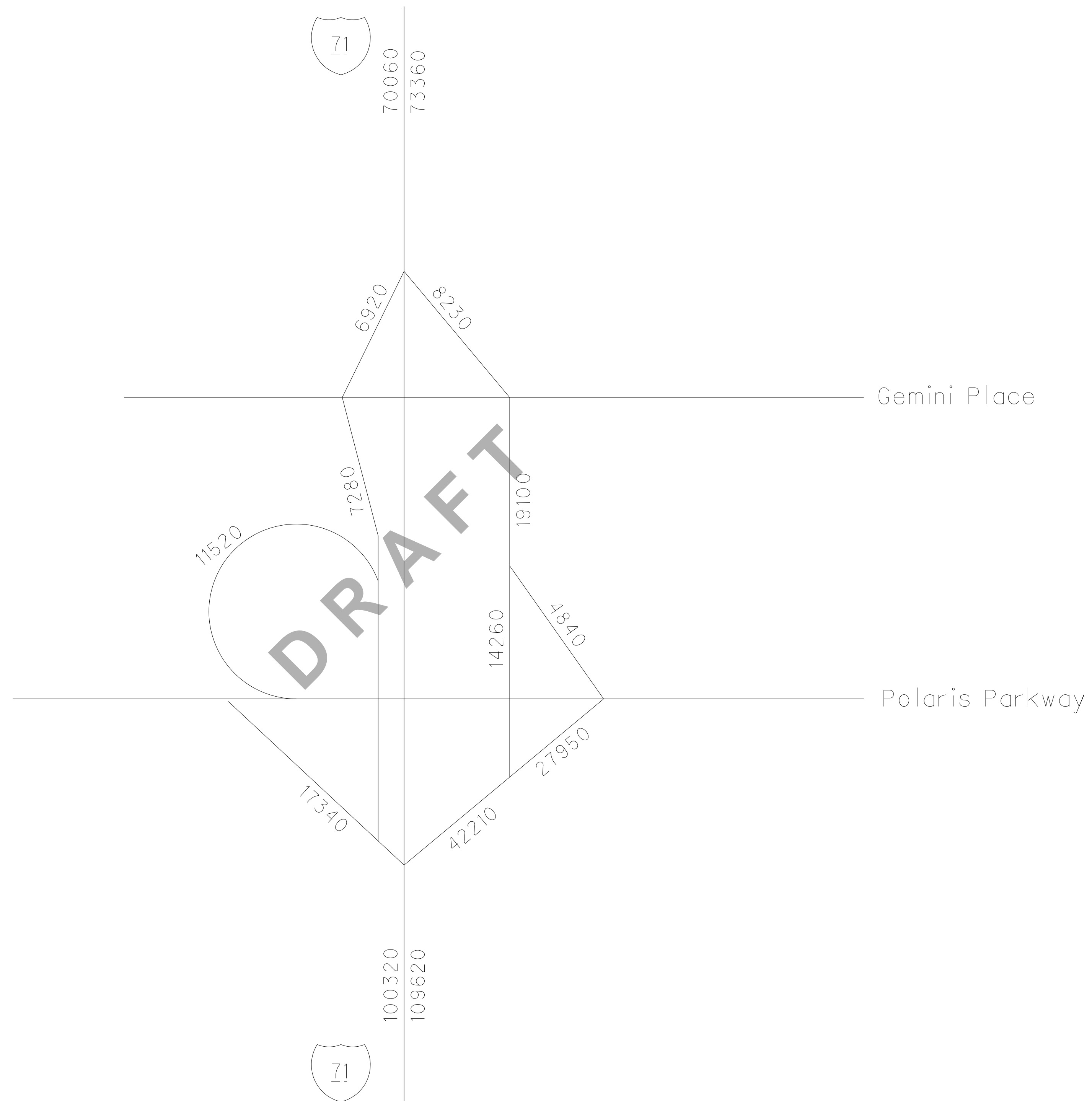
DEL-71-3.550
 PID 79608
 PLATE 29 OF 38
 ALTERNATIVE 3

DRAFT



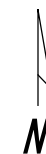
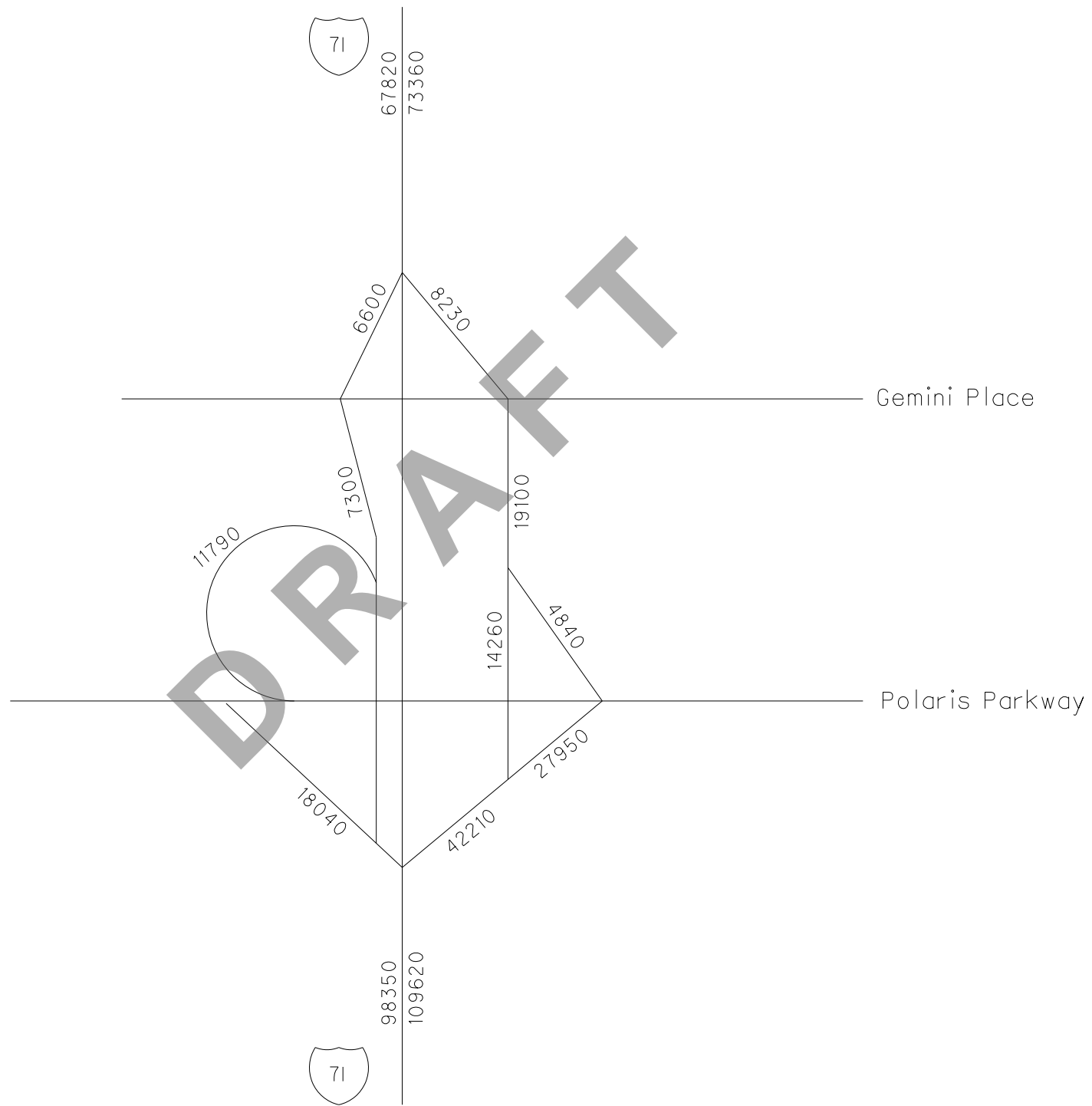
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FULL BUILD 2040 ADT PEAK ALT 3	
OHIO DEPARTMENT OF TRANSPORTATION	
OFFICE OF STATEWIDE PLANNING & RESEARCH	
DECEMBER 8, 2015	NOT TO SCALE

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PID 79608
PLATE 30 OF 38



DEL-71-3.550 PID NO. 79608	
FULL BUILD 2040 ADT (1 & 3)	
OHIO DEPARTMENT OF TRANSPORTATION	
OFFICE OF STATEWIDE PLANNING & RESEARCH	
DECEMBER 8, 2015	NOT TO SCALE

DEL-71-3.550
PID 79608
PLATE 30 OF 38
ALTERNATIVE ~~5~~
2



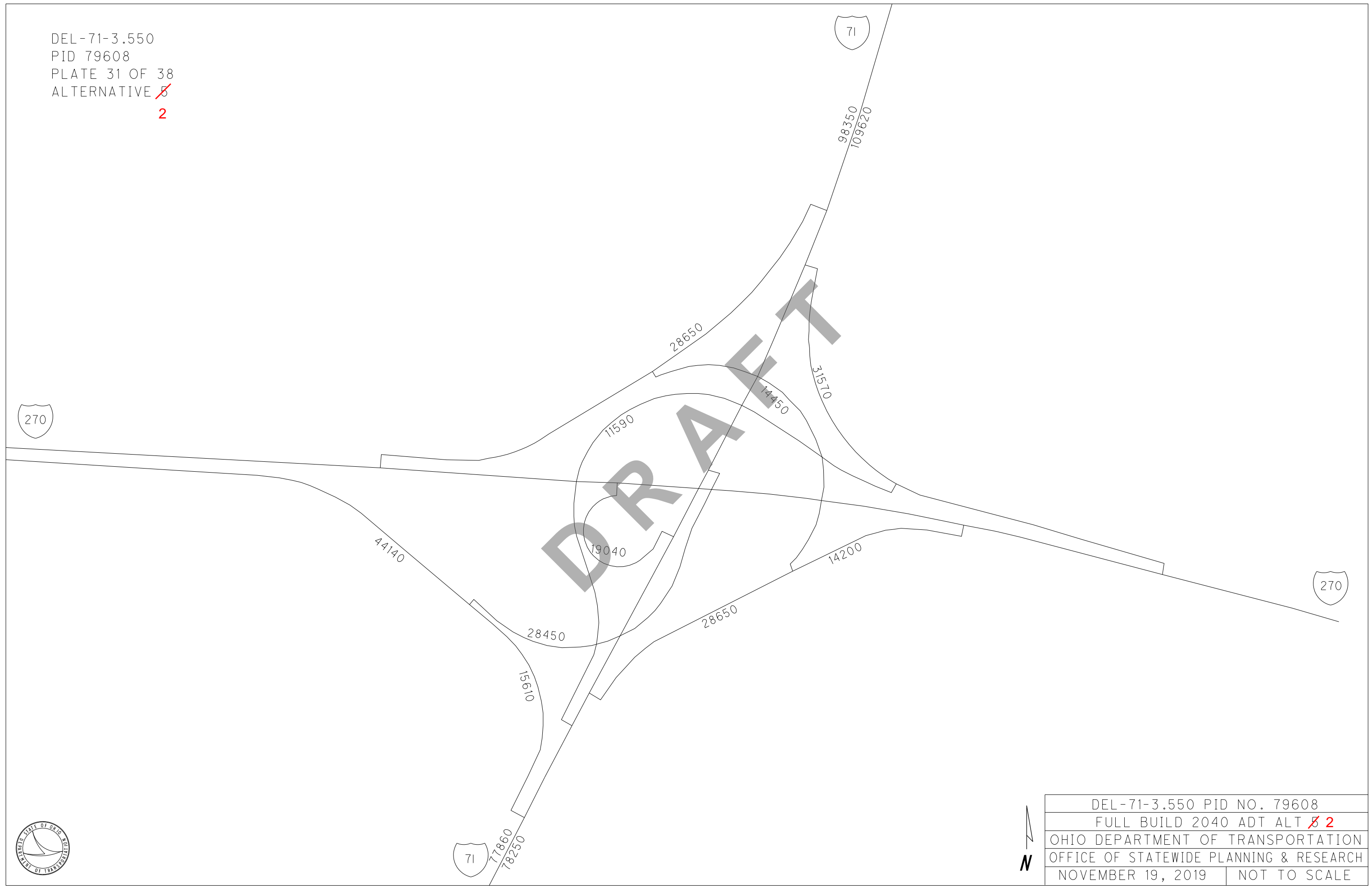
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OHIO DEPARTMENT OF TRANSPORTATION	
OFFICE OF STATEWIDE PLANNING & RESEARCH	
NOVEMBER 19, 2019	NOT TO SCALE

DEL-71-3.550
PID 79608
PLATE 31 OF 38



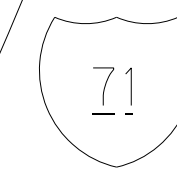
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FULL BUILD 2040 ADT (1 & 3)	
OHIO DEPARTMENT OF TRANSPORTATION	
OFFICE OF STATEWIDE PLANNING & RESEARCH	
DECEMBER 8, 2015	NOT TO SCALE

DEL-71-3.550
PID 79608
PLATE 31 OF 38
ALTERNATIVE ~~5~~
2

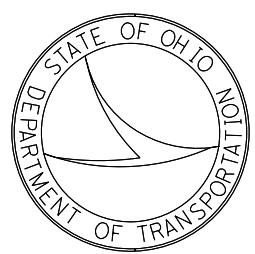
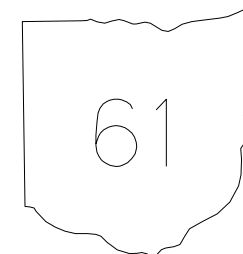
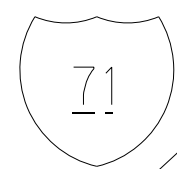


DEL-71-3.550 PID NO. 79608	
FULL BUILD 2040 ADT ALT 5 2	
OHIO DEPARTMENT OF TRANSPORTATION	
OFFICE OF STATEWIDE PLANNING & RESEARCH	
NOVEMBER 19, 2019	NOT TO SCALE

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PID 79608
PLATE 32 OF 38



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3740/3270

2180/4700

300/1070

1180/440

210/220

220/220

2780/3050

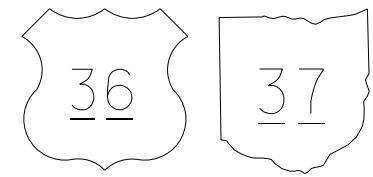
2090/3850

Bennington Way

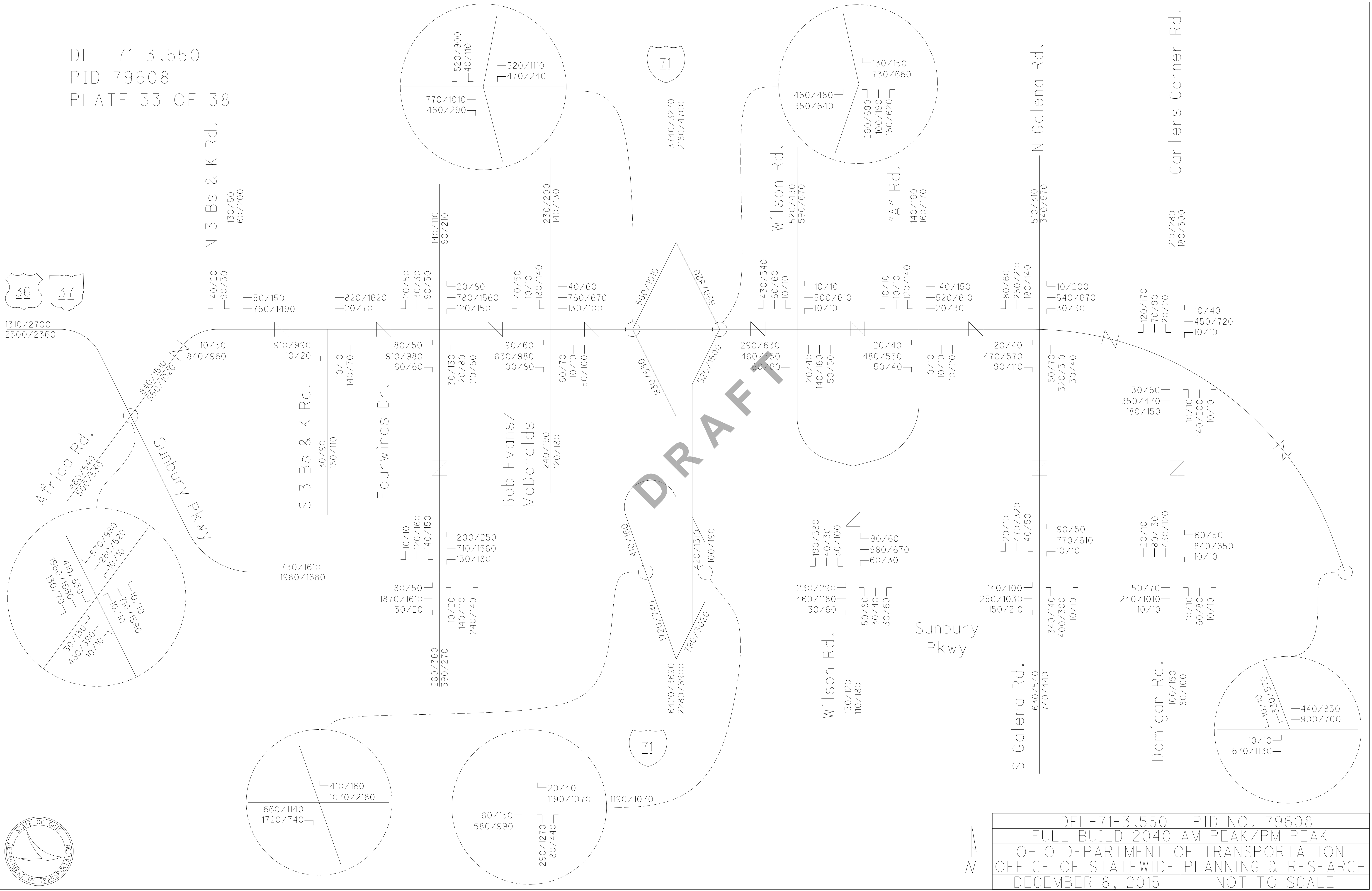
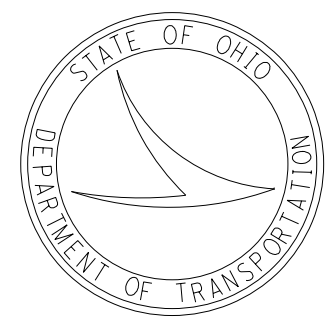


DEL-71-3.550 PID NO. 79608	
FULL BUILD 2040 AM PEAK/PM PEAK	
OHIO DEPARTMENT OF TRANSPORTATION	
OFFICE OF STATEWIDE PLANNING & RESEARCH	
DECEMBER 8, 2015	NOT TO SCALE

DEL-71-3.550
 PID 79608
 PLATE 33 OF 38



1310/2700
 2500/2360

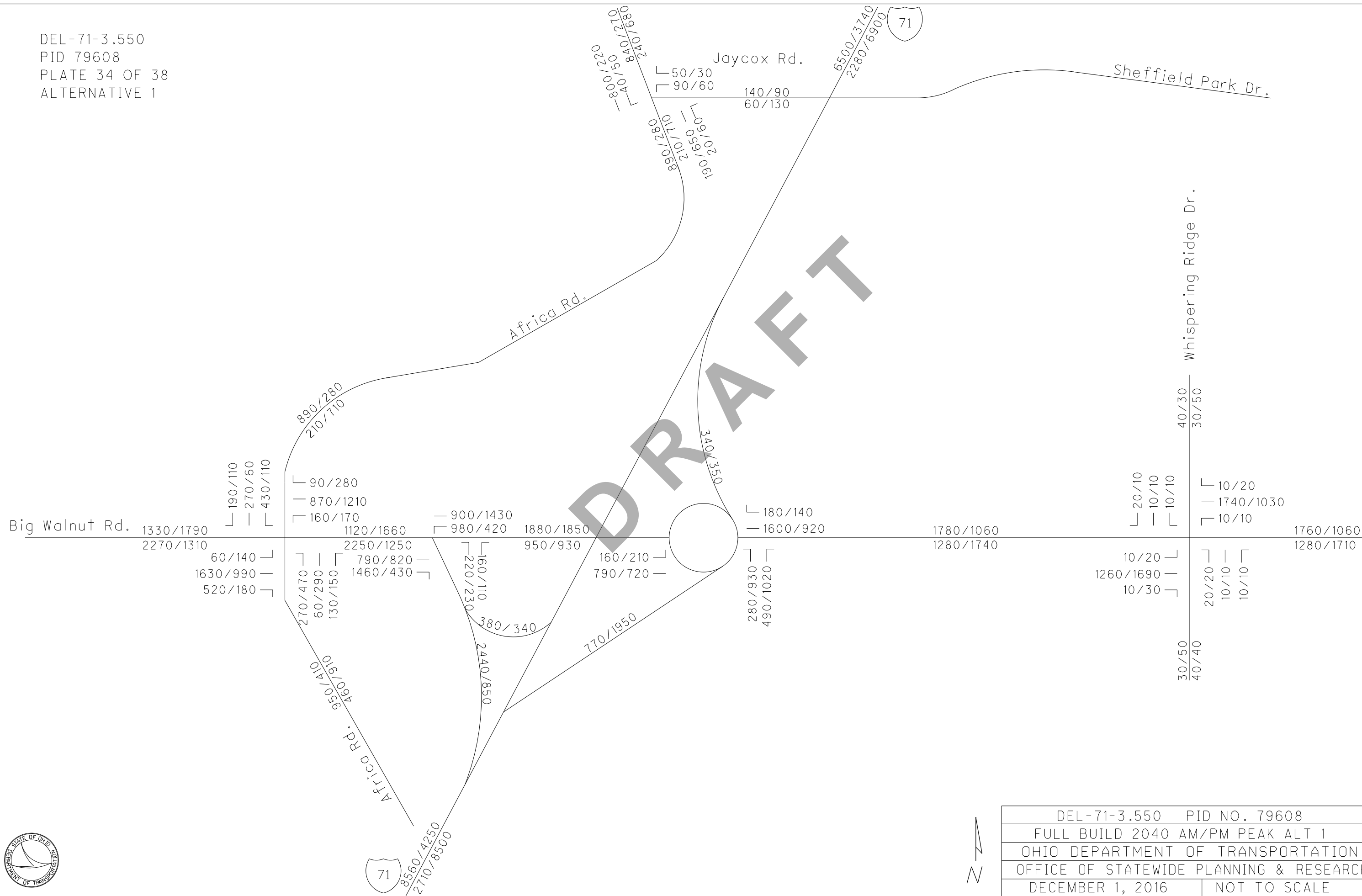


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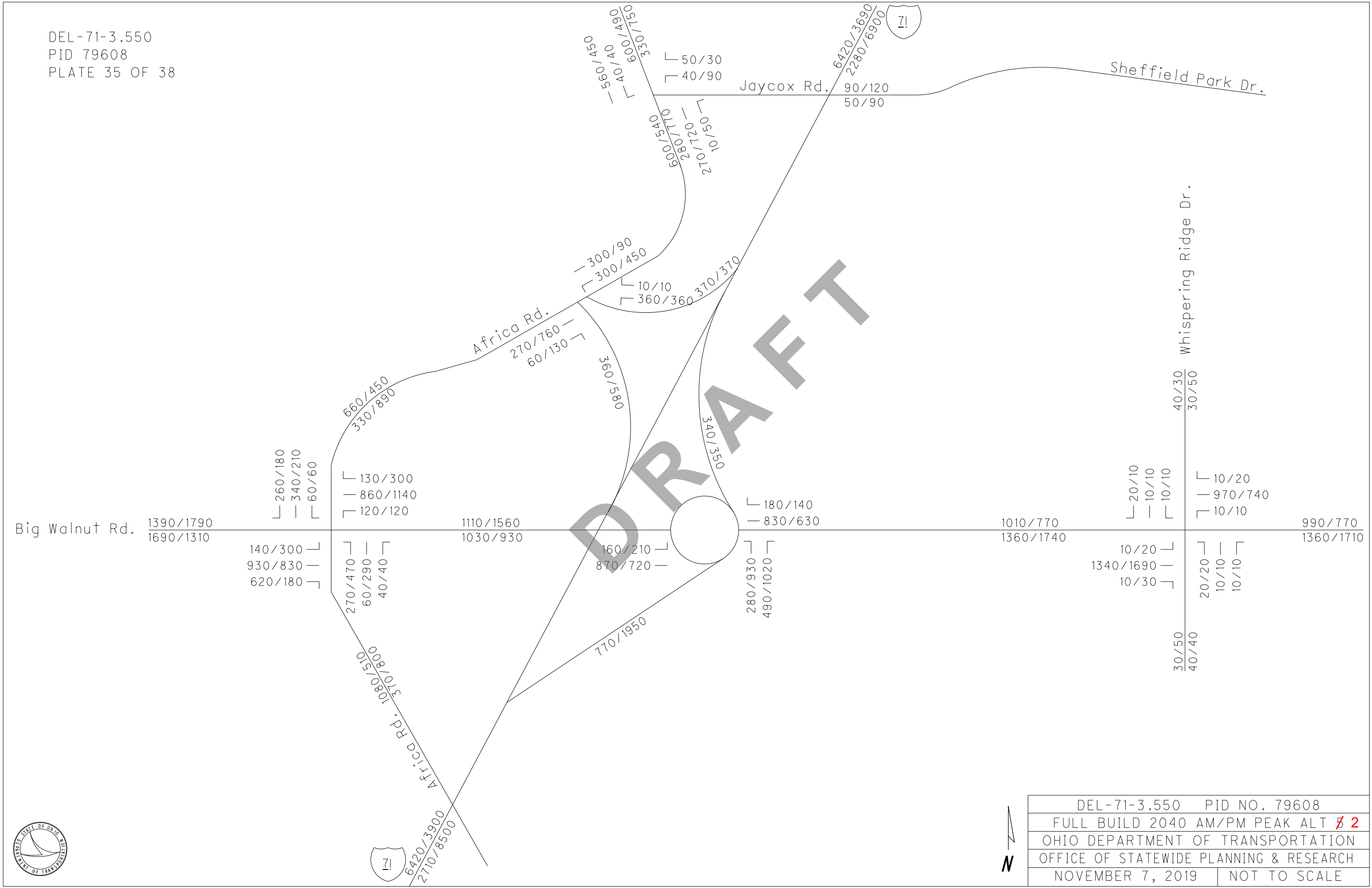
DEL-71-3.550 PID NO. 79608	
FULL BUILD 2040 AM PEAK/PM PEAK	
OHIO DEPARTMENT OF TRANSPORTATION	
OFFICE OF STATEWIDE PLANNING & RESEARCH	
DECEMBER 8, 2015	NOT TO SCALE

DEL-71-3.550
 PID 79608
 PLATE 34 OF 38
 ALTERNATIVE 1



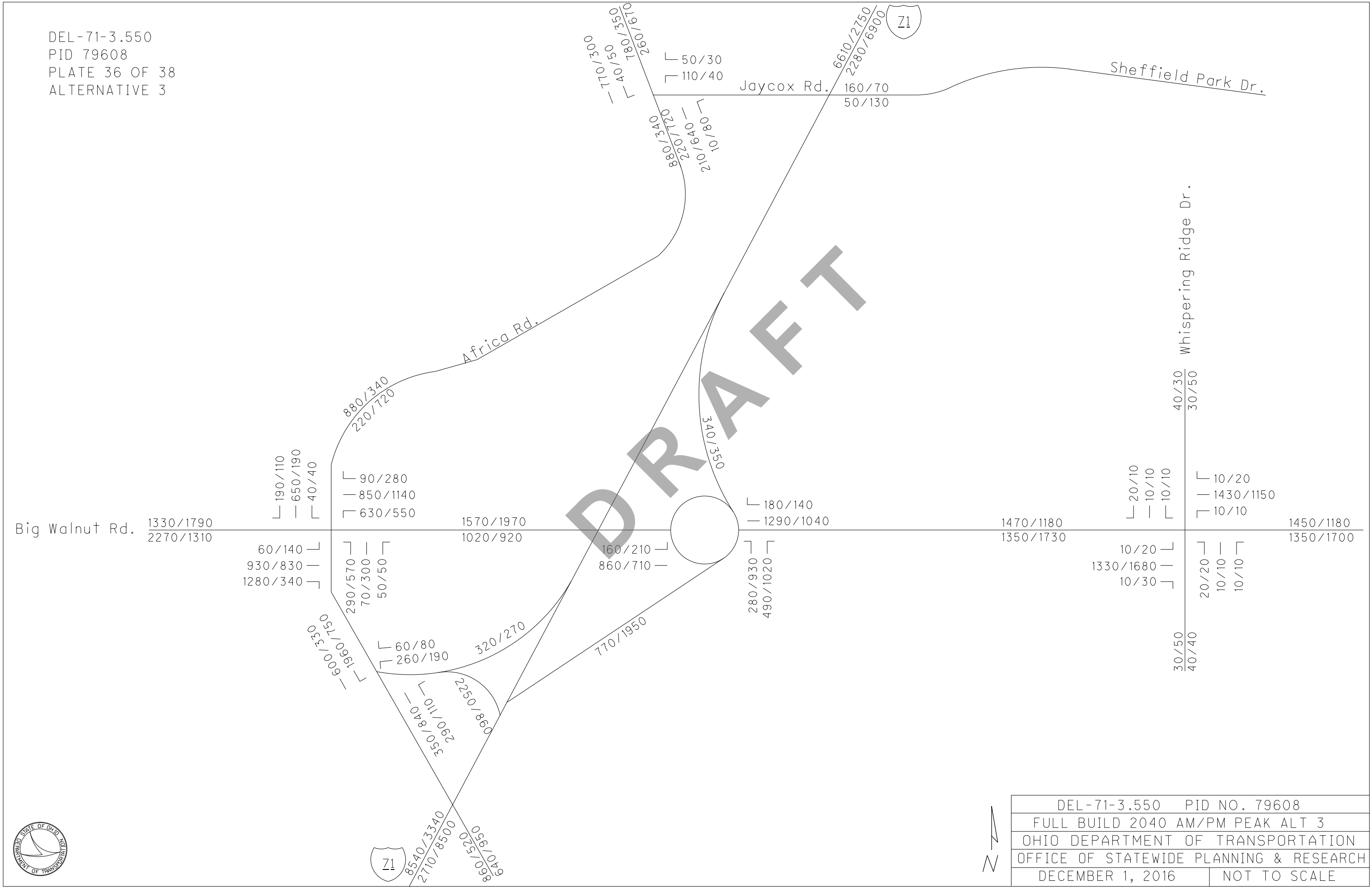
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FULL BUILD 2040 AM/PM PEAK ALT 1	
OHIO DEPARTMENT OF TRANSPORTATION	
OFFICE OF STATEWIDE PLANNING & RESEARCH	
DECEMBER 1, 2016	NOT TO SCALE

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 PID 79608
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DEL-71-3.550 PID NO. 79608	
FULL BUILD 2040 AM/PM PEAK ALT 1 2	
OHIO DEPARTMENT OF TRANSPORTATION	
OFFICE OF STATEWIDE PLANNING & RESEARCH	
NOVEMBER 7, 2019	NOT TO SCALE

DEL-71-3.550
 PID 79608
 PLATE 36 OF 38
 ALTERNATIVE 3

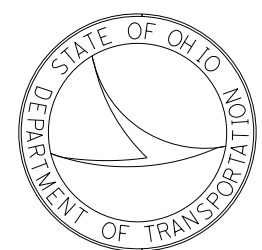
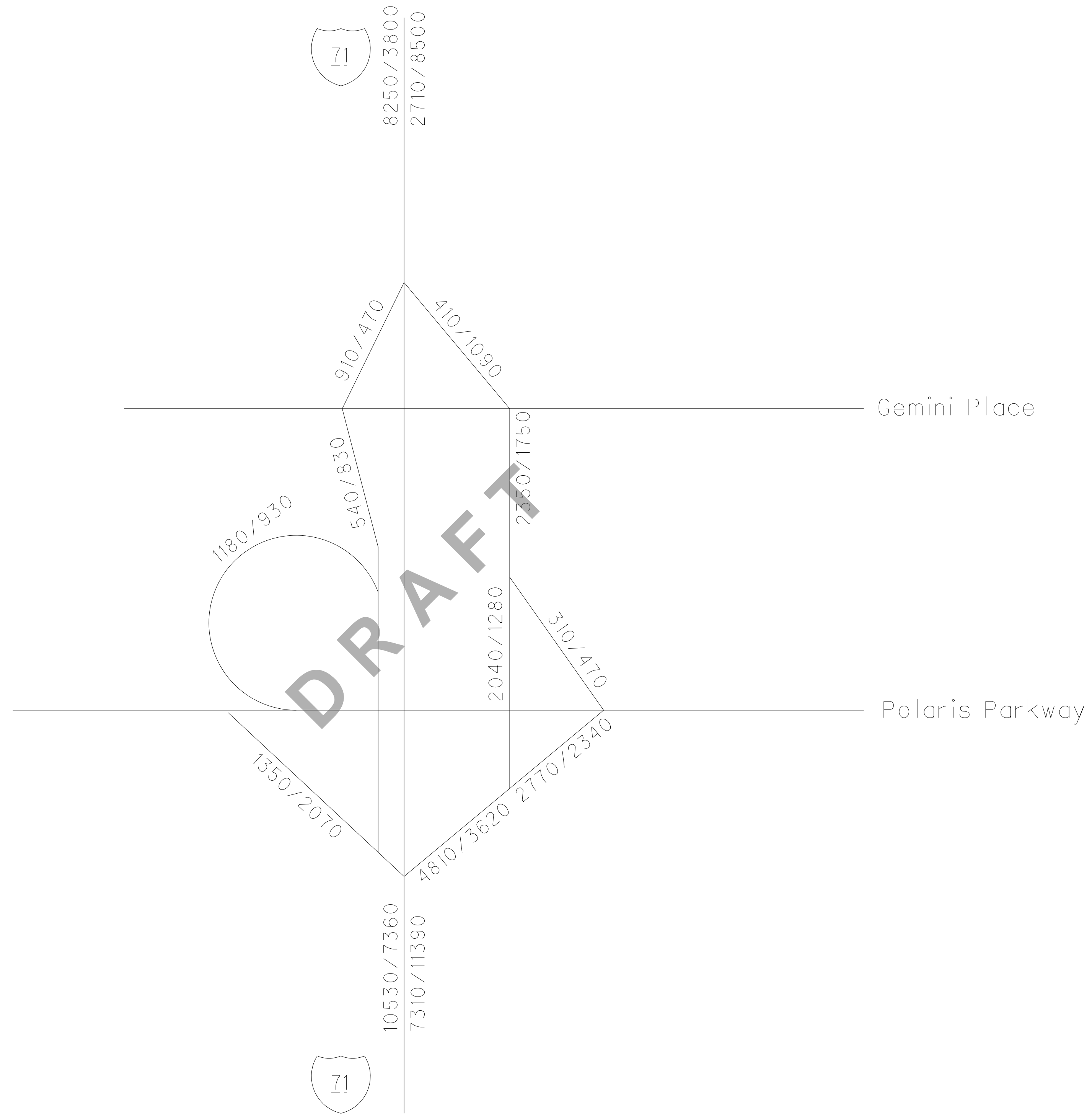


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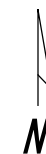
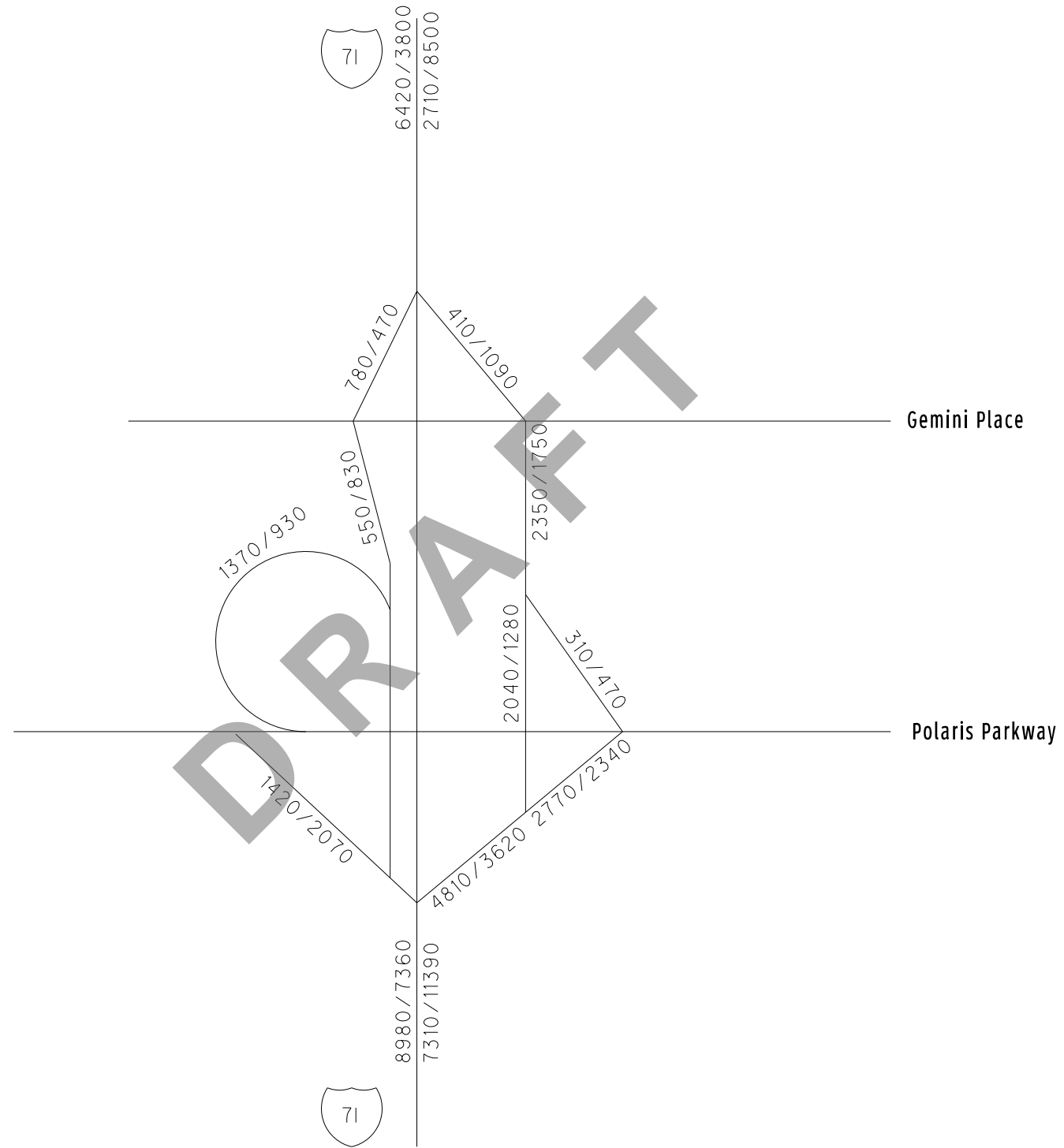
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OHIO DEPARTMENT OF TRANSPORTATION	
OFFICE OF STATEWIDE PLANNING & RESEARCH	
DECEMBER 1, 2016	NOT TO SCALE

DEL-71-3.550
PID 79608
PLATE 37 OF 38



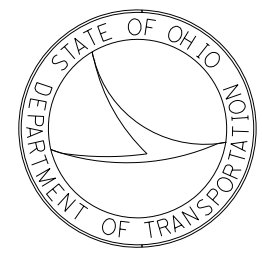
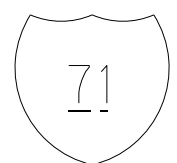
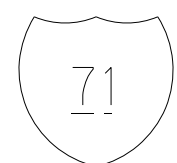
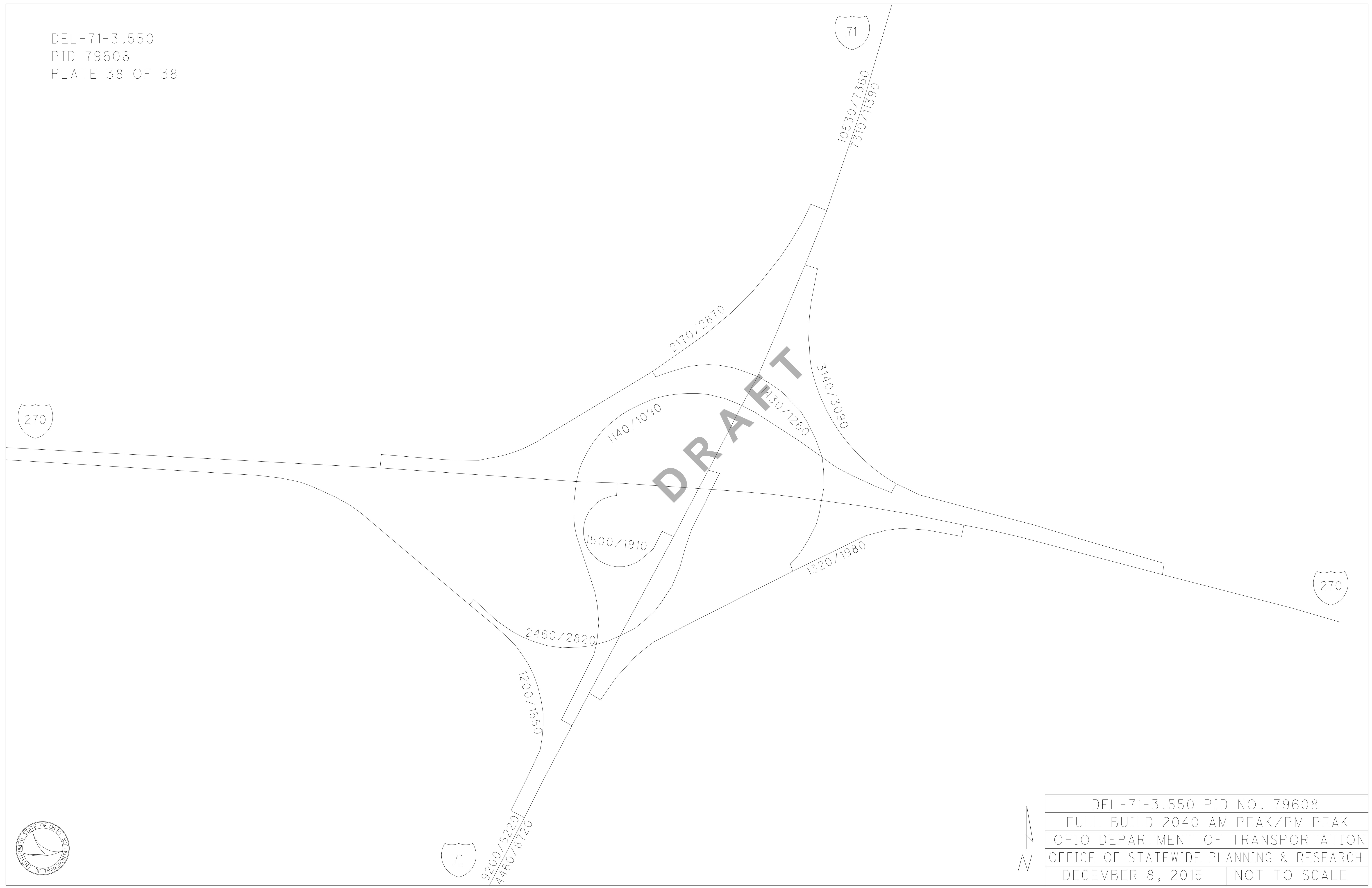
DEL-71-3.550 PID NO. 79608	
FULL BUILD 2040 AM PEAK/PM PEAK (1 & 3)	
OHIO DEPARTMENT OF TRANSPORTATION	
OFFICE OF STATEWIDE PLANNING & RESEARCH	
DECEMBER 8, 2015	NOT TO SCALE

DEL-71-3.550
PID 79608
PLATE 37 OF 38



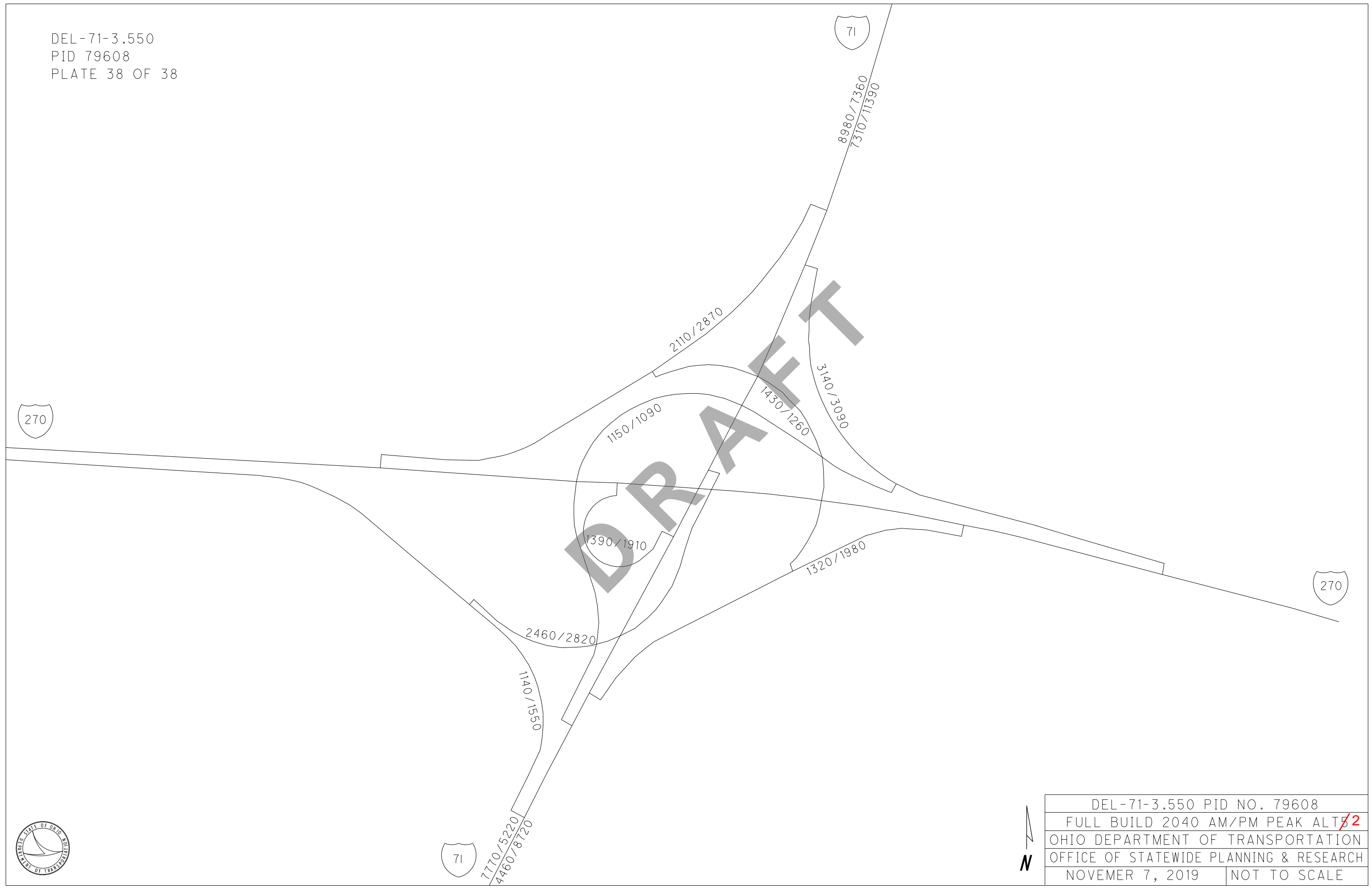
DEL-71-3.550 PID NO. 79608	
FULL BUILD 2040 AM/PM PEAK ALT 1 2	
OHIO DEPARTMENT OF TRANSPORTATION	
OFFICE OF STATEWIDE PLANNING & RESEARCH	
NOVEMBER 7, 2019	NOT TO SCALE

DEL-71-3.550
PID 79608
PLATE 38 OF 38

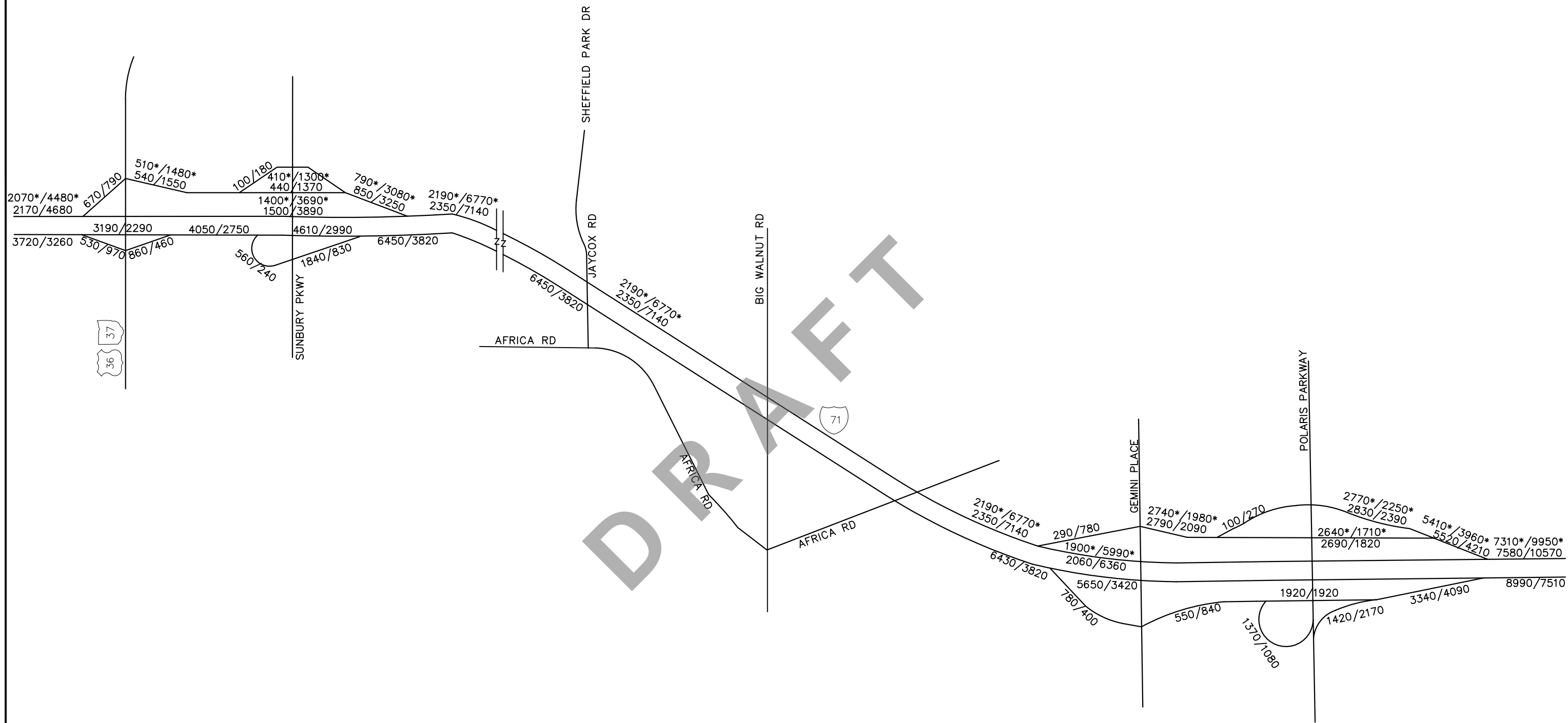


DEL-71-3.550 PID NO. 79608	
FULL BUILD 2040 AM PEAK/PM PEAK	
OHIO DEPARTMENT OF TRANSPORTATION	
OFFICE OF STATEWIDE PLANNING & RESEARCH	
DECEMBER 8, 2015	NOT TO SCALE

DEL-71-3.550
PID 79608
PLATE 38 OF 38



DEL-71-3.550 PID NO. 79608	
FULL BUILD 2040 AM/PM PEAK ALT 1 2	
OHIO DEPARTMENT OF TRANSPORTATION	
OFFICE OF STATEWIDE PLANNING & RESEARCH	
NOVEMBER 7, 2019	NOT TO SCALE



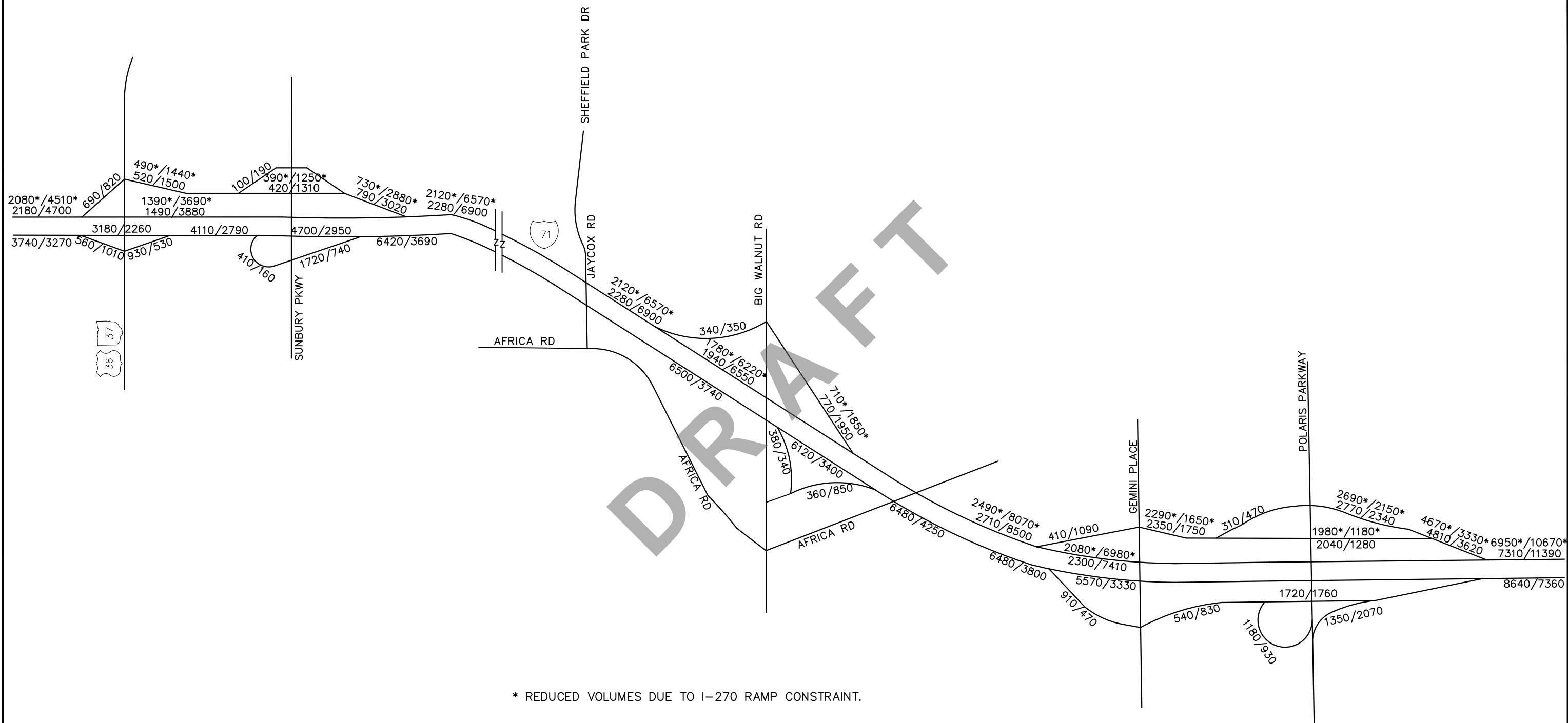
* REDUCED VOLUMES DUE TO I-270 RAMP CONSTRAINT.

PEAK HOUR VOLUMES WERE CALCULATED BASED ON THE CERTIFIED TRAFFIC.
SOME LOCATIONS WERE NOT BALANCED.



FREEWAY AND RAMP PEAK HOUR VOLUMES
 NO BUILD 2040 AM/PM
 I-71 BIG WALNUT INTERCHANGE
 DELAWARE COUNTY, OHIO

AECOM

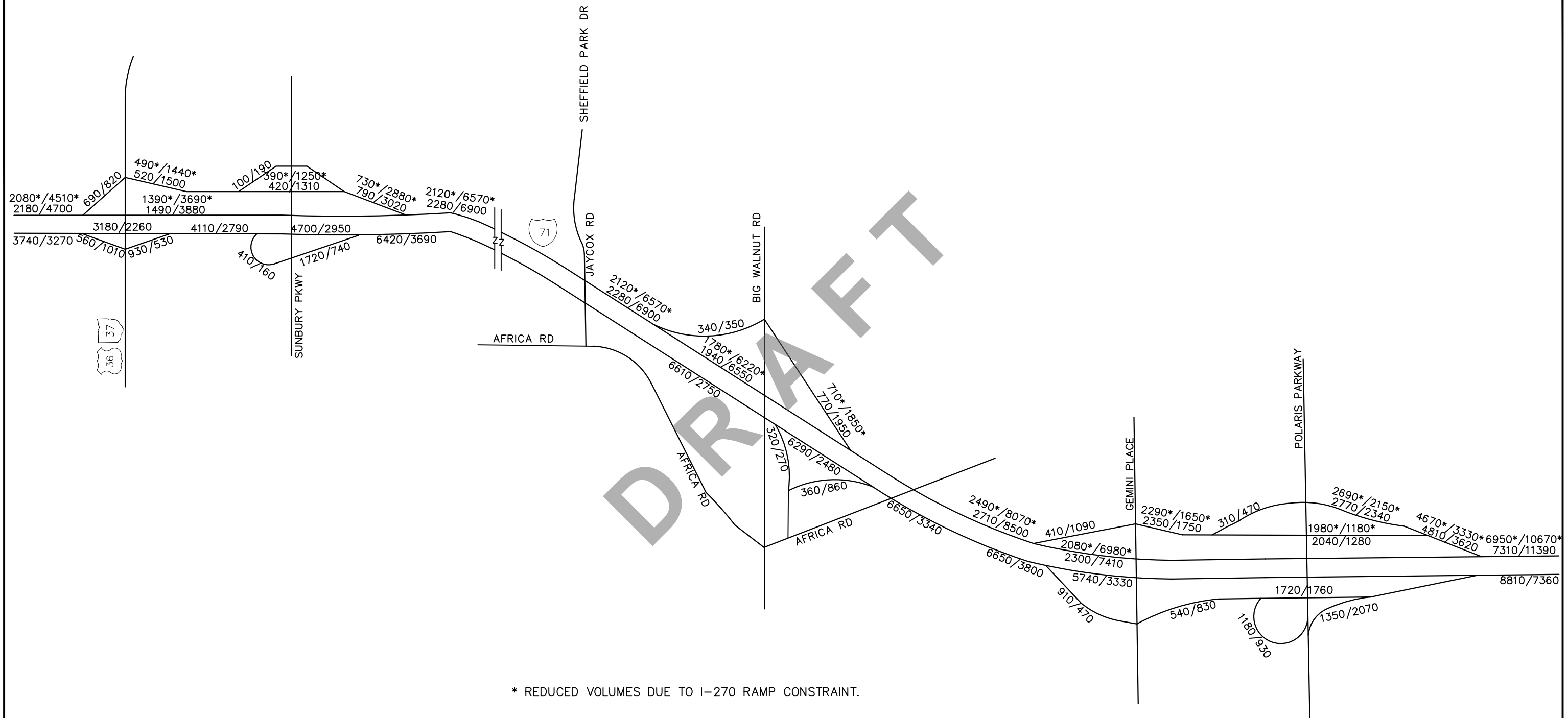


* REDUCED VOLUMES DUE TO I-270 RAMP CONSTRAINT.

PEAK HOUR VOLUMES WERE CALCULATED BASED ON THE CERTIFIED TRAFFIC.
SOME LOCATIONS WERE NOT BALANCED.



FREEWAY AND RAMP PEAK HOUR VOLUMES
ALT 1 FULL BUILD 2040 AM/PM
I-71 BIG WALNUT INTERCHANGE
DELAWARE COUNTY, OHIO



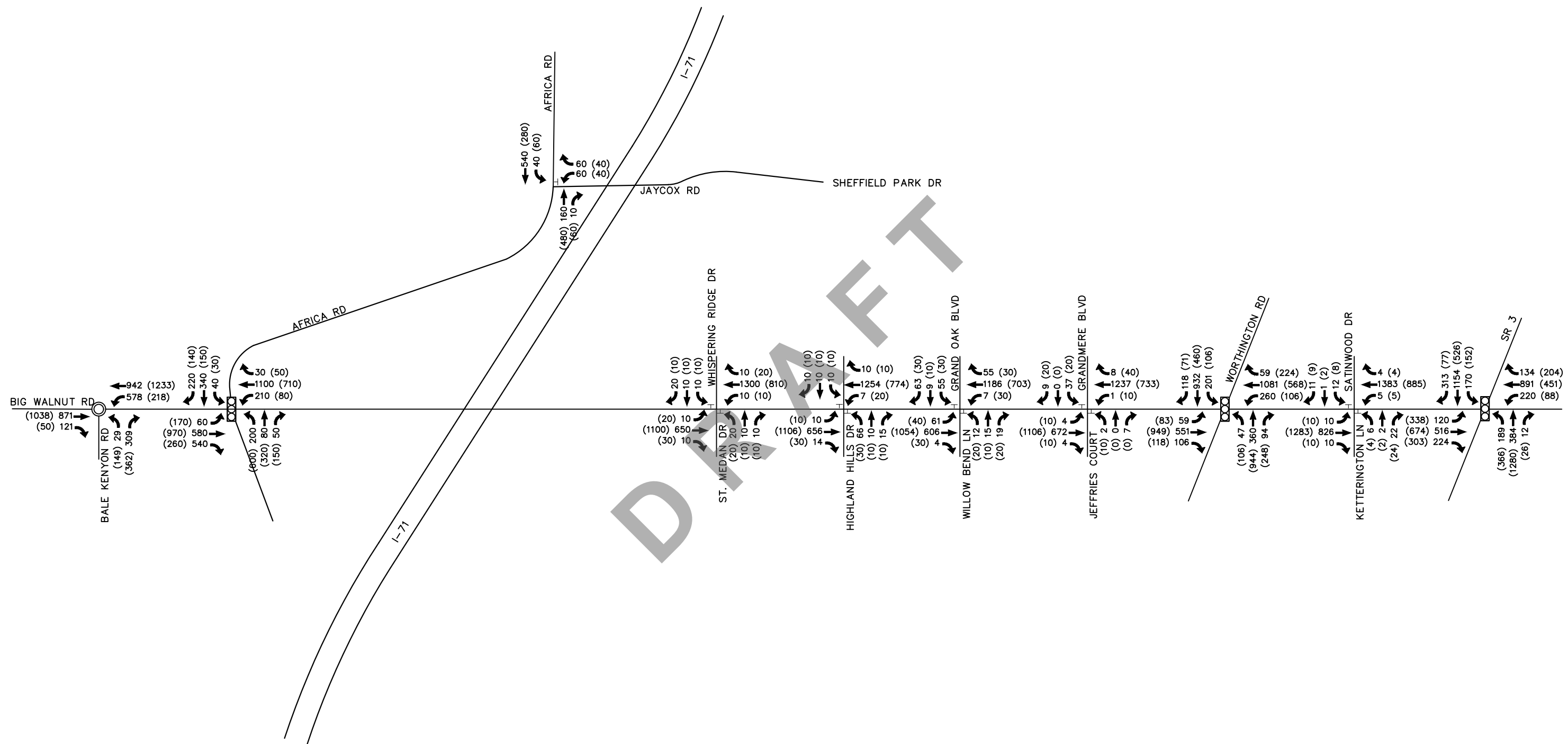
* REDUCED VOLUMES DUE TO I-270 RAMP CONSTRAINT.

PEAK HOUR VOLUMES WERE CALCULATED BASED ON THE CERTIFIED TRAFFIC.
SOME LOCATIONS WERE NOT BALANCED.



FREEWAY AND RAMP PEAK HOUR VOLUMES
 ALT 3 FULL BUILD 2040 AM/PM
 I-71 BIG WALNUT INTERCHANGE
 DELAWARE COUNTY, OHIO

AECOM



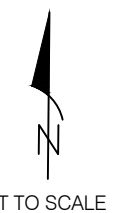
DRAFT

LEGEND

➔ TRAFFIC MOVEMENT

ⓧ TRAFFIC SIGNAL

XX (XX) AM (PM) PEAK HOUR VOLUME

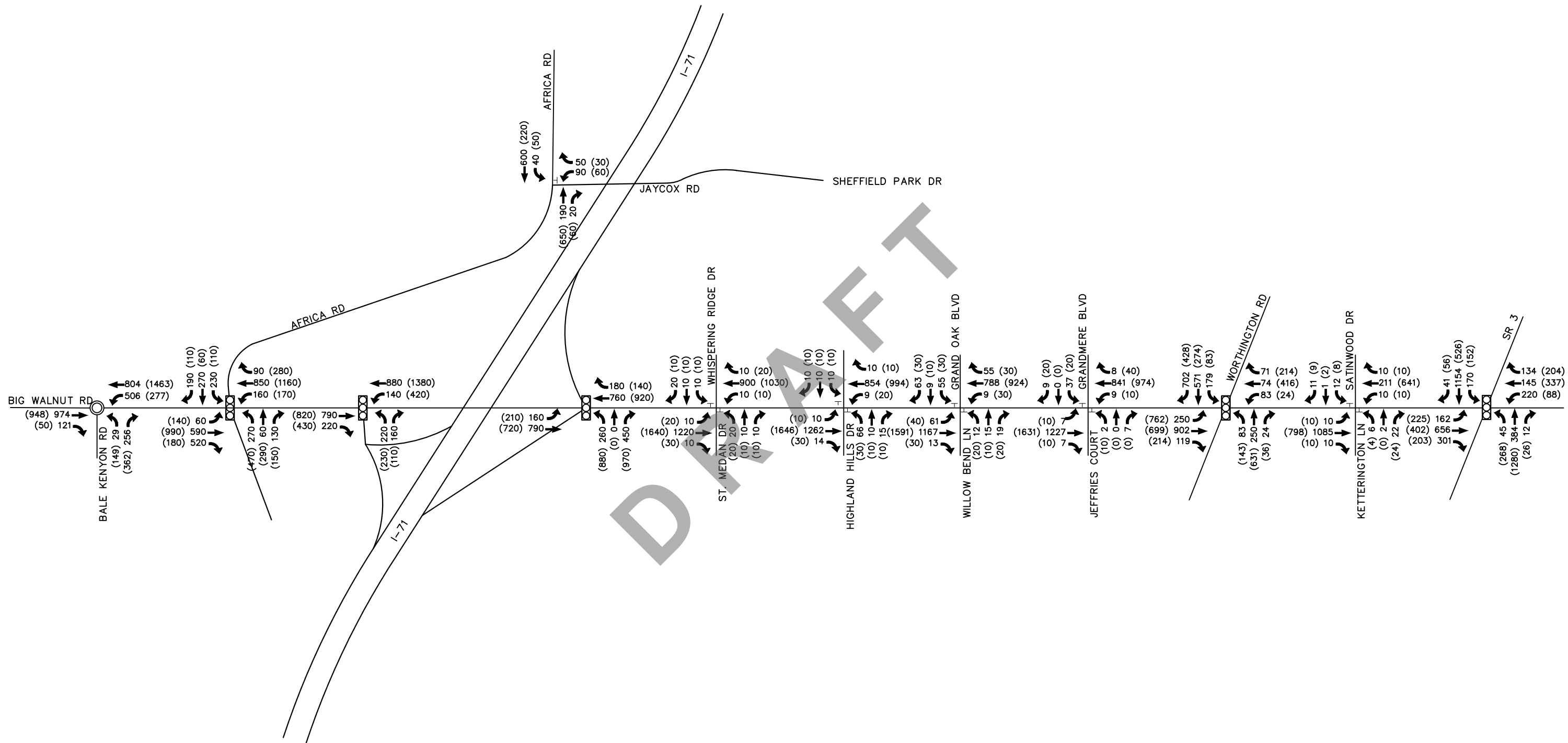


NOT TO SCALE

INTERSECTION PEAK HOUR VOLUMES
NO BUILD DESIGN YEAR 2040
I-71 BIG WALNUT INTERCHANGE
DELAWARE COUNTY, OHIO



564 White Pond Drive Akron, Ohio 44320-1100 (330) 836-9111



LEGEND

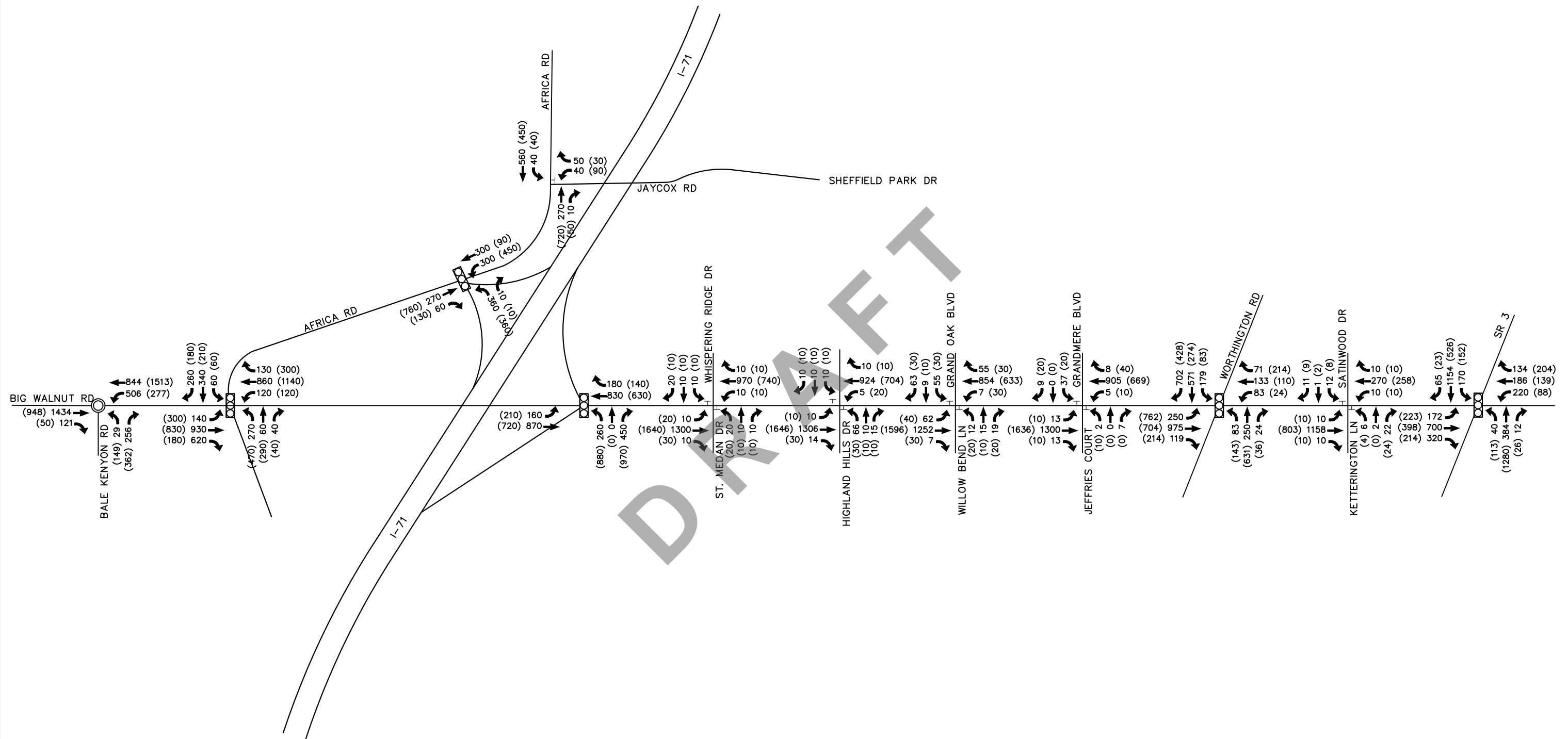
→ TRAFFIC MOVEMENT

ⓧ TRAFFIC SIGNAL

XX (XX) AM (PM) PEAK HOUR VOLUME



<p>INTERSECTION PEAK HOUR VOLUMES ALT 1 DESIGN YEAR 2040 I-71 BIG WALNUT INTERCHANGE DELAWARE COUNTY, OHIO</p>
<p>AECOM <small>564 White Pond Drive Akron, Ohio 44320-1100 (330) 836-9111</small></p>

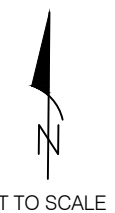


LEGEND

➔ TRAFFIC MOVEMENT

ⓧ TRAFFIC SIGNAL

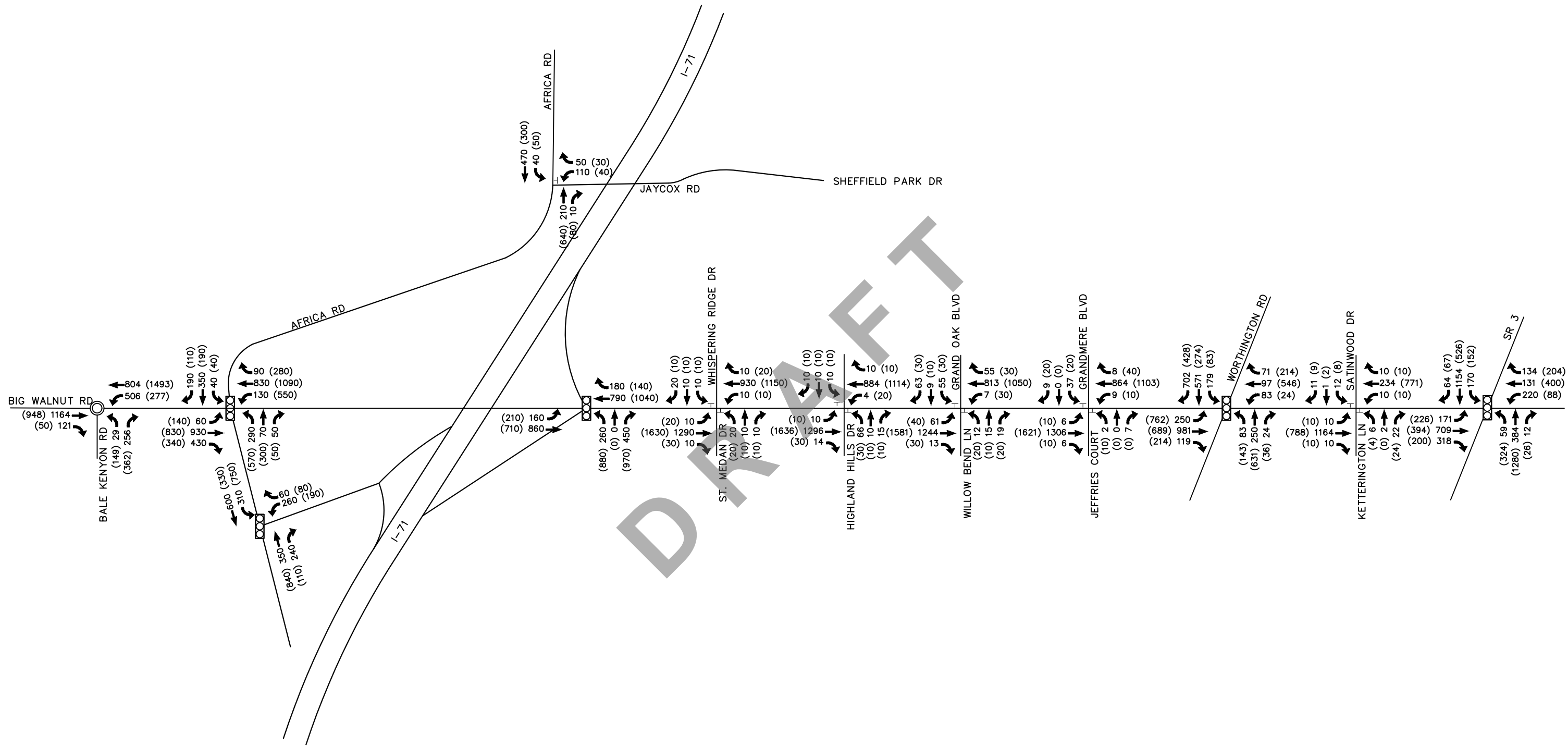
XX (XX) AM (PM) PEAK HOUR VOLUME



INTERSECTION PEAK HOUR VOLUMES
 ALT 2 DESIGN YEAR 2040
 I-71 BIG WALNUT INTERCHANGE
 DELAWARE COUNTY, OHIO



564 White Pond Drive Akron, Ohio 44320-1100 (330) 836-9111



DRAFT

LEGEND

→ TRAFFIC MOVEMENT

◻ TRAFFIC SIGNAL

XX (XX) AM (PM) PEAK HOUR VOLUME



NOT TO SCALE

INTERSECTION PEAK HOUR VOLUMES
ALT 3 DESIGN YEAR 2040
I-71 BIG WALNUT INTERCHANGE
DELAWARE COUNTY, OHIO



DRAFT

Appendix C
Freeway HCS Analysis

HCS7 Freeway Facilities Report

Project Information

Analyst	GM	Date	5/21/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	AM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	2
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.38		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-71 NB btwn I-270 & Polaris (5-lane)	4300	5
2	Basic	Basic	I-71 NB btwn I-270 & Polaris (6-lane)	3000	6

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.935	8624	11935	0.72	66.0	26.1	D

Segment 2: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.935	8624	14322	0.60	68.3	21.0	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	66.9	23.8	22.2	1.20	C

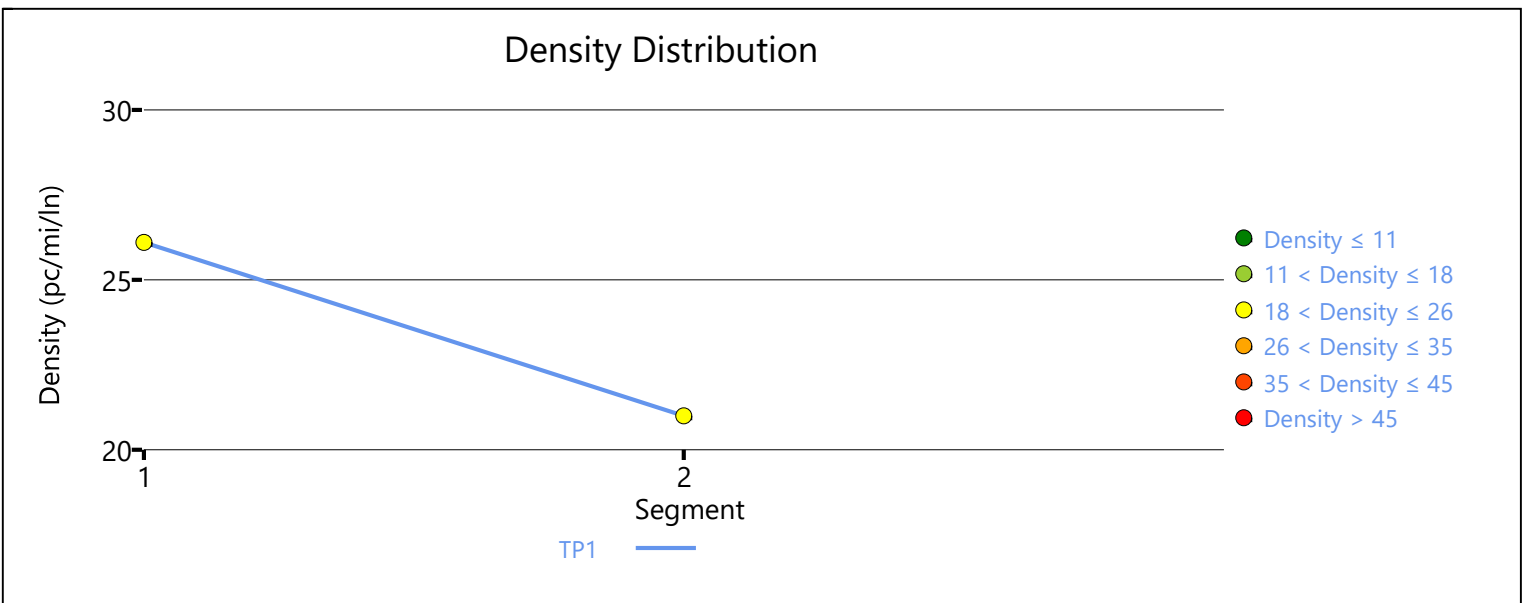
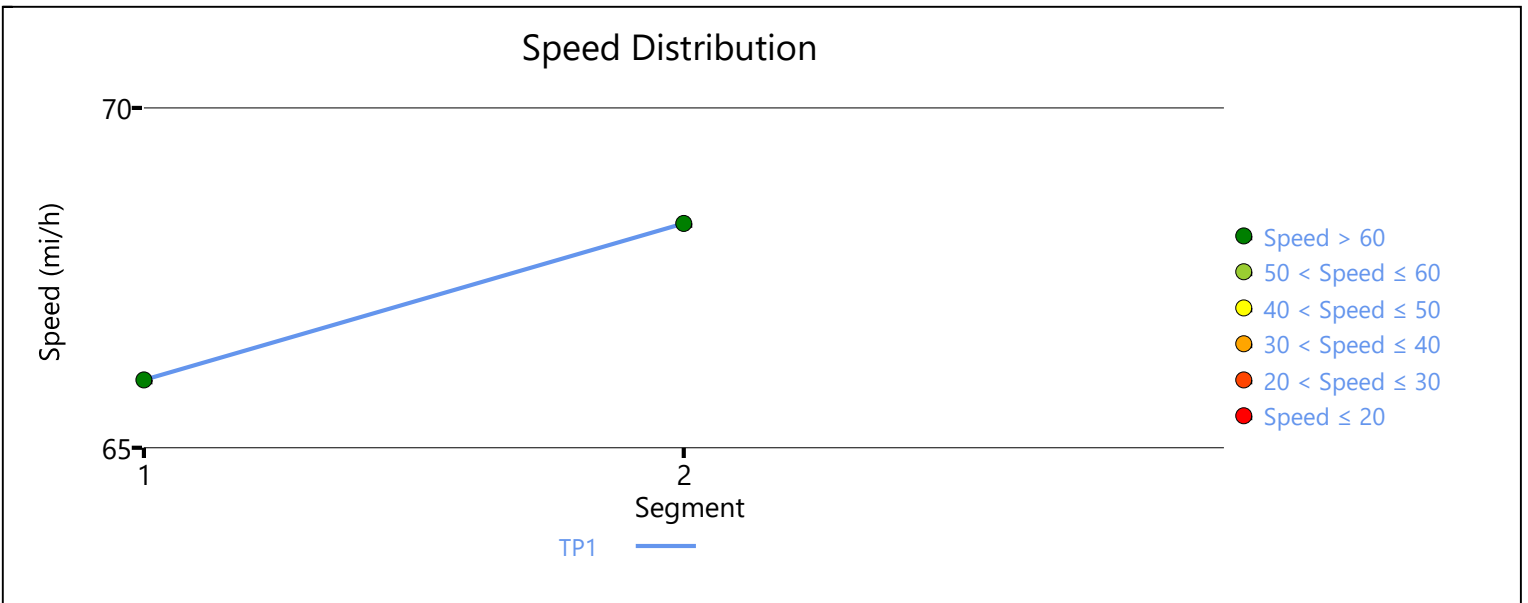
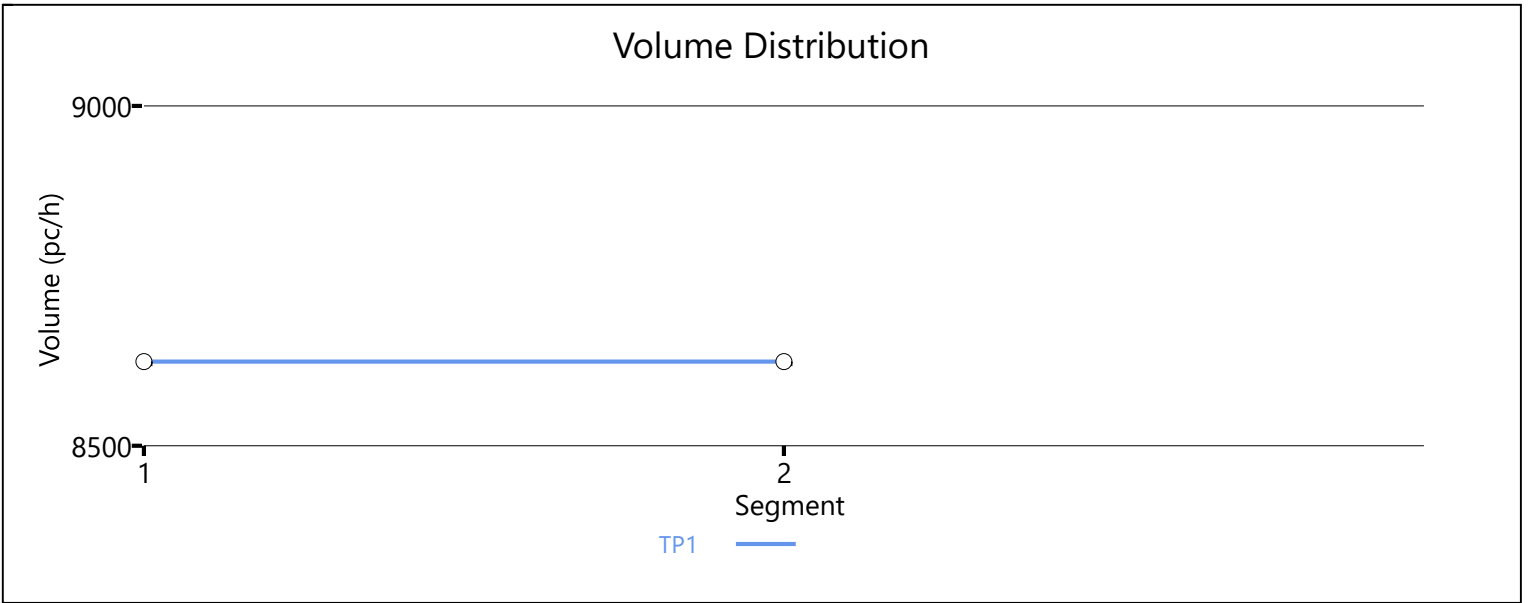
Facility Overall Results

Space Mean Speed, mi/h	66.9	Density, veh/mi/ln	22.2
Average Travel Time, min	1.20	Density, pc/mi/ln	23.8

Messages

Comments

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HCS7 Basic Freeway Report

Project Information

Analyst	GM	Date	4/30/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	AM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange (NB Polaris-Gemini off Ramp) - No Build	Unit	United States Customary

Geometric Data

Number of Lanes, ln	3	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	2.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	54.2
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	5520	Heavy Vehicle Adjustment Factor (fhv)	0.980
Peak Hour Factor	0.94	Flow Rate (Vp), pc/h/ln	1997
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2242
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2242
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.89
Passenger Car Equivalent (ET)	2.000		

Speed and Density

Lane Width Adjustment (fLW)	0.0	Average Speed (S), mi/h	53.5
Right-Side Lateral Clearance Adj. (fRLC)	0.0	Density (D), pc/mi/ln	37.3
Total Ramp Density Adjustment	5.8	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFSadj), mi/h	54.2		

HCS7 Freeway Facilities Report

Project Information

Analyst	GM	Date	4/24/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	AM Peak hour
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	8
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	11.08		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-71 NB btwn Polaris Pkwy/Gemini PI diverge and merge (4 lane)	6000	4
2	Basic	Basic	I-71 NB btwn Polaris Pkwy/Gemini PI diverge and merge (3 lane)	1200	3
3	Merge	Merge	I-71 NB merge at Gemini PI	1500	3
4	Basic	Basic	I-71 NB btwn Gemini PI and Sunbury Pkwy/US36/SR37	32500	3
5	Diverge	Diverge	I-71 NB diverge at Sunbury Pkwy/US36/SR37	4000	3
6	Basic	Basic	I-71 NB btwn Sunbury Pkwy/US36/SR37 diverge and merge	6500	3
7	Merge	Merge	I-71 NB merge at US36/SR37	1500	3
8	Basic	Basic	I-71 NB N of US36/SR37	5280	3

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.935	2344	9548	0.25	68.7	8.5	A

Segment 2: Basic

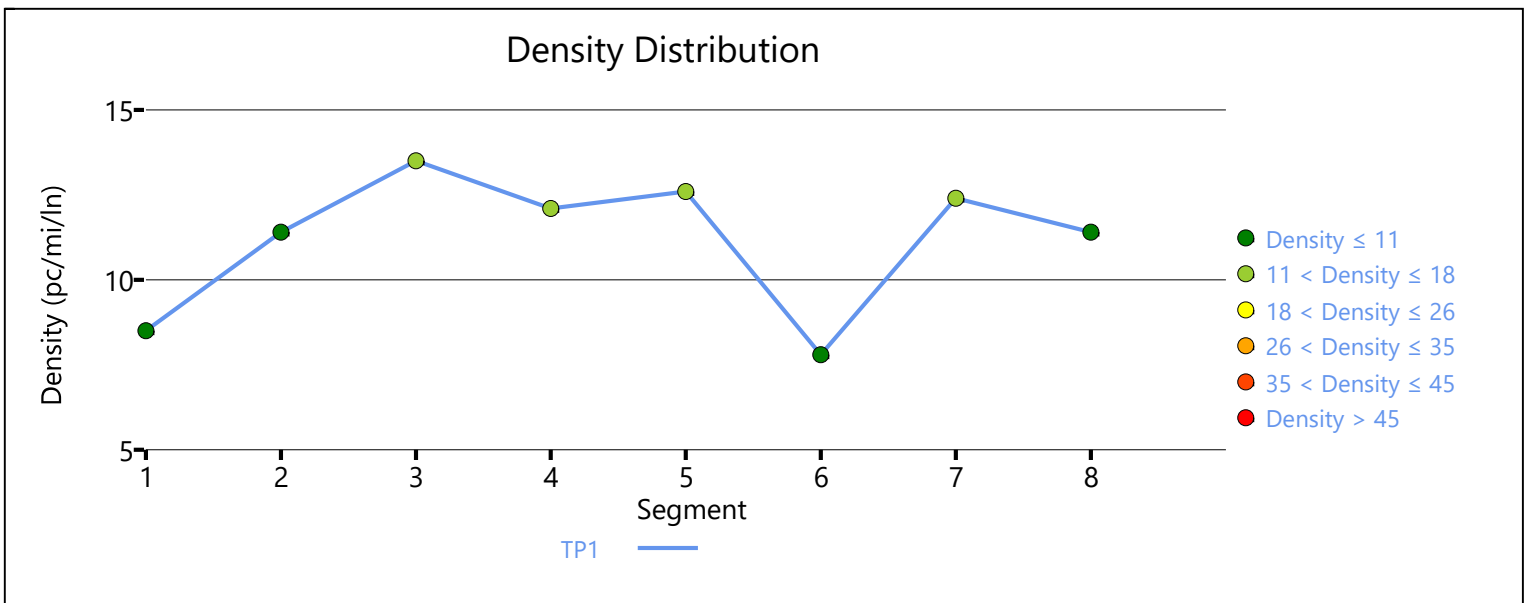
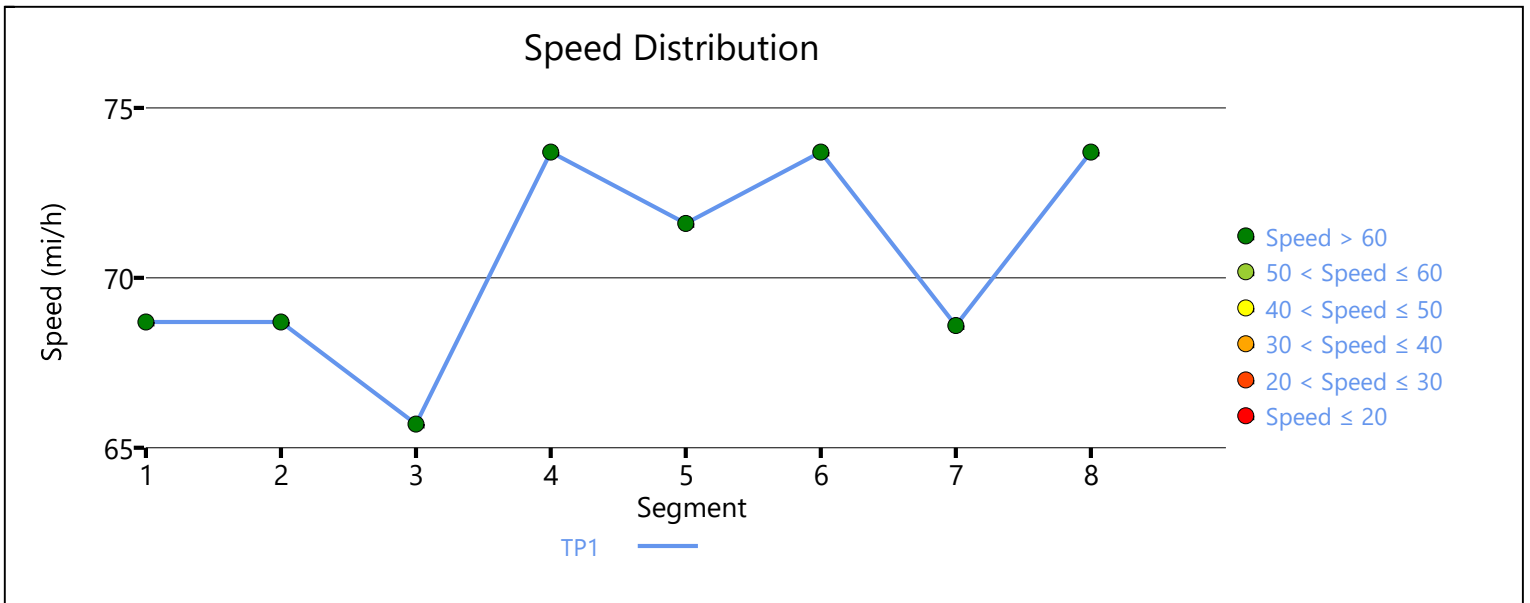
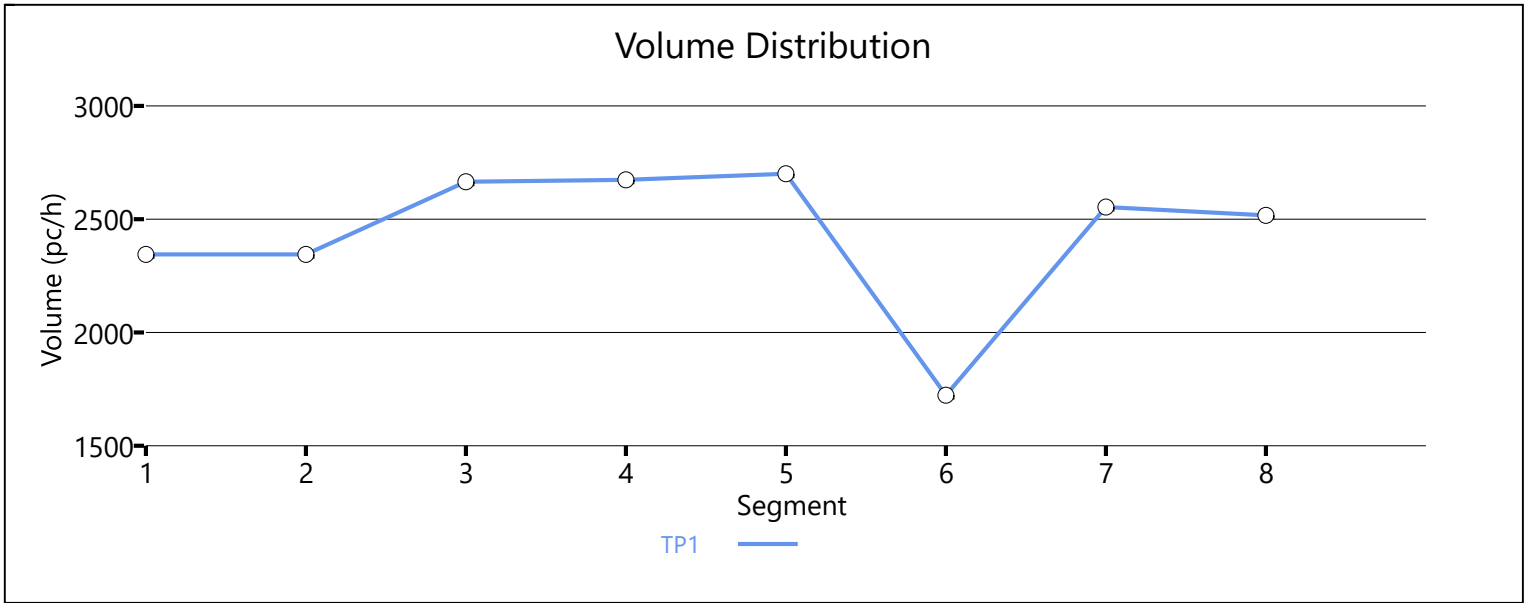
Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.935	2344	7161	0.33	68.7	11.4	B

Segment 3: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.935	0.962	2665	321	7200	2200	0.37	0.15	65.7	64.4	13.5	11.0	B

Segment 4: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS		
1	0.94		0.935		2674		7200		0.37		73.7		12.1		B		
Segment 5: Diverge																	
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS		
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp			
1	0.94	0.94	0.926	0.962	2700	940	7200	4400	0.38	0.21	71.6	66.7	12.6	5.6	A		
Segment 6: Basic																	
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS		
1	0.94		0.926		1723		7200		0.24		73.7		7.8		A		
Segment 7: Merge																	
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS		
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp			
1	0.94	0.94	0.917	0.877	2553	813	7200	2200	0.35	0.37	68.6	66.7	12.4	14.3	B		
Segment 8: Basic																	
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS		
1	0.94		0.917		2517		7200		0.35		73.7		11.4		B		
Facility Time Period Results																	
T	Speed, mi/h				Density, pc/mi/ln				Density, veh/mi/ln				Travel Time, min				LOS
1	72.6				11.2				10.4				9.20				B
Facility Overall Results																	
Space Mean Speed, mi/h					72.6				Density, veh/mi/ln				10.4				
Average Travel Time, min					9.20				Density, pc/mi/ln				11.2				
Messages																	
Comments																	



HCS7 Freeway Facilities Report

Project Information

Analyst	GM	Date	4/27/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	AM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	3
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.04		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Diverge	Diverge	I-71 NB CD diverge at Polaris Pkwy	1500	3
2	Basic	Basic	I-71 NB CD btwn Polaris Pkwy diverge and merge	2500	2
3	Merge	Basic	I-71 NB CD merge at Polaris Pkwy	1500	3

Facility Segment Data

Segment 1: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.980	0.980	5992	3072	6600	4200	0.91	0.73	52.8	49.7	37.8	42.0	E

Segment 2: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	2920	4484	0.65	54.1	26.9	D

Segment 3: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.980	0.952	3032	112	6900	2100	0.44	0.05	59.8	-	16.8	-	B

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	54.7	27.2	26.6	1.10	D

Facility Overall Results

Space Mean Speed, mi/h	54.7	Density, veh/mi/ln	26.6
Average Travel Time, min	1.10	Density, pc/mi/ln	27.2

Messages

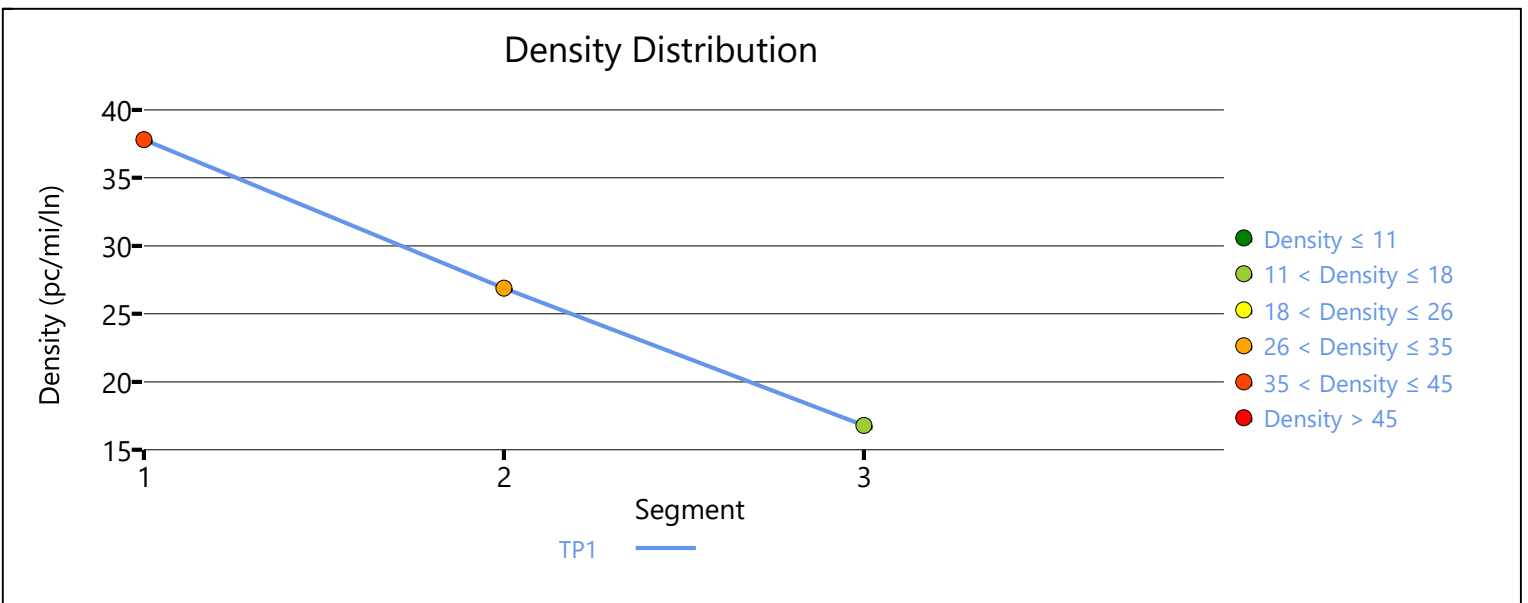
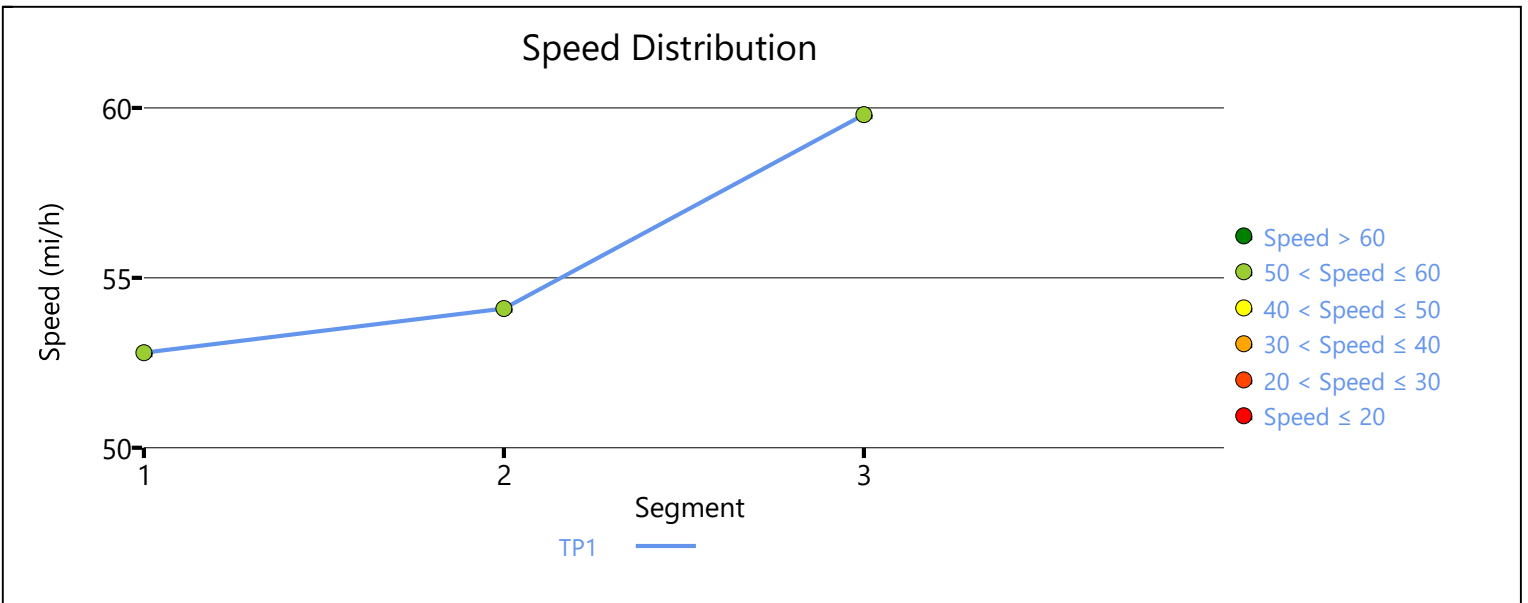
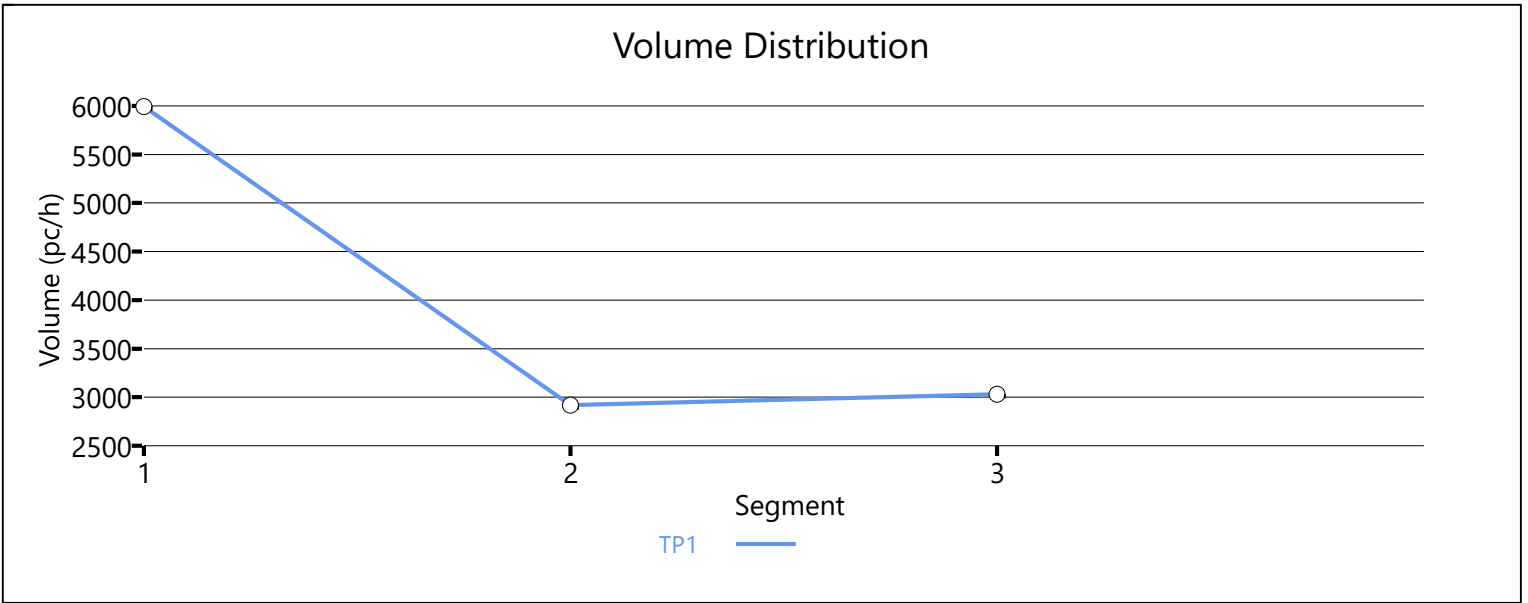
WARNING 1

Beginning and ending the facility with a basic freeway segment is highly recommended. Use caution when interpreting results of a Freeway Facility without a basic segment bounding the beginning and end of the facility.

WARNING 2

Beginning and ending the facility with a basic freeway segment is highly recommended. Use caution when interpreting results of a Freeway Facility without a basic segment bounding the beginning and end of the facility.

Comments



HCS7 Freeway Facilities Report

Project Information

Analyst	GM	Date	4/27/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	AM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	3
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.57		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Diverge	Diverge	I-71 NB CD diverge at Sunbury Pkwy	1500	2
2	Basic	Basic	I-71 NB CD bwtm Sunbury diverge and merge	5280	2
3	Merge	Merge	I-71 NB CD merge at Sunbury Pkwy	1500	2

Facility Segment Data

Segment 1: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.952	0.962	950	453	4400	2100	0.22	0.22	53.9	53.9	8.8	0.0	A

Segment 2: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.952	492	4484	0.11	54.2	4.5	A

Segment 3: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.952	0.962	603	111	4400	2100	0.14	0.05	55.4	55.4	5.4	5.2	A

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	54.3	5.4	5.2	1.70	A

Facility Overall Results

Space Mean Speed, mi/h	54.3	Density, veh/mi/ln	5.2
Average Travel Time, min	1.70	Density, pc/mi/ln	5.4

Messages

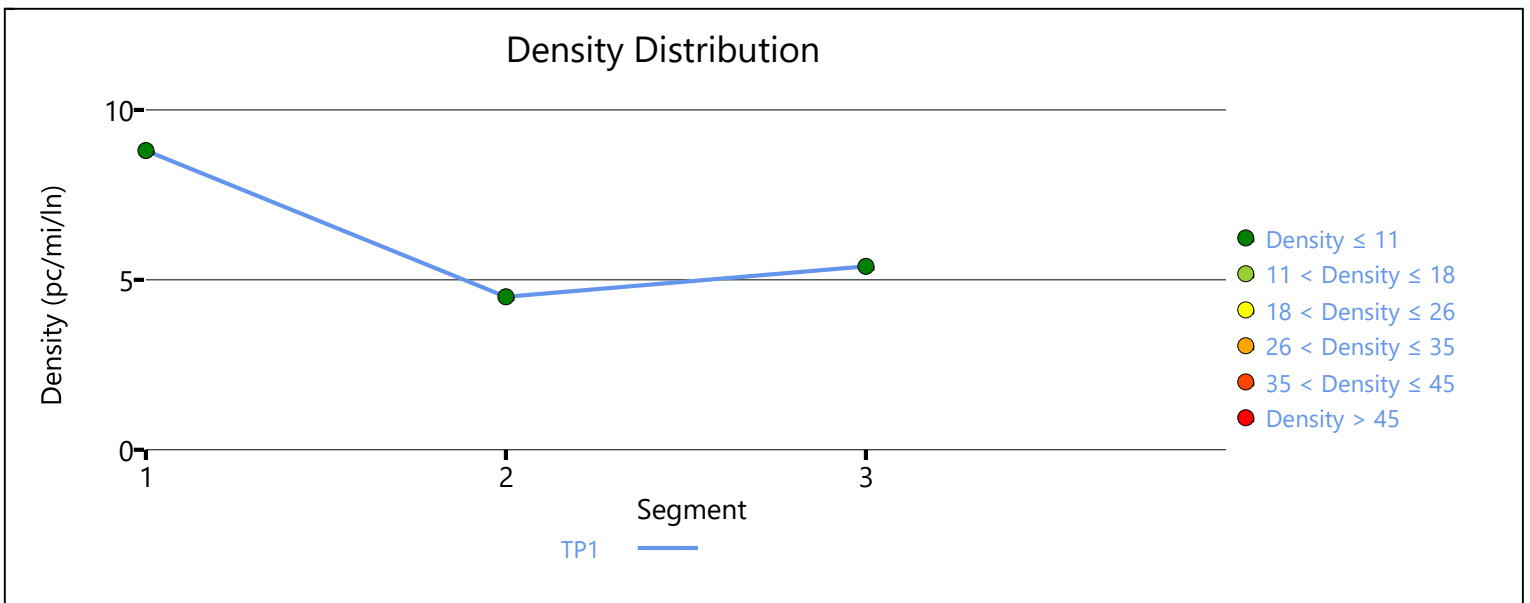
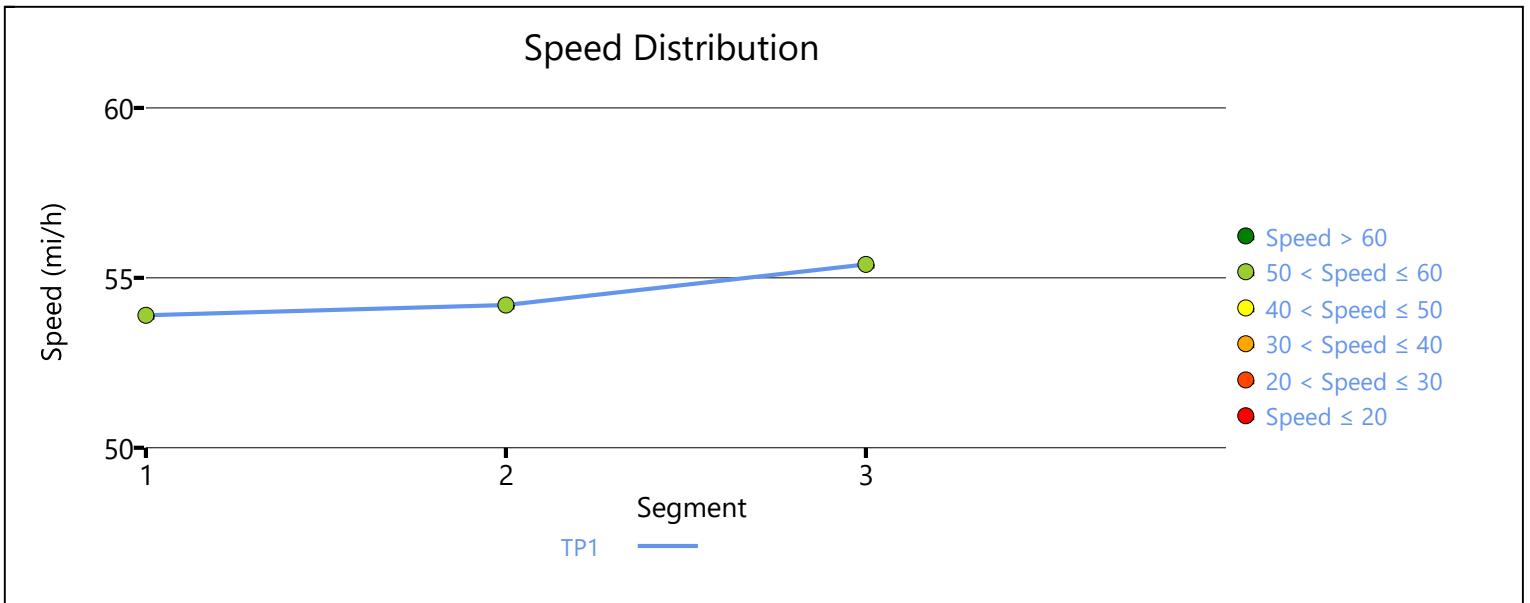
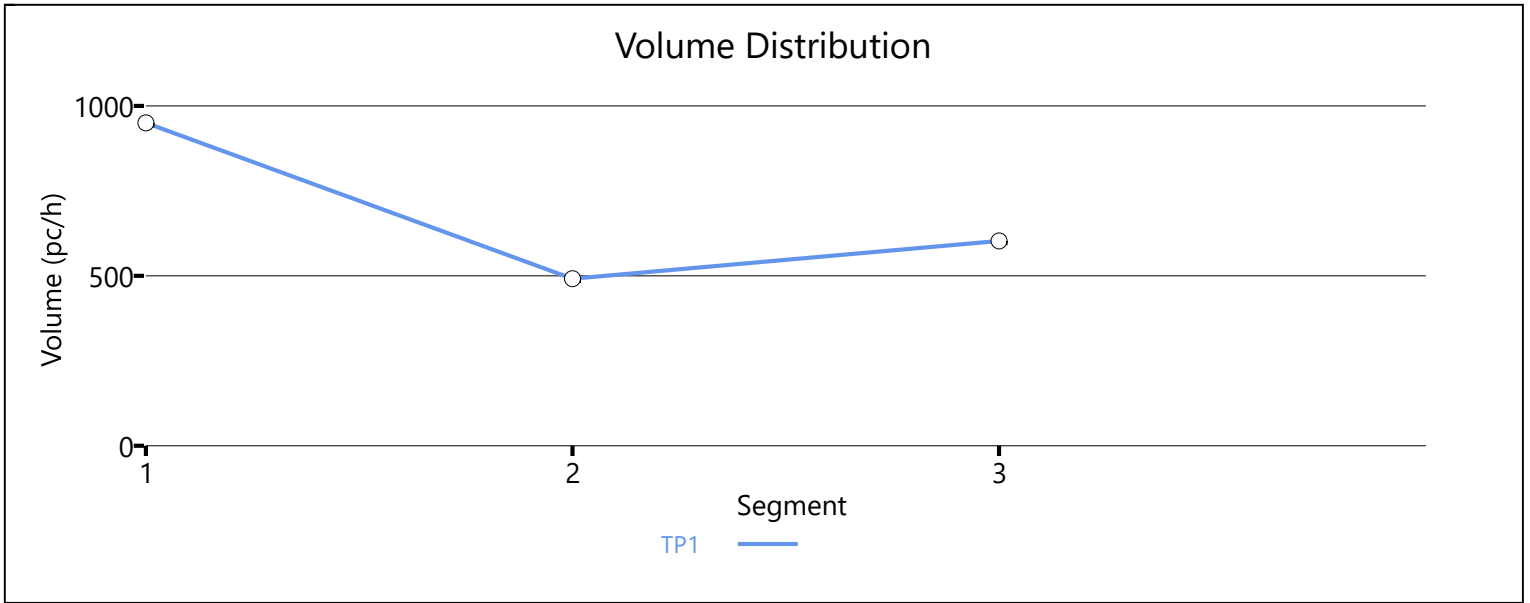
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Comments



HCS7 Freeway Facilities Report

Project Information

Analyst	GM	Date	4/26/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	AM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	15
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	12.14		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-71 SB N of US36/SR37	5280	3
2	Diverge	Diverge	I-71 SB diverge at US36/SR37	1500	3
3	Basic	Basic	I-71 SB btwn US36/SR37 diverge and merge	2400	3
4	Merge	Merge	I-71 SB merge at US36/SR37	1500	3
5	Basic	Basic	I-71 SB btwn US36/SR37 and Sunbury Pkwy	3000	3
6	Merge	Merge	I-71 SB merge at Sunbury Pkwy Loop Ramp	1500	3
7	Basic	Basic	I-71 SB btwn Sunbury Pkwy merges	2000	3
8	Merge	Merge	I-71 SB merge at Sunbury Pkwy	1500	3
9	Basic	Basic	I-71 SB btwn Sunbury Pkwy and Gemini PI/Polaris Pkwy	35000	3
10	Diverge	Diverge	I-71 SB diverge at Gemini PI/Polaris Pkwy	1500	3
11	Basic	Basic	I-71 SB btwn Gemini PI diverge and merge	3000	3
12	Merge	Merge	I-71 SB merge at Gemini PI	1500	3
13	Basic	Basic	I-71 SB btwn Gemini PI and Polaris Pkwy	1000	3
14	Merge	Merge	I-71 SB merge at Polaris Pkwy	1500	5
15	Basic	Basic	I-71 SB btwn Polaris Pkwy and I-270	1900	5

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.917	4316	7200	0.60	71.7	20.1	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.917	0.806	4316	700	7200	2200	0.60	0.32	71.2	67.4	20.2	21.5	C

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.926	3616	7200	0.51	73.0	16.5	B

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.909	4622	1006	7200	2200	0.65	0.46	66.6	64.6	23.1	24.3	C

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.926	4622	7200	0.65	70.7	21.8	C

Segment 6: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.952	5248	626	7200	2000	0.73	0.31	65.3	62.9	26.8	26.2	C

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.926	5248	7200	0.74	67.8	25.8	C

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.943	7192	2076	7200	2200	1.02	0.94	50.2	45.2	47.8	39.2	F

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.935	7192	7200	1.02	53.4	44.9	F

Segment 10: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.935	0.962	7192	863	7200	2200	1.02	0.39	65.6	63.1	36.5	37.5	F

Segment 11: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.935	6329	7146	0.90	59.5	35.5	E

Segment 12: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.935	0.962	6937	608	7200	2200	0.98	0.28	56.9	54.3	40.6	35.4	E

Segment 13: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94		0.935		6937		7146		0.99		54.8		42.2		E

Segment 14: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.935	0.971	9994	3057	12000	4400	0.84	0.69	49.8	43.4	40.1	43.8	E

Segment 15: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94		0.935		9994		11910		0.86		61.7		32.4		D

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	56.6	37.4	34.8	12.90	F

Facility Overall Results

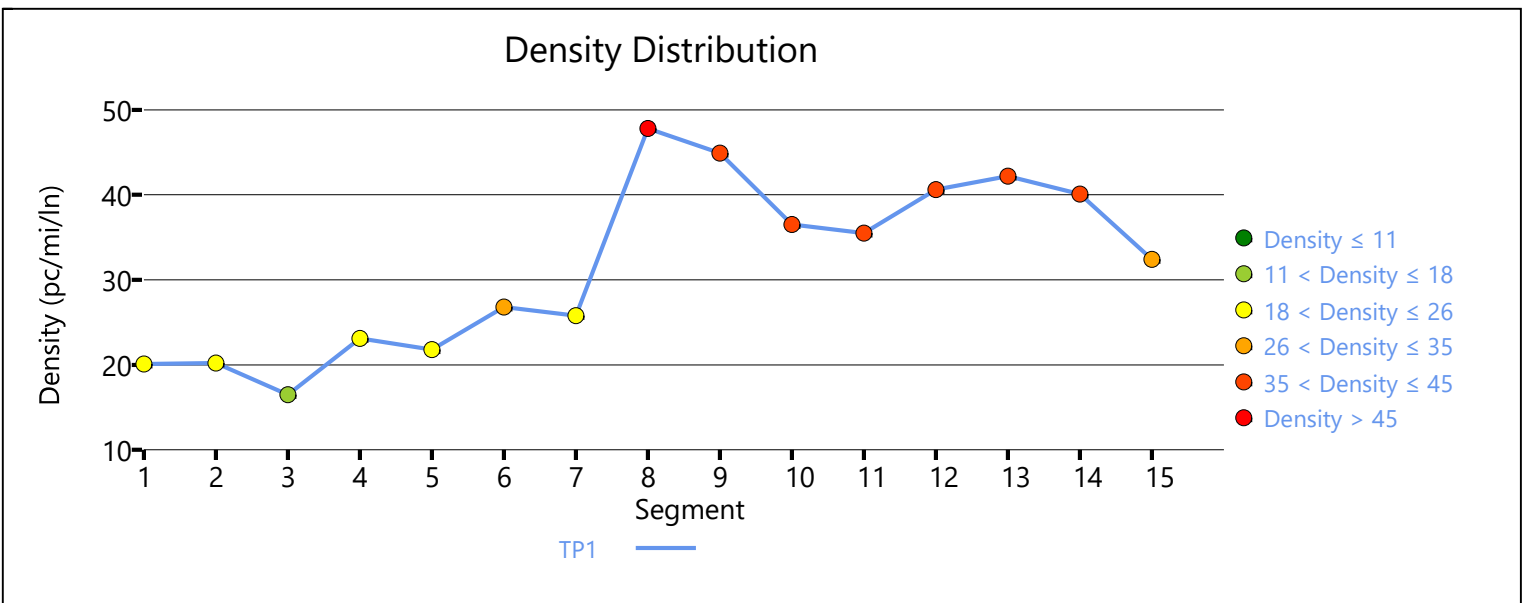
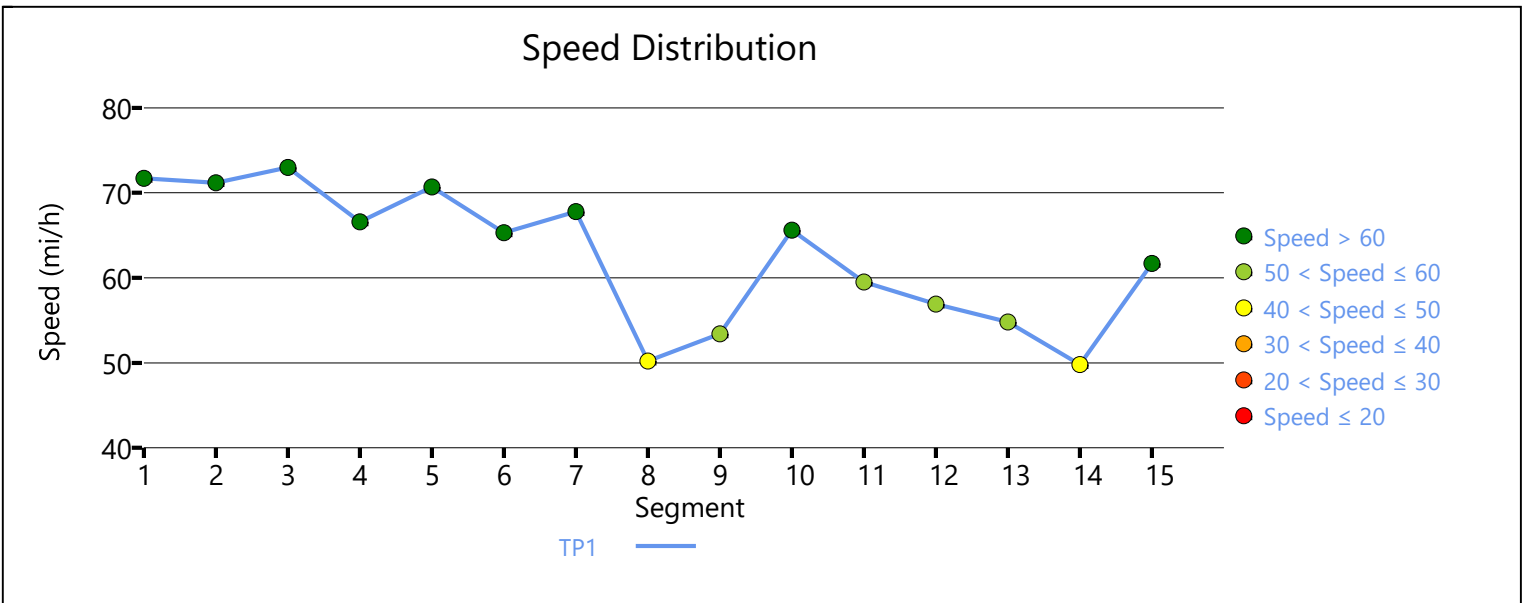
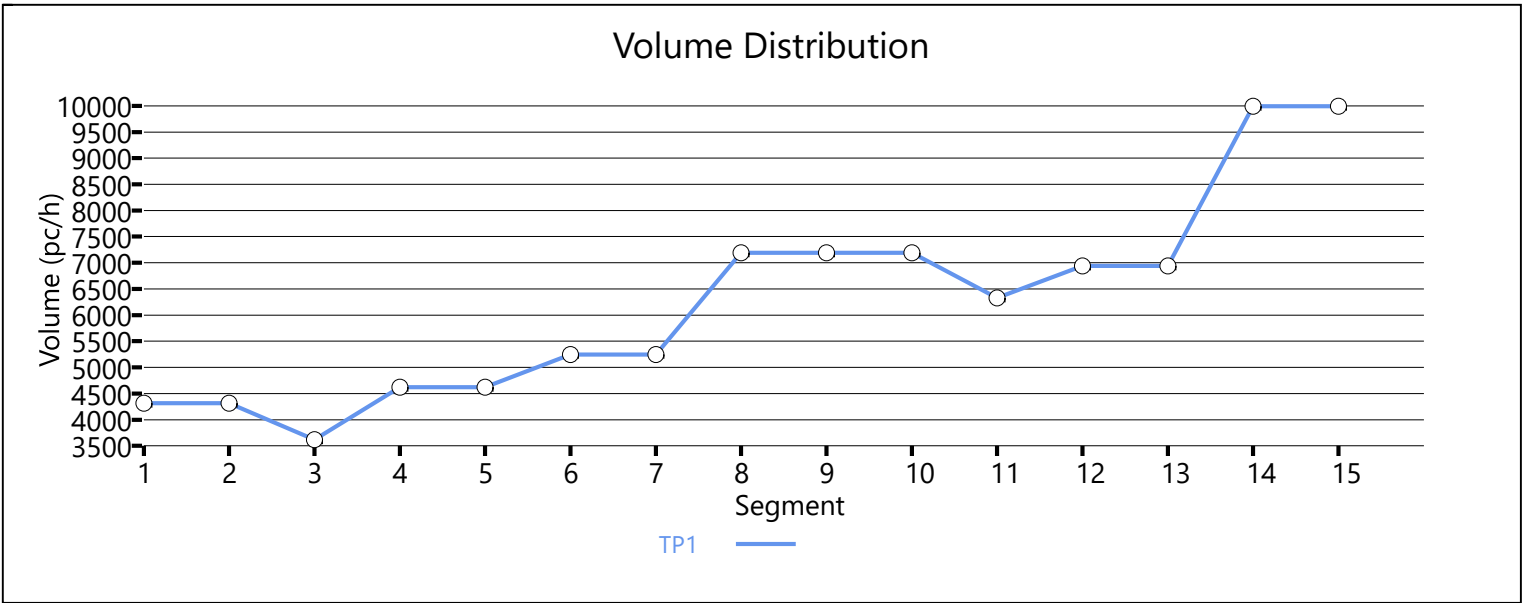
Space Mean Speed, mi/h	56.6	Density, veh/mi/ln	34.8
Average Travel Time, min	12.90	Density, pc/mi/ln	37.4

Messages

WARNING 1	Oversaturated conditions currently exist in boundary time period 1. Results may not be reliable. Consider expanding analysis in time and/or space to resolve this warning.
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Comments

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HCS7 Basic Freeway Report

Project Information

Analyst	GM	Date	4/30/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	AM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange (SB Polaris loop on ramp) - No Build	Unit	United States Customary

Geometric Data

Number of Lanes, ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	45.0	Total Ramp Density (TRD), ramps/mi	2.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	39.2
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	2740	Heavy Vehicle Adjustment Factor (fhv)	0.971
Peak Hour Factor	0.94	Flow Rate (Vp), pc/h/ln	1501
Total Trucks, %	3.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2200
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.68
Passenger Car Equivalent (ET)	2.000		

Speed and Density

Lane Width Adjustment (fLW)	0.0	Average Speed (S), mi/h	39.2
Right-Side Lateral Clearance Adj. (fRLC)	0.0	Density (D), pc/mi/ln	38.3
Total Ramp Density Adjustment	5.8	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFSadj), mi/h	39.2		

HCS7 Basic Freeway Report

Project Information

Analyst	GM	Date	4/30/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	AM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange (SB Polaris EB on ramp) - No Build	Unit	United States Customary

Geometric Data

Number of Lanes, ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	45.0	Total Ramp Density (TRD), ramps/mi	2.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	39.2
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	2840	Heavy Vehicle Adjustment Factor (fhv)	0.971
Peak Hour Factor	0.94	Flow Rate (Vp), pc/h/ln	1556
Total Trucks, %	3.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2200
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.71
Passenger Car Equivalent (ET)	2.000		

Speed and Density

Lane Width Adjustment (fLW)	0.0	Average Speed (S), mi/h	39.2
Right-Side Lateral Clearance Adj. (fRLC)	0.0	Density (D), pc/mi/ln	39.7
Total Ramp Density Adjustment	5.8	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFSadj), mi/h	39.2		

HCS7 Freeway Facilities Report

Project Information

Analyst	GM	Date	5/21/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	PM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	2
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.38		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-71 NB btwn I-270 & Polaris (5-lane)	4300	5
2	Basic	Basic	I-71 NB btwn I-270 & Polaris (6-lane)	3000	6

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.935	11935	11935	1.01	53.0	45.0	F

Segment 2: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.935	11935	14322	0.84	62.1	32.0	D

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	56.4	39.1	36.6	1.50	F

Facility Overall Results

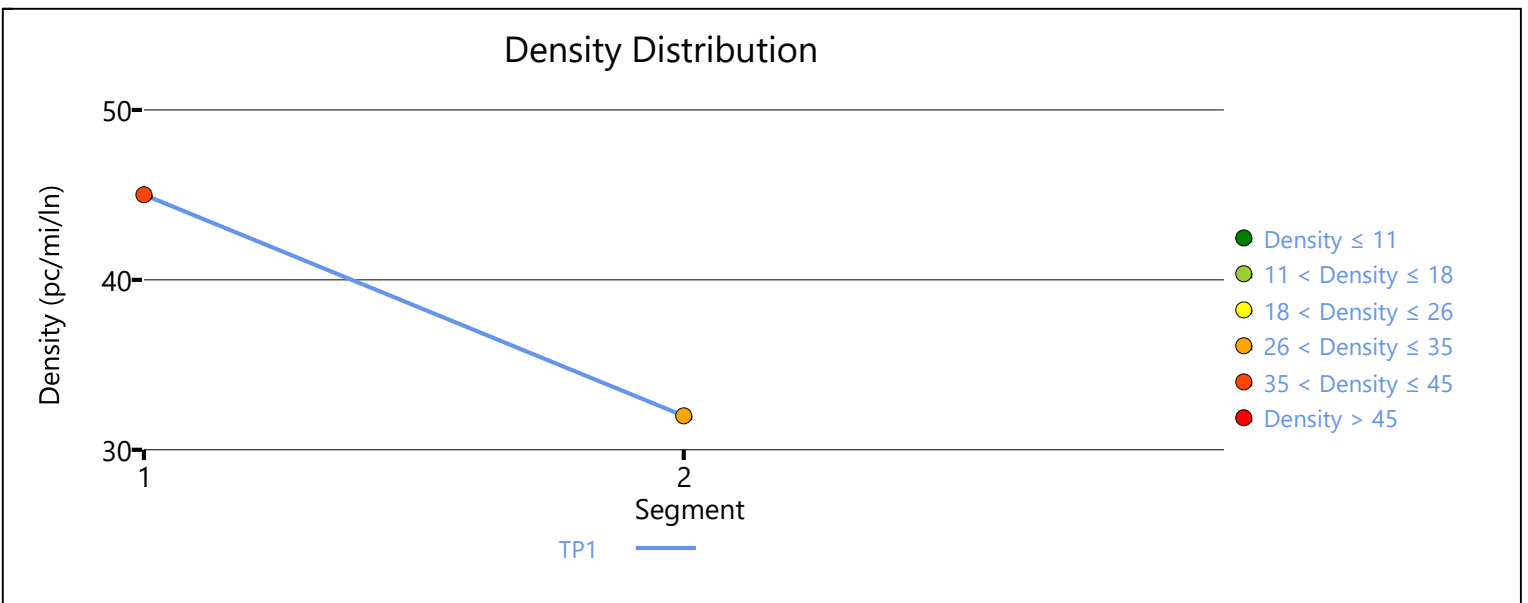
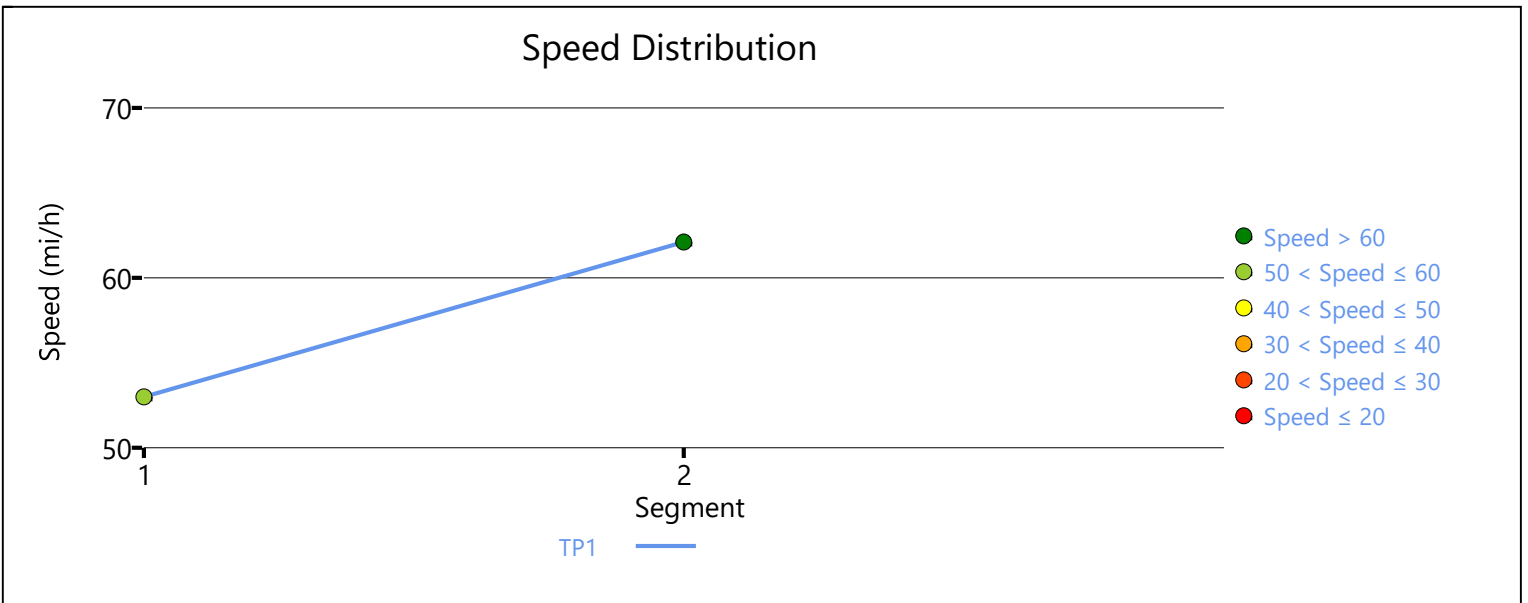
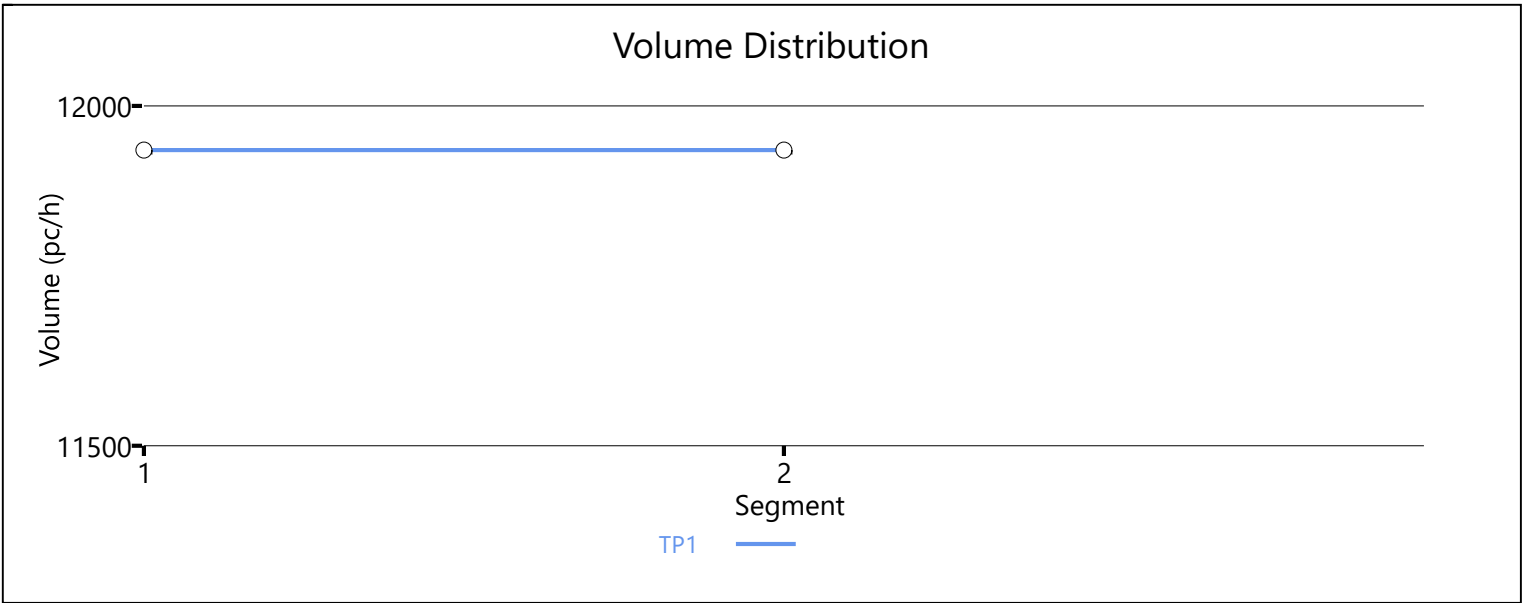
Space Mean Speed, mi/h	56.4	Density, veh/mi/ln	36.6
Average Travel Time, min	1.50	Density, pc/mi/ln	39.1

Messages

WARNING 1	Oversaturated conditions currently exist in boundary segment 1. Results may not be reliable. Consider expanding analysis in time and/or space to resolve this warning.
WARNING 2	Oversaturated conditions currently exist in boundary time period 1. Results may not be reliable. Consider expanding analysis in time and/or space to resolve this warning.

Comments

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HCS7 Basic Freeway Report

Project Information

Analyst	KM	Date	5/7/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	PM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange (NB Polaris-Gemini off Ramp) - No Build	Unit	United States Customary

Geometric Data

Number of Lanes, In	3	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	2.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	54.2
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	4210	Heavy Vehicle Adjustment Factor (fhv)	0.980
Peak Hour Factor	0.94	Flow Rate (Vp), pc/h/ln	1523
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2242
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2242
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.68
Passenger Car Equivalent (ET)	2.000		

Speed and Density

Lane Width Adjustment (fLW)	0.0	Average Speed (S), mi/h	54.2
Right-Side Lateral Clearance Adj. (fRLC)	0.0	Density (D), pc/mi/ln	28.1
Total Ramp Density Adjustment	5.8	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	54.2		

HCS7 Freeway Facilities Report

Project Information

Analyst	KM	Date	5/7/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	PM Peak hour
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	8
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	11.08		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-71 NB btwn Polaris Pkwy/Gemini PI diverge and merge (4 lane)	6000	4
2	Basic	Basic	I-71 NB btwn Polaris Pkwy/Gemini PI diverge and merge (3 lane)	1200	3
3	Merge	Merge	I-71 NB merge at Gemini PI	1500	3
4	Basic	Basic	I-71 NB btwn Gemini PI and Sunbury Pkwy/US36/SR37	32500	3
5	Diverge	Diverge	I-71 NB diverge at Sunbury Pkwy/US36/SR37	4000	3
6	Basic	Basic	I-71 NB btwn Sunbury Pkwy/US36/SR37 diverge and merge	6500	3
7	Merge	Merge	I-71 NB merge at US36/SR37	1500	3
8	Basic	Basic	I-71 NB N of US36/SR37	5280	3

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.935	5915	9548	0.76	23.6	62.7	F

Segment 2: Basic

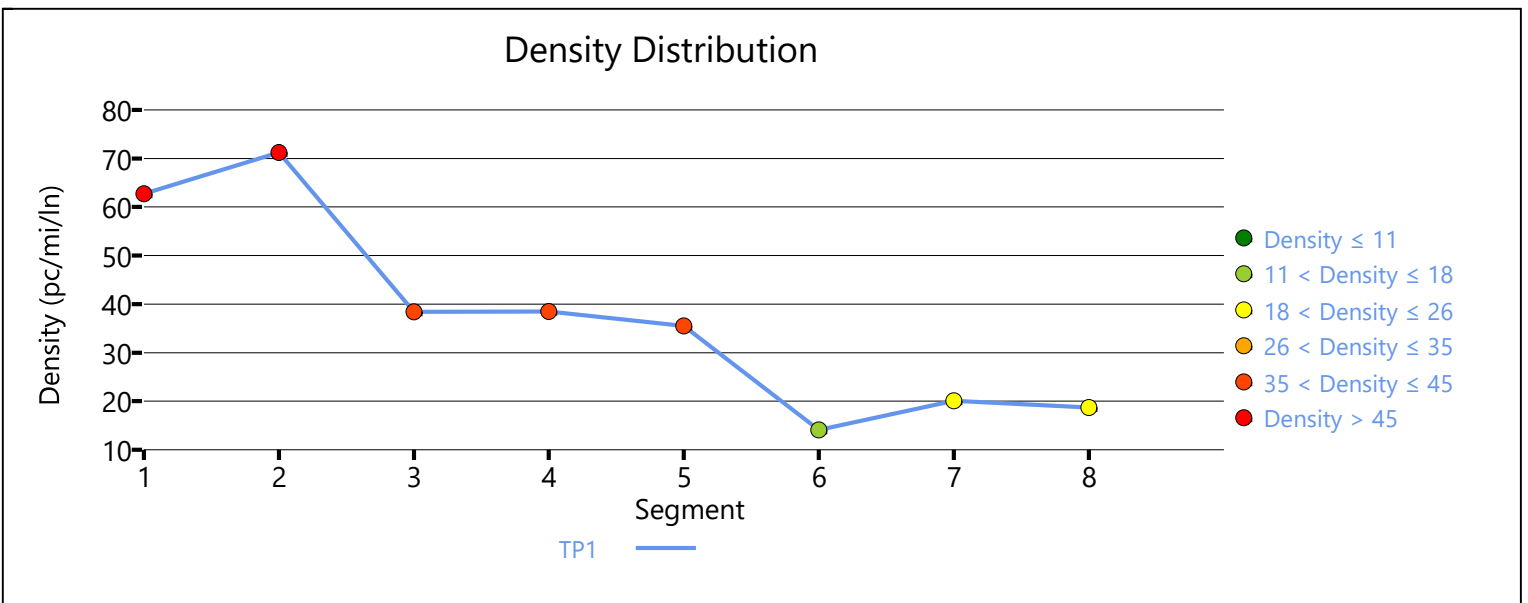
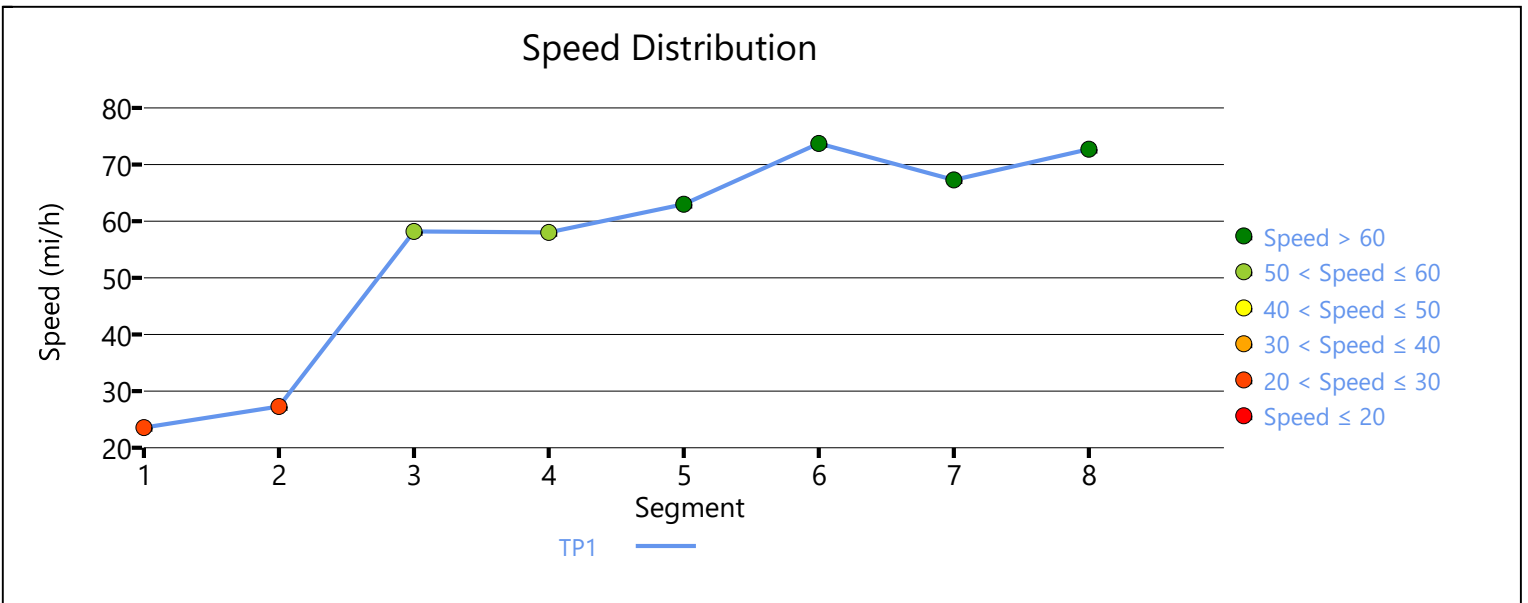
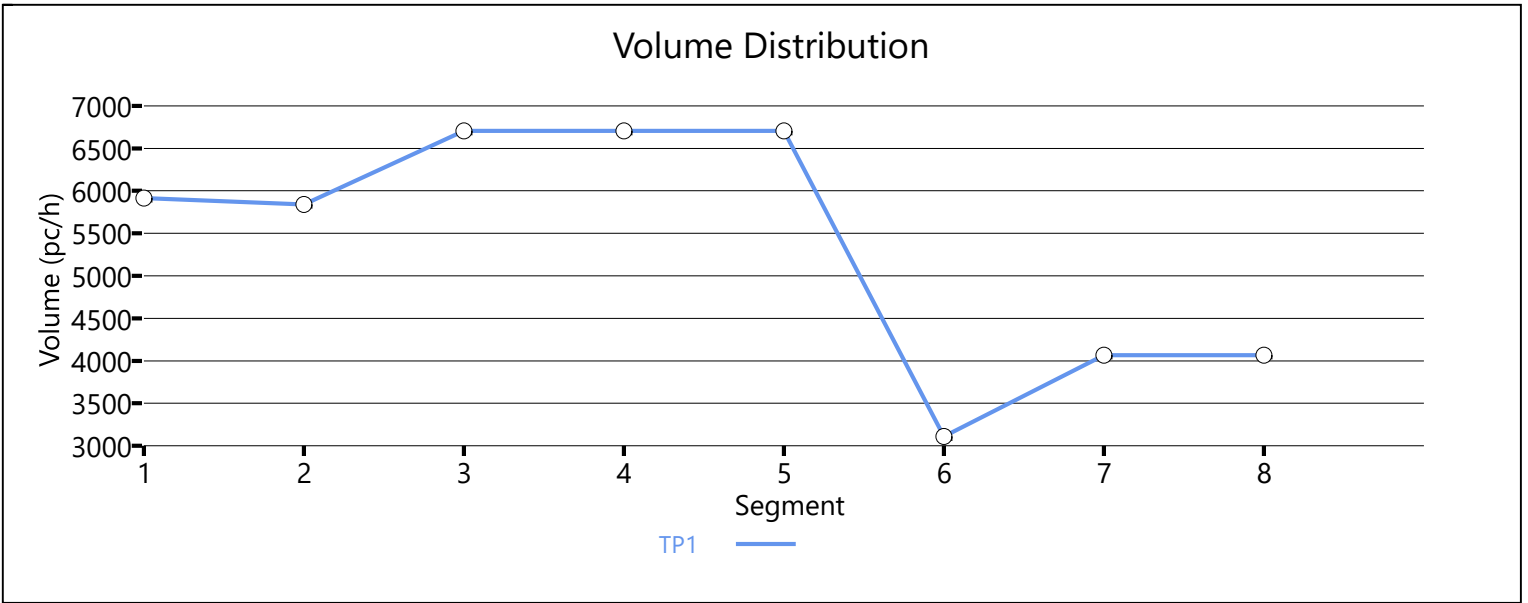
Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.935	5841	7161	1.01	27.3	71.2	F

Segment 3: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.935	0.962	6704	863	7200	2200	1.12	0.39	58.2	55.7	38.4	31.7	F

Segment 4: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS		
1	0.94		0.935		6704		7200		1.13		58.0		38.5		F		
Segment 5: Diverge																	
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS		
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp			
1	0.94	0.94	0.926	0.962	6704	3594	7200	4400	1.14	0.82	63.0	58.8	35.5	33.7	F		
Segment 6: Basic																	
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS		
1	0.94		0.926		3110		7200		0.62		73.7		14.1		B		
Segment 7: Merge																	
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS		
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp			
1	0.94	0.94	0.917	0.877	4068	958	7200	2200	0.76	0.44	67.3	65.3	20.1	21.8	C		
Segment 8: Basic																	
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS		
1	0.94		0.917		4068		7200		0.75		72.7		18.7		C		
Facility Time Period Results																	
T	Speed, mi/h				Density, pc/mi/ln				Density, veh/mi/ln				Travel Time, min				LOS
1	50.9				37.4				34.9				13.10				F
Facility Overall Results																	
Space Mean Speed, mi/h					50.9					Density, veh/mi/ln					34.9		
Average Travel Time, min					13.10					Density, pc/mi/ln					37.4		
Messages																	
WARNING 1					Oversaturated conditions currently exist in boundary time period 1. Results may not be reliable. Consider expanding analysis in time and/or space to resolve this warning.												
Comments																	



HCS7 Freeway Facilities Report

Project Information

Analyst	KM	Date	5/7/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	PM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	3
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.04		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Diverge	Diverge	I-71 NB CD diverge at Polaris Pkwy	1500	3
2	Basic	Basic	I-71 NB CD btwn Polaris Pkwy diverge and merge	2500	2
3	Merge	Basic	I-71 NB CD merge at Polaris Pkwy	1500	3

Facility Segment Data

Segment 1: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.980	0.980	4570	2594	6600	4200	0.69	0.62	53.3	50.4	28.6	34.2	D

Segment 2: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	1976	4484	0.44	54.2	18.2	C

Segment 3: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.980	0.952	2278	302	6900	2100	0.33	0.14	59.8	-	12.7	-	B

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	54.9	19.8	19.3	1.10	C

Facility Overall Results

Space Mean Speed, mi/h	54.9	Density, veh/mi/ln	19.3
Average Travel Time, min	1.10	Density, pc/mi/ln	19.8

Messages

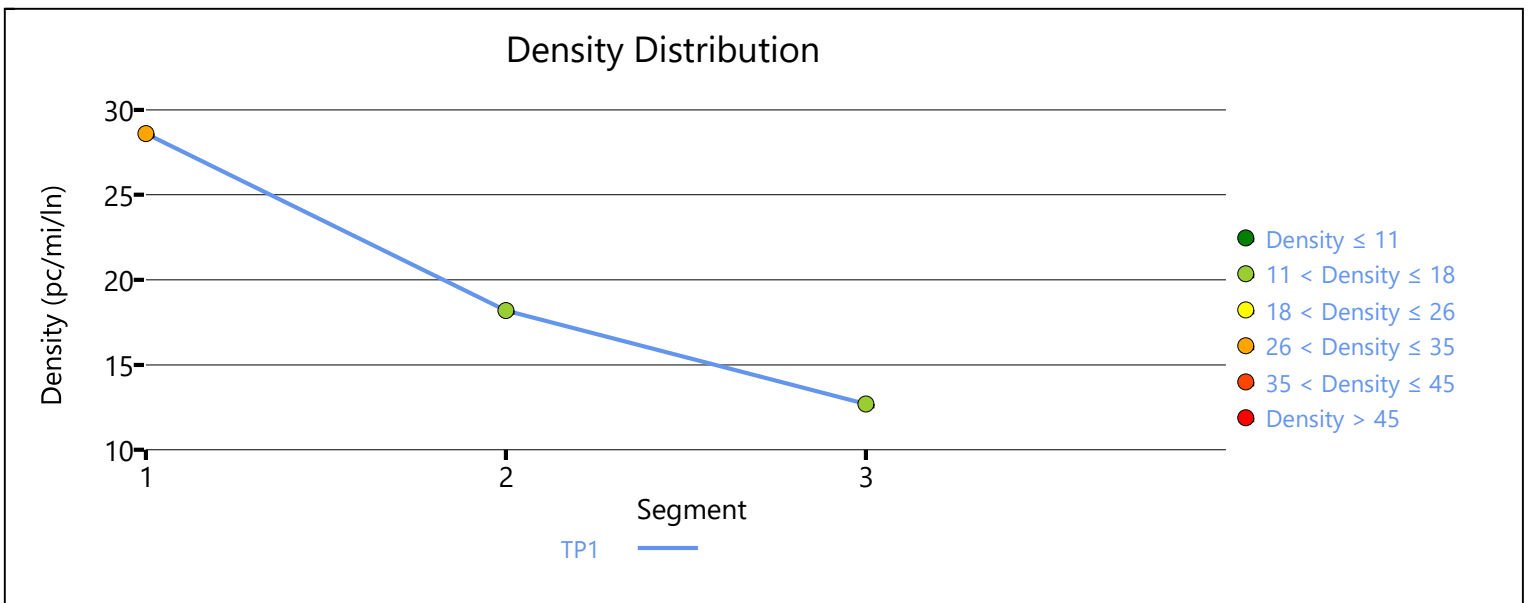
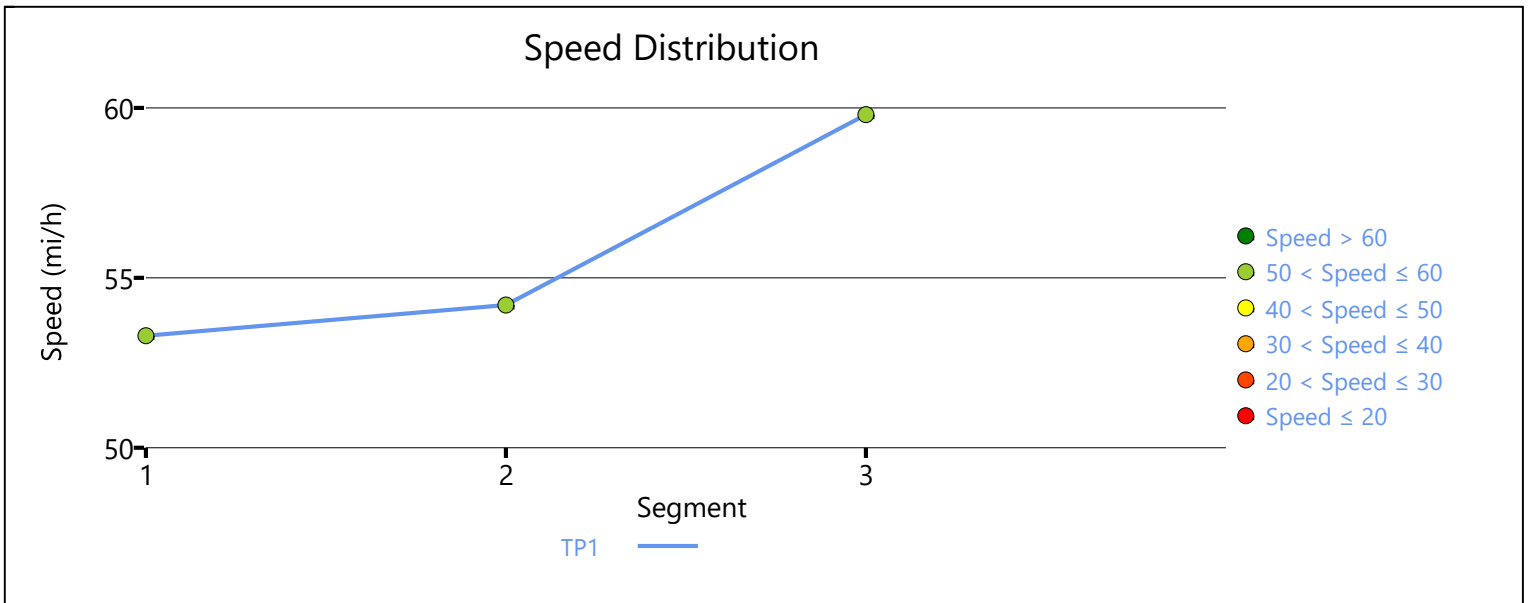
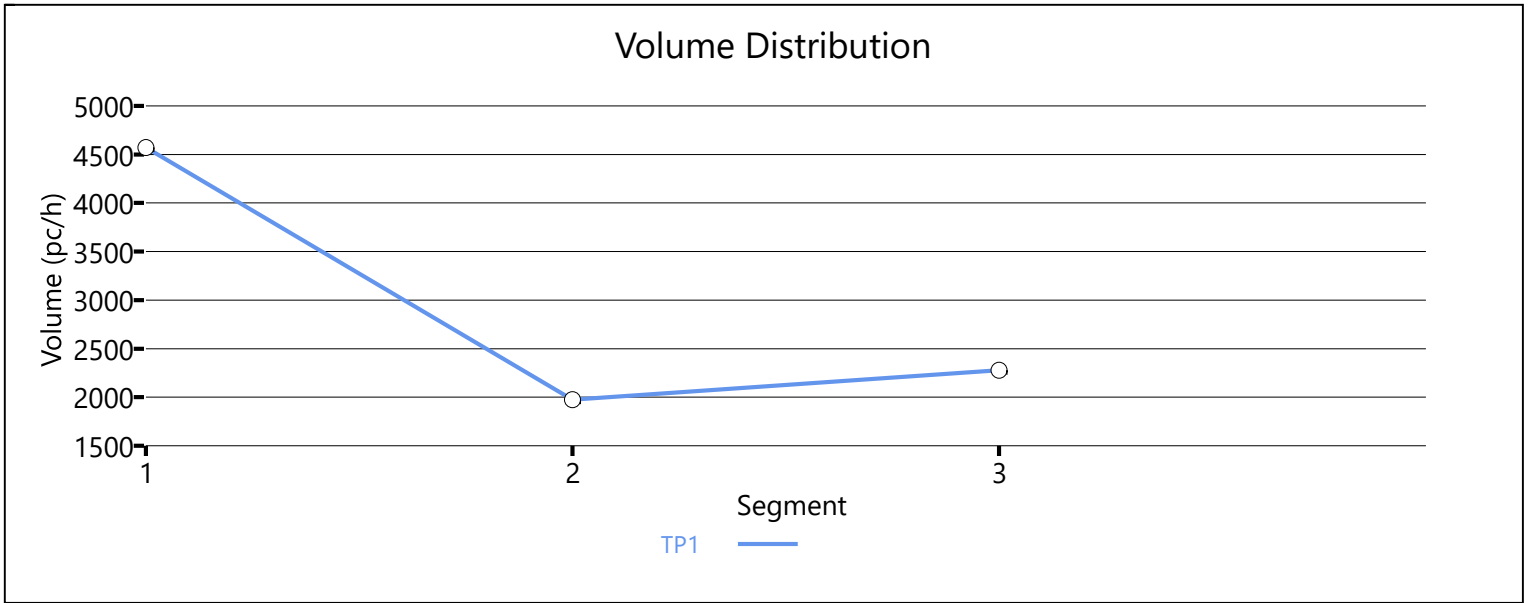
WARNING 1

Beginning and ending the facility with a basic freeway segment is highly recommended. Use caution when interpreting results of a Freeway Facility without a basic segment bounding the beginning and end of the facility.

WARNING 2

Beginning and ending the facility with a basic freeway segment is highly recommended. Use caution when interpreting results of a Freeway Facility without a basic segment bounding the beginning and end of the facility.

Comments



HCS7 Freeway Facilities Report

Project Information

Analyst	KM	Date	5/7/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	PM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	3
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.57		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Diverge	Diverge	I-71 NB CD diverge at Sunbury Pkwy	1500	2
2	Basic	Basic	I-71 NB CD bwtm Sunbury diverge and merge	5280	2
3	Merge	Merge	I-71 NB CD merge at Sunbury Pkwy	1500	2

Facility Segment Data

Segment 1: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.952	0.962	3632	2079	4400	2100	0.83	0.99	51.3	51.3	35.4	22.0	C

Segment 2: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.952	1531	4484	0.34	54.2	14.1	B

Segment 3: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.952	0.962	1730	199	4400	2100	0.39	0.09	55.1	55.1	15.7	13.9	B

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	53.3	18.3	17.4	1.80	C

Facility Overall Results

Space Mean Speed, mi/h	53.3	Density, veh/mi/ln	17.4
Average Travel Time, min	1.80	Density, pc/mi/ln	18.3

Messages

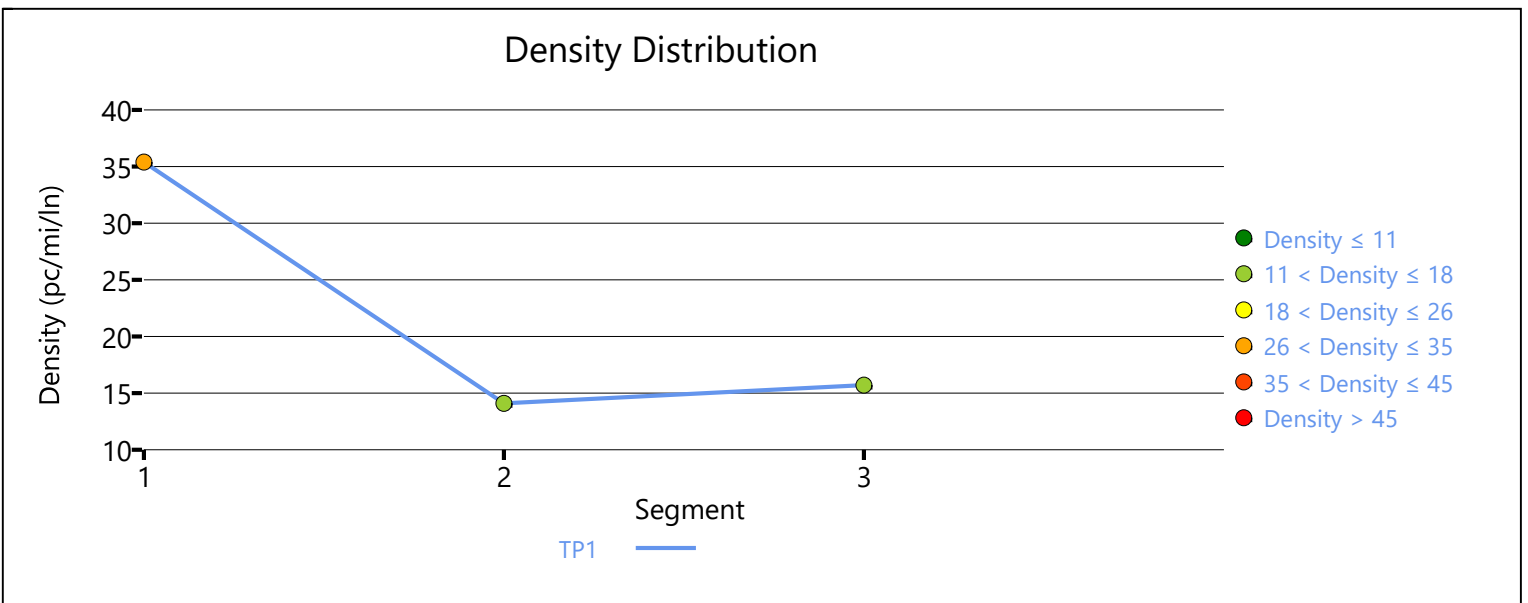
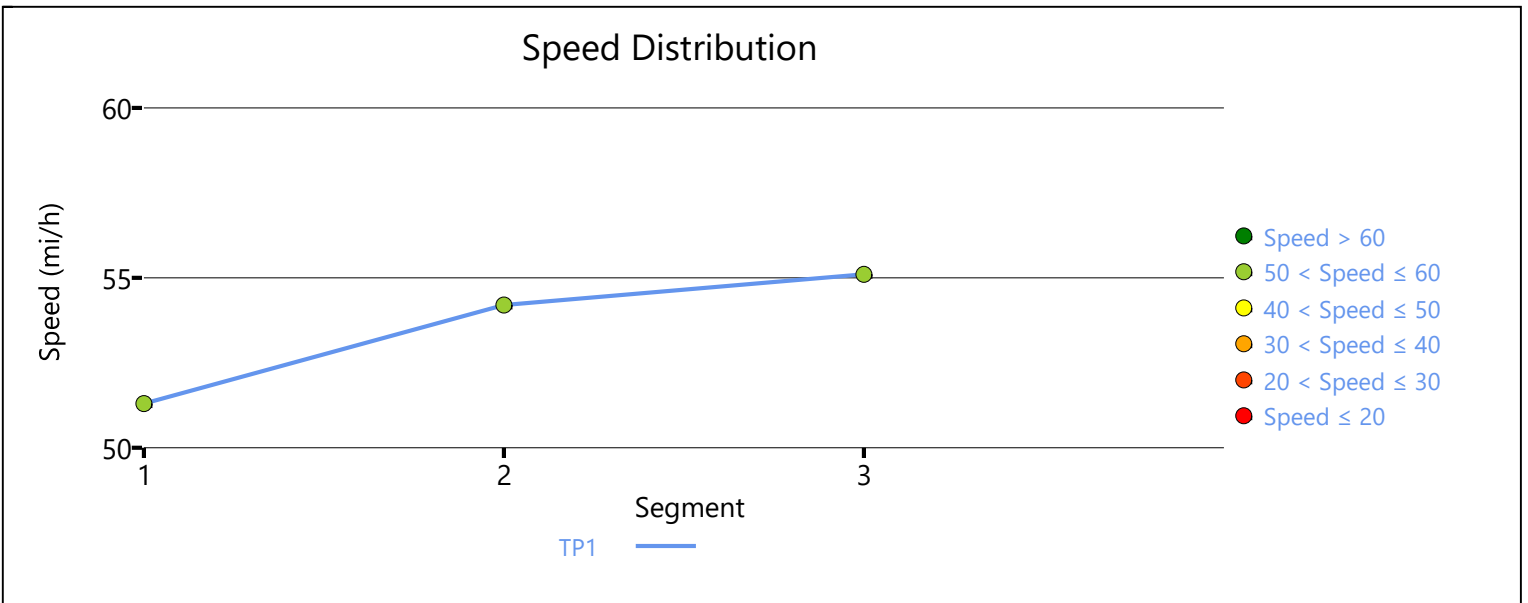
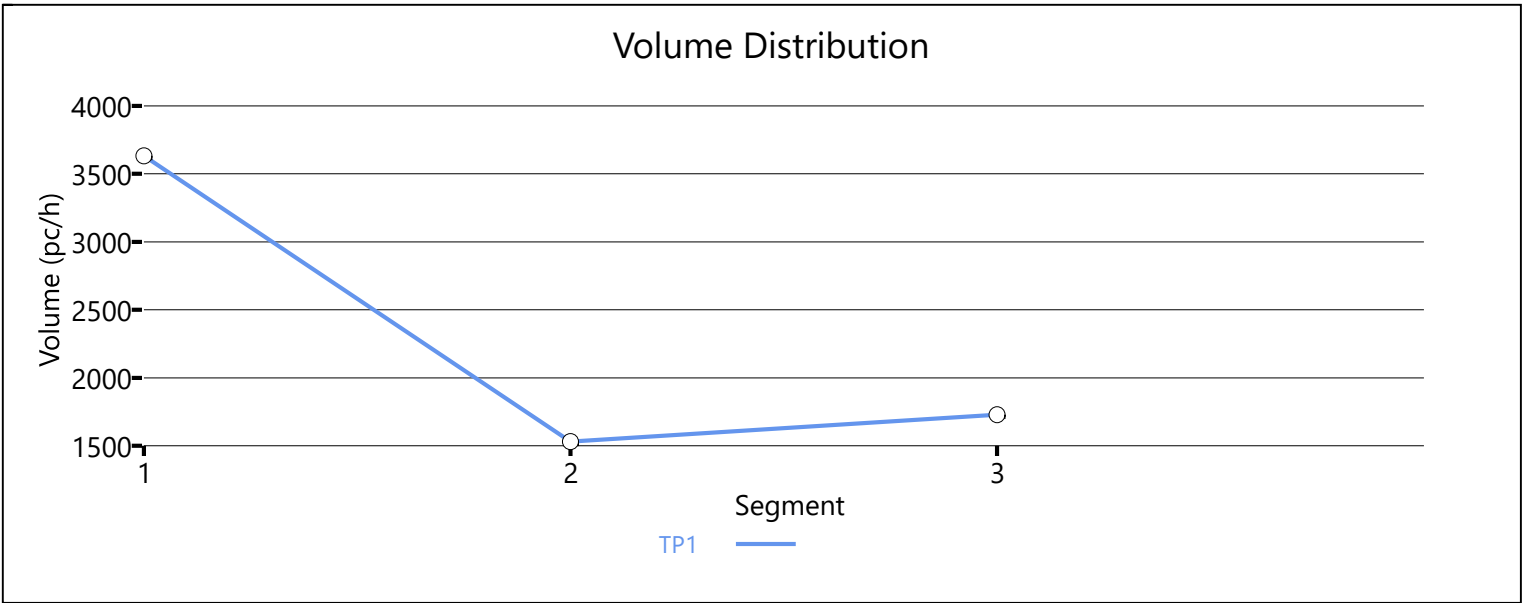
WARNING 1

Beginning and ending the facility with a basic freeway segment is highly recommended. Use caution when interpreting results of a Freeway Facility without a basic segment bounding the beginning and end of the facility.

WARNING 2

Beginning and ending the facility with a basic freeway segment is highly recommended. Use caution when interpreting results of a Freeway Facility without a basic segment bounding the beginning and end of the facility.

Comments



HCS7 Freeway Facilities Report

Project Information

Analyst	KM	Date	5/7/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	PM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	15
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	12.14		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-71 SB N of US36/SR37	5280	3
2	Diverge	Diverge	I-71 SB diverge at US36/SR37	1500	3
3	Basic	Basic	I-71 SB btwn US36/SR37 diverge and merge	2400	3
4	Merge	Merge	I-71 SB merge at US36/SR37	1500	3
5	Basic	Basic	I-71 SB btwn US36/SR37 and Sunbury Pkwy	3000	3
6	Merge	Merge	I-71 SB merge at Sunbury Pkwy Loop Ramp	1500	3
7	Basic	Basic	I-71 SB btwn Sunbury Pkwy merges	2000	3
8	Merge	Merge	I-71 SB merge at Sunbury Pkwy	1500	3
9	Basic	Basic	I-71 SB btwn Sunbury Pkwy and Gemini Pl/Polaris Pkwy	35000	3
10	Diverge	Diverge	I-71 SB diverge at Gemini Pl	1500	3
11	Basic	Basic	I-71 SB btwn Gemini Pl diverge and merge	3000	3
12	Merge	Merge	I-71 SB merge at Gemini Pl	1500	3
13	Basic	Basic	I-71 SB btwn Gemini Pl and Polaris Pkwy	1000	3
14	Merge	Merge	I-71 SB merge at Polaris Pkwy	1500	5
15	Basic	Basic	I-71 SB btwn Polaris Pkwy and I-270	1900	5

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.917	3782	7200	0.53	72.8	17.3	B

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.917	0.806	3782	1280	7200	2200	0.53	0.58	69.3	65.7	18.2	20.2	C

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.926	2631	7200	0.37	73.0	12.0	B

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.909	3169	538	7200	2200	0.44	0.24	68.6	66.6	15.4	16.2	B

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.926	3159	7200	0.44	73.1	14.4	B

Segment 6: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.952	3427	268	7200	2000	0.48	0.13	68.0	65.7	16.8	16.7	B

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.926	3435	7200	0.48	72.9	15.7	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.943	4371	936	7200	2200	0.61	0.43	67.1	65.1	21.7	22.9	C

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.935	4346	7200	0.60	71.6	20.2	C

Segment 10: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.935	0.962	4346	442	7200	2200	0.60	0.20	67.4	64.2	21.5	23.8	C

Segment 11: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.935	3891	7146	0.54	68.2	19.0	C

Segment 12: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.935	0.962	4820	929	7200	2200	0.67	0.42	62.0	60.2	25.9	26.4	C

Segment 13: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94		0.935		4847		7146		0.68		66.7		24.2		C

Segment 14: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.935	0.971	8408	3561	12000	4400	0.70	0.81	49.0	43.6	34.3	43.5	E

Segment 15: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94		0.935		8545		11910		0.72		65.8		26.0		C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	69.1	20.1	18.7	10.50	C

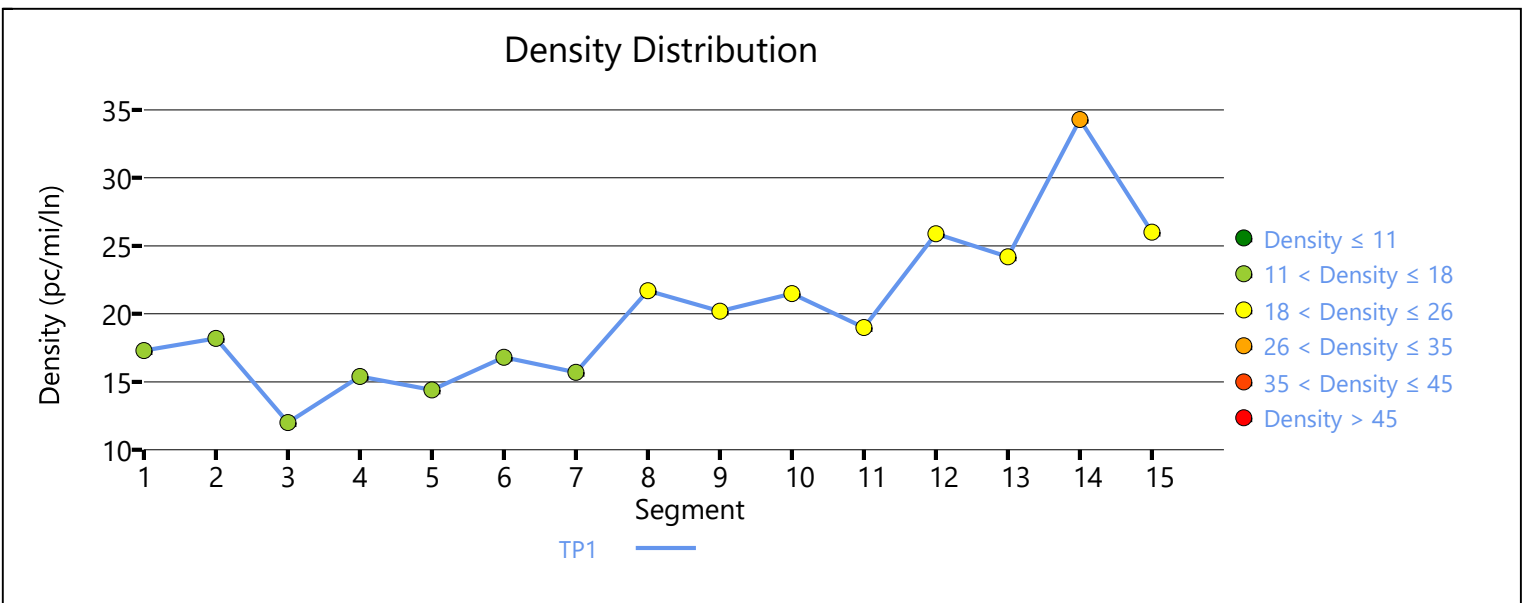
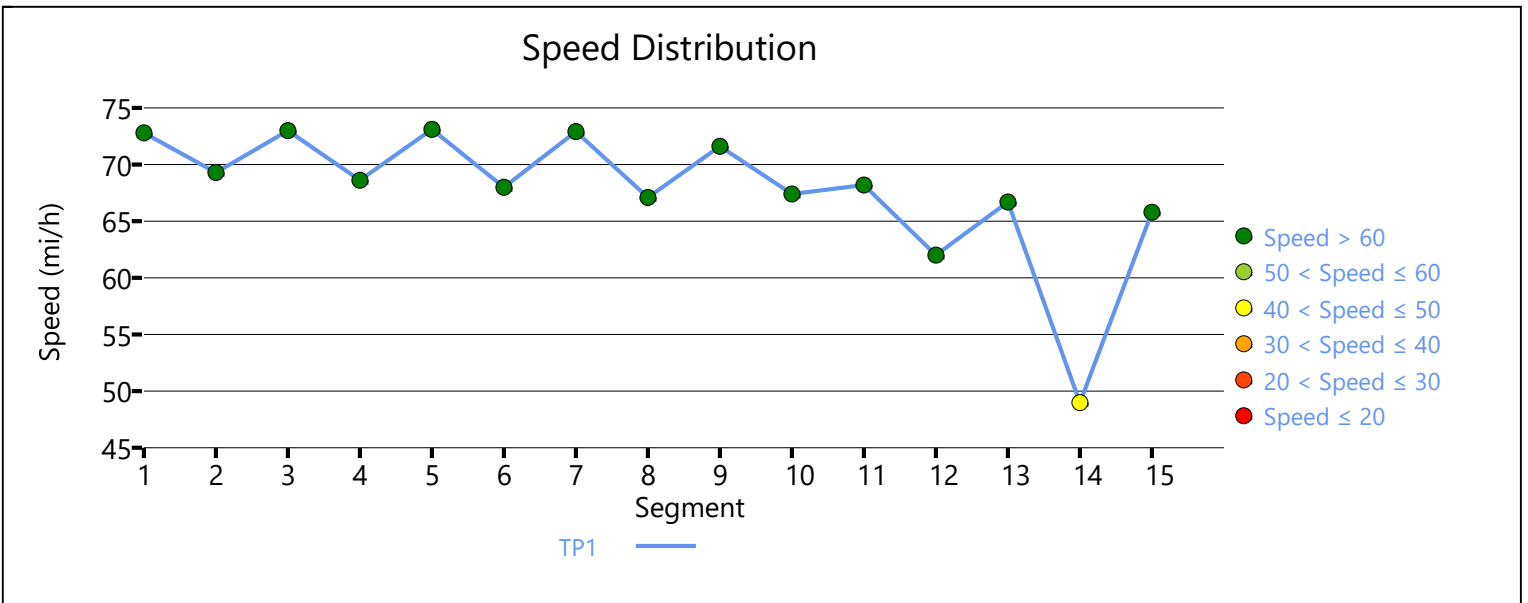
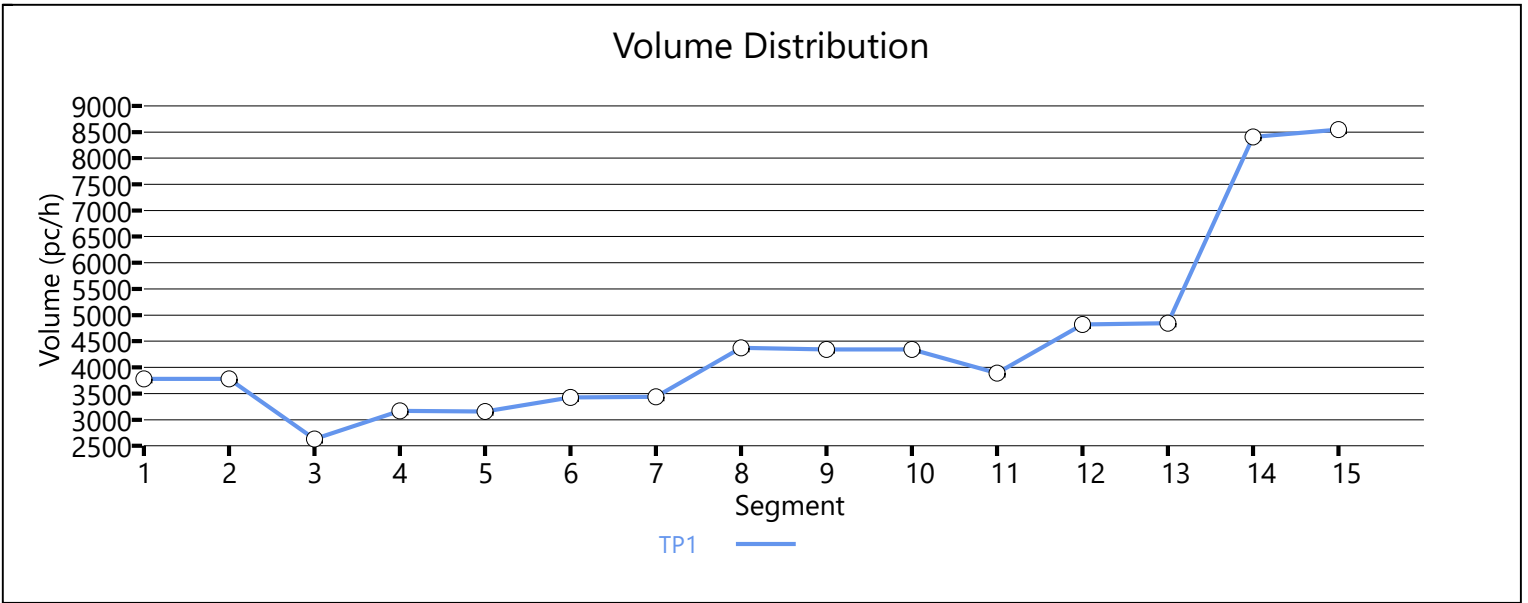
Facility Overall Results

Space Mean Speed, mi/h	69.1	Density, veh/mi/ln	18.7
Average Travel Time, min	10.50	Density, pc/mi/ln	20.1

Messages

Comments

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HCS7 Basic Freeway Report

Project Information

Analyst	KM	Date	5/7/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	PM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange (SB Polaris loop on ramp) - No Build	Unit	United States Customary

Geometric Data

Number of Lanes, ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	45.0	Total Ramp Density (TRD), ramps/mi	2.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	39.2
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	2160	Heavy Vehicle Adjustment Factor (fhv)	0.971
Peak Hour Factor	0.94	Flow Rate (Vp), pc/h/ln	1184
Total Trucks, %	3.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2200
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.54
Passenger Car Equivalent (ET)	2.000		

Speed and Density

Lane Width Adjustment (fLW)	0.0	Average Speed (S), mi/h	39.2
Right-Side Lateral Clearance Adj. (fRLC)	0.0	Density (D), pc/mi/ln	30.2
Total Ramp Density Adjustment	5.8	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	39.2		

HCS7 Basic Freeway Report

Project Information

Analyst	KM	Date	5/7/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	PM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange (SB Polaris EB on ramp) - No Build	Unit	United States Customary

Geometric Data

Number of Lanes, ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	45.0	Total Ramp Density (TRD), ramps/mi	2.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	39.2
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	4340	Heavy Vehicle Adjustment Factor (fhv)	0.971
Peak Hour Factor	0.94	Flow Rate (Vp), pc/h/ln	2378
Total Trucks, %	3.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2200
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	1.08
Passenger Car Equivalent (ET)	2.000		

Speed and Density

Lane Width Adjustment (fLW)	0.0	Average Speed (S), mi/h	-
Right-Side Lateral Clearance Adj. (fRLC)	0.0	Density (D), pc/mi/ln	-
Total Ramp Density Adjustment	5.8	Level of Service (LOS)	F
Adjusted Free-Flow Speed (FFSadj), mi/h	39.2		

HCS7 Freeway Facilities Report

Project Information

Analyst	GM	Date	5/21/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	AM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build (Constraint)	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	2
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.38		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-71 NB btwn I-270 & Polaris (5-lane)	4300	5
2	Basic	Basic	I-71 NB btwn I-270 & Polaris (6-lane)	3000	6

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.935	8317	11935	0.70	66.6	25.0	C

Segment 2: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.935	8317	14322	0.58	68.5	20.2	C

Facility Time Period Results

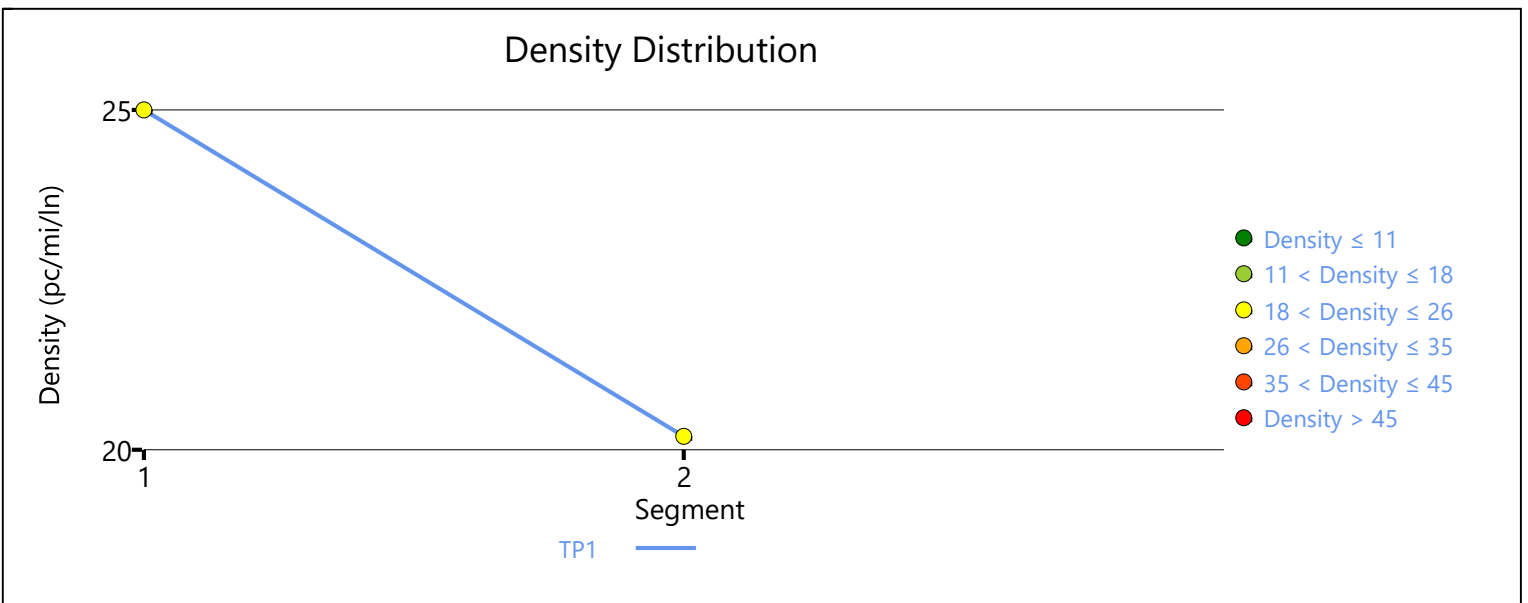
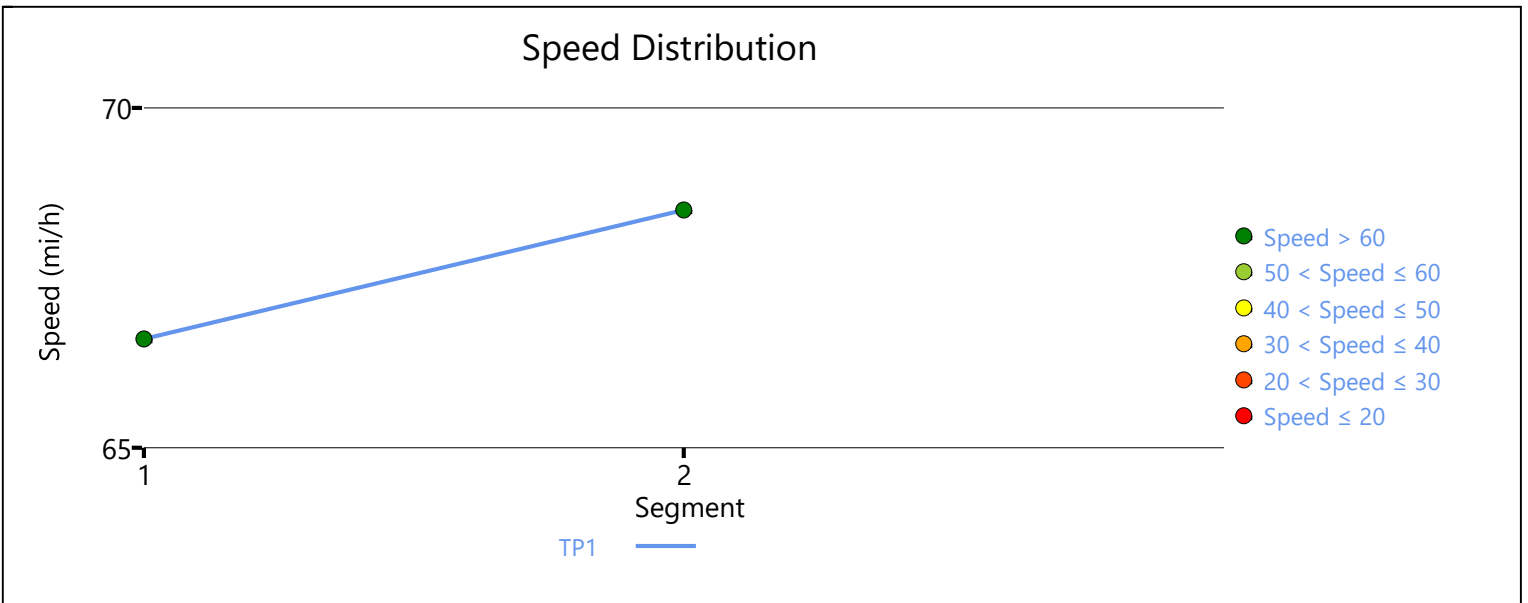
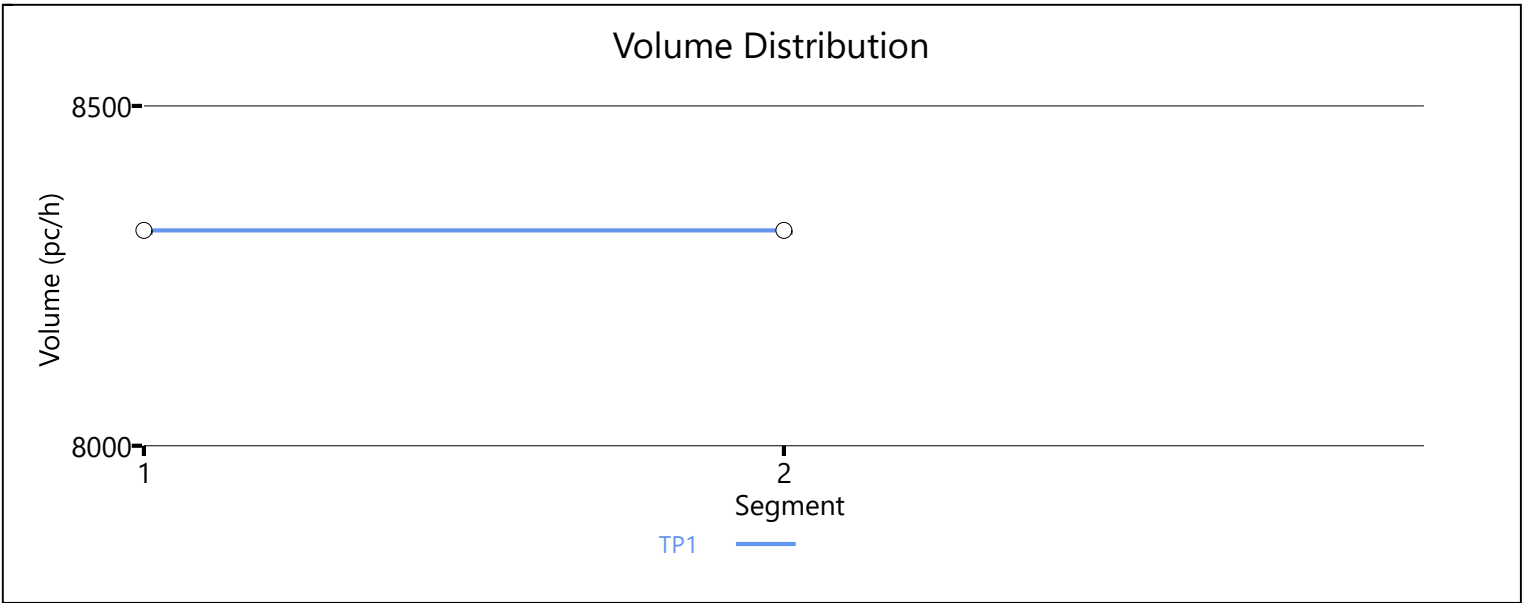
T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	67.4	22.8	21.4	1.20	C

Facility Overall Results

Space Mean Speed, mi/h	67.4	Density, veh/mi/ln	21.4
Average Travel Time, min	1.20	Density, pc/mi/ln	22.8

Messages

Comments



HCS7 Basic Freeway Report

Project Information

Analyst	KM	Date	6/29/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	AM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange at NB Polaris-Gemini off Ramp - No Build (Constraint)	Unit	United States Customary

Geometric Data

Number of Lanes, ln	3	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	2.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	54.2
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	5410	Heavy Vehicle Adjustment Factor (fhv)	0.980
Peak Hour Factor	0.94	Flow Rate (Vp), pc/h/ln	1958
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2242
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2242
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.87
Passenger Car Equivalent (ET)	2.000		

Speed and Density

Lane Width Adjustment (fLW)	0.0	Average Speed (S), mi/h	53.8
Right-Side Lateral Clearance Adj. (fRLC)	0.0	Density (D), pc/mi/ln	36.4
Total Ramp Density Adjustment	5.8	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFSadj), mi/h	54.2		

HCS7 Freeway Facilities Report

Project Information

Analyst	KM	Date	6/29/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	AM Peak hour
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build (Constraint)	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	8
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	11.08		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-71 NB btwn Polaris Pkwy/Gemini PI diverge and merge (4 lane)	6000	4
2	Basic	Basic	I-71 NB btwn Polaris Pkwy/Gemini PI diverge and merge (3 lane)	1200	3
3	Merge	Merge	I-71 NB merge at Gemini PI	1500	3
4	Basic	Basic	I-71 NB btwn Gemini PI and Sunbury Pkwy/US36/SR37	32500	3
5	Diverge	Diverge	I-71 NB diverge at Sunbury Pkwy/US36/SR37	4000	3
6	Basic	Basic	I-71 NB btwn Sunbury Pkwy/US36/SR37 diverge and merge	6500	3
7	Merge	Merge	I-71 NB merge at US36/SR37	1500	3
8	Basic	Basic	I-71 NB N of US36/SR37	5280	3

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.935	2162	9548	0.23	68.7	7.9	A

Segment 2: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.935	2162	7161	0.30	68.7	10.5	A

Segment 3: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.935	0.962	2483	321	7200	2200	0.34	0.15	65.9	64.5	12.6	10.1	B

Segment 4: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.935		2492		7200		0.35		73.7		11.3		B

Segment 5: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.962	2516	874	7200	4400	0.35	0.20	71.6	66.8	11.7	4.6	A

Segment 6: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.926		1608		7200		0.22		73.7		7.3		A

Segment 7: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.917	0.877	2437	813	7200	2200	0.34	0.37	68.6	66.7	11.8	13.8	B

Segment 8: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.917		2401		7200		0.33		73.7		10.9		A

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	72.6	10.4	9.8	9.20	A

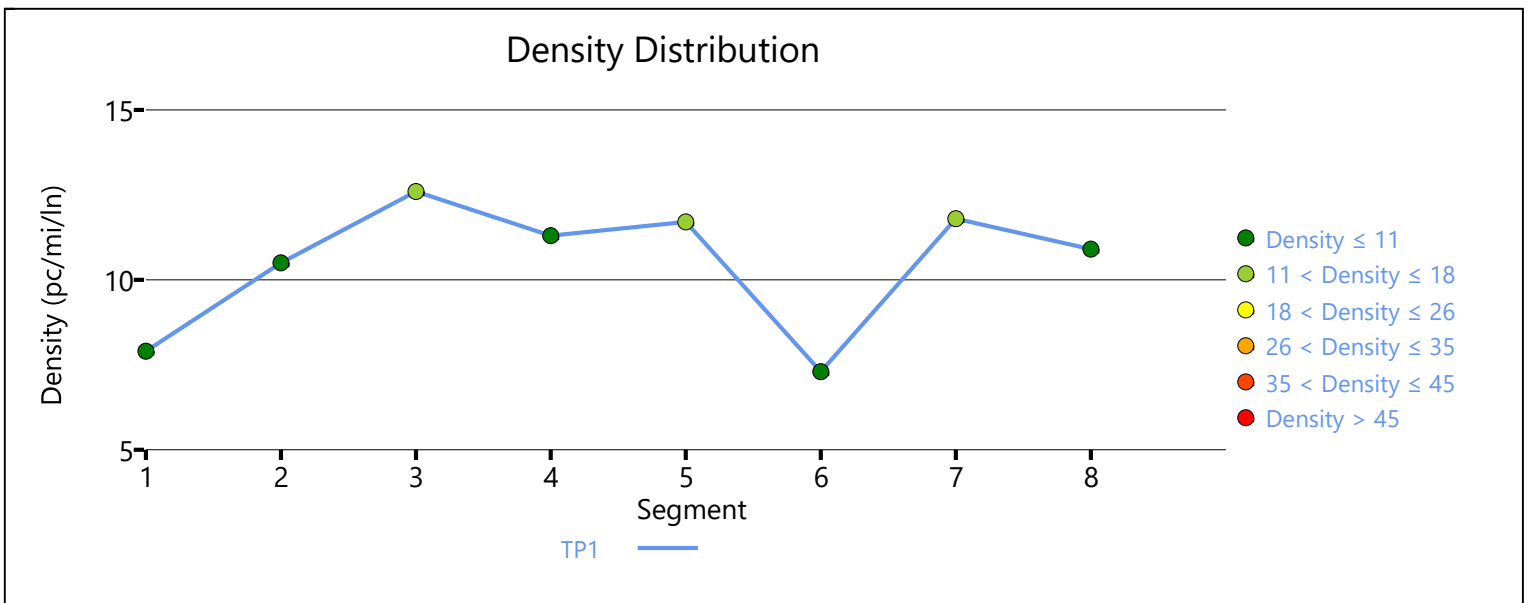
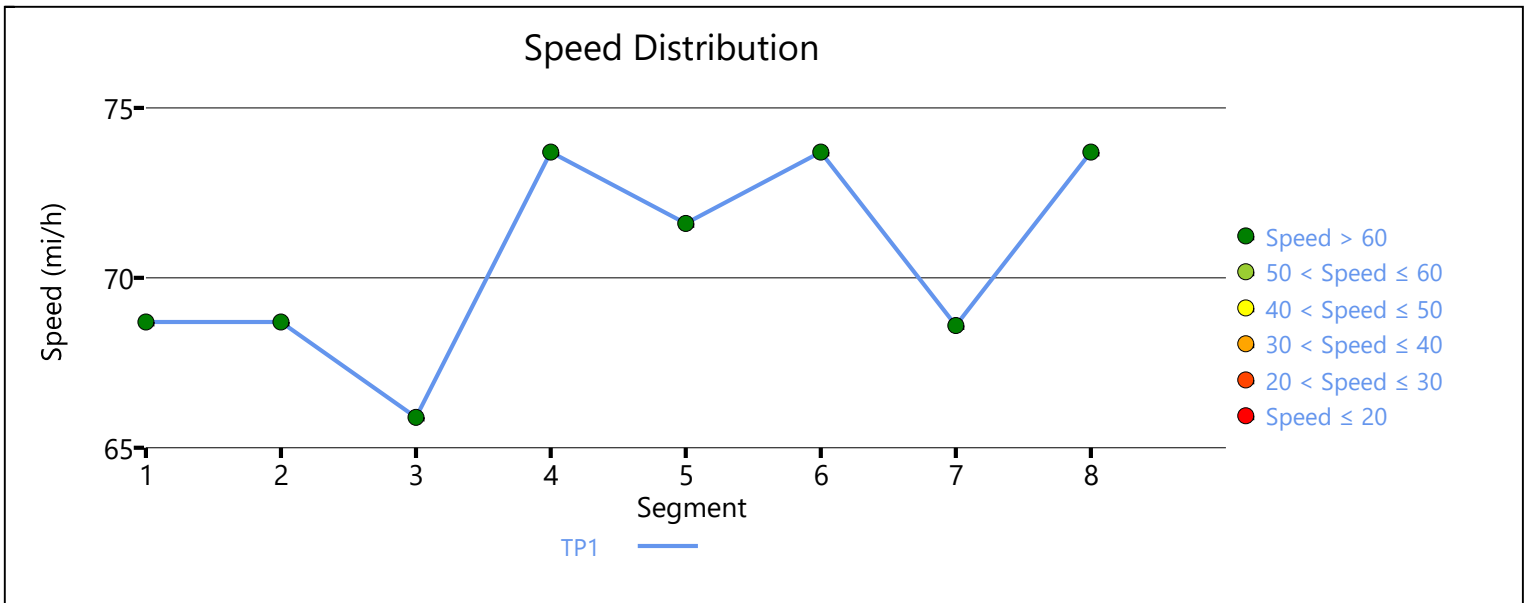
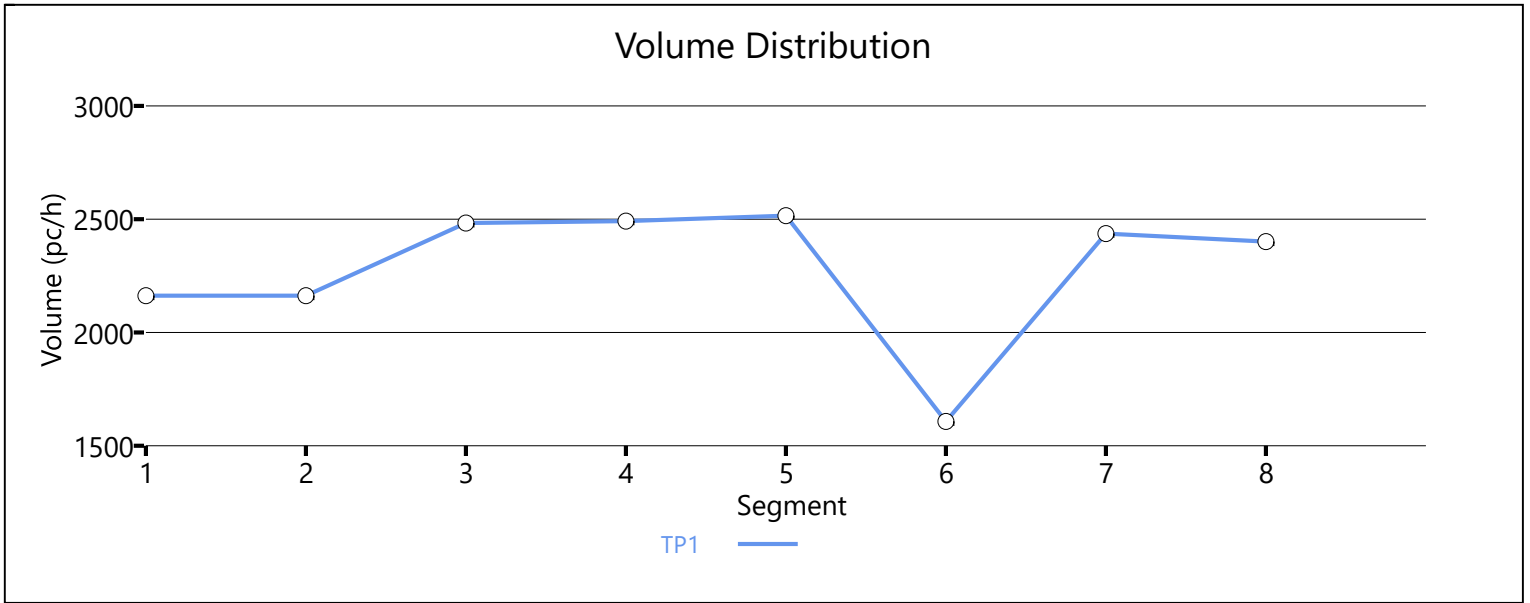
Facility Overall Results

Space Mean Speed, mi/h	72.6	Density, veh/mi/ln	9.8
Average Travel Time, min	9.20	Density, pc/mi/ln	10.4

Messages

Comments

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HCS7 Freeway Facilities Report

Project Information

Analyst	KM	Date	6/29/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	AM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build (Constraint)	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	3
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.04		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Diverge	Diverge	I-71 NB CD diverge at Polaris Pkwy	1500	3
2	Basic	Basic	I-71 NB CD btwn Polaris Pkwy diverge and merge	2500	2
3	Merge	Basic	I-71 NB CD merge at Polaris Pkwy	1500	3

Facility Segment Data

Segment 1: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.980	0.980	5873	3007	6600	4200	0.89	0.72	52.9	49.8	37.0	41.2	E

Segment 2: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	2866	4484	0.64	54.1	26.4	D

Segment 3: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.980	0.952	2978	112	6900	2100	0.43	0.05	59.8	-	16.5	-	B

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	54.7	26.6	26.1	1.10	D

Facility Overall Results

Space Mean Speed, mi/h	54.7	Density, veh/mi/ln	26.1
Average Travel Time, min	1.10	Density, pc/mi/ln	26.6

Messages

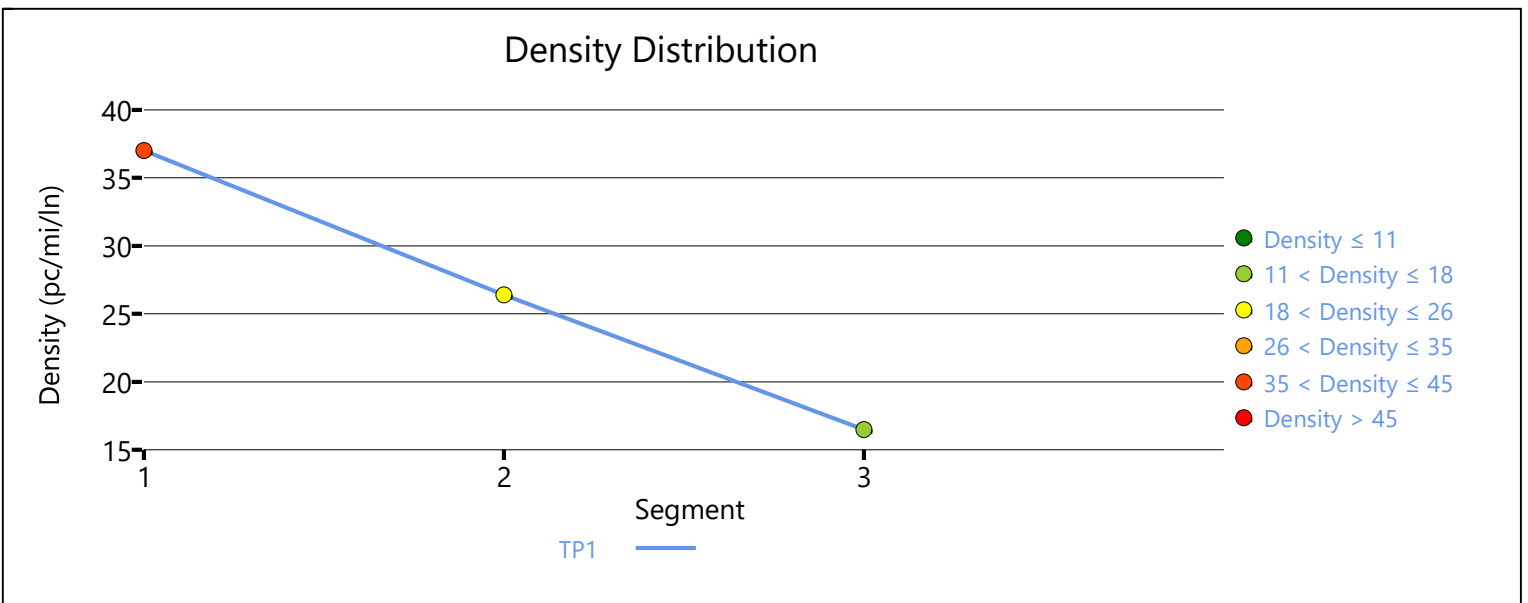
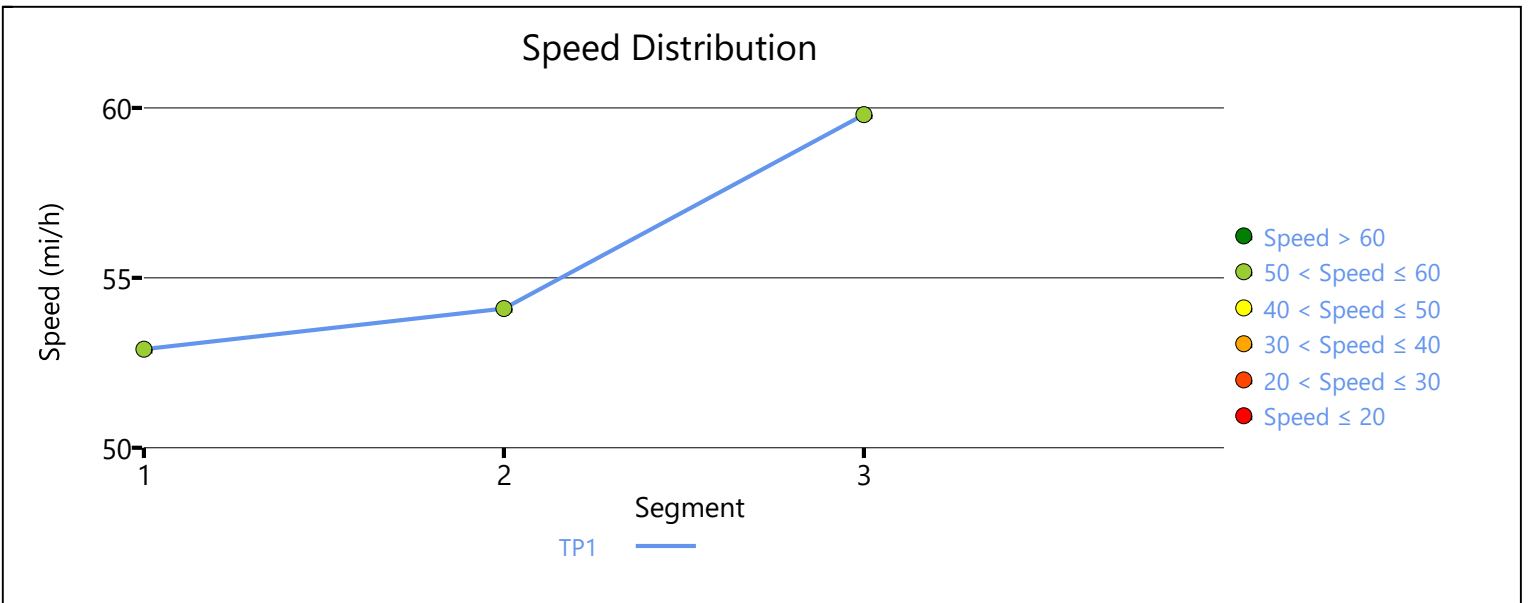
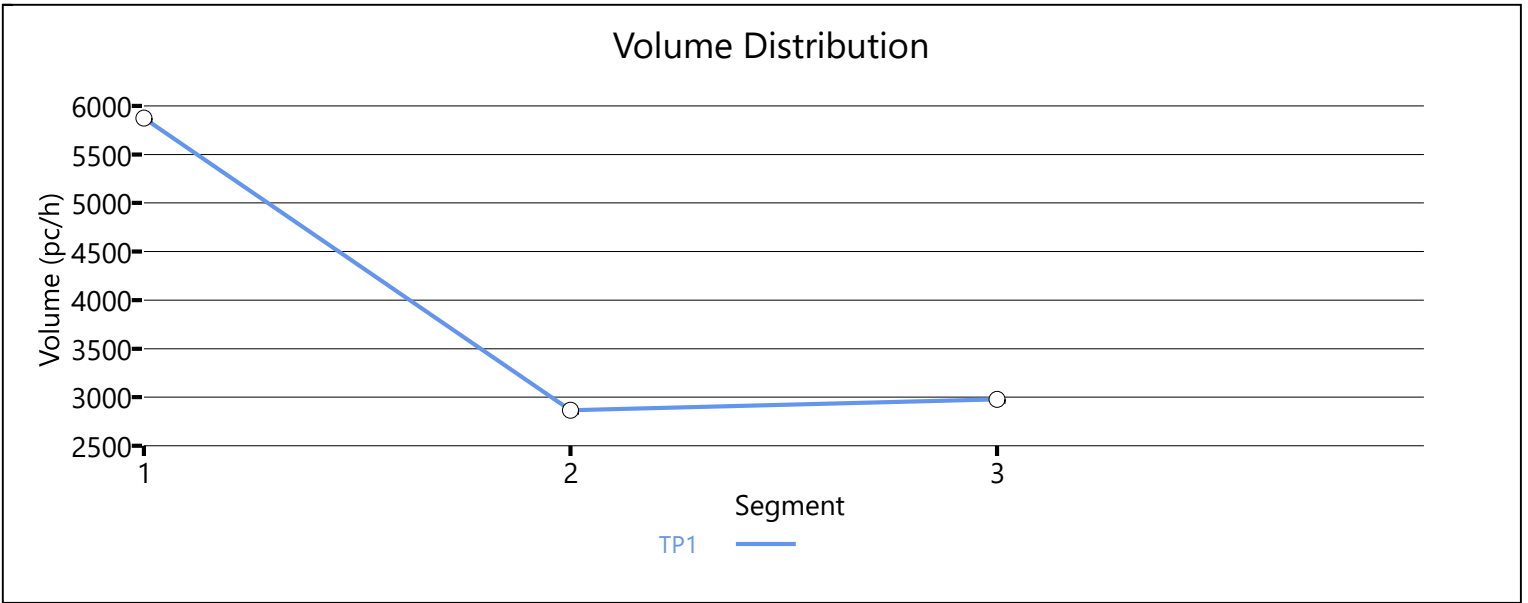
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Comments



HCS7 Freeway Facilities Report

Project Information

Analyst	KM	Date	6/29/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	AM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build (Constraint)	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	3
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.57		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Diverge	Diverge	I-71 NB CD diverge at Sunbury Pkwy	1500	2
2	Basic	Basic	I-71 NB CD bwtm Sunbury diverge and merge	5280	2
3	Merge	Merge	I-71 NB CD merge at Sunbury Pkwy	1500	2

Facility Segment Data

Segment 1: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.952	0.962	883	420	4400	2100	0.20	0.20	54.0	54.0	8.2	0.0	A

Segment 2: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.952	458	4484	0.10	54.2	4.2	A

Segment 3: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.952	0.962	569	111	4400	2100	0.13	0.05	55.4	55.4	5.1	4.9	A

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	54.4	5.1	4.9	1.70	A

Facility Overall Results

Space Mean Speed, mi/h	54.4	Density, veh/mi/ln	4.9
Average Travel Time, min	1.70	Density, pc/mi/ln	5.1

Messages

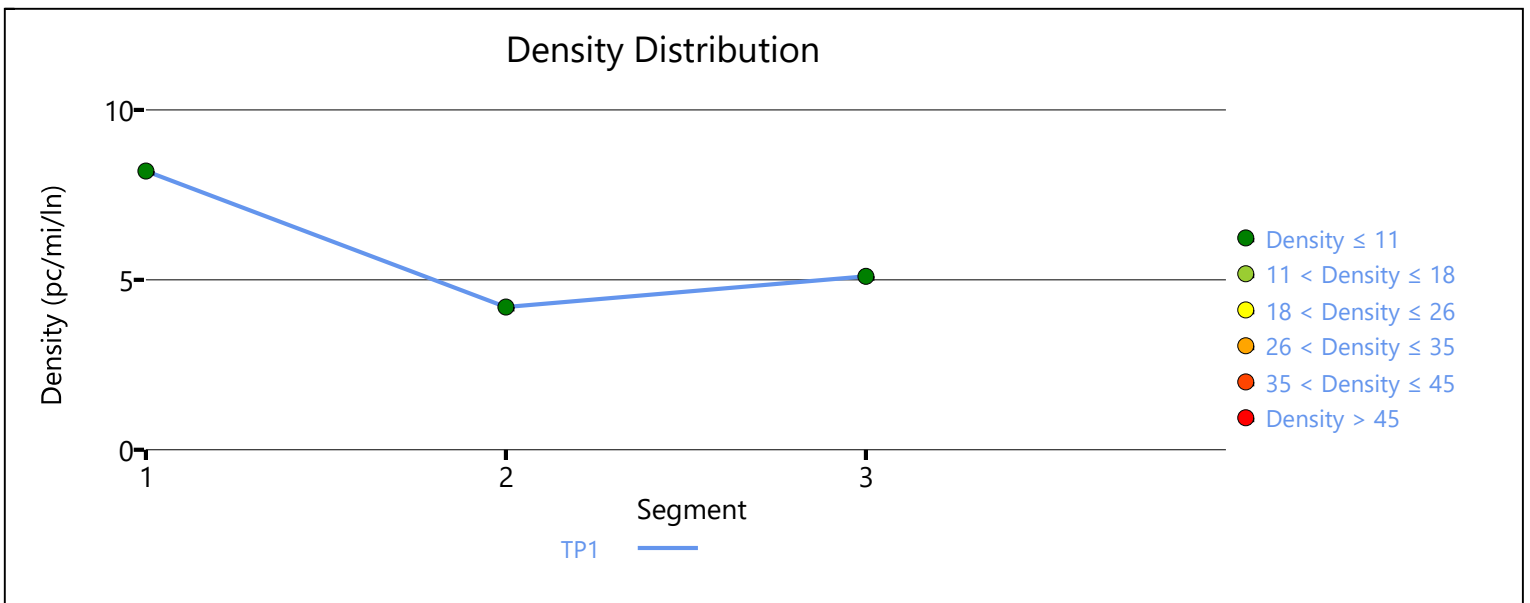
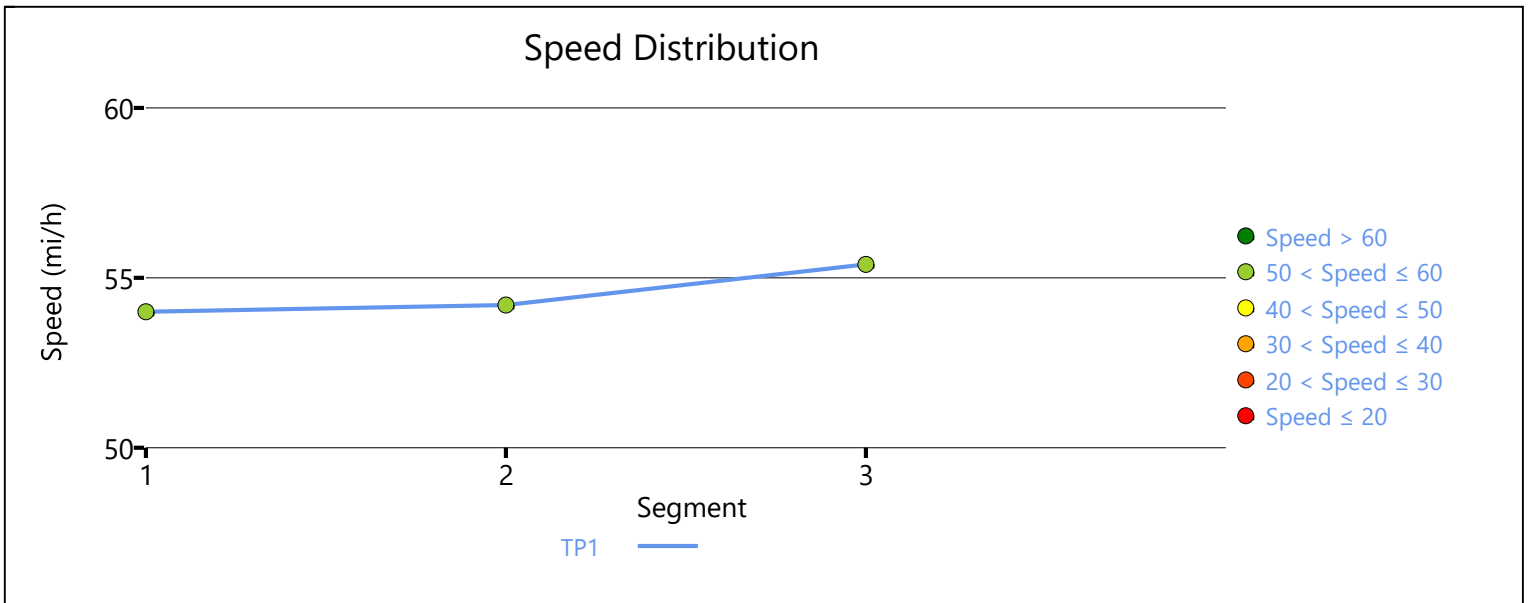
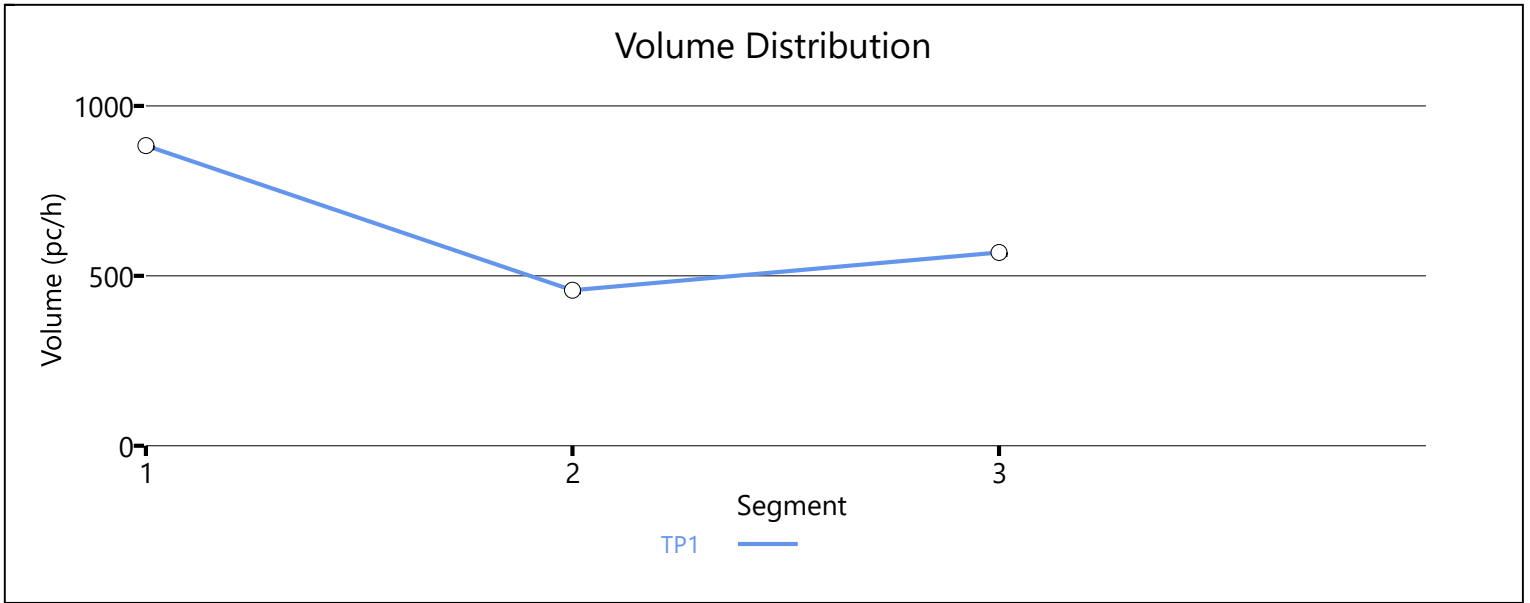
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Comments



HCS7 Freeway Facilities Report

Project Information

Analyst	km	Date	6/29/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	PM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build (Constraint)	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	2
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.38		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-71 NB btwn I-270 & Polaris (5-lane)	4300	5
2	Basic	Basic	I-71 NB btwn I-270 & Polaris (6-lane)	3000	6

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.935	11321	11935	0.95	56.3	40.2	E

Segment 2: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.935	11321	14322	0.79	63.8	29.6	D

Facility Time Period Results

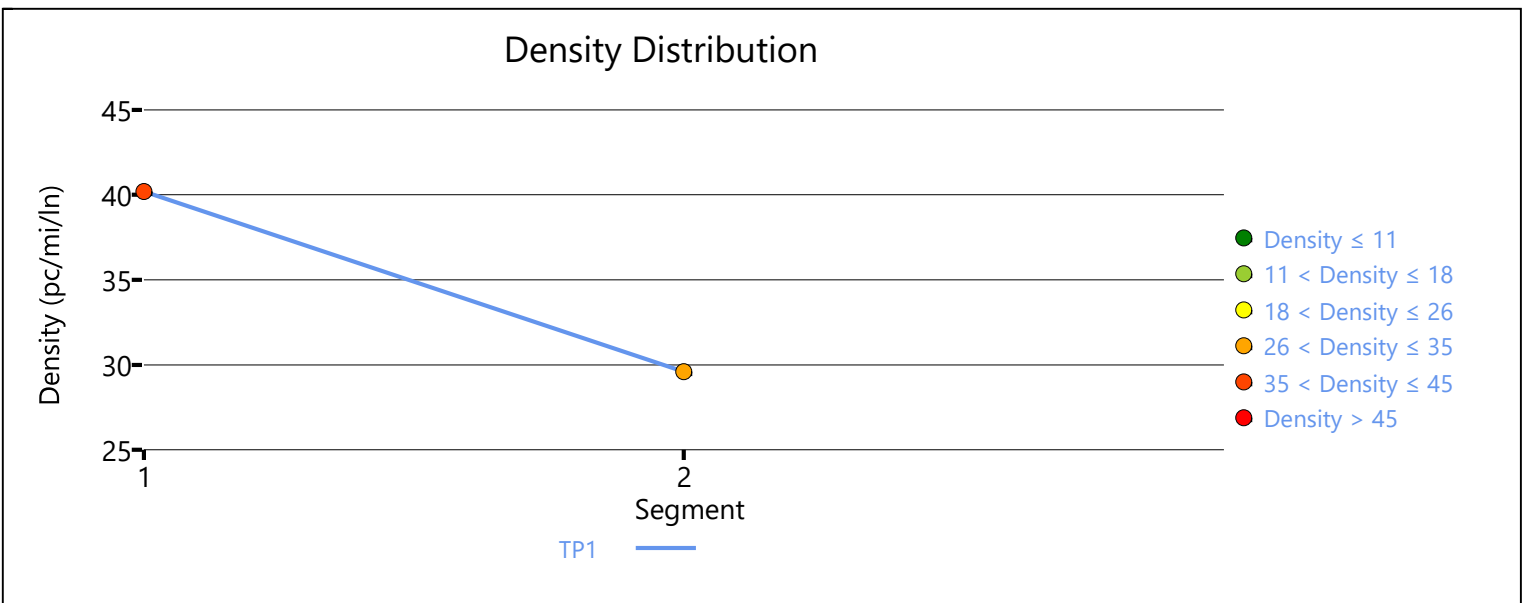
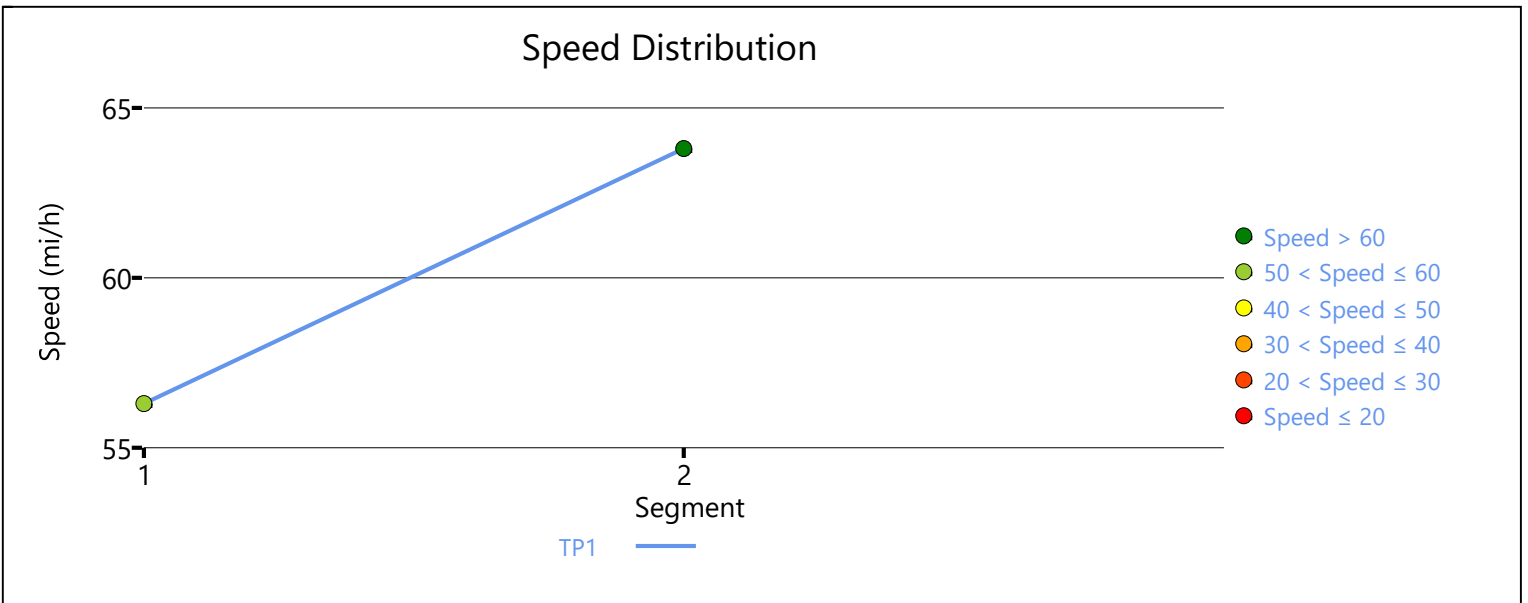
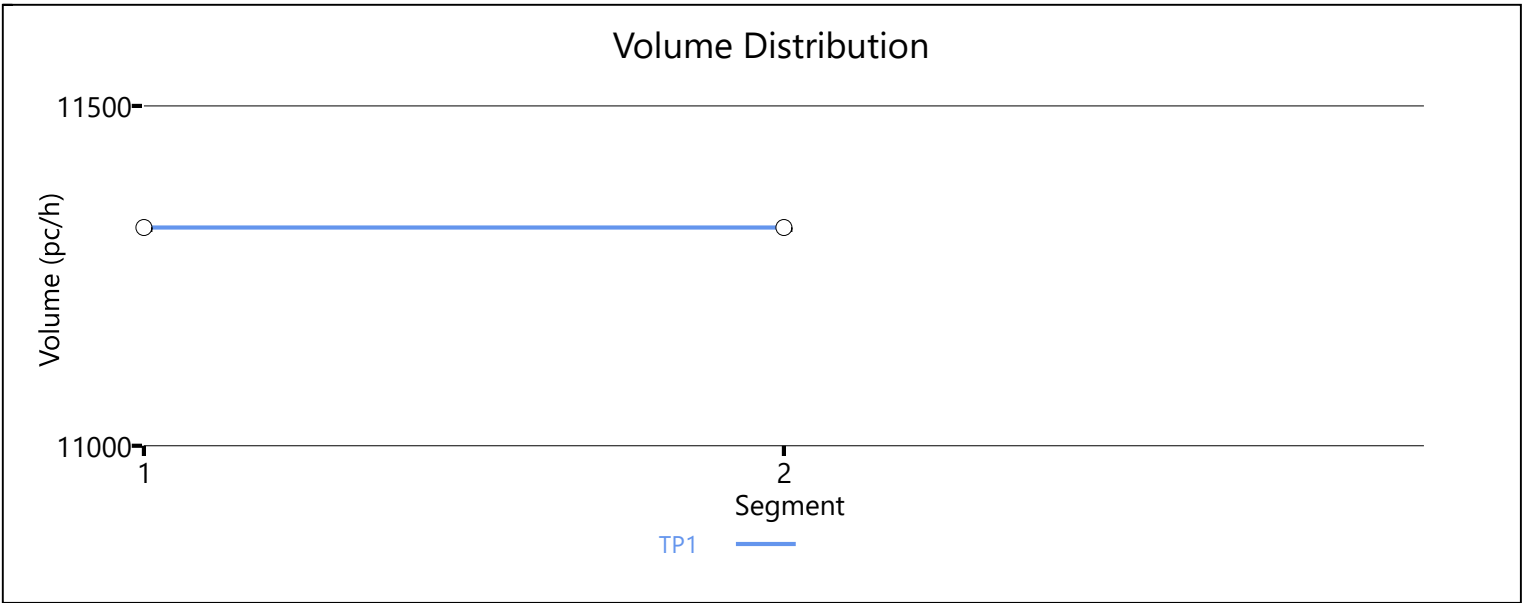
T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	59.2	35.4	33.1	1.40	E

Facility Overall Results

Space Mean Speed, mi/h	59.2	Density, veh/mi/ln	33.1
Average Travel Time, min	1.40	Density, pc/mi/ln	35.4

Messages

Comments



HCS7 Basic Freeway Report

Project Information

Analyst	KM	Date	5/7/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	PM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange at NB Polaris-Gemini off Ramp - No Build (Constraint)	Unit	United States Customary

Geometric Data

Number of Lanes, ln	3	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	2.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	54.2
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	3960	Heavy Vehicle Adjustment Factor (fhv)	0.980
Peak Hour Factor	0.94	Flow Rate (Vp), pc/h/ln	1433
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2242
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2242
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.64
Passenger Car Equivalent (ET)	2.000		

Speed and Density

Lane Width Adjustment (fLW)	0.0	Average Speed (S), mi/h	54.2
Right-Side Lateral Clearance Adj. (fRLC)	0.0	Density (D), pc/mi/ln	26.4
Total Ramp Density Adjustment	5.8	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	54.2		

HCS7 Freeway Facilities Report

Project Information

Analyst	KM	Date	6/29/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	PM Peak hour
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build (Constraint)	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	8
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	11.08		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-71 NB btwn Polaris Pkwy/Gemini PI diverge and merge (4 lane)	6000	4
2	Basic	Basic	I-71 NB btwn Polaris Pkwy/Gemini PI diverge and merge (3 lane)	1200	3
3	Merge	Merge	I-71 NB merge at Gemini PI	1500	3
4	Basic	Basic	I-71 NB btwn Gemini PI and Sunbury Pkwy/US36/SR37	32500	3
5	Diverge	Diverge	I-71 NB diverge at Sunbury Pkwy/US36/SR37	4000	3
6	Basic	Basic	I-71 NB btwn Sunbury Pkwy/US36/SR37 diverge and merge	6500	3
7	Merge	Merge	I-71 NB merge at US36/SR37	1500	3
8	Basic	Basic	I-71 NB N of US36/SR37	5280	3

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.935	5927	9548	0.71	30.7	48.2	F

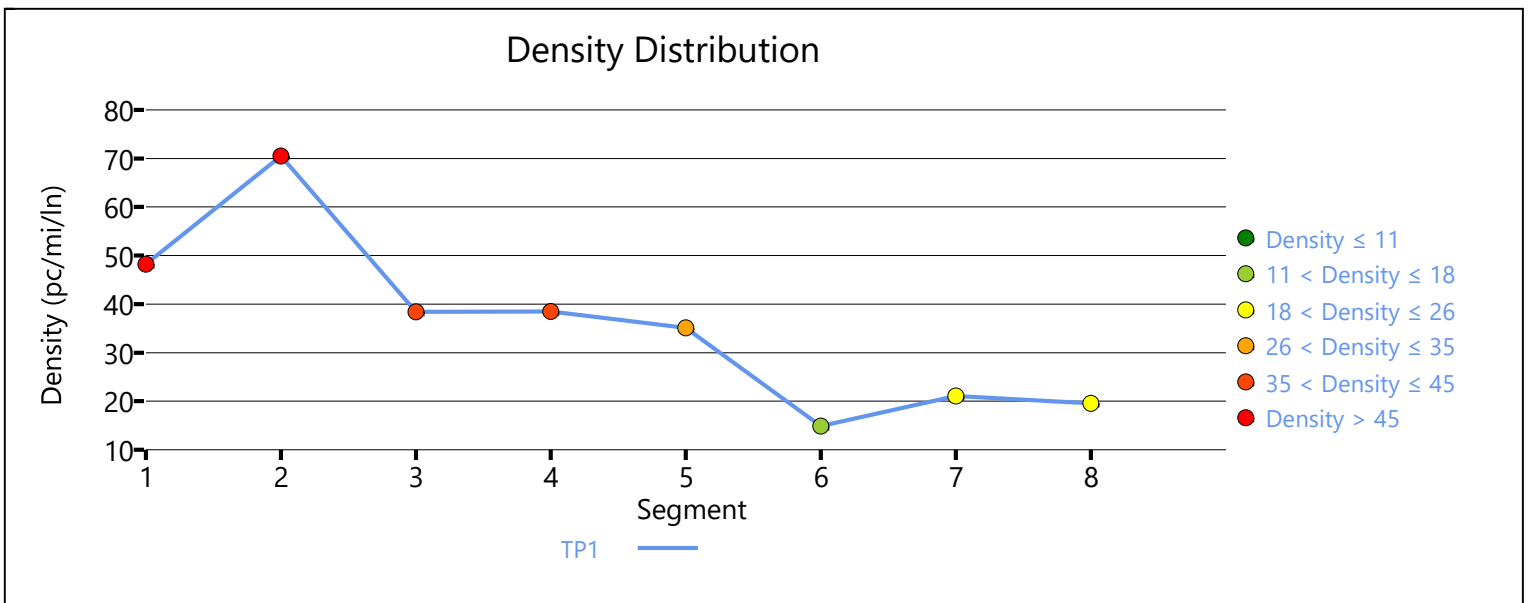
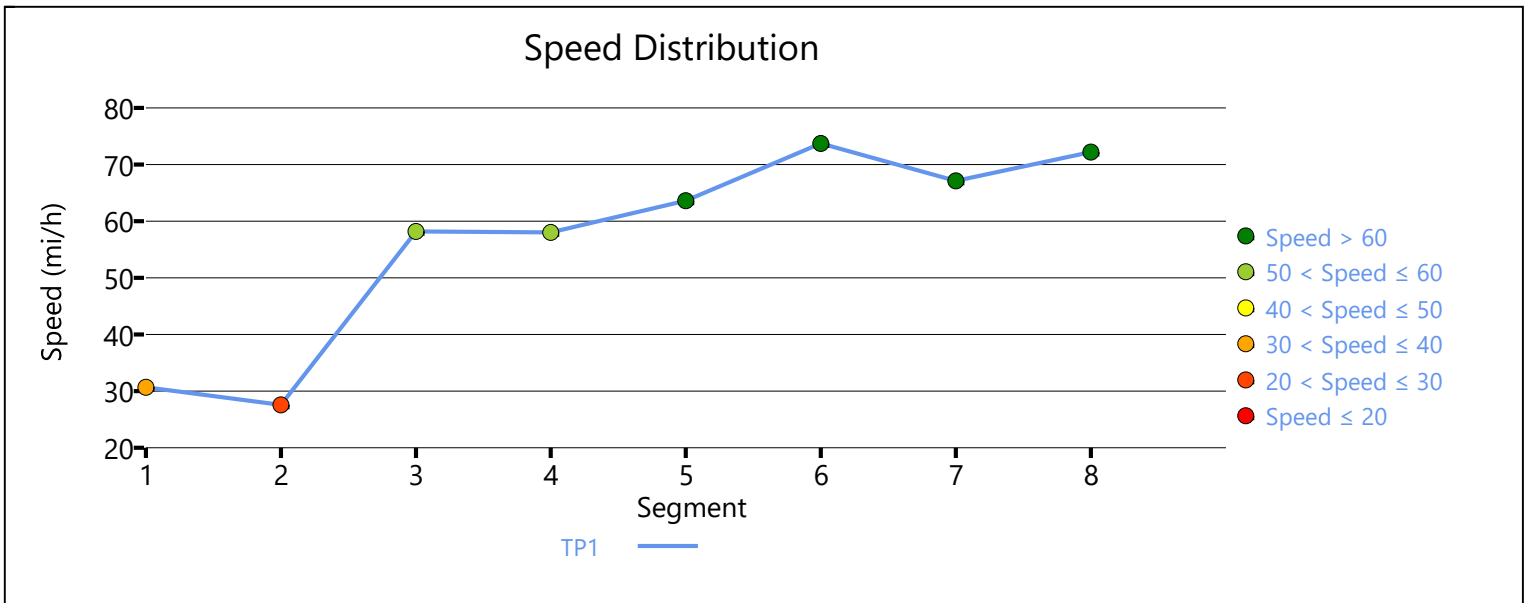
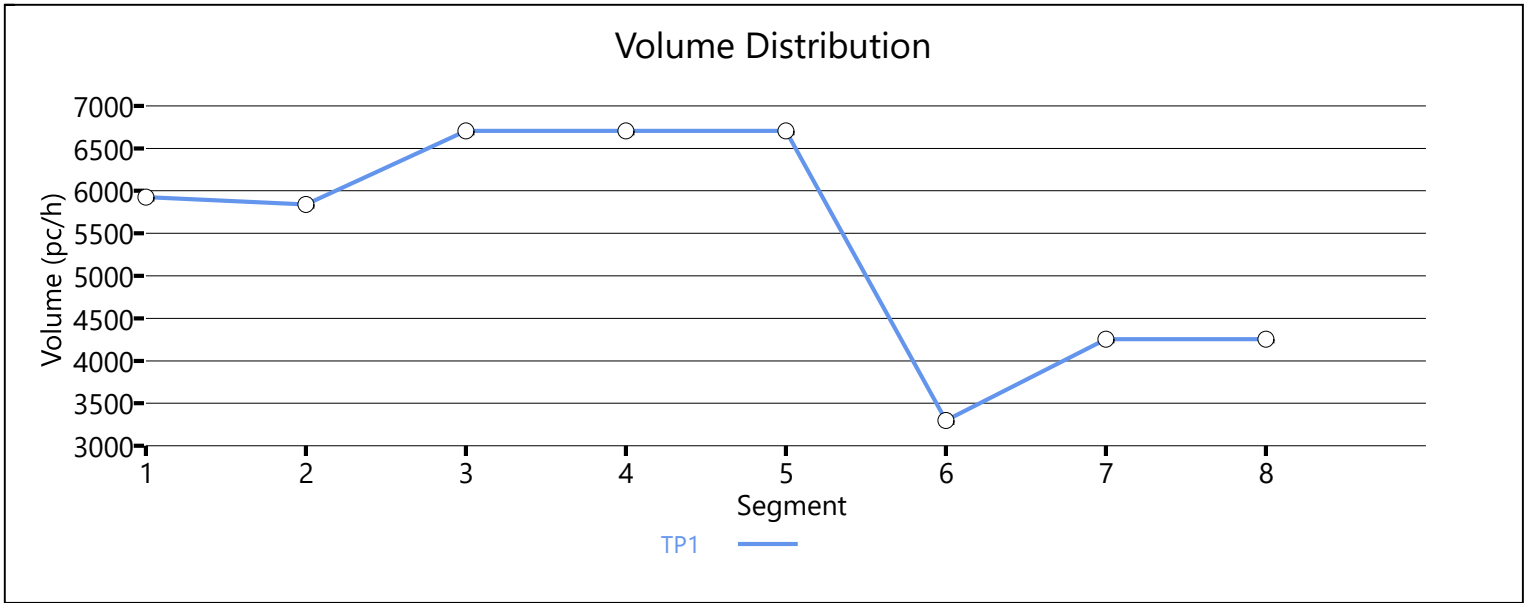
Segment 2: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.935	5841	7161	0.95	27.6	70.5	F

Segment 3: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.935	0.962	6704	863	7200	2200	1.07	0.39	58.2	55.7	38.4	31.7	F

Segment 4: Basic																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
1	0.94		0.935		6704		7200		1.07		58.0		38.5		F	
Segment 5: Diverge																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp		
1	0.94	0.94	0.926	0.962	6704	3406	7200	4400	1.08	0.77	63.6	59.3	35.1	32.8	F	
Segment 6: Basic																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
1	0.94		0.926		3298		7200		0.59		73.7		14.9		B	
Segment 7: Merge																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp		
1	0.94	0.94	0.917	0.877	4256	958	7200	2200	0.73	0.44	67.1	65.1	21.1	22.7	C	
Segment 8: Basic																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
1	0.94		0.917		4256		7200		0.72		72.2		19.6		C	
Facility Time Period Results																
T	Speed, mi/h				Density, pc/mi/ln				Density, veh/mi/ln				Travel Time, min		LOS	
1	53.8				35.6				33.2				12.40		F	
Facility Overall Results																
Space Mean Speed, mi/h					53.8					Density, veh/mi/ln					33.2	
Average Travel Time, min					12.40					Density, pc/mi/ln					35.6	
Messages																
WARNING 1					Oversaturated conditions currently exist in boundary time period 1. Results may not be reliable. Consider expanding analysis in time and/or space to resolve this warning.											
Comments																



HCS7 Freeway Facilities Report

Project Information

Analyst	KM	Date	6/29/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	PM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build (Constraint)	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	3
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.04		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Diverge	Diverge	I-71 NB CD diverge at Polaris Pkwy	1500	3
2	Basic	Basic	I-71 NB CD btwn Polaris Pkwy diverge and merge	2500	2
3	Merge	Basic	I-71 NB CD merge at Polaris Pkwy	1500	3

Facility Segment Data

Segment 1: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.980	0.980	4299	2442	6600	4200	0.65	0.58	53.6	50.7	26.7	32.4	D

Segment 2: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	1856	4484	0.41	54.2	17.1	B

Segment 3: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.980	0.952	2158	302	6900	2100	0.31	0.14	59.8	-	12.0	-	B

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	55.1	18.6	18.2	1.10	C

Facility Overall Results

Space Mean Speed, mi/h	55.1	Density, veh/mi/ln	18.2
Average Travel Time, min	1.10	Density, pc/mi/ln	18.6

Messages

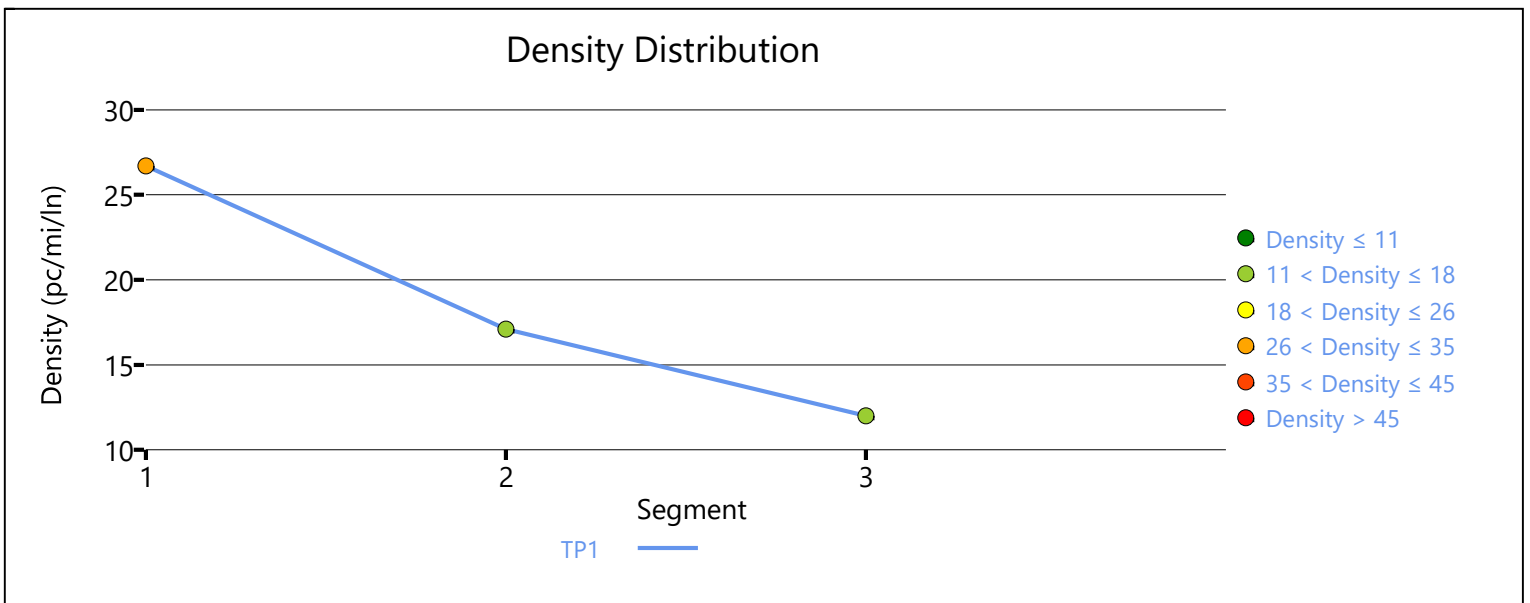
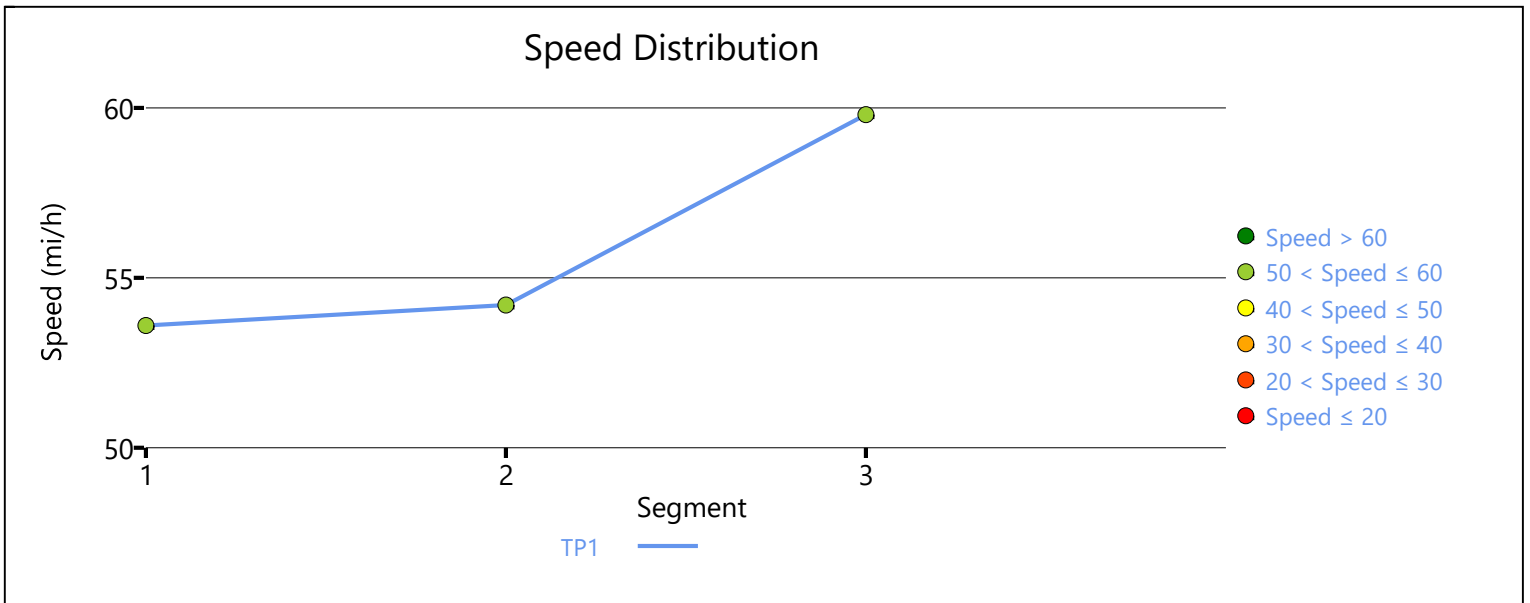
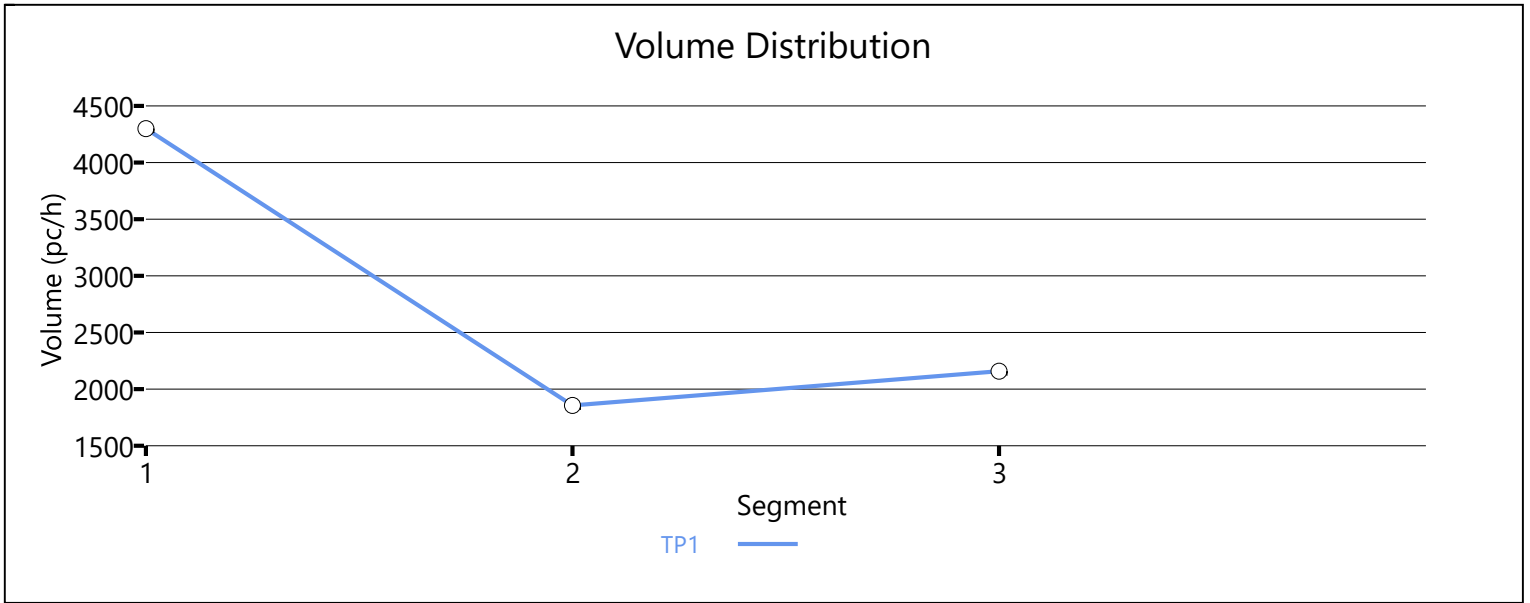
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Comments



HCS7 Freeway Facilities Report

Project Information

Analyst	KM	Date	6/29/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	PM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build (Constraint)	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	3
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.57		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Diverge	Diverge	I-71 NB CD diverge at Sunbury Pkwy	1500	2
2	Basic	Basic	I-71 NB CD bwtm Sunbury diverge and merge	5280	2
3	Merge	Merge	I-71 NB CD merge at Sunbury Pkwy	1500	2

Facility Segment Data

Segment 1: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.952	0.962	3442	1968	4400	2100	0.78	0.94	51.4	51.4	33.5	20.4	C

Segment 2: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.952	1453	4484	0.32	54.2	13.4	B

Segment 3: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.952	0.962	1652	199	4400	2100	0.38	0.09	55.2	55.2	15.0	13.3	B

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	53.4	17.3	16.5	1.80	B

Facility Overall Results

Space Mean Speed, mi/h	53.4	Density, veh/mi/ln	16.5
Average Travel Time, min	1.80	Density, pc/mi/ln	17.3

Messages

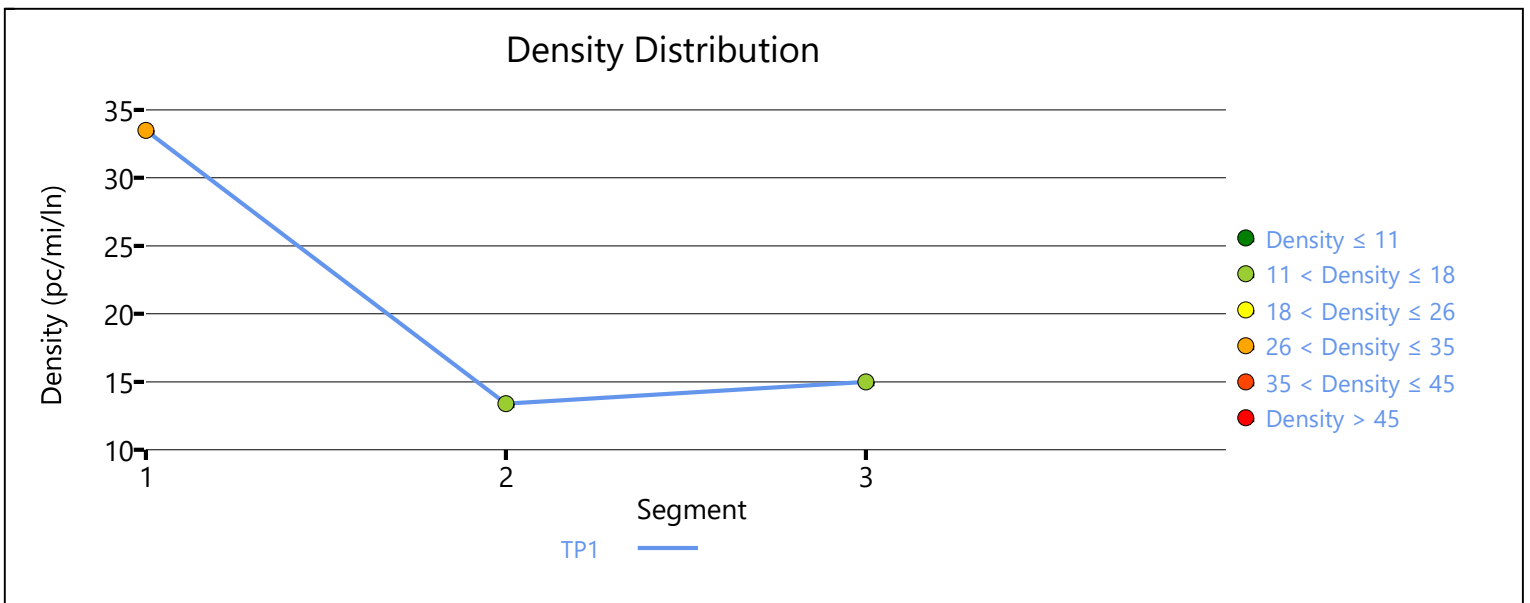
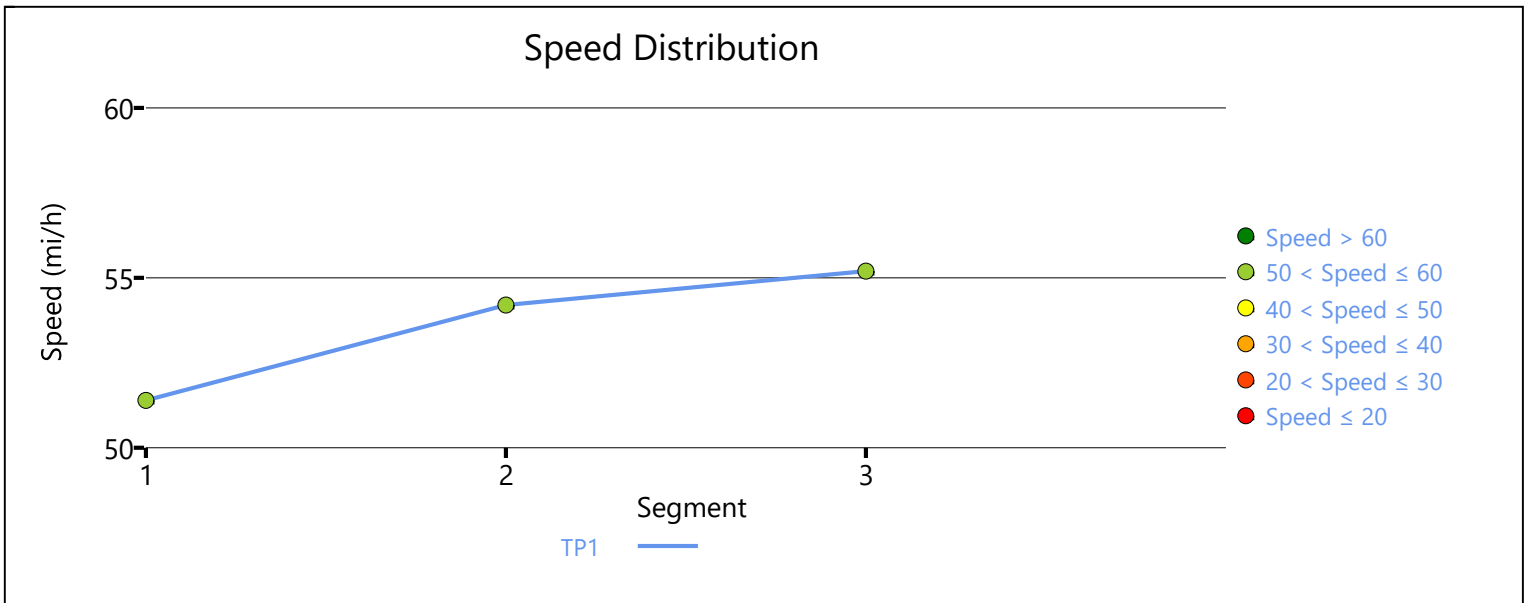
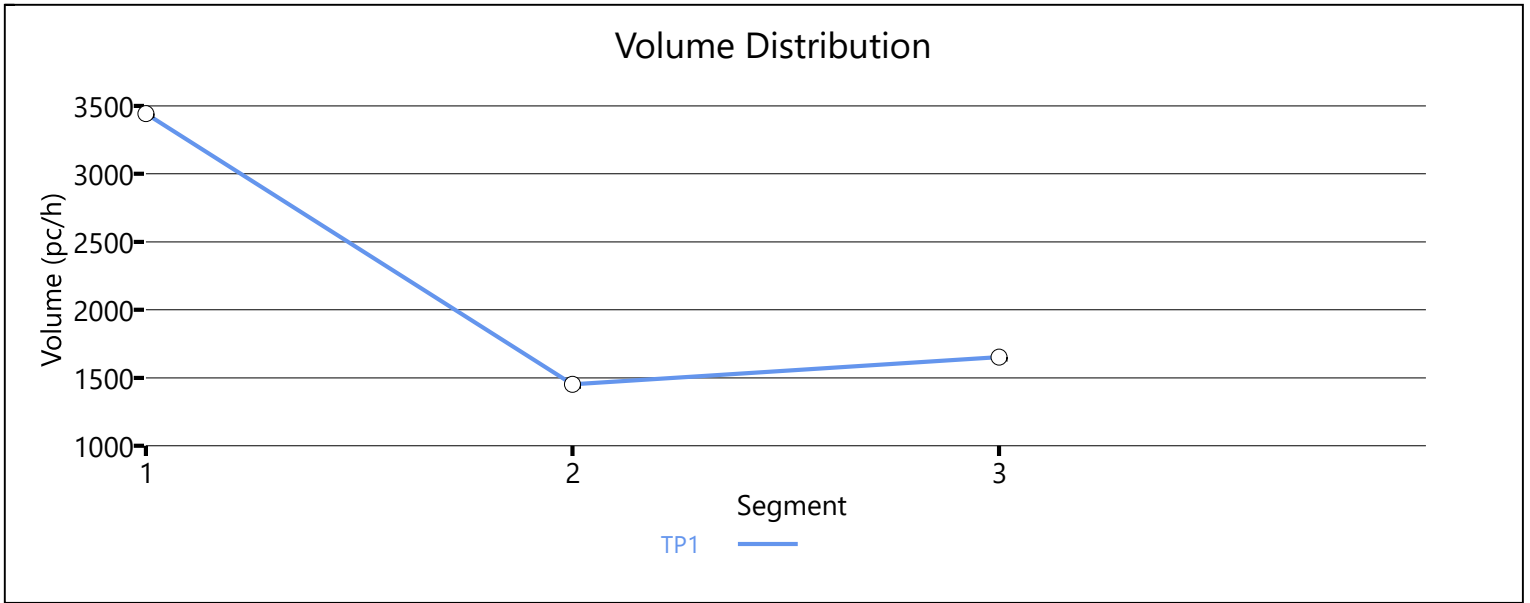
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Comments



HCS7 Freeway Facilities Report

Project Information

Analyst	GM	Date	5/21/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	AM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - Build Alt. 1-3	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	2
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.38		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-71 NB btwn I-270 & Polaris (5-lane)	4300	5
2	Basic	Basic	I-71 NB btwn I-270 & Polaris (6-lane)	3000	6

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.935	8317	11935	0.70	66.6	25.0	C

Segment 2: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.935	8317	14322	0.58	68.5	20.2	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	67.4	22.8	21.4	1.20	C

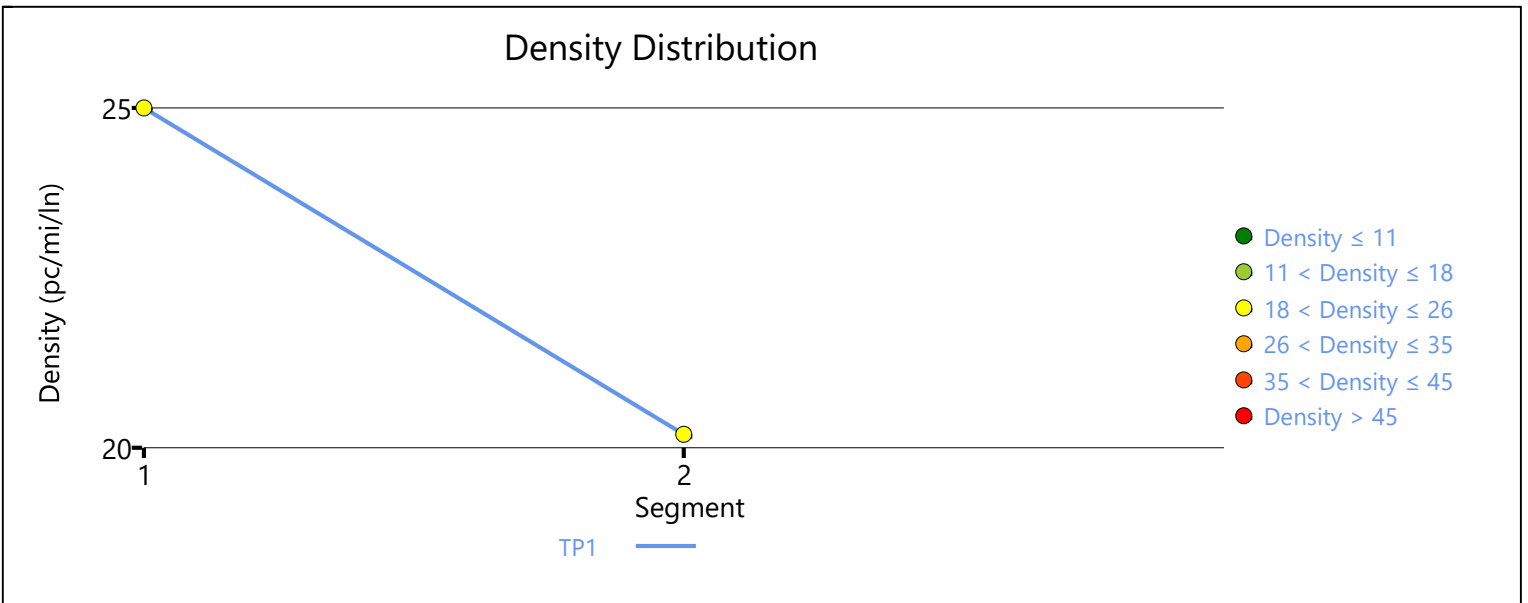
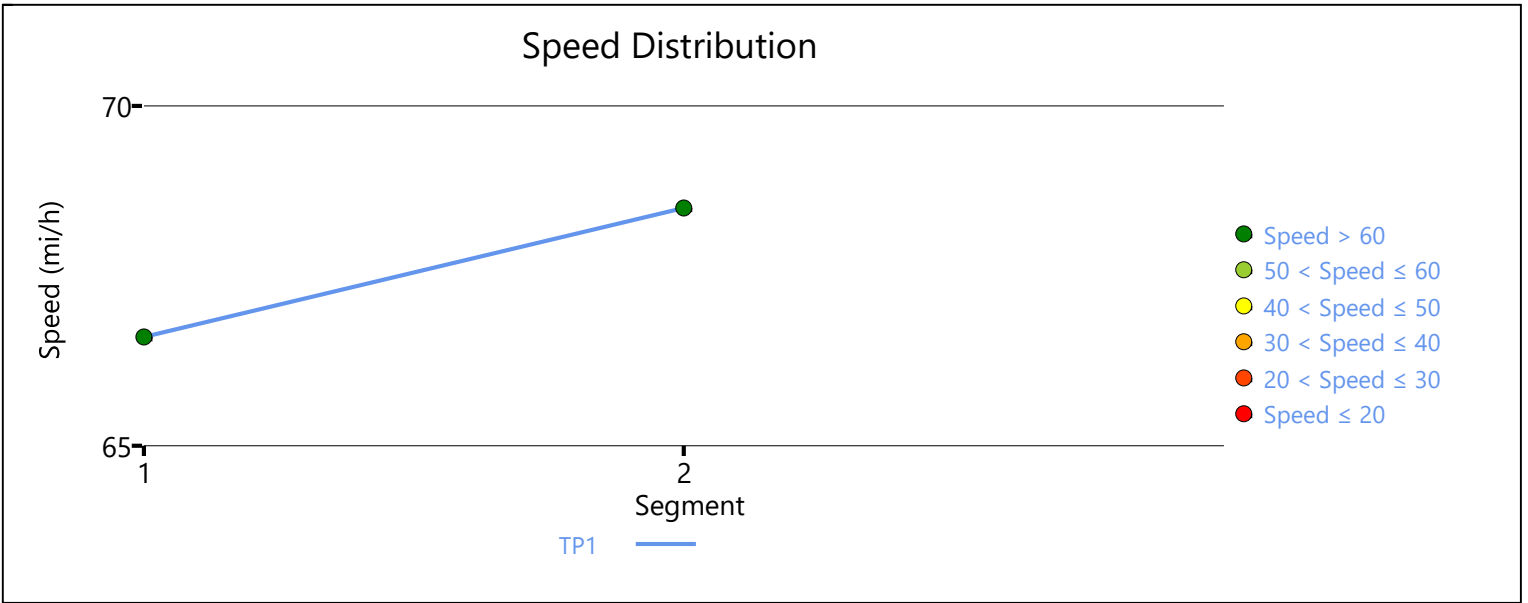
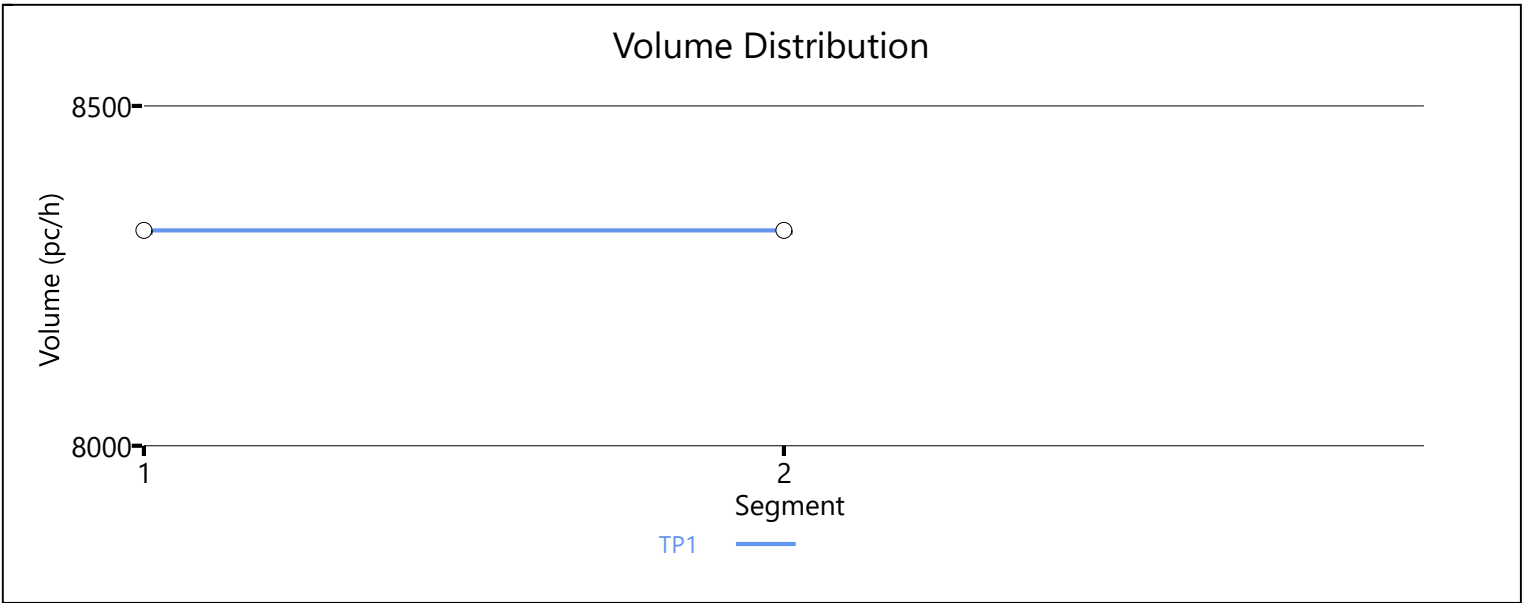
Facility Overall Results

Space Mean Speed, mi/h	67.4	Density, veh/mi/ln	21.4
Average Travel Time, min	1.20	Density, pc/mi/ln	22.8

Messages

Comments

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HCS7 Basic Freeway Report

Project Information

Analyst	GM	Date	4/30/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	AM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange (NB Polaris-Gemini off Ramp) - Build Alt. 1-3	Unit	United States Customary

Geometric Data

Number of Lanes, ln	3	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	2.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	54.2
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	4810	Heavy Vehicle Adjustment Factor (fhv)	0.980
Peak Hour Factor	0.94	Flow Rate (Vp), pc/h/ln	1740
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2242
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2242
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.78
Passenger Car Equivalent (ET)	2.000		

Speed and Density

Lane Width Adjustment (fLW)	0.0	Average Speed (S), mi/h	54.2
Right-Side Lateral Clearance Adj. (fRLC)	0.0	Density (D), pc/mi/ln	32.1
Total Ramp Density Adjustment	5.8	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	54.2		

HCS7 Freeway Facilities Report

Project Information

Analyst	GM	Date	4/24/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	AM Peak hour
Project Description	DEL-71-3.55 Big Walnut Interchange - Build Alt. 1-3	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	12
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	11.09		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-71 NB btwn Polaris Pkwy/Gemini PI diverge and merge (4 lane)	7200	4
2	Merge	Merge	I-71 NB merge at Gemini PI	1500	4
3	Basic	Basic	I-71 NB btwn Gemini PI and Big Walnut Rd	6900	4
4	Diverge	Diverge	I-71 NB diverge at Big Walnut Rd	1500	4
5	Basic	Basic	I-71 NB btwn Big Walnut Rd diverge and merge	2650	4
6	Merge	Merge	I-71 NB merge at Big Walnut Rd	1500	4
7	Basic	Basic	I-71 NB btwn Big Walnut Rd and Sunbury Pkwy (4 lane)	3000	4
8	Basic	Basic	I-71 NB btwn Big Walnut Rd and Sunbury Pkwy (3 lane)	17000	3
9	Diverge	Diverge	I-71 NB divergence at Sunbury Pkwy/US36/SR37	4000	3
10	Basic	Basic	I-71 NB btwn Sunbury Pkwy/US36/SR37 diverge and merge	6500	3
11	Merge	Merge	I-71 NB merge at US36/SR37	1500	3
12	Basic	Basic	I-71 NB N of US36/SR37	5280	3

Facility Segment Data

Segment 1: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.935		2617		9528		0.27		68.2		9.6		A

Segment 2: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.935	0.971	3066	449	9600	2200	0.32	0.20	65.7	62.5	11.7	12.9	B

Segment 3: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.935		3083		9600		0.32		73.2		10.5		A
Segment 4: Diverge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.935	0.980	3083	836	9600	4400	0.32	0.19	74.5	67.0	10.3	3.0	A
Segment 5: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.935		2207		9600		0.23		73.2		7.5		A
Segment 6: Merge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.926	2620	391	9600	2200	0.27	0.18	70.9	67.6	9.2	9.1	A
Segment 7: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.926		2619		9600		0.27		73.1		8.9		A
Segment 8: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.926		2619		7200		0.36		73.2		11.9		B
Segment 9: Diverge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.962	2619	874	7200	4400	0.36	0.20	71.8	66.8	12.2	5.0	A
Segment 10: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.926		1712		7200		0.24		73.2		7.8		A
Segment 11: Merge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.917	0.877	2566	837	7200	2200	0.36	0.38	68.6	66.7	12.5	14.5	B
Segment 12: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.917		2529		7200		0.35		73.2		11.5		B

Facility Time Period Results

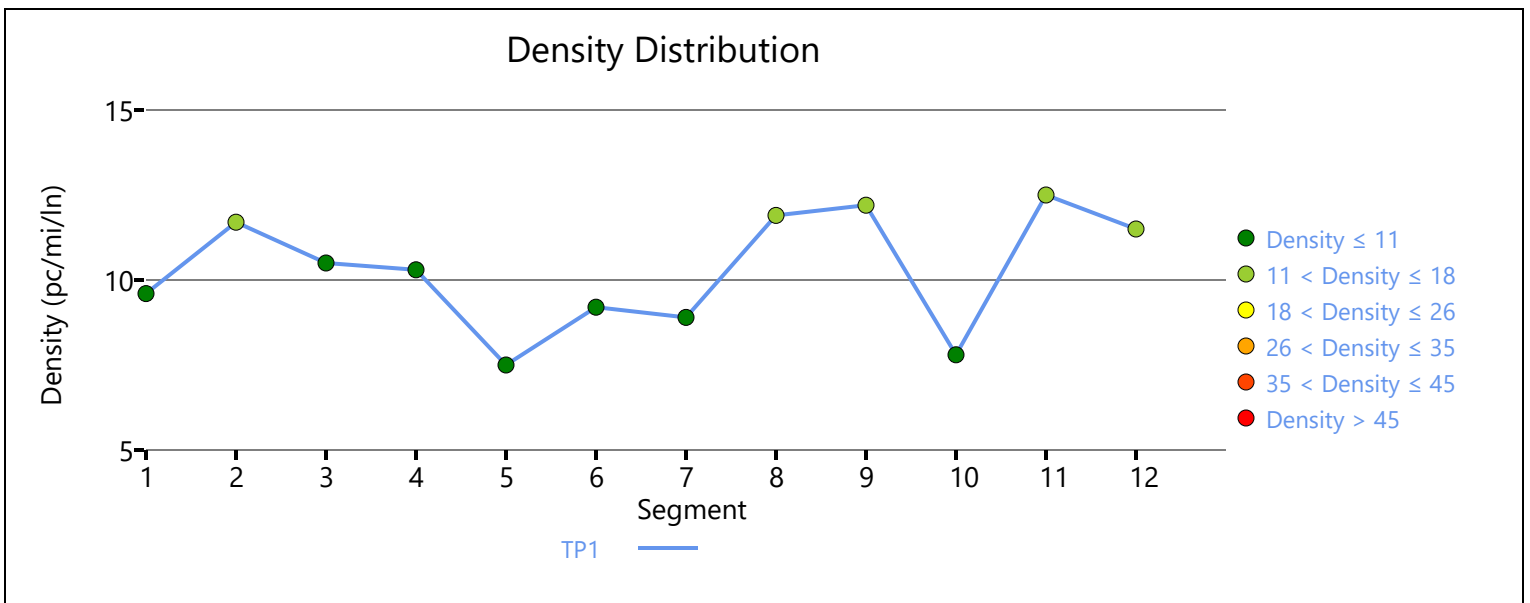
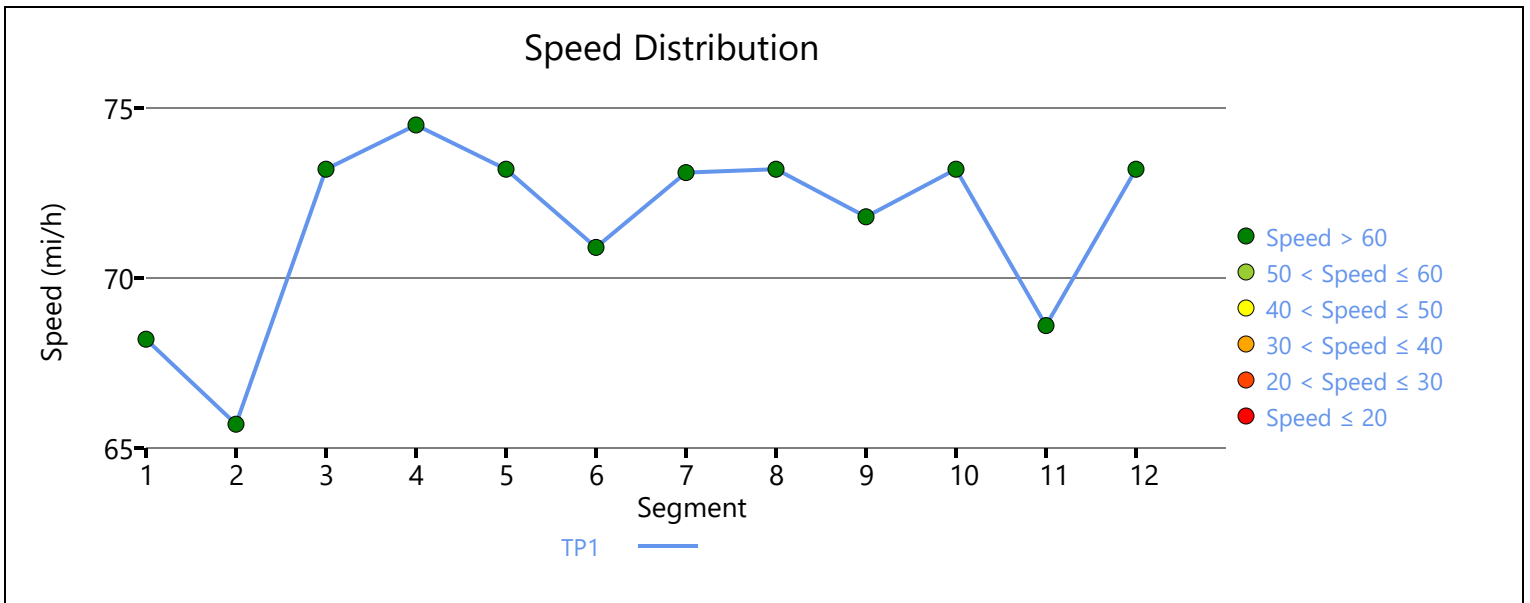
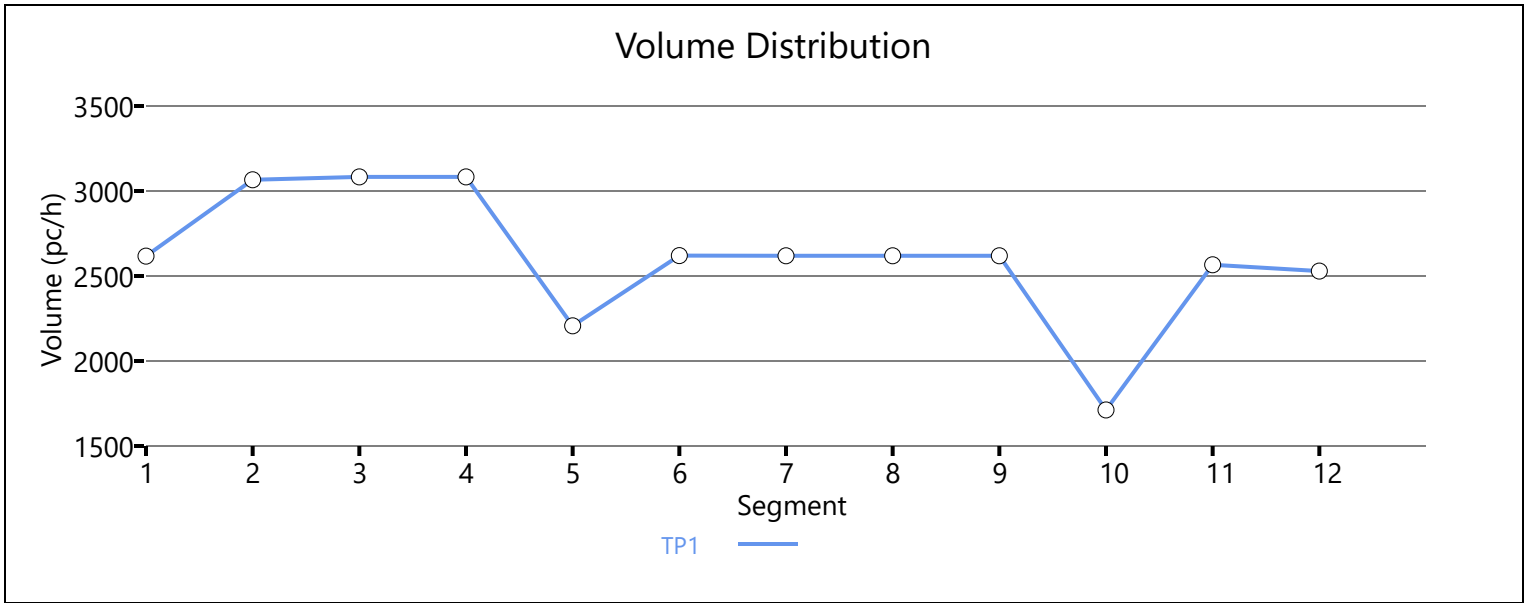
T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	72.0	10.4	9.7	9.20	A

Facility Overall Results

Space Mean Speed, mi/h	72.0	Density, veh/mi/ln	9.7
Average Travel Time, min	9.20	Density, pc/mi/ln	10.4

Messages**Comments**

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HCS7 Freeway Facilities Report

Project Information

Analyst	GM	Date	4/27/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	AM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - Build Alt. 1-3	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	3
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.57		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Diverge	Diverge	I-71 NB CD diverge at Sunbury Pkwy	1500	2
2	Basic	Basic	I-71 NB CD bwtm Sunbury diverge and merge	5280	2
3	Merge	Merge	I-71 NB CD merge at Sunbury Pkwy	1500	2

Facility Segment Data

Segment 1: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.962	0.962	874	409	4400	2100	0.20	0.19	54.0	54.0	8.1	0.0	A

Segment 2: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.962	464	4484	0.10	54.2	4.3	A

Segment 3: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.962	0.962	575	111	4400	2100	0.13	0.05	55.4	55.4	5.2	5.0	A

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	54.4	5.2	4.9	1.70	A

Facility Overall Results

Space Mean Speed, mi/h	54.4	Density, veh/mi/ln	4.9
Average Travel Time, min	1.70	Density, pc/mi/ln	5.2

Messages

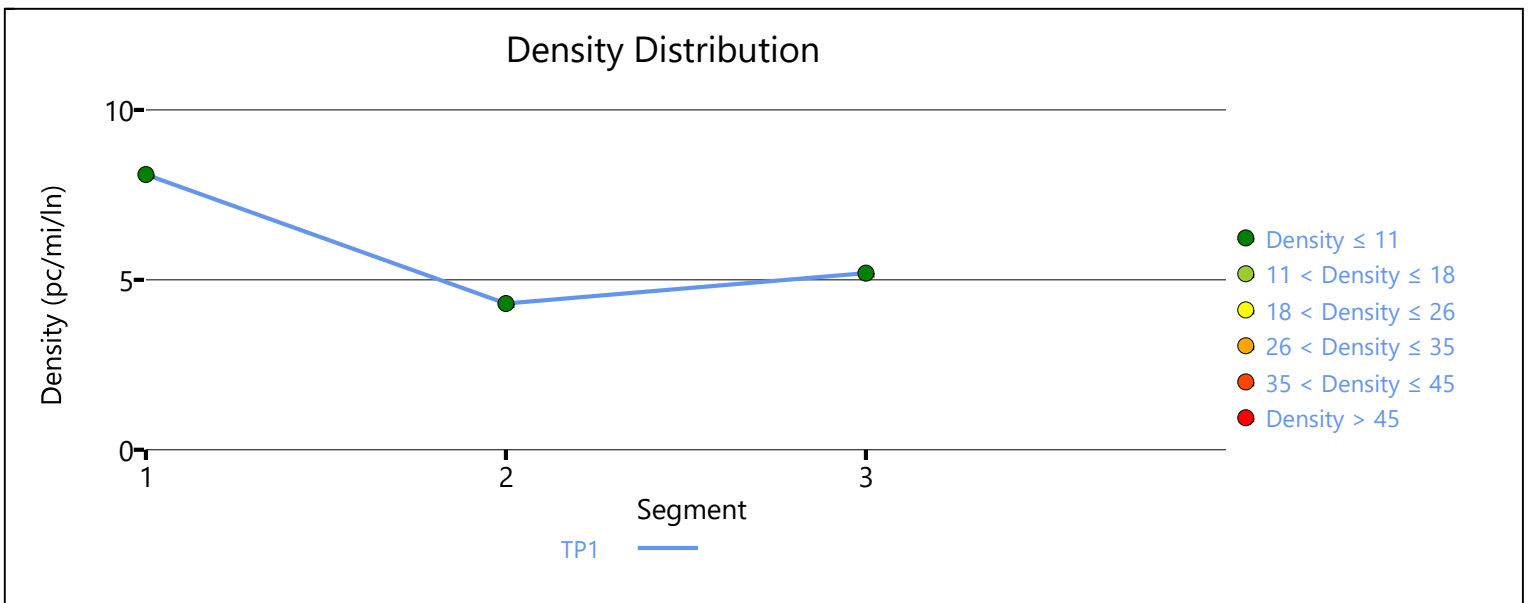
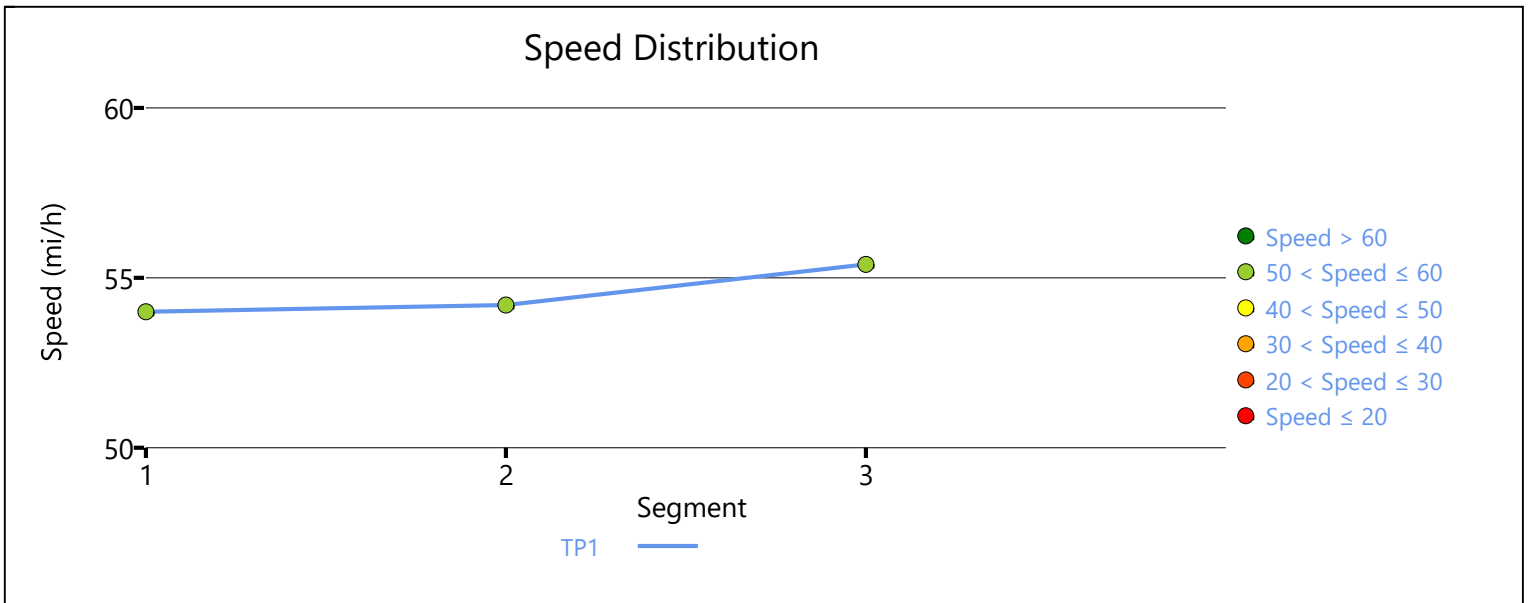
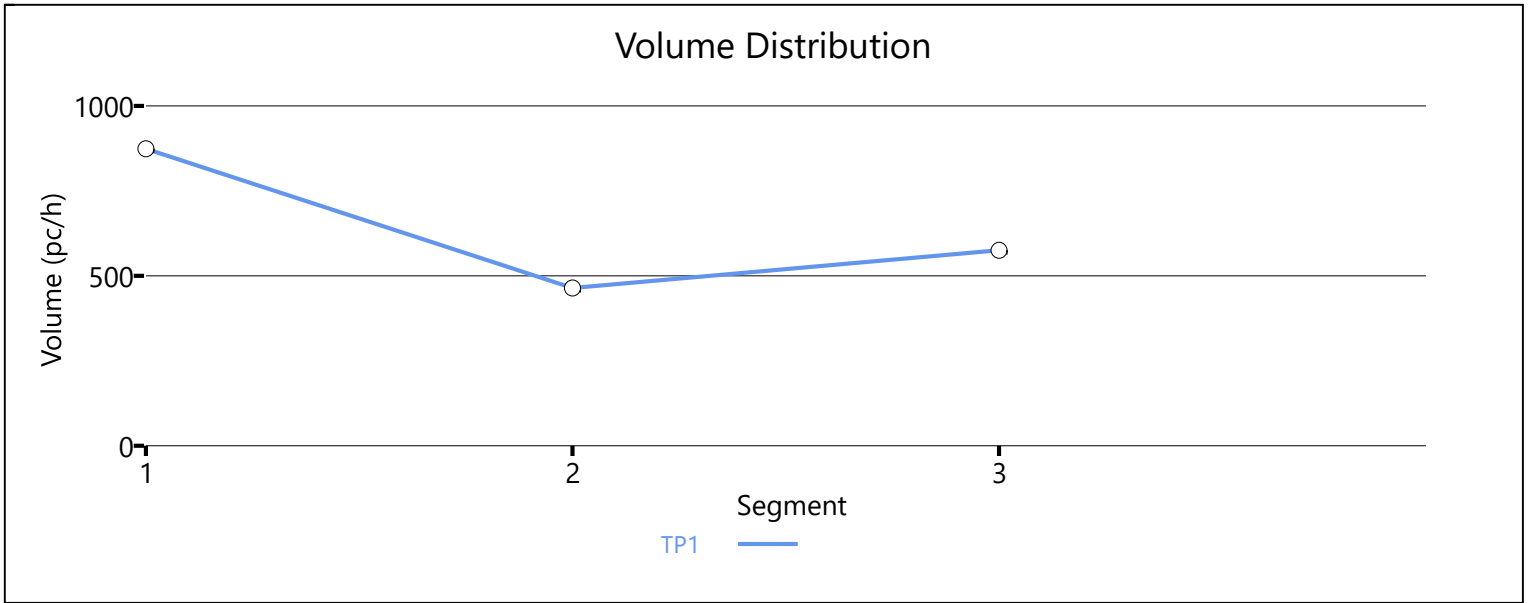
WARNING 1

Beginning and ending the facility with a basic freeway segment is highly recommended. Use caution when interpreting results of a Freeway Facility without a basic segment bounding the beginning and end of the facility.

WARNING 2

Beginning and ending the facility with a basic freeway segment is highly recommended. Use caution when interpreting results of a Freeway Facility without a basic segment bounding the beginning and end of the facility.

Comments



HCS7 Freeway Facilities Report

Project Information

Analyst	GM	Date	4/27/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	AM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - Build Alt. 1-3	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	3
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.57		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Diverge	Diverge	I-71 NB CD diverge at Sunbury Pkwy	1500	2
2	Basic	Basic	I-71 NB CD bwtm Sunbury diverge and merge	5280	2
3	Merge	Merge	I-71 NB CD merge at Sunbury Pkwy	1500	2

Facility Segment Data

Segment 1: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.962	0.962	874	409	4400	2100	0.20	0.19	54.0	54.0	8.1	0.0	A

Segment 2: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.962	464	4484	0.10	54.2	4.3	A

Segment 3: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.962	0.962	575	111	4400	2100	0.13	0.05	55.4	55.4	5.2	5.0	A

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	54.4	5.2	4.9	1.70	A

Facility Overall Results

Space Mean Speed, mi/h	54.4	Density, veh/mi/ln	4.9
Average Travel Time, min	1.70	Density, pc/mi/ln	5.2

Messages

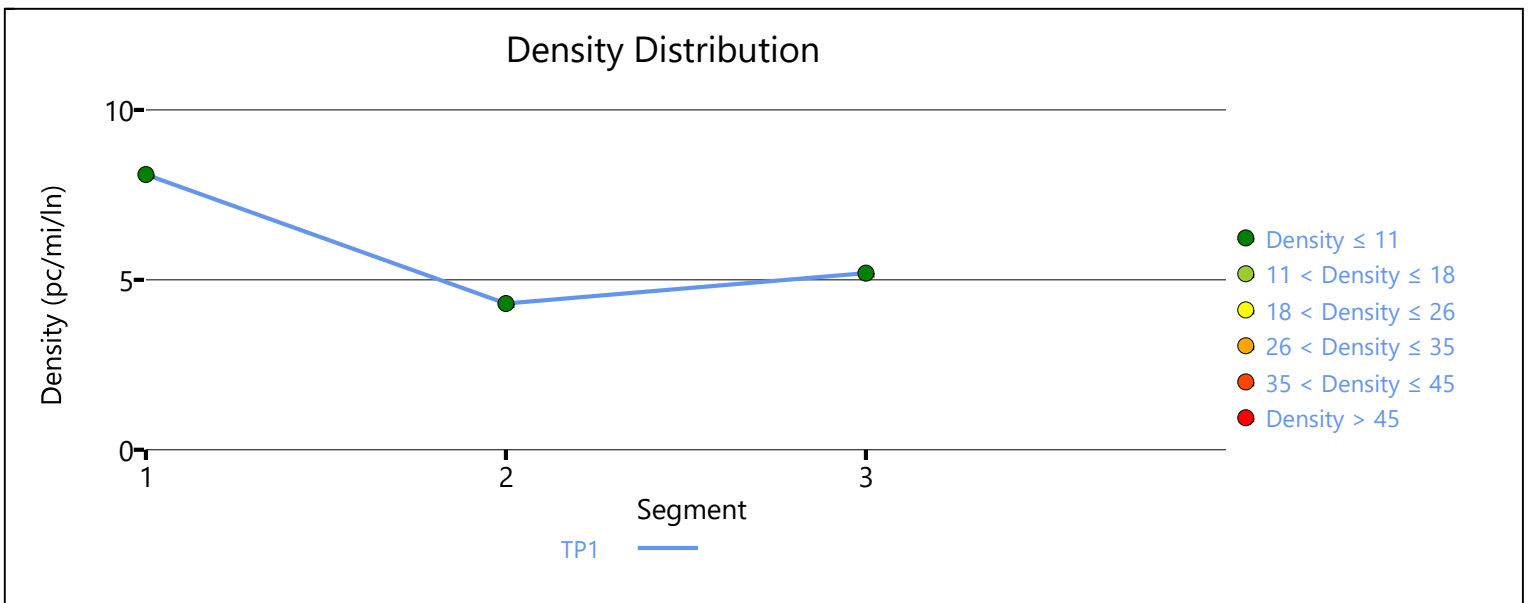
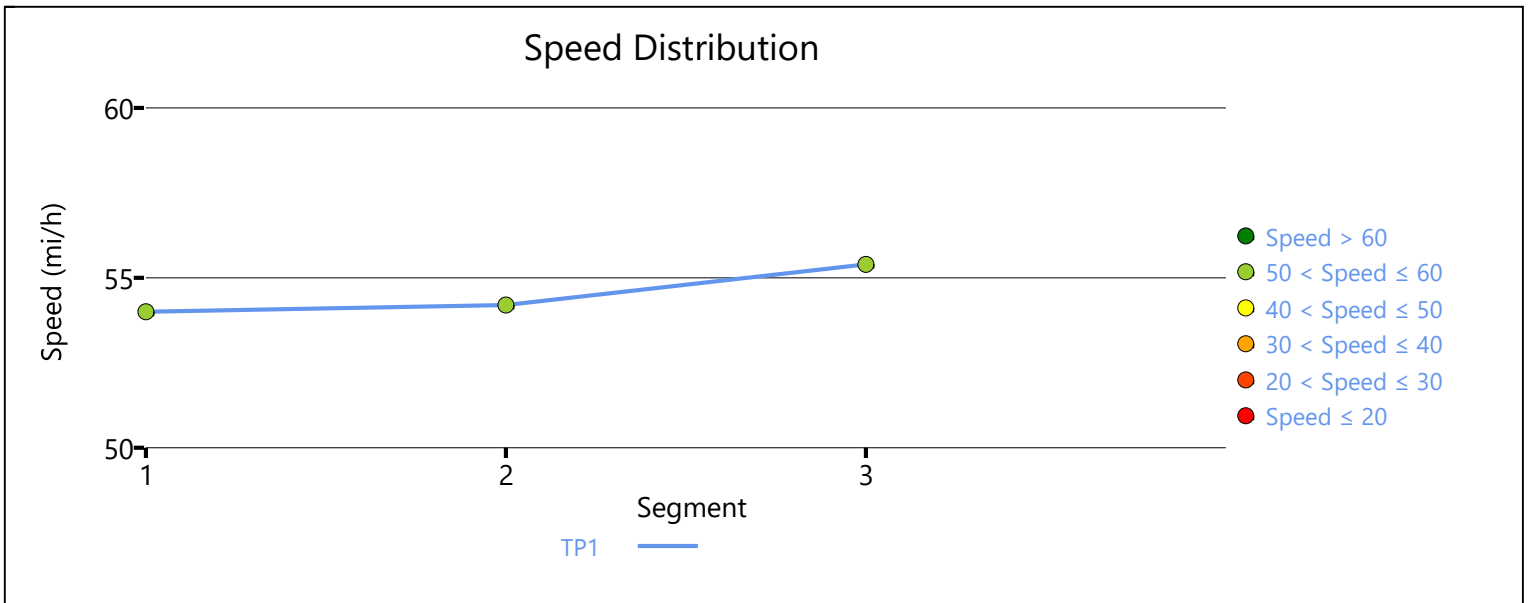
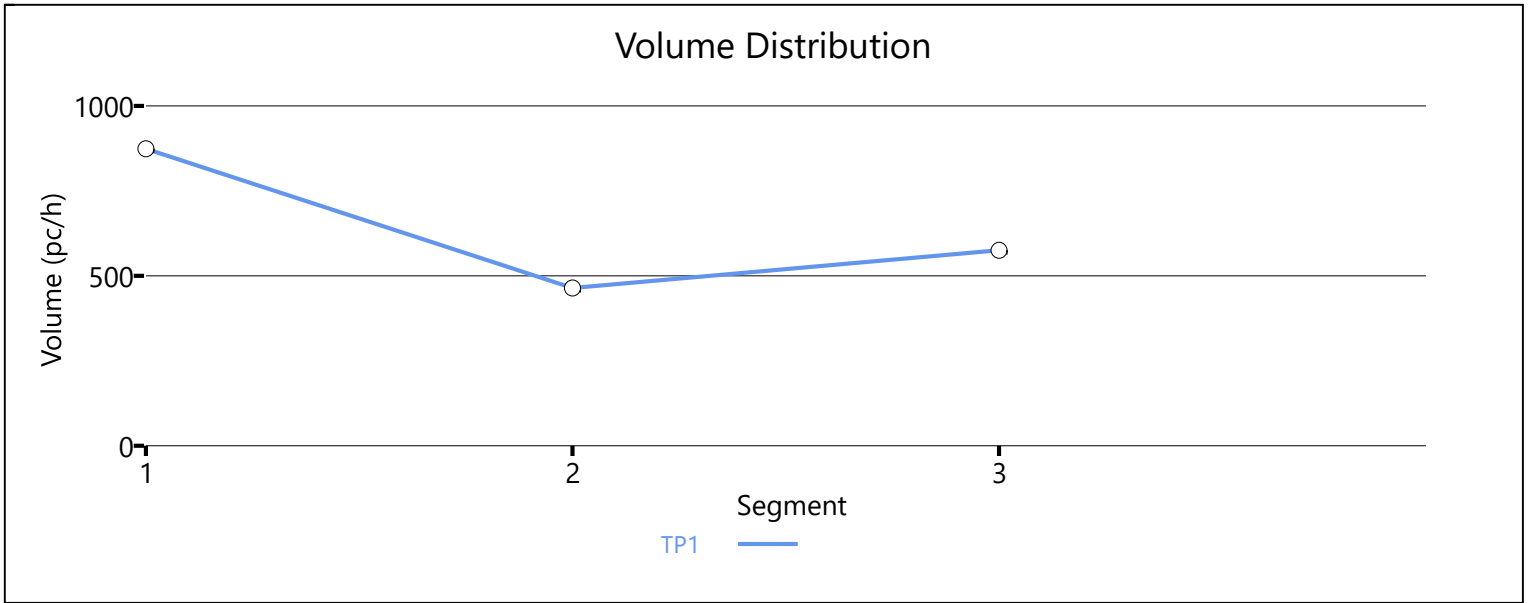
WARNING 1

Beginning and ending the facility with a basic freeway segment is highly recommended. Use caution when interpreting results of a Freeway Facility without a basic segment bounding the beginning and end of the facility.

WARNING 2

Beginning and ending the facility with a basic freeway segment is highly recommended. Use caution when interpreting results of a Freeway Facility without a basic segment bounding the beginning and end of the facility.

Comments



HCS7 Freeway Facilities Report

Project Information

Analyst	GM	Date	4/26/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	AM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - Build Alt. 1	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	19
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	12.14		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-71 SB N of US36/SR37	5280	3
2	Diverge	Diverge	I-71 SB diverge at US36/SR37	1500	3
3	Basic	Basic	I-71 SB btwn US36/SR37 diverge and merge	2400	3
4	Merge	Merge	I-71 SB merge at US36/SR37	1500	3
5	Basic	Basic	I-71 SB btwn US36/SR37 and Sunbury Pkwy	3000	3
6	Merge	Merge	I-71 SB merge at Sunbury Pkwy Loop Ramp	1500	3
7	Basic	Basic	I-71 SB btwn Sunbury Pkwy merges	2000	3
8	Merge	Merge	I-71 SB merge at Sunbury Pkwy	1500	3
9	Basic	Basic	I-71 SB btwn Sunbury Pkwy and Big Walnut Rd	22250	3
10	Diverge	Diverge	I-71 SB diverge at Big Walnut Rd	1500	3
11	Basic	Basic	I-71 SB btwn Big Walnut Rd diverge and merge	1500	3
12	Merge	Merge	I-71 SB merge at Big Walnut Rd	1500	3
13	Basic	Basic	I-71 SB btwn Big Walnut Rd and Gemini Pl	8250	3
14	Diverge	Diverge	I-71 SB diverge at Gemini Pl	1500	3
15	Basic	Basic	I-71 SB btwn Gemini Pl diverge and merge	3000	3
16	Merge	Merge	I-71 SB merge at Gemini Pl	1500	3
17	Basic	Basic	I-71 SB bwtwn Gemini Pl and Polaris Pkwy	1000	3
18	Merge	Merge	I-71 SB merge at Polaris Pkwy	1500	5
19	Basic	Basic	I-71 SB btwn Polaris Pkwy and I-270	1900	5

Facility Segment Data

Segment 1: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.917		4640		7200		0.64		70.4		22.0		C
Segment 2: Diverge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.917	0.800	4640	745	7200	2200	0.64	0.34	71.0	67.2	21.8	23.0	C
Segment 3: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.926		3895		7200		0.55		72.2		18.0		B
Segment 4: Merge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.943	4944	1049	7200	2200	0.69	0.48	65.9	63.8	25.0	25.9	C
Segment 5: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.926		4944		7200		0.70		69.2		23.8		C
Segment 6: Merge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.962	5397	453	7200	2000	0.76	0.23	65.1	62.8	27.6	26.5	C
Segment 7: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.926		5397		7200		0.76		67.0		26.9		D
Segment 8: Merge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.962	7192	1902	7200	2200	1.03	0.86	51.6	46.7	46.5	38.7	F
Segment 9: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.935		7192		7200		1.03		53.4		44.9		F
Segment 10: Diverge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.926	7192	437	7200	2100	1.04	0.21	67.8	63.9	35.4	29.4	F

Segment 11: Basic																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
1	0.94		0.926		6755		7200		0.98		57.5		39.2		E	
Segment 12: Merge																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp		
1	0.94	0.94	0.926	0.971	7149	394	7200	2200	1.03	0.18	59.9	56.6	39.8	34.1	F	
Segment 13: Basic																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
1	0.94		0.935		7149		7200		1.02		53.8		44.3		F	
Segment 14: Diverge																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp		
1	0.94	0.94	0.935	0.971	7149	997	7200	2200	1.02	0.45	65.4	62.8	36.4	37.1	F	
Segment 15: Basic																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
1	0.94		0.935		6152		7131		0.89		60.4		34.0		D	
Segment 16: Merge																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp		
1	0.94	0.94	0.935	0.971	6744	592	7200	2200	0.96	0.27	57.7	55.3	39.0	34.4	D	
Segment 17: Basic																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
1	0.94		0.935		6744		7131		0.97		56.1		40.1		E	
Segment 18: Merge																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp		
1	0.94	0.94	0.935	0.971	9516	2772	12000	4400	0.81	0.63	54.1	48.5	35.2	41.3	E	
Segment 19: Basic																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
1	0.94		0.935		9516		11885		0.83		63.0		30.2		D	
Facility Time Period Results																
T	Speed, mi/h				Density, pc/mi/ln				Density, veh/mi/ln				Travel Time, min		LOS	
1	57.6				36.8				34.3				12.60		F	

Facility Overall Results

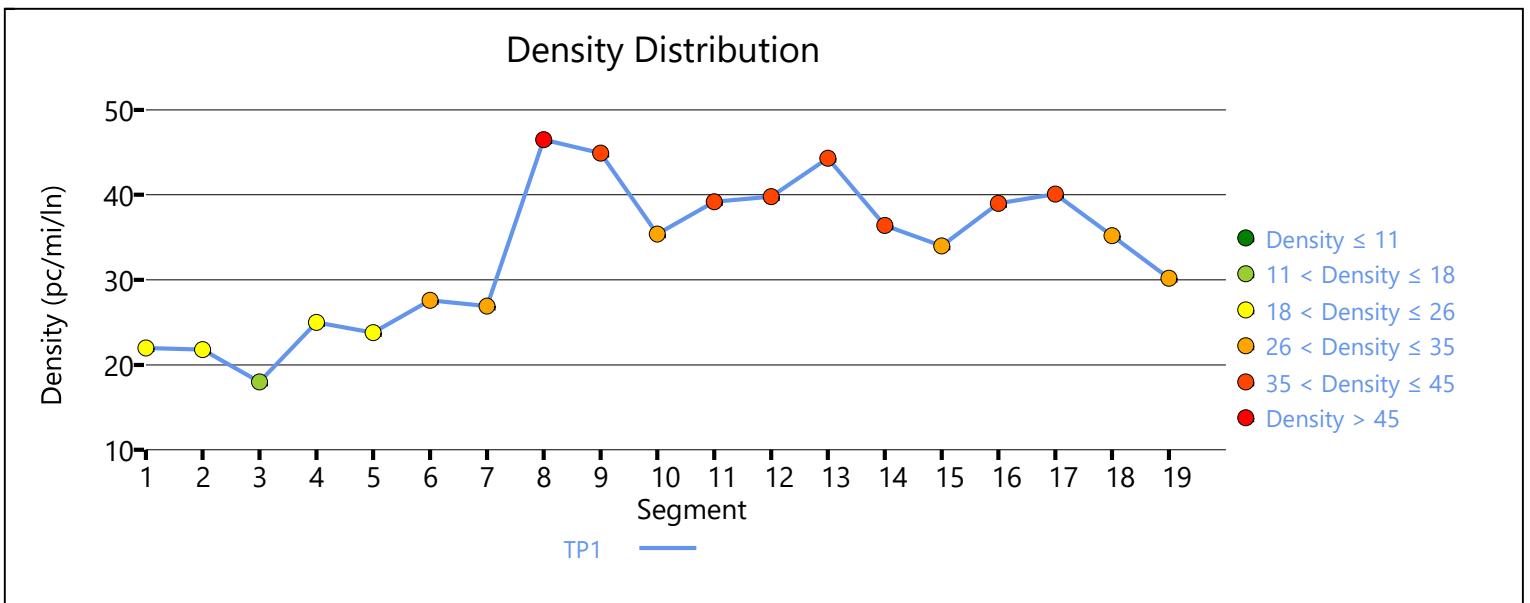
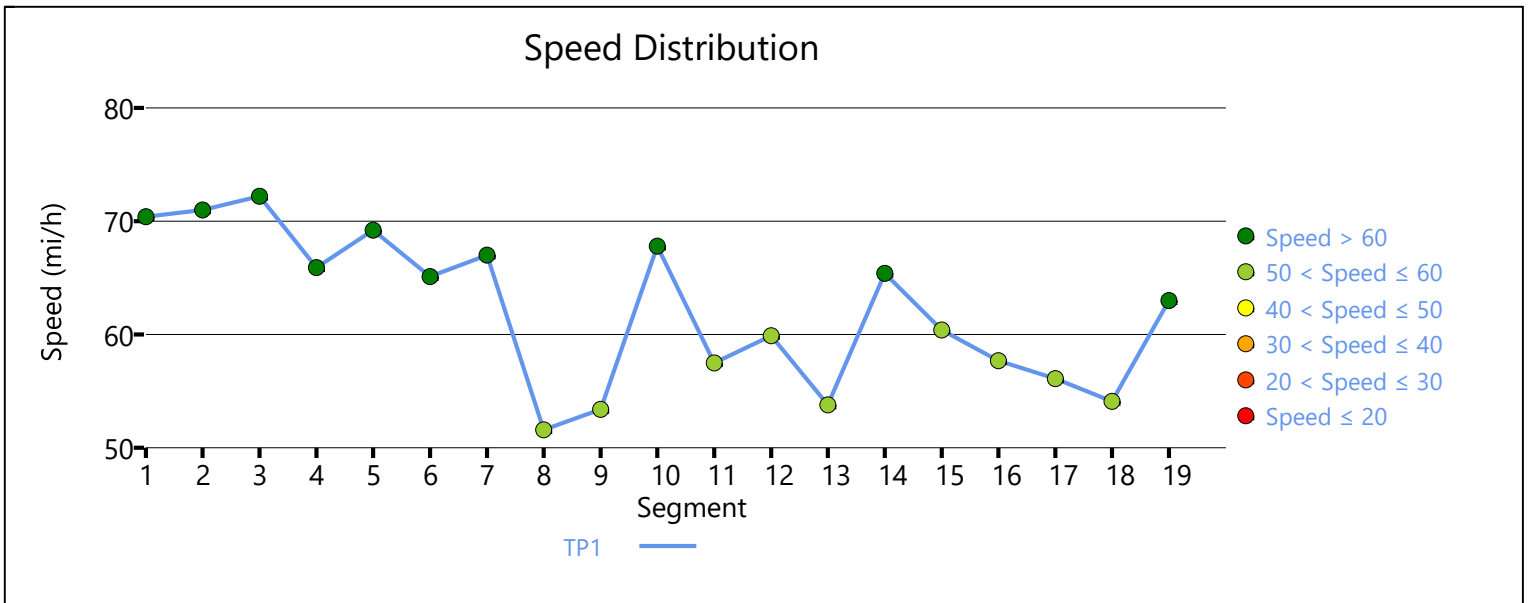
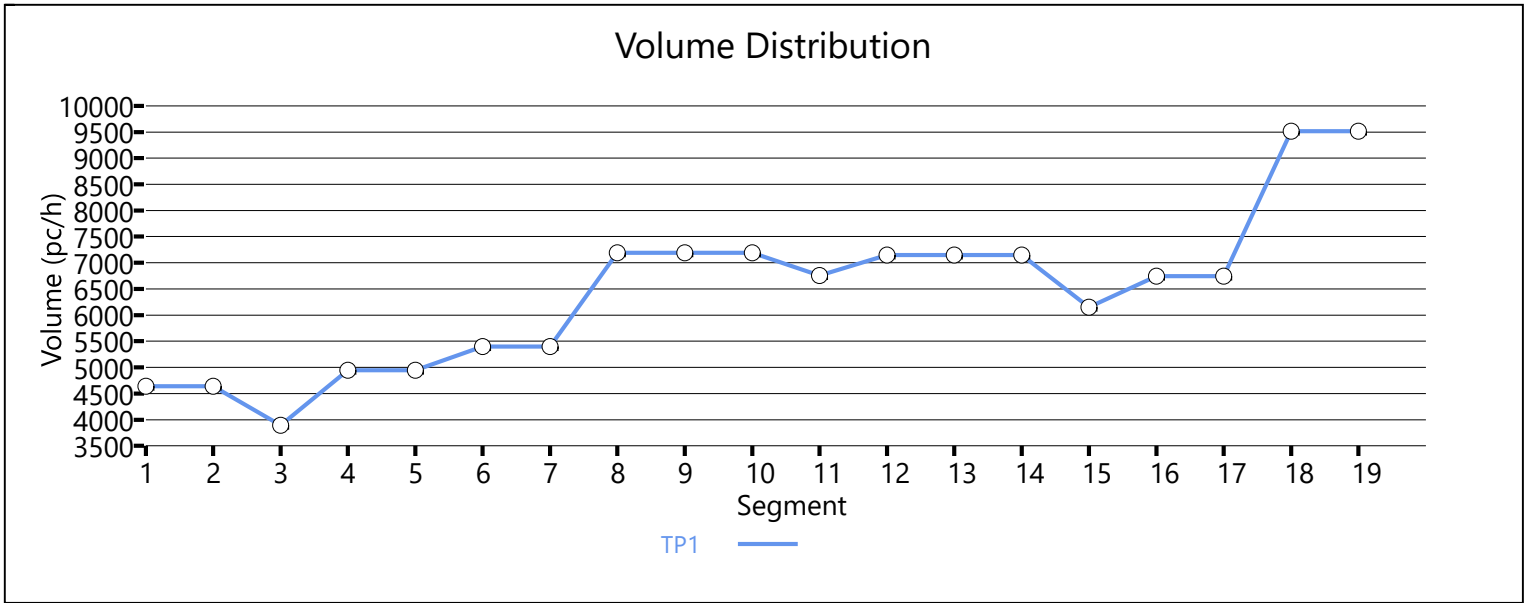
Space Mean Speed, mi/h	57.6	Density, veh/mi/ln	34.3
Average Travel Time, min	12.60	Density, pc/mi/ln	36.8

Messages

WARNING 1	Oversaturated conditions currently exist in boundary time period 1. Results may not be reliable. Consider expanding analysis in time and/or space to resolve this warning.
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Comments

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HCS7 Freeway Facilities Report

Project Information

Analyst	GM	Date	4/26/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	AM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - Build Alt. 2	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	19
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	11.34		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-71 SB N of US36/SR37	5280	3
2	Diverge	Diverge	I-71 SB diverge at US36/SR37	1500	3
3	Basic	Basic	I-71 SB btwn US36/SR37 diverge and merge	2400	3
4	Merge	Merge	I-71 SB merge at US36/SR37	1500	3
5	Basic	Basic	I-71 SB btwn US36/SR37 and Sunbury Pkwy	3000	3
6	Merge	Merge	I-71 SB merge at Sunbury Pkwy Loop Ramp	1500	3
7	Basic	Basic	I-71 SB btwn Sunbury Pkwy merges	2000	3
8	Merge	Merge	I-71 SB merge at Sunbury Pkwy	1500	3
9	Basic	Basic	I-71 SB btwn Sunbury Pkwy and Africa Rd	19650	3
10	Diverge	Diverge	I-71 SB diverge at Africa Rd	1500	3
11	Basic	Basic	I-71 SB btwn Africa Rd diverge and merge	2000	3
12	Merge	Merge	I-71 SB merge at Africa Rd	1500	3
13	Basic	Basic	I-71 SB btwn Africa Rd and Gemini Pl	6150	3
14	Diverge	Diverge	I-71 SB diverge at Gemini Pl	1500	3
15	Basic	Basic	I-71 SB btwn Gemini Pl diverge and merge	3000	3
16	Merge	Merge	I-71 SB merge at Gemini Pl	1500	3
17	Basic	Basic	I-71 SB btwn Gemini Pl and Polaris Pkwy	1000	3
18	Merge	Merge	I-71 SB merge at Polaris Pkwy	1500	5
19	Basic	Basic	I-71 SB btwn Polaris Pkwy and I-270	1900	5

Facility Segment Data

Segment 1: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.917		4548		7200		0.63		70.7		21.4		C
Segment 2: Diverge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.917	0.800	4548	745	7200	2200	0.63	0.34	71.0	67.2	21.4	22.6	C
Segment 3: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.926		3803		7200		0.54		72.4		17.5		B
Segment 4: Merge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.943	4852	1049	7200	2200	0.68	0.48	66.1	64.0	24.5	25.5	C
Segment 5: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.926		4852		7200		0.68		69.6		23.2		C
Segment 6: Merge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.962	5305	453	7200	2000	0.75	0.23	65.3	63.0	27.1	26.1	C
Segment 7: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.926		5305		7200		0.75		67.5		26.2		D
Segment 8: Merge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.962	7192	1902	7200	2200	1.01	0.86	51.6	46.7	46.5	38.7	F
Segment 9: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.935		7192		7200		1.01		53.4		44.9		F
Segment 10: Diverge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.926	7192	425	7200	2100	1.02	0.20	67.8	63.9	35.4	29.4	F

Segment 11: Basic																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
1	0.94		0.926		6767		7200		0.97		57.4		39.3		E	
Segment 12: Merge																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp		
1	0.94	0.94	0.926	0.971	7161	394	7200	2200	1.02	0.18	59.8	56.5	39.9	34.2	F	
Segment 13: Basic																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
1	0.94		0.935		7161		7200		1.01		53.7		44.5		F	
Segment 14: Diverge																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp		
1	0.94	0.94	0.935	0.971	7161	855	7200	2200	1.01	0.39	65.6	63.1	36.4	37.2	F	
Segment 15: Basic																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
1	0.94		0.935		6306		7131		0.90		59.4		35.4		E	
Segment 16: Merge																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp		
1	0.94	0.94	0.935	0.971	6909	603	7200	2200	0.97	0.27	57.0	54.5	40.4	35.2	E	
Segment 17: Basic																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
1	0.94		0.935		6909		7131		0.99		54.8		42.0		E	
Segment 18: Merge																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp		
1	0.94	0.94	0.935	0.971	9966	3057	12000	4400	0.84	0.69	50.0	43.6	39.9	43.7	E	
Segment 19: Basic																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
1	0.94		0.935		9966		11885		0.86		61.5		32.4		D	
Facility Time Period Results																
T	Speed, mi/h				Density, pc/mi/ln				Density, veh/mi/ln				Travel Time, min		LOS	
1	57.6				36.5				34.0				11.80		F	

Facility Overall Results

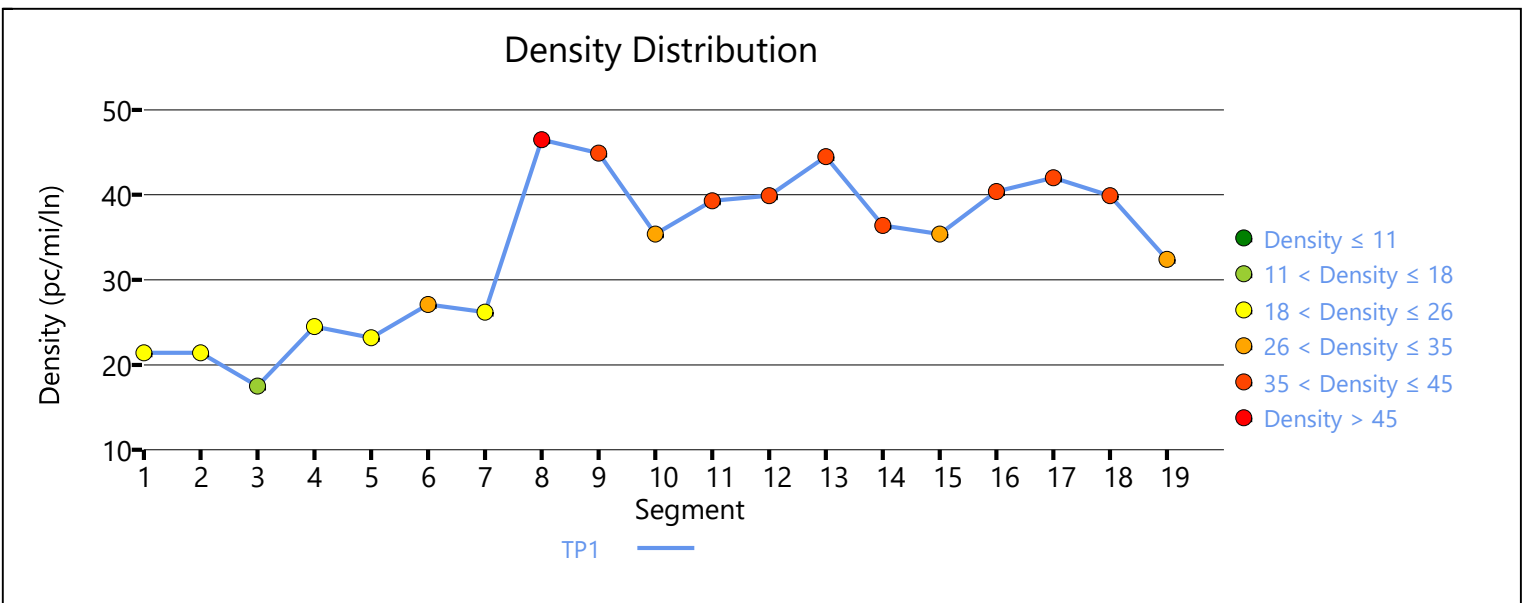
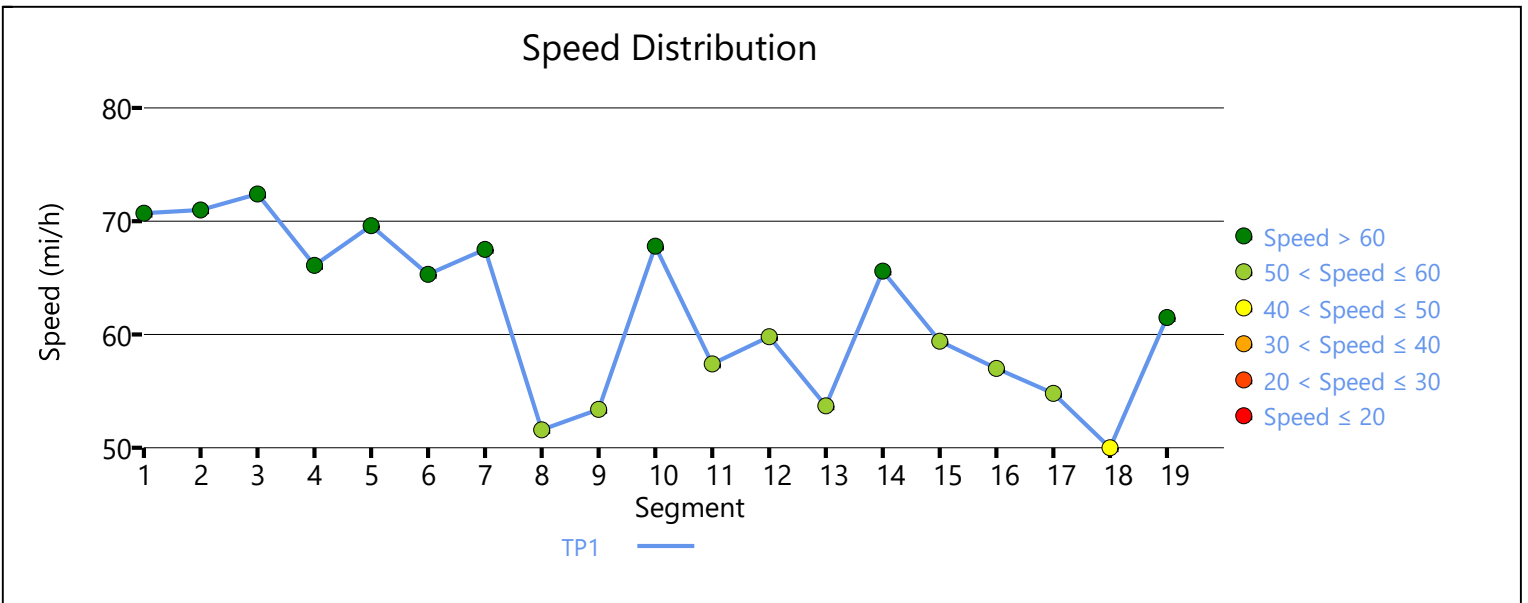
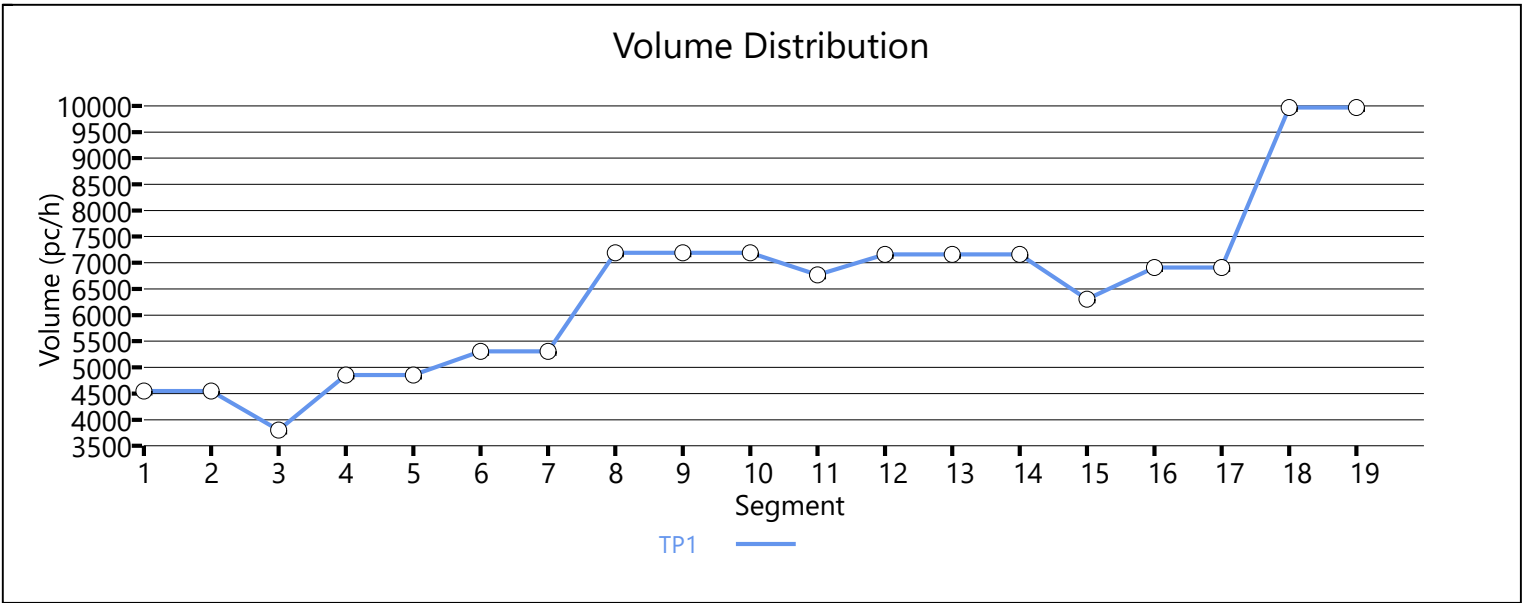
Space Mean Speed, mi/h	57.6	Density, veh/mi/ln	34.0
Average Travel Time, min	11.80	Density, pc/mi/ln	36.5

Messages

WARNING 1	Oversaturated conditions currently exist in boundary time period 1. Results may not be reliable. Consider expanding analysis in time and/or space to resolve this warning.
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Comments

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HCS7 Freeway Facilities Report

Project Information

Analyst	GM	Date	4/26/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	AM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - Build Alt. 3	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	19
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	12.14		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-71 SB N of US36/SR37	5280	3
2	Diverge	Diverge	I-71 SB diverge at US36/SR37	1500	3
3	Basic	Basic	I-71 SB btwn US36/SR37 diverge and merge	2400	3
4	Merge	Merge	I-71 SB merge at US36/SR37	1500	3
5	Basic	Basic	I-71 SB btwn US36/SR37 and Sunbury Pkwy	3000	3
6	Merge	Merge	I-71 SB merge at Sunbury Pkwy Loop Ramp	1500	3
7	Basic	Basic	I-71 SB btwn Sunbury Pkwy merges	2000	3
8	Merge	Merge	I-71 SB merge at Sunbury Pkwy	1500	3
9	Basic	Basic	I-71 SB btwn Sunbury Pkwy and Big Walnut Rd	22250	3
10	Diverge	Diverge	I-71 SB diverge at Big Walnut Rd	1500	3
11	Basic	Basic	I-71 SB btwn Big Walnut Rd diverge and merge	2000	3
12	Merge	Merge	I-71 SB merge at Big Walnut Rd	1500	3
13	Basic	Basic	I-71 SB btwn Big Walnut Rd and Gemini PI	7750	3
14	Diverge	Diverge	I-71 SB diverge at Gemini PI	1500	3
15	Basic	Basic	I-71 SB btwn Gemini PI diverge and merge	3000	3
16	Merge	Merge	I-71 SB merge at Gemini PI	1500	3
17	Basic	Basic	I-71 SB btwn Gemini PI and Polaris Pkwy	1000	3
18	Merge	Merge	I-71 SB merge at Polaris Pkwy	1500	5
19	Basic	Basic	I-71 SB btwn Polaris Pkwy and I-270	1900	5

Facility Segment Data

Segment 1: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.917		4768		7200		0.66		69.9		22.7		C
Segment 2: Diverge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.917	0.800	4768	745	7200	2200	0.66	0.34	71.0	67.2	22.4	23.6	C
Segment 3: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.926		4023		7200		0.57		72.0		18.6		C
Segment 4: Merge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.943	5072	1049	7200	2200	0.71	0.48	65.7	63.5	25.7	26.5	C
Segment 5: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.926		5072		7200		0.71		68.6		24.6		C
Segment 6: Merge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.962	5525	453	7200	2000	0.78	0.23	64.9	62.5	28.4	27.1	C
Segment 7: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.926		5525		7200		0.78		66.3		27.8		D
Segment 8: Merge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.962	7158	1902	7200	2200	1.04	0.86	52.0	47.2	45.9	38.6	F
Segment 9: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.935		6797		7200		1.04		47.7		47.5		F
Segment 10: Diverge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.926	6761	368	7200	2100	1.05	0.18	42.7	64.1	52.7	32.8	F

Segment 11: Basic																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
1	0.94		0.926		6310		7200		1.00		35.0		60.1		F	
Segment 12: Merge																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp		
1	0.94	0.94	0.926	0.971	6704	394	7200	2200	1.06	0.18	62.1	59.3	36.0	32.0	F	
Segment 13: Basic																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
1	0.94		0.935		6704		7200		1.05		57.9		38.6		F	
Segment 14: Diverge																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp		
1	0.94	0.94	0.935	0.971	6704	997	7200	2200	1.05	0.45	65.6	62.8	34.1	34.3	F	
Segment 15: Basic																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
1	0.94		0.935		5707		7131		0.92		63.0		30.2		D	
Segment 16: Merge																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp		
1	0.94	0.94	0.935	0.971	6299	592	7200	2000	0.99	0.30	58.8	56.4	35.7	32.3	D	
Segment 17: Basic																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
1	0.94		0.935		6299		7131		1.00		59.5		35.3		F	
Segment 18: Merge																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp		
1	0.94	0.94	0.935	0.971	9071	2772	12000	4400	0.83	0.63	54.6	49.2	33.2	40.8	E	
Segment 19: Basic																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
1	0.94		0.935		9071		11885		0.84		64.3		28.2		D	
Facility Time Period Results																
T	Speed, mi/h				Density, pc/mi/ln				Density, veh/mi/ln				Travel Time, min		LOS	
1	54.2				37.5				35.0				13.40		F	

Facility Overall Results

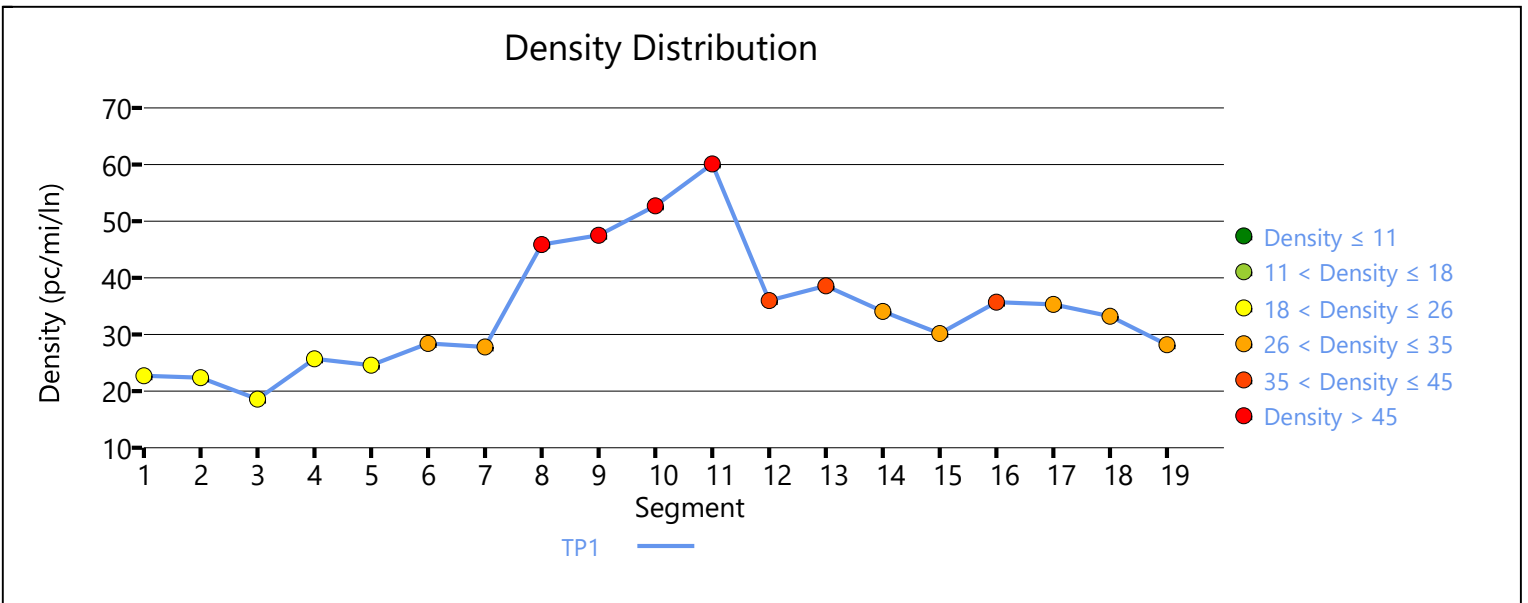
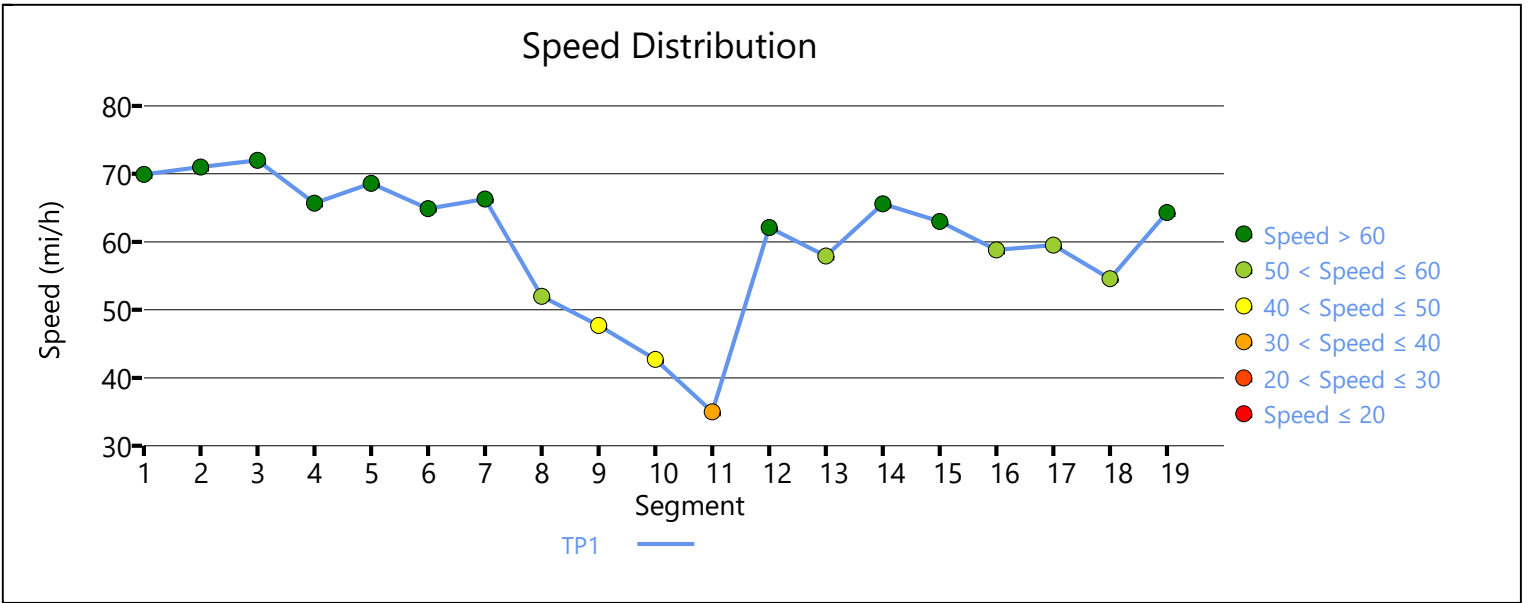
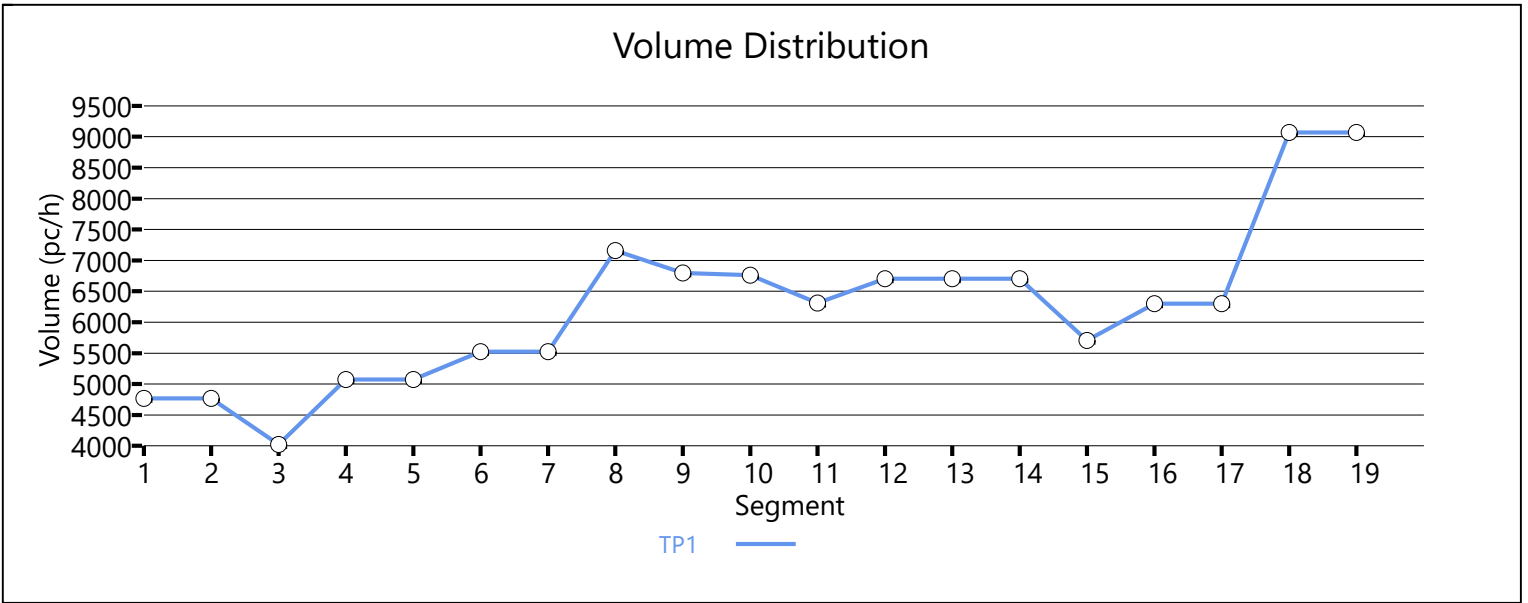
Space Mean Speed, mi/h	54.2	Density, veh/mi/ln	35.0
Average Travel Time, min	13.40	Density, pc/mi/ln	37.5

Messages

WARNING 1	Oversaturated conditions currently exist in boundary time period 1. Results may not be reliable. Consider expanding analysis in time and/or space to resolve this warning.
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Comments

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HCS7 Basic Freeway Report

Project Information

Analyst	GM	Date	4/30/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	AM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange (SB Polaris loop on ramp) - Build Alt. 1&3	Unit	United States Customary

Geometric Data

Number of Lanes, In	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	45.0	Total Ramp Density (TRD), ramps/mi	2.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	39.2
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	2360	Heavy Vehicle Adjustment Factor (fhv)	0.971
Peak Hour Factor	0.94	Flow Rate (Vp), pc/h/ln	1293
Total Trucks, %	3.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2200
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.59
Passenger Car Equivalent (ET)	2.000		

Speed and Density

Lane Width Adjustment (fLW)	0.0	Average Speed (S), mi/h	39.2
Right-Side Lateral Clearance Adj. (fRLC)	0.0	Density (D), pc/mi/ln	33.0
Total Ramp Density Adjustment	5.8	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	39.2		

HCS7 Basic Freeway Report

Project Information

Analyst	GM	Date	4/30/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	AM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange (SB Polaris EB on ramp) - Build Alt. 1&3	Unit	United States Customary

Geometric Data

Number of Lanes, ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	45.0	Total Ramp Density (TRD), ramps/mi	2.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	39.2
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	2700	Heavy Vehicle Adjustment Factor (fhv)	0.971
Peak Hour Factor	0.94	Flow Rate (Vp), pc/h/ln	1479
Total Trucks, %	3.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2200
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.67
Passenger Car Equivalent (ET)	2.000		

Speed and Density

Lane Width Adjustment (fLW)	0.0	Average Speed (S), mi/h	39.2
Right-Side Lateral Clearance Adj. (fRLC)	0.0	Density (D), pc/mi/ln	37.7
Total Ramp Density Adjustment	5.8	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFSadj), mi/h	39.2		

HCS7 Basic Freeway Report

Project Information

Analyst	GM	Date	4/30/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	AM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange (SB Polaris loop on ramp) - Build Alt. 2	Unit	United States Customary

Geometric Data

Number of Lanes, In	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	45.0	Total Ramp Density (TRD), ramps/mi	2.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	39.2
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	2740	Heavy Vehicle Adjustment Factor (fhv)	0.971
Peak Hour Factor	0.94	Flow Rate (Vp), pc/h/ln	1501
Total Trucks, %	3.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2200
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.68
Passenger Car Equivalent (ET)	2.000		

Speed and Density

Lane Width Adjustment (fLW)	0.0	Average Speed (S), mi/h	39.2
Right-Side Lateral Clearance Adj. (fRLC)	0.0	Density (D), pc/mi/ln	38.3
Total Ramp Density Adjustment	5.8	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFSadj), mi/h	39.2		

HCS7 Basic Freeway Report

Project Information

Analyst	GM	Date	4/30/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	AM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange (SB Polaris EB on ramp) - Build Alt. 2	Unit	United States Customary

Geometric Data

Number of Lanes, ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	45.0	Total Ramp Density (TRD), ramps/mi	2.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	39.2
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	2840	Heavy Vehicle Adjustment Factor (fhv)	0.971
Peak Hour Factor	0.94	Flow Rate (Vp), pc/h/ln	1556
Total Trucks, %	3.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2200
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.71
Passenger Car Equivalent (ET)	2.000		

Speed and Density

Lane Width Adjustment (fLW)	0.0	Average Speed (S), mi/h	39.2
Right-Side Lateral Clearance Adj. (fRLC)	0.0	Density (D), pc/mi/ln	39.7
Total Ramp Density Adjustment	5.8	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFSadj), mi/h	39.2		

HCS7 Freeway Facilities Report

Project Information

Analyst	GM	Date	5/21/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	PM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - Build Alt. 1-3	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	2
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.38		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-71 NB btwn I-270 & Polaris (5-lane)	4300	5
2	Basic	Basic	I-71 NB btwn I-270 & Polaris (6-lane)	3000	6

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.935	11935	11935	1.09	53.0	45.0	F

Segment 2: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.935	11935	14322	0.90	62.1	32.0	D

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	56.4	39.1	36.6	1.50	F

Facility Overall Results

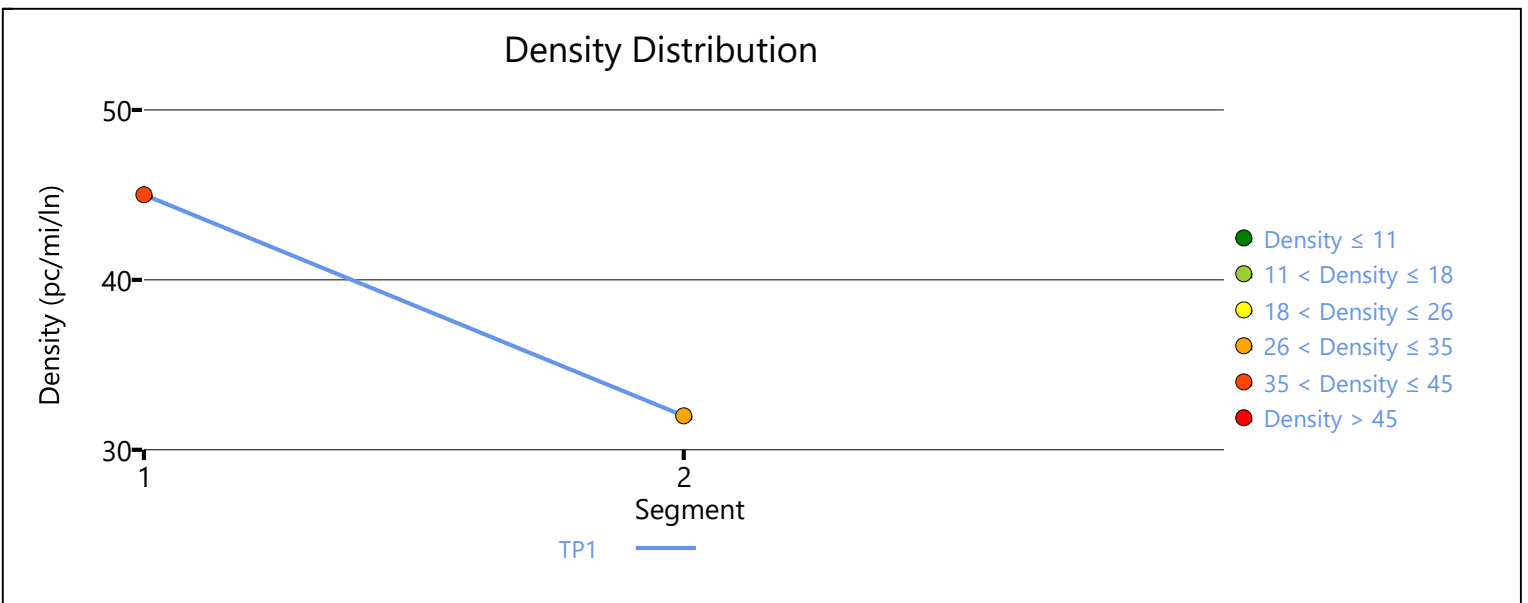
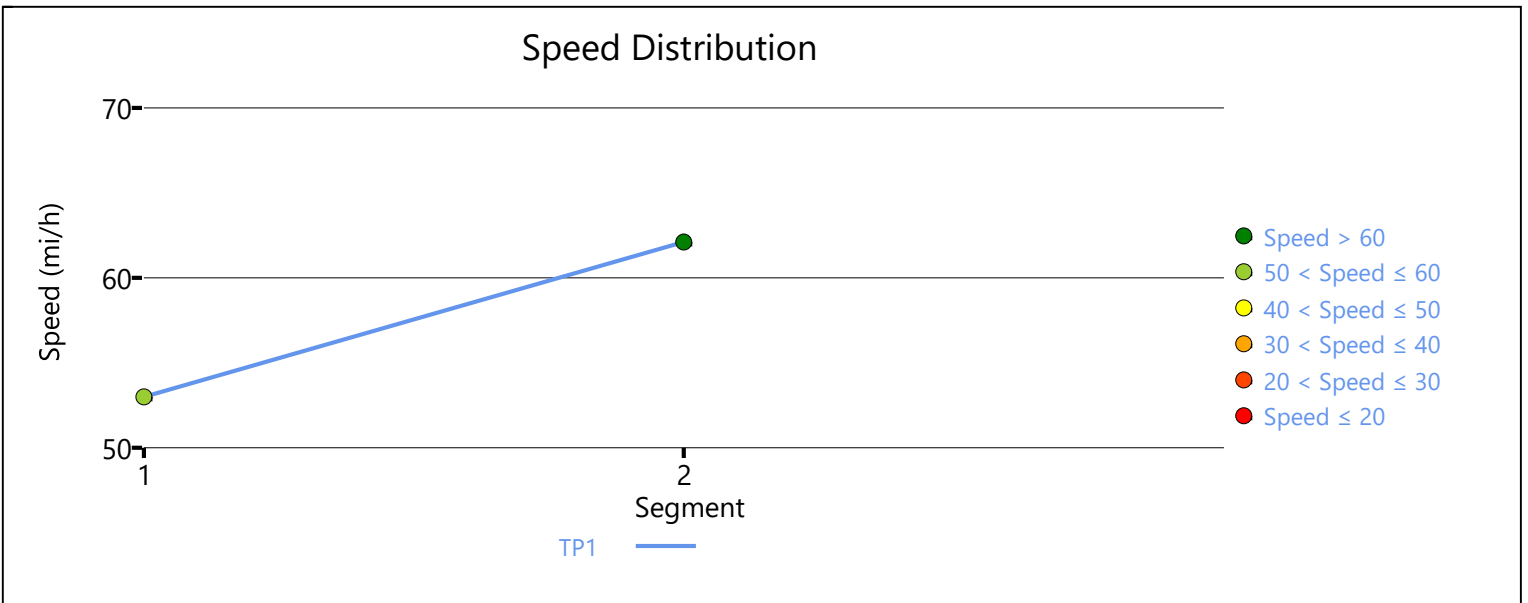
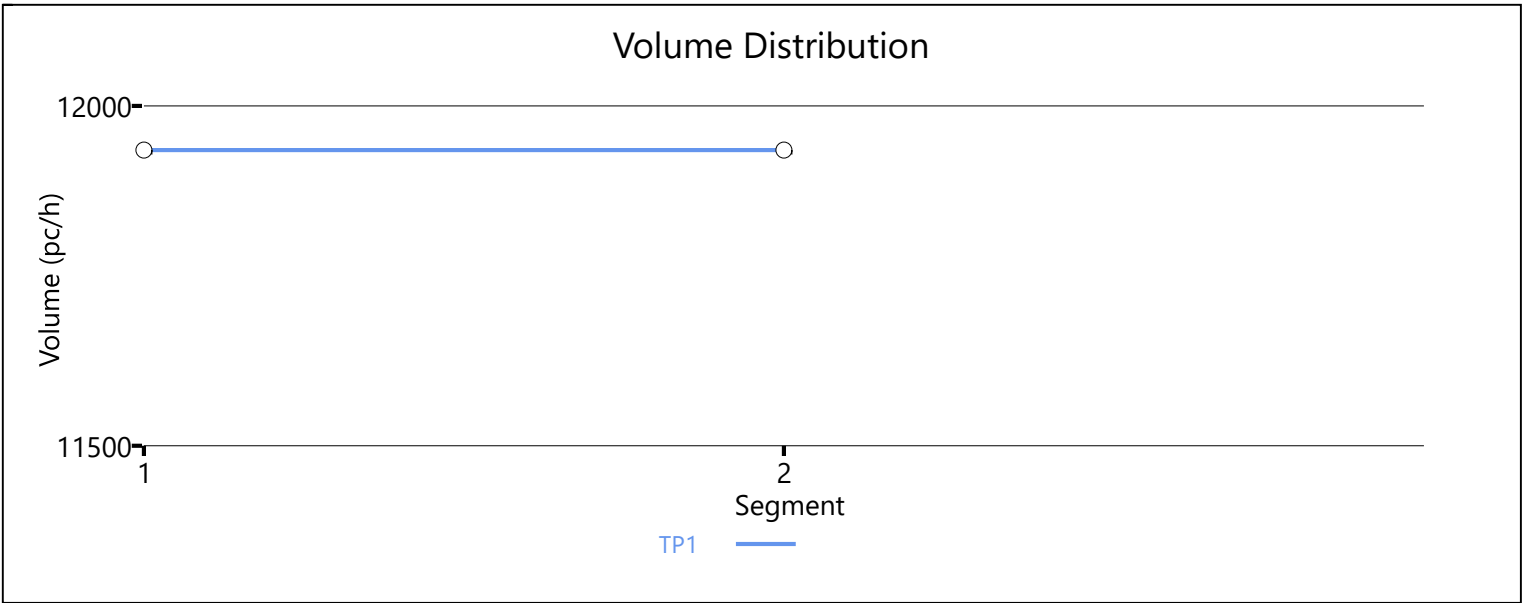
Space Mean Speed, mi/h	56.4	Density, veh/mi/ln	36.6
Average Travel Time, min	1.50	Density, pc/mi/ln	39.1

Messages

WARNING 1	Oversaturated conditions currently exist in boundary segment 1. Results may not be reliable. Consider expanding analysis in time and/or space to resolve this warning.
WARNING 2	Oversaturated conditions currently exist in boundary time period 1. Results may not be reliable. Consider expanding analysis in time and/or space to resolve this warning.

Comments

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HCS7 Basic Freeway Report

Project Information

Analyst	KM	Date	5/7/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	PM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange (NB Polaris-Gemini off Ramp) - Build Alt. 1-3	Unit	United States Customary

Geometric Data

Number of Lanes, In	3	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	2.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	54.2
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	3620	Heavy Vehicle Adjustment Factor (fhv)	0.980
Peak Hour Factor	0.94	Flow Rate (Vp), pc/h/ln	1310
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2242
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2242
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.58
Passenger Car Equivalent (ET)	2.000		

Speed and Density

Lane Width Adjustment (fLW)	0.0	Average Speed (S), mi/h	54.2
Right-Side Lateral Clearance Adj. (fRLC)	0.0	Density (D), pc/mi/ln	24.2
Total Ramp Density Adjustment	5.8	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	54.2		

HCS7 Freeway Facilities Report

Project Information

Analyst	KM	Date	5/7/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	PM Peak hour
Project Description	DEL-71-3.55 Big Walnut Interchange - Build Alt. 1-3	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	12
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	11.09		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-71 NB btwn Polaris Pkwy/Gemini PI diverge and merge (4 lane)	7200	4
2	Merge	Merge	I-71 NB merge at Gemini PI	1500	4
3	Basic	Basic	I-71 NB btwn Gemini PI and Big Walnut Rd	6900	4
4	Diverge	Diverge	I-71 NB diverge at Big Walnut Rd	1500	4
5	Basic	Basic	I-71 NB btwn Big Walnut Rd diverge and merge	2650	4
6	Merge	Merge	I-71 NB merge at Big Walnut Rd	1500	4
7	Basic	Basic	I-71 NB btwn Big Walnut Rd and Sunbury Pkwy (4 lane)	3000	4
8	Basic	Basic	I-71 NB btwn Big Walnut Rd and Sunbury Pkwy (3 lane)	17000	3
9	Diverge	Diverge	I-71 NB divergence at Sunbury Pkwy/US36/SR37	4000	3
10	Basic	Basic	I-71 NB btwn Sunbury Pkwy/US36/SR37 diverge and merge	6500	3
11	Merge	Merge	I-71 NB merge at US36/SR37	1500	3
12	Basic	Basic	I-71 NB N of US36/SR37	5280	3

Facility Segment Data

Segment 1: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.935		7822		9528		0.88		39.6		49.4		F

Segment 2: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.935	0.971	8939	1194	9600	2200	1.00	0.54	59.0	55.0	37.9	34.4	D

Segment 3: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.935		8939		9600		1.01		58.0		38.5		F
Segment 4: Diverge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.935	0.980	8939	2117	9600	4400	1.01	0.48	70.0	63.2	31.9	24.2	F
Segment 5: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.935		6822		9600		0.78		68.7		24.8		C
Segment 6: Merge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.926	7224	402	9600	2200	0.83	0.18	67.5	65.1	26.8	23.5	C
Segment 7: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.926		6704		9600		0.83		27.8		60.2		F
Segment 8: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.926		6704		7200		1.10		58.0		38.5		F
Segment 9: Diverge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.962	6704	3340	7200	4400	1.10	0.76	63.8	59.5	35.0	32.5	F
Segment 10: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.926		3364		7200		0.62		73.2		15.3		B
Segment 11: Merge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.917	0.877	4359	995	7200	2200	0.76	0.45	66.9	64.9	21.7	23.3	C
Segment 12: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.917		4359		7200		0.76		71.6		20.3		C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	54.0	35.8	33.3	12.30	F

Facility Overall Results

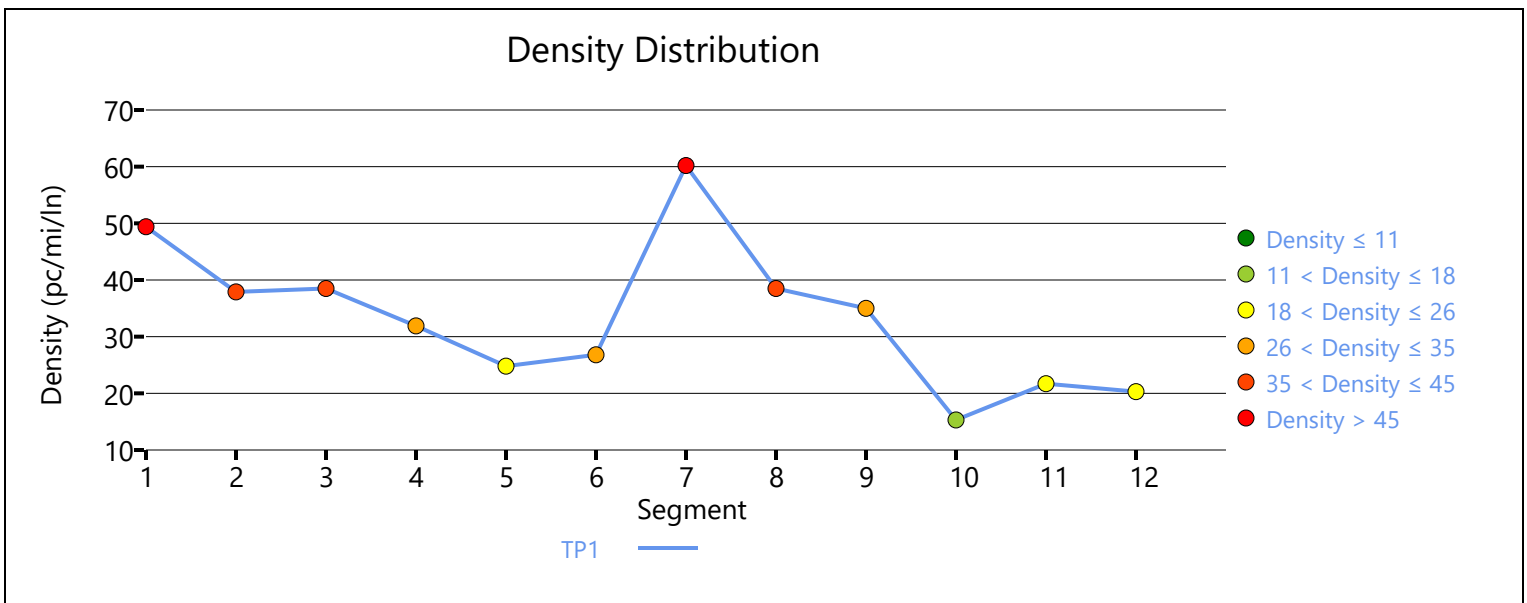
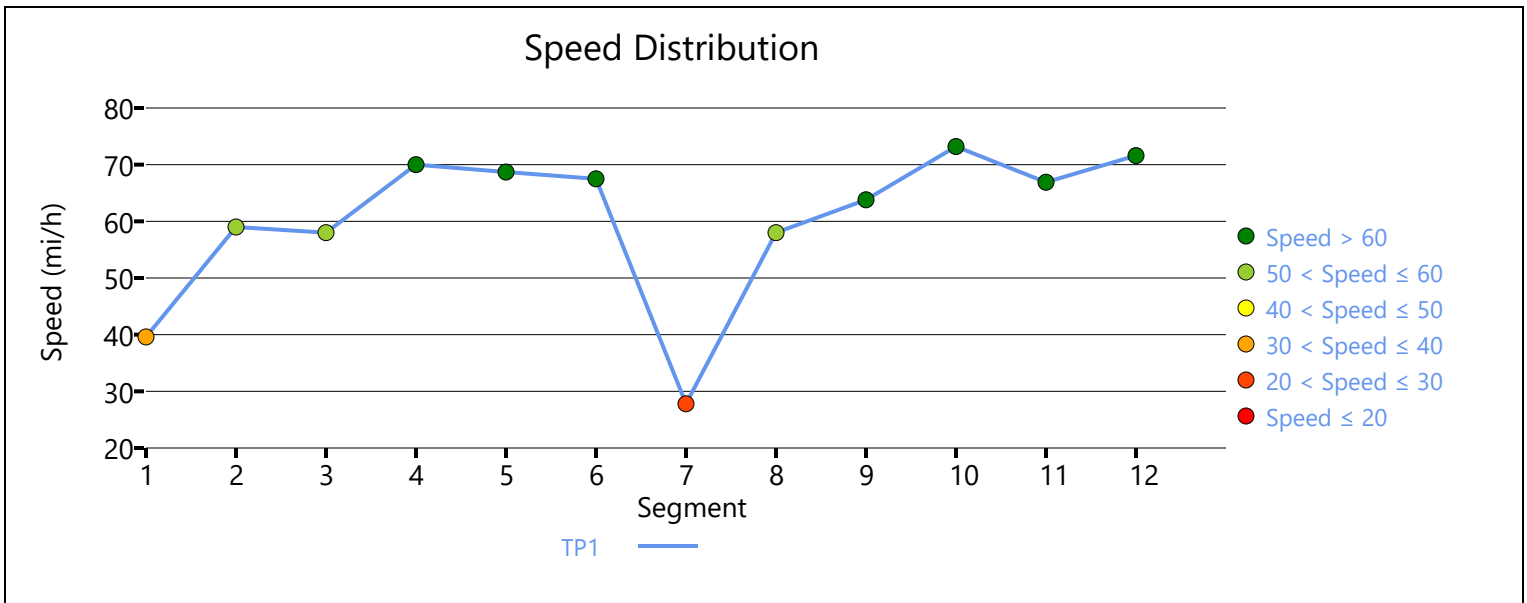
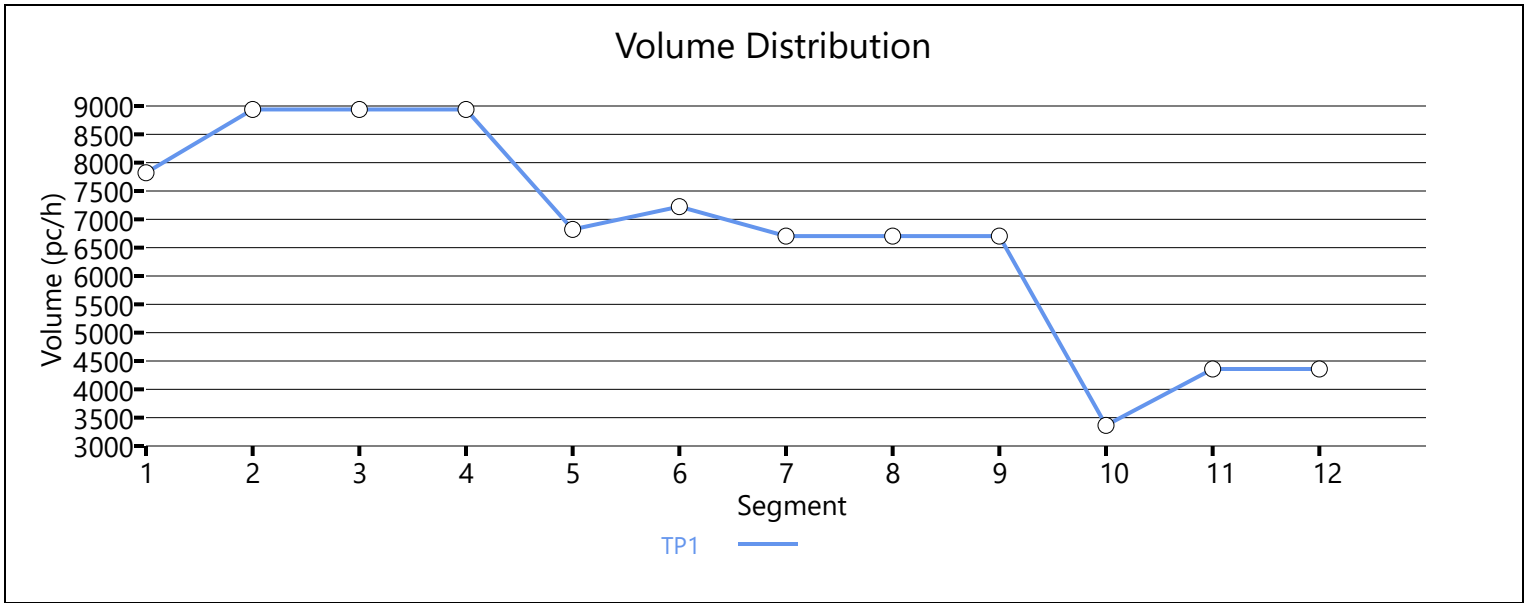
Space Mean Speed, mi/h	54.0	Density, veh/mi/ln	33.3
Average Travel Time, min	12.30	Density, pc/mi/ln	35.8

Messages

WARNING 1	Oversaturated conditions currently exist in boundary time period 1. Results may not be reliable. Consider expanding analysis in time and/or space to resolve this warning.
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Comments

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HCS7 Freeway Facilities Report

Project Information

Analyst	KM	Date	5/7/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	PM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - Build Alt. 1-3	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	3
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.04		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Diverge	Diverge	I-71 NB CD diverge at Polaris Pkwy	1500	3
2	Basic	Basic	I-71 NB CD btwn Polaris Pkwy diverge and merge	2500	2
3	Merge	Basic	I-71 NB CD merge at Polaris Pkwy	1500	3

Facility Segment Data

Segment 1: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.980	0.980	3930	2540	6600	4200	0.60	0.60	52.9	50.5	24.8	31.5	D

Segment 2: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	1389	4484	0.31	54.1	12.8	B

Segment 3: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.980	0.962	1909	520	6900	2100	0.28	0.25	59.8	-	10.6	-	A

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	54.7	16.0	15.6	1.10	B

Facility Overall Results

Space Mean Speed, mi/h	54.7	Density, veh/mi/ln	15.6
Average Travel Time, min	1.10	Density, pc/mi/ln	16.0

Messages

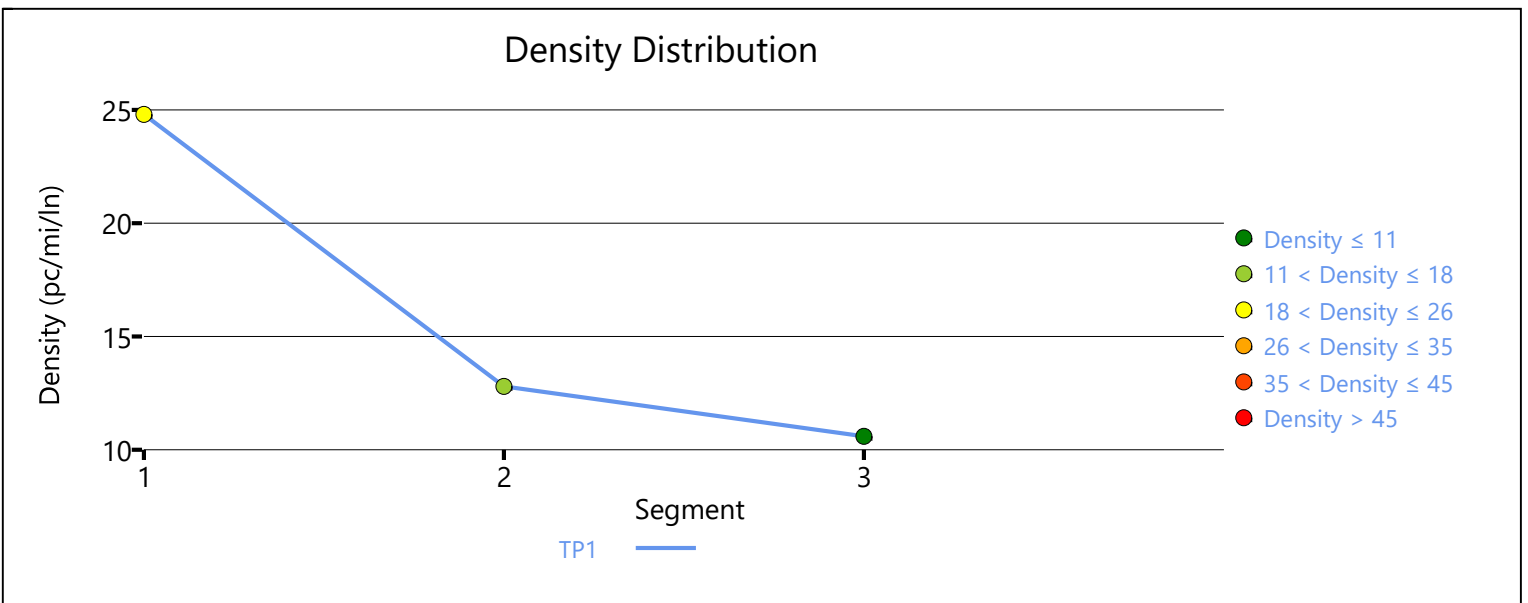
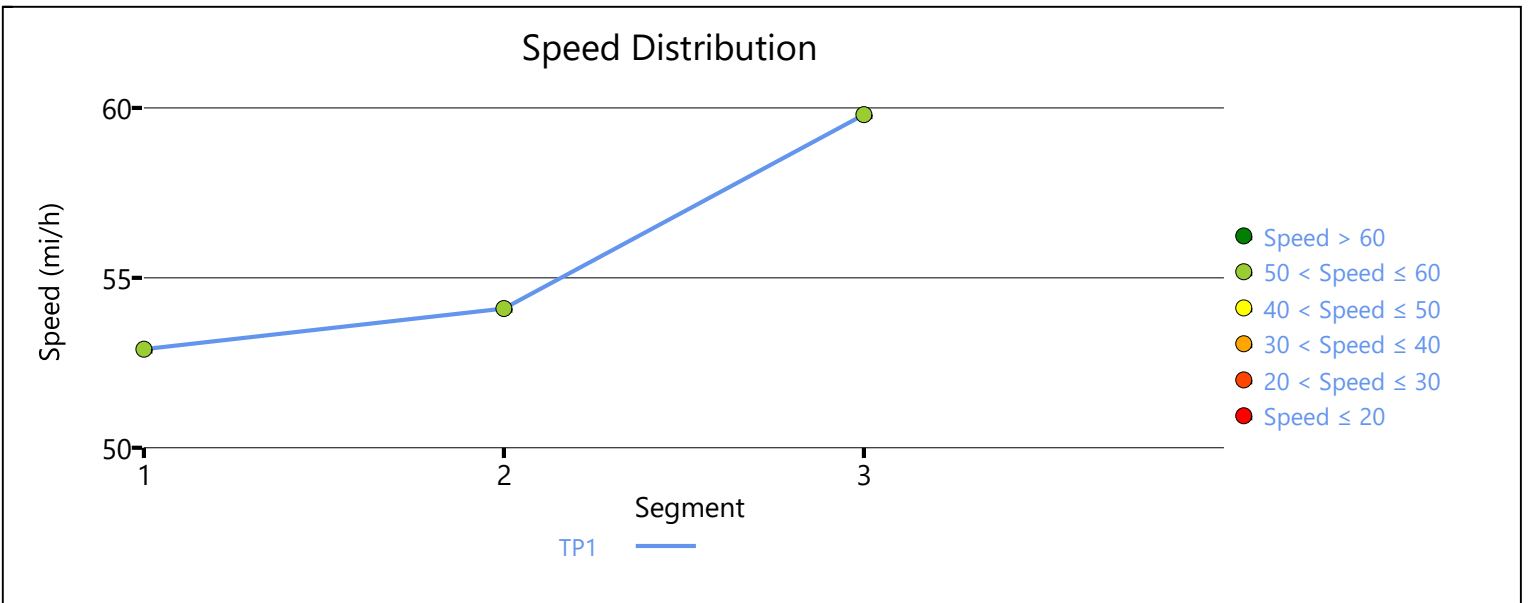
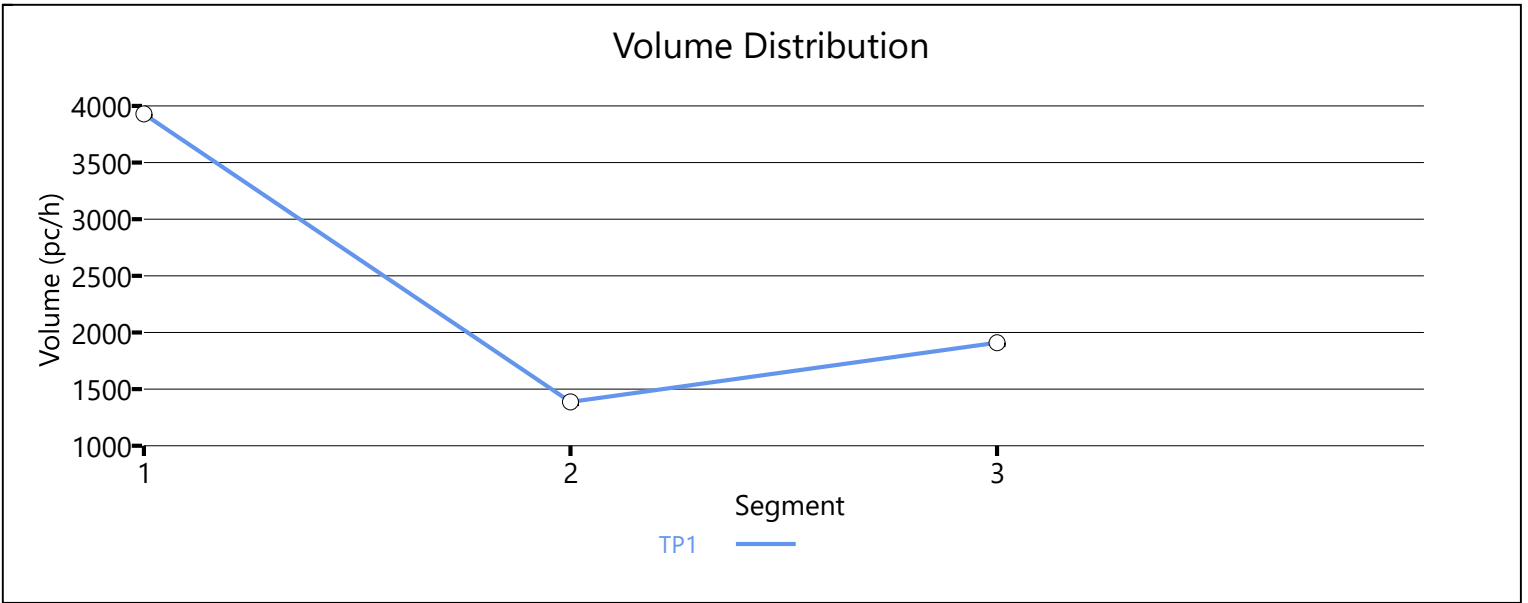
WARNING 1

Beginning and ending the facility with a basic freeway segment is highly recommended. Use caution when interpreting results of a Freeway Facility without a basic segment bounding the beginning and end of the facility.

WARNING 2

Beginning and ending the facility with a basic freeway segment is highly recommended. Use caution when interpreting results of a Freeway Facility without a basic segment bounding the beginning and end of the facility.

Comments



HCS7 Freeway Facilities Report

Project Information

Analyst	KM	Date	5/7/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	PM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - Build Alt. 1-3	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	3
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.57		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Diverge	Diverge	I-71 NB CD diverge at Sunbury Pkwy	1500	2
2	Basic	Basic	I-71 NB CD bwtm Sunbury diverge and merge	5280	2
3	Merge	Merge	I-71 NB CD merge at Sunbury Pkwy	1500	2

Facility Segment Data

Segment 1: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.962	0.962	3340	1891	4400	2100	0.76	0.90	51.6	51.6	32.4	19.5	B

Segment 2: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.962	1449	4484	0.32	54.2	13.4	B

Segment 3: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.962	0.962	1659	210	4400	2100	0.38	0.10	55.2	55.2	15.0	13.4	B

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	53.5	17.1	16.5	1.80	B

Facility Overall Results

Space Mean Speed, mi/h	53.5	Density, veh/mi/ln	16.5
Average Travel Time, min	1.80	Density, pc/mi/ln	17.1

Messages

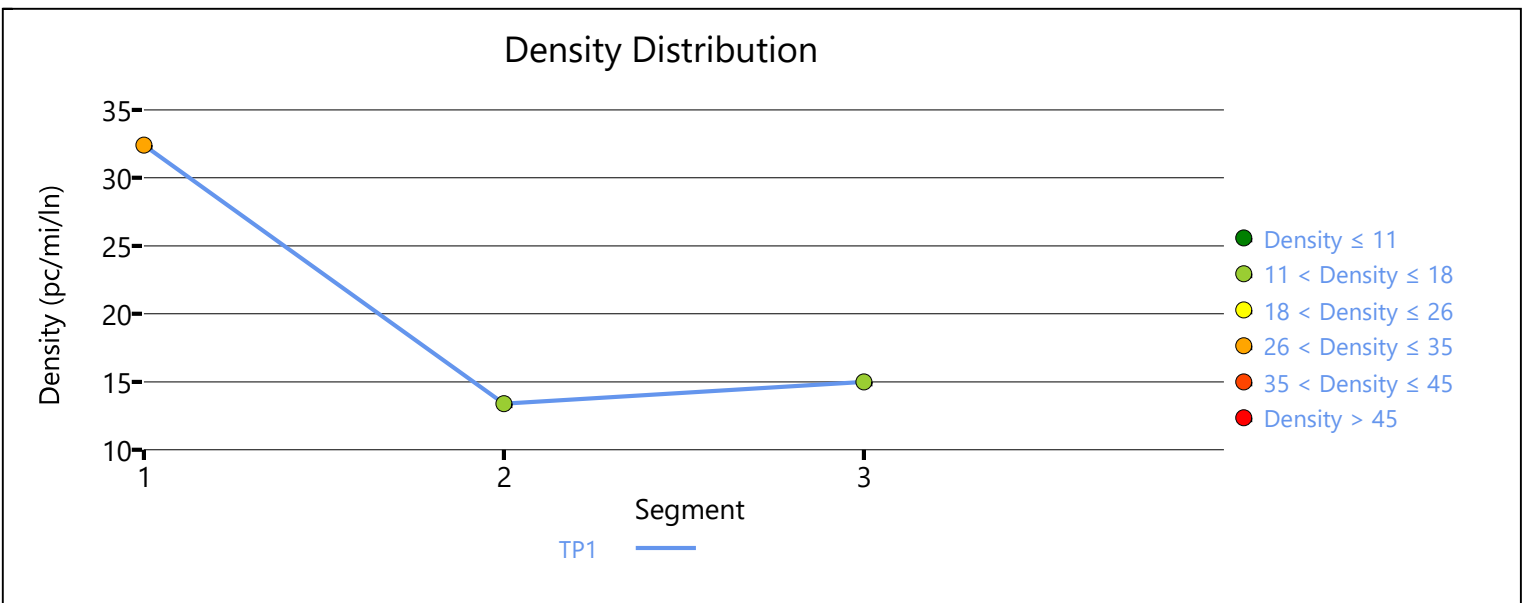
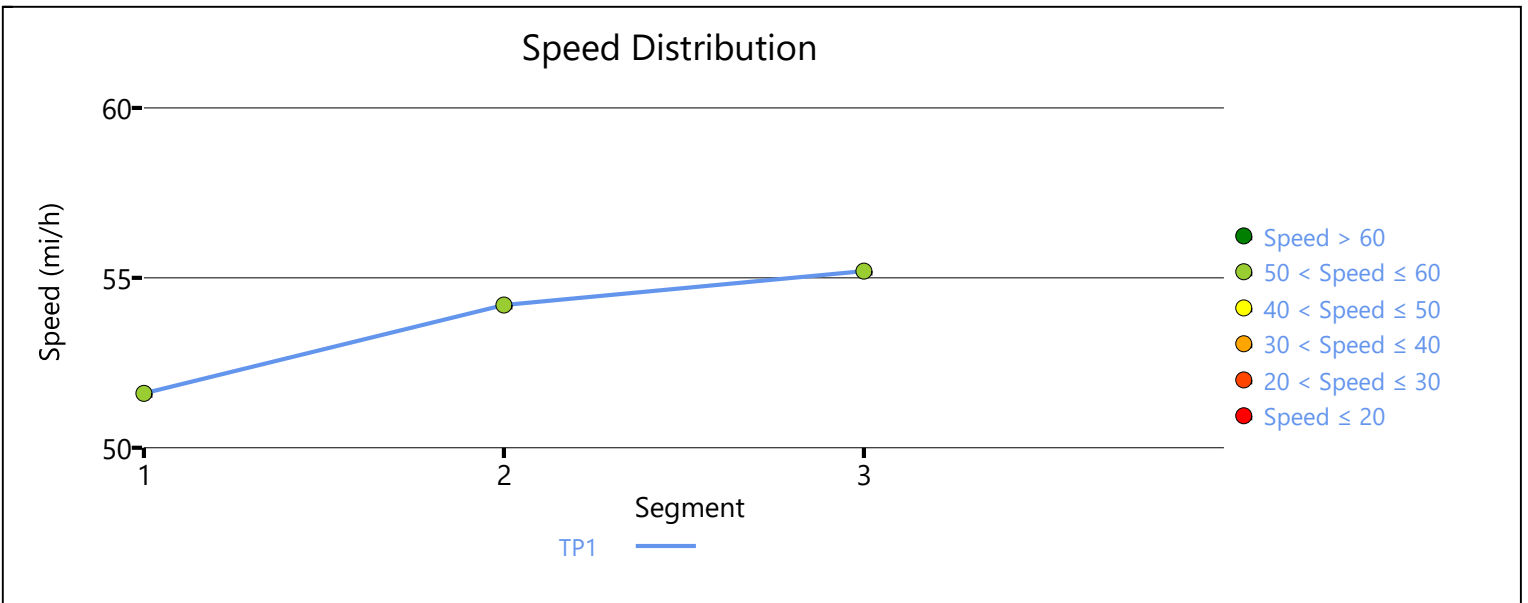
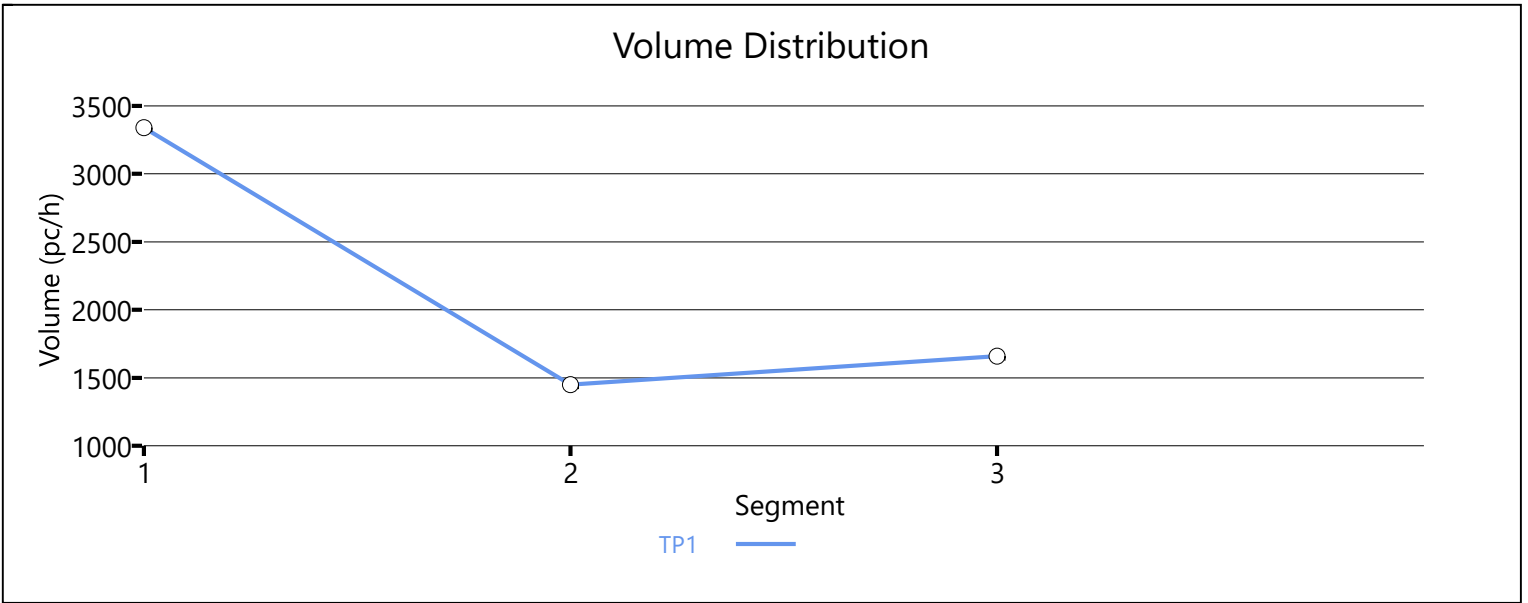
WARNING 1

Beginning and ending the facility with a basic freeway segment is highly recommended. Use caution when interpreting results of a Freeway Facility without a basic segment bounding the beginning and end of the facility.

WARNING 2

Beginning and ending the facility with a basic freeway segment is highly recommended. Use caution when interpreting results of a Freeway Facility without a basic segment bounding the beginning and end of the facility.

Comments



HCS7 Freeway Facilities Report

Project Information

Analyst	KM	Date	5/7/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	PM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - Build Alt. 1	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	19
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	12.14		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-71 SB N of US36/SR37	5280	3
2	Diverge	Diverge	I-71 SB diverge at US36/SR37	1500	3
3	Basic	Basic	I-71 SB btwn US36/SR37 diverge and merge	2400	3
4	Merge	Merge	I-71 SB merge at US36/SR37	1500	3
5	Basic	Basic	I-71 SB btwn US36/SR37 and Sunbury Pkwy	3000	3
6	Merge	Merge	I-71 SB merge at Sunbury Pkwy Loop Ramp	1500	3
7	Basic	Basic	I-71 SB btwn Sunbury Pkwy merges	2000	3
8	Merge	Merge	I-71 SB merge at Sunbury Pkwy	1500	3
9	Basic	Basic	I-71 SB btwn Sunbury Pkwy and Big Walnut Rd	22250	3
10	Diverge	Diverge	I-71 SB diverge at Big Walnut Rd	1500	3
11	Basic	Basic	I-71 SB btwn Big Walnut Rd diverge and merge	1500	3
12	Merge	Merge	I-71 SB merge at Big Walnut Rd	1500	3
13	Basic	Basic	I-71 SB btwn Big Walnut Rd and Gemini Pl	8250	3
14	Diverge	Diverge	I-71 SB diverge at Gemini Pl	1500	3
15	Basic	Basic	I-71 SB btwn Gemini Pl/Polaris Pkwy diverge and merge	3000	3
16	Merge	Merge	I-71 SB merge at Gemini Pl	1500	3
17	Basic	Basic	I-71 SB btwn Gemini Pl and Polaris Pkwy	1000	3
18	Merge	Merge	I-71 SB merge at Polaris Pkwy	1500	5
19	Basic	Basic	I-71 SB btwn Polaris Pkwy and I-270	1900	5

Facility Segment Data

Segment 1: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.917		3852		7200		0.54		72.3		17.8		B
Segment 2: Diverge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.917	0.909	3852	1182	7200	2200	0.54	0.54	69.7	66.0	18.4	20.3	C
Segment 3: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.926		2654		7200		0.37		72.6		12.2		B
Segment 4: Merge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.943	3252	598	7200	2200	0.45	0.27	68.5	66.5	15.8	16.8	B
Segment 5: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.926		3263		7200		0.45		72.6		15.0		B
Segment 6: Merge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.962	3440	177	7200	2000	0.48	0.09	68.0	65.7	16.9	16.6	B
Segment 7: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.926		3447		7200		0.48		72.4		15.8		B
Segment 8: Merge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.962	4265	818	7200	2200	0.59	0.37	67.3	65.3	21.1	22.1	C
Segment 9: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.935		4255		7200		0.59		71.5		19.8		C
Segment 10: Diverge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.926	4297	391	7200	2100	0.60	0.19	68.7	64.0	20.8	15.4	B

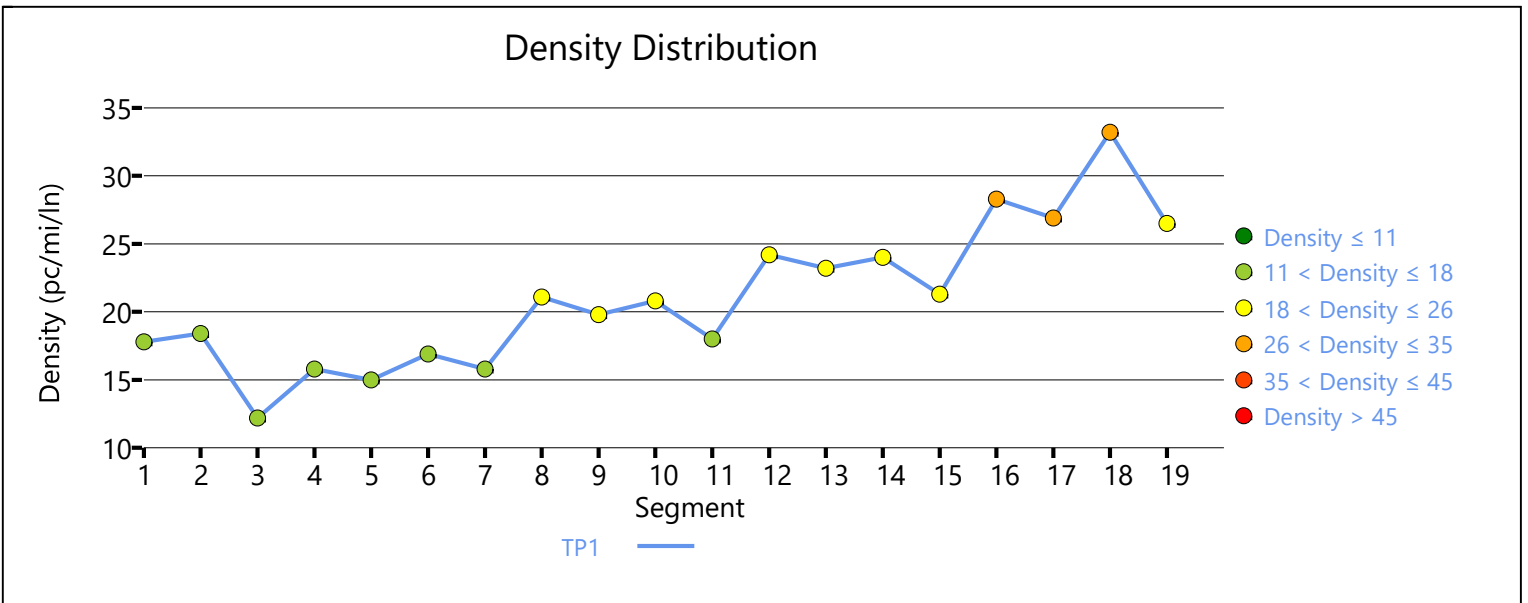
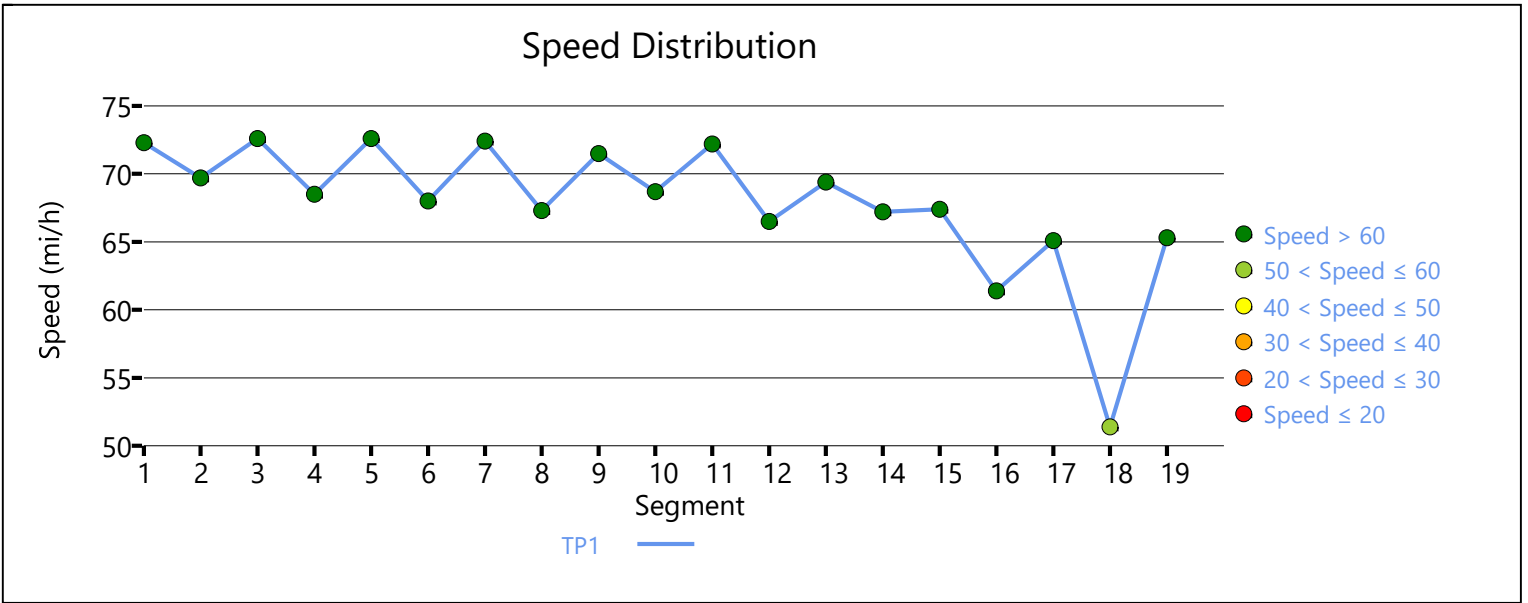
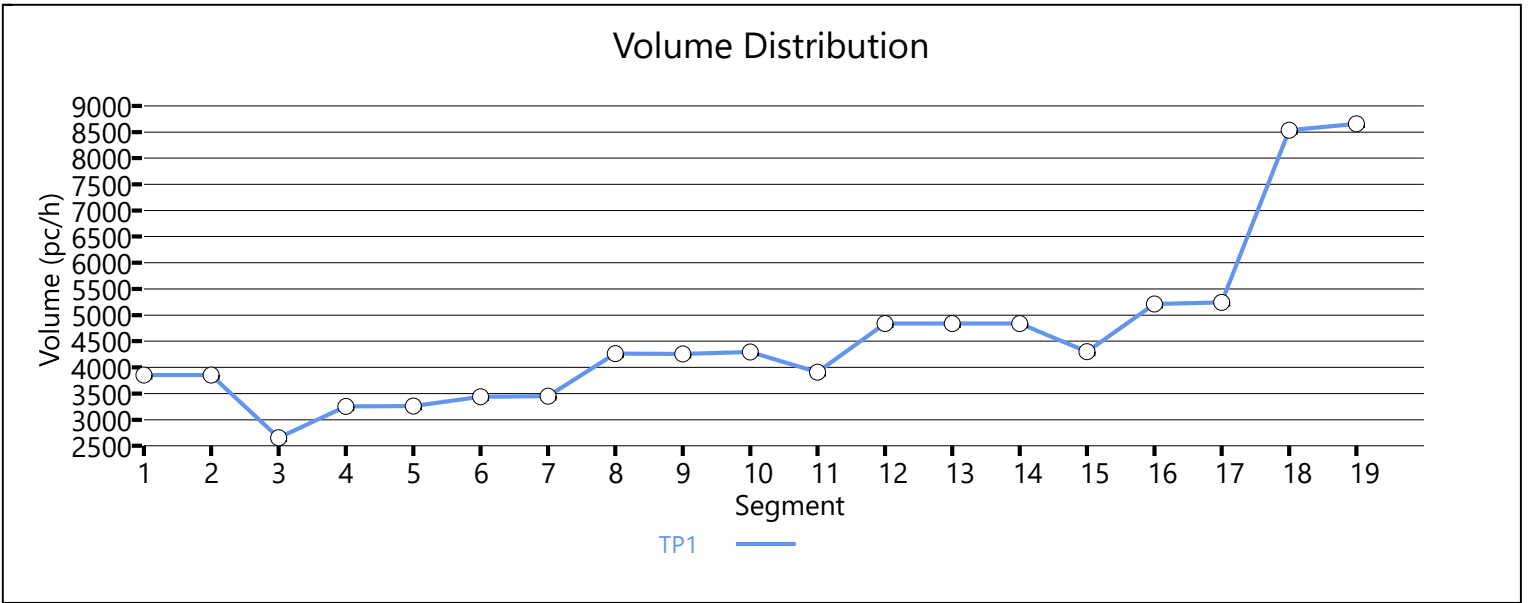
Segment 11: Basic																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
1	0.94		0.926		3906		7200		0.54		72.2		18.0		B	
Segment 12: Merge																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp		
1	0.94	0.94	0.926	0.971	4837	931	7200	2200	0.67	0.42	66.5	64.5	24.2	24.6	C	
Segment 13: Basic																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
1	0.94		0.935		4836		7200		0.67		69.4		23.2		C	
Segment 14: Diverge																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp		
1	0.94	0.94	0.935	0.971	4836	515	7200	2200	0.67	0.23	67.2	64.0	24.0	26.1	C	
Segment 15: Basic																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
1	0.94		0.935		4301		7131		0.60		67.4		21.3		C	
Segment 16: Merge																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp		
1	0.94	0.94	0.935	0.971	5210	909	7200	2200	0.72	0.41	61.4	59.5	28.3	28.1	D	
Segment 17: Basic																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
1	0.94		0.935		5245		7131		0.74		65.1		26.9		D	
Segment 18: Merge																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp		
1	0.94	0.94	0.935	0.971	8532	3287	12000	4400	0.71	0.75	51.4	46.0	33.2	42.4	E	
Segment 19: Basic																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
1	0.94		0.935		8659		11885		0.73		65.3		26.5		D	
Facility Time Period Results																
T	Speed, mi/h				Density, pc/mi/ln				Density, veh/mi/ln				Travel Time, min		LOS	
1	68.6				20.7				19.2				10.60		C	

Facility Overall Results

Space Mean Speed, mi/h	68.6	Density, veh/mi/ln	19.2
Average Travel Time, min	10.60	Density, pc/mi/ln	20.7

Messages**Comments**

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HCS7 Freeway Facilities Report

Project Information

Analyst	KM	Date	5/7/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	PM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - Build Alt. 2	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	19
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	11.34		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-71 SB N of US36/SR37	5280	3
2	Diverge	Diverge	I-71 SB diverge at US36/SR37	1500	3
3	Basic	Basic	I-71 SB btwn US36/SR37 diverge and merge	2400	3
4	Merge	Merge	I-71 SB merge at US36/SR37	1500	3
5	Basic	Basic	I-71 SB btwn US36/SR37 and Sunbury Pkwy	3000	3
6	Merge	Merge	I-71 SB merge at Sunbury Pkwy Loop Ramp	1500	3
7	Basic	Basic	I-71 SB btwn Sunbury Pkwy merges	2000	3
8	Merge	Merge	I-71 SB merge at Sunbury Pkwy	1500	3
9	Basic	Basic	I-71 SB btwn Sunbury Pkwy and Africa Rd	19650	3
10	Diverge	Diverge	I-71 SB diverge at Africa Rd	1500	3
11	Basic	Basic	I-71 SB btwn Africa Rd diverge and merge	2000	3
12	Merge	Merge	I-71 SB merge at Africa Rd	1500	3
13	Basic	Basic	I-71 SB btwn Africa Rd and Gemini Pl	6150	3
14	Diverge	Diverge	I-71 SB diverge at Gemini Pl	1500	3
15	Basic	Basic	I-71 SB btwn Gemini Pl diverge and merge	3000	3
16	Merge	Merge	I-71 SB merge at Gemini Pl	1500	3
17	Basic	Basic	I-71 SB btwn Gemini Pl and Polaris Pkwy	1000	3
18	Merge	Merge	I-71 SB merge at Polaris Pkwy	1500	5
19	Basic	Basic	I-71 SB btwn Polaris Pkwy and I-270	1900	5

Facility Segment Data

Segment 1: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.917		3794		7200		0.53		72.4		17.5		B
Segment 2: Diverge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.917	0.909	3794	1182	7200	2200	0.53	0.54	69.7	66.0	18.1	20.0	B
Segment 3: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.926		2596		7200		0.36		72.6		11.9		B
Segment 4: Merge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.943	3194	598	7200	2200	0.44	0.27	68.6	66.6	15.5	16.5	B
Segment 5: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.926		3205		7200		0.45		72.6		14.7		B
Segment 6: Merge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.962	3382	177	7200	2000	0.47	0.09	68.0	65.7	16.6	16.3	B
Segment 7: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.926		3389		7200		0.47		72.4		15.5		B
Segment 8: Merge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.962	4207	818	7200	2200	0.58	0.37	67.4	65.4	20.8	21.9	C
Segment 9: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.935		4198		7200		0.58		71.6		19.5		C
Segment 10: Diverge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.926	4239	425	7200	2100	0.59	0.20	68.6	63.9	20.6	15.2	B

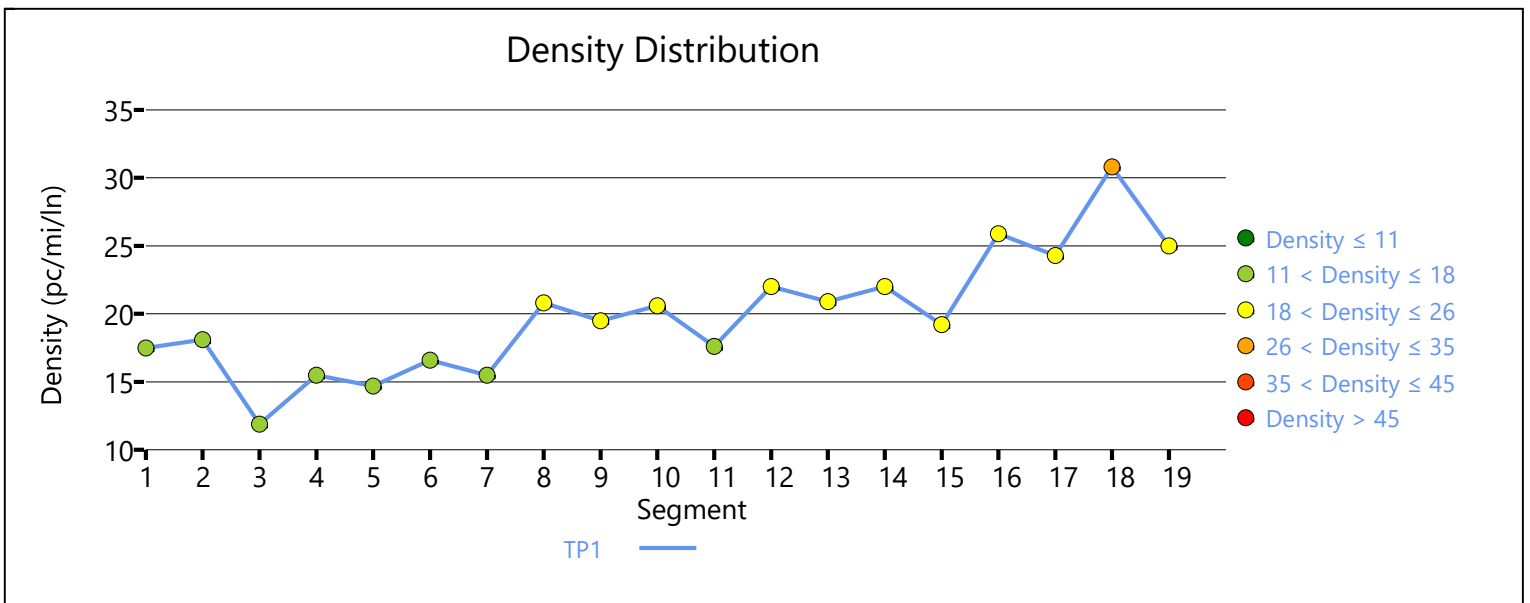
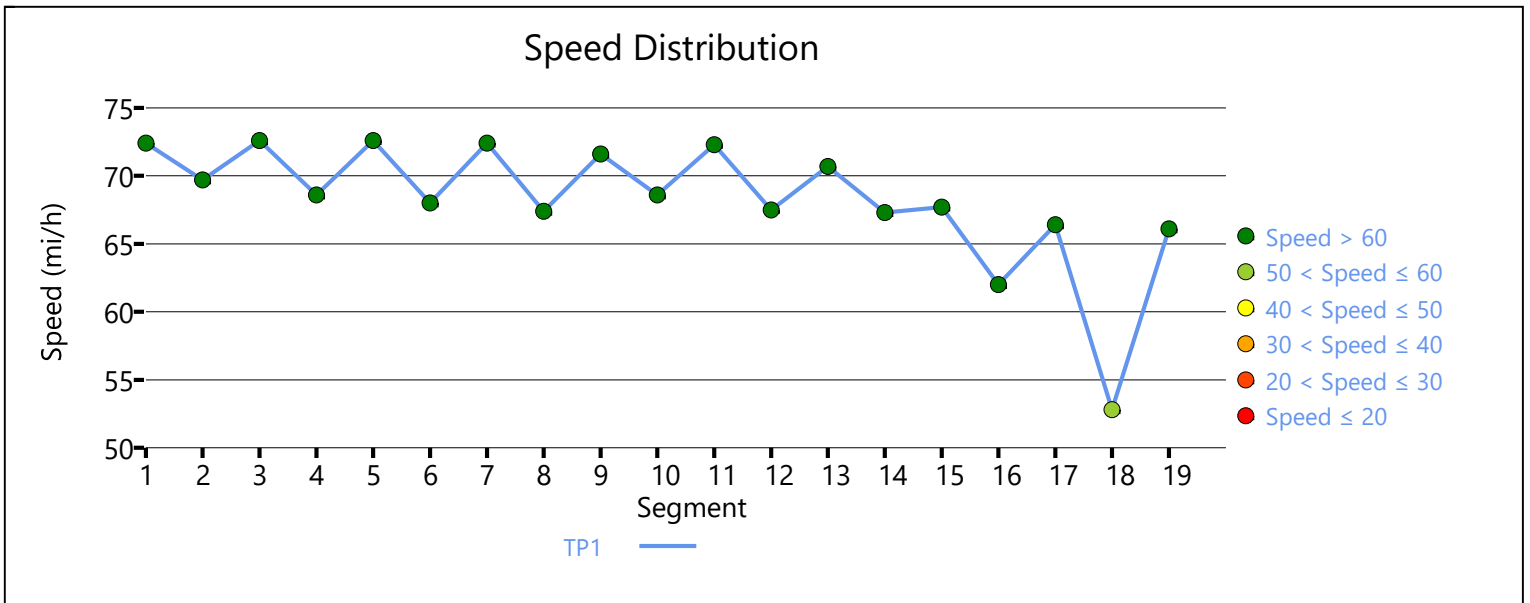
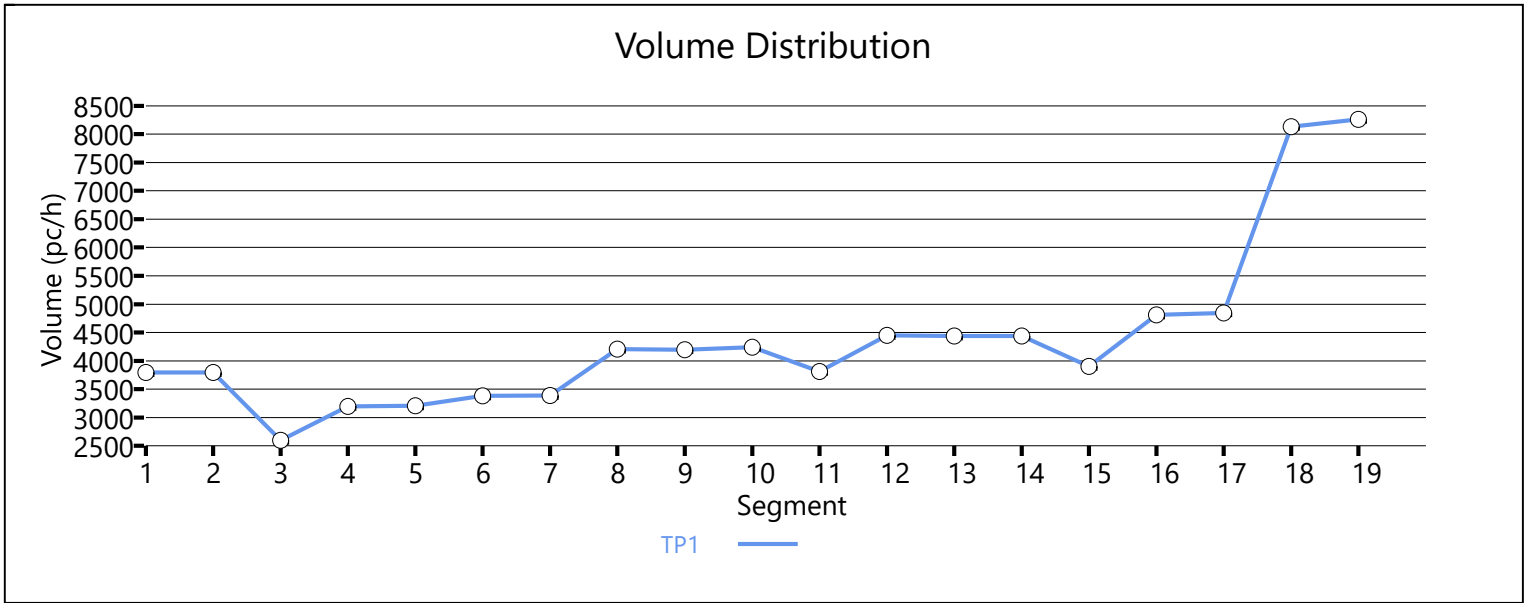
Segment 11: Basic																	
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS		
1	0.94		0.926		3814		7200		0.53		72.3		17.6		B		
Segment 12: Merge																	
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS		
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp			
1	0.94	0.94	0.926	0.971	4449	635	7200	2200	0.62	0.29	67.5	65.6	22.0	22.0	C		
Segment 13: Basic																	
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS		
1	0.94		0.935		4437		7200		0.62		70.7		20.9		C		
Segment 14: Diverge																	
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS		
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp			
1	0.94	0.94	0.935	0.971	4437	515	7200	2200	0.62	0.23	67.3	64.0	22.0	24.4	C		
Segment 15: Basic																	
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS		
1	0.94		0.935		3903		7131		0.55		67.7		19.2		C		
Segment 16: Merge																	
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS		
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp			
1	0.94	0.94	0.935	0.971	4812	909	7200	2200	0.67	0.41	62.0	60.2	25.9	26.3	C		
Segment 17: Basic																	
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS		
1	0.94		0.935		4847		7131		0.68		66.4		24.3		C		
Segment 18: Merge																	
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS		
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp			
1	0.94	0.94	0.935	0.971	8134	3287	12000	4400	0.68	0.75	52.8	47.8	30.8	41.5	E		
Segment 19: Basic																	
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS		
1	0.94		0.935		8260		11885		0.69		66.1		25.0		C		
Facility Time Period Results																	
T	Speed, mi/h				Density, pc/mi/ln				Density, veh/mi/ln				Travel Time, min				LOS
1	69.0				19.7				18.3				9.90				C

Facility Overall Results

Space Mean Speed, mi/h	69.0	Density, veh/mi/ln	18.3
Average Travel Time, min	9.90	Density, pc/mi/ln	19.7

Messages**Comments**

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HCS7 Freeway Facilities Report

Project Information

Analyst	KM	Date	5/7/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	PM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - Build Alt. 3	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	19
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	12.14		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-71 SB N of US36/SR37	5280	3
2	Diverge	Diverge	I-71 SB diverge at US36/SR37	1500	3
3	Basic	Basic	I-71 SB btwn US36/SR37 diverge and merge	2400	3
4	Merge	Merge	I-71 SB merge at US36/SR37	1500	3
5	Basic	Basic	I-71 SB btwn US36/SR37 and Sunbury Pkwy	3000	3
6	Merge	Merge	I-71 SB merge at Sunbury Pkwy Loop Ramp	1500	3
7	Basic	Basic	I-71 SB btwn Sunbury Pkwy merges	2000	3
8	Merge	Merge	I-71 SB merge at Sunbury Pkwy	1500	3
9	Basic	Basic	I-71 SB btwn Sunbury Pkwy and Big Walnut Rd	22250	3
10	Diverge	Diverge	I-71 SB diverge at Big Walnut Rd	1500	3
11	Basic	Basic	I-71 SB btwn Big Walnut Rd diverge and merge	2000	3
12	Merge	Merge	I-71 SB merge at Big Walnut Rd	1500	3
13	Basic	Basic	I-71 SB btwn Big Walnut Rd and Gemini PI	7750	3
14	Diverge	Diverge	I-71 SB diverge at Gemini PI	1500	3
15	Basic	Basic	I-71 SB btwn Gemini PI diverge and merge	3000	3
16	Merge	Merge	I-71 SB merge at Gemini PI	1500	3
17	Basic	Basic	I-71 SB btwn Gemini PI and Polaris Pkwy	1000	3
18	Merge	Merge	I-71 SB merge at Polaris Pkwy	1500	5
19	Basic	Basic	I-71 SB btwn Polaris Pkwy and I-270	1900	5

Facility Segment Data

Segment 1: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.917		2703		7200		0.38		72.7		12.4		B
Segment 2: Diverge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.917	0.909	2703	1182	7200	2200	0.38	0.54	68.8	66.0	13.1	14.7	B
Segment 3: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.926		1516		7200		0.21		72.5		6.9		A
Segment 4: Merge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.943	2114	598	7200	2200	0.29	0.27	69.1	67.1	10.2	11.4	B
Segment 5: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.926		2125		7200		0.30		72.6		9.7		A
Segment 6: Merge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.962	2302	177	7200	2000	0.32	0.09	68.8	66.2	11.2	11.2	B
Segment 7: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.926		2309		7200		0.32		72.5		10.6		A
Segment 8: Merge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.962	3127	818	7200	2200	0.43	0.37	68.4	66.5	15.2	16.8	B
Segment 9: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.935		3129		7200		0.43		72.7		14.3		B
Segment 10: Diverge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.926	3159	310	7200	2100	0.44	0.15	68.7	64.2	15.3	9.8	A

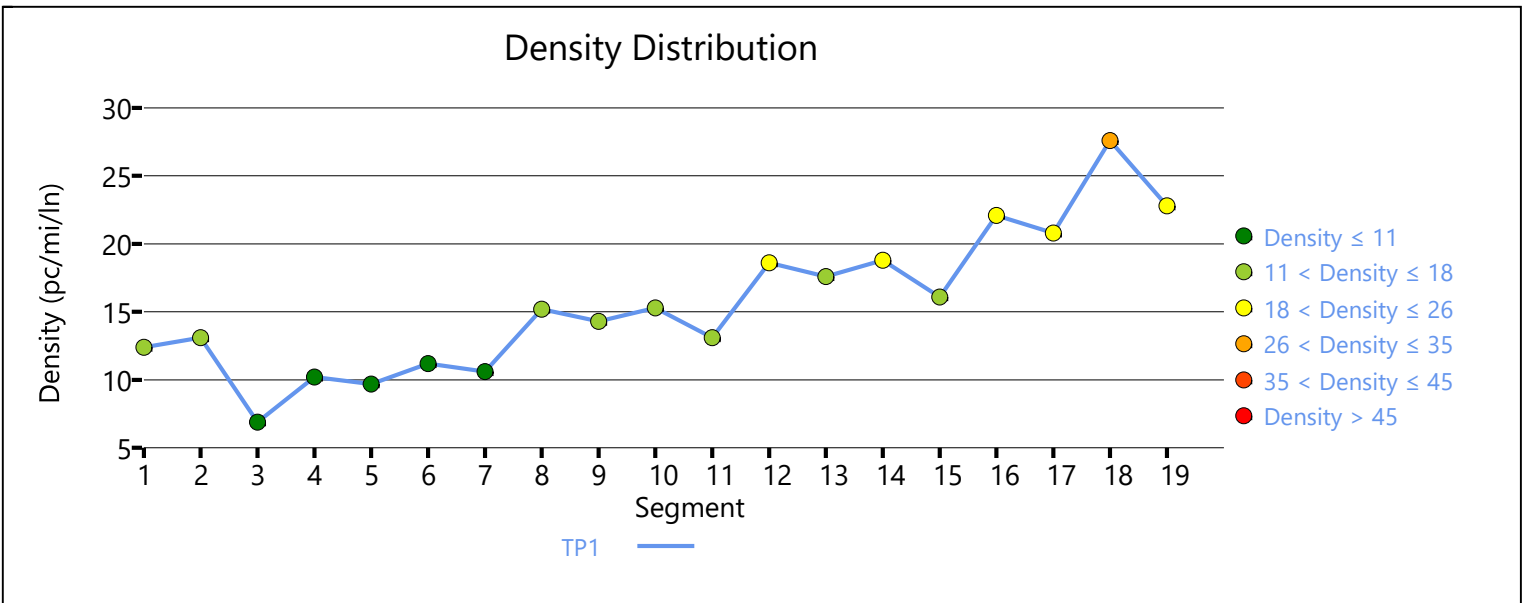
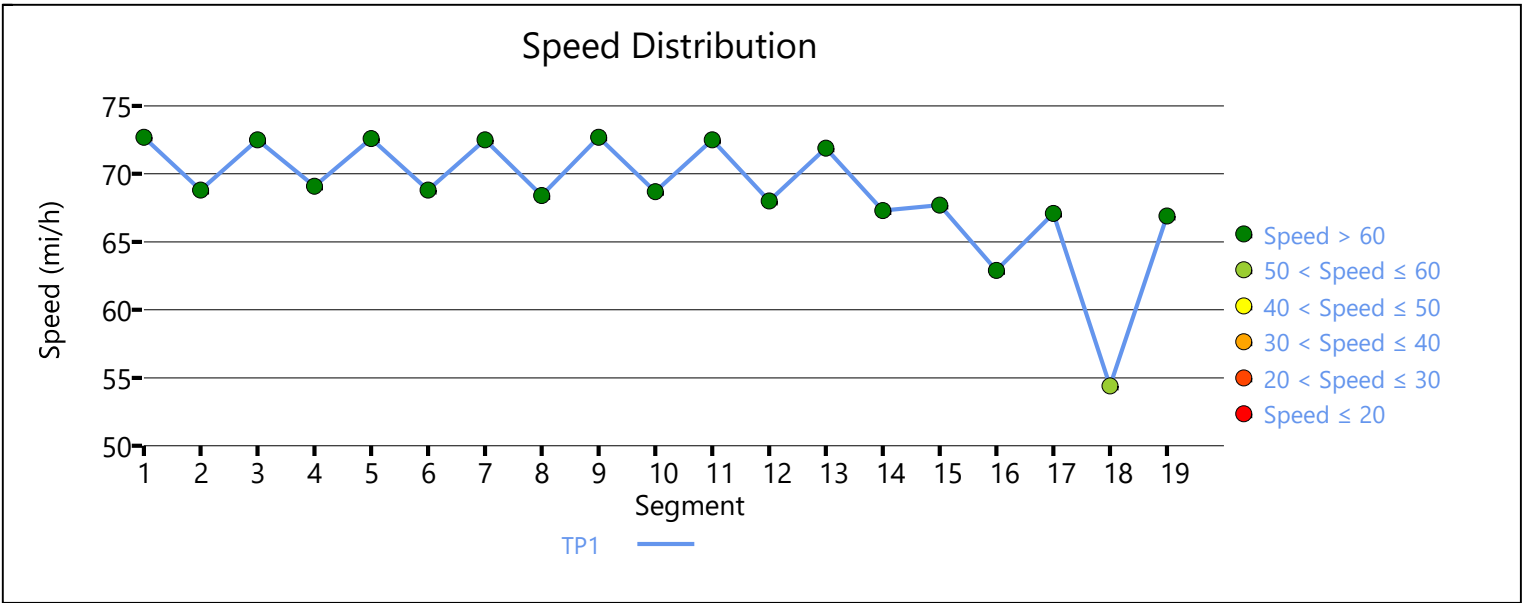
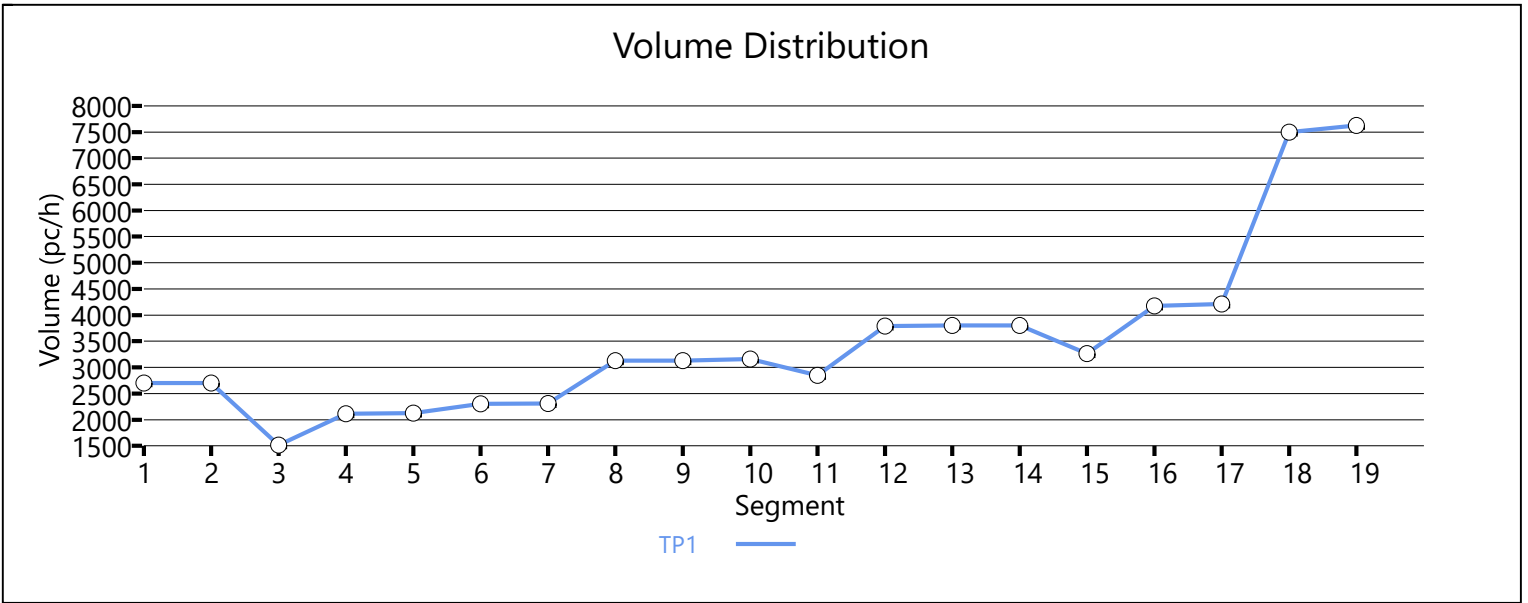
Segment 11: Basic																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
1	0.94		0.926		2849		7200		0.40		72.5		13.1		B	
Segment 12: Merge																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp		
1	0.94	0.94	0.926	0.971	3791	942	7200	2200	0.53	0.43	68.0	66.2	18.6	19.7	B	
Segment 13: Basic																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
1	0.94		0.935		3800		7200		0.53		71.9		17.6		B	
Segment 14: Diverge																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp		
1	0.94	0.94	0.935	0.971	3800	515	7200	2200	0.53	0.23	67.3	64.0	18.8	21.4	C	
Segment 15: Basic																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
1	0.94		0.935		3265		7131		0.46		67.7		16.1		B	
Segment 16: Merge																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp		
1	0.94	0.94	0.935	0.971	4174	909	7200	2200	0.58	0.41	62.9	61.1	22.1	23.3	C	
Segment 17: Basic																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
1	0.94		0.935		4210		7131		0.59		67.1		20.8		C	
Segment 18: Merge																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp		
1	0.94	0.94	0.935	0.971	7497	3287	12000	4400	0.62	0.75	54.4	50.1	27.6	39.9	E	
Segment 19: Basic																
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS	
1	0.94		0.935		7623		11885		0.64		66.9		22.8		C	
Facility Time Period Results																
T	Speed, mi/h				Density, pc/mi/ln				Density, veh/mi/ln				Travel Time, min		LOS	
1	69.6				15.2				14.2				10.50		B	

Facility Overall Results

Space Mean Speed, mi/h	69.6	Density, veh/mi/ln	14.2
Average Travel Time, min	10.50	Density, pc/mi/ln	15.2

Messages**Comments**

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HCS7 Basic Freeway Report

Project Information

Analyst	KM	Date	5/7/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	PM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange (SB Polaris loop on ramp) - Build Alt. 1&3	Unit	United States Customary

Geometric Data

Number of Lanes, ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	45.0	Total Ramp Density (TRD), ramps/mi	2.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	39.2
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	1860	Heavy Vehicle Adjustment Factor (fhv)	0.971
Peak Hour Factor	0.94	Flow Rate (Vp), pc/h/ln	1019
Total Trucks, %	3.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2200
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.46
Passenger Car Equivalent (ET)	2.000		

Speed and Density

Lane Width Adjustment (fLW)	0.0	Average Speed (S), mi/h	39.2
Right-Side Lateral Clearance Adj. (fRLC)	0.0	Density (D), pc/mi/ln	26.0
Total Ramp Density Adjustment	5.8	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	39.2		

HCS7 Basic Freeway Report

Project Information

Analyst	KM	Date	5/7/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	PM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange (SB Polaris EB on ramp) - Build Alt. 1&3	Unit	United States Customary

Geometric Data

Number of Lanes, ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	45.0	Total Ramp Density (TRD), ramps/mi	2.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	39.2
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	4140	Heavy Vehicle Adjustment Factor (fhv)	0.971
Peak Hour Factor	0.94	Flow Rate (Vp), pc/h/ln	2268
Total Trucks, %	3.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2200
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	1.03
Passenger Car Equivalent (ET)	2.000		

Speed and Density

Lane Width Adjustment (fLW)	0.0	Average Speed (S), mi/h	-
Right-Side Lateral Clearance Adj. (fRLC)	0.0	Density (D), pc/mi/ln	-
Total Ramp Density Adjustment	5.8	Level of Service (LOS)	F
Adjusted Free-Flow Speed (FFSadj), mi/h	39.2		

HCS7 Basic Freeway Report

Project Information

Analyst	KM	Date	5/7/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	PM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange (SB Polaris loop on ramp) - Build Alt. 2	Unit	United States Customary

Geometric Data

Number of Lanes, ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	45.0	Total Ramp Density (TRD), ramps/mi	2.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	39.2
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	1860	Heavy Vehicle Adjustment Factor (fhv)	0.971
Peak Hour Factor	0.94	Flow Rate (Vp), pc/h/ln	1019
Total Trucks, %	3.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2200
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.46
Passenger Car Equivalent (ET)	2.000		

Speed and Density

Lane Width Adjustment (fLW)	0.0	Average Speed (S), mi/h	39.2
Right-Side Lateral Clearance Adj. (fRLC)	0.0	Density (D), pc/mi/ln	26.0
Total Ramp Density Adjustment	5.8	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	39.2		

HCS7 Basic Freeway Report

Project Information

Analyst	KM	Date	5/7/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	PM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange (SB Polaris EB on ramp) - Build Alt. 2	Unit	United States Customary

Geometric Data

Number of Lanes, ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	45.0	Total Ramp Density (TRD), ramps/mi	2.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	39.2
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	4140	Heavy Vehicle Adjustment Factor (fhv)	0.971
Peak Hour Factor	0.94	Flow Rate (Vp), pc/h/ln	2268
Total Trucks, %	3.00	Capacity (c), pc/h/ln	2200
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2200
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	1.03
Passenger Car Equivalent (ET)	2.000		

Speed and Density

Lane Width Adjustment (fLW)	0.0	Average Speed (S), mi/h	-
Right-Side Lateral Clearance Adj. (fRLC)	0.0	Density (D), pc/mi/ln	-
Total Ramp Density Adjustment	5.8	Level of Service (LOS)	F
Adjusted Free-Flow Speed (FFSadj), mi/h	39.2		

HCS7 Freeway Facilities Report

Project Information

Analyst	GM	Date	5/21/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	AM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - Build Alt. 1-3 (Constraint)	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	2
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.38		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-71 NB btwn I-270 & Polaris (5-lane)	4300	5
2	Basic	Basic	I-71 NB btwn I-270 & Polaris (6-lane)	3000	6

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.935	7908	11935	0.66	67.4	23.5	C

Segment 2: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.935	7908	14322	0.55	68.6	19.2	C

Facility Time Period Results

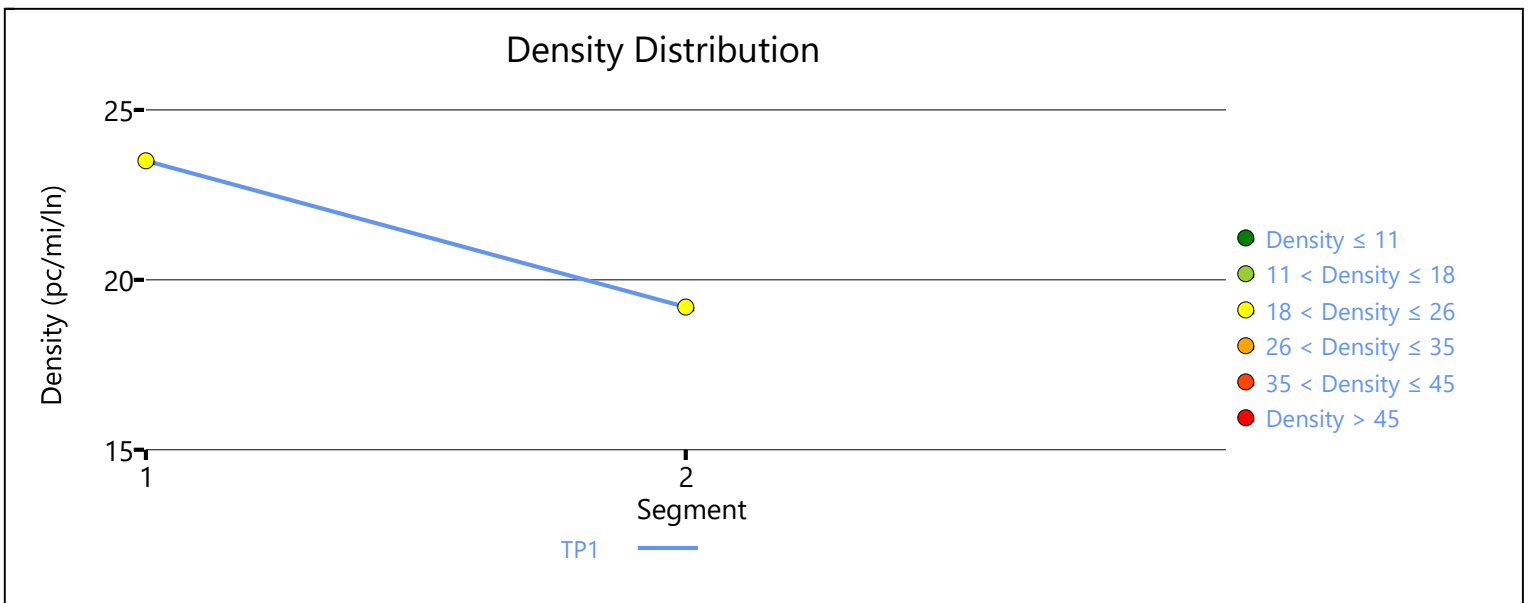
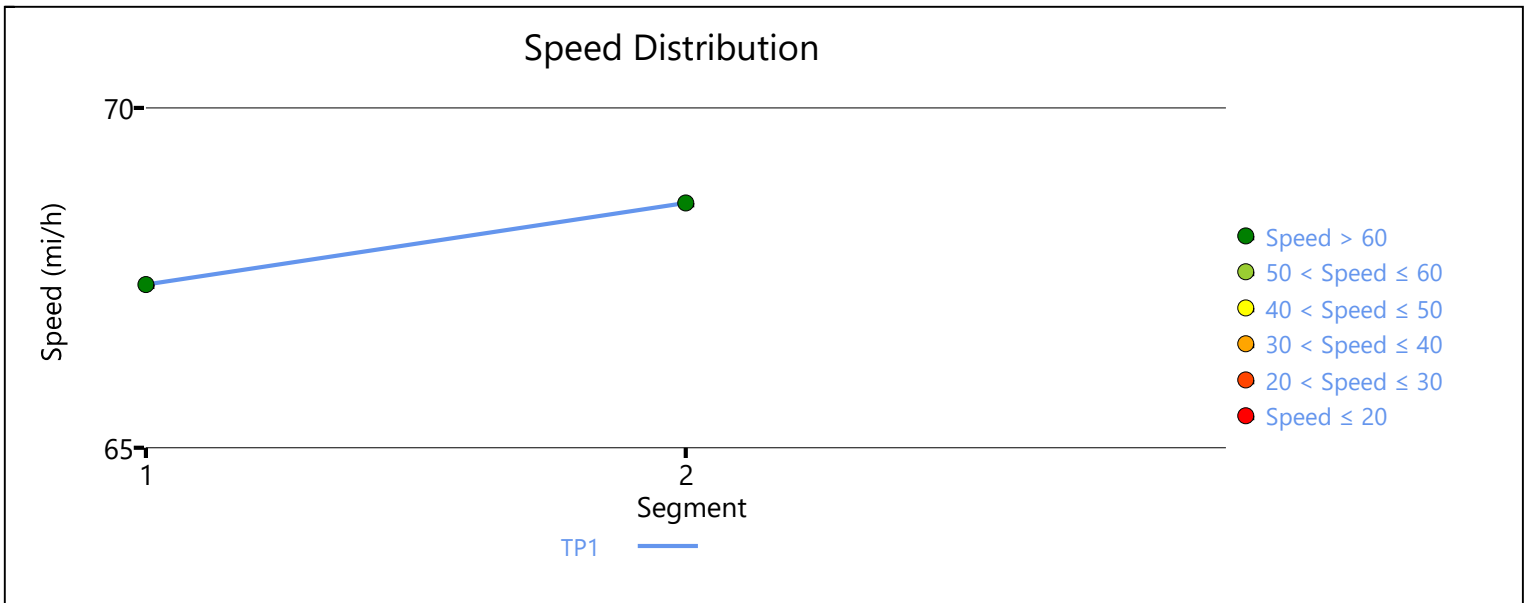
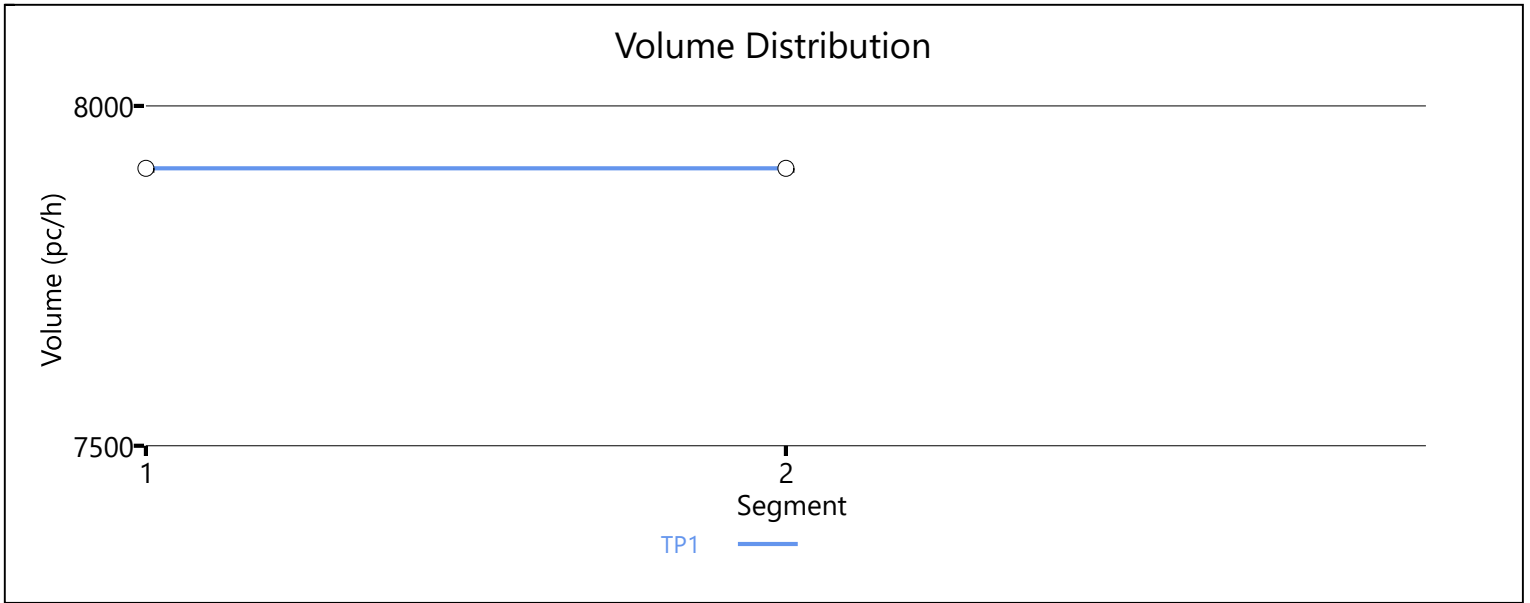
T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	67.9	21.5	20.2	1.20	C

Facility Overall Results

Space Mean Speed, mi/h	67.9	Density, veh/mi/ln	20.2
Average Travel Time, min	1.20	Density, pc/mi/ln	21.5

Messages

Comments



HCS7 Basic Freeway Report

Project Information

Analyst	KM	Date	6/29/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	AM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange at NB Polaris-Gemini off Ramp - Build Alt. 1-3 (Constraint)	Unit	United States Customary

Geometric Data

Number of Lanes, ln	3	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	2.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	54.2
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	4670	Heavy Vehicle Adjustment Factor (fhv)	0.980
Peak Hour Factor	0.94	Flow Rate (Vp), pc/h/ln	1690
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2242
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2242
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.75
Passenger Car Equivalent (ET)	2.000		

Speed and Density

Lane Width Adjustment (fLW)	0.0	Average Speed (S), mi/h	54.2
Right-Side Lateral Clearance Adj. (fRLC)	0.0	Density (D), pc/mi/ln	31.2
Total Ramp Density Adjustment	5.8	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	54.2		

1	0.94	0.94	0.935	0.971	2816	449	9600	2200	0.29	0.20	65.8	62.6	10.7	12.2	B
Segment 3: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.935		2833		9600		0.30		73.2		9.7		A
Segment 4: Diverge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.935	0.980	2833	771	9600	4400	0.30	0.18	74.6	67.2	9.5	2.0	A
Segment 5: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.935		2025		9600		0.21		73.2		6.9		A
Segment 6: Merge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.926	2436	391	9600	2200	0.25	0.18	71.0	67.6	8.6	8.5	A
Segment 7: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.926		2436		9600		0.25		73.1		8.3		A
Segment 8: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.926		2436		7200		0.34		73.2		11.1		B
Segment 9: Diverge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.962	2436	807	7200	4400	0.34	0.18	71.9	67.0	11.3	4.0	A
Segment 10: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.926		1597		7200		0.22		73.2		7.3		A
Segment 11: Merge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.917	0.877	2450	837	7200	2200	0.34	0.38	68.6	66.7	11.9	13.9	B
Segment 12: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS

1	0.94	0.917	2413	7200	0.34	73.2	11.0	A
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Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	72.1	9.7	9.0	9.20	A

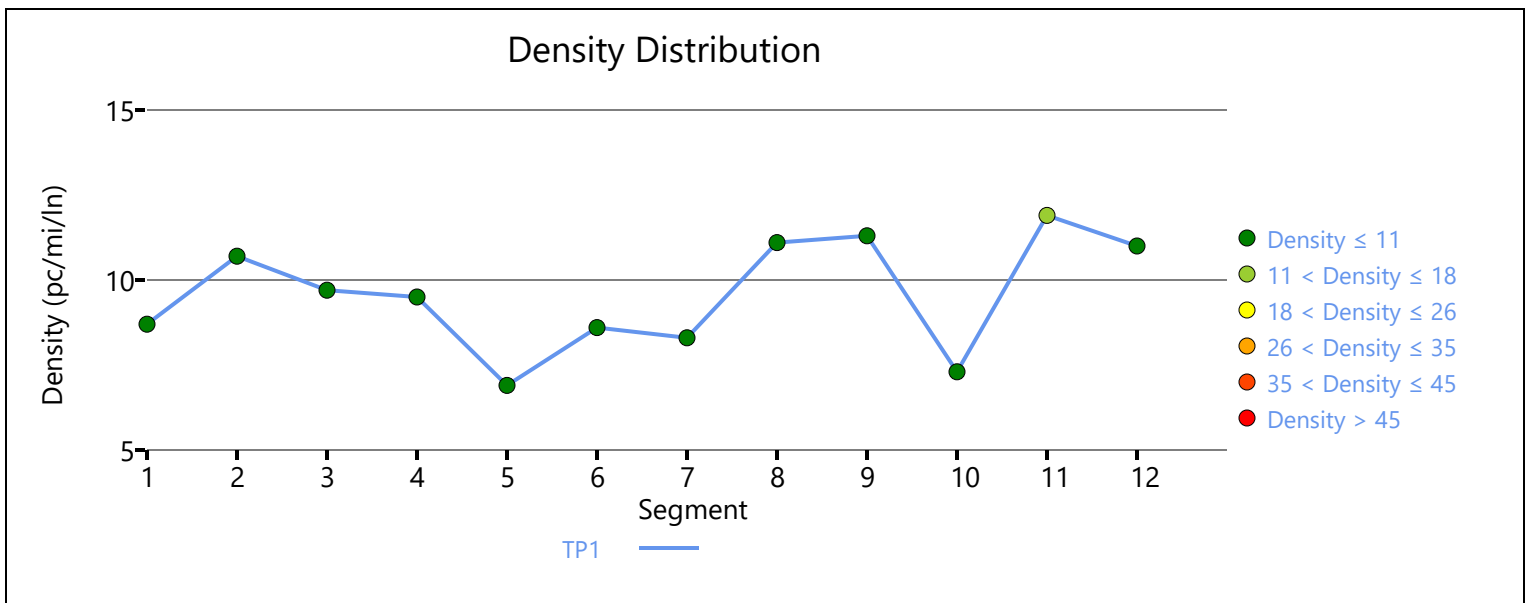
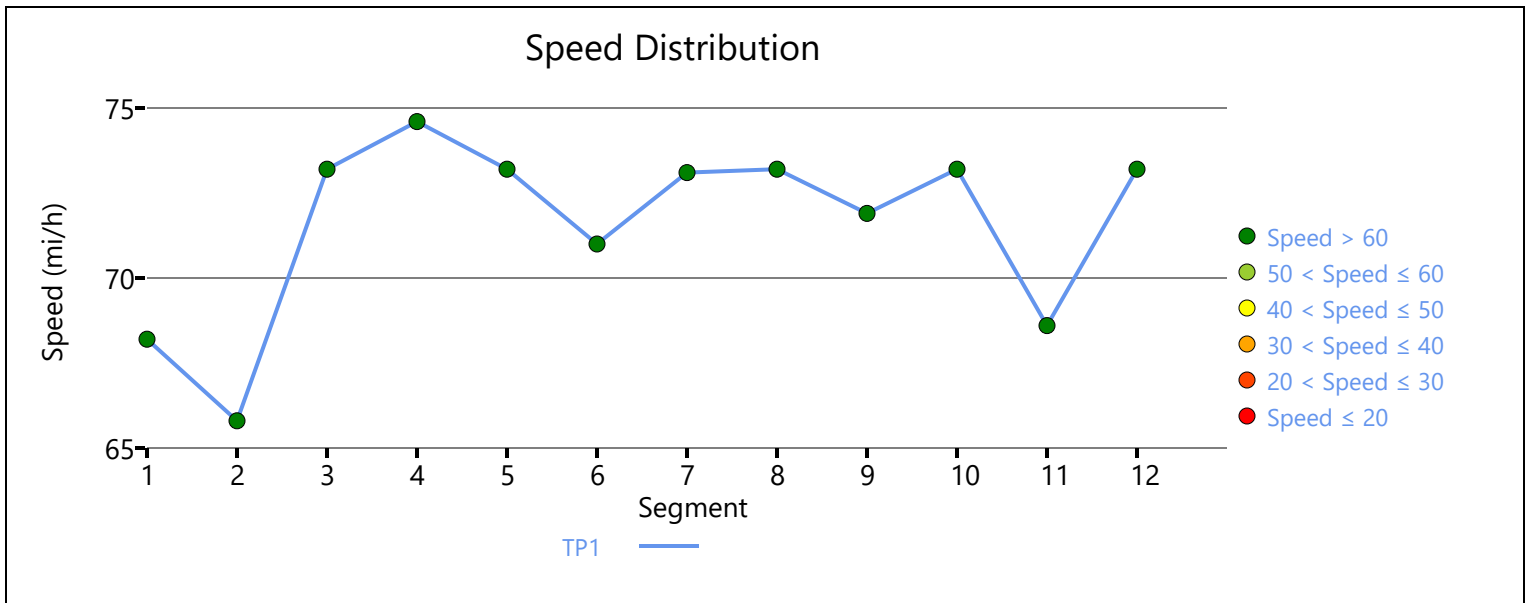
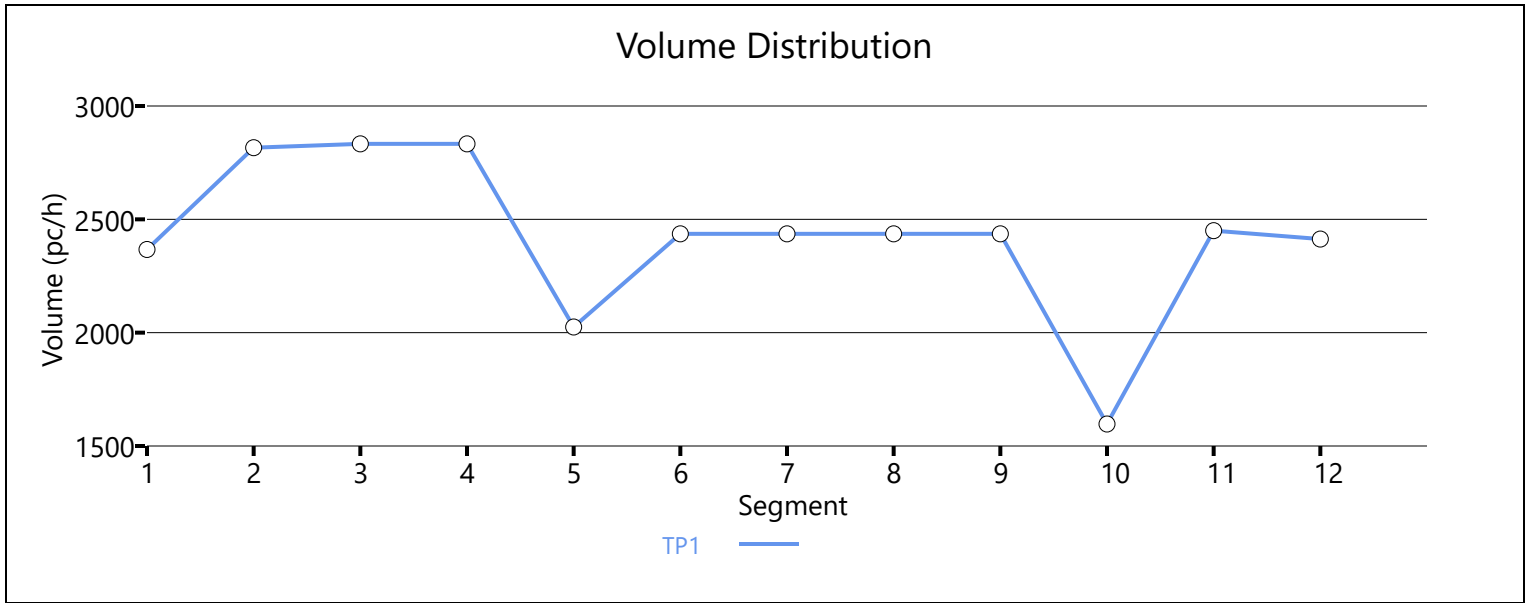
Facility Overall Results

Space Mean Speed, mi/h	72.1	Density, veh/mi/ln	9.0
Average Travel Time, min	9.20	Density, pc/mi/ln	9.7

Messages

Comments

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HCS7 Freeway Facilities Report

Project Information

Analyst	KM	Date	6/29/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	AM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - Build Alt. 1-3 (Constraint)	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	3
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.04		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Diverge	Diverge	I-71 NB CD diverge at Polaris Pkwy	1500	3
2	Basic	Basic	I-71 NB CD btwn Polaris Pkwy diverge and merge	2500	2
3	Merge	Basic	I-71 NB CD merge at Polaris Pkwy	1500	3

Facility Segment Data

Segment 1: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.980	0.980	5069	2920	6600	4200	0.77	0.70	52.8	49.9	32.0	37.7	E

Segment 2: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	2149	4484	0.48	54.1	19.8	C

Segment 3: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.980	0.962	2492	343	6900	2100	0.36	0.16	59.8	-	13.8	-	B

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	54.7	21.8	21.4	1.10	C

Facility Overall Results

Space Mean Speed, mi/h	54.7	Density, veh/mi/ln	21.4
Average Travel Time, min	1.10	Density, pc/mi/ln	21.8

Messages

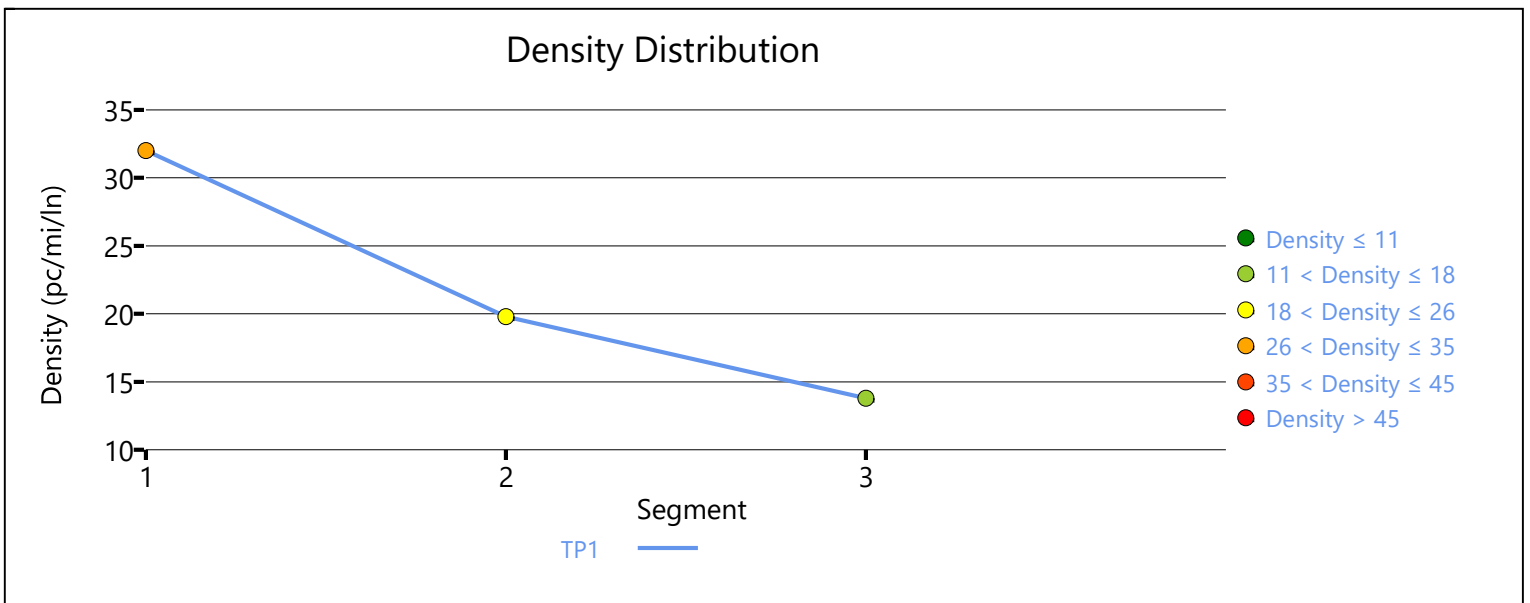
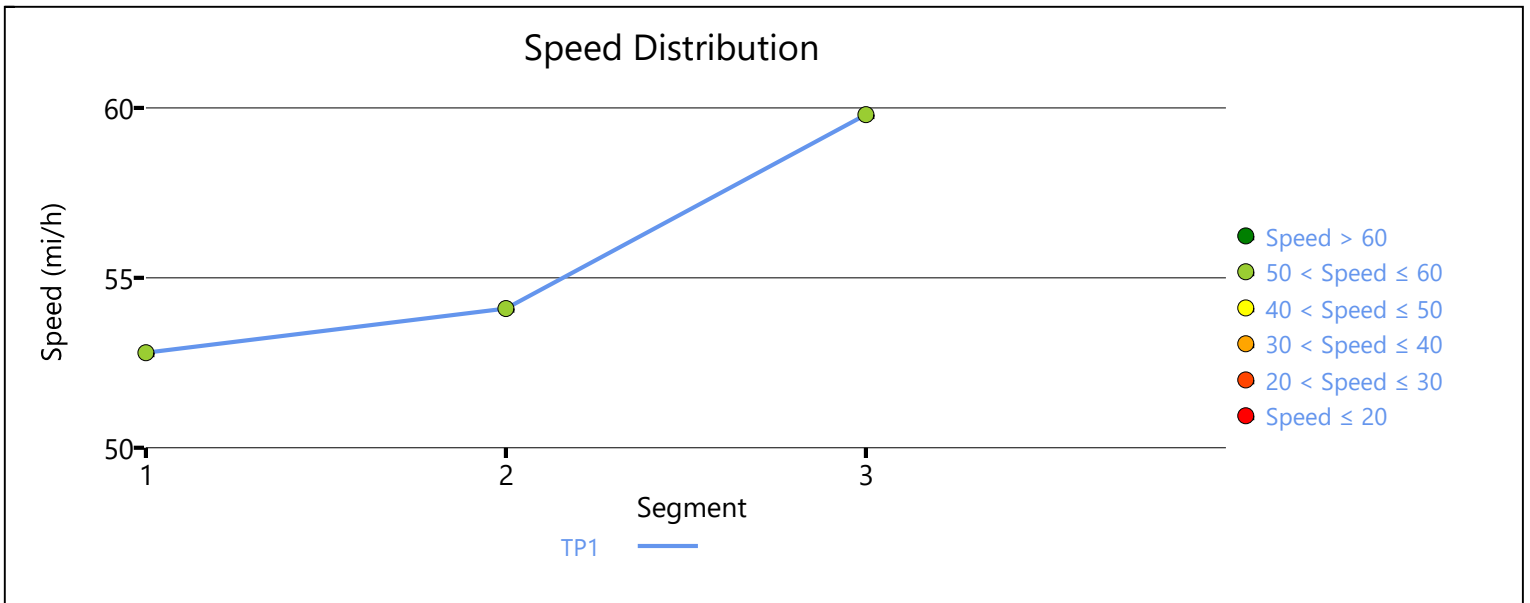
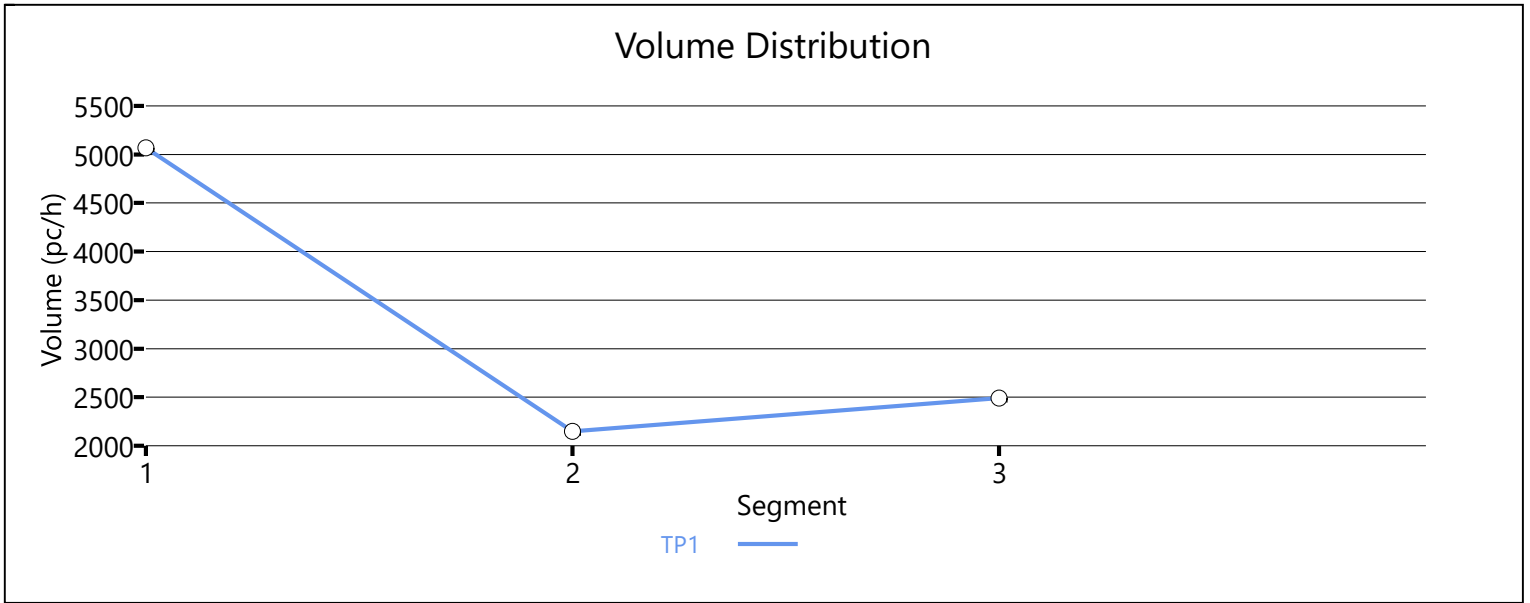
WARNING 1

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WARNING 2

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Comments



HCS7 Freeway Facilities Report

Project Information

Analyst	KM	Date	6/29/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	AM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - Build Alt. 1-3 (Constraint)	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	3
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.57		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Diverge	Diverge	I-71 NB CD diverge at Sunbury Pkwy	1500	2
2	Basic	Basic	I-71 NB CD bwtm Sunbury diverge and merge	5280	2
3	Merge	Merge	I-71 NB CD merge at Sunbury Pkwy	1500	2

Facility Segment Data

Segment 1: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.962	0.962	807	376	4400	2100	0.18	0.18	54.0	54.0	7.5	0.0	A

Segment 2: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.962	431	4484	0.10	54.2	4.0	A

Segment 3: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.962	0.962	542	111	4400	2100	0.12	0.05	55.4	55.4	4.9	4.7	A

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	54.4	4.8	4.6	1.70	A

Facility Overall Results

Space Mean Speed, mi/h	54.4	Density, veh/mi/ln	4.6
Average Travel Time, min	1.70	Density, pc/mi/ln	4.8

Messages

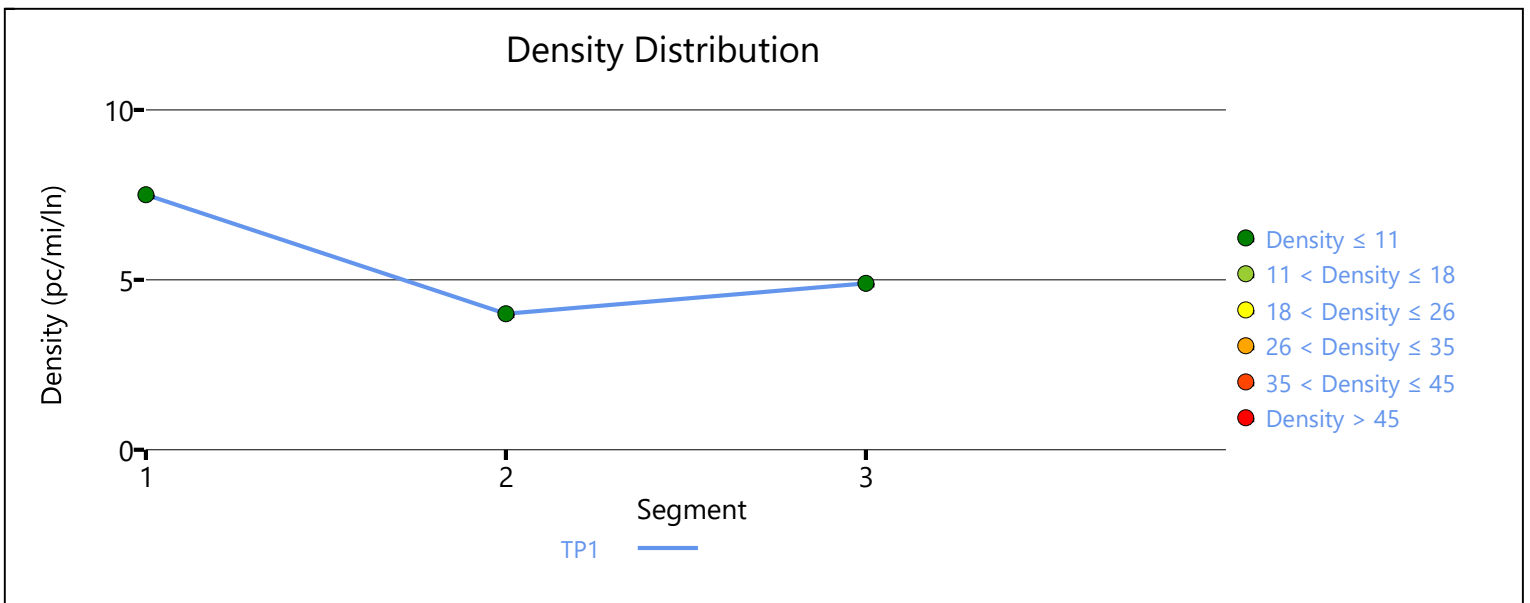
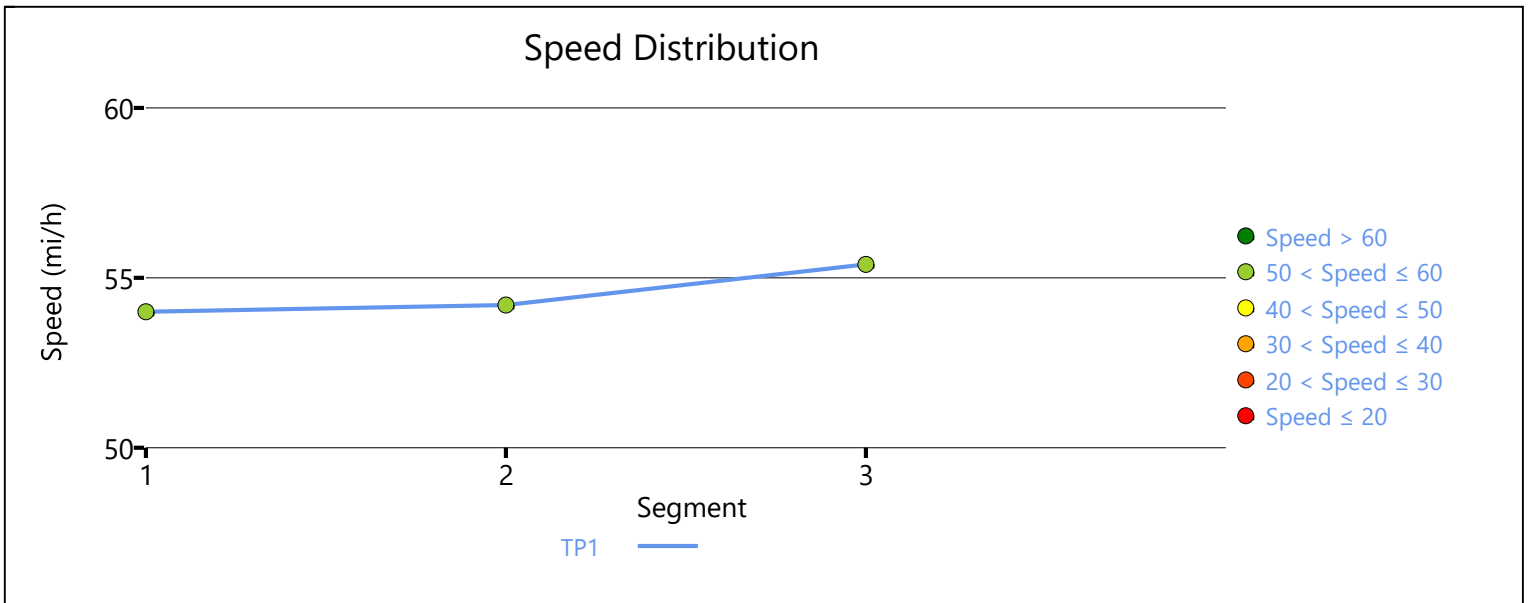
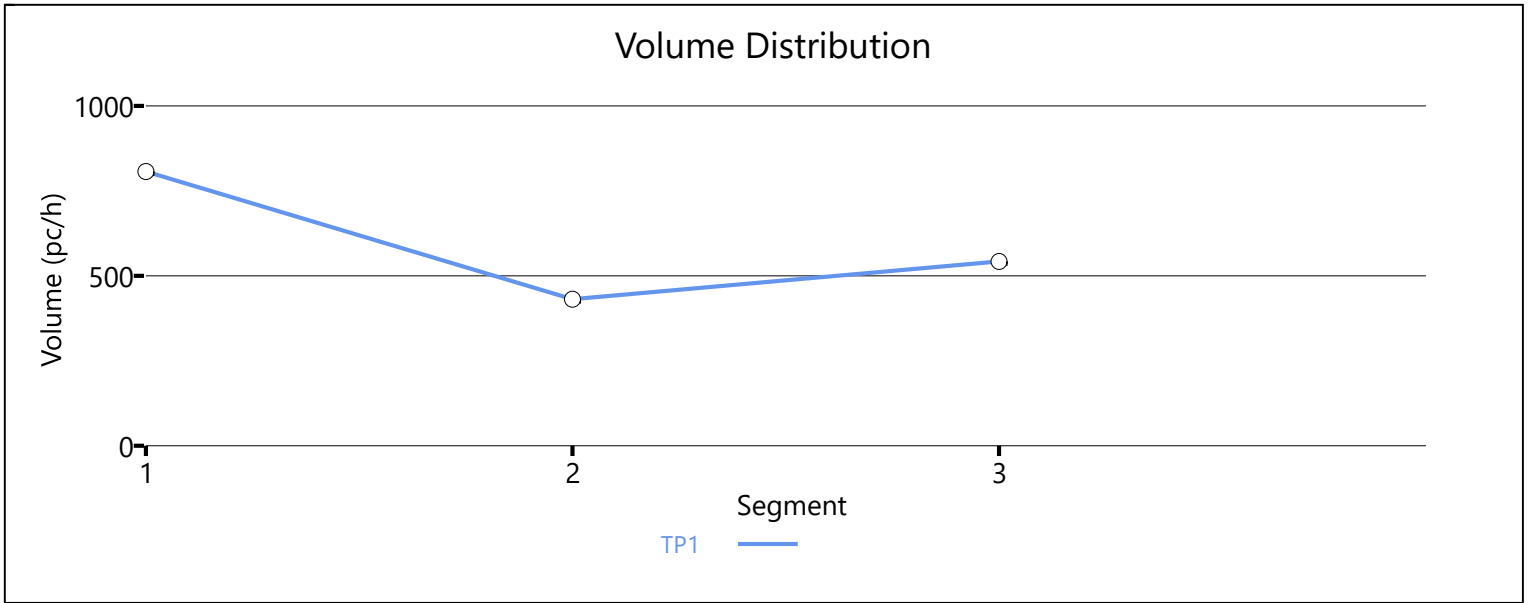
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WARNING 2

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Comments



HCS7 Freeway Facilities Report

Project Information

Analyst	GM	Date	5/21/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	PM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - Build Alt. 1-3 (Constraint)	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	2
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.38		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-71 NB btwn I-270 & Polaris (5-lane)	4300	5
2	Basic	Basic	I-71 NB btwn I-270 & Polaris (6-lane)	3000	6

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.935	11935	11935	1.02	53.0	45.0	F

Segment 2: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.935	11935	14322	0.85	62.1	32.0	D

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	56.4	39.1	36.6	1.50	F

Facility Overall Results

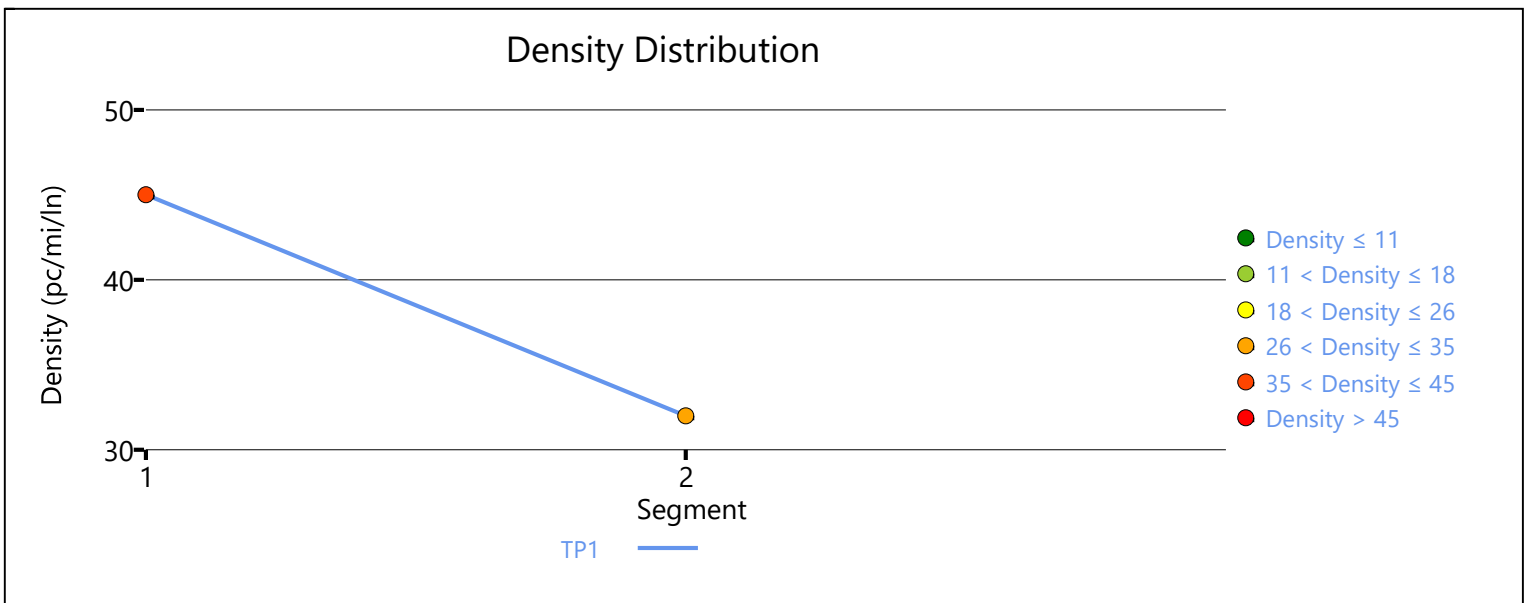
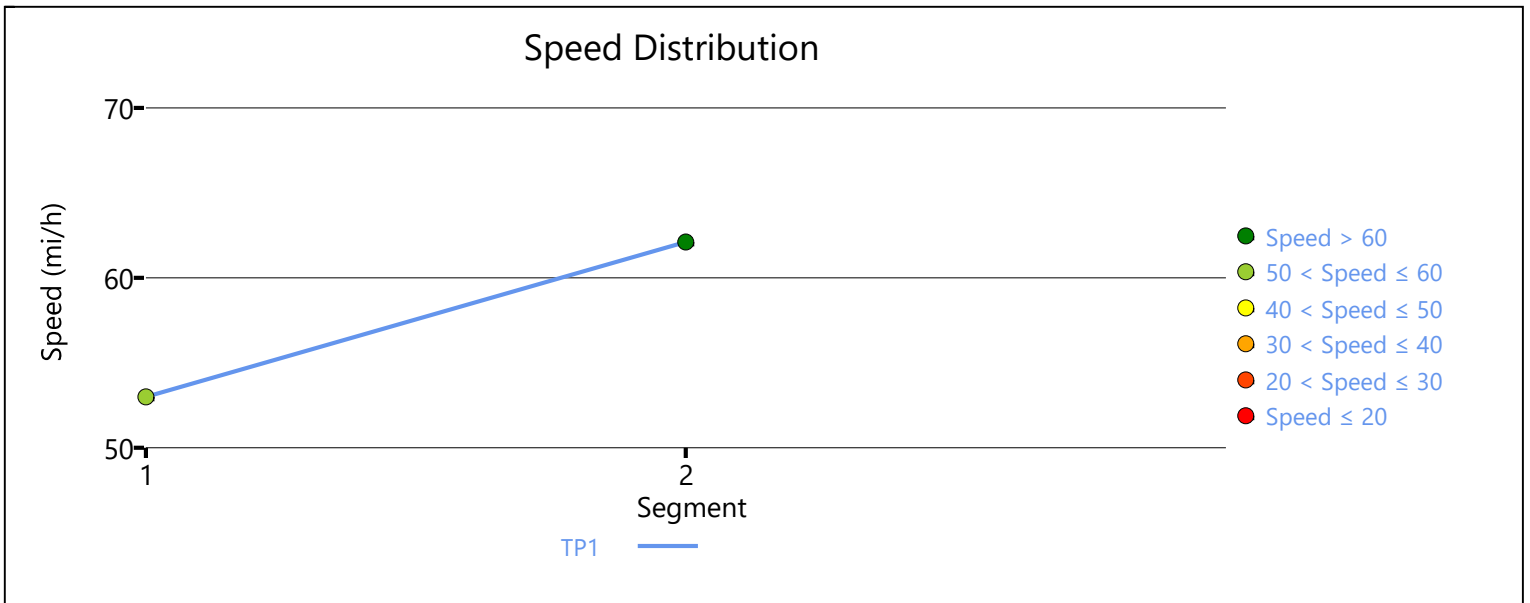
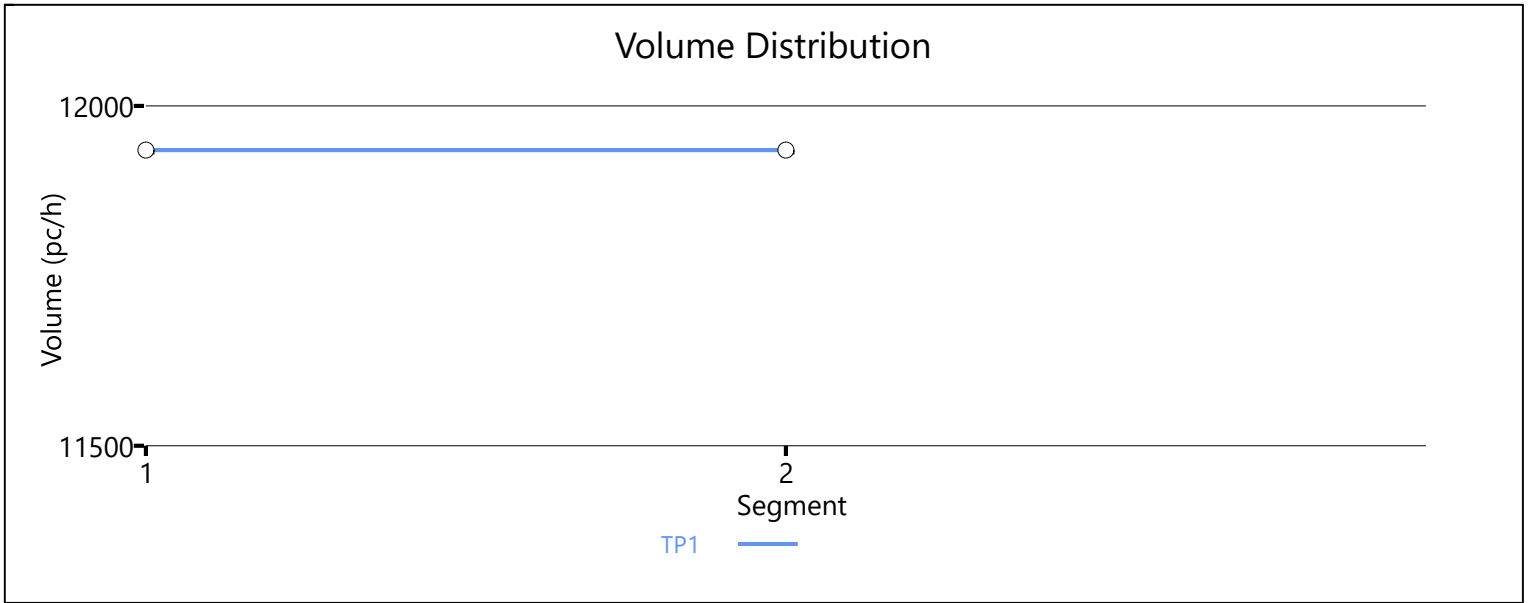
Space Mean Speed, mi/h	56.4	Density, veh/mi/ln	36.6
Average Travel Time, min	1.50	Density, pc/mi/ln	39.1

Messages

WARNING 1	Oversaturated conditions currently exist in boundary segment 1. Results may not be reliable. Consider expanding analysis in time and/or space to resolve this warning.
WARNING 2	Oversaturated conditions currently exist in boundary time period 1. Results may not be reliable. Consider expanding analysis in time and/or space to resolve this warning.

Comments

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HCS7 Basic Freeway Report

Project Information

Analyst	KM	Date	5/7/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	PM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange at NB Polaris-Gemini off Ramp - Build Alt. 1-3 (Constraint)	Unit	United States Customary

Geometric Data

Number of Lanes, ln	3	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Total Ramp Density (TRD), ramps/mi	2.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	54.2
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	3330	Heavy Vehicle Adjustment Factor (fhv)	0.980
Peak Hour Factor	0.94	Flow Rate (Vp), pc/h/ln	1205
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2242
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2242
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.54
Passenger Car Equivalent (ET)	2.000		

Speed and Density

Lane Width Adjustment (fLW)	0.0	Average Speed (S), mi/h	54.2
Right-Side Lateral Clearance Adj. (fRLC)	0.0	Density (D), pc/mi/ln	22.2
Total Ramp Density Adjustment	5.8	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	54.2		

1	0.94	0.94	0.935	0.971	9136	1194	9600	2200	0.95	0.54	58.6	54.4	39.0	35.0	D
Segment 3: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.935		9136		9600		0.96		56.7		40.3		E
Segment 4: Diverge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.935	0.980	9136	2008	9600	4400	0.96	0.46	70.1	63.5	32.6	24.0	C
Segment 5: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.935		7126		9600		0.74		67.5		26.4		D
Segment 6: Merge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.926	7251	402	9600	2200	0.79	0.18	67.5	65.1	26.9	23.6	C
Segment 7: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.926		6704		9600		0.79		24.3		69.0		F
Segment 8: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.926		6704		7200		1.05		58.0		38.5		F
Segment 9: Diverge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.926	0.962	6704	3185	7200	4400	1.05	0.72	64.4	60.0	34.7	31.8	F
Segment 10: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.926		3519		7200		0.59		73.1		16.0		B
Segment 11: Merge															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.917	0.877	4514	995	7200	2200	0.73	0.45	66.7	64.6	22.6	24.0	C
Segment 12: Basic															
Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS

1	0.94	0.917	4514	7200	0.73	71.1	21.2	C
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Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	57.1	34.4	31.9	11.70	F

Facility Overall Results

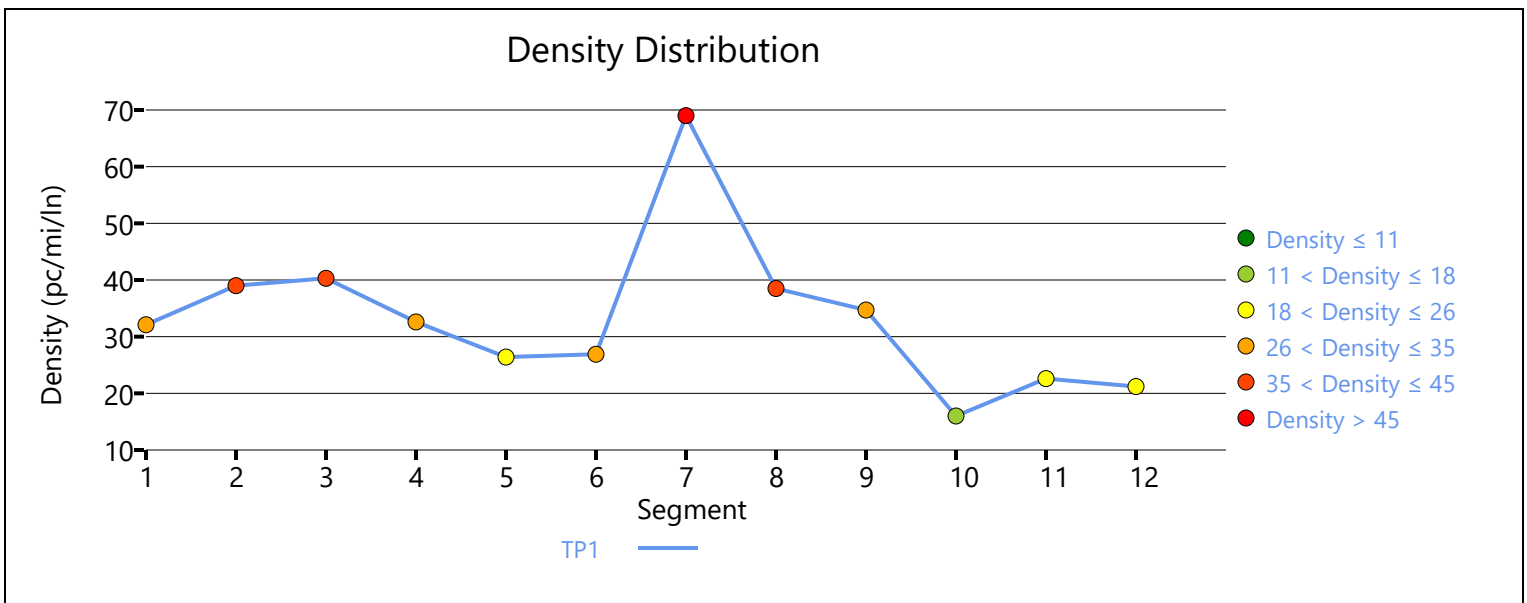
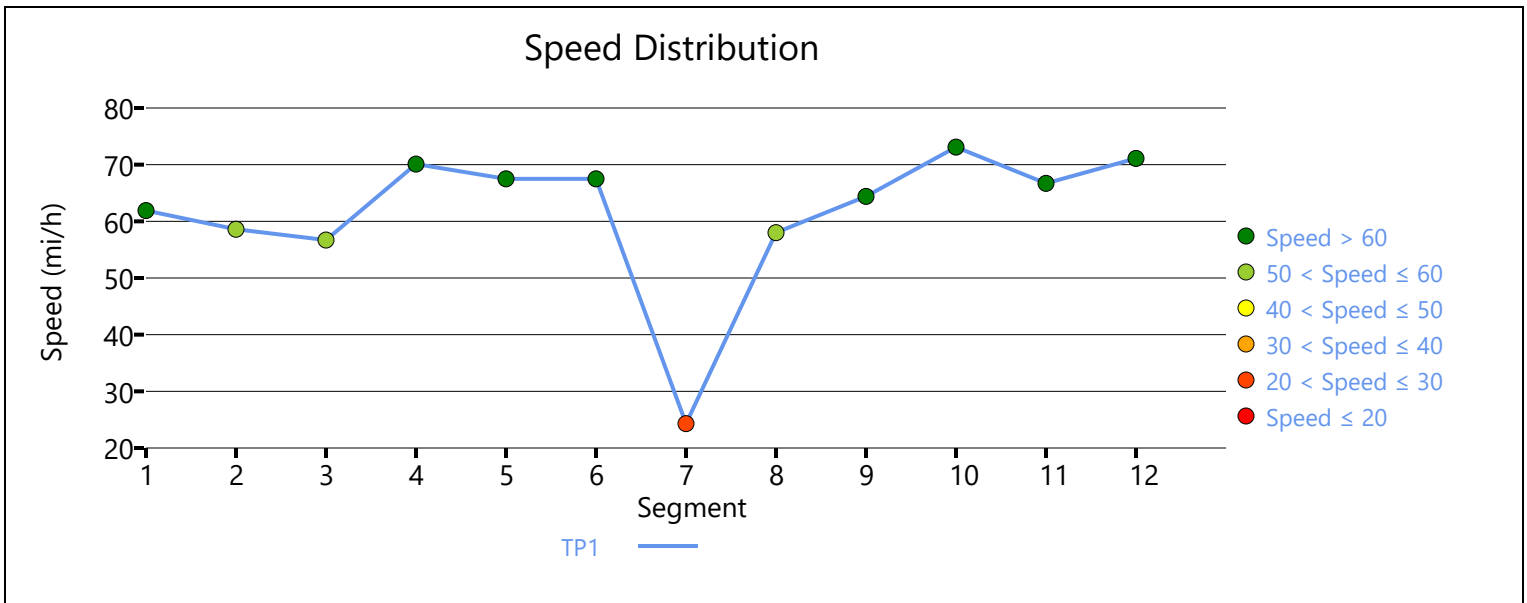
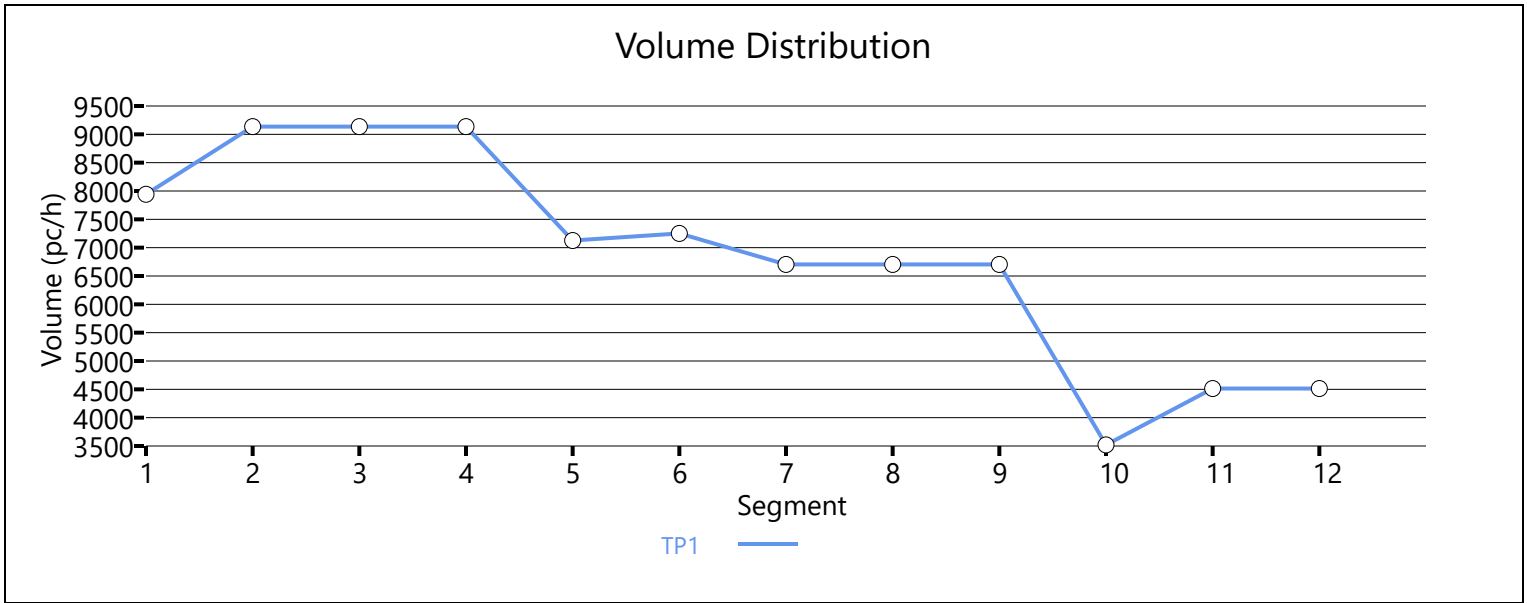
Space Mean Speed, mi/h	57.1	Density, veh/mi/ln	31.9
Average Travel Time, min	11.70	Density, pc/mi/ln	34.4

Messages

WARNING 1	Oversaturated conditions currently exist in boundary time period 1. Results may not be reliable. Consider expanding analysis in time and/or space to resolve this warning.
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Comments

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HCS7 Freeway Facilities Report

Project Information

Analyst	KM	Date	6/29/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	PM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - Build Alt. 1-3 (Constraint)	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	3
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.04		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Diverge	Diverge	I-71 NB CD diverge at Polaris Pkwy	1500	3
2	Basic	Basic	I-71 NB CD btwn Polaris Pkwy diverge and merge	2500	2
3	Merge	Basic	I-71 NB CD merge at Polaris Pkwy	1500	3

Facility Segment Data

Segment 1: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.980	0.980	3615	2334	6600	4200	0.55	0.56	53.3	50.9	22.6	29.3	D

Segment 2: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	1281	4484	0.29	54.2	11.8	B

Segment 3: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.980	0.962	1801	520	6900	2100	0.26	0.25	59.8	-	10.0	-	A

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	55.0	14.7	14.4	1.10	B

Facility Overall Results

Space Mean Speed, mi/h	55.0	Density, veh/mi/ln	14.4
Average Travel Time, min	1.10	Density, pc/mi/ln	14.7

Messages

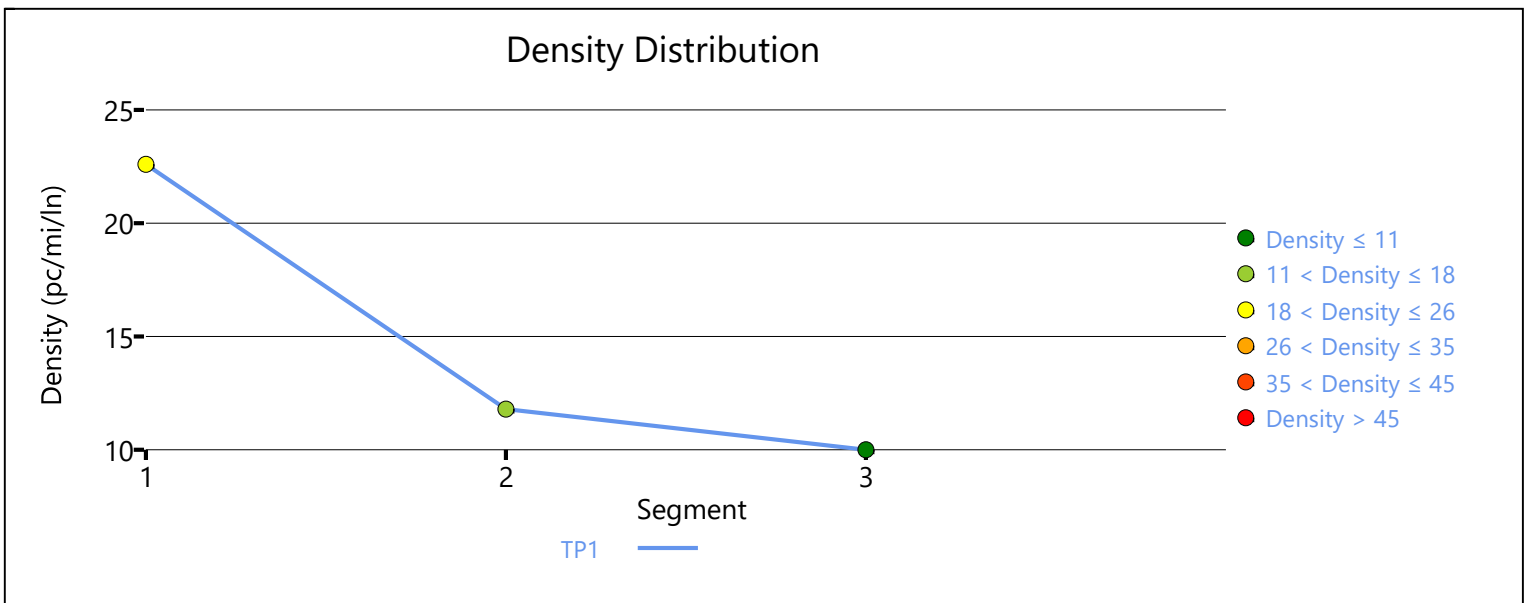
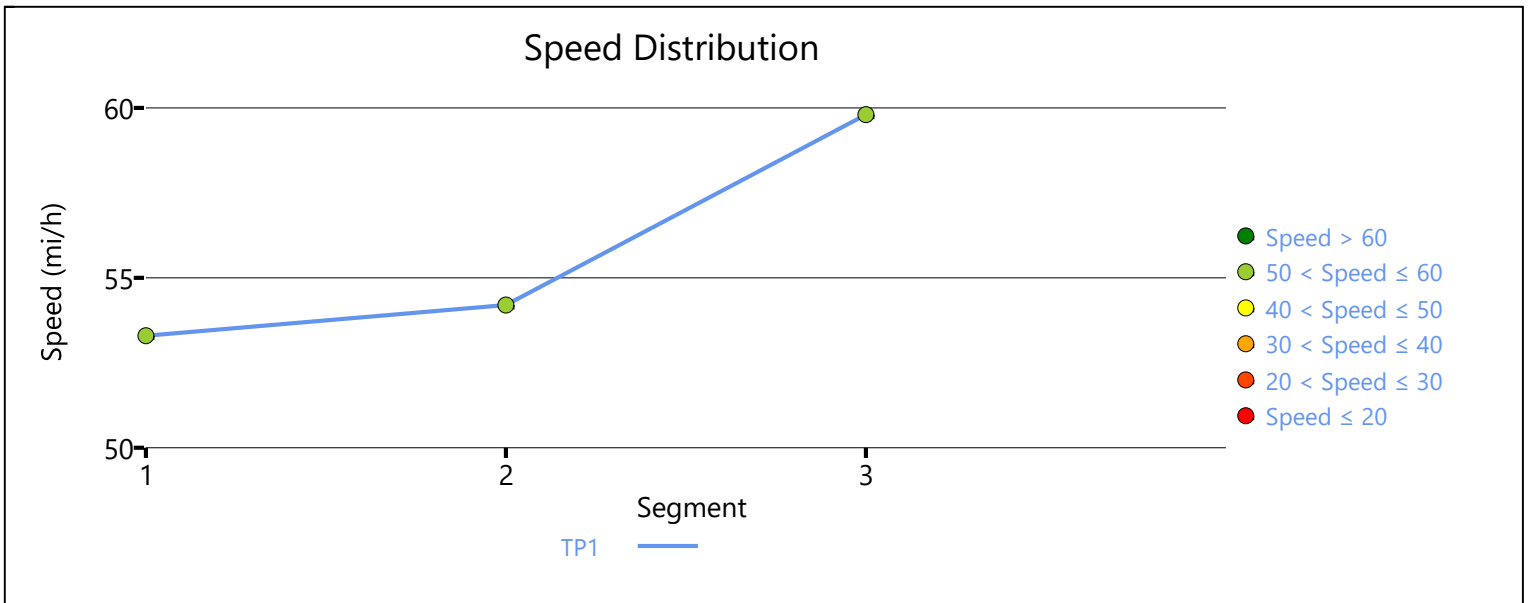
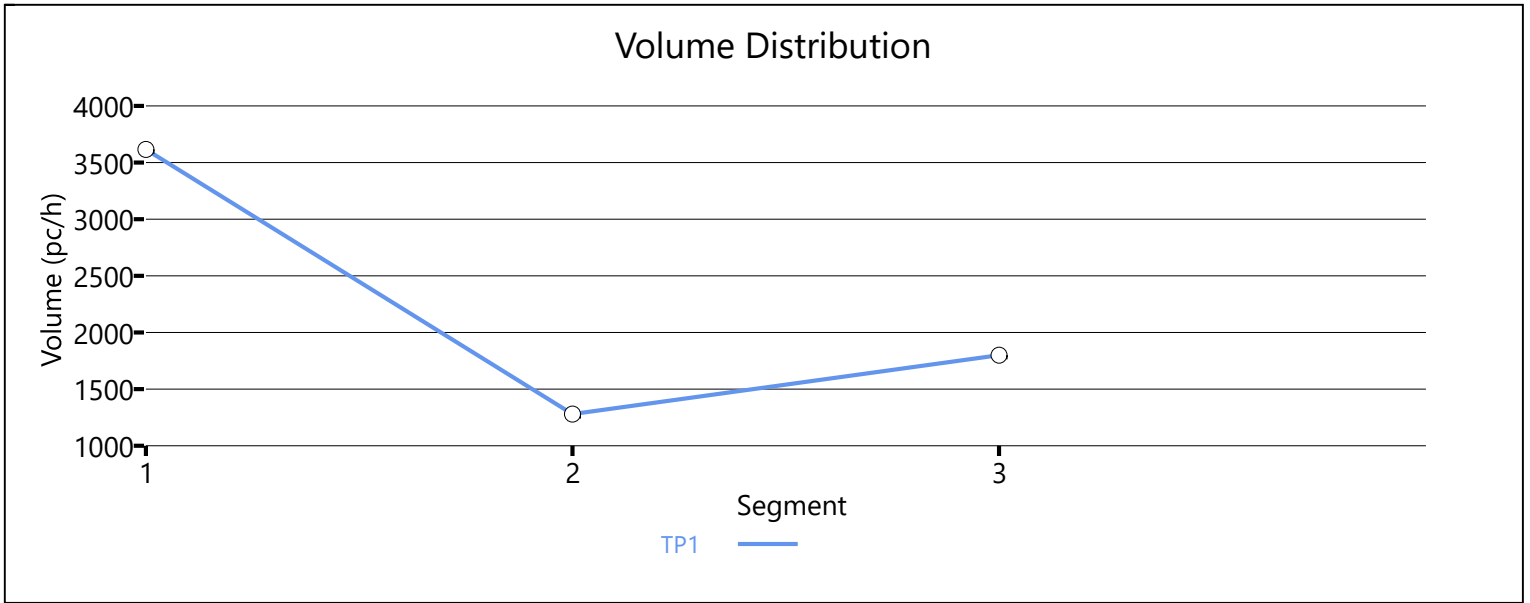
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Comments



HCS7 Freeway Facilities Report

Project Information

Analyst	KM	Date	6/29/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	PM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - Build Alt. 1-3 (Constraint)	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	3
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.57		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Diverge	Diverge	I-71 NB CD diverge at Sunbury Pkwy	1500	2
2	Basic	Basic	I-71 NB CD bwtm Sunbury diverge and merge	5280	2
3	Merge	Merge	I-71 NB CD merge at Sunbury Pkwy	1500	2

Facility Segment Data

Segment 1: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.962	0.962	3185	1803	4400	2100	0.72	0.86	51.7	51.7	30.8	18.1	B

Segment 2: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.962	1382	4484	0.31	54.2	12.7	B

Segment 3: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.962	0.962	1592	210	4400	2100	0.36	0.10	55.2	55.2	14.4	12.9	B

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	53.5	16.3	15.7	1.80	B

Facility Overall Results

Space Mean Speed, mi/h	53.5	Density, veh/mi/ln	15.7
Average Travel Time, min	1.80	Density, pc/mi/ln	16.3

Messages

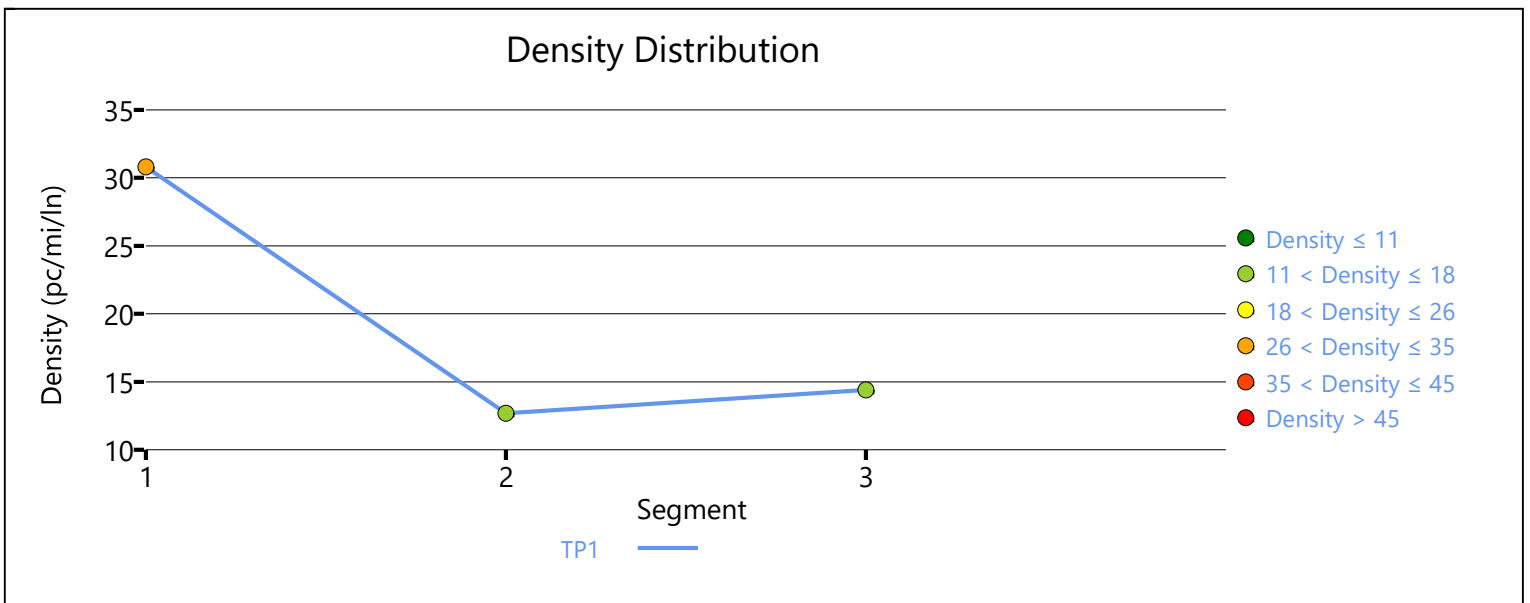
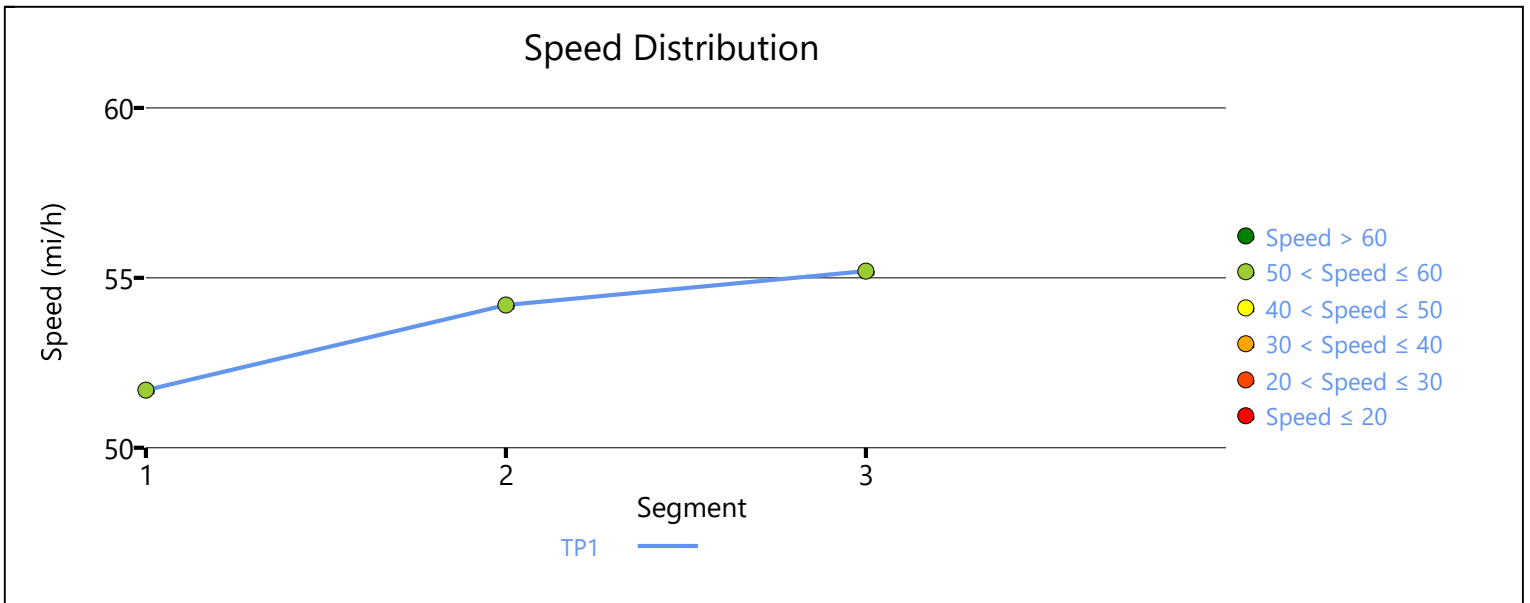
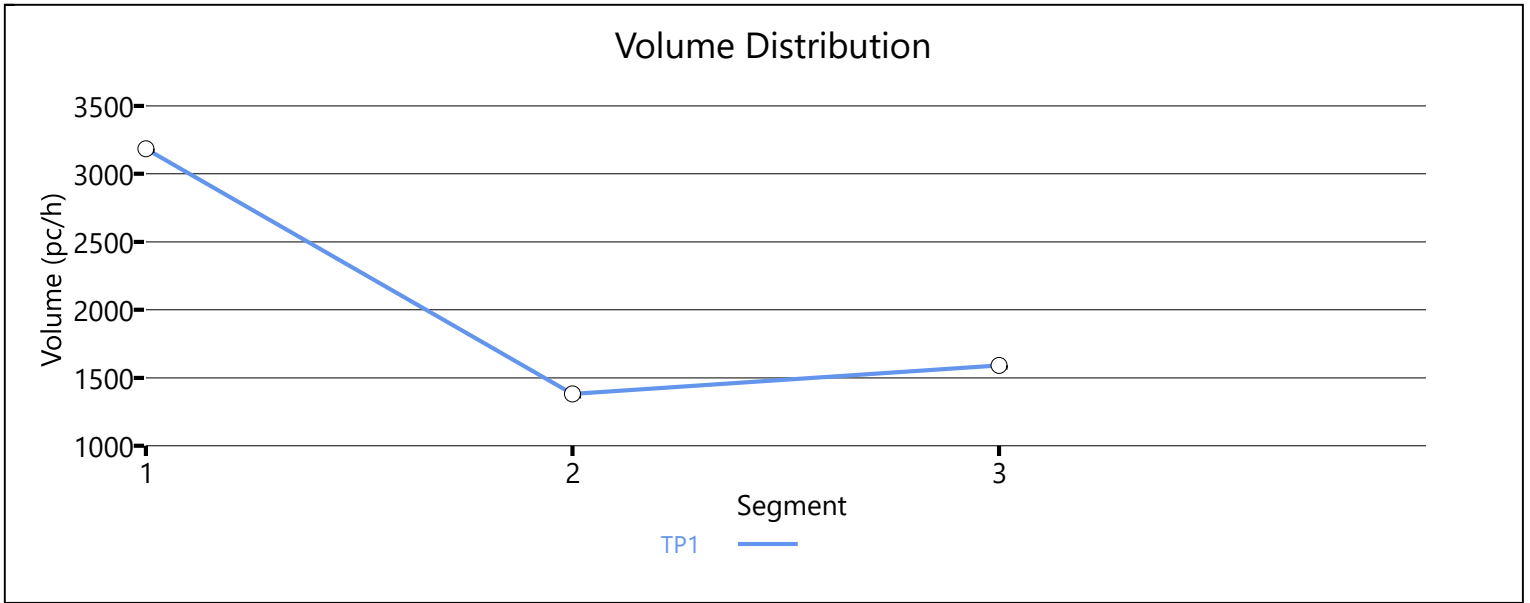
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WARNING 2

Beginning and ending the facility with a basic freeway segment is highly recommended. Use caution when interpreting results of a Freeway Facility without a basic segment bounding the beginning and end of the facility.

Comments



DRAFT

Appendix D
Weave HCS Analysis

HCS7 Basic Freeway Report

Project Information

Analyst	GM	Date	6/1/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	AM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build	Unit	United States Customary

Geometric Data

Number of Lanes, In	5	Terrain Type	Level
Segment Length (L), ft	3000	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	70.0	Total Ramp Density (TRD), ramps/mi	0.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.0
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	7580	Heavy Vehicle Adjustment Factor (fhv)	0.935
Peak Hour Factor	0.94	Flow Rate (Vp), pc/h/ln	1669
Total Trucks, %	7.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.70
Passenger Car Equivalent (ET)	2.000		

Speed and Density

Lane Width Adjustment (fLW)	0.0	Average Speed (S), mi/h	67.5
Right-Side Lateral Clearance Adj. (fRLC)	0.0	Density (D), pc/mi/ln	24.7
Total Ramp Density Adjustment	0.0	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	70.0		

HCS7 Freeway Weaving Report

Project Information

Analyst	GM	Date	6/1/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	AM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build	Unit	United States Customary

Geometric Data

Number of Lanes (N), ln	5	Segment Type	Freeway
Segment Length (Ls), ft	3000	Number of Maneuver Lanes (NWL), ln	3
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LCRF), lc	0
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LCFR), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LCRR), lc	0
Interchange Density (ID), int/mi	0.17	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

	FF	RF	RR	FR
Demand Volume (Vi), veh/h	1333	727	1953	3567
Peak Hour Factor (PHF)	0.94	0.94	0.94	0.94
Total Trucks, %	7.00	8.00	2.00	2.00
Heavy Vehicle Adjustment Factor (fHV)	0.935	0.926	0.980	0.980
Flow Rate (vi), pc/h	1517	835	2120	3872
Weaving Flow Rate (vw), pc/h	4707	Freeway Max Capacity (cIFL), pc/h/ln		2400
Non-Weaving Flow Rate (vNW), pc/h	3637	Density-Based Capacity (cIWL), pc/h/ln		2093
Total Flow Rate (v), pc/h	8344	Demand Flow-Based Capacity (cIW), pc/h		6206
Volume Ratio (VR)	0.564	Weaving Segment Capacity (cW), veh/h		5997
Minimum Lane Change Rate (LCMIN), lc/h	0	Adjusted Weaving Area Capacity, pc/h		6205
Maximum Weaving Length (LMAX), ft	7018	Volume-to-Capacity Ratio (v/c)		1.34

Speed and Density

Non-Weaving Vehicle Index (INW)	-	Average Weaving Speed (SW), mi/h	-
Non-Weaving Lane Change Rate (LCNW), lc/h	-	Average Non-Weaving Speed (SNW), mi/h	-
Weaving Lane Change Rate (LCW), lc/h	-	Average Speed (S), mi/h	-
Weaving Lane Change Rate (LCAII), lc/h	-	Density (D), pc/mi/ln	-
Weaving Intensity Factor (W)	-	Level of Service (LOS)	F

HCS7 Basic Freeway Report

Project Information

Analyst	GM	Date	6/1/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	PM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build	Unit	United States Customary

Geometric Data

Number of Lanes, In	5	Terrain Type	Level
Segment Length (L), ft	3000	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	70.0	Total Ramp Density (TRD), ramps/mi	0.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.0
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	10570	Heavy Vehicle Adjustment Factor (fhv)	0.935
Peak Hour Factor	0.94	Flow Rate (Vp), pc/h/ln	2365
Total Trucks, %	7.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.99
Passenger Car Equivalent (ET)	2.000		

Speed and Density

Lane Width Adjustment (fLW)	0.0	Average Speed (S), mi/h	54.3
Right-Side Lateral Clearance Adj. (fRLC)	0.0	Density (D), pc/mi/ln	43.6
Total Ramp Density Adjustment	0.0	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFSadj), mi/h	70.0		

HCS7 Freeway Weaving Report

Project Information

Analyst	GM	Date	6/1/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	PM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build	Unit	United States Customary

Geometric Data

Number of Lanes (N), ln	5	Segment Type	Freeway
Segment Length (Ls), ft	3000	Number of Maneuver Lanes (NWL), ln	3
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LCRF), lc	0
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LCFR), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LCRR), lc	0
Interchange Density (ID), int/mi	0.17	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

	FF	RF	RR	FR
Demand Volume (Vi), veh/h	4774	1586	1054	3156
Peak Hour Factor (PHF)	0.94	0.94	0.94	0.94
Total Trucks, %	7.00	8.00	2.00	2.00
Heavy Vehicle Adjustment Factor (fHV)	0.935	0.926	0.980	0.980
Flow Rate (vi), pc/h	5432	1822	1144	3426
Weaving Flow Rate (vw), pc/h	5248	Freeway Max Capacity (cIFL), pc/h/ln		2400
Non-Weaving Flow Rate (vNW), pc/h	6576	Density-Based Capacity (cIWL), pc/h/ln		2200
Total Flow Rate (v), pc/h	11824	Demand Flow-Based Capacity (cIW), pc/h		7883
Volume Ratio (VR)	0.444	Weaving Segment Capacity (cW), veh/h		7497
Minimum Lane Change Rate (LCMIN), lc/h	0	Adjusted Weaving Area Capacity, pc/h		7883
Maximum Weaving Length (LMAX), ft	5613	Volume-to-Capacity Ratio (v/c)		1.50

Speed and Density

Non-Weaving Vehicle Index (INW)	-	Average Weaving Speed (SW), mi/h	-
Non-Weaving Lane Change Rate (LCNW), lc/h	-	Average Non-Weaving Speed (SNW), mi/h	-
Weaving Lane Change Rate (LCW), lc/h	-	Average Speed (S), mi/h	-
Weaving Lane Change Rate (LCAII), lc/h	-	Density (D), pc/mi/ln	-
Weaving Intensity Factor (W)	-	Level of Service (LOS)	F

HCS7 Basic Freeway Report

Project Information

Analyst	GM	Date	6/1/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	AM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 1-3	Unit	United States Customary

Geometric Data

Number of Lanes, ln	5	Terrain Type	Level
Segment Length (L), ft	3000	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	70.0	Total Ramp Density (TRD), ramps/mi	0.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.0
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	7310	Heavy Vehicle Adjustment Factor (fhv)	0.935
Peak Hour Factor	0.94	Flow Rate (Vp), pc/h/ln	1616
Total Trucks, %	7.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.67
Passenger Car Equivalent (ET)	2.000		

Speed and Density

Lane Width Adjustment (fLW)	0.0	Average Speed (S), mi/h	68.0
Right-Side Lateral Clearance Adj. (fRLC)	0.0	Density (D), pc/mi/ln	23.8
Total Ramp Density Adjustment	0.0	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	70.0		

HCS7 Freeway Weaving Report

Project Information

Analyst	GM	Date	6/1/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	AM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 1-3	Unit	United States Customary

Geometric Data

Number of Lanes (N), ln	5	Segment Type	Freeway
Segment Length (Ls), ft	3000	Number of Maneuver Lanes (NWL), ln	3
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LCRF), lc	0
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LCFR), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LCRR), lc	0
Interchange Density (ID), int/mi	0.17	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

	FF	RF	RR	FR
Demand Volume (Vi), veh/h	1426	1074	2066	2744
Peak Hour Factor (PHF)	0.94	0.94	0.94	0.94
Total Trucks, %	7.00	8.00	2.00	2.00
Heavy Vehicle Adjustment Factor (fHV)	0.935	0.926	0.980	0.980
Flow Rate (vi), pc/h	1622	1234	2243	2979
Weaving Flow Rate (vw), pc/h	4213	Freeway Max Capacity (cIFL), pc/h/ln		2400
Non-Weaving Flow Rate (vNW), pc/h	3865	Density-Based Capacity (cIWL), pc/h/ln		2131
Total Flow Rate (v), pc/h	8078	Demand Flow-Based Capacity (cIW), pc/h		6705
Volume Ratio (VR)	0.522	Weaving Segment Capacity (cW), veh/h		6455
Minimum Lane Change Rate (LCMIN), lc/h	0	Adjusted Weaving Area Capacity, pc/h		6705
Maximum Weaving Length (LMAX), ft	6519	Volume-to-Capacity Ratio (v/c)		1.20

Speed and Density

Non-Weaving Vehicle Index (INW)	-	Average Weaving Speed (SW), mi/h	-
Non-Weaving Lane Change Rate (LCNW), lc/h	-	Average Non-Weaving Speed (SNW), mi/h	-
Weaving Lane Change Rate (LCW), lc/h	-	Average Speed (S), mi/h	-
Weaving Lane Change Rate (LCAII), lc/h	-	Density (D), pc/mi/ln	-
Weaving Intensity Factor (W)	-	Level of Service (LOS)	F

HCS7 Basic Freeway Report

Project Information

Analyst	GM	Date	6/1/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	PM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 1-3	Unit	United States Customary

Geometric Data

Number of Lanes, ln	5	Terrain Type	Level
Segment Length (L), ft	3000	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	70.0	Total Ramp Density (TRD), ramps/mi	0.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.0
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	11920	Heavy Vehicle Adjustment Factor (fhv)	0.935
Peak Hour Factor	0.94	Flow Rate (Vp), pc/h/ln	2681
Total Trucks, %	7.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	1.12
Passenger Car Equivalent (ET)	2.000		

Speed and Density

Lane Width Adjustment (fLW)	0.0	Average Speed (S), mi/h	-
Right-Side Lateral Clearance Adj. (fRLC)	0.0	Density (D), pc/mi/ln	-
Total Ramp Density Adjustment	0.0	Level of Service (LOS)	F
Adjusted Free-Flow Speed (FFSadj), mi/h	70.0		

HCS7 Freeway Weaving Report

Project Information

Analyst	GM	Date	6/1/2020
Agency	AECOM	Analysis Year	2040
Jurisdiction	ODOT - District 6	Time Period Analyzed	PM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 1-3	Unit	United States Customary

Geometric Data

Number of Lanes (N), ln	5	Segment Type	Freeway
Segment Length (Ls), ft	3000	Number of Maneuver Lanes (NWL), ln	3
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LCRF), lc	0
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LCFR), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LCRR), lc	0
Interchange Density (ID), int/mi	0.17	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

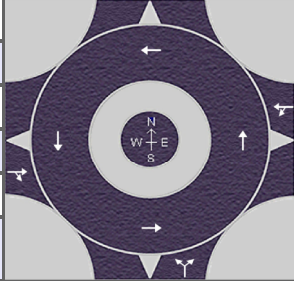
	FF	RF	RR	FR
Demand Volume (Vi), veh/h	5661	2639	981	2639
Peak Hour Factor (PHF)	0.94	0.94	0.94	0.94
Total Trucks, %	7.00	8.00	2.00	2.00
Heavy Vehicle Adjustment Factor (fHV)	0.935	0.926	0.980	0.980
Flow Rate (vi), pc/h	6441	3032	1065	2865
Weaving Flow Rate (vw), pc/h	5897	Freeway Max Capacity (cIFL), pc/h/ln	2400	
Non-Weaving Flow Rate (vNW), pc/h	7506	Density-Based Capacity (cIWL), pc/h/ln	2204	
Total Flow Rate (v), pc/h	13403	Demand Flow-Based Capacity (cIW), pc/h	7955	
Volume Ratio (VR)	0.440	Weaving Segment Capacity (cW), veh/h	7526	
Minimum Lane Change Rate (LCMIN), lc/h	0	Adjusted Weaving Area Capacity, pc/h	7954	
Maximum Weaving Length (LMAX), ft	5568	Volume-to-Capacity Ratio (v/c)	1.69	

Speed and Density

Non-Weaving Vehicle Index (INW)	-	Average Weaving Speed (SW), mi/h	-
Non-Weaving Lane Change Rate (LCNW), lc/h	-	Average Non-Weaving Speed (SNW), mi/h	-
Weaving Lane Change Rate (LCW), lc/h	-	Average Speed (S), mi/h	-
Weaving Lane Change Rate (LCAII), lc/h	-	Density (D), pc/mi/ln	-
Weaving Intensity Factor (W)	-	Level of Service (LOS)	F

Appendix E
Intersection HCS Analysis

HCS7 Roundabouts Report

General Information				Site Information				
Analyst	KKM				Intersection	Bale Kenyon & Big Walnut		
Agency or Co.	AECOM				E/W Street Name	Big Walnut Road		
Date Performed	5/4/2020				N/S Street Name	Bale Kenyon Road		
Analysis Year	2040				Analysis Time Period (hrs)	0.25		
Time Analyzed	AM Peak Hour				Peak Hour Factor	0.92		
Project Description	DEL-71-3.55 Big Walnut Inte...				Jurisdiction	Delaware County		

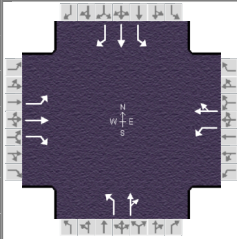
Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0
Lane Assignment	TR				LT				LR							
Volume (V), veh/h	0		871	121	0	578	942		0	29		309				
Percent Heavy Vehicles, %	2		2	2	2	2	2		2	2		2				
Flow Rate (v _{PCE}), pc/h	0		966	134	0	641	1044		0	32		343				
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1							
Pedestrians Crossing, p/h	0				0				0							

Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (s)		4.9763			4.9763			4.9763					
Follow-Up Headway (s)		2.6087			2.6087			2.6087					

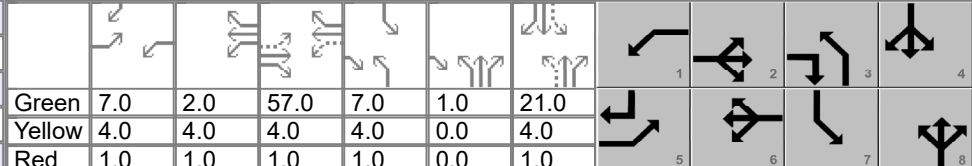
Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (v _e), pc/h		1100			1685			375					
Entry Volume, veh/h		1078			1652			368					
Circulating Flow (v _c), pc/h		641			32			966					1717
Exiting Flow (v _{ex}), pc/h		1309			1076			0					775
Capacity (C _{PCE}), pc/h		718			1336			515					
Capacity (c), veh/h		704			1309			505					
v/c Ratio (x)		1.53			1.26			0.73					

Delay and Level of Service													
Approach	EB			WB			NB			SB			
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Lane Control Delay (d), s/veh		263.8			137.5			27.5					
Lane LOS		F			F			D					
95% Queue, veh		54.3			54.2			6.0					
Approach Delay, s/veh	263.8			137.5			27.5						
Approach LOS	F			F			D						
Intersection Delay, s/veh LOS	168.4						F						

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information		
Agency	AECOM			Duration, h	0.25	
Analyst	KKM	Analysis Date	May 12, 2020	Area Type	Other	
Jurisdiction	Delaware County	Time Period	AM Peak Hour	PHF	0.92	
Urban Street	Big Walnut Road	Analysis Year	2040	Analysis Period	1 > 7:00	
Intersection	Big Walnut & Africa	File Name	9-2040 No Build AM BW-Africa Road.xus			
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build					

Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	60	580	540	210	1100	30	200	80	50	40	340	220

Signal Information														
Cycle, s	120.0	Reference Phase	2	Green	7.0	2.0	57.0	7.0	1.0	21.0				
Offset, s	0	Reference Point	End	Yellow	4.0	4.0	4.0	4.0	0.0	4.0				
Uncoordinated	Yes	Simult. Gap E/W	On	Red	1.0	1.0	1.0	1.0	0.0	1.0				
Force Mode	Fixed	Simult. Gap N/S	On											

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	3.0	1.1	4.0	1.1	4.0	1.1	3.0
Phase Duration, s	12.0	62.0	19.0	69.0	13.0	27.0	12.0	26.0
Change Period, (Y+R _c), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (MAH), s	3.0	3.0	3.0	3.0	3.0	3.1	3.0	3.1
Queue Clearance Time (g _s), s	4.1	34.8	9.0	66.0	10.0	10.7	4.3	23.0
Green Extension Time (g _e), s	0.0	7.0	0.2	0.0	0.0	1.2	0.0	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	1.00	0.19	0.14	1.00	1.00	0.02	1.00	1.00

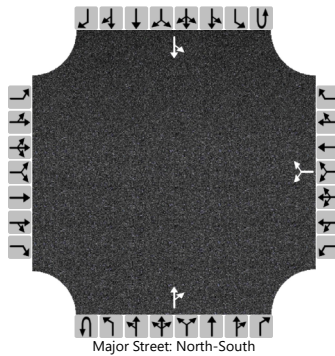
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	65	630	587	228	1228		217	141		43	370	239
Adjusted Saturation Flow Rate (s), veh/h/ln	1767	1856	1572	1767	1847		1767	1735		1767	1856	1572
Queue Service Time (g _s), s	2.1	32.4	32.8	7.0	64.0		8.0	8.7		2.3	21.0	16.5
Cycle Queue Clearance Time (g _c), s	2.1	32.4	32.8	7.0	64.0		8.0	8.7		2.3	21.0	16.5
Green Ratio (g/C)	0.53	0.48	0.54	0.61	0.53		0.24	0.18		0.23	0.18	0.23
Capacity (c), veh/h	163	881	852	428	985		178	318		280	325	367
Volume-to-Capacity Ratio (X)	0.400	0.715	0.689	0.533	1.247		1.223	0.444		0.155	1.138	0.652
Back of Queue (Q), ft/ln (95 th percentile)	38.5	512.3	434.9	117.7	2124.7		353.9	169.1		45.4	674.1	274.6
Back of Queue (Q), veh/ln (95 th percentile)	1.5	20.0	17.0	4.6	83.0		13.8	6.6		1.8	26.3	10.7
Queue Storage Ratio (RQ) (95 th percentile)	0.11	0.27	1.24	0.59	0.79		0.88	0.11		0.23	0.13	1.10
Uniform Delay (d ₁), s/veh	27.1	25.0	20.1	17.5	28.0		43.4	43.6		36.6	49.5	41.6
Incremental Delay (d ₂), s/veh	0.6	2.4	2.0	0.7	119.7		140.0	0.4		0.1	92.8	3.2
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Control Delay (d), s/veh	27.7	27.4	22.1	18.2	147.7		183.4	43.9		36.7	142.3	44.8
Level of Service (LOS)	C	C	C	B	F		F	D		D	F	D
Approach Delay, s/veh / LOS	25.0		C	127.4		F	128.5		F	99.5		F
Intersection Delay, s/veh / LOS	87.6						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.91	B	2.09	B	1.95	B	2.14	B
Bicycle LOS Score / LOS	2.60	C	2.89	C	1.08	A	1.56	B

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Africa & Jaycox		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/15/2020			East/West Street	Jaycox Road		
Analysis Year	2040			North/South Street	Africa Road		
Time Analyzed	AM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	North-South			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						60		60			160	10		40	540	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2							4.1	
Critical Headway (sec)						6.42		6.22							4.12	
Base Follow-Up Headway (sec)						3.5		3.3							2.2	
Follow-Up Headway (sec)						3.52		3.32							2.22	

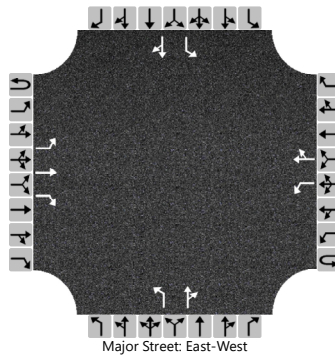
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						130									43	
Capacity, c (veh/h)						461									1390	
v/c Ratio						0.28									0.03	
95% Queue Length, Q ₉₅ (veh)						1.2									0.1	
Control Delay (s/veh)						15.9									7.7	
Level of Service (LOS)						C									A	
Approach Delay (s/veh)					15.9								0.9			
Approach LOS					C											

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Medan		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/14/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Medan Dr/Whispering Ridge		
Time Analyzed	AM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	1	0	1	1	0		1	1	0		1	1	0
Configuration		L	T	R		L		TR		L		TR		L		TR
Volume (veh/h)		10	650	10		10	1300	10		20	10	10		10	10	20
Percent Heavy Vehicles (%)		3				3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized	No															
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.13				4.13				7.13	6.53	6.23		7.13	6.53	6.23
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

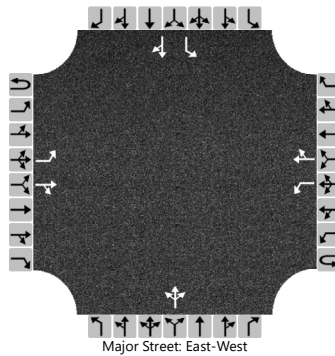
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		11				11				22		22		11		33	
Capacity, c (veh/h)		475				879				22		81		25		86	
v/c Ratio		0.02				0.01				0.97		0.27		0.43		0.38	
95% Queue Length, Q ₉₅ (veh)		0.1				0.0				2.8		1.0		1.3		1.5	
Control Delay (s/veh)		12.8				9.1				424.8		65.4		230.8		69.9	
Level of Service (LOS)		B				A				F		F		F		F	
Approach Delay (s/veh)		0.2				0.1				245.1				110.1			
Approach LOS										F				F			

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Highland		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/14/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Highland Hills Drive		
Time Analyzed	AM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Priority																
Number of Lanes	0	1	1	0	0	1	1	0	0	1	0		1	1	0	
Configuration		L		TR		L		TR		LTR				L		TR
Volume (veh/h)		10	656	14		7	1254	10		66	10	15		10	10	10
Percent Heavy Vehicles (%)		3				3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.13				4.13				7.13	6.53	6.23		7.13	6.53	6.23
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

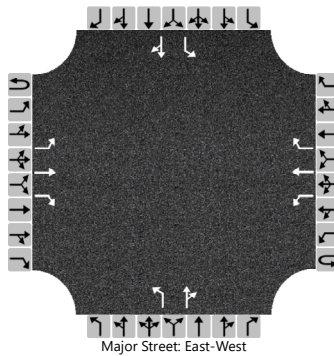
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		11				8				99				11		22
Capacity, c (veh/h)		496				871				34				27		75
v/c Ratio		0.02				0.01				2.95				0.40		0.29
95% Queue Length, Q ₉₅ (veh)		0.1				0.0				11.4				1.2		1.1
Control Delay (s/veh)		12.4				9.2				1129.8				206.5		71.5
Level of Service (LOS)		B				A				F				F		F
Approach Delay (s/veh)	0.2				0.1				1129.8				116.5			
Approach LOS									F				F			

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Willow Bend		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/14/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Willow Bend/Grand Oak		
Time Analyzed	AM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL071-3.55 Big Walnut Interchange - No Build						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Priority																
Number of Lanes	0	1	1	1	0	1	1	1	1	1	0		1	1	0	
Configuration		L	T	R		L	T	R		L		TR		L		TR
Volume (veh/h)		61	606	4		7	1186	55		12	15	19		55	9	63
Percent Heavy Vehicles (%)		3				3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized	No				No											
Median Type Storage	Undivided															

Critical and Follow-up Headways

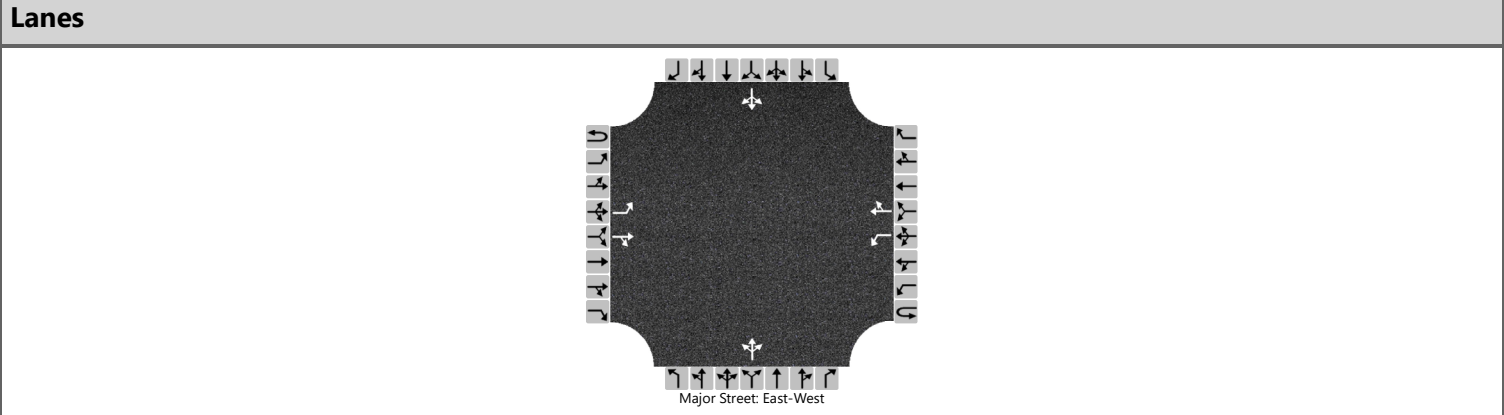
Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.13				4.13				7.13	6.53	6.23		7.13	6.53	6.23
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		66				8				13		37		60		78
Capacity, c (veh/h)		507				921				17		83		22		139
v/c Ratio		0.13				0.01				0.79		0.44		2.75		0.56
95% Queue Length, Q ₉₅ (veh)		0.4				0.0				2.0		1.8		7.7		2.8
Control Delay (s/veh)		13.2				8.9				457.8		78.8		1164.5		60.3
Level of Service (LOS)		B				A				F		F		F		F
Approach Delay (s/veh)	1.2				0.1				177.7				538.5			
Approach LOS									F				F			

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Jeffries		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/15/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Jeffries Court/Grandmere		
Time Analyzed	AM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build						



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	1	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		4	672	4		1	1237	8		2	0	7		37	0	9
Percent Heavy Vehicles (%)		3				3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

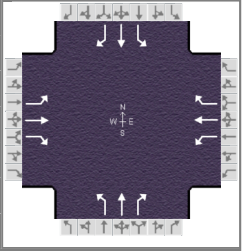
Base Critical Headway (sec)		4.1				4.1					7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.13				4.13					7.13	6.53	6.23		7.13	6.53	6.23
Base Follow-Up Headway (sec)		2.2				2.2					3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23					3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		4				1					10					50	
Capacity, c (veh/h)		505				866					123					44	
v/c Ratio		0.01				0.00					0.08					1.14	
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.3					4.7	
Control Delay (s/veh)		12.2				9.2					36.7					328.3	
Level of Service (LOS)		B				A					E					F	
Approach Delay (s/veh)		0.1				0.0				36.7				328.3			
Approach LOS										E				F			

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	AECOM			Duration, h	0.25
Analyst	KKM	Analysis Date	May 15, 2020	Area Type	Other
Jurisdiction	Delaware County	Time Period	AM Peak Hour	PHF	0.92
Urban Street	Big Walnut Road	Analysis Year	2040	Analysis Period	1 > 7:00
Intersection	Big Walnut/Worthington	File Name	9-2040 No Build AM BW-Worthington Road.xus		
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	59	551	106	260	1081	59	47	360	94	201	932	118

Signal Information																		
Cycle, s	120.0	Reference Phase	2															
Offset, s	0	Reference Point	End															
Uncoordinated	Yes	Simult. Gap E/W	On	Green	60.0	50.0	0.0	0.0	0.0	0.0	1		2		3		4	
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.0	0.0	0.0	0.0	0.0	5		6		7		8	
				Red	1.0	1.0	0.0	0.0	0.0	0.0								

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6		8		4
Case Number		5.0		5.0		5.0		5.0
Phase Duration, s		65.0		65.0		55.0		55.0
Change Period, (Y+R _c), s		5.0		5.0		5.0		5.0
Max Allow Headway (MAH), s		3.3		3.3		3.2		3.2
Queue Clearance Time (g _s), s		62.0		62.0		52.0		52.0
Green Extension Time (g _e), s		0.0		0.0		0.0		0.0
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		1.00		1.00		1.00		1.00

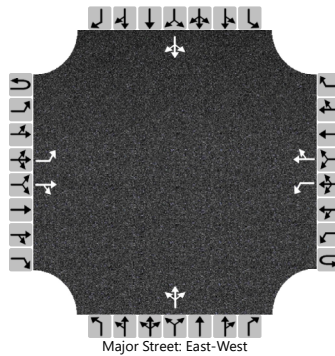
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	64	599	115	283	1175	64	51	391	102	218	1013	128
Adjusted Saturation Flow Rate (s), veh/h/ln	474	1856	1572	813	1856	1572	552	1856	1572	985	1856	1572
Queue Service Time (g _s), s	0.0	28.6	4.7	31.4	60.0	2.6	0.0	18.7	4.9	25.3	50.0	6.2
Cycle Queue Clearance Time (g _c), s	60.0	28.6	4.7	60.0	60.0	2.6	50.0	18.7	4.9	44.0	50.0	6.2
Green Ratio (g/C)	0.50	0.50	0.50	0.50	0.50	0.50	0.42	0.42	0.42	0.42	0.42	0.42
Capacity (c), veh/h	60	928	786	273	928	786	60	773	655	317	773	655
Volume-to-Capacity Ratio (X)	1.069	0.646	0.147	1.036	1.266	0.082	0.851	0.506	0.156	0.690	1.310	0.196
Back of Queue (Q), ft/ln (95 th percentile)	187.2	448.7	75.4	495.6	2114.6	40.6	119.1	320.4	80.2	269.3	1979.7	102.6
Back of Queue (Q), veh/ln (95 th percentile)	7.3	17.5	2.9	19.4	82.6	1.6	4.7	12.5	3.1	10.5	77.3	4.0
Queue Storage Ratio (RQ) (95 th percentile)	0.99	0.22	0.38	1.42	1.41	0.12	0.36	0.21	0.24	0.90	1.16	0.34
Uniform Delay (d ₁), s/veh	60.0	22.1	16.2	47.8	30.0	15.6	60.0	25.9	21.8	42.1	35.0	22.2
Incremental Delay (d ₂), s/veh	136.6	1.2	0.0	64.2	128.5	0.0	63.9	0.2	0.0	5.2	148.9	0.1
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	196.6	23.4	16.2	111.9	158.5	15.7	123.9	26.1	21.9	47.4	183.9	22.3
Level of Service (LOS)	F	C	B	F	F	B	F	C	C	D	F	C
Approach Delay, s/veh / LOS	36.6		D	143.8		F	34.5		C	146.7		F
Intersection Delay, s/veh / LOS	110.7						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.10	B	2.10	B	2.11	B	2.11	B
Bicycle LOS Score / LOS	1.77	B	3.00	C	1.39	A	2.73	C

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Ketterington		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/15/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Ketterington/Satinwood		
Time Analyzed	AM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12	
Priority																	
Number of Lanes	0	1	1	0	0	1	1	0		0	1	0		0	1	0	
Configuration		L		TR		L		TR			LTR				LTR		
Volume (veh/h)		10	826	10		5	1383	4		6	2	22		12	1	11	
Percent Heavy Vehicles (%)		3				3				3	3	3		3	3	3	
Proportion Time Blocked																	
Percent Grade (%)										0				0			
Right Turn Channelized																	
Median Type Storage	Undivided																

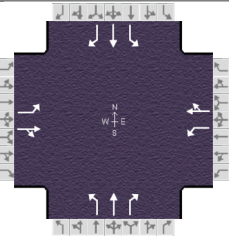
Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.13				4.13				7.13	6.53	6.23		7.13	6.53	6.23
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

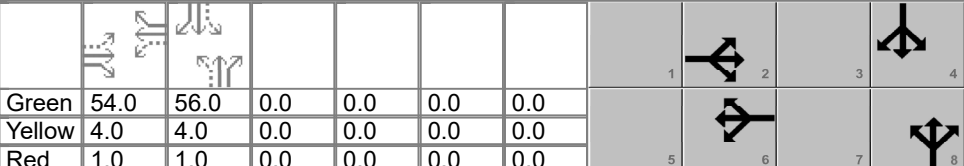
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		11				5					33					26	
Capacity, c (veh/h)		441				745					65					31	
v/c Ratio		0.02				0.01					0.50					0.85	
95% Queue Length, Q ₉₅ (veh)		0.1				0.0					2.0					2.8	
Control Delay (s/veh)		13.4				9.9					105.6					301.8	
Level of Service (LOS)		B				A					F					F	
Approach Delay (s/veh)		0.2				0.0				105.6				301.8			
Approach LOS		B				A				F				F			

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information		
Agency	AECOM			Duration, h	0.25	
Analyst	KKM	Analysis Date	May 15, 2020	Area Type	Other	
Jurisdiction	Delaware County	Time Period	AM Peak Hour	PHF	0.92	
Urban Street	Big Walnut Road	Analysis Year	2040	Analysis Period	1 > 7:00	
Intersection	Big Walnut/SR3	File Name	9-2040 No Build AM BW-SR3.xus			
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build					

Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	120	516	224	220	891	134	189	384	12	170	1154	313

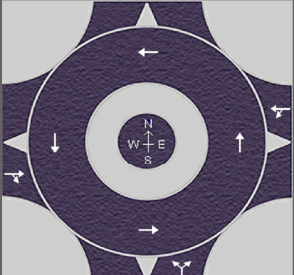
Signal Information														
Cycle, s	120.0	Reference Phase	2	Green	54.0	56.0	0.0	0.0	0.0	0.0	1	2	3	4
Offset, s	0	Reference Point	End	Yellow	4.0	4.0	0.0	0.0	0.0	0.0	5	6	7	8
Uncoordinated	Yes	Simult. Gap E/W	On	Red	1.0	1.0	0.0	0.0	0.0	0.0				
Force Mode	Fixed	Simult. Gap N/S	On											

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6		8		4
Case Number		6.0		6.0		5.0		5.0
Phase Duration, s		59.0		59.0		61.0		61.0
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		5.0
Max Allow Headway (MAH), s		3.4		3.4		3.3		3.3
Queue Clearance Time (g_s), s		56.0		56.0		58.0		58.0
Green Extension Time (g_e), s		0.0		0.0		0.0		0.0
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		1.00		1.00		1.00		1.00

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	130	804		239	1114		205	417	13	185	1254	340
Adjusted Saturation Flow Rate (s), veh/h/ln	514	1802		688	1856		450	1900	1610	984	1900	1610
Queue Service Time (g_s), s	0.0	53.2		0.8	54.0		0.0	18.0	0.5	19.0	56.0	17.1
Cycle Queue Clearance Time (g_c), s	54.0	53.2		54.0	54.0		56.0	18.0	0.5	37.0	56.0	17.1
Green Ratio (g/C)	0.45	0.45		0.45	0.45		0.47	0.47	0.47	0.47	0.47	0.47
Capacity (c), veh/h	60	811		64	835		60	887	751	372	887	751
Volume-to-Capacity Ratio (X)	2.174	0.992		3.709	1.334		3.424	0.471	0.017	0.497	1.415	0.453
Back of Queue (Q), ft/ln (95 th percentile)	514.5	919.7		1098.6	2169		927.8	296.1	8.2	193.1	2628.3	249.4
Back of Queue (Q), veh/ln (95 th percentile)	20.6	36.8		43.9	86.8		37.1	11.8	0.3	7.7	105.1	10.0
Queue Storage Ratio (RQ) (95 th percentile)	2.57	0.46		7.32	0.87		1.69	0.09	0.04	0.39	0.43	1.08
Uniform Delay (d_1), s/veh	60.0	32.8		60.0	33.0		60.0	21.9	17.2	34.5	32.0	21.6
Incremental Delay (d_2), s/veh	579.0	29.5		1256.3	158.3		1131.6	0.1	0.0	0.4	193.3	0.2
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	639.0	62.3		1316.3	191.3		1191.6	22.0	17.2	34.9	225.3	21.8
Level of Service (LOS)	F	E		F	F		F	C	B	C	F	C
Approach Delay, s/veh / LOS	142.8	F		390.1	F		399.8	F		166.6	F	
Intersection Delay, s/veh / LOS	257.7						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.10	B	2.10	B	1.91	B	1.91	B
Bicycle LOS Score / LOS	2.03	B	2.72	C	1.54	B	3.42	C

HCS7 Roundabouts Report

General Information				Site Information			
Analyst	KKM		Intersection	Bale Kenyon & Big Walnut			
Agency or Co.	AECOM		E/W Street Name	Big Walnut Road			
Date Performed	5/4/2020		N/S Street Name	Bale Kenyon Road			
Analysis Year	2040		Analysis Time Period (hrs)	0.25			
Time Analyzed	PM Peak Hour		Peak Hour Factor	0.92			
Project Description	DEL-71-3.55 Big Walnut Inte...		Jurisdiction	Delaware County			

Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0
Lane Assignment	TR				LT				LR							
Volume (V), veh/h	0		1038	50	0	218	1233		0	149		362				
Percent Heavy Vehicles, %	2		2	2	2	2	2		2	2		2				
Flow Rate (v _{PCE}), pc/h	0		1151	55	0	242	1367		0	165		401				
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1							
Pedestrians Crossing, p/h	0				0				0							

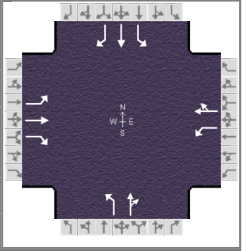
Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (s)		4.9763			4.9763			4.9763					
Follow-Up Headway (s)		2.6087			2.6087			2.6087					

Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (v _e), pc/h		1206			1609			566					
Entry Volume, veh/h		1182			1577			555					
Circulating Flow (v _c), pc/h	242			165			1151			1774			
Exiting Flow (v _{ex}), pc/h	1552			1532			0			297			
Capacity (C _{PCE}), pc/h		1078			1166			427					
Capacity (c), veh/h		1057			1143			418					
v/c Ratio (x)		1.12			1.38			1.33					

Delay and Level of Service													
Approach	EB			WB			NB			SB			
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Lane Control Delay (d), s/veh		84.3			189.8			189.8					
Lane LOS		F			F			F					
95% Queue, veh		30.3			63.6			25.3					
Approach Delay, s/veh	84.3			189.8			189.8						
Approach LOS	F			F			F						
Intersection Delay, s/veh LOS	152.2						F						

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information			
Agency	AECOM			Duration, h	0.25		
Analyst	KKM	Analysis Date	May 12, 2020	Area Type	Other		
Jurisdiction	Delaware County	Time Period	PM Peak Hour	PHF	0.92		
Urban Street	Big Walnut Road	Analysis Year	2040	Analysis Period	1 > 17:00		
Intersection	Big Walnut & Africa	File Name	10-2040 No Build PM BW-Africa Road.xus				
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build						



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	170	970	260	80	710	50	600	320	150	30	150	140

Signal Information														
Cycle, s	120.0	Reference Phase	2											
Offset, s	0	Reference Point	End											
Uncoordinated	Yes	Simult. Gap E/W	On	Green	7.0	52.5	7.0	18.5	10.0	0.0				
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.0	4.0	4.0	4.0	0.0				
				Red	1.0	1.0	1.0	1.0	1.0	0.0				

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	3.0	1.1	4.0	1.1	4.0	1.1	3.0
Phase Duration, s	12.0	57.5	12.0	57.5	35.5	38.5	12.0	15.0
Change Period, ($Y+R_c$), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (MAH), s	3.0	3.0	3.0	3.0	3.0	3.1	3.0	3.1
Queue Clearance Time (g_s), s	9.0	54.5	5.1	54.5	32.5	35.5	3.9	12.0
Green Extension Time (g_e), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	1.00	1.00	1.00	1.00	1.00	1.00	0.92	1.00

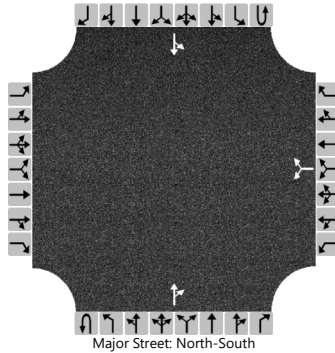
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	185	1054	283	87	826		652	511		33	163	152
Adjusted Saturation Flow Rate (s), veh/h/ln	1767	1856	1572	1767	1834		1767	1755		1767	1856	1572
Queue Service Time (g_s), s	7.0	52.5	8.1	3.1	52.5		30.5	33.5		1.9	10.0	10.0
Cycle Queue Clearance Time (g_c), s	7.0	52.5	8.1	3.1	52.5		30.5	33.5		1.9	10.0	10.0
Green Ratio (g/C)	0.50	0.44	0.69	0.50	0.44		0.35	0.28		0.14	0.08	0.14
Capacity (c), veh/h	163	812	1088	163	802		509	490		163	155	223
Volume-to-Capacity Ratio (X)	1.133	1.299	0.260	0.533	1.030		1.281	1.043		0.200	1.054	0.683
Back of Queue (Q), ft/ln (95 th percentile)	314.8	2020.2	107.4	59.2	1035.4		1234.1	750.2		38.7	340.4	209.5
Back of Queue (Q), veh/ln (95 th percentile)	12.3	78.9	4.2	2.3	40.4		48.2	29.3		1.5	13.3	8.2
Queue Storage Ratio (RQ) (95 th percentile)	0.90	1.06	0.31	0.30	0.38		3.09	0.50		0.19	0.07	0.84
Uniform Delay (d_1), s/veh	33.0	33.8	7.0	27.5	33.8		36.0	43.3		45.5	55.0	48.9
Incremental Delay (d_2), s/veh	110.7	143.5	0.0	1.8	39.6		140.9	52.3		0.2	87.6	6.9
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Control Delay (d), s/veh	143.7	177.2	7.0	29.3	73.3		176.8	95.5		45.7	142.6	55.9
Level of Service (LOS)	F	F	A	C	F		F	F		D	F	E
Approach Delay, s/veh / LOS	141.5	F		69.1	E		141.1	F		95.6	F	
Intersection Delay, s/veh / LOS	120.6						F					

Multimodal Results	EB		WB		NB		SB	
	Pedestrian LOS Score / LOS	1.92	B	2.11	B	1.94	B	2.15
Bicycle LOS Score / LOS	3.00	C	1.99	B	2.41	B	1.06	A

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Africa & Jaycox		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/15/2020			East/West Street	Jaycox Road		
Analysis Year	2040			North/South Street	Africa Road		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	North-South			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement																	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0	
Configuration							LR					TR		LT			
Volume (veh/h)						40		40			480	60		60	280		
Percent Heavy Vehicles (%)						2		2						2			
Proportion Time Blocked																	
Percent Grade (%)						0											
Right Turn Channelized																	
Median Type Storage					Undivided												

Critical and Follow-up Headways

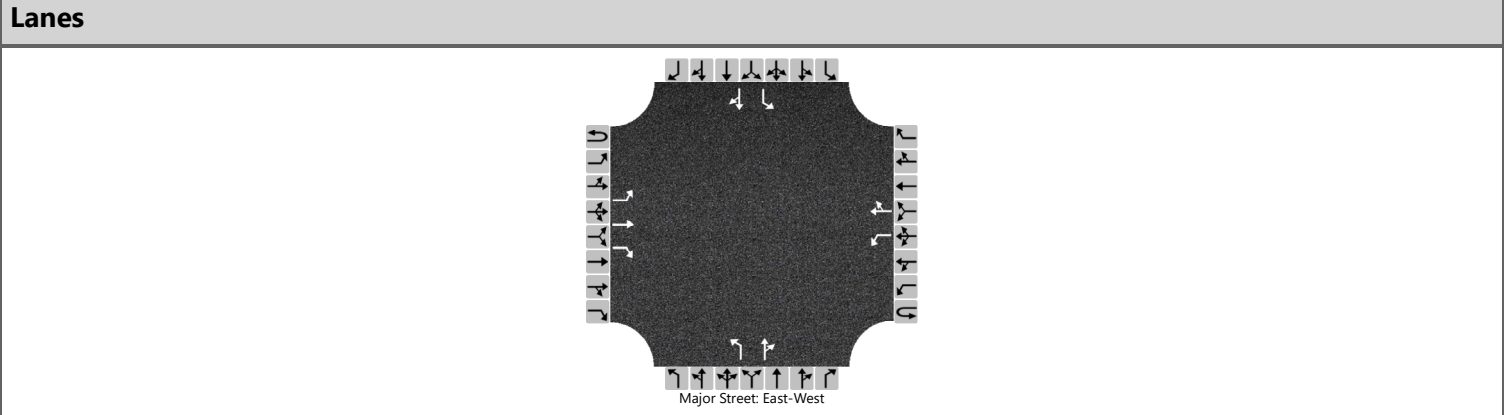
Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						87								65		
Capacity, c (veh/h)						342								988		
v/c Ratio						0.25								0.07		
95% Queue Length, Q ₉₅ (veh)						1.0								0.2		
Control Delay (s/veh)						19.1								8.9		
Level of Service (LOS)						C								A		
Approach Delay (s/veh)					19.1								2.2			
Approach LOS					C											

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Medan		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/14/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Medan Dr/Whispering Ridge		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build						



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	1	1	0	1	1	0		1	1	0		1	1	0
Configuration		L	T	R		L		TR		L		TR		L		TR
Volume (veh/h)		20	1100	30		10	810	20		20	10	10		10	10	10
Percent Heavy Vehicles (%)		3				3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized	No															
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.13				4.13				7.13	6.53	6.23		7.13	6.53	6.23
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

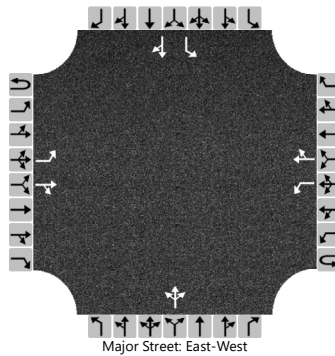
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		22				11				22		22		11		22	
Capacity, c (veh/h)		749				564				26		75		25		77	
v/c Ratio		0.03				0.02				0.85		0.29		0.44		0.28	
95% Queue Length, Q ₉₅ (veh)		0.1				0.1				2.6		1.1		1.3		1.0	
Control Delay (s/veh)		9.9				11.5				347.9		72.0		237.6		69.5	
Level of Service (LOS)		A				B				F		F		F		F	
Approach Delay (s/veh)		0.2				0.1				210.0				125.5			
Approach LOS										F				F			

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Highland		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/14/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Highland Hills Drive		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	1	0	0	1	1	0		0	1	0		1	1	0
Configuration		L		TR		L		TR			LTR			L		TR
Volume (veh/h)		10	1106	30		20	774	10		30	10	10		10	10	10
Percent Heavy Vehicles (%)		3				3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.13				4.13				7.13	6.53	6.23		7.13	6.53	6.23
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

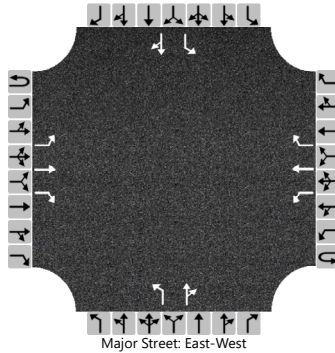
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		11				22					54				11		22	
Capacity, c (veh/h)		782				561					36				26		81	
v/c Ratio		0.01				0.04					1.50				0.41		0.27	
95% Queue Length, Q ₉₅ (veh)		0.0				0.1					5.8				1.3		1.0	
Control Delay (s/veh)		9.7				11.7					501.8				217.2		65.2	
Level of Service (LOS)		A				B					F				F		F	
Approach Delay (s/veh)		0.1				0.3					501.8				115.8			
Approach LOS											F				F			

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Willow Bend		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/14/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Willow Bend/Grand Oak		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL071-3.55 Big Walnut Interchange - No Build						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	1	1	0	1	1	1		1	1	0		1	1	0
Configuration		L	T	R		L	T	R		L		TR		L		TR
Volume (veh/h)		40	1054	30		30	703	30		20	10	20		30	10	30
Percent Heavy Vehicles (%)		3				3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized	No				No											
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.13				4.13				7.13	6.53	6.23		7.13	6.53	6.23
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

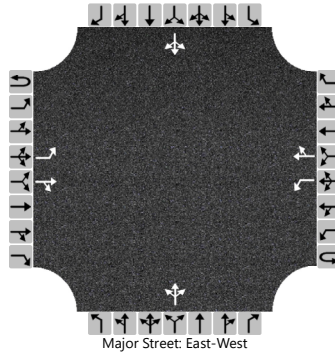
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		43				33				22		33		33		43	
Capacity, c (veh/h)		821				589				26		100		26		138	
v/c Ratio		0.05				0.06				0.83		0.32		1.25		0.32	
95% Queue Length, Q ₉₅ (veh)		0.2				0.2				2.6		1.3		3.9		1.3	
Control Delay (s/veh)		9.6				11.5				336.1		57.2		484.1		42.8	
Level of Service (LOS)		A				B				F		F		F		E	
Approach Delay (s/veh)		0.3				0.5				168.7				231.9			
Approach LOS										F				F			

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Jeffries		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/15/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Jeffries Court/Grandmere		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12	
Priority																	
Number of Lanes	0	1	1	0	0	1	1	0		0	1	0		0	1	0	
Configuration		L		TR		L		TR			LTR				LTR		
Volume (veh/h)		10	1106	10		10	733	40		10	0	0		20	0	20	
Percent Heavy Vehicles (%)		3				3				3	3	3		3	3	3	
Proportion Time Blocked																	
Percent Grade (%)										0				0			
Right Turn Channelized																	
Median Type Storage	Undivided																

Critical and Follow-up Headways

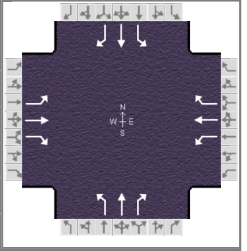
Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.13				4.13				7.13	6.53	6.23		7.13	6.53	6.23
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		11				11					11					43	
Capacity, c (veh/h)		791				571					36					70	
v/c Ratio		0.01				0.02					0.30					0.62	
95% Queue Length, Q ₉₅ (veh)		0.0				0.1					1.0					2.7	
Control Delay (s/veh)		9.6				11.4					145.3					118.7	
Level of Service (LOS)		A				B					F					F	
Approach Delay (s/veh)		0.1				0.1				145.3				118.7			
Approach LOS										F				F			

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information			
Agency	AECOM			Duration, h	0.25		
Analyst	KKM	Analysis Date	May 15, 2020	Area Type	Other		
Jurisdiction	Delaware County	Time Period	PM Peak Hour	PHF	0.92		
Urban Street	Big Walnut Road	Analysis Year	2040	Analysis Period	1 > 7:00		
Intersection	Big Walnut/Worthington	File Name	10-2040 No Build PM BW-Worthington Road.xus				
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build						



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	83	949	118	106	568	224	106	944	248	106	460	71

Signal Information													
Cycle, s	120.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	Yes	Simult. Gap E/W	On	Green	56.0	54.0	0.0	0.0	0.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.0	0.0	0.0	0.0	0.0			
				Red	1.0	1.0	0.0	0.0	0.0	0.0			

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6		8		4
Case Number		5.0		5.0		5.0		5.0
Phase Duration, s		61.0		61.0		59.0		59.0
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		5.0
Max Allow Headway (MAH), s		3.2		3.2		3.2		3.2
Queue Clearance Time (g_s), s		58.0		58.0		56.0		56.0
Green Extension Time (g_e), s		0.0		0.0		0.0		0.0
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		1.00		1.00		1.00		1.00

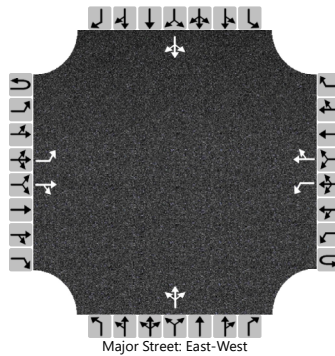
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	90	1032	128	115	617	243	115	1026	270	115	500	77
Adjusted Saturation Flow Rate (s), veh/h/ln	799	1856	1572	543	1856	1572	891	1856	1572	545	1856	1572
Queue Service Time (g_s), s	12.2	56.0	5.7	0.0	31.9	11.7	13.4	54.0	13.7	0.0	24.3	3.4
Cycle Queue Clearance Time (g_c), s	44.1	56.0	5.7	56.0	31.9	11.7	37.8	54.0	13.7	54.0	24.3	3.4
Green Ratio (g/C)	0.47	0.47	0.47	0.47	0.47	0.47	0.45	0.45	0.45	0.45	0.45	0.45
Capacity (c), veh/h	220	866	734	60	866	734	280	835	708	60	835	708
Volume-to-Capacity Ratio (X)	0.409	1.191	0.175	1.920	0.713	0.332	0.411	1.229	0.381	1.920	0.599	0.109
Back of Queue (Q), ft/ln (95 th percentile)	109.5	1676.8	91.8	442.7	507	189.5	132.7	1778.4	216	442.7	398.6	55.4
Back of Queue (Q), veh/ln (95 th percentile)	4.3	65.5	3.6	17.3	19.8	7.4	5.2	69.5	8.4	17.3	15.6	2.2
Queue Storage Ratio (RQ) (95 th percentile)	0.58	0.84	0.46	1.26	0.34	0.54	0.40	1.19	0.65	1.48	0.23	0.18
Uniform Delay (d_1), s/veh	43.2	32.0	18.6	60.0	25.6	20.2	39.1	33.0	21.9	60.0	24.8	19.1
Incremental Delay (d_2), s/veh	0.5	97.5	0.0	469.4	2.4	0.1	0.4	113.5	0.1	469.4	0.8	0.0
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	43.7	129.5	18.6	529.4	28.0	20.3	39.4	146.5	22.0	529.4	25.7	19.1
Level of Service (LOS)	D	F	B	F	C	C	D	F	C	F	C	B
Approach Delay, s/veh / LOS	111.9	F		85.2	F		114.0	F		108.8	F	
Intersection Delay, s/veh / LOS	106.1						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.10	B	2.10	B	2.10	B	2.10	B
Bicycle LOS Score / LOS	2.55	C	2.10	B	2.82	C	1.63	B

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Ketterington		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/15/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Ketterington/Satinwood		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12	
Priority																	
Number of Lanes	0	1	1	0	0	1	1	0		0	1	0		0	1	0	
Configuration		L		TR		L		TR			LTR				LTR		
Volume (veh/h)		10	1283	10		5	885	4		4	2	24		8	2	9	
Percent Heavy Vehicles (%)		3				3				3	3	3		3	3	3	
Proportion Time Blocked																	
Percent Grade (%)										0				0			
Right Turn Channelized																	
Median Type Storage	Undivided																

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.13				4.13				7.13	6.53	6.23		7.13	6.53	6.23
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		11				5					33					21	
Capacity, c (veh/h)		709				483					75					35	
v/c Ratio		0.02				0.01					0.43					0.59	
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					1.7					2.0	
Control Delay (s/veh)		10.2				12.5					85.1					206.0	
Level of Service (LOS)		B				B					F					F	
Approach Delay (s/veh)		0.1				0.1				85.1				206.0			
Approach LOS		B				B				F				F			

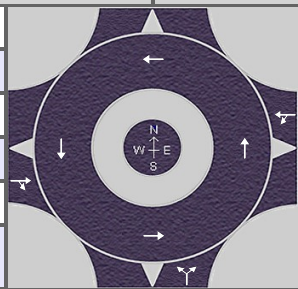
HCS7 Signalized Intersection Results Summary

General Information					Intersection Information											
Agency	AECOM				Duration, h	0.25										
Analyst	KKM		Analysis Date	May 15, 2020		Area Type	Other									
Jurisdiction	Delaware County		Time Period	PM Peak Hour		PHF	0.92									
Urban Street	Big Walnut Road		Analysis Year	2040		Analysis Period	1 > 7:00									
Intersection	Big Walnut/SR3		File Name	10-2040 No Build PM BW-SR3.xus												
Project Description	DEL-71-3.55 Big Walnut Interchange - No Build															
Demand Information					EB			WB			NB			SB		
Approach Movement					L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h					338	674	303	88	451	204	366	1280	26	152	526	77
Signal Information																
Cycle, s	120.0	Reference Phase	2													
Offset, s	0	Reference Point	End													
Uncoordinated	Yes	Simult. Gap E/W	On		Green	56.0	54.0	0.0	0.0	0.0	0.0					
Force Mode	Fixed	Simult. Gap N/S	On		Yellow	4.0	4.0	0.0	0.0	0.0	0.0					
					Red	1.0	1.0	0.0	0.0	0.0	0.0					
Timer Results					EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Assigned Phase						2		6		8		4				
Case Number						6.0		6.0		5.0		5.0				
Phase Duration, s						61.0		61.0		59.0		59.0				
Change Period, (Y+R _c), s						5.0		5.0		5.0		5.0				
Max Allow Headway (MAH), s						3.5		3.5		3.4		3.4				
Queue Clearance Time (g _s), s						58.0		58.0		56.0		56.0				
Green Extension Time (g _e), s						0.0		0.0		0.0		0.0				
Phase Call Probability						1.00		1.00		1.00		1.00				
Max Out Probability						1.00		1.00		1.00		1.00				
Movement Group Results					EB			WB			NB			SB		
Approach Movement					L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement					5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h					367	1062		96	712		398	1391	28	165	572	84
Adjusted Saturation Flow Rate (s), veh/h/ln					750	1800		540	1799		854	1900	1610	395	1900	1610
Queue Service Time (g _s), s					14.1	56.0		0.0	41.9		25.6	54.0	1.2	0.0	28.4	3.6
Cycle Queue Clearance Time (g _c), s					56.0	56.0		56.0	41.9		54.0	54.0	1.2	54.0	28.4	3.6
Green Ratio (g/C)					0.47	0.47		0.47	0.47		0.45	0.45	0.45	0.45	0.45	0.45
Capacity (c), veh/h					148	840		60	840		242	855	725	60	855	725
Volume-to-Capacity Ratio (X)					2.482	1.265		1.594	0.848		1.643	1.627	0.039	2.754	0.669	0.116
Back of Queue (Q), ft/ln (95 th percentile)					1456.7	1888.8		329.4	639.9		1170.8	3494.4	18.6	704.4	445.4	57.1
Back of Queue (Q), veh/ln (95 th percentile)					58.3	75.6		13.2	25.6		46.8	139.8	0.7	28.2	17.8	2.3
Queue Storage Ratio (RQ) (95 th percentile)					7.28	0.94		2.20	0.26		2.13	1.09	0.08	1.41	0.07	0.25
Uniform Delay (d ₁), s/veh					55.8	32.0		60.0	28.2		50.4	33.0	18.5	60.0	26.0	19.1
Incremental Delay (d ₂), s/veh					686.8	128.5		332.2	7.7		307.4	287.6	0.0	833.7	1.6	0.0
Initial Queue Delay (d ₃), s/veh					0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh					742.6	160.5		392.2	36.0		357.8	320.6	18.5	893.7	27.6	19.2
Level of Service (LOS)					F	F		F	D		F	F	B	F	C	B
Approach Delay, s/veh / LOS					310.1	F		78.2	E		324.1	F		201.1	F	
Intersection Delay, s/veh / LOS					258.5					F						
Multimodal Results					EB			WB			NB			SB		
Pedestrian LOS Score / LOS					2.10	B		2.10	B		1.91	B		1.91	B	
Bicycle LOS Score / LOS					2.85	C		1.82	B		3.49	C		1.84	B	

HCS7 Roundabouts Report

General Information

Analyst	KKM
Agency or Co.	AECOM
Date Performed	5/4/2020
Analysis Year	2040
Time Analyzed	AM Peak Hour
Project Description	DEL-71-3.55 Big Walnut Inte...



Site Information

Intersection	Bale Kenyon & Big Walnut
E/W Street Name	Big Walnut Road
N/S Street Name	Bale Kenyon Road
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	Delaware County

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0
Lane Assignment	TR				LT				LR							
Volume (V), veh/h	0		974	121	0	506	804		0	29		256				
Percent Heavy Vehicles, %	2		2	2	2	2	2		2	2		2				
Flow Rate (v _{PCE}), pc/h	0		1080	134	0	561	891		0	32		284				
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1							
Pedestrians Crossing, p/h	0				0				0							

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763				
Follow-Up Headway (s)		2.6087			2.6087			2.6087				

Flow Computations, Capacity and v/c Ratios

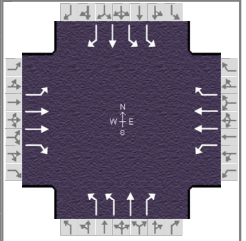
Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v _e), pc/h		1214			1452			316				
Entry Volume, veh/h		1190			1424			310				
Circulating Flow (v _c), pc/h	561			32			1080			1484		
Exiting Flow (v _{ex}), pc/h	1364			923			0			695		
Capacity (C _{PCE}), pc/h		779			1336			459				
Capacity (c), veh/h		763			1309			450				
v/c Ratio (x)		1.56			1.09			0.69				

Delay and Level of Service

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		273.8			68.9			27.4				
Lane LOS		F			F			D				
95% Queue, veh		60.7			31.3			5.1				
Approach Delay, s/veh	273.8			68.9			27.4					
Approach LOS	F			F			D					
Intersection Delay, s/veh LOS	147.9						F					

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	AECOM			Duration, h	0.25
Analyst	KKM	Analysis Date	May 12, 2020	Area Type	Other
Jurisdiction	Delaware County	Time Period	AM Peak Hour	PHF	0.92
Urban Street	Big Walnut Road	Analysis Year	2040	Analysis Period	1 > 7:00
Intersection	Big Walnut & Africa	File Name	11-2040 Alt 1 AM BW-Africa Road.xus		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 1				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	60	590	520	160	850	90	270	60	130	230	270	190

Signal Information													
Cycle, s	120.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	Yes	Simult. Gap E/W	On	Green	7.0	2.0	37.0	18.0	36.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	0.0	4.0	4.0	4.0	0.0			
				Red	1.0	0.0	1.0	1.0	1.0	0.0			

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	3.0	1.1	3.0	2.0	3.0	2.0	3.0
Phase Duration, s	12.0	42.0	14.0	44.0	23.0	41.0	23.0	41.0
Change Period, (Y+R _c), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (MAH), s	3.0	3.0	3.0	3.0	3.0	3.1	3.0	3.1
Queue Clearance Time (g _s), s	4.9	38.5	10.1	30.7	11.5	9.2	10.0	17.8
Green Extension Time (g _e), s	0.0	0.0	0.0	4.0	0.4	1.3	0.3	1.3
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	1.00	1.00	1.00	0.49	0.03	0.00	0.00	0.00

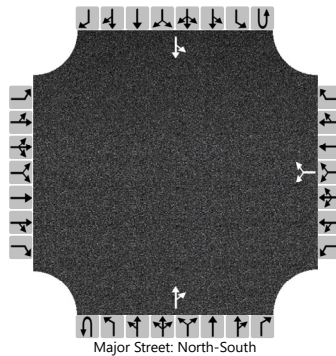
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	65	641	565	174	924	98	293	65	141	250	293	207
Adjusted Saturation Flow Rate (s), veh/h/ln	1767	1766	1572	1767	1766	1610	1716	1856	1610	1716	1856	1572
Queue Service Time (g _s), s	2.9	18.4	36.5	8.1	28.7	4.1	9.5	3.1	7.2	8.0	15.8	11.6
Cycle Queue Clearance Time (g _c), s	2.9	18.4	36.5	8.1	28.7	4.1	9.5	3.1	7.2	8.0	15.8	11.6
Green Ratio (g/C)	0.37	0.31	0.46	0.38	0.32	0.48	0.15	0.30	0.38	0.15	0.30	0.36
Capacity (c), veh/h	205	1089	721	314	1148	765	515	557	604	515	557	563
Volume-to-Capacity Ratio (X)	0.319	0.589	0.784	0.554	0.805	0.128	0.570	0.117	0.234	0.486	0.527	0.367
Back of Queue (Q), ft/ln (95 th percentile)	55.5	314.3	509.9	155.6	467.3	65.6	186.3	61.7	120.8	154.8	289	195.8
Back of Queue (Q), veh/ln (95 th percentile)	2.2	12.3	19.9	6.1	18.3	2.6	7.3	2.4	4.8	6.0	11.3	7.6
Queue Storage Ratio (RQ) (95 th percentile)	0.10	0.17	0.76	0.28	0.38	0.10	0.47	0.04	0.32	0.44	0.06	0.60
Uniform Delay (d ₁), s/veh	28.8	35.1	27.5	27.1	37.0	17.6	47.4	30.5	25.7	46.8	34.9	28.4
Incremental Delay (d ₂), s/veh	0.3	0.6	5.2	1.3	4.0	0.0	1.0	0.0	0.1	0.3	0.5	0.1
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	29.2	35.6	32.7	28.4	41.0	17.6	48.4	30.5	25.8	47.0	35.4	28.6
Level of Service (LOS)	C	D	C	C	D	B	D	C	C	D	D	C
Approach Delay, s/veh / LOS	34.0	C		37.2	D		39.7	D		37.4	D	
Intersection Delay, s/veh / LOS	36.5						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.29	B	2.29	B	2.45	B	2.45	B
Bicycle LOS Score / LOS	1.54	B	1.47	A	1.31	A	1.73	B

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Africa & Jaycox		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/15/2020			East/West Street	Jaycox Road		
Analysis Year	2040			North/South Street	Africa Road		
Time Analyzed	AM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	North-South			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 1						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						90		50			190	20		40	600	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type Storage						Undivided										

Critical and Follow-up Headways

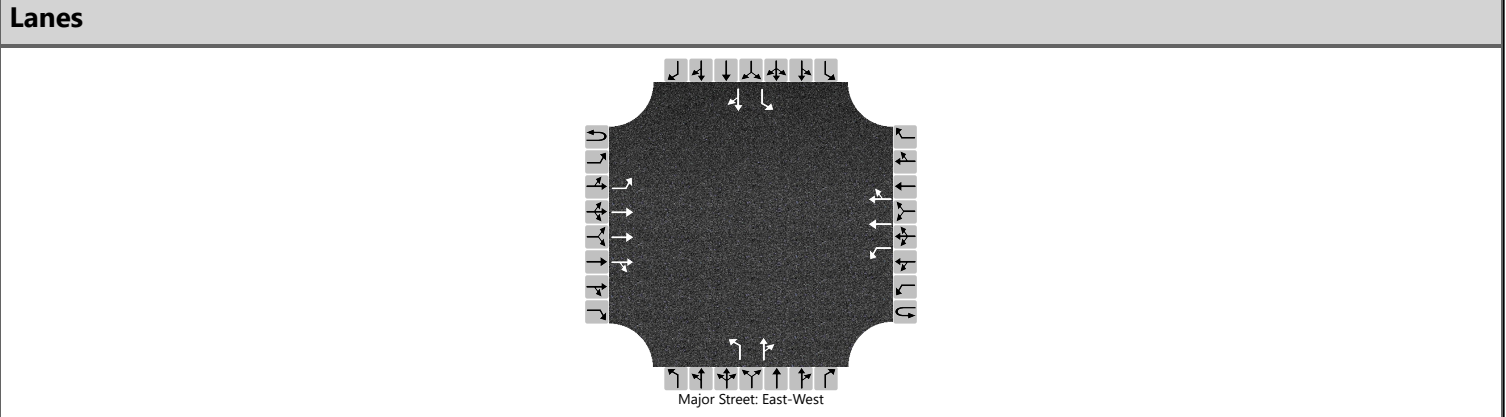
Base Critical Headway (sec)						7.1		6.2							4.1		
Critical Headway (sec)						6.42		6.22							4.12		
Base Follow-Up Headway (sec)						3.5		3.3							2.2		
Follow-Up Headway (sec)						3.52		3.32							2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						152									43		
Capacity, c (veh/h)						357									1340		
v/c Ratio						0.43									0.03		
95% Queue Length, Q ₉₅ (veh)						2.1									0.1		
Control Delay (s/veh)						22.4									7.8		
Level of Service (LOS)						C									A		
Approach Delay (s/veh)						22.4									0.9		
Approach LOS						C											

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Medan		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/14/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Medan Dr/Whispering Ridge		
Time Analyzed	AM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative1A						



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	3	0	0	1	2	0		1	1	0		1	1	0
Configuration		L	T	TR		L	T	TR		L		TR		L		TR
Volume (veh/h)	0	10	1220	10	0	10	900	10		20	10	10		10	10	20
Percent Heavy Vehicles (%)	3	3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

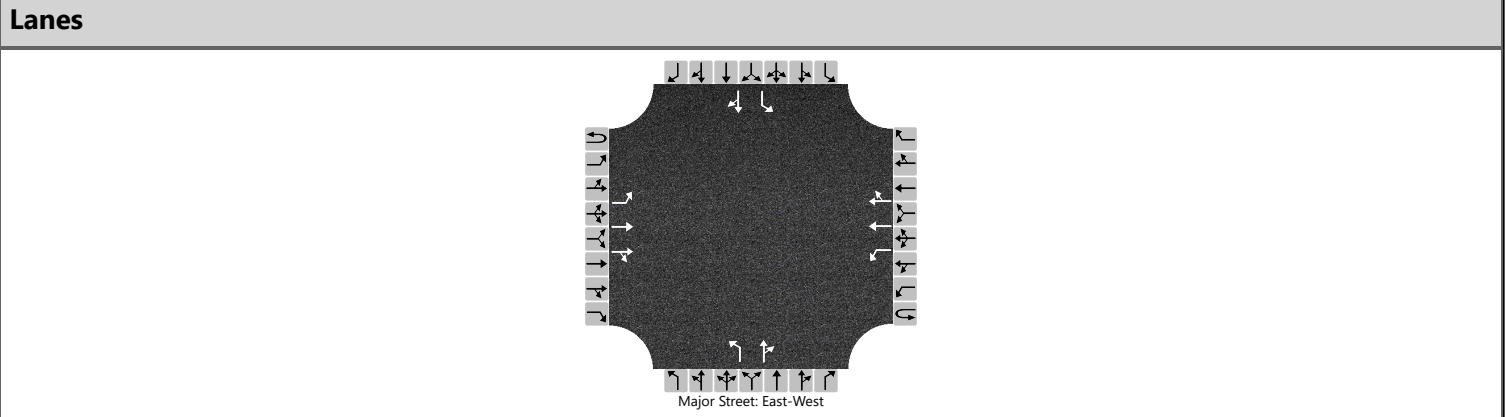
Base Critical Headway (sec)		5.3				5.3				6.4	6.5	7.1		6.4	6.5	7.1
Critical Headway (sec)		5.36				5.36				6.46	6.56	7.16		6.46	6.56	7.16
Base Follow-Up Headway (sec)		3.1				3.1				3.8	4.0	3.9		3.8	4.0	3.9
Follow-Up Headway (sec)		3.13				3.13				3.83	4.03	3.93		3.83	4.03	3.93

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		11				11				22		22		11		33	
Capacity, c (veh/h)		393				266				50		58		79		84	
v/c Ratio		0.03				0.04				0.43		0.37		0.14		0.39	
95% Queue Length, Q ₉₅ (veh)		0.1				0.1				1.6		1.4		0.5		1.5	
Control Delay (s/veh)		14.4				19.1				123.1		99.7		57.8		73.4	
Level of Service (LOS)		B				C				F		F		F		F	
Approach Delay (s/veh)		0.1				0.2				111.4				69.5			
Approach LOS										F				F			

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Medan		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/14/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Medan Dr/Whispering Ridge		
Time Analyzed	AM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 1						



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	2	0	0	1	2	0		1	1	0		1	1	0
Configuration		L	T	TR		L	T	TR		L		TR		L		TR
Volume (veh/h)	0	10	1220	10	0	10	900	10		20	10	10		10	10	20
Percent Heavy Vehicles (%)	3	3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

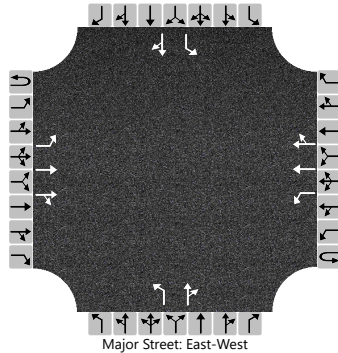
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		11				11				22		22		11		33	
Capacity, c (veh/h)		688				506				30		61		42		88	
v/c Ratio		0.02				0.02				0.71		0.36		0.26		0.37	
95% Queue Length, Q ₉₅ (veh)		0.0				0.1				2.4		1.3		0.9		1.5	
Control Delay (s/veh)		10.3				12.3				264.5		94.0		118.9		68.6	
Level of Service (LOS)		B				B				F		F		F		F	
Approach Delay (s/veh)		0.1				0.1				179.3				81.2			
Approach LOS										F				F			

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Highland		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/14/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Highland Hills Drive		
Time Analyzed	AM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 1						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Priority																
Number of Lanes	0	1	2	0	0	1	2	0	1	1	0		1	1	0	
Configuration		L	T	TR		L	T	TR		L		TR		L		TR
Volume (veh/h)	0	10	1262	14	0	9	854	10	66	10	15		10	10	10	
Percent Heavy Vehicles (%)	3	3			3	3			3	3	3		3	3	3	
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

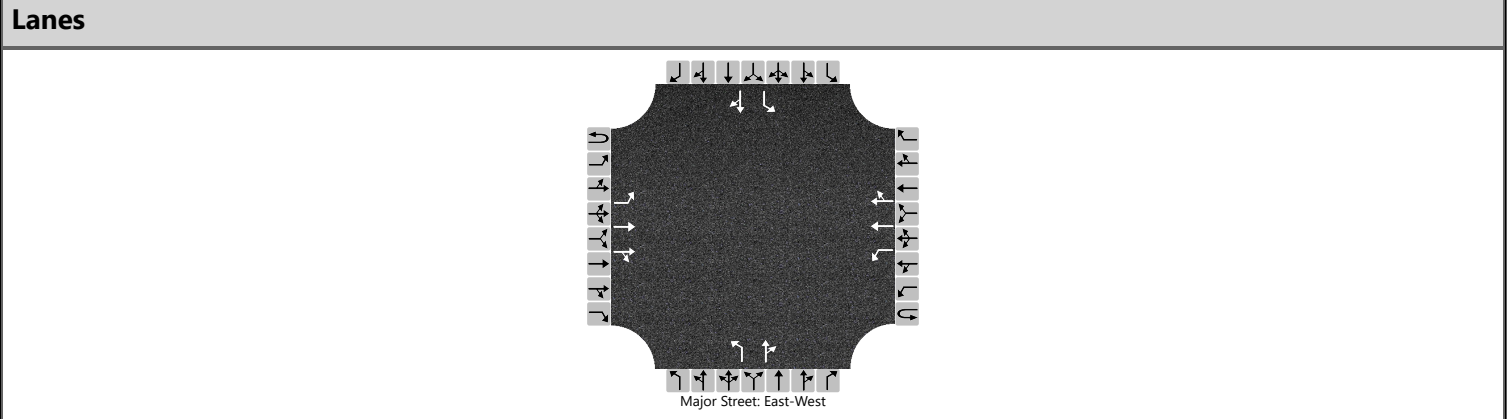
Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		11				10				72		27		11		22
Capacity, c (veh/h)		719				484				30		73		44		62
v/c Ratio		0.02				0.02				2.38		0.37		0.25		0.35
95% Queue Length, Q ₉₅ (veh)		0.0				0.1				8.4		1.4		0.8		1.3
Control Delay (s/veh)		10.1				12.6				910.7		80.3		113.3		90.9
Level of Service (LOS)		B				B				F		F		F		F
Approach Delay (s/veh)	0.1				0.1				682.6				98.4			
Approach LOS									F				F			

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Willow Bend		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/14/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Willow Bend/Grand Oak		
Time Analyzed	AM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL071-3.55 Big Walnut Interchange - Alternative 1						



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	2	0	0	1	2	0		1	1	0		1	1	0
Configuration		L	T	TR		L	T	TR		L		TR		L		TR
Volume (veh/h)	0	61	1167	13	0	9	788	55		12	15	19		55	9	63
Percent Heavy Vehicles (%)	3	3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

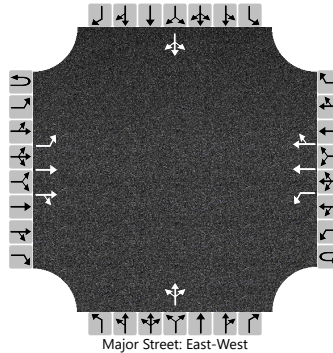
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		66				10				13		37		60		78	
Capacity, c (veh/h)		734				531				27		65		31		183	
v/c Ratio		0.09				0.02				0.48		0.57		1.90		0.43	
95% Queue Length, Q ₉₅ (veh)		0.3				0.1				1.5		2.4		6.8		1.9	
Control Delay (s/veh)		10.4				11.9				223.3		117.6		693.8		38.6	
Level of Service (LOS)		B				B				F		F		F		E	
Approach Delay (s/veh)		0.5				0.1				145.2				322.3			
Approach LOS										F				F			

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Jeffries		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/15/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Jeffries Court/Grandmere		
Time Analyzed	AM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 1						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	2	0	0	1	2	0	0	1	0	0	0	1	0	
Configuration		L	T	TR		L	T	TR		LTR				LTR		
Volume (veh/h)	0	7	1227	7	0	9	841	8	2	0	7		37	0	9	
Percent Heavy Vehicles (%)	3	3			3	3			3	3	3		3	3	3	
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

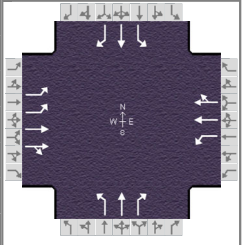
Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		8				10				10					50		
Capacity, c (veh/h)		730				504				145					78		
v/c Ratio		0.01				0.02				0.07					0.64		
95% Queue Length, Q ₉₅ (veh)		0.0				0.1				0.2					2.9		
Control Delay (s/veh)		10.0				12.3				31.6					110.1		
Level of Service (LOS)		A				B				D					F		
Approach Delay (s/veh)		0.1				0.1				31.6				110.1			
Approach LOS										D				F			

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	AECOM			Duration, h	0.25
Analyst	KKM	Analysis Date	May 15, 2020	Area Type	Other
Jurisdiction	Delaware County	Time Period	AM Peak Hour	PHF	0.92
Urban Street	Big Walnut Road	Analysis Year	2040	Analysis Period	1 > 7:00
Intersection	Big Walnut/Worthington	File Name	11-2040 Alt 1 AM BW-Worthington Road.xus		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 1				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	250	902	119	83	74	71	83	250	24	179	571	702

Signal Information														
Cycle, s	120.0	Reference Phase	2											
Offset, s	0	Reference Point	End											
Uncoordinated	Yes	Simult. Gap E/W	On											
Force Mode	Fixed	Simult. Gap N/S	On											
				Green	7.0	3.0	34.0	7.0	44.0	0.0				
				Yellow	4.0	4.0	4.0	4.0	4.0	0.0				
				Red	1.0	1.0	1.0	1.0	1.0	0.0				

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	2.0	4.0	1.1	4.0	1.1	3.0	1.1	3.0
Phase Duration, s	20.0	47.0	12.0	39.0	12.0	49.0	12.0	49.0
Change Period, (Y+R _c), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (MAH), s	3.0	3.0	3.0	3.0	3.0	3.1	3.0	3.1
Queue Clearance Time (g _s), s	11.0	36.3	6.3	6.4	5.7	15.0	9.0	46.0
Green Extension Time (g _e), s	0.2	1.6	0.0	2.4	0.0	4.0	0.0	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.37	0.47	1.00	0.00	1.00	0.01	1.00	1.00

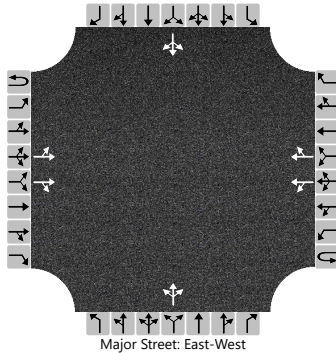
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	272	566	543	90	80	77	90	272	26	195	621	763
Adjusted Saturation Flow Rate (s), veh/h/ln	1716	1856	1779	1767	1856	1572	1767	1856	1572	1767	1856	1572
Queue Service Time (g _s), s	9.0	34.3	34.3	4.3	3.9	4.4	3.7	13.0	1.2	7.0	38.2	44.0
Cycle Queue Clearance Time (g _c), s	9.0	34.3	34.3	4.3	3.9	4.4	3.7	13.0	1.2	7.0	38.2	44.0
Green Ratio (g/C)	0.12	0.35	0.35	0.34	0.28	0.28	0.42	0.37	0.43	0.42	0.37	0.49
Capacity (c), veh/h	429	649	623	187	526	446	188	680	668	428	680	773
Volume-to-Capacity Ratio (X)	0.633	0.872	0.873	0.482	0.153	0.173	0.479	0.399	0.039	0.454	0.912	0.987
Back of Queue (Q), ft/ln (95 th percentile)	180.5	605.1	586.8	82	79.1	76.4	69.8	243.1	19.1	158.2	682.4	881.4
Back of Queue (Q), veh/ln (95 th percentile)	7.1	23.6	22.9	3.2	3.1	3.0	2.7	9.5	0.7	6.2	26.7	34.4
Queue Storage Ratio (RQ) (95 th percentile)	0.36	0.30	0.29	0.20	0.05	0.05	0.13	0.16	0.15	0.29	0.40	1.18
Uniform Delay (d ₁), s/veh	49.9	36.5	36.5	31.5	32.2	32.4	28.4	28.2	20.2	25.4	36.2	30.1
Incremental Delay (d ₂), s/veh	2.3	12.0	12.5	0.7	0.0	0.1	0.7	0.1	0.0	0.3	16.3	29.0
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	52.2	48.4	49.0	32.2	32.3	32.5	29.1	28.3	20.2	25.7	52.5	59.1
Level of Service (LOS)	D	D	D	C	C	C	C	C	C	C	D	E
Approach Delay, s/veh / LOS	49.4	D		32.3	C		28.0	C		52.4	D	
Intersection Delay, s/veh / LOS	47.2						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.12	B	2.29	B	2.28	B	2.44	B
Bicycle LOS Score / LOS	1.63	B	0.69	A	1.13	A	3.09	C

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Ketterington		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/15/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Ketterington/Satinwood		
Time Analyzed	AM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 1						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Priority																
Number of Lanes	0	0	2	0	0	0	2	0	0	1	0		0	1	0	
Configuration		LT		TR		LT		TR		LTR				LTR		
Volume (veh/h)		10	1085	10		10	211	10		6	2	22		12	1	11
Percent Heavy Vehicles (%)		3				3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

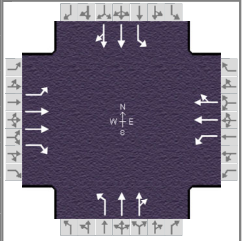
Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		11				11				33						26
Capacity, c (veh/h)		1316				577				241						320
v/c Ratio		0.01				0.02				0.14						0.08
95% Queue Length, Q ₉₅ (veh)		0.0				0.1				0.5						0.3
Control Delay (s/veh)		7.8				11.4				22.2						17.3
Level of Service (LOS)		A				B				C						C
Approach Delay (s/veh)	0.2				0.6				22.2				17.3			
Approach LOS									C				C			

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	AECOM			Duration, h	0.25
Analyst	KKM	Analysis Date	May 15, 2020	Area Type	Other
Jurisdiction	Delaware County	Time Period	AM Peak Hour	PHF	0.92
Urban Street	Big Walnut Road	Analysis Year	2040	Analysis Period	1 > 7:00
Intersection	Big Walnut/SR3	File Name	11-2040 Alt 1 AM BW-SR3.xus		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 1				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	162	656	301	220	145	134	45	384	12	170	1154	41

Signal Information													
Cycle, s	120.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	Yes	Simult. Gap E/W	On	Green	8.0	4.0	31.0	7.0	2.0	48.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	0.0	4.0	4.0	0.0	4.0			
				Red	1.0	0.0	1.0	1.0	0.0	1.0			

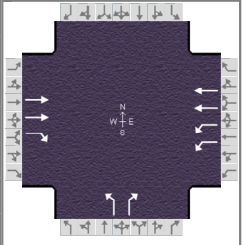
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	3.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	13.0	36.0	17.0	40.0	14.0	55.0	12.0	53.0
Change Period, ($Y+R_c$), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (MAH), s	3.0	3.0	3.0	3.0	2.9	2.9	2.9	2.9
Queue Clearance Time (g_s), s	10.0	23.8	13.6	10.5	3.8	11.0	9.0	39.8
Green Extension Time (g_e), s	0.0	2.1	0.0	3.0	0.0	3.2	0.0	2.4
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	1.00	0.32	1.00	0.00	0.02	0.00	1.00	0.33

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	176	713	327	239	158	146	49	216	214	185	653	646
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1809	1610	1810	1900	1610	1810	1900	1879	1810	1900	1877
Queue Service Time (g_s), s	8.0	21.8	20.4	11.6	7.7	8.5	1.8	9.0	9.0	7.0	37.7	37.8
Cycle Queue Clearance Time (g_c), s	8.0	21.8	20.4	11.6	7.7	8.5	1.8	9.0	9.0	7.0	37.7	37.8
Green Ratio (g/C)	0.32	0.26	0.33	0.37	0.29	0.29	0.48	0.42	0.42	0.46	0.40	0.40
Capacity (c), veh/h	404	935	537	298	554	470	232	792	783	482	760	751
Volume-to-Capacity Ratio (X)	0.436	0.763	0.610	0.802	0.284	0.310	0.210	0.273	0.274	0.384	0.859	0.860
Back of Queue (Q), ft/ln (95 th percentile)	167.4	374.6	312.1	248.3	155.8	145.2	30.9	169.7	168.5	130.7	619.8	615.7
Back of Queue (Q), veh/ln (95 th percentile)	6.7	15.0	12.5	9.9	6.2	5.8	1.2	6.8	6.7	5.2	24.8	24.6
Queue Storage Ratio (RQ) (95 th percentile)	0.42	0.19	0.69	0.71	0.06	0.06	0.06	0.05	0.05	0.27	0.10	0.10
Uniform Delay (d_1), s/veh	30.9	41.1	33.5	30.9	32.8	33.1	23.7	23.0	23.0	20.4	32.9	32.9
Incremental Delay (d_2), s/veh	0.3	3.4	1.5	13.5	0.1	0.1	0.2	0.1	0.1	0.2	9.3	9.5
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	31.2	44.5	34.9	44.4	32.9	33.2	23.9	23.1	23.1	20.5	42.2	42.5
Level of Service (LOS)	C	D	C	D	C	C	C	C	C	C	D	D
Approach Delay, s/veh / LOS	40.0		D	38.1		D	23.2		C	39.6		D
Intersection Delay, s/veh / LOS	37.4						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.30	B	2.29	B	2.28	B	2.43	B
Bicycle LOS Score / LOS	1.49	A	0.94	A	0.88	A	1.71	B

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	AECOM			Duration, h	0.25
Analyst	KKM	Analysis Date	May 12, 2020	Area Type	CBD
Jurisdiction	Delaware County	Time Period	AM Peak Hour	PHF	0.92
Urban Street	Big Walnut Road	Analysis Year	2040	Analysis Period	1 > 7:00
Intersection	Big Walnut & I-71 SB Ra...	File Name	11-2040 Alt 1 AM BW-I-71 SB Ramp.xus		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 1				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h		790	220	140	880		220		160			

Signal Information												
Cycle, s	120.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	Yes	Simult. Gap E/W	On									
Force Mode	Fixed	Simult. Gap N/S	On									
		Green	18.0	45.0	42.0	0.0	0.0	0.0				
		Yellow	4.0	4.0	4.0	0.0	0.0	0.0				
		Red	1.0	1.0	1.0	0.0	0.0	0.0				

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2	1	6		8		
Case Number		7.3	2.0	4.0		9.0		
Phase Duration, s		50.0	23.0	73.0		47.0		
Change Period, (Y+R _c), s		5.0	5.0	5.0		5.0		
Max Allow Headway (MAH), s		3.0	3.0	3.0		3.1		
Queue Clearance Time (g _s), s		29.7	7.3	24.4		17.6		
Green Extension Time (g _e), s		4.9	0.2	5.7		0.8		
Phase Call Probability		1.00	1.00	1.00		1.00		
Max Out Probability		0.13	0.00	0.00		0.00		

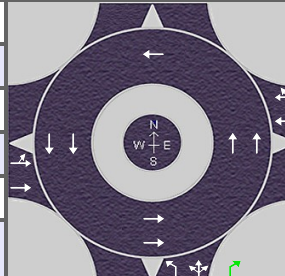
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement		2	12	1	6		3		18			
Adjusted Flow Rate (v), veh/h		859	239	152	957		239		174			
Adjusted Saturation Flow Rate (s), veh/h/ln		1590	1415	1544	1590		1431		1415			
Queue Service Time (g _s), s		27.7	6.7	5.3	22.4		15.6		8.4			
Cycle Queue Clearance Time (g _c), s		27.7	6.7	5.3	22.4		15.6		8.4			
Green Ratio (g/C)		0.38	0.73	0.15	0.57		0.35		0.50			
Capacity (c), veh/h		1192	1026	463	1802		501		708			
Volume-to-Capacity Ratio (X)		0.720	0.233	0.328	0.531		0.477		0.246			
Back of Queue (Q), ft/ln (95 th percentile)		403.5	74.9	91.8	305.8		229.7		120.4			
Back of Queue (Q), veh/ln (95 th percentile)		15.8	2.9	3.6	11.9		9.0		4.7			
Queue Storage Ratio (RQ) (95 th percentile)		0.33	0.13	0.18	0.29		0.57		0.15			
Uniform Delay (d ₁), s/veh		32.1	5.5	45.6	16.1		30.4		17.1			
Incremental Delay (d ₂), s/veh		1.9	0.0	0.2	0.2		0.3		0.1			
Initial Queue Delay (d ₃), s/veh		0.0	0.0	0.0	0.0		0.0		0.0			
Control Delay (d), s/veh		34.0	5.5	45.7	16.3		30.7		17.2			
Level of Service (LOS)		C	A	D	B		C		B			
Approach Delay, s/veh / LOS	27.8	C		20.3	C		25.0	C		0.0		
Intersection Delay, s/veh / LOS	24.2						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.11	B	0.70	A	2.48	B	2.32	B
Bicycle LOS Score / LOS	1.39	A	1.40	A		F		

HCS7 Roundabouts Report

General Information

Site Information

Analyst	KKM		Intersection	I-71 NB Ramp & Big Walnut
Agency or Co.	AECOM		E/W Street Name	Big Walnut Road
Date Performed	5/21/2020		N/S Street Name	I-71 NB Ramps
Analysis Year	2040		Analysis Time Period (hrs)	0.25
Time Analyzed	AM Peak Hour		Peak Hour Factor	0.92
Project Description	DEL-71-3.55 Big Walnut Inte...		Jurisdiction	Delaware County

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	2	0	0	0	2	0	0	1	1	0	0	0	0	0
Lane Assignment	LT		T		T	TR			L	LTR						
Volume (V), veh/h	0	160	790		0		760	180	0	260	0	450				
Percent Heavy Vehicles, %	3	3	3		3		3	3	3	3	3	3				
Flow Rate (v _{PCE}), pc/h	0	179	884		0		851	202	0	291	0	504				
Right-Turn Bypass	None				None				Non-Yielding				None			
Conflicting Lanes	2				2				2							
Pedestrians Crossing, p/h	0				0				0							

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)	4.6453	4.3276		4.6453	4.3276		4.6453	4.3276				
Follow-Up Headway (s)	2.6667	2.5352		2.6667	2.5352		2.6667	2.5352				

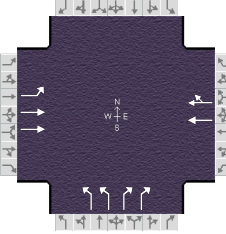












Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v _e), pc/h	500	563		495	558		291	0	504			
Entry Volume, veh/h	485	547		480	542		283	0	489			
Circulating Flow (v _c), pc/h	0			470			1063			1142		
Exiting Flow (v _{ex}), pc/h	884			1142			381			0		
Capacity (C _{PCE}), pc/h	1350	1420		876	952		508	575				
Capacity (c), veh/h	1311	1379		851	925		493	559				
v/c Ratio (x)	0.37	0.40		0.56	0.59		0.57	0.00				

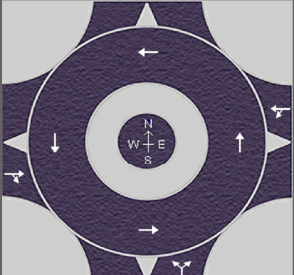
Delay and Level of Service

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh	6.2	6.3		12.4	12.2		19.5	6.4				
Lane LOS	A	A		B	B		C	A	A			
95% Queue, veh	1.7	1.9		3.6	3.9		3.5	0.0				
Approach Delay, s/veh	6.3			12.3			7.1					
Approach LOS	A			B			A					
Intersection Delay, s/veh LOS	8.7						A					

HCS7 Signalized Intersection Results Summary

General Information					Intersection Information												
Agency	AECOM				Duration, h	0.25											
Analyst	KKM		Analysis Date	May 12, 2020		Area Type	Other										
Jurisdiction	Delaware County		Time Period	AM Peak Hour		PHF	0.92										
Urban Street	Big Walnut Road		Analysis Year	2040		Analysis Period	1 > 7:00										
Intersection	Big Walnut & I-71 NB R...		File Name	11-2040 Alt 1B AM BW-I-71 NB Ramp.xus													
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 1B																
Demand Information					EB			WB			NB			SB			
Approach Movement					L	T	R	L	T	R	L	T	R	L	T	R	
Demand (v), veh/h					160	790			760	180	260		450				
Signal Information																	
Cycle, s	120.0	Reference Phase	2														
Offset, s	0	Reference Point	End		Green	10.0	52.0	43.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Uncoordinated	Yes	Simult. Gap E/W	On		Yellow	4.0	4.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Force Mode	Fixed	Simult. Gap N/S	On		Red	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Timer Results					EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT					
Assigned Phase					5	2		6		8							
Case Number					1.0	4.0		8.3		9.0							
Phase Duration, s					15.0	72.0		57.0		48.0							
Change Period, ($Y+R_c$), s					5.0	5.0		5.0		5.0							
Max Allow Headway (MAH), s					3.0	3.0		3.0		3.2							
Queue Clearance Time (g_s), s					8.1	19.0		29.1		18.4							
Green Extension Time (g_e), s					0.1	4.4		4.3		2.0							
Phase Call Probability					1.00	1.00		1.00		1.00							
Max Out Probability					1.00	0.00		0.03		0.00							
Movement Group Results					EB			WB			NB			SB			
Approach Movement					L	T	R	L	T	R	L	T	R	L	T	R	
Assigned Movement					5	2			6	16	3		18				
Adjusted Flow Rate (v), veh/h					174	859			528	493	283		489				
Adjusted Saturation Flow Rate (s), veh/h/ln					1767	1766			1856	1732	1716		1392				
Queue Service Time (g_s), s					6.1	17.0			26.7	27.1	6.9		16.4				
Cycle Queue Clearance Time (g_c), s					6.1	17.0			26.7	27.1	6.9		16.4				
Green Ratio (g/C)					0.53	0.56			0.43	0.43	0.36		0.36				
Capacity (c), veh/h					321	1973			804	750	1230		997				
Volume-to-Capacity Ratio (X)					0.542	0.435			0.657	0.657	0.230		0.490				
Back of Queue (Q), ft/ln (95 th percentile)					110.2	267.9			441.6	408.3	126.7		232.3				
Back of Queue (Q), veh/ln (95 th percentile)					4.3	10.5			17.3	16.3	4.9		9.1				
Queue Storage Ratio (RQ) (95 th percentile)					0.23	0.25			0.74	0.70	0.25		0.37				
Uniform Delay (d_1), s/veh					19.7	15.5			26.9	26.9	26.9		30.0				
Incremental Delay (d_2), s/veh					1.0	0.1			1.6	1.7	0.0		0.1				
Initial Queue Delay (d_3), s/veh					0.0	0.0			0.0	0.0	0.0		0.0				
Control Delay (d), s/veh					20.7	15.5			28.5	28.6	27.0		30.1				
Level of Service (LOS)					C	B			C	C	C		C				
Approach Delay, s/veh / LOS					16.4	B		28.6	C	29.0	C		0.0				
Intersection Delay, s/veh / LOS					24.2					C							
Multimodal Results					EB			WB			NB			SB			
Pedestrian LOS Score / LOS					2.09	B		1.40	A	2.16	B		2.32	B			
Bicycle LOS Score / LOS					1.34	A		1.33	A		F						

HCS7 Roundabouts Report

General Information				Site Information				
Analyst	KKM				Intersection	Bale Kenyon & Big Walnut		
Agency or Co.	AECOM				E/W Street Name	Big Walnut Road		
Date Performed	5/4/2020				N/S Street Name	Bale Kenyon Road		
Analysis Year	2040				Analysis Time Period (hrs)	0.25		
Time Analyzed	PM Peak Hour				Peak Hour Factor	0.92		
Project Description	DEL-71-3.55 Big Walnut Inte...				Jurisdiction	Delaware County		

Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0
Lane Assignment	TR				LT				LR							
Volume (V), veh/h	0		948	50	0	277	1463		0	149		362				
Percent Heavy Vehicles, %	2		2	2	2	2	2		2	2		2				
Flow Rate (v _{PCE}), pc/h	0		1051	55	0	307	1622		0	165		401				
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1							
Pedestrians Crossing, p/h	0				0				0							

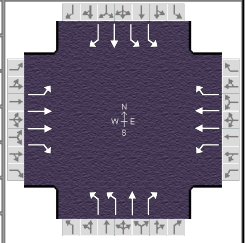
Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (s)		4.9763			4.9763			4.9763					
Follow-Up Headway (s)		2.6087			2.6087			2.6087					

Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (v _e), pc/h		1106			1929			566					
Entry Volume, veh/h		1084			1891			555					
Circulating Flow (v _c), pc/h	307			165			1051			2094			
Exiting Flow (v _{ex}), pc/h	1452			1787			0			362			
Capacity (C _{PCE}), pc/h		1009			1166			472					
Capacity (c), veh/h		989			1143			463					
v/c Ratio (x)		1.10			1.65			1.20					

Delay and Level of Service													
Approach	EB			WB			NB			SB			
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Lane Control Delay (d), s/veh		77.8			310.2			136.0					
Lane LOS		F			F			F					
95% Queue, veh		27.0			100.5			21.3					
Approach Delay, s/veh	77.8			310.2			136.0						
Approach LOS	F			F			F						
Intersection Delay, s/veh LOS	211.5						F						

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information			
Agency	AECOM			Duration, h	0.25		
Analyst	KKM	Analysis Date	May 12, 2020		Area Type	CBD	
Jurisdiction	Delaware County	Time Period	PM Peak Hour		PHF	0.92	
Urban Street	Big Walnut Road	Analysis Year	2040		Analysis Period	1 > 7:00	
Intersection	Big Walnut & Africa	File Name	12-2040 Alt 1 PM BW-Africa Road.xus				
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 1						



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	140	990	180	170	1160	280	470	290	150	110	60	110

Signal Information				Signal Timing (s)										
Cycle, s	120.0	Reference Phase	2											
Offset, s	0	Reference Point	End											
Uncoordinated	Yes	Simult. Gap E/W	On	Green	10.0	49.0	11.0	9.0	16.0	0.0				
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.0	4.0	4.0	4.0	0.0				
				Red	1.0	1.0	1.0	1.0	1.0	0.0				

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	3.0	1.1	3.0	2.0	3.0	2.0	3.0
Phase Duration, s	15.0	54.0	15.0	54.0	30.0	35.0	16.0	21.0
Change Period, ($Y+R_c$), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (MAH), s	3.0	3.0	3.0	3.0	3.0	3.1	3.0	3.1
Queue Clearance Time (g_s), s	8.5	38.3	10.0	48.7	20.8	22.9	6.4	10.7
Green Extension Time (g_e), s	0.0	6.0	0.0	0.3	0.6	0.9	0.1	0.7
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	1.00	0.51	1.00	1.00	0.44	0.13	0.09	0.32

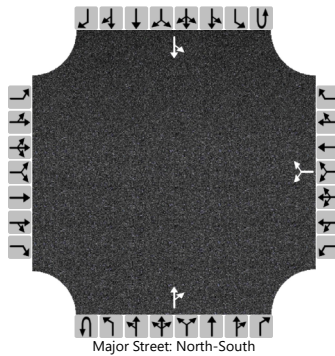
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	152	1076	196	185	1261	304	511	315	163	120	65	120
Adjusted Saturation Flow Rate (s), veh/h/ln	1590	1590	1415	1590	1590	1449	1544	1670	1449	1544	1670	1415
Queue Service Time (g_s), s	6.5	36.3	7.4	8.0	46.7	16.0	18.8	20.9	10.1	4.4	4.2	8.7
Cycle Queue Clearance Time (g_c), s	6.5	36.3	7.4	8.0	46.7	16.0	18.8	20.9	10.1	4.4	4.2	8.7
Green Ratio (g/C)	0.49	0.41	0.62	0.49	0.41	0.50	0.21	0.25	0.33	0.09	0.13	0.22
Capacity (c), veh/h	194	1298	873	234	1298	725	643	417	483	283	223	307
Volume-to-Capacity Ratio (X)	0.786	0.829	0.224	0.789	0.971	0.420	0.794	0.755	0.338	0.422	0.293	0.390
Back of Queue (Q), ft/ln (95 th percentile)	146.6	512.6	97	173.9	705.4	219.3	308.1	360.4	155.2	77.1	79.9	136.8
Back of Queue (Q), veh/ln (95 th percentile)	5.7	20.0	3.8	6.8	27.6	8.8	12.0	14.1	6.2	3.0	3.1	5.3
Queue Storage Ratio (RQ) (95 th percentile)	0.27	0.27	0.14	0.32	0.58	0.34	0.77	0.24	0.41	0.22	0.02	0.42
Uniform Delay (d_1), s/veh	27.6	31.7	10.2	26.3	34.8	19.0	45.1	41.6	30.0	51.5	46.9	40.2
Incremental Delay (d_2), s/veh	17.5	4.4	0.0	15.2	18.3	0.1	6.3	6.9	0.2	0.4	0.3	0.3
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	45.1	36.1	10.3	41.5	53.1	19.1	51.3	48.5	30.2	51.9	47.2	40.5
Level of Service (LOS)	D	D	B	D	D	B	D	D	C	D	D	D
Approach Delay, s/veh / LOS	33.5		C	46.0		D	46.9		D	46.4		D
Intersection Delay, s/veh / LOS	42.2						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.28	B	2.28	B	2.45	B	2.46	B
Bicycle LOS Score / LOS	1.66	B	1.93	B	2.12	B	0.99	A

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Africa & Jaycox		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/15/2020			East/West Street	Jaycox Road		
Analysis Year	2040			North/South Street	Africa Road		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	North-South			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 1						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						60		30			650	60		50	220	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type Storage						Undivided										

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2							4.1	
Critical Headway (sec)						6.42		6.22							4.12	
Base Follow-Up Headway (sec)						3.5		3.3							2.2	
Follow-Up Headway (sec)						3.52		3.32							2.22	

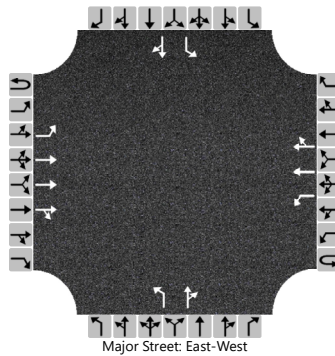
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						98									54	
Capacity, c (veh/h)						262									843	
v/c Ratio						0.37									0.06	
95% Queue Length, Q ₉₅ (veh)						1.7									0.2	
Control Delay (s/veh)						26.7									9.6	
Level of Service (LOS)						D									A	
Approach Delay (s/veh)						26.7									2.4	
Approach LOS						D										

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Medan		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/14/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Medan Dr/Whispering Ridge		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative1A						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Priority																
Number of Lanes	0	1	3	0	0	1	2	0	1	1	0		1	1	0	
Configuration		L	T	TR		L	T	TR		L		TR		L		TR
Volume (veh/h)	0	20	1640	30	0	10	1030	20	20	10	10		10	10	10	
Percent Heavy Vehicles (%)	3	3			3	3			3	3	3		3	3	3	
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

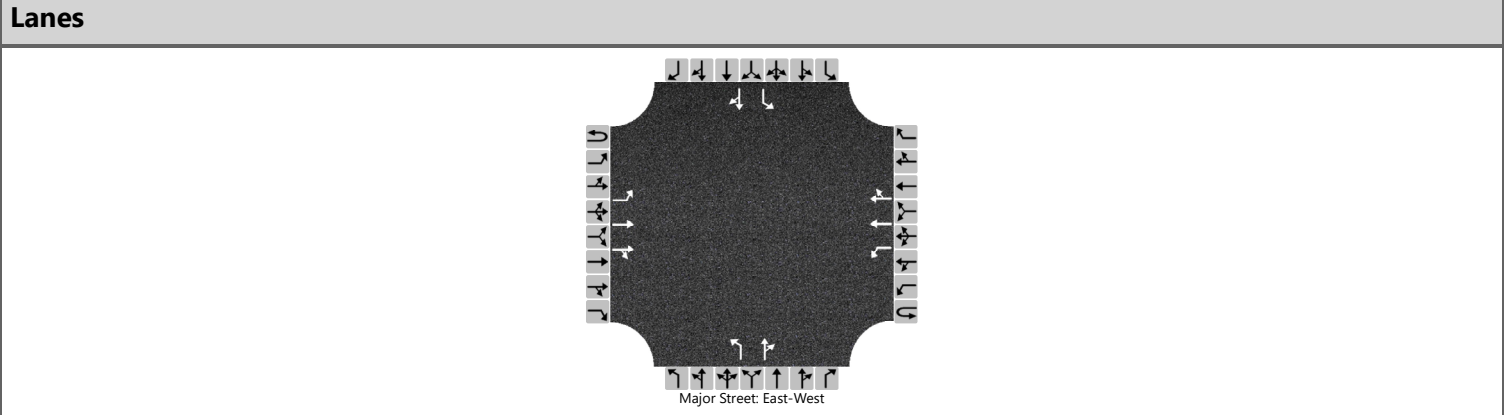
Base Critical Headway (sec)		5.3				5.3				6.4	6.5	7.1			6.4	6.5	7.1
Critical Headway (sec)		5.36				5.36				6.46	6.56	7.16			6.46	6.56	7.16
Base Follow-Up Headway (sec)		3.1				3.1				3.8	4.0	3.9			3.8	4.0	3.9
Follow-Up Headway (sec)		3.13				3.13				3.83	4.03	3.93			3.83	4.03	3.93

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		22				11				22		22			11		22
Capacity, c (veh/h)		332				153											
v/c Ratio		0.07				0.07											
95% Queue Length, Q ₉₅ (veh)		0.2				0.2											
Control Delay (s/veh)		16.6				30.3											
Level of Service (LOS)		C				D											
Approach Delay (s/veh)	0.2				0.3												
Approach LOS																	

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Medan		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/14/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Medan Dr/Whispering Ridge		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 1						



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	2	0	0	1	2	0		1	1	0		1	1	0
Configuration		L	T	TR		L	T	TR		L		TR		L		TR
Volume (veh/h)	0	20	1640	30	0	10	1030	20		20	10	10		10	10	10
Percent Heavy Vehicles (%)	3	3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

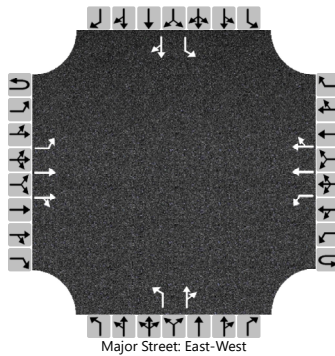
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		22				11				22		22		11		22
Capacity, c (veh/h)		602				330										
v/c Ratio		0.04				0.03										
95% Queue Length, Q ₉₅ (veh)		0.1				0.1										
Control Delay (s/veh)		11.2				16.3										
Level of Service (LOS)		B				C										
Approach Delay (s/veh)		0.1				0.2										
Approach LOS																

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Highland		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/14/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Highland Hills Drive		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 1						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	2	0	0	1	2	0		1	1	0		1	1	0
Configuration		L	T	TR		L	T	TR		L		TR		L		TR
Volume (veh/h)	0	10	1646	30	0	20	994	10		30	10	10		10	10	10
Percent Heavy Vehicles (%)	3	3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

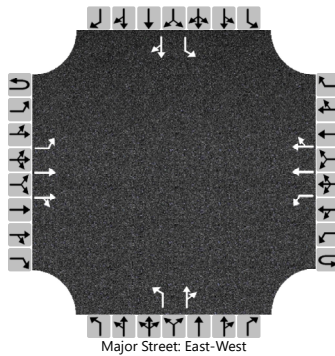
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		11				22				33		22		11		22
Capacity, c (veh/h)		629				328										
v/c Ratio		0.02				0.07										
95% Queue Length, Q ₉₅ (veh)		0.1				0.2										
Control Delay (s/veh)		10.8				16.7										
Level of Service (LOS)		B				C										
Approach Delay (s/veh)		0.1				0.3										
Approach LOS																

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Willow Bend		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/14/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Willow Bend/Grand Oak		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL071-3.55 Big Walnut Interchange - Alternative 1						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	2	0	0	1	2	0		1	1	0		1	1	0
Configuration		L	T	TR		L	T	TR		L		TR		L		TR
Volume (veh/h)	0	40	1591	30	0	30	924	30		20	10	20		30	10	30
Percent Heavy Vehicles (%)	3	3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

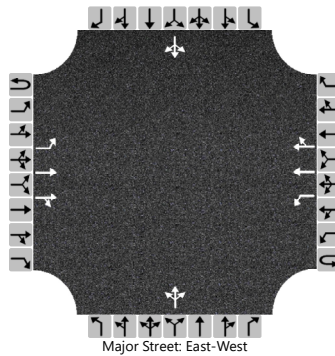
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		43				33				22		33		33		43	
Capacity, c (veh/h)		660				346				2		32		4		43	
v/c Ratio		0.07				0.09				10.29		1.02		8.20		1.01	
95% Queue Length, Q ₉₅ (veh)		0.2				0.3				4.3		3.5		5.7		4.1	
Control Delay (s/veh)		10.8				16.5				7301.7		352.2		4973.4		288.1	
Level of Service (LOS)		B				C				F		F		F		F	
Approach Delay (s/veh)		0.3				0.5				3132.0				2296.1			
Approach LOS										F				F			

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Jeffries		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/15/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Jeffries Court/Grandmere		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 1						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	2	0	0	1	2	0		0	1	0		0	1	0
Configuration		L	T	TR		L	T	TR			LTR				LTR	
Volume (veh/h)	0	10	1631	10	0	10	974	40		10	0	0		20	0	20
Percent Heavy Vehicles (%)	3	3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

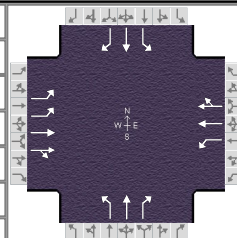
Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		11				11					11					43	
Capacity, c (veh/h)		623				340					17					61	
v/c Ratio		0.02				0.03					0.64					0.72	
95% Queue Length, Q ₉₅ (veh)		0.1				0.1					1.7					3.1	
Control Delay (s/veh)		10.9				16.0					398.1					152.7	
Level of Service (LOS)		B				C					F					F	
Approach Delay (s/veh)		0.1				0.2				398.1				152.7			
Approach LOS										F				F			

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	AECOM			Duration, h	0.25
Analyst	KKM	Analysis Date	May 15, 2020	Area Type	Other
Jurisdiction	Delaware County	Time Period	PM Peak Hour	PHF	0.92
Urban Street	Big Walnut Road	Analysis Year	2040	Analysis Period	1 > 7:00
Intersection	Big Walnut/Worthington	File Name	12-2040 Alt 1 PM BW-Worthington Road.xus		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 1				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	762	699	214	24	416	214	143	631	36	83	274	428

Signal Information													
Cycle, s	120.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	Yes	Simult. Gap E/W	On	Green	7.0	15.0	24.5	7.0	41.5	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.0	4.0	4.0	4.0	0.0			
				Red	1.0	1.0	1.0	1.0	1.0	0.0			

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	2.0	4.0	1.1	4.0	1.1	3.0	1.1	3.0
Phase Duration, s	32.0	49.5	12.0	29.5	12.0	46.5	12.0	46.5
Change Period, ($Y+R_c$), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (MAH), s	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Queue Clearance Time (g_s), s	29.0	31.2	3.3	25.4	8.9	43.5	5.8	23.6
Green Extension Time (g_e), s	0.0	3.1	0.0	0.0	0.0	0.0	0.0	3.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	1.00	0.13	0.26	1.00	1.00	1.00	1.00	0.04

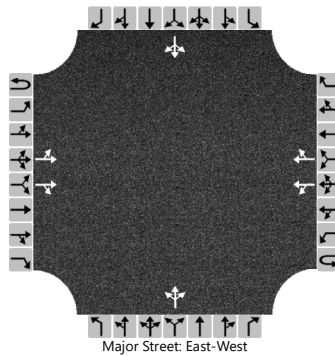
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	828	517	475	26	361	323	155	686	39	90	298	465
Adjusted Saturation Flow Rate (s), veh/h/ln	1716	1856	1705	1767	1856	1643	1767	1856	1572	1767	1856	1572
Queue Service Time (g_s), s	27.0	29.2	29.2	1.3	23.1	23.4	6.9	41.5	1.8	3.8	15.0	21.6
Cycle Queue Clearance Time (g_c), s	27.0	29.2	29.2	1.3	23.1	23.4	6.9	41.5	1.8	3.8	15.0	21.6
Green Ratio (g/C)	0.22	0.37	0.37	0.26	0.20	0.20	0.40	0.35	0.40	0.40	0.35	0.57
Capacity (c), veh/h	772	688	632	226	379	335	382	642	636	163	642	898
Volume-to-Capacity Ratio (X)	1.073	0.752	0.752	0.116	0.954	0.964	0.407	1.069	0.062	0.553	0.464	0.518
Back of Queue (Q), ft/ln (95 th percentile)	627.6	492.3	460.5	25.9	512.5	480.8	128.8	974.9	30.2	76.2	273.6	295.5
Back of Queue (Q), veh/ln (95 th percentile)	24.5	19.2	18.0	1.0	20.0	18.8	5.0	38.1	1.2	3.0	10.7	11.5
Queue Storage Ratio (RQ) (95 th percentile)	1.26	0.25	0.23	0.06	0.34	0.32	0.23	0.65	0.24	0.14	0.16	0.39
Uniform Delay (d_1), s/veh	46.5	32.9	32.9	33.7	47.2	47.3	24.8	39.3	21.8	29.6	30.6	15.7
Incremental Delay (d_2), s/veh	53.7	4.1	4.5	0.1	34.1	39.2	0.3	55.3	0.0	2.4	0.2	0.2
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	100.2	37.1	37.4	33.8	81.3	86.5	25.0	94.6	21.9	32.0	30.8	15.9
Level of Service (LOS)	F	D	D	C	F	F	C	F	C	C	C	B
Approach Delay, s/veh / LOS	65.9		E	81.9		F	79.1		E	22.8		C
Intersection Delay, s/veh / LOS	62.7						E					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.12	B	2.30	B	2.29	B	2.44	B
Bicycle LOS Score / LOS	1.99	B	1.07	A	1.94	B	1.90	B

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Ketterington		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/15/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Ketterington/Satinwood		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 1						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12	
Priority																	
Number of Lanes	0	0	2	0	0	0	2	0		0	1	0		0	1	0	
Configuration		LT		TR		LT		TR			LTR				LTR		
Volume (veh/h)		10	798	10		10	641	10		4	0	24		8	2	9	
Percent Heavy Vehicles (%)		3				3				3	3	3		3	3	3	
Proportion Time Blocked																	
Percent Grade (%)										0				0			
Right Turn Channelized																	
Median Type Storage	Undivided																

Critical and Follow-up Headways

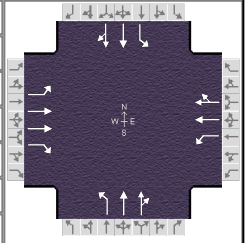
Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		11				11					30					21	
Capacity, c (veh/h)		880				759					364					200	
v/c Ratio		0.01				0.01					0.08					0.10	
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.3					0.3	
Control Delay (s/veh)		9.1				9.8					15.8					25.1	
Level of Service (LOS)		A				A					C					D	
Approach Delay (s/veh)		0.2				0.3				15.8				25.1			
Approach LOS		A				A				C				D			

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information			
Agency	AECOM			Duration, h	0.25		
Analyst	KKM	Analysis Date	May 15, 2020	Area Type	Other		
Jurisdiction	Delaware County	Time Period	PM Peak Hour	PHF	0.92		
Urban Street	Big Walnut Road	Analysis Year	2040	Analysis Period	1 > 7:00		
Intersection	Big Walnut/SR3	File Name	12-2040 Alt 1 PM BW-SR3.xus				
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 1						



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	225	402	203	88	337	204	268	1280	26	152	526	56

Signal Information													
Cycle, s	120.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	Yes	Simult. Gap E/W	On	Green	7.0	3.0	31.0	7.0	52.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	0.0	4.0	4.0	4.0	0.0			
				Red	1.0	0.0	1.0	1.0	1.0	0.0			

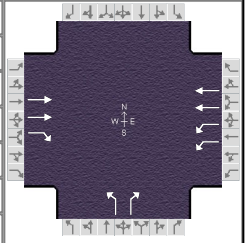
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	3.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	15.0	39.0	12.0	36.0	12.0	57.0	12.0	57.0
Change Period, (Y+R _c), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (MAH), s	3.0	3.0	3.0	3.0	2.9	2.9	2.9	2.9
Queue Clearance Time (g _s), s	12.0	14.5	6.6	19.8	9.0	42.8	8.1	15.9
Green Extension Time (g _e), s	0.0	2.5	0.0	2.2	0.0	3.1	0.0	4.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	1.00	0.01	1.00	0.09	1.00	0.36	1.00	0.00

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	245	437	221	96	311	277	291	712	708	165	321	311
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1809	1610	1810	1900	1661	1810	1900	1886	1810	1900	1835
Queue Service Time (g _s), s	10.0	11.8	12.5	4.6	17.4	17.8	7.0	40.7	40.8	6.1	13.8	13.9
Cycle Queue Clearance Time (g _c), s	10.0	11.8	12.5	4.6	17.4	17.8	7.0	40.7	40.8	6.1	13.8	13.9
Green Ratio (g/C)	0.34	0.28	0.34	0.32	0.26	0.26	0.49	0.43	0.43	0.49	0.43	0.43
Capacity (c), veh/h	303	1025	550	328	491	429	408	823	817	195	823	795
Volume-to-Capacity Ratio (X)	0.807	0.426	0.401	0.291	0.633	0.646	0.713	0.865	0.866	0.848	0.390	0.392
Back of Queue (Q), ft/ln (95 th percentile)	138.9	218.7	207.3	87.9	320.3	294.7	173.4	654	652.4	170.3	242.7	237.3
Back of Queue (Q), veh/ln (95 th percentile)	5.6	8.7	8.3	3.5	12.8	11.8	6.9	26.2	26.1	6.8	9.7	9.5
Queue Storage Ratio (RQ) (95 th percentile)	0.35	0.11	0.46	0.25	0.13	0.12	0.32	0.20	0.20	0.35	0.04	0.04
Uniform Delay (d ₁), s/veh	35.3	35.1	30.1	30.1	39.5	39.6	26.1	30.8	30.8	27.5	23.2	23.2
Incremental Delay (d ₂), s/veh	13.8	0.1	0.2	0.2	2.0	2.6	5.0	9.1	9.3	26.7	0.1	0.1
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	49.1	35.2	30.3	30.3	41.5	42.2	31.1	39.9	40.1	54.2	23.3	23.3
Level of Service (LOS)	D	D	C	C	D	D	C	D	D	D	C	C
Approach Delay, s/veh / LOS	37.8		D	40.2		D	38.5		D	29.7		C
Intersection Delay, s/veh / LOS	36.9						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.29	B	2.30	B	2.28	B	2.43	B
Bicycle LOS Score / LOS	1.23	A	1.05	A	1.90	B	1.15	A

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	AECOM			Duration, h	0.25
Analyst	KKM	Analysis Date	May 12, 2020	Area Type	CBD
Jurisdiction	Delaware County	Time Period	PM Peak Hour	PHF	0.92
Urban Street	Big Walnut Road	Analysis Year	2040	Analysis Period	1 > 7:00
Intersection	Big Walnut & I-71 SB Ra...	File Name	12-2040 Alt 1 PM BW-I-71 SB Ramp.xus		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 1				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h		820	430	420	1380		230		110			

Signal Information													
Cycle, s	120.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	Yes	Simult. Gap E/W	On										
Force Mode	Fixed	Simult. Gap N/S	On										
		Green		37.0	38.0	30.0	0.0	0.0	0.0				
		Yellow		4.0	4.0	4.0	0.0	0.0	0.0				
		Red		1.0	1.0	1.0	0.0	0.0	0.0				

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2	1	6		8		
Case Number		7.3	2.0	4.0		9.0		
Phase Duration, s		43.0	42.0	85.0		35.0		
Change Period, ($Y+R_c$), s		5.0	5.0	5.0		5.0		
Max Allow Headway (MAH), s		3.0	3.0	3.0		3.1		
Queue Clearance Time (g_s), s		33.9	16.4	37.7		21.0		
Green Extension Time (g_e), s		3.0	1.0	10.0		0.5		
Phase Call Probability		1.00	1.00	1.00		1.00		
Max Out Probability		0.91	0.00	0.06		0.01		

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement		2	12	1	6		3		18			
Adjusted Flow Rate (v), veh/h		891	467	457	1500		250		120			
Adjusted Saturation Flow Rate (s), veh/h/ln		1590	1415	1544	1590		1431		1415			
Queue Service Time (g_s), s		31.9	25.6	14.4	35.7		19.0		4.9			
Cycle Queue Clearance Time (g_c), s		31.9	25.6	14.4	35.7		19.0		4.9			
Green Ratio (g/C)		0.32	0.57	0.31	0.67		0.25		0.56			
Capacity (c), veh/h		1007	802	952	2120		358		790			
Volume-to-Capacity Ratio (X)		0.885	0.583	0.479	0.708		0.699		0.151			
Back of Queue (Q), ft/ln (95 th percentile)		489.6	315.5	229.9	421.1		290		67.5			
Back of Queue (Q), veh/ln (95 th percentile)		19.1	12.3	9.0	16.4		11.3		2.6			
Queue Storage Ratio (RQ) (95 th percentile)		0.40	0.55	0.46	0.39		0.72		0.08			
Uniform Delay (d_1), s/veh		38.9	16.8	33.7	12.6		40.9		12.8			
Incremental Delay (d_2), s/veh		9.2	0.7	0.1	0.9		5.0		0.0			
Initial Queue Delay (d_3), s/veh		0.0	0.0	0.0	0.0		0.0		0.0			
Control Delay (d), s/veh		48.2	17.5	33.8	13.6		45.9		12.8			
Level of Service (LOS)		D	B	C	B		D		B			
Approach Delay, s/veh / LOS	37.6		D	18.3		B	35.2		D	0.0		
Intersection Delay, s/veh / LOS	27.1						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.12	B	0.68	A	2.48	B	2.32	B
Bicycle LOS Score / LOS	1.61	B	2.10	B		F		

HCS7 Roundabouts Report

General Information				Site Information				
Analyst	KKM				Intersection	I-71 NB Ramp & Big Walnut		
Agency or Co.	AECOM				E/W Street Name	Big Walnut Road		
Date Performed	5/21/2020				N/S Street Name	I-71 NB Ramps		
Analysis Year	2040				Analysis Time Period (hrs)	0.25		
Time Analyzed	PM Peak Hour				Peak Hour Factor	0.92		
Project Description	DEL-71-3.55 Big Walnut Inte...				Jurisdiction	Delaware County		

Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	2	0	0	0	2	0	0	1	1	0	0	0	0	0
Lane Assignment	LT		T		T	TR			L	LTR						
Volume (V), veh/h	0	210	720		0		920	140	0	880	0	970				
Percent Heavy Vehicles, %	3	3	3		3		3	3	3	3	3	3				
Flow Rate (v _{PCE}), pc/h	0	235	806		0		1030	157	0	985	0	1086				
Right-Turn Bypass	None				None				Non-Yielding				None			
Conflicting Lanes	2				2				2							
Pedestrians Crossing, p/h	0				0				0							

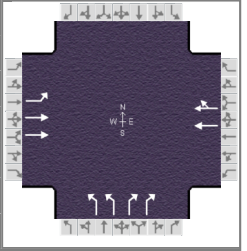
Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (s)	4.6453	4.3276		4.6453	4.3276		4.6453	4.3276					
Follow-Up Headway (s)	2.6667	2.5352		2.6667	2.5352		2.6667	2.5352					

Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (v _e), pc/h	489	552		558	629		985	0	1086				
Entry Volume, veh/h	475	536		542	611		956	0	1054				
Circulating Flow (v _c), pc/h	0			1220			1041			2015			
Exiting Flow (v _{ex}), pc/h	806			2015			392			0			
Capacity (C _{PCE}), pc/h	1350	1420		439	503		518	586					
Capacity (c), veh/h	1311	1379		427	489		503	569					
v/c Ratio (x)	0.36	0.39		1.27	1.25		1.90	0.00					

Delay and Level of Service													
Approach	EB			WB			NB			SB			
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Lane Control Delay (d), s/veh	6.1	6.2		166.3	154.0		432.3	6.3					
Lane LOS	A	A		F	F		F	A	A				
95% Queue, veh	1.7	1.9		23.2	24.6		62.4	0.0					
Approach Delay, s/veh	6.2			159.8			205.6						
Approach LOS	A			F			F						
Intersection Delay, s/veh LOS	144.7						F						

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	AECOM			Duration, h	0.25
Analyst	KKM	Analysis Date	May 12, 2020	Area Type	Other
Jurisdiction	Delaware County	Time Period	AM Peak Hour	PHF	0.92
Urban Street	Big Walnut Road	Analysis Year	2040	Analysis Period	1 > 7:00
Intersection	Big Walnut & I-71 NB R...	File Name	12-2040 Alt 1B PM BW-I-71 NB Ramp.xus		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 1B				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	210	720			920	140	880		970			

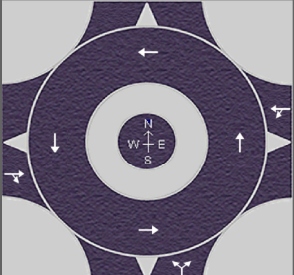
Signal Information													
Cycle, s	120.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	Yes	Simult. Gap E/W	On	Green	12.0	45.0	48.0	0.0	0.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.0	4.0	0.0	0.0	0.0			
				Red	1.0	1.0	1.0	0.0	0.0	0.0			

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6		8		
Case Number	1.0	4.0		8.3		9.0		
Phase Duration, s	17.0	67.0		50.0		53.0		
Change Period, ($Y+R_c$), s	5.0	5.0		5.0		5.0		
Max Allow Headway (MAH), s	3.0	3.0		3.0		3.1		
Queue Clearance Time (g_s), s	11.0	18.5		37.0		45.9		
Green Extension Time (g_e), s	0.0	4.5		3.1		1.4		
Phase Call Probability	1.00	1.00		1.00		1.00		
Max Out Probability	1.00	0.00		0.42		1.00		

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16	3		18			
Adjusted Flow Rate (v), veh/h	228	783			589	563	957		1054			
Adjusted Saturation Flow Rate (s), veh/h/ln	1767	1766			1856	1769	1716		1392			
Queue Service Time (g_s), s	9.0	16.5			34.7	35.0	27.8		43.9			
Cycle Queue Clearance Time (g_c), s	9.0	16.5			34.7	35.0	27.8		43.9			
Green Ratio (g/C)	0.49	0.52			0.38	0.38	0.40		0.40			
Capacity (c), veh/h	277	1825			696	664	1373		1113			
Volume-to-Capacity Ratio (X)	0.824	0.429			0.847	0.848	0.697		0.947			
Back of Queue (Q), ft/ln (95 th percentile)	214.7	266.9			597.6	564.3	425.1		589			
Back of Queue (Q), veh/ln (95 th percentile)	8.4	10.4			23.3	22.6	16.6		23.0			
Queue Storage Ratio (RQ) (95 th percentile)	0.45	0.25			1.00	0.96	0.85		0.94			
Uniform Delay (d_1), s/veh	26.1	18.0			34.3	34.4	29.9		34.8			
Incremental Delay (d_2), s/veh	16.9	0.1			9.1	9.6	1.3		15.7			
Initial Queue Delay (d_3), s/veh	0.0	0.0			0.0	0.0	0.0		0.0			
Control Delay (d), s/veh	43.0	18.1			43.4	44.0	31.3		50.5			
Level of Service (LOS)	D	B			D	D	C		D			
Approach Delay, s/veh / LOS	23.7	C		43.7	D		41.3	D	0.0			
Intersection Delay, s/veh / LOS	37.7						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.09	B	1.41	A	2.16	B	2.32	B
Bicycle LOS Score / LOS	1.32	A	1.44	A		F		

HCS7 Roundabouts Report

General Information				Site Information				
Analyst	KKM				Intersection	Bale Kenyon & Big Walnut		
Agency or Co.	AECOM				E/W Street Name	Big Walnut Road		
Date Performed	5/4/2020				N/S Street Name	Bale Kenyon Road		
Analysis Year	2040				Analysis Time Period (hrs)	0.25		
Time Analyzed	AM Peak Hour				Peak Hour Factor	0.92		
Project Description	DEL-71-3.55 Big Walnut Inte...				Jurisdiction	Delaware County		

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0
Lane Assignment	TR				LT				LR							
Volume (V), veh/h	0		1434	121	0	506	884		0	29		256				
Percent Heavy Vehicles, %	2		2	2	2	2	2		2	2		2				
Flow Rate (v _{PCE}), pc/h	0		1590	134	0	561	980		0	32		284				
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1							
Pedestrians Crossing, p/h	0				0				0							

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763				
Follow-Up Headway (s)		2.6087			2.6087			2.6087				

Flow Computations, Capacity and v/c Ratios

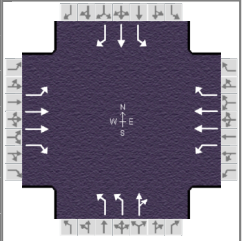
Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v _e), pc/h		1724			1541			316				
Entry Volume, veh/h		1690			1511			310				
Circulating Flow (v _c), pc/h	561			32			1590			1573		
Exiting Flow (v _{ex}), pc/h	1874			1012			0			695		
Capacity (C _{PCE}), pc/h		779			1336			273				
Capacity (c), veh/h		763			1309			267				
v/c Ratio (x)		2.21			1.15			1.16				

Delay and Level of Service

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		564.5			93.6			145.4				
Lane LOS		F			F			F				
95% Queue, veh		121.1			39.5			13.8				
Approach Delay, s/veh	564.5			93.6			145.4					
Approach LOS	F			F			F					
Intersection Delay, s/veh LOS	324.8						F					

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	AECOM			Duration, h	0.25
Analyst	KKM	Analysis Date	May 12, 2020	Area Type	Other
Jurisdiction	Delaware County	Time Period	AM Peak Hour	PHF	0.92
Urban Street	Big Walnut Road	Analysis Year	2040	Analysis Period	1 > 7:00
Intersection	Big Walnut & Africa	File Name	13-2040 Alt 2 AM BW-Africa Road.xus		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 2				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	140	930	620	120	860	130	270	60	40	60	340	260

Signal Information												
Cycle, s	120.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	Yes	Simult. Gap E/W	On									
Force Mode	Fixed	Simult. Gap N/S	On									
				Green	7.0	44.0	7.0	3.0	34.0	0.0		
				Yellow	4.0	4.0	4.0	0.0	4.0	0.0		
				Red	1.0	1.0	1.0	0.0	1.0	0.0		

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	3.0	1.1	3.0	1.1	4.0	1.1	3.0
Phase Duration, s	17.0	54.0	12.0	49.0	15.0	42.0	12.0	39.0
Change Period, (Y+R _c), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (MAH), s	3.0	3.0	3.0	3.0	3.0	3.1	3.0	3.1
Queue Clearance Time (g _s), s	7.8	47.7	7.5	29.3	9.1	7.6	5.0	23.4
Green Extension Time (g _e), s	0.1	1.0	0.0	6.9	0.1	1.4	0.0	1.2
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.26	1.00	1.00	0.37	1.00	0.00	1.00	0.03

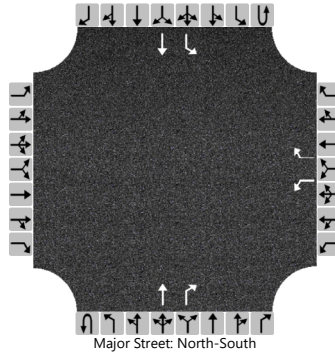
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	152	1011	674	130	935	141	293	109		65	370	283
Adjusted Saturation Flow Rate (s), veh/h/ln	1767	1766	1572	1767	1766	1610	1716	1731		1767	1856	1572
Queue Service Time (g _s), s	5.8	28.5	45.7	5.5	27.3	6.6	7.1	5.6		3.0	21.4	16.2
Cycle Queue Clearance Time (g _c), s	5.8	28.5	45.7	5.5	27.3	6.6	7.1	5.6		3.0	21.4	16.2
Green Ratio (g/C)	0.48	0.41	0.49	0.42	0.37	0.43	0.37	0.31		0.34	0.28	0.38
Capacity (c), veh/h	319	1443	773	249	1295	684	617	534		476	526	603
Volume-to-Capacity Ratio (X)	0.477	0.701	0.872	0.525	0.722	0.206	0.476	0.204		0.137	0.703	0.469
Back of Queue (Q), ft/ln (95 th percentile)	106.1	442.8	638.4	104	435.6	109.3	130.1	104.5		57.5	385.7	252.7
Back of Queue (Q), veh/ln (95 th percentile)	4.1	17.3	24.9	4.1	17.0	4.4	5.1	4.1		2.2	15.1	9.9
Queue Storage Ratio (RQ) (95 th percentile)	0.19	0.23	0.85	0.19	0.20	0.17	0.33	0.07		0.14	0.13	0.59
Uniform Delay (d ₁), s/veh	22.3	29.4	27.1	25.0	32.7	21.7	28.5	30.6		27.1	38.5	27.8
Incremental Delay (d ₂), s/veh	0.4	1.3	10.3	1.0	1.7	0.1	0.2	0.1		0.0	3.6	0.2
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Control Delay (d), s/veh	22.8	30.7	37.4	26.0	34.5	21.8	28.8	30.7		27.1	42.1	28.0
Level of Service (LOS)	C	C	D	C	C	C	C	C		C	D	C
Approach Delay, s/veh / LOS	32.5		C	32.1		C	29.3		C	35.2		D
Intersection Delay, s/veh / LOS	32.5						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.11	B	2.12	B	2.44	B	2.45	B
Bicycle LOS Score / LOS	2.00	B	1.48	A	1.15	A	1.67	B

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Africa & Jaycox		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/15/2020			East/West Street	Jaycox Road		
Analysis Year	2040			North/South Street	Africa Road		
Time Analyzed	AM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	North-South			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 2						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	1	1	0	1	1	0
Configuration						L		R			T	R		L	T	
Volume (veh/h)						40		50			270	10		40	560	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized					No				No							
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2							4.1	
Critical Headway (sec)						6.42		6.22							4.12	
Base Follow-Up Headway (sec)						3.5		3.3							2.2	
Follow-Up Headway (sec)						3.52		3.32							2.22	

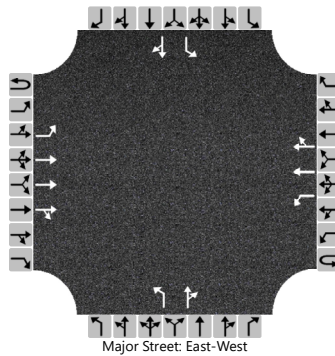
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						43		54							43	
Capacity, c (veh/h)						264		746							1256	
v/c Ratio						0.16		0.07							0.03	
95% Queue Length, Q ₉₅ (veh)						0.6		0.2							0.1	
Control Delay (s/veh)						21.3		10.2							8.0	
Level of Service (LOS)						C		B							A	
Approach Delay (s/veh)					15.1								0.5			
Approach LOS					C											

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Medan		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/14/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Medan Dr/Whispering Ridge		
Time Analyzed	AM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative2A						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	3	0	0	1	2	0		1	1	0		1	1	0
Configuration		L	T	TR		L	T	TR		L		TR		L		TR
Volume (veh/h)	0	10	1300	10	0	10	970	10		20	10	10		10	10	20
Percent Heavy Vehicles (%)	3	3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

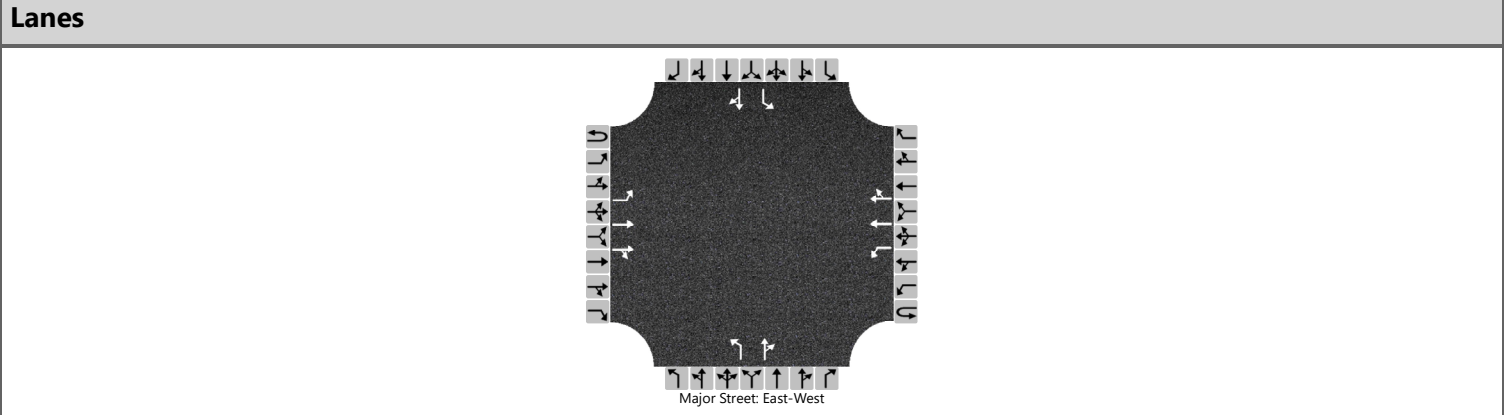
Base Critical Headway (sec)		5.3				5.3				6.4	6.5	7.1		6.4	6.5	7.1
Critical Headway (sec)		5.36				5.36				6.46	6.56	7.16		6.46	6.56	7.16
Base Follow-Up Headway (sec)		3.1				3.1				3.8	4.0	3.9		3.8	4.0	3.9
Follow-Up Headway (sec)		3.13				3.13				3.83	4.03	3.93		3.83	4.03	3.93

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		11				11				22		22		11		33
Capacity, c (veh/h)		361				241				37		46		60		66
v/c Ratio		0.03				0.05				0.59		0.47		0.18		0.49
95% Queue Length, Q ₉₅ (veh)		0.1				0.1				2.0		1.7		0.6		2.0
Control Delay (s/veh)		15.3				20.7				193.5		140.2		78.1		103.2
Level of Service (LOS)		C				C				F		F		F		F
Approach Delay (s/veh)	0.1				0.2				166.9				96.9			
Approach LOS									F				F			

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Medan		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/14/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Medan Dr/Whispering Ridge		
Time Analyzed	AM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 2						



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	2	0	0	1	2	0		1	1	0		1	1	0
Configuration		L	T	TR		L	T	TR		L		TR		L		TR
Volume (veh/h)	0	10	1300	10	0	10	970	10		20	10	10		10	10	20
Percent Heavy Vehicles (%)	3	3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

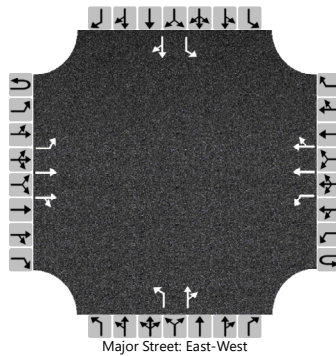
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		11				11				22		22		11		33	
Capacity, c (veh/h)		644				469				22		48		30		70	
v/c Ratio		0.02				0.02				0.99		0.45		0.36		0.47	
95% Queue Length, Q ₉₅ (veh)		0.1				0.1				2.8		1.6		1.1		1.9	
Control Delay (s/veh)		10.7				12.9				439.2		130.9		178.3		95.4	
Level of Service (LOS)		B				B				F		F		F		F	
Approach Delay (s/veh)		0.1				0.1				285.0				116.2			
Approach LOS										F				F			

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Highland		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/14/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Highland Hills Drive		
Time Analyzed	AM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 2						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	2	0	0	1	2	0		1	1	0		1	1	0
Configuration		L	T	TR		L	T	TR		L		TR		L		TR
Volume (veh/h)	0	10	1306	14	0	5	924	10		66	10	15		10	10	10
Percent Heavy Vehicles (%)	3	3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

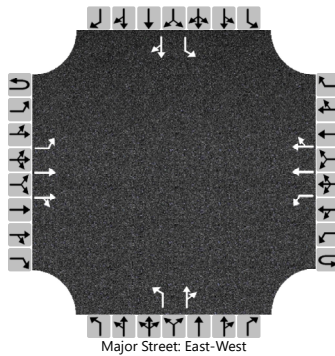
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		11				5				72		27		11		22
Capacity, c (veh/h)		673				464				25		63		35		53
v/c Ratio		0.02				0.01				2.90		0.43		0.31		0.41
95% Queue Length, Q ₉₅ (veh)		0.0				0.0				8.9		1.7		1.0		1.5
Control Delay (s/veh)		10.4				12.8				1189.4		99.5		149.2		113.2
Level of Service (LOS)		B				B				F		F		F		F
Approach Delay (s/veh)	0.1				0.1				890.0				125.2			
Approach LOS									F				F			

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Willow Bend		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/14/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Willow Bend/Grand Oak		
Time Analyzed	AM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL071-3.55 Big Walnut Interchange - Alternative 2						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	2	0	0	1	2	0		1	1	0		1	1	0
Configuration		L	T	TR		L	T	TR		L		TR		L		TR
Volume (veh/h)	0	62	1252	7	0	7	854	55		12	15	19		55	9	63
Percent Heavy Vehicles (%)	3	3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

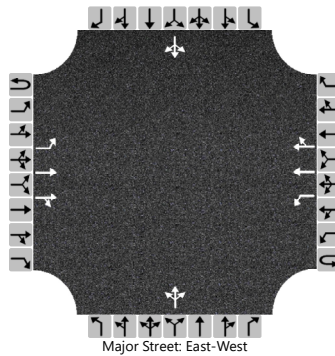
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		67				8				13		37		60		78	
Capacity, c (veh/h)		689				492				20		51		20		151	
v/c Ratio		0.10				0.02				0.65		0.72		2.97		0.52	
95% Queue Length, Q ₉₅ (veh)		0.3				0.0				1.8		2.9		7.8		2.5	
Control Delay (s/veh)		10.8				12.4				351.0		175.3		1288.2		51.8	
Level of Service (LOS)		B				B				F		F		F		F	
Approach Delay (s/veh)		0.5				0.1				221.2				587.2			
Approach LOS										F				F			

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Jeffries		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/15/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Jeffries Court/Grandmere		
Time Analyzed	AM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 2						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	2	0	0	1	2	0		0	1	0		0	1	0
Configuration		L	T	TR		L	T	TR			LTR				LTR	
Volume (veh/h)	0	13	1300	13	0	5	905	8		2	0	7		37	0	9
Percent Heavy Vehicles (%)	3	3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

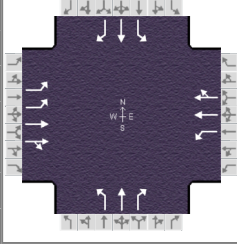
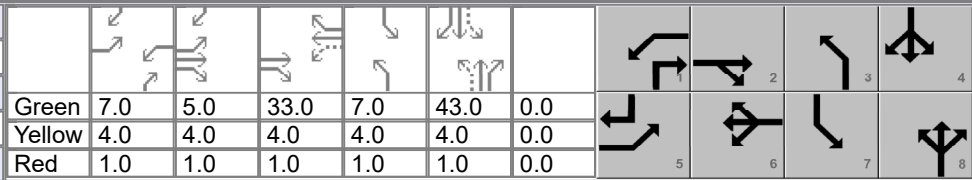
Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		14				5					10					50	
Capacity, c (veh/h)		686				467					122					64	
v/c Ratio		0.02				0.01					0.08					0.78	
95% Queue Length, Q ₉₅ (veh)		0.1				0.0					0.3					3.5	
Control Delay (s/veh)		10.4				12.8					37.1					159.4	
Level of Service (LOS)		B				B					E					F	
Approach Delay (s/veh)		0.1				0.1				37.1				159.4			
Approach LOS										E				F			

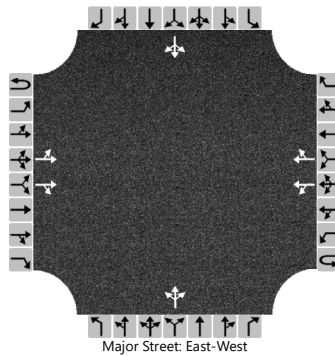
HCS7 Signalized Intersection Results Summary

General Information					Intersection Information											
Agency	AECOM				Duration, h	0.25										
Analyst	KKM		Analysis Date	May 15, 2020		Area Type	Other									
Jurisdiction	Delaware County		Time Period	AM Peak Hour		PHF	0.92									
Urban Street	Big Walnut Road		Analysis Year	2040		Analysis Period	1 > 7:00									
Intersection	Big Walnut/Worthington		File Name	13-2040 Alt 2 AM BW-Worthington Road.xus												
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 2															
Demand Information					EB			WB			NB			SB		
Approach Movement					L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h					250	975	119	83	133	71	83	250	24	179	571	702
Signal Information																
Cycle, s	120.0	Reference Phase	2													
Offset, s	0	Reference Point	End													
Uncoordinated	Yes	Simult. Gap E/W	On													
Force Mode	Fixed	Simult. Gap N/S	On		Green	7.0	5.0	33.0	7.0	43.0	0.0					
					Yellow	4.0	4.0	4.0	4.0	4.0	0.0					
					Red	1.0	1.0	1.0	1.0	1.0	0.0					
Timer Results					EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Assigned Phase					5	2	1	6	3	8	7	4				
Case Number					2.0	4.0	1.1	4.0	1.1	3.0	1.1	3.0				
Phase Duration, s					22.0	48.0	12.0	38.0	12.0	48.0	12.0	48.0				
Change Period, (Y+R _c), s					5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Allow Headway (MAH), s					3.0	3.0	3.0	3.0	3.0	3.1	3.0	3.1				
Queue Clearance Time (g _s), s					10.9	39.4	6.3	8.1	5.8	15.2	9.0	45.0				
Green Extension Time (g _e), s					0.3	1.3	0.0	2.8	0.0	4.0	0.0	0.0				
Phase Call Probability					1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Max Out Probability					0.04	0.86	1.00	0.00	1.00	0.01	1.00	1.00				
Movement Group Results					EB			WB			NB			SB		
Approach Movement					L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement					5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h					272	606	583	90	114	108	90	272	26	195	621	763
Adjusted Saturation Flow Rate (s), veh/h/ln					1716	1856	1784	1767	1856	1644	1767	1856	1572	1767	1856	1572
Queue Service Time (g _s), s					8.9	37.3	37.4	4.3	5.7	6.1	3.8	13.2	1.2	7.0	38.7	43.0
Cycle Queue Clearance Time (g _c), s					8.9	37.3	37.4	4.3	5.7	6.1	3.8	13.2	1.2	7.0	38.7	43.0
Green Ratio (g/C)					0.14	0.36	0.36	0.33	0.28	0.28	0.42	0.36	0.42	0.42	0.36	0.50
Capacity (c), veh/h					486	665	639	177	510	452	178	665	655	418	665	786
Volume-to-Capacity Ratio (X)					0.559	0.911	0.913	0.510	0.223	0.239	0.506	0.409	0.040	0.466	0.933	0.970
Back of Queue (Q), ft/ln (95 th percentile)					173	670.8	654	83.9	115.3	110.4	71.4	246.3	19.5	49.7	708.6	845
Back of Queue (Q), veh/ln (95 th percentile)					6.8	26.2	25.5	3.3	4.5	4.3	2.8	9.6	0.8	1.9	27.7	33.0
Queue Storage Ratio (RQ) (95 th percentile)					0.35	0.34	0.33	0.37	0.08	0.07	0.13	0.16	0.16	0.09	0.42	1.13
Uniform Delay (d ₁), s/veh					48.0	36.7	36.7	32.4	33.6	33.8	29.0	28.9	20.8	26.3	37.1	29.1
Incremental Delay (d ₂), s/veh					0.9	16.4	17.2	1.0	0.1	0.1	0.9	0.2	0.0	0.3	20.0	24.8
Initial Queue Delay (d ₃), s/veh					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay (d), s/veh					48.9	53.1	53.9	33.4	33.7	33.9	30.0	29.1	20.8	26.6	57.1	54.0
Level of Service (LOS)					D	D	D	C	C	C	C	C	C	E	D	
Approach Delay, s/veh / LOS					52.6	D		33.7	C		28.7	C		51.8	D	
Intersection Delay, s/veh / LOS					48.2						D					
Multimodal Results					EB			WB			NB			SB		
Pedestrian LOS Score / LOS					2.12	B		2.30	B		2.29	B		2.44	B	
Bicycle LOS Score / LOS					1.69	B		0.74	A		1.13	A		3.09	C	

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Ketterington		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/15/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Ketterington/Satinwood		
Time Analyzed	AM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 2						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	2	0	0	0	2	0		0	1	0		0	1	0
Configuration		LT		TR		LT		TR			LTR				LTR	
Volume (veh/h)		10	1158	10		10	270	10		6	2	22		12	1	11
Percent Heavy Vehicles (%)		3				3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

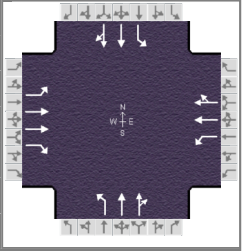
Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		11				11					33					26	
Capacity, c (veh/h)		1246				538					208					270	
v/c Ratio		0.01				0.02					0.16					0.10	
95% Queue Length, Q ₉₅ (veh)		0.0				0.1					0.5					0.3	
Control Delay (s/veh)		7.9				11.8					25.5					19.7	
Level of Service (LOS)		A				B					D					C	
Approach Delay (s/veh)		0.2				0.5				25.5				19.7			
Approach LOS										D				C			

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	AECOM			Duration, h	0.25
Analyst	KKM	Analysis Date	May 15, 2020	Area Type	Other
Jurisdiction	Delaware County	Time Period	AM Peak Hour	PHF	0.92
Urban Street	Big Walnut Road	Analysis Year	2040	Analysis Period	1 > 7:00
Intersection	Big Walnut/SR3	File Name	13-2040 Alt 2 AM BW-SR3.xus		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 2				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	172	700	320	220	186	134	40	384	12	170	1154	65

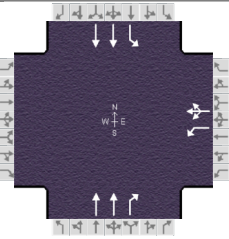
Signal Information																						
Cycle, s	120.0	Reference Phase	2																			
Offset, s	0	Reference Point	End																			
Uncoordinated	Yes	Simult. Gap E/W	On	Green	7.0	3.0	31.0	7.0	47.0	0.0	1			2			3			4		
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.0	4.0	4.0	4.0	0.0	5			6			7			8		
				Red	1.0	1.0	1.0	1.0	1.0	0.0												

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	3.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	12.0	36.0	20.0	44.0	12.0	52.0	12.0	52.0
Change Period, (Y+R _c), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (MAH), s	3.0	3.0	3.0	3.0	2.9	2.9	2.9	2.9
Queue Clearance Time (g _s), s	9.0	25.7	13.0	11.1	3.6	11.4	9.0	41.7
Green Extension Time (g _e), s	0.0	1.9	0.1	3.3	0.0	3.3	0.0	2.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	1.00	0.57	1.00	0.00	0.44	0.00	1.00	0.61

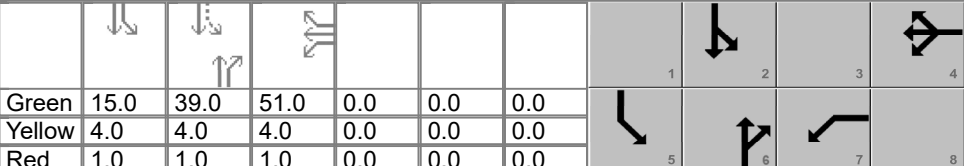
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	187	761	348	239	182	166	43	216	214	185	668	657
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1809	1610	1810	1900	1641	1810	1900	1879	1810	1900	1864
Queue Service Time (g _s), s	7.0	23.7	22.6	11.0	8.6	9.1	1.6	9.4	9.4	7.0	39.6	39.7
Cycle Queue Clearance Time (g _c), s	7.0	23.7	22.6	11.0	8.6	9.1	1.6	9.4	9.4	7.0	39.6	39.7
Green Ratio (g/C)	0.32	0.26	0.32	0.40	0.32	0.32	0.45	0.39	0.39	0.45	0.39	0.39
Capacity (c), veh/h	409	935	510	330	618	533	184	744	736	454	744	730
Volume-to-Capacity Ratio (X)	0.457	0.814	0.682	0.725	0.294	0.312	0.236	0.290	0.291	0.407	0.898	0.900
Back of Queue (Q), ft/ln (95 th percentile)	191.9	406.5	346.7	221.1	171.7	158.3	29.1	179	177.6	133.4	669	662.7
Back of Queue (Q), veh/ln (95 th percentile)	7.7	16.3	13.9	8.8	6.9	6.3	1.2	7.2	7.1	5.3	26.8	26.5
Queue Storage Ratio (RQ) (95 th percentile)	0.43	0.20	0.73	0.63	0.07	0.06	0.05	0.06	0.06	0.27	0.11	0.11
Uniform Delay (d ₁), s/veh	32.2	41.8	35.7	28.8	30.2	30.4	26.7	25.1	25.1	21.4	34.2	34.3
Incremental Delay (d ₂), s/veh	0.3	5.2	3.1	6.8	0.1	0.1	0.2	0.1	0.1	0.2	13.4	13.8
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	32.5	47.0	38.8	35.5	30.3	30.5	26.9	25.1	25.1	21.6	47.6	48.1
Level of Service (LOS)	C	D	D	D	C	C	C	C	C	C	D	D
Approach Delay, s/veh / LOS	42.7		D	32.5		C	25.3		C	44.7		D
Intersection Delay, s/veh / LOS	39.8						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.30	B	2.29	B	2.28	B	2.43	B
Bicycle LOS Score / LOS	1.56	B	0.97	A	0.88	A	1.73	B

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information		
Agency	AECOM			Duration, h	0.25	
Analyst	KKM	Analysis Date	May 12, 2020	Area Type	Other	
Jurisdiction	Delaware County	Time Period	AM Peak Hour	PHF	0.92	
Urban Street	Africa Road	Analysis Year	2040	Analysis Period	1 > 7:00	
Intersection	Africa Road & I-71 SB R...	File Name	13-2040 Alt 2 AM Africa Road-I-71 SB Ramp.xus			
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 2					

Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h				360	0	10		270	60		300	300

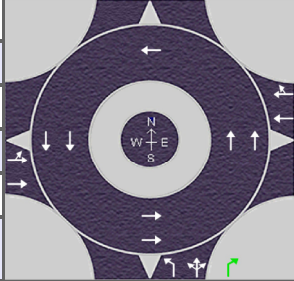
Signal Information													
Cycle, s	120.0	Reference Phase	2										
Offset, s	0	Reference Point	End	Green	15.0	39.0	51.0	0.0	0.0	0.0			
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	4.0	4.0	4.0	0.0	0.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.0	1.0	1.0	0.0	0.0	0.0			

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase				4		6	5	2
Case Number				10.0		7.3	1.0	4.0
Phase Duration, s				56.0		44.0	20.0	64.0
Change Period, (Y+R _c), s				5.0		5.0	5.0	5.0
Max Allow Headway (MAH), s				3.0		2.9	2.9	2.9
Queue Clearance Time (g _s), s				21.6		9.3	16.5	8.2
Green Extension Time (g _e), s				0.7		1.3	0.0	1.4
Phase Call Probability				1.00		1.00	1.00	1.00
Max Out Probability				0.00		0.00	1.00	0.00

Movement Group Results	EB			WB			NB			SB				
	L	T	R	L	T	R	L	T	R	L	T	R		
Assigned Movement				7	4	14		6	16	5	2			
Adjusted Flow Rate (v), veh/h				391	11			293	65	326	326			
Adjusted Saturation Flow Rate (s), veh/h/ln				1767	1572			1766		1767	1766			
Queue Service Time (g _s), s				19.6	0.5			7.3		14.5	6.2			
Cycle Queue Clearance Time (g _c), s				19.6	0.5			7.3		14.5	6.2			
Green Ratio (g/C)				0.42	0.42			0.32		0.47	0.49			
Capacity (c), veh/h				751	668			1148		565	1737			
Volume-to-Capacity Ratio (X)				0.521	0.016			0.256		0.577	0.188			
Back of Queue (Q), ft/ln (95 th percentile)				319.9	7.9			136.7		244.4	107.3			
Back of Queue (Q), veh/ln (95 th percentile)				12.5	0.3			5.3		9.5	4.2			
Queue Storage Ratio (RQ) (95 th percentile)				0.98	0.08			0.05		0.44	0.04			
Uniform Delay (d ₁), s/veh				25.5	20.0			29.8		21.4	17.1			
Incremental Delay (d ₂), s/veh				0.3	0.0			0.0		1.0	0.0			
Initial Queue Delay (d ₃), s/veh				0.0	0.0			0.0		0.0	0.0			
Control Delay (d), s/veh				25.8	20.0			29.9	0.0	22.4	17.1			
Level of Service (LOS)				C	B			C	A	C	B			
Approach Delay, s/veh / LOS	0.0			25.6			C	24.4			C	19.8		B
Intersection Delay, s/veh / LOS	22.6						C							

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.32	B	2.33	B	1.93	B	1.39	A
Bicycle LOS Score / LOS			1.15	A	0.78	A	1.03	A

HCS7 Roundabouts Report

General Information				Site Information			
Analyst	KKM		Intersection	I-71 NB Ramp & Big Walnut			
Agency or Co.	AECOM		E/W Street Name	Big Walnut Road			
Date Performed	5/21/2020		N/S Street Name	I-71 NB Ramps			
Analysis Year	2040		Analysis Time Period (hrs)	0.25			
Time Analyzed	AM Peak Hour		Peak Hour Factor	0.92			
Project Description	DEL-71-3.55 Big Walnut Inte...		Jurisdiction	Delaware County			

Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	2	0	0	0	2	0	0	1	1	0	0	0	0	0
Lane Assignment	LT		T		T		TR		L		LTR					
Volume (V), veh/h	0	160	870		0		830	180	0	260	0	450				
Percent Heavy Vehicles, %	3	3	3		3		3	3	3	3	3	3				
Flow Rate (v _{PCE}), pc/h	0	179	974		0		929	202	0	291	0	504				
Right-Turn Bypass	None				None				Non-Yielding				None			
Conflicting Lanes	2				2				2							
Pedestrians Crossing, p/h	0				0				0							

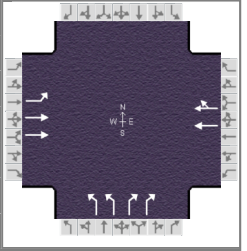
Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (s)	4.6453	4.3276		4.6453	4.3276		4.6453	4.3276					
Follow-Up Headway (s)	2.6667	2.5352		2.6667	2.5352		2.6667	2.5352					

Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (v _e), pc/h	542	611		532	599		291	0	504				
Entry Volume, veh/h	526	593		516	582		283	0	489				
Circulating Flow (v _c), pc/h	0			470			1153			1220			
Exiting Flow (v _{ex}), pc/h	974			1220			381			0			
Capacity (C _{PCE}), pc/h	1350	1420		876	952		467	533					
Capacity (c), veh/h	1311	1379		851	925		454	517					
v/c Ratio (x)	0.40	0.43		0.61	0.63		0.62	0.00					

Delay and Level of Service													
Approach	EB			WB			NB			SB			
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Lane Control Delay (d), s/veh	6.6	6.7		13.6	13.4		23.3	7.0					
Lane LOS	A	A		B	B		C	A	A				
95% Queue, veh	2.0	2.2		4.2	4.6		4.1	0.0					
Approach Delay, s/veh	6.7			13.5			8.5						
Approach LOS	A			B			A						
Intersection Delay, s/veh LOS	9.6						A						

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	AECOM			Duration, h	0.25
Analyst	KKM	Analysis Date	May 12, 2020	Area Type	Other
Jurisdiction	Delaware County	Time Period	AM Peak Hour	PHF	0.92
Urban Street	Big Walnut Road	Analysis Year	2040	Analysis Period	1 > 7:00
Intersection	Big Walnut & I-71 NB R...	File Name	13-2040 Alt 2B AM BW-I-71 NB Ramp.xus		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative2B				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	160	870			830	180	260		450			

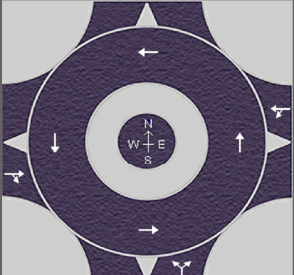
Signal Information													
Cycle, s	120.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	Yes	Simult. Gap E/W	On	Green	10.0	52.0	43.0	0.0	0.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.0	4.0	0.0	0.0	0.0			
				Red	1.0	1.0	1.0	0.0	0.0	0.0			

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6		8		
Case Number	1.0	4.0		8.3		9.0		
Phase Duration, s	15.0	72.0		57.0		48.0		
Change Period, ($Y+R_c$), s	5.0	5.0		5.0		5.0		
Max Allow Headway (MAH), s	3.0	3.0		3.0		3.2		
Queue Clearance Time (g_s), s	8.1	21.4		31.9		18.4		
Green Extension Time (g_e), s	0.1	5.0		4.7		2.0		
Phase Call Probability	1.00	1.00		1.00		1.00		
Max Out Probability	1.00	0.00		0.07		0.00		

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16	3		18			
Adjusted Flow Rate (v), veh/h	174	946			566	532	283		489			
Adjusted Saturation Flow Rate (s), veh/h/ln	1767	1766			1856	1740	1716		1392			
Queue Service Time (g_s), s	6.1	19.4			29.6	29.9	6.9		16.4			
Cycle Queue Clearance Time (g_c), s	6.1	19.4			29.6	29.9	6.9		16.4			
Green Ratio (g/C)	0.53	0.56			0.43	0.43	0.36		0.36			
Capacity (c), veh/h	301	1973			804	754	1230		997			
Volume-to-Capacity Ratio (X)	0.578	0.479			0.704	0.705	0.230		0.490			
Back of Queue (Q), ft/ln (95 th percentile)	112.9	297.1			484.4	449.6	126.7		232.3			
Back of Queue (Q), veh/ln (95 th percentile)	4.4	11.6			18.9	18.0	4.9		9.1			
Queue Storage Ratio (RQ) (95 th percentile)	0.22	0.14			0.81	0.77	0.25		0.37			
Uniform Delay (d_1), s/veh	20.9	16.0			27.7	27.7	26.9		30.0			
Incremental Delay (d_2), s/veh	1.8	0.1			2.4	2.6	0.0		0.1			
Initial Queue Delay (d_3), s/veh	0.0	0.0			0.0	0.0	0.0		0.0			
Control Delay (d), s/veh	22.7	16.0			30.1	30.3	27.0		30.1			
Level of Service (LOS)	C	B			C	C	C		C			
Approach Delay, s/veh / LOS	17.1		B	30.2		C	29.0		C	0.0		
Intersection Delay, s/veh / LOS	25.0						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.09	B	1.40	A	2.16	B	2.32	B
Bicycle LOS Score / LOS	1.41	A	1.39	A		F		

HCS7 Roundabouts Report

General Information				Site Information				
Analyst	KKM				Intersection	Bale Kenyon & Big Walnut		
Agency or Co.	AECOM				E/W Street Name	Big Walnut Road		
Date Performed	5/4/2020				N/S Street Name	Bale Kenyon Road		
Analysis Year	2040				Analysis Time Period (hrs)	0.25		
Time Analyzed	PM Peak Hour				Peak Hour Factor	0.92		
Project Description	DEL-71-3.55 Big Walnut Inte...				Jurisdiction	Delaware County		

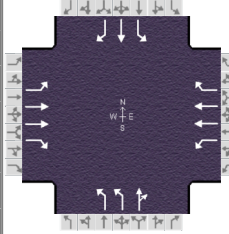
Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0
Lane Assignment	TR				LT				LR							
Volume (V), veh/h	0		948	50	0	277	1513		0	149		362				
Percent Heavy Vehicles, %	2		2	2	2	2	2		2	2		2				
Flow Rate (v _{PCE}), pc/h	0		1051	55	0	307	1677		0	165		401				
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1							
Pedestrians Crossing, p/h	0				0				0							

Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (s)		4.9763			4.9763			4.9763					
Follow-Up Headway (s)		2.6087			2.6087			2.6087					

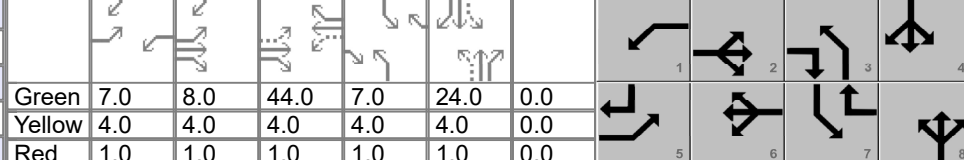
Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (v _e), pc/h		1106			1984			566					
Entry Volume, veh/h		1084			1945			555					
Circulating Flow (v _c), pc/h	307			165			1051			2149			
Exiting Flow (v _{ex}), pc/h	1452			1842			0			362			
Capacity (C _{PCE}), pc/h		1009			1166			472					
Capacity (c), veh/h		989			1143			463					
v/c Ratio (x)		1.10			1.70			1.20					

Delay and Level of Service													
Approach	EB			WB			NB			SB			
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Lane Control Delay (d), s/veh		77.8			331.1			136.0					
Lane LOS		F			F			F					
95% Queue, veh		27.0			107.0			21.3					
Approach Delay, s/veh	77.8			331.1			136.0						
Approach LOS	F			F			F						
Intersection Delay, s/veh LOS	224.3						F						

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information		
Agency	AECOM			Duration, h	0.25	
Analyst	KKM	Analysis Date	May 12, 2020	Area Type	Other	
Jurisdiction	Delaware County	Time Period	PM Peak Hour	PHF	0.92	
Urban Street	Big Walnut Road	Analysis Year	2040	Analysis Period	1 > 7:00	
Intersection	Big Walnut & Africa	File Name	14-2040 Alt 2 PM BW-Africa Road.xus			
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 2					

Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	300	830	180	120	1140	300	470	290	40	60	210	180

Signal Information														
Cycle, s	120.0	Reference Phase	2	Green	7.0	8.0	44.0	7.0	24.0	0.0	1	2	3	4
Offset, s	0	Reference Point	End	Yellow	4.0	4.0	4.0	4.0	4.0	0.0	5	6	7	8
Uncoordinated	Yes	Simult. Gap E/W	On	Red	1.0	1.0	1.0	1.0	1.0	0.0				
Force Mode	Fixed	Simult. Gap N/S	On											

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	3.0	1.1	3.0	1.1	4.0	1.1	3.0
Phase Duration, s	25.0	62.0	12.0	49.0	17.0	34.0	12.0	29.0
Change Period, ($Y+R_c$), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (MAH), s	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Queue Clearance Time (g_s), s	18.7	23.6	7.5	43.1	14.0	24.4	5.4	15.5
Green Extension Time (g_e), s	0.1	8.4	0.0	0.7	0.0	0.8	0.0	1.1
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	1.00	0.05	1.00	1.00	1.00	0.49	1.00	0.08

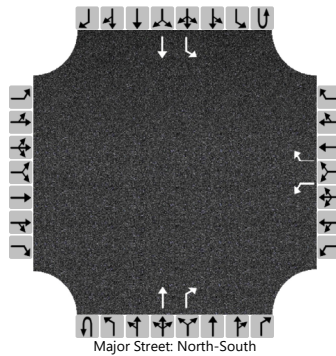
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	326	902	196	130	1239	326	511	359		65	228	196
Adjusted Saturation Flow Rate (s), veh/h/ln	1767	1766	1572	1767	1766	1610	1716	1816		1767	1856	1572
Queue Service Time (g_s), s	16.7	21.6	7.2	5.5	41.1	17.5	12.0	22.4		3.4	13.5	10.8
Cycle Queue Clearance Time (g_c), s	16.7	21.6	7.2	5.5	41.1	17.5	12.0	22.4		3.4	13.5	10.8
Green Ratio (g/C)	0.55	0.48	0.58	0.42	0.37	0.43	0.32	0.24		0.26	0.20	0.37
Capacity (c), veh/h	365	1678	904	334	1295	684	664	439		202	371	577
Volume-to-Capacity Ratio (X)	0.892	0.538	0.216	0.391	0.957	0.477	0.769	0.817		0.323	0.615	0.339
Back of Queue (Q), ft/ln (95 th percentile)	284.2	339.6	109.7	102	686.4	264.2	88.8	421.1		66.8	264.4	181.5
Back of Queue (Q), veh/ln (95 th percentile)	11.1	13.3	4.3	4.0	26.8	10.6	3.5	16.4		2.6	10.3	7.1
Queue Storage Ratio (RQ) (95 th percentile)	0.52	0.18	0.15	0.19	0.31	0.41	0.22	0.28		0.17	0.09	0.43
Uniform Delay (d_1), s/veh	35.0	22.2	12.4	22.0	37.1	24.9	36.5	43.0		35.9	43.8	27.5
Incremental Delay (d_2), s/veh	22.4	0.2	0.0	0.3	15.6	0.2	5.0	10.8		0.3	2.2	0.1
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Control Delay (d), s/veh	57.4	22.4	12.4	22.3	52.7	25.1	41.5	53.8		36.3	46.0	27.6
Level of Service (LOS)	E	C	B	C	D	C	D	D		D	D	C
Approach Delay, s/veh / LOS	29.0			C			45.1			D		
Intersection Delay, s/veh / LOS	39.4						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.10	B	2.12	B	2.45	B	2.46	B
Bicycle LOS Score / LOS	1.66	B	1.89	B	1.92	B	1.29	A

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Africa & Jaycox		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/15/2020			East/West Street	Jaycox Road		
Analysis Year	2040			North/South Street	Africa Road		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	North-South			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 2						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	1	1	0	1	1	0
Configuration						L		R			T	R		L	T	
Volume (veh/h)						90		30			720	50		40	450	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized					No				No							
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2							4.1		
Critical Headway (sec)						6.42		6.22							4.12		
Base Follow-Up Headway (sec)						3.5		3.3							2.2		
Follow-Up Headway (sec)						3.52		3.32							2.22		

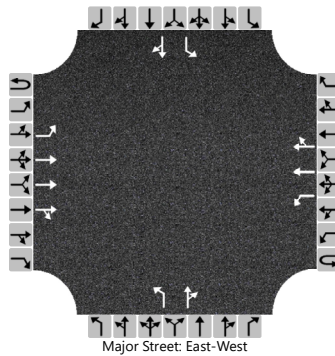
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)					98		33							43		
Capacity, c (veh/h)					155		394							797		
v/c Ratio					0.63		0.08							0.05		
95% Queue Length, Q ₉₅ (veh)					3.5		0.3							0.2		
Control Delay (s/veh)					61.4		15.0							9.8		
Level of Service (LOS)					F		B							A		
Approach Delay (s/veh)					49.8								0.8			
Approach LOS					E											

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Medan		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/14/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Medan Dr/Whispering Ridge		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative2A						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	3	0	0	1	2	0		1	1	0		1	1	0
Configuration		L	T	TR		L	T	TR		L		TR		L		TR
Volume (veh/h)	0	20	1640	30	0	10	740	10		20	10	10		10	10	10
Percent Heavy Vehicles (%)	3	3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		5.3				5.3					6.4	6.5	7.1			6.4	6.5	7.1
Critical Headway (sec)		5.36				5.36					6.46	6.56	7.16			6.46	6.56	7.16
Base Follow-Up Headway (sec)		3.1				3.1					3.8	4.0	3.9			3.8	4.0	3.9
Follow-Up Headway (sec)		3.13				3.13					3.83	4.03	3.93			3.83	4.03	3.93

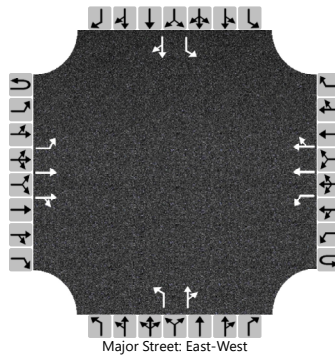
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		22				11					22		22			11		22
Capacity, c (veh/h)		477				153												
v/c Ratio		0.05				0.07												
95% Queue Length, Q ₉₅ (veh)		0.1				0.2												
Control Delay (s/veh)		12.9				30.3												
Level of Service (LOS)		B				D												
Approach Delay (s/veh)		0.2				0.4												
Approach LOS																		

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Medan		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/14/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Medan Dr/Whispering Ridge		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 2						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	2	0	0	1	2	0		1	1	0		1	1	0
Configuration		L	T	TR		L	T	TR		L		TR		L		TR
Volume (veh/h)	0	20	1640	30	0	10	740	10		20	10	10		10	10	10
Percent Heavy Vehicles (%)	3	3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

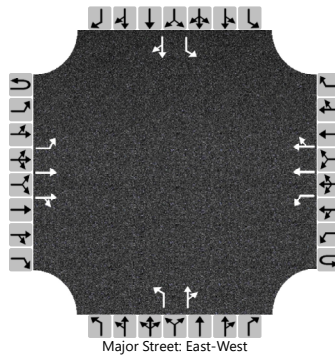
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		22				11				22		22		11		22
Capacity, c (veh/h)		802				330										
v/c Ratio		0.03				0.03										
95% Queue Length, Q ₉₅ (veh)		0.1				0.1										
Control Delay (s/veh)		9.6				16.3										
Level of Service (LOS)		A				C										
Approach Delay (s/veh)	0.1				0.2											
Approach LOS																

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Highland		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/14/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Highland Hills Drive		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 2						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	2	0	0	1	2	0		1	1	0		1	1	0
Configuration		L	T	TR		L	T	TR		L		TR		L		TR
Volume (veh/h)	0	10	1646	30	0	20	704	10		30	10	10		10	10	10
Percent Heavy Vehicles (%)	3	3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

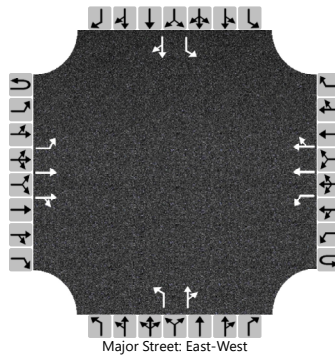
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		11				22				33		22		11		22
Capacity, c (veh/h)		829				328										
v/c Ratio		0.01				0.07										
95% Queue Length, Q ₉₅ (veh)		0.0				0.2										
Control Delay (s/veh)		9.4				16.7										
Level of Service (LOS)		A				C										
Approach Delay (s/veh)		0.1				0.5										
Approach LOS																

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Willow Bend		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/14/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Willow Bend/Grand Oak		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL071-3.55 Big Walnut Interchange - Alternative 2						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	2	0	0	1	2	0		1	1	0		1	1	0
Configuration		L	T	TR		L	T	TR		L		TR		L		TR
Volume (veh/h)	0	40	1596	30	0	30	633	30		20	10	20		30	10	30
Percent Heavy Vehicles (%)	3	3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

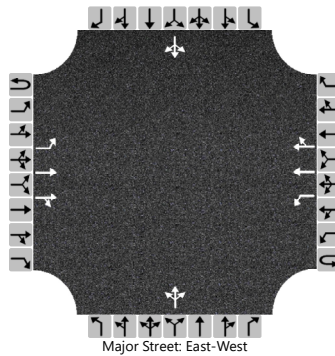
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		43				33				22		33		33		43	
Capacity, c (veh/h)		870				345				10		50		25		69	
v/c Ratio		0.05				0.09				2.16		0.65		1.32		0.63	
95% Queue Length, Q ₉₅ (veh)		0.2				0.3				3.7		2.6		4.0		2.7	
Control Delay (s/veh)		9.4				16.5				1269.1		162.9		528.2		119.8	
Level of Service (LOS)		A				C				F		F		F		F	
Approach Delay (s/veh)		0.2				0.7				605.4				294.9			
Approach LOS										F				F			

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Jeffries		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/15/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Jeffries Court/Grandmere		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 2						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	2	0	0	1	2	0		0	1	0		0	1	0
Configuration		L	T	TR		L	T	TR			LTR				LTR	
Volume (veh/h)	0	10	1636	10	0	10	669	40		10	0	0		20	0	20
Percent Heavy Vehicles (%)	3	3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

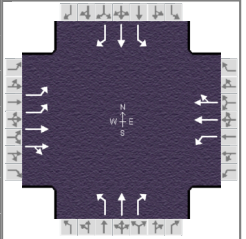
Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		11				11					11					43	
Capacity, c (veh/h)		833				338					23					106	
v/c Ratio		0.01				0.03					0.48					0.41	
95% Queue Length, Q ₉₅ (veh)		0.0				0.1					1.4					1.7	
Control Delay (s/veh)		9.4				16.0					262.5					60.8	
Level of Service (LOS)		A				C					F					F	
Approach Delay (s/veh)		0.1				0.2				262.5				60.8			
Approach LOS										F				F			

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	AECOM			Duration, h	0.25
Analyst	KKM	Analysis Date	May 15, 2020	Area Type	Other
Jurisdiction	Delaware County	Time Period	PM Peak Hour	PHF	0.92
Urban Street	Big Walnut Road	Analysis Year	2040	Analysis Period	1 > 7:00
Intersection	Big Walnut/Worthington	File Name	14-2040 Alt 2 PM BW-Worthington Road.xus		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 2				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	762	704	214	24	110	214	143	631	36	83	274	428

Signal Information				Signal Phases										
Cycle, s	120.0	Reference Phase	2											
Offset, s	0	Reference Point	End	Green	7.0	17.0	20.0	7.0	44.0	0.0				
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	4.0	4.0	4.0	4.0	4.0	0.0				
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.0	1.0	1.0	1.0	1.0	0.0				

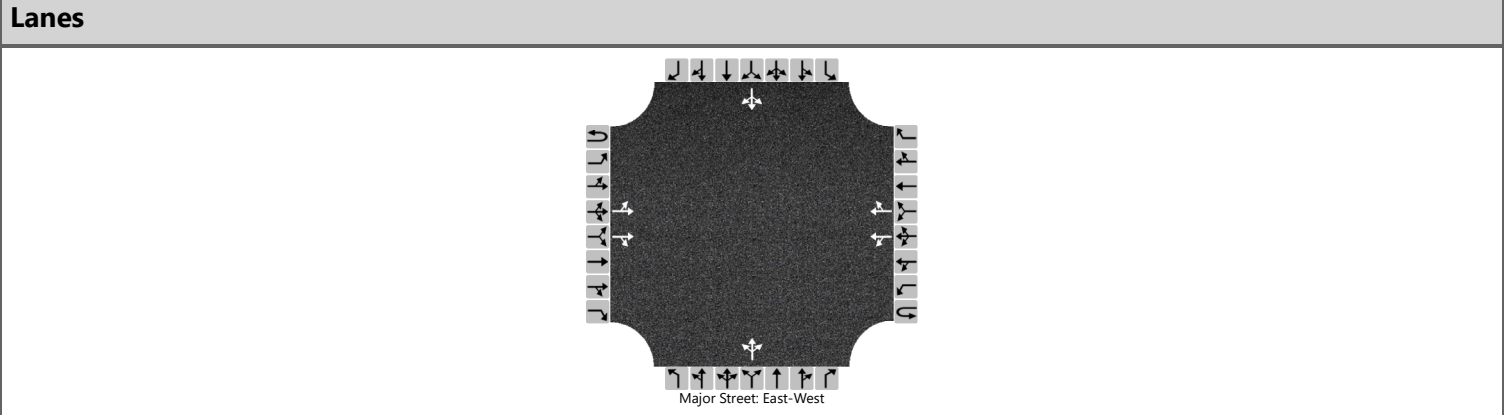
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	2.0	4.0	1.1	4.0	1.1	3.0	1.1	3.0
Phase Duration, s	34.0	47.0	12.0	25.0	12.0	49.0	12.0	49.0
Change Period, (Y+R _c), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (MAH), s	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Queue Clearance Time (g _s), s	30.9	32.4	3.4	19.4	8.7	46.0	5.7	21.7
Green Extension Time (g _e), s	0.0	2.2	0.0	0.3	0.0	0.0	0.0	3.1
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	1.00	0.19	0.30	1.00	1.00	1.00	1.00	0.01

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	828	520	478	26	120	233	155	686	39	90	298	465
Adjusted Saturation Flow Rate (s), veh/h/ln	1716	1856	1706	1767	1856	1572	1767	1856	1572	1767	1856	1572
Queue Service Time (g _s), s	28.9	30.4	30.4	1.4	6.9	17.4	6.7	44.0	1.8	3.7	14.5	19.7
Cycle Queue Clearance Time (g _c), s	28.9	30.4	30.4	1.4	6.9	17.4	6.7	44.0	1.8	3.7	14.5	19.7
Green Ratio (g/C)	0.24	0.35	0.35	0.22	0.17	0.17	0.42	0.37	0.43	0.42	0.37	0.61
Capacity (c), veh/h	829	649	597	208	309	262	409	680	668	163	680	957
Volume-to-Capacity Ratio (X)	0.999	0.800	0.800	0.125	0.387	0.888	0.380	1.008	0.059	0.553	0.438	0.486
Back of Queue (Q), ft/ln (95 th percentile)	558.9	522.9	489.8	27.4	143.6	344.3	123.3	877.2	29	73.2	265	266.8
Back of Queue (Q), veh/ln (95 th percentile)	21.8	20.4	19.1	1.1	5.6	13.4	4.8	34.3	1.1	2.9	10.4	10.4
Queue Storage Ratio (RQ) (95 th percentile)	1.12	0.26	0.24	0.12	0.10	0.23	0.22	0.58	0.23	0.13	0.16	0.36
Uniform Delay (d ₁), s/veh	45.5	35.2	35.2	37.0	44.5	48.9	23.1	38.0	20.3	29.0	28.7	13.1
Incremental Delay (d ₂), s/veh	30.9	6.6	7.1	0.1	0.3	27.8	0.2	36.5	0.0	2.4	0.2	0.1
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	76.4	41.8	42.3	37.1	44.8	76.7	23.3	74.5	20.4	31.4	28.8	13.2
Level of Service (LOS)	E	D	D	D	D	E	C	F	C	C	C	B
Approach Delay, s/veh / LOS	57.6	E		63.9	E		63.1	E		20.6	C	
Intersection Delay, s/veh / LOS	51.4						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.12	B	2.31	B	2.28	B	2.44	B
Bicycle LOS Score / LOS	1.99	B	0.80	A	1.94	B	1.90	B

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Ketterington		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/15/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Ketterington/Satinwood		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 2						



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12	
Priority																	
Number of Lanes	0	0	2	0	0	0	2	0		0	1	0		0	1	0	
Configuration		LT		TR		LT		TR			LTR				LTR		
Volume (veh/h)		10	803	10		10	258	10		4	0	24		8	2	9	
Percent Heavy Vehicles (%)		3				3				3	3	3		3	3	3	
Proportion Time Blocked																	
Percent Grade (%)										0				0			
Right Turn Channelized																	
Median Type Storage	Undivided																

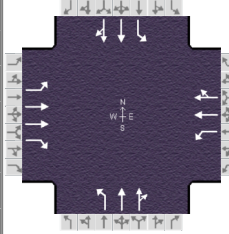
Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

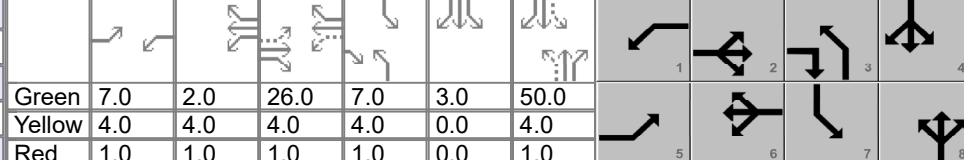
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		11				11					30					21	
Capacity, c (veh/h)		1260				755					420					369	
v/c Ratio		0.01				0.01					0.07					0.06	
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.2					0.2	
Control Delay (s/veh)		7.9				9.8					14.2					15.3	
Level of Service (LOS)		A				A					B					C	
Approach Delay (s/veh)		0.2				0.4				14.2				15.3			
Approach LOS		A				A				B				C			

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information		
Agency	AECOM			Duration, h	0.25	
Analyst	KKM	Analysis Date	May 15, 2020	Area Type	Other	
Jurisdiction	Delaware County	Time Period	PM Peak Hour	PHF	0.92	
Urban Street	Big Walnut Road	Analysis Year	2040	Analysis Period	1 > 7:00	
Intersection	Big Walnut/SR3	File Name	14-2040 Alt 2 PM BW-SR3.xus			
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 2					

Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	223	398	214	88	139	204	113	1280	26	152	526	23

Signal Information														
Cycle, s	120.0	Reference Phase	2	Green	7.0	2.0	26.0	7.0	3.0	50.0				
Offset, s	0	Reference Point	End	Yellow	4.0	4.0	4.0	4.0	0.0	4.0				
Uncoordinated	Yes	Simult. Gap E/W	On	Red	1.0	1.0	1.0	1.0	0.0	1.0				
Force Mode	Fixed	Simult. Gap N/S	On											

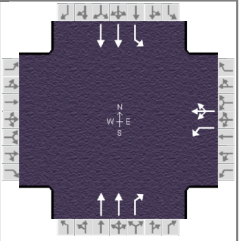
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	3.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	12.0	31.0	19.0	38.0	12.0	55.0	15.0	58.0
Change Period, ($Y+R_c$), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (MAH), s	3.0	3.1	3.0	3.1	2.9	2.8	2.9	2.8
Queue Clearance Time (g_s), s	9.0	16.7	6.4	15.9	6.6	44.0	8.0	14.6
Green Extension Time (g_e), s	0.0	1.8	0.1	2.1	0.0	2.4	0.0	3.9
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	1.00	0.10	0.00	0.01	1.00	0.60	1.00	0.00

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	242	433	233	96	151	222	123	712	708	165	300	296
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1809	1610	1810	1900	1610	1810	1900	1886	1810	1900	1872
Queue Service Time (g_s), s	7.0	12.8	14.7	4.4	7.5	13.9	4.6	41.9	42.0	6.0	12.6	12.6
Cycle Queue Clearance Time (g_c), s	7.0	12.8	14.7	4.4	7.5	13.9	4.6	41.9	42.0	6.0	12.6	12.6
Green Ratio (g/C)	0.28	0.22	0.28	0.35	0.28	0.28	0.48	0.42	0.42	0.50	0.44	0.44
Capacity (c), veh/h	312	784	443	378	523	443	432	792	786	236	839	827
Volume-to-Capacity Ratio (X)	0.778	0.552	0.525	0.253	0.289	0.501	0.284	0.899	0.900	0.699	0.358	0.359
Back of Queue (Q), ft/ln (95 th percentile)	191.4	236.6	239.4	82.8	153	228.2	80.4	694.7	693.3	125.2	224.1	222.2
Back of Queue (Q), veh/ln (95 th percentile)	7.7	9.5	9.6	3.3	6.1	9.1	3.2	27.8	27.7	5.0	9.0	8.9
Queue Storage Ratio (RQ) (95 th percentile)	0.43	0.12	0.50	0.24	0.06	0.09	0.15	0.22	0.22	0.26	0.04	0.04
Uniform Delay (d_1), s/veh	42.0	41.8	36.9	27.8	34.3	36.6	18.4	32.6	32.7	26.3	22.2	22.2
Incremental Delay (d_2), s/veh	10.8	0.5	0.6	0.1	0.1	0.3	0.1	12.9	13.1	7.5	0.1	0.1
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	52.8	42.3	37.4	27.9	34.4	36.9	18.5	45.5	45.8	33.8	22.3	22.3
Level of Service (LOS)	D	D	D	C	C	D	B	D	D	C	C	C
Approach Delay, s/veh / LOS	43.9		D	34.3		C	43.5		D	24.8		C
Intersection Delay, s/veh / LOS	38.5						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.30	B	2.30	B	2.28	B	2.43	B
Bicycle LOS Score / LOS	1.24	A	0.87	A	1.76	B	1.12	A

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	AECOM			Duration, h	0.25
Analyst	KKM	Analysis Date	May 12, 2020	Area Type	Other
Jurisdiction	Delaware County	Time Period	PM Peak Hour	PHF	0.92
Urban Street	Africa Road	Analysis Year	2040	Analysis Period	1 > 7:00
Intersection	Africa Road & I-71 SB R...	File Name	14-2040 Alt 2 PM Africa Road-I-71 SB Ramp.xus		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 2				



Demand Information	EB			WB			NB			SB					
	L	T	R	L	T	R	L	T	R	L	T	R			
Approach Movement															
Demand (v), veh/h				360	0	10				760	130		450	90	

Signal Information				Phase Diagram											
Cycle, s	120.0	Reference Phase	2												
Offset, s	0	Reference Point	End												
Uncoordinated	Yes	Simult. Gap E/W	On												
Force Mode	Fixed	Simult. Gap N/S	On												
		Green	30.0	35.0	40.0	0.0	0.0	0.0							
		Yellow	4.0	4.0	4.0	0.0	0.0	0.0							
		Red	1.0	1.0	1.0	0.0	0.0	0.0							

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase				4		6	5	2
Case Number				10.0		7.3	1.0	4.0
Phase Duration, s				45.0		40.0	35.0	75.0
Change Period, (Y+R _c), s				5.0		5.0	5.0	5.0
Max Allow Headway (MAH), s				3.0		2.9	2.9	2.9
Queue Clearance Time (g _s), s				24.8		27.9	26.1	3.4
Green Extension Time (g _e), s				0.7		1.6	0.4	2.3
Phase Call Probability				1.00		1.00	1.00	1.00
Max Out Probability				0.00		0.18	0.55	0.00

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement				7	4	14		6	16	5	2	
Adjusted Flow Rate (v), veh/h				391	11			826	141	489	98	
Adjusted Saturation Flow Rate (s), veh/h/ln				1767	1572			1766		1767	1766	
Queue Service Time (g _s), s				22.8	0.6			25.9		24.1	1.4	
Cycle Queue Clearance Time (g _c), s				22.8	0.6			25.9		24.1	1.4	
Green Ratio (g/C)				0.33	0.33			0.29		0.56	0.58	
Capacity (c), veh/h				589	524			1030		551	2061	
Volume-to-Capacity Ratio (X)				0.664	0.021			0.802		0.887	0.047	
Back of Queue (Q), ft/ln (95 th percentile)				380.4	9.4			426.2		437.5	23	
Back of Queue (Q), veh/ln (95 th percentile)				14.9	0.4			16.6		17.1	0.9	
Queue Storage Ratio (RQ) (95 th percentile)				1.17	0.09			0.14		0.80	0.01	
Uniform Delay (d ₁), s/veh				34.3	26.9			39.3		27.8	10.7	
Incremental Delay (d ₂), s/veh				2.3	0.0			4.3		15.5	0.0	
Initial Queue Delay (d ₃), s/veh				0.0	0.0			0.0		0.0	0.0	
Control Delay (d), s/veh				36.5	26.9			43.6	0.0	43.3	10.7	
Level of Service (LOS)				D	C			D	A	D	B	
Approach Delay, s/veh / LOS	0.0			36.3			37.2			37.9		
Intersection Delay, s/veh / LOS				37.2						D		

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.32	B	2.33	B	1.93	B	1.37	A
Bicycle LOS Score / LOS			1.15	A	1.29	A	0.97	A

HCS7 Roundabouts Report

General Information				Site Information				
Analyst	KKM				Intersection	I-71 NB Ramp & Big Walnut		
Agency or Co.	AECOM				E/W Street Name	Big Walnut Road		
Date Performed	5/21/2020				N/S Street Name	I-71 NB Ramps		
Analysis Year	2040				Analysis Time Period (hrs)	0.25		
Time Analyzed	PM Peak Hour				Peak Hour Factor	0.92		
Project Description	DEL-71-3.55 Big Walnut Inte...				Jurisdiction	Delaware County		

Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	2	0	0	0	2	0	0	1	1	0	0	0	0	0
Lane Assignment	LT		T		T		TR		L		LTR					
Volume (V), veh/h	0	210	720		0		630	140	0	880	0	970				
Percent Heavy Vehicles, %	3	3	3		3		3	3	3	3	3	3				
Flow Rate (v _{PCE}), pc/h	0	235	806		0		705	157	0	985	0	1086				
Right-Turn Bypass	None				None				Non-Yielding				None			
Conflicting Lanes	2				2				2							
Pedestrians Crossing, p/h	0				0				0							

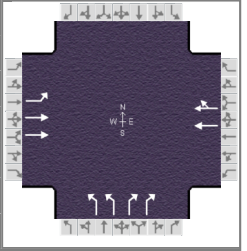
Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (s)	4.6453	4.3276		4.6453	4.3276		4.6453	4.3276					
Follow-Up Headway (s)	2.6667	2.5352		2.6667	2.5352		2.6667	2.5352					

Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (v _e), pc/h	489	552		405	457		985	0	1086				
Entry Volume, veh/h	475	536		393	444		956	0	1054				
Circulating Flow (v _c), pc/h	0			1220			1041			1690			
Exiting Flow (v _{ex}), pc/h	806			1690			392			0			
Capacity (C _{PCE}), pc/h	1350	1420		439	503		518	586					
Capacity (c), veh/h	1311	1379		427	489		503	569					
v/c Ratio (x)	0.36	0.39		0.92	0.91		1.90	0.00					

Delay and Level of Service													
Approach	EB			WB			NB			SB			
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Lane Control Delay (d), s/veh	6.1	6.2		57.2	49.8		432.3	6.3					
Lane LOS	A	A		F	E		F	A	A				
95% Queue, veh	1.7	1.9		10.2	10.4		62.4	0.0					
Approach Delay, s/veh	6.2			53.3			205.6						
Approach LOS	A			F			F						
Intersection Delay, s/veh LOS	120.3						F						

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	AECOM			Duration, h	0.25
Analyst	KKM	Analysis Date	May 12, 2020	Area Type	Other
Jurisdiction	Delaware County	Time Period	PM Peak Hour	PHF	0.92
Urban Street	Big Walnut Road	Analysis Year	2040	Analysis Period	1 > 7:00
Intersection	Big Walnut & I-71 NB R...	File Name	14-2040 Alt 2B PM BW-I-71 NB Ramp.xus		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative2B				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	210	720			630	140	880		970			

Signal Information												
Cycle, s	120.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	Yes	Simult. Gap E/W	On									
Force Mode	Fixed	Simult. Gap N/S	On									
		Green	10.0	44.0	51.0	0.0	0.0	0.0				
		Yellow	4.0	4.0	4.0	0.0	0.0	0.0				
		Red	1.0	1.0	1.0	0.0	0.0	0.0				

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6		8		
Case Number	1.0	4.0		8.3		9.0		
Phase Duration, s	15.0	64.0		49.0		56.0		
Change Period, (Y+R _c), s	5.0	5.0		5.0		5.0		
Max Allow Headway (MAH), s	3.0	3.0		3.0		3.1		
Queue Clearance Time (g _s), s	11.5	19.4		25.1		44.1		
Green Extension Time (g _e), s	0.0	3.6		3.4		3.7		
Phase Call Probability	1.00	1.00		1.00		1.00		
Max Out Probability	1.00	0.00		0.03		0.58		

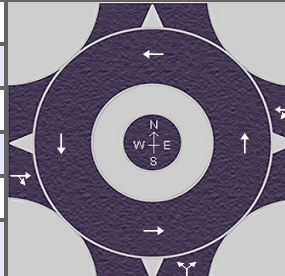
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16	3		18			
Adjusted Flow Rate (v), veh/h	228	783			432	405	957		1054			
Adjusted Saturation Flow Rate (s), veh/h/ln	1767	1766			1856	1738	1716		1392			
Queue Service Time (g _s), s	9.5	17.4			22.8	23.1	26.7		42.1			
Cycle Queue Clearance Time (g _c), s	9.5	17.4			22.8	23.1	26.7		42.1			
Green Ratio (g/C)	0.47	0.49			0.37	0.37	0.42		0.42			
Capacity (c), veh/h	321	1737			680	637	1459		1183			
Volume-to-Capacity Ratio (X)	0.712	0.451			0.635	0.636	0.656		0.891			
Back of Queue (Q), ft/ln (95 th percentile)	195.8	281.3			393.4	365.3	405.1		534.8			
Back of Queue (Q), veh/ln (95 th percentile)	7.6	11.0			15.4	14.6	15.8		20.9			
Queue Storage Ratio (RQ) (95 th percentile)	0.37	0.13			0.79	0.75	0.68		0.86			
Uniform Delay (d ₁), s/veh	23.6	19.9			31.4	31.4	27.5		31.9			
Incremental Delay (d ₂), s/veh	6.2	0.1			1.5	1.6	0.9		8.5			
Initial Queue Delay (d ₃), s/veh	0.0	0.0			0.0	0.0	0.0		0.0			
Control Delay (d), s/veh	29.8	20.0			32.9	33.0	28.4		40.4			
Level of Service (LOS)	C	B			C	C	C		D			
Approach Delay, s/veh / LOS	22.2	C		32.9	C		34.7	C	0.0			
Intersection Delay, s/veh / LOS	31.0						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.10	B	1.41	A	2.16	B	2.32	B
Bicycle LOS Score / LOS	1.32	A	1.18	A		F		

HCS7 Roundabouts Report

General Information

Site Information

Analyst	KKM		Intersection	Bale Kenyon & Big Walnut
Agency or Co.	AECOM		E/W Street Name	Big Walnut Road
Date Performed	5/4/2020		N/S Street Name	Bale Kenyon Road
Analysis Year	2040		Analysis Time Period (hrs)	0.25
Time Analyzed	AM Peak Hour		Peak Hour Factor	0.92
Project Description	DEL-71-3.55 Big Walnut Inte...		Jurisdiction	Delaware County

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0
Lane Assignment	TR				LT				LR							
Volume (V), veh/h	0		1164	121	0	506	804		0	29		256				
Percent Heavy Vehicles, %	2		2	2	2	2	2		2	2		2				
Flow Rate (v _{PCE}), pc/h	0		1291	134	0	561	891		0	32		284				
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1							
Pedestrians Crossing, p/h	0				0				0							

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763				
Follow-Up Headway (s)		2.6087			2.6087			2.6087				

Flow Computations, Capacity and v/c Ratios

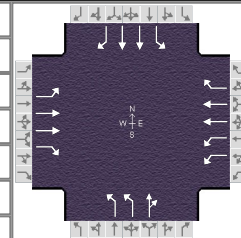
Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v _e), pc/h		1425			1452			316				
Entry Volume, veh/h		1397			1424			310				
Circulating Flow (v _c), pc/h	561			32			1291			1484		
Exiting Flow (v _{ex}), pc/h	1575			923			0			695		
Capacity (C _{PCE}), pc/h		779			1336			370				
Capacity (c), veh/h		763			1309			363				
v/c Ratio (x)		1.83			1.09			0.85				

Delay and Level of Service

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		393.3			68.9			51.4				
Lane LOS		F			F			F				
95% Queue, veh		85.3			31.3			8.0				
Approach Delay, s/veh	393.3			68.9			51.4					
Approach LOS	F			F			F					
Intersection Delay, s/veh LOS	212.0						F					

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information			
Agency	AECOM			Duration, h	0.25		
Analyst	KKM	Analysis Date	May 12, 2020	Area Type	Other		
Jurisdiction	Delaware County	Time Period	AM Peak Hour	PHF	0.92		
Urban Street	Big Walnut Road	Analysis Year	2040	Analysis Period	1 > 7:00		
Intersection	Big Walnut & Africa	File Name	15-2040 Alt 3 AM BW-Africa Road.xus				
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 3						



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	60	930	430	130	830	90	290	70	50	40	350	190

Signal Information													
Cycle, s	120.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	Yes	Simult. Gap E/W	On	Green	7.0	11.0	37.0	7.0	5.0	23.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.0	4.0	4.0	4.0	4.0			
				Red	1.0	1.0	1.0	1.0	1.0	1.0			

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	3.0	2.0	3.0	2.0	4.0	1.1	3.0
Phase Duration, s	12.0	42.0	28.0	58.0	22.0	38.0	12.0	28.0
Change Period, ($Y+R_c$), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (MAH), s	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Queue Clearance Time (g_s), s	4.9	35.3	6.2	25.0	12.4	9.1	4.3	15.6
Green Extension Time (g_e), s	0.0	1.3	0.2	7.3	0.3	1.5	0.0	1.1
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	1.00	1.00	0.00	0.06	0.23	0.00	1.00	0.11

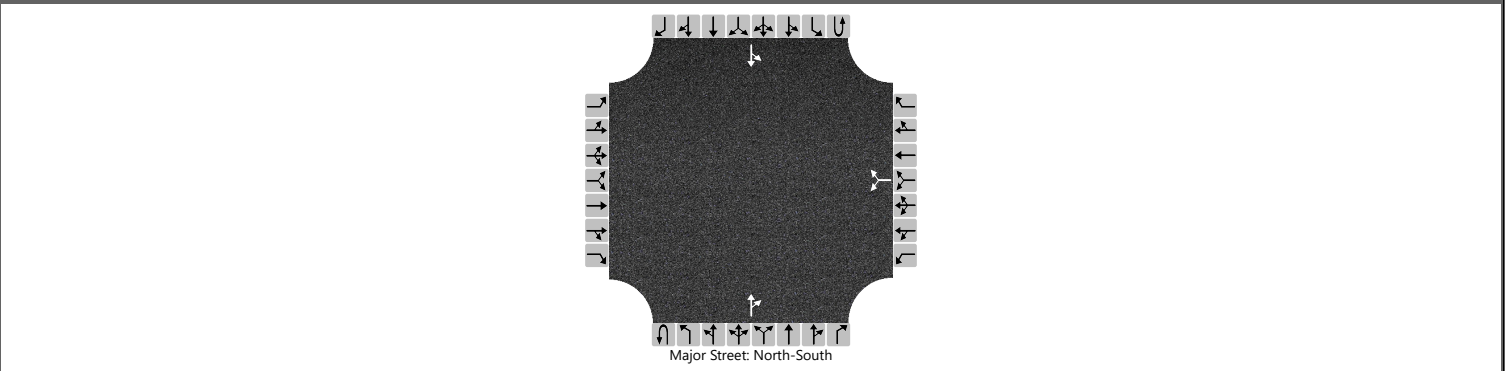
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	65	1011	467	141	902	98	315	130		43	380	207
Adjusted Saturation Flow Rate (s), veh/h/ln	1767	1766	1572	1716	1766	1610	1716	1726		1767	1766	1572
Queue Service Time (g_s), s	2.9	33.3	27.9	4.2	23.0	3.9	10.4	7.1		2.3	11.7	13.6
Cycle Queue Clearance Time (g_c), s	2.9	33.3	27.9	4.2	23.0	3.9	10.4	7.1		2.3	11.7	13.6
Green Ratio (g/C)	0.37	0.31	0.45	0.19	0.44	0.50	0.14	0.28		0.25	0.19	0.25
Capacity (c), veh/h	306	1089	708	658	1560	805	486	475		403	677	393
Volume-to-Capacity Ratio (X)	0.213	0.928	0.661	0.215	0.578	0.122	0.648	0.275		0.108	0.562	0.525
Back of Queue (Q), ft/ln (95 th percentile)	55.1	570.6	394.9	79.7	362.4	61.6	204.5	134.6		44.2	223.3	227.6
Back of Queue (Q), veh/ln (95 th percentile)	2.2	22.3	15.4	3.1	14.2	2.5	8.0	5.3		1.7	8.7	8.9
Queue Storage Ratio (RQ) (95 th percentile)	0.10	0.30	0.69	0.14	0.16	0.10	0.45	0.17		0.18	0.04	0.70
Uniform Delay (d_1), s/veh	25.4	40.2	25.8	40.9	25.1	16.0	48.7	34.1		34.6	43.9	38.9
Incremental Delay (d_2), s/veh	0.1	13.1	1.8	0.1	0.4	0.0	2.4	0.1		0.0	0.7	0.6
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Control Delay (d), s/veh	25.5	53.4	27.7	40.9	25.5	16.0	51.0	34.2		34.6	44.6	39.5
Level of Service (LOS)	C	D	C	D	C	B	D	C		C	D	D
Approach Delay, s/veh / LOS	44.4		D	26.6		C	46.1		D	42.2		D
Intersection Delay, s/veh / LOS	38.8						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.29	B	2.27	B	2.59	C	2.46	B
Bicycle LOS Score / LOS	1.76	B	1.43	A	1.22	A	1.01	A

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	KKM	Intersection	Africa & Jaycox
Agency/Co.	AECOM	Jurisdiction	Delaware County
Date Performed	5/15/2020	East/West Street	Jaycox Road
Analysis Year	2040	North/South Street	Africa Road
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 3		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						110		50			210	10		40	470	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type Storage						Undivided										

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2							4.1	
Critical Headway (sec)						6.42		6.22							4.12	
Base Follow-Up Headway (sec)						3.5		3.3							2.2	
Follow-Up Headway (sec)						3.52		3.32							2.22	

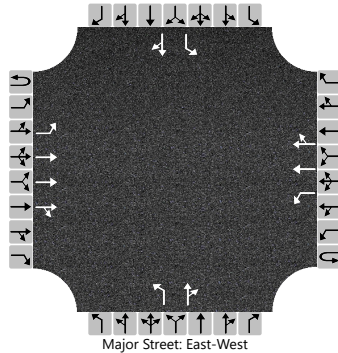
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						174								43		
Capacity, c (veh/h)						398								1328		
v/c Ratio						0.44								0.03		
95% Queue Length, Q ₉₅ (veh)						2.2								0.1		
Control Delay (s/veh)						20.9								7.8		
Level of Service (LOS)						C								A		
Approach Delay (s/veh)						20.9								0.9		
Approach LOS						C										

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Medan		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/14/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Medan Dr/Whispering Ridge		
Time Analyzed	AM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative3A						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	3	0	0	1	2	0		1	1	0		1	1	0
Configuration		L	T	TR		L	T	TR		L		TR		L		TR
Volume (veh/h)	0	10	1290	10	0	10	930	10		20	10	10		10	10	20
Percent Heavy Vehicles (%)	3	3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		5.3				5.3				6.4	6.5	7.1		6.4	6.5	7.1
Critical Headway (sec)		5.36				5.36				6.46	6.56	7.16		6.46	6.56	7.16
Base Follow-Up Headway (sec)		3.1				3.1				3.8	4.0	3.9		3.8	4.0	3.9
Follow-Up Headway (sec)		3.13				3.13				3.83	4.03	3.93		3.83	4.03	3.93

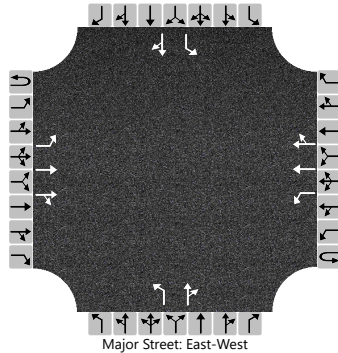
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		11				11				22		22		11		33	
Capacity, c (veh/h)		379				244				41		50		67		72	
v/c Ratio		0.03				0.04				0.53		0.44		0.16		0.45	
95% Queue Length, Q ₉₅ (veh)		0.1				0.1				1.9		1.6		0.5		1.8	
Control Delay (s/veh)		14.8				20.5				167.7		124.9		69.0		91.5	
Level of Service (LOS)		B				C				F		F		F		F	
Approach Delay (s/veh)		0.1				0.2				146.3				85.8			
Approach LOS										F				F			

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Medan		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/14/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Medan Dr/Whispering Ridge		
Time Analyzed	AM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 3						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Priority																
Number of Lanes	0	1	2	0	0	1	2	0	1	1	0		1	1	0	
Configuration		L	T	TR		L	T	TR		L		TR		L		TR
Volume (veh/h)	0	10	1290	10	0	10	930	10	20	10	10		10	10	20	
Percent Heavy Vehicles (%)	3	3			3	3			3	3	3		3	3	3	
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

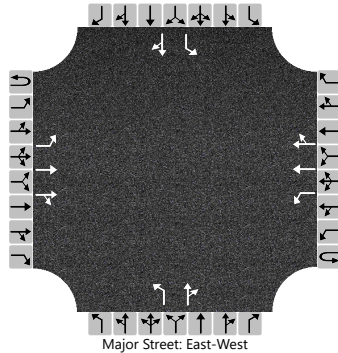
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		11				11				22		22		11		33
Capacity, c (veh/h)		669				473				24		52		35		75
v/c Ratio		0.02				0.02				0.90		0.42		0.31		0.43
95% Queue Length, Q ₉₅ (veh)		0.0				0.1				2.7		1.5		1.0		1.7
Control Delay (s/veh)		10.5				12.8				378.1		117.0		151.4		85.0
Level of Service (LOS)		B				B				F		F		F		F
Approach Delay (s/veh)	0.1				0.1				247.5				101.6			
Approach LOS									F				F			

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Highland		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/14/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Highland Hills Drive		
Time Analyzed	AM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 3						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Priority																
Number of Lanes	0	1	2	0	0	1	2	0	1	1	0		1	1	0	
Configuration		L	T	TR		L	T	TR	L		TR		L		TR	
Volume (veh/h)	0	10	1296	14	0	4	884	10	66	10	15		10	10	10	
Percent Heavy Vehicles (%)	3	3			3	3			3	3	3		3	3	3	
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

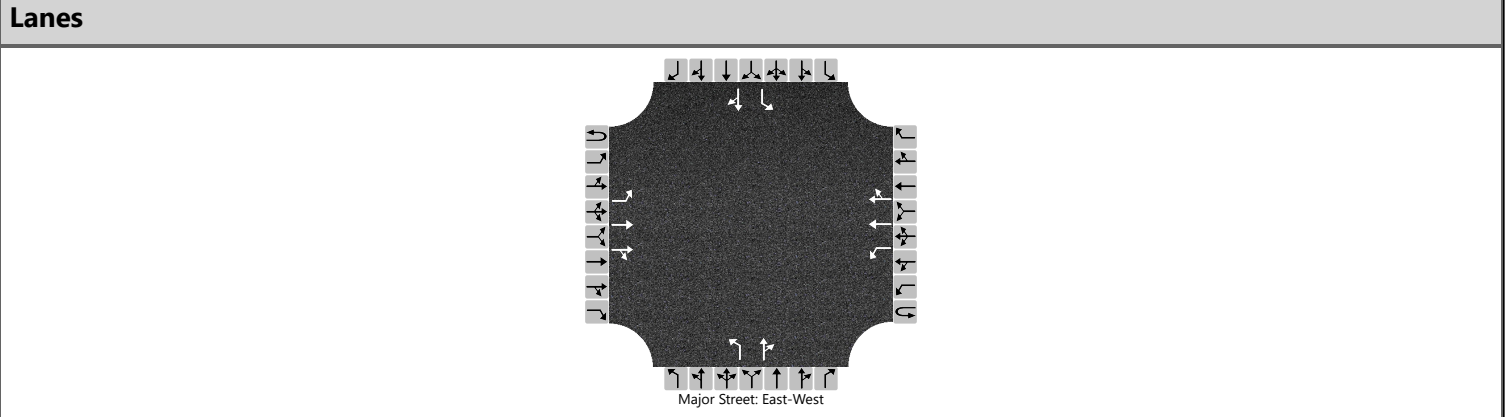
Base Critical Headway (sec)		4.1				4.1			7.5	6.5	6.9		7.5	6.5	6.9	
Critical Headway (sec)		4.16				4.16			7.56	6.56	6.96		7.56	6.56	6.96	
Base Follow-Up Headway (sec)		2.2				2.2			3.5	4.0	3.3		3.5	4.0	3.3	
Follow-Up Headway (sec)		2.23				2.23			3.53	4.03	3.33		3.53	4.03	3.33	

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		11				4			72		27		11		22	
Capacity, c (veh/h)		699				469			27		68		40		58	
v/c Ratio		0.02				0.01			2.62		0.40		0.27		0.38	
95% Queue Length, Q ₉₅ (veh)		0.0				0.0			8.7		1.5		0.9		1.4	
Control Delay (s/veh)		10.2				12.8			1039.7		88.8		126.9		100.6	
Level of Service (LOS)		B				B			F		F		F		F	
Approach Delay (s/veh)	0.1				0.1				778.4				109.4			
Approach LOS									F				F			

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Willow Bend		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/14/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Willow Bend/Grand Oak		
Time Analyzed	AM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL071-3.55 Big Walnut Interchange - Alternative 3						



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	2	0	0	1	2	0		1	1	0		1	1	0
Configuration		L	T	TR		L	T	TR		L		TR		L		TR
Volume (veh/h)	0	61	1244	13	0	7	813	55		12	15	19		55	9	63
Percent Heavy Vehicles (%)	3	3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

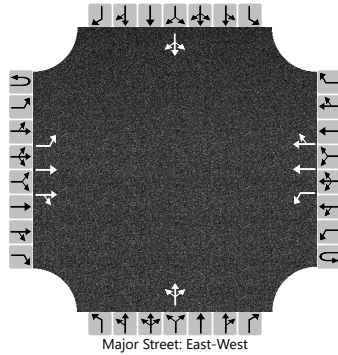
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		66				8				13		37		60		78	
Capacity, c (veh/h)		717				493				22		56		24		162	
v/c Ratio		0.09				0.02				0.60		0.67		2.46		0.48	
95% Queue Length, Q ₉₅ (veh)		0.3				0.0				1.7		2.7		7.4		2.3	
Control Delay (s/veh)		10.5				12.4				306.8		152.9		1001.8		46.4	
Level of Service (LOS)		B				B				F		F		F		E	
Approach Delay (s/veh)		0.5				0.1				193.1				460.1			
Approach LOS										F				F			

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Jeffries		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/15/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Jeffries Court/Grandmere		
Time Analyzed	AM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 3						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	2	0	0	1	2	0		0	1	0		0	1	0
Configuration		L	T	TR		L	T	TR			LTR				LTR	
Volume (veh/h)	0	6	1306	6	0	9	864	8		2	0	7		37	0	9
Percent Heavy Vehicles (%)	3	3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

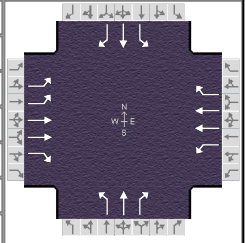
Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		7				10					10					50	
Capacity, c (veh/h)		714				468					126					70	
v/c Ratio		0.01				0.02					0.08					0.71	
95% Queue Length, Q ₉₅ (veh)		0.0				0.1					0.2					3.3	
Control Delay (s/veh)		10.1				12.9					35.9					135.7	
Level of Service (LOS)		B				B					E					F	
Approach Delay (s/veh)		0.0				0.1				35.9				135.7			
Approach LOS										E				F			

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	AECOM			Duration, h	0.25
Analyst	KKM	Analysis Date	May 15, 2020	Area Type	Other
Jurisdiction	Delaware County	Time Period	AM Peak Hour	PHF	0.92
Urban Street	Big Walnut Road	Analysis Year	2040	Analysis Period	1 > 7:00
Intersection	Big Walnut/Worthington	File Name	15-2040 Alt 3 AM BW-Worthington Road.xus		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 3				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	250	981	119	83	97	71	83	250	24	179	571	702

Signal Information				Signal Phases														
Cycle, s	120.0	Reference Phase	2															
Offset, s	0	Reference Point	End															
Uncoordinated	Yes	Simult. Gap E/W	On															
Force Mode	Fixed	Simult. Gap N/S	On															
		Green		7.0	3.0	32.0	7.0	46.0	0.0									
		Yellow		4.0	4.0	4.0	4.0	4.0	0.0									
		Red		1.0	1.0	1.0	1.0	1.0	0.0									

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	2.0	3.0	1.1	3.0	1.1	3.0	1.1	3.0
Phase Duration, s	20.0	45.0	12.0	37.0	12.0	51.0	12.0	51.0
Change Period, (Y+R _c), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (MAH), s	3.0	3.0	3.0	3.0	3.0	3.1	3.0	3.1
Queue Clearance Time (g _s), s	11.0	36.6	6.4	6.2	5.6	14.7	9.0	48.0
Green Extension Time (g _e), s	0.2	1.4	0.0	3.4	0.0	4.0	0.0	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.37	0.88	1.00	0.00	1.00	0.01	1.00	1.00

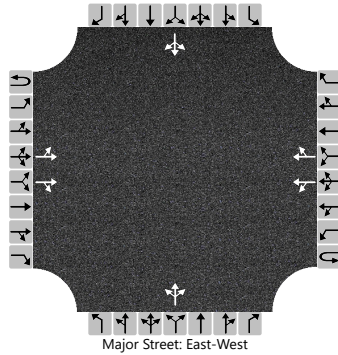
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	272	1066	129	90	105	77	90	272	26	195	621	763
Adjusted Saturation Flow Rate (s), veh/h/ln	1716	1766	1572	1767	1766	1572	1767	1856	1572	1767	1856	1572
Queue Service Time (g _s), s	9.0	34.6	6.5	4.4	2.7	4.2	3.6	12.7	1.1	7.0	37.2	46.0
Cycle Queue Clearance Time (g _c), s	9.0	34.6	6.5	4.4	2.7	4.2	3.6	12.7	1.1	7.0	37.2	46.0
Green Ratio (g/C)	0.12	0.33	0.39	0.32	0.27	0.33	0.44	0.38	0.44	0.44	0.38	0.51
Capacity (c), veh/h	429	1178	616	178	942	511	208	711	695	450	711	799
Volume-to-Capacity Ratio (X)	0.633	0.905	0.210	0.507	0.112	0.151	0.433	0.382	0.038	0.433	0.873	0.955
Back of Queue (Q), ft/ln (95 th percentile)	180.5	572.6	108.9	84.9	52.4	71.2	67.1	237.1	18.5	152.3	639.6	812.1
Back of Queue (Q), veh/ln (95 th percentile)	7.1	22.4	4.3	3.3	2.0	2.8	2.6	9.3	0.7	6.0	25.0	31.7
Queue Storage Ratio (RQ) (95 th percentile)	0.36	0.29	0.27	0.24	0.03	0.20	0.12	0.16	0.15	0.28	0.38	1.08
Uniform Delay (d ₁), s/veh	49.9	38.2	24.2	32.8	33.3	28.7	26.9	26.7	19.0	23.7	34.3	28.2
Incremental Delay (d ₂), s/veh	2.3	9.8	0.1	1.0	0.0	0.1	0.5	0.1	0.0	0.2	11.1	21.3
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	52.2	48.0	24.3	33.8	33.3	28.8	27.5	26.9	19.0	23.9	45.4	49.4
Level of Service (LOS)	D	D	C	C	C	C	C	C	B	C	D	D
Approach Delay, s/veh / LOS	46.7		D	32.2		C	26.5		C	44.7		D
Intersection Delay, s/veh / LOS	42.7						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.12	B	2.30	B	2.44	B	2.58	C
Bicycle LOS Score / LOS	1.70	B	0.71	A	1.13	A	3.09	C

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	KKM	Intersection	Big Walnut & Ketterington
Agency/Co.	AECOM	Jurisdiction	Delaware County
Date Performed	5/15/2020	East/West Street	Big Walnut Road
Analysis Year	2040	North/South Street	Ketterington/Satinwood
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 3		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12	
Priority																	
Number of Lanes	0	0	2	0	0	0	2	0		0	1	0		0	1	0	
Configuration		LT		TR		LT		TR			LTR				LTR		
Volume (veh/h)		10	1164	10		10	234	10		6	2	22		12	1	11	
Percent Heavy Vehicles (%)		3				3				3	3	3		3	3	3	
Proportion Time Blocked																	
Percent Grade (%)										0				0			
Right Turn Channelized																	
Median Type Storage	Undivided																

Critical and Follow-up Headways

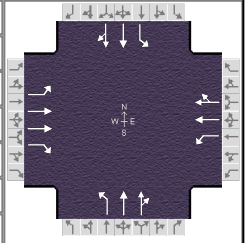
Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		11				11					33					26	
Capacity, c (veh/h)		1288				535					212					285	
v/c Ratio		0.01				0.02					0.15					0.09	
95% Queue Length, Q ₉₅ (veh)		0.0				0.1					0.5					0.3	
Control Delay (s/veh)		7.8				11.9					25.1					18.9	
Level of Service (LOS)		A				B					D					C	
Approach Delay (s/veh)		0.2				0.6				25.1				18.9			
Approach LOS		D				D				D				C			

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	AECOM			Duration, h	0.25
Analyst	KKM	Analysis Date	May 15, 2020	Area Type	Other
Jurisdiction	Delaware County	Time Period	AM Peak Hour	PHF	0.92
Urban Street	Big Walnut Road	Analysis Year	2040	Analysis Period	1 > 7:00
Intersection	Big Walnut/SR3	File Name	15-2040 Alt 3 AM BW-SR3.xus		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 3				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	171	709	318	220	131	134	59	384	12	170	1154	64

Signal Information																						
Cycle, s	120.0	Reference Phase	2																			
Offset, s	0	Reference Point	End																			
Uncoordinated	Yes	Simult. Gap E/W	On	Green	7.0	2.5	30.7	7.0	47.8	0.0	1			2			3			4		
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.0	4.0	4.0	4.0	0.0	5			6			7			8		
				Red	1.0	1.0	1.0	1.0	1.0	0.0												

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	3.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	12.0	35.7	19.5	43.2	12.0	52.8	12.0	52.8
Change Period, ($Y+R_c$), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (MAH), s	3.0	3.0	3.0	3.0	2.9	2.9	2.9	2.9
Queue Clearance Time (g_s), s	9.0	26.2	13.1	10.1	4.4	11.3	9.0	41.2
Green Extension Time (g_e), s	0.0	1.7	0.1	3.2	0.0	3.3	0.0	2.2
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	1.00	0.68	1.00	0.00	1.00	0.00	1.00	0.47

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	186	771	346	239	142	146	64	216	214	185	667	657
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1809	1610	1810	1900	1610	1810	1900	1879	1810	1900	1864
Queue Service Time (g_s), s	7.0	24.2	22.5	11.1	6.6	8.1	2.4	9.3	9.3	7.0	39.1	39.2
Cycle Queue Clearance Time (g_c), s	7.0	24.2	22.5	11.1	6.6	8.1	2.4	9.3	9.3	7.0	39.1	39.2
Green Ratio (g/C)	0.31	0.26	0.31	0.39	0.32	0.32	0.46	0.40	0.40	0.46	0.40	0.40
Capacity (c), veh/h	425	926	506	317	605	513	189	757	749	461	757	743
Volume-to-Capacity Ratio (X)	0.438	0.833	0.683	0.754	0.235	0.284	0.340	0.285	0.286	0.400	0.882	0.884
Back of Queue (Q), ft/ln (95 th percentile)	189.8	417.2	345.7	228.7	133.2	138.5	46.8	176.8	175.7	131.5	651.4	645.6
Back of Queue (Q), veh/ln (95 th percentile)	7.6	16.7	13.8	9.1	5.3	5.5	1.9	7.1	7.0	5.3	26.1	25.8
Queue Storage Ratio (RQ) (95 th percentile)	0.42	0.21	0.73	0.65	0.05	0.06	0.09	0.06	0.05	0.27	0.11	0.11
Uniform Delay (d_1), s/veh	32.2	42.2	35.9	29.4	30.1	30.7	26.7	24.5	24.5	20.8	33.5	33.5
Incremental Delay (d_2), s/veh	0.3	6.2	3.1	8.8	0.1	0.1	0.4	0.1	0.1	0.2	11.4	11.8
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	32.5	48.4	39.1	38.2	30.2	30.8	27.1	24.6	24.6	21.0	44.9	45.4
Level of Service (LOS)	C	D	D	D	C	C	C	C	C	C	D	D
Approach Delay, s/veh / LOS	43.7		D	34.0		C	24.9		C	42.2		D
Intersection Delay, s/veh / LOS	39.3						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.30	B	2.29	B	2.28	B	2.43	B
Bicycle LOS Score / LOS	1.56	B	0.92	A	0.90	A	1.73	B

HCS7 Signalized Intersection Results Summary

General Information					Intersection Information										
Agency	AECOM				Duration, h	0.25									
Analyst	KKM		Analysis Date	May 12, 2020		Area Type	Other								
Jurisdiction	Delaware County		Time Period	AM Peak Hour		PHF	0.92								
Urban Street	Africa Road		Analysis Year	2040		Analysis Period	1 > 7:00								
Intersection	Africa Road and I-71 SB...		File Name	15-2040 Alt 3 AM Africa Road-I-71 SB Ramp.xus											
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 3														
Demand Information				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h							260		60		350	240	310	600	
Signal Information															
Cycle, s	120.0	Reference Phase	2												
Offset, s	0	Reference Point	End	Green	20.0	42.0	43.0	0.0	0.0	0.0					
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	4.0	4.0	4.0	0.0	0.0	0.0					
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.0	1.0	1.0	0.0	0.0	0.0					
Timer Results				EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Assigned Phase							8		2	1	6				
Case Number							9.0		7.3	2.0	4.0				
Phase Duration, s							48.0		47.0	25.0	72.0				
Change Period, (Y+R _c), s							5.0		5.0	5.0	5.0				
Max Allow Headway (MAH), s							3.1		3.0	3.0	3.0				
Queue Clearance Time (g _s), s							16.7		11.4	12.9	14.0				
Green Extension Time (g _e), s							0.6		3.0	0.5	3.0				
Phase Call Probability							1.00		1.00	1.00	1.00				
Max Out Probability							0.00		0.00	0.02	0.00				
Movement Group Results				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement							3		18	2	12	1	6		
Adjusted Flow Rate (v), veh/h							283		65	380	261	337	652		
Adjusted Saturation Flow Rate (s), veh/h/ln							1767		1572	1766	1610	1716	1766		
Queue Service Time (g _s), s							14.7		2.5	9.4	6.8	10.9	12.0		
Cycle Queue Clearance Time (g _c), s							14.7		2.5	9.4	6.8	10.9	12.0		
Green Ratio (g/C)							0.36		0.53	0.35	0.71	0.17	0.56		
Capacity (c), veh/h							633		826	1237	1141	572	1973		
Volume-to-Capacity Ratio (X)							0.446		0.079	0.308	0.229	0.589	0.331		
Back of Queue (Q), ft/ln (95 th percentile)							257.5		38.6	177.9	86.6	208.1	203.1		
Back of Queue (Q), veh/ln (95 th percentile)							10.1		1.5	6.9	3.5	8.1	7.9		
Queue Storage Ratio (RQ) (95 th percentile)							0.61		0.03	0.21	0.17	0.42	0.25		
Uniform Delay (d ₁), s/veh							29.4		14.1	28.4	6.1	46.2	14.4		
Incremental Delay (d ₂), s/veh							0.2		0.0	0.1	0.0	1.1	0.0		
Initial Queue Delay (d ₃), s/veh							0.0		0.0	0.0	0.0	0.0	0.0		
Control Delay (d), s/veh							29.6		14.1	28.5	6.1	47.3	14.4		
Level of Service (LOS)							C		B	C	A	D	B		
Approach Delay, s/veh / LOS				0.0			26.7	C	19.4	B	25.6	C			
Intersection Delay, s/veh / LOS				23.8					C						
Multimodal Results				EB			WB			NB			SB		
Pedestrian LOS Score / LOS				2.32	B		2.48	B		2.12	B		0.70	A	
Bicycle LOS Score / LOS							F			1.02	A		1.30	A	

HCS7 Roundabouts Report

General Information

Site Information

Analyst	KKM		Intersection	I-71 NB Ramp & Big Walnut
Agency or Co.	AECOM		E/W Street Name	Big Walnut Road
Date Performed	5/21/2020		N/S Street Name	I-71 NB Ramps
Analysis Year	2040		Analysis Time Period (hrs)	0.25
Time Analyzed	AM Peak Hour		Peak Hour Factor	0.92
Project Description	DEL-71-3.55 Big Walnut Inte...		Jurisdiction	Delaware County

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	2	0	0	0	2	0	0	1	1	0	0	0	0	0
Lane Assignment	LT		T		T	TR			L	LTR						
Volume (V), veh/h	0	160	860		0		790	180	0	260	0	450				
Percent Heavy Vehicles, %	3	3	3		3		3	3	3	3	3	3				
Flow Rate (v _{pce}), pc/h	0	179	963		0		884	202	0	291	0	504				
Right-Turn Bypass	None				None				Non-Yielding				None			
Conflicting Lanes	2				2				2							
Pedestrians Crossing, p/h	0				0				0							

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)	4.6453	4.3276		4.6453	4.3276		4.6453	4.3276				
Follow-Up Headway (s)	2.6667	2.5352		2.6667	2.5352		2.6667	2.5352				

Flow Computations, Capacity and v/c Ratios

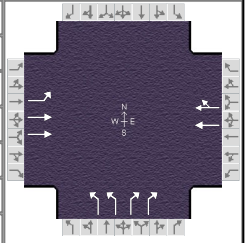
Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v _e), pc/h	537	605		510	576		291	0	504			
Entry Volume, veh/h	521	588		496	559		283	0	489			
Circulating Flow (v _c), pc/h	0			470			1142			1175		
Exiting Flow (v _{ex}), pc/h	963			1175			381			0		
Capacity (C _{pce}), pc/h	1350	1420		876	952		472	538				
Capacity (c), veh/h	1311	1379		851	925		458	522				
v/c Ratio (x)	0.40	0.43		0.58	0.60		0.62	0.00				

Delay and Level of Service

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh	6.5	6.7		12.9	12.7		22.7	6.9				
Lane LOS	A	A		B	B		C	A	A			
95% Queue, veh	1.9	2.2		3.9	4.2		4.1	0.0				
Approach Delay, s/veh	6.6			12.8			8.3					
Approach LOS	A			B			A					
Intersection Delay, s/veh LOS	9.3						A					

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	AECOM			Duration, h	0.25
Analyst	KKM	Analysis Date	May 12, 2020	Area Type	Other
Jurisdiction	Delaware County	Time Period	AM Peak Hour	PHF	0.92
Urban Street	Big Walnut Road	Analysis Year	2040	Analysis Period	1 > 7:00
Intersection	Big Walnut & I-71 NB R...	File Name	15-2040 Alt 3B AM BW-I-71 NB Ramp.xus		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative3B				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	160	860			790	180	260		450			

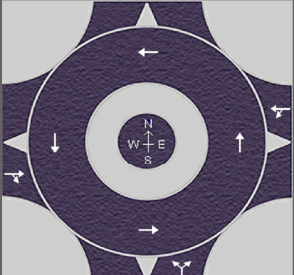
Signal Information																		
Cycle, s	120.0	Reference Phase	2															
Offset, s	0	Reference Point	End															
Uncoordinated	Yes	Simult. Gap E/W	On	Green	10.0	51.0	44.0	0.0	0.0	0.0	1		2		3		4	
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.0	4.0	0.0	0.0	0.0	5		6		7		8	
				Red	1.0	1.0	1.0	0.0	0.0	0.0								

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6		8		
Case Number	1.0	4.0		8.3		9.0		
Phase Duration, s	15.0	71.0		56.0		49.0		
Change Period, ($Y+R_c$), s	5.0	5.0		5.0		5.0		
Max Allow Headway (MAH), s	3.0	3.0		3.0		3.2		
Queue Clearance Time (g_s), s	8.2	21.4		30.7		18.2		
Green Extension Time (g_e), s	0.1	4.9		4.6		2.0		
Phase Call Probability	1.00	1.00		1.00		1.00		
Max Out Probability	1.00	0.00		0.06		0.00		

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16	3		18			
Adjusted Flow Rate (v), veh/h	174	935			545	510	283		489			
Adjusted Saturation Flow Rate (s), veh/h/ln	1767	1766			1856	1736	1716		1392			
Queue Service Time (g_s), s	6.2	19.4			28.3	28.7	6.8		16.2			
Cycle Queue Clearance Time (g_c), s	6.2	19.4			28.3	28.7	6.8		16.2			
Green Ratio (g/C)	0.52	0.55			0.42	0.42	0.37		0.37			
Capacity (c), veh/h	306	1943			789	738	1258		1021			
Volume-to-Capacity Ratio (X)	0.568	0.481			0.691	0.691	0.225		0.479			
Back of Queue (Q), ft/ln (95 th percentile)	114.8	300			468.5	433.2	124.7		229.4			
Back of Queue (Q), veh/ln (95 th percentile)	4.5	11.7			18.3	17.3	4.9		9.0			
Queue Storage Ratio (RQ) (95 th percentile)	0.23	0.14			0.78	0.74	0.25		0.37			
Uniform Delay (d_1), s/veh	20.9	16.5			28.1	28.1	26.2		29.2			
Incremental Delay (d_2), s/veh	1.6	0.1			2.2	2.3	0.0		0.1			
Initial Queue Delay (d_3), s/veh	0.0	0.0			0.0	0.0	0.0		0.0			
Control Delay (d), s/veh	22.4	16.6			30.2	30.4	26.3		29.3			
Level of Service (LOS)	C	B			C	C	C		C			
Approach Delay, s/veh / LOS	17.5	B		30.3	C		28.2	C	0.0			
Intersection Delay, s/veh / LOS	24.9						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.09	B	1.40	A	2.16	B	2.32	B
Bicycle LOS Score / LOS	1.40	A	1.36	A		F		

HCS7 Roundabouts Report

General Information				Site Information			
Analyst	KKM		Intersection	Bale Kenyon & Big Walnut			
Agency or Co.	AECOM		E/W Street Name	Big Walnut Road			
Date Performed	5/4/2020		N/S Street Name	Bale Kenyon Road			
Analysis Year	2040		Analysis Time Period (hrs)	0.25			
Time Analyzed	PM Peak Hour		Peak Hour Factor	0.92			
Project Description	DEL-71-3.55 Big Walnut Inte...		Jurisdiction	Delaware County			

Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0
Lane Assignment	TR				LT				LR							
Volume (V), veh/h	0		948	50	0	277	1493		0	149		362				
Percent Heavy Vehicles, %	2		2	2	2	2	2		2	2		2				
Flow Rate (v _{PCE}), pc/h	0		1051	55	0	307	1655		0	165		401				
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1							
Pedestrians Crossing, p/h	0				0				0							

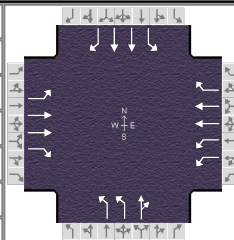
Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (s)		4.9763			4.9763			4.9763					
Follow-Up Headway (s)		2.6087			2.6087			2.6087					

Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (v _e), pc/h		1106			1962			566					
Entry Volume, veh/h		1084			1924			555					
Circulating Flow (v _c), pc/h	307			165			1051			2127			
Exiting Flow (v _{ex}), pc/h	1452			1820			0			362			
Capacity (C _{PCE}), pc/h		1009			1166			472					
Capacity (c), veh/h		989			1143			463					
v/c Ratio (x)		1.10			1.68			1.20					

Delay and Level of Service													
Approach	EB			WB			NB			SB			
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Lane Control Delay (d), s/veh		77.8			322.8			136.0					
Lane LOS		F			F			F					
95% Queue, veh		27.0			104.4			21.3					
Approach Delay, s/veh	77.8			322.8			136.0						
Approach LOS	F			F			F						
Intersection Delay, s/veh LOS	219.1						F						

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information			
Agency	AECOM			Duration, h	0.25		
Analyst	KKM	Analysis Date	May 12, 2020	Area Type	Other		
Jurisdiction	Delaware County	Time Period	PM Peak Hour	PHF	0.92		
Urban Street	Big Walnut Road	Analysis Year	2040	Analysis Period	1 > 7:00		
Intersection	Big Walnut & Africa	File Name	16-2040 Alt 3 PM BW-Africa Road.xus				
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 3						



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	140	830	340	550	1090	280	570	300	50	40	190	110

Signal Information													
Cycle, s	120.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	Yes	Simult. Gap E/W	On	Green	7.0	11.0	33.0	7.0	14.0	18.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.0	4.0	4.0	4.0	4.0			
				Red	1.0	1.0	1.0	1.0	1.0	1.0			

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	3.0	2.0	3.0	2.0	4.0	1.1	3.0
Phase Duration, s	12.0	38.0	28.0	54.0	31.0	42.0	12.0	23.0
Change Period, (Y+R _c), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (MAH), s	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Queue Clearance Time (g _s), s	9.0	31.8	22.5	37.8	22.7	24.1	4.4	9.8
Green Extension Time (g _e), s	0.0	0.9	0.1	5.9	0.6	1.2	0.0	1.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	1.00	1.00	1.00	0.48	0.85	0.01	1.00	0.07

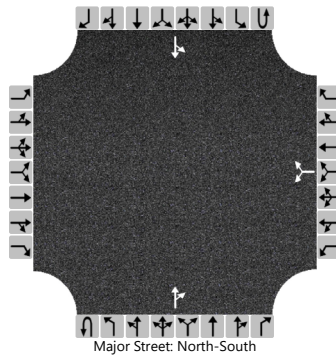
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	152	902	370	598	1185	304	620	380		43	207	120
Adjusted Saturation Flow Rate (s), veh/h/ln	1767	1766	1572	1716	1766	1610	1716	1809		1767	1766	1572
Queue Service Time (g _s), s	7.0	29.8	18.7	20.5	35.8	14.9	20.7	22.1		2.4	6.3	7.8
Cycle Queue Clearance Time (g _c), s	7.0	29.8	18.7	20.5	35.8	14.9	20.7	22.1		2.4	6.3	7.8
Green Ratio (g/C)	0.33	0.28	0.49	0.19	0.41	0.47	0.22	0.31		0.21	0.15	0.21
Capacity (c), veh/h	207	972	773	658	1443	751	744	558		270	530	328
Volume-to-Capacity Ratio (X)	0.736	0.929	0.478	0.909	0.821	0.405	0.833	0.682		0.161	0.390	0.365
Back of Queue (Q), ft/ln (95 th percentile)	172.9	528.8	273.6	387	550.3	229	366.3	382.6		47.2	125.6	137.1
Back of Queue (Q), veh/ln (95 th percentile)	6.8	20.7	10.7	15.1	21.5	9.2	14.3	14.9		1.8	4.9	5.4
Queue Storage Ratio (RQ) (95 th percentile)	0.31	0.28	0.48	0.70	0.25	0.37	0.81	0.48		0.19	0.03	0.42
Uniform Delay (d ₁), s/veh	33.7	42.4	20.3	47.5	31.6	21.0	44.9	36.3		38.7	46.0	40.7
Incremental Delay (d ₂), s/veh	11.4	14.4	0.2	16.3	3.7	0.1	7.6	2.8		0.1	0.2	0.3
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Control Delay (d), s/veh	45.1	56.8	20.4	63.7	35.3	21.2	52.5	39.2		38.8	46.2	41.0
Level of Service (LOS)	D	E	C	E	D	C	D	D		D	D	D
Approach Delay, s/veh / LOS	46.1		D	41.4		D	47.5		D	43.6		D
Intersection Delay, s/veh / LOS	44.2						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.30	B	2.28	B	2.59	C	2.46	B
Bicycle LOS Score / LOS	1.66	B	2.21	B	2.14	B	0.79	A

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Africa & Jaycox		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/15/2020			East/West Street	Jaycox Road		
Analysis Year	2040			North/South Street	Africa Road		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	North-South			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 3						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						40		30			640	80		50	300	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2							4.1	
Critical Headway (sec)						6.42		6.22							4.12	
Base Follow-Up Headway (sec)						3.5		3.3							2.2	
Follow-Up Headway (sec)						3.52		3.32							2.22	

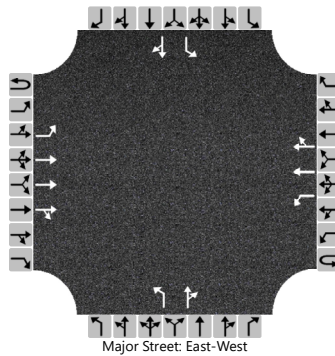
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						76									54	
Capacity, c (veh/h)						253									835	
v/c Ratio						0.30									0.07	
95% Queue Length, Q ₉₅ (veh)						1.2									0.2	
Control Delay (s/veh)						25.3									9.6	
Level of Service (LOS)						D									A	
Approach Delay (s/veh)		25.3										2.0				
Approach LOS		D														

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Medan		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/14/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Medan Dr/Whispering Ridge		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative3A						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	3	0	0	1	2	0		1	1	0		1	1	0
Configuration		L	T	TR		L	T	TR		L		TR		L		TR
Volume (veh/h)	0	20	1630	30	0	10	1150	20		20	10	10		10	10	10
Percent Heavy Vehicles (%)	3	3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		5.3				5.3					6.4	6.5	7.1			6.4	6.5	7.1
Critical Headway (sec)		5.36				5.36					6.46	6.56	7.16			6.46	6.56	7.16
Base Follow-Up Headway (sec)		3.1				3.1					3.8	4.0	3.9			3.8	4.0	3.9
Follow-Up Headway (sec)		3.13				3.13					3.83	4.03	3.93			3.83	4.03	3.93

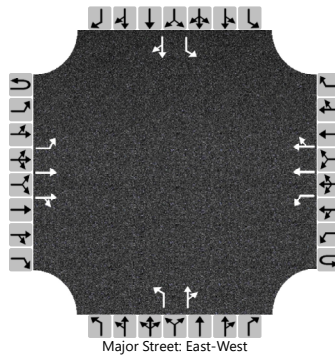
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		22				11					22		22			11		22
Capacity, c (veh/h)		286				155												
v/c Ratio		0.08				0.07												
95% Queue Length, Q ₉₅ (veh)		0.2				0.2												
Control Delay (s/veh)		18.6				29.9												
Level of Service (LOS)		C				D												
Approach Delay (s/veh)		0.2				0.3												
Approach LOS																		

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Medan		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/14/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Medan Dr/Whispering Ridge		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 3						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Priority																
Number of Lanes	0	1	2	0	0	1	2	0	1	1	0		1	1	0	
Configuration		L	T	TR		L	T	TR		L		TR		L		TR
Volume (veh/h)	0	20	1630	30	0	10	1150	20	20	10	10		10	10	10	
Percent Heavy Vehicles (%)	3	3			3	3			3	3	3		3	3	3	
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

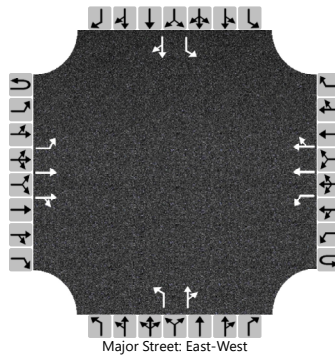
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		22				11				22		22		11		22
Capacity, c (veh/h)		537				333										
v/c Ratio		0.04				0.03										
95% Queue Length, Q ₉₅ (veh)		0.1				0.1										
Control Delay (s/veh)		12.0				16.2										
Level of Service (LOS)		B				C										
Approach Delay (s/veh)	0.1				0.1											
Approach LOS																

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Highland		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/14/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Highland Hills Drive		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 3						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	2	0	0	1	2	0		1	1	0		1	1	0
Configuration		L	T	TR		L	T	TR		L		TR		L		TR
Volume (veh/h)	0	10	1636	30	0	20	1114	10		30	10	10		10	10	10
Percent Heavy Vehicles (%)	3	3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

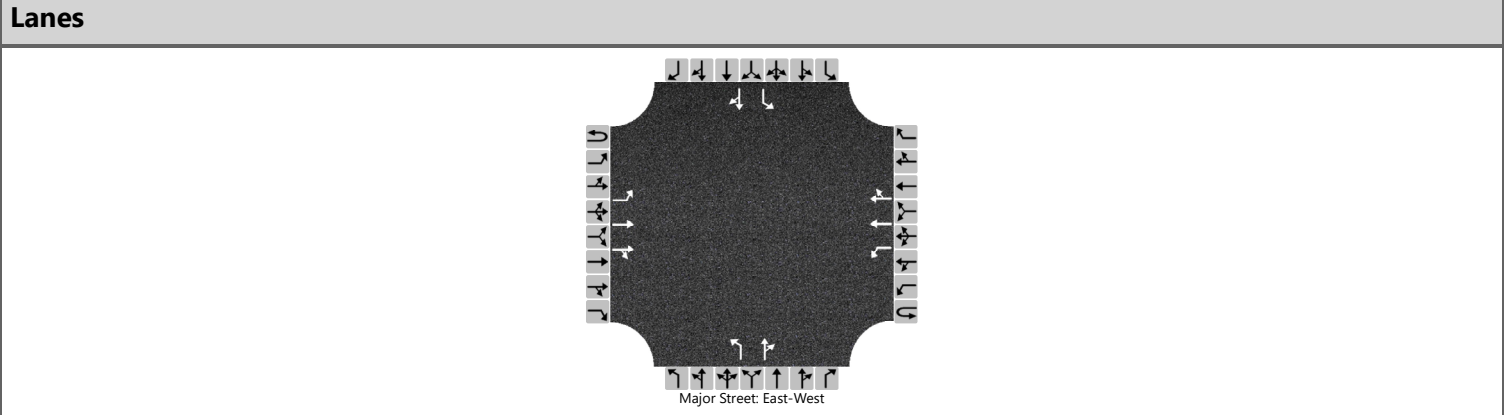
Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		11				22				33		22		11		22
Capacity, c (veh/h)		561				331										
v/c Ratio		0.02				0.07										
95% Queue Length, Q ₉₅ (veh)		0.1				0.2										
Control Delay (s/veh)		11.5				16.6										
Level of Service (LOS)		B				C										
Approach Delay (s/veh)		0.1				0.3										
Approach LOS																

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Willow Bend		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/14/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Willow Bend/Grand Oak		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL071-3.55 Big Walnut Interchange - Alternative 3						



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	2	0	0	1	2	0		1	1	0		1	1	0
Configuration		L	T	TR		L	T	TR		L		TR		L		TR
Volume (veh/h)	0	40	1581	30	0	30	1050	30		20	10	20		30	10	30
Percent Heavy Vehicles (%)	3	3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

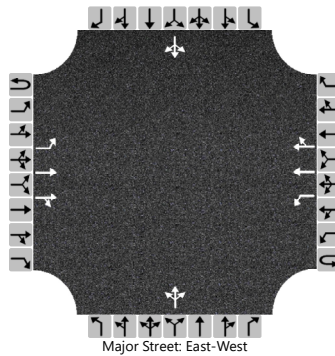
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		43				33				22		33		33		43
Capacity, c (veh/h)		585				350						26				35
v/c Ratio		0.07				0.09						1.24				1.24
95% Queue Length, Q ₉₅ (veh)		0.2				0.3						3.9				4.6
Control Delay (s/veh)		11.6				16.4						476.9				405.1
Level of Service (LOS)		B				C						F				F
Approach Delay (s/veh)		0.3				0.4										
Approach LOS																

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Jeffries		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/15/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Jeffries Court/Grandmere		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 3						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	2	0	0	1	2	0		0	1	0		0	1	0
Configuration		L	T	TR		L	T	TR			LTR				LTR	
Volume (veh/h)	0	10	1621	10	0	10	1103	40		10	0	0		20	0	20
Percent Heavy Vehicles (%)	3	3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

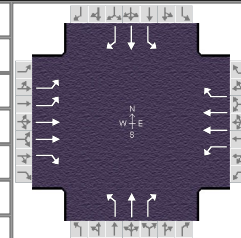
Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		11				11					11					43		
Capacity, c (veh/h)		551				343					15					48		
v/c Ratio		0.02				0.03					0.72					0.90		
95% Queue Length, Q ₉₅ (veh)		0.1				0.1					1.8					3.8		
Control Delay (s/veh)		11.7				15.8					464.5					233.3		
Level of Service (LOS)		B				C					F					F		
Approach Delay (s/veh)		0.1				0.1					464.5				233.3			
Approach LOS											F				F			

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	AECOM			Duration, h	0.25
Analyst	KKM	Analysis Date	May 15, 2020	Area Type	Other
Jurisdiction	Delaware County	Time Period	PM Peak Hour	PHF	0.92
Urban Street	Big Walnut Road	Analysis Year	2040	Analysis Period	1 > 7:00
Intersection	Big Walnut/Worthington	File Name	16-2040 Alt 3 PM BW-Worthington Road.xus		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 3				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	762	689	214	24	546	214	143	631	36	83	274	428

Signal Information													
Cycle, s	120.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	Yes	Simult. Gap E/W	On										
Force Mode	Fixed	Simult. Gap N/S	On										
		Green		7.0	16.0	21.0	7.0	44.0	0.0				
		Yellow		4.0	4.0	4.0	4.0	4.0	0.0				
		Red		1.0	1.0	1.0	1.0	1.0	0.0				

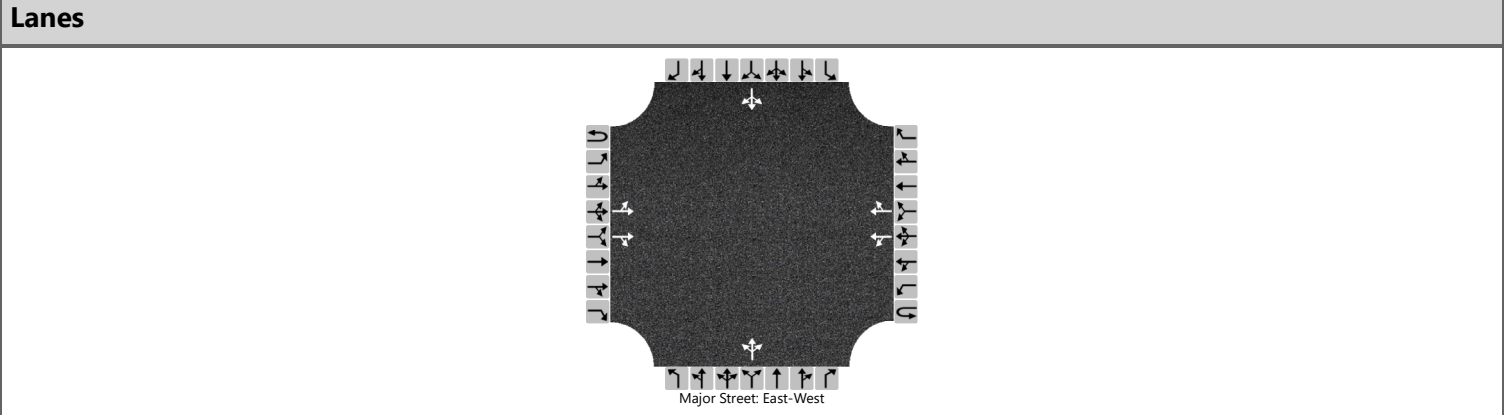
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	2.0	3.0	1.1	3.0	1.1	3.0	1.1	3.0
Phase Duration, s	33.0	47.0	12.0	26.0	12.0	49.0	12.0	49.0
Change Period, ($Y+R_c$), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (MAH), s	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Queue Clearance Time (g_s), s	30.0	23.0	3.4	22.0	8.7	46.0	5.7	22.2
Green Extension Time (g_e), s	0.0	4.3	0.0	0.0	0.0	0.0	0.0	3.1
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	1.00	0.04	0.29	1.00	1.00	1.00	1.00	0.02

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	828	749	233	26	593	233	155	686	39	90	298	465
Adjusted Saturation Flow Rate (s), veh/h/ln	1716	1766	1572	1767	1766	1572	1767	1856	1572	1767	1856	1572
Queue Service Time (g_s), s	28.0	21.0	12.3	1.4	20.0	16.0	6.7	44.0	1.8	3.7	14.5	20.2
Cycle Queue Clearance Time (g_c), s	28.0	21.0	12.3	1.4	20.0	16.0	6.7	44.0	1.8	3.7	14.5	20.2
Green Ratio (g/C)	0.23	0.35	0.41	0.23	0.18	0.23	0.42	0.37	0.43	0.42	0.37	0.60
Capacity (c), veh/h	801	1237	642	275	618	367	409	680	668	163	680	943
Volume-to-Capacity Ratio (X)	1.034	0.606	0.362	0.095	0.960	0.634	0.380	1.008	0.059	0.553	0.438	0.493
Back of Queue (Q), ft/ln (95 th percentile)	590.4	346.4	202	27	414.3	266	123.3	877.2	29	73.2	265	273
Back of Queue (Q), veh/ln (95 th percentile)	23.1	13.5	7.9	1.1	16.2	10.4	4.8	34.3	1.1	2.9	10.4	10.7
Queue Storage Ratio (RQ) (95 th percentile)	1.18	0.17	0.50	0.08	0.28	0.76	0.22	0.58	0.23	0.13	0.16	0.36
Uniform Delay (d_1), s/veh	46.0	32.2	24.7	35.8	49.1	41.4	23.1	38.0	20.3	29.0	28.7	13.6
Incremental Delay (d_2), s/veh	41.0	0.6	0.1	0.1	26.3	2.7	0.2	36.5	0.0	2.4	0.2	0.1
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	87.0	32.8	24.8	35.9	75.4	44.1	23.3	74.5	20.4	31.4	28.8	13.8
Level of Service (LOS)	F	C	C	D	E	D	C	F	C	C	C	B
Approach Delay, s/veh / LOS	56.6		E	65.6		E	63.1		E	20.9		C
Intersection Delay, s/veh / LOS	52.7						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.12	B	2.31	B	2.44	B	2.58	C
Bicycle LOS Score / LOS	1.98	B	1.19	A	1.94	B	1.90	B

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	KKM			Intersection	Big Walnut & Ketterington		
Agency/Co.	AECOM			Jurisdiction	Delaware County		
Date Performed	5/15/2020			East/West Street	Big Walnut Road		
Analysis Year	2040			North/South Street	Ketterington/Satinwood		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 3						



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12	
Priority																	
Number of Lanes	0	0	2	0	0	0	2	0		0	1	0		0	1	0	
Configuration		LT		TR		LT		TR			LTR				LTR		
Volume (veh/h)		10	788	10		10	771	10		4	0	24		8	2	9	
Percent Heavy Vehicles (%)		3				3				3	3	3		3	3	3	
Proportion Time Blocked																	
Percent Grade (%)										0				0			
Right Turn Channelized																	
Median Type Storage	Undivided																

Critical and Follow-up Headways

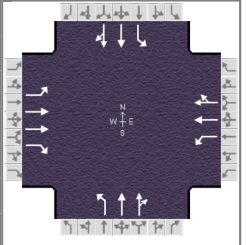
Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		11				11					30					21	
Capacity, c (veh/h)		778				766					347					162	
v/c Ratio		0.01				0.01					0.09					0.13	
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.3					0.4	
Control Delay (s/veh)		9.7				9.8					16.4					30.4	
Level of Service (LOS)		A				A					C					D	
Approach Delay (s/veh)		0.2				0.2				16.4				30.4			
Approach LOS		A				A				C				D			

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	AECOM			Duration, h	0.25
Analyst	KKM	Analysis Date	May 15, 2020	Area Type	Other
Jurisdiction	Delaware County	Time Period	PM Peak Hour	PHF	0.92
Urban Street	Big Walnut Road	Analysis Year	2040	Analysis Period	1 > 7:00
Intersection	Big Walnut/SR3	File Name	16-2040 Alt 3 PM BW-SR3.xus		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 3				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	226	394	200	88	400	204	324	1280	26	152	526	67

Signal Information													
Cycle, s	120.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	Yes	Simult. Gap E/W	On	Green	7.0	30.0	8.0	50.0	0.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.0	4.0	4.0	0.0	0.0			
				Red	1.0	1.0	1.0	1.0	0.0	0.0			

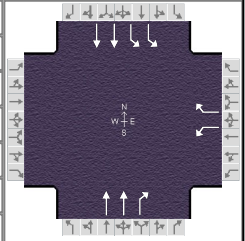
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	3.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	17.0	40.0	12.0	35.0	13.0	55.0	13.0	55.0
Change Period, ($Y+R_c$), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (MAH), s	3.0	3.0	3.0	3.0	2.9	2.9	2.9	2.9
Queue Clearance Time (g_s), s	13.9	14.0	6.6	22.3	10.0	44.0	8.2	16.7
Green Extension Time (g_e), s	0.0	2.7	0.0	2.0	0.0	2.5	0.0	4.1
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	1.00	0.01	1.00	0.27	1.00	0.61	1.00	0.01

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	246	428	217	96	346	310	352	712	708	165	328	316
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1809	1610	1810	1900	1684	1810	1900	1886	1810	1900	1824
Queue Service Time (g_s), s	11.9	11.4	12.0	4.6	20.0	20.3	8.0	41.9	42.0	6.2	14.6	14.7
Cycle Queue Clearance Time (g_c), s	11.9	11.4	12.0	4.6	20.0	20.3	8.0	41.9	42.0	6.2	14.6	14.7
Green Ratio (g/C)	0.37	0.29	0.36	0.31	0.25	0.25	0.48	0.42	0.42	0.48	0.42	0.42
Capacity (c), veh/h	304	1055	577	341	475	421	402	792	786	200	792	760
Volume-to-Capacity Ratio (X)	0.807	0.406	0.377	0.281	0.729	0.738	0.876	0.899	0.900	0.827	0.414	0.416
Back of Queue (Q), ft/ln (95 th percentile)	254.8	212.5	199.6	89.2	370.3	343.2	300	694.7	693.3	164.4	255.5	248
Back of Queue (Q), veh/ln (95 th percentile)	10.2	8.5	8.0	3.6	14.8	13.7	12.0	27.8	27.7	6.6	10.2	9.9
Queue Storage Ratio (RQ) (95 th percentile)	0.57	0.11	0.42	0.25	0.15	0.14	0.55	0.22	0.22	0.34	0.04	0.04
Uniform Delay (d_1), s/veh	30.9	34.1	28.6	30.6	41.3	41.4	31.0	32.6	32.7	27.7	24.7	24.7
Incremental Delay (d_2), s/veh	13.8	0.1	0.2	0.2	4.9	5.9	18.3	12.9	13.1	22.8	0.1	0.1
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	44.6	34.2	28.7	30.8	46.2	47.3	49.4	45.5	45.8	50.5	24.8	24.8
Level of Service (LOS)	D	C	C	C	D	D	D	D	D	D	C	C
Approach Delay, s/veh / LOS	35.8		D	44.7		D	46.4		D	30.1		C
Intersection Delay, s/veh / LOS	40.7						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.29	B	2.30	B	2.28	B	2.43	B
Bicycle LOS Score / LOS	1.22	A	1.11	A	1.95	B	1.16	A

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information			
Agency	AECOM			Duration, h	0.25		
Analyst	KKM	Analysis Date	May 12, 2020	Area Type	Other		
Jurisdiction	Delaware County	Time Period	PM Peak Hour	PHF	0.92		
Urban Street	Africa Road	Analysis Year	2040	Analysis Period	1 > 7:00		
Intersection	Africa Road and I-71 SB...	File Name	16-2040 Alt 3 PM Africa Road-I-71 SB Ramp.xus				
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative 3						



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h				190		80		840	110	750	330	

Signal Information															
Cycle, s	120.0	Reference Phase	2												
Offset, s	0	Reference Point	End												
Uncoordinated	Yes	Simult. Gap E/W	On	Green	41.0	40.0	24.0	0.0	0.0	0.0					
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.0	4.0	0.0	0.0	0.0					
				Red	1.0	1.0	1.0	0.0	0.0	0.0					

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase				8		2	1	6
Case Number				9.0		7.3	2.0	4.0
Phase Duration, s				29.0		45.0	46.0	91.0
Change Period, (Y+R _c), s				5.0		5.0	5.0	5.0
Max Allow Headway (MAH), s				3.1		3.0	3.0	3.0
Queue Clearance Time (g _s), s				14.7		29.9	26.6	5.8
Green Extension Time (g _e), s				0.4		2.7	1.8	3.4
Phase Call Probability				1.00		1.00	1.00	1.00
Max Out Probability				0.01		0.12	0.00	0.00

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement				3		18		2	12	1		6
Adjusted Flow Rate (v), veh/h				207		87		913	120	815		359
Adjusted Saturation Flow Rate (s), veh/h/ln				1767		1572		1766	1610	1716		1766
Queue Service Time (g _s), s				12.7		3.2		27.9	4.5	24.6		3.8
Cycle Queue Clearance Time (g _c), s				12.7		3.2		27.9	4.5	24.6		3.8
Green Ratio (g/C)				0.20		0.54		0.33	0.53	0.34		0.72
Capacity (c), veh/h				353		852		1178	859	1173		2532
Volume-to-Capacity Ratio (X)				0.584		0.102		0.775	0.139	0.695		0.142
Back of Queue (Q), ft/ln (95 th percentile)				241.4		49.9		451.6	69.9	390.8		54.3
Back of Queue (Q), veh/ln (95 th percentile)				9.4		1.9		17.6	2.8	15.3		2.1
Queue Storage Ratio (RQ) (95 th percentile)				0.57		0.04		0.53	0.14	0.78		0.07
Uniform Delay (d ₁), s/veh				43.5		13.3		36.0	14.1	34.1		5.4
Incremental Delay (d ₂), s/veh				1.7		0.0		3.0	0.0	1.5		0.0
Initial Queue Delay (d ₃), s/veh				0.0		0.0		0.0	0.0	0.0		0.0
Control Delay (d), s/veh				45.2		13.4		39.0	14.1	35.6		5.4
Level of Service (LOS)				D		B		D	B	D		A
Approach Delay, s/veh / LOS	0.0			35.7		D	36.1		D	26.4		C
Intersection Delay, s/veh / LOS				31.5						C		

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.32	B	2.48	B	2.12	B	0.66	A
Bicycle LOS Score / LOS				F	1.34	A	1.46	A

HCS7 Roundabouts Report

General Information				Site Information				
Analyst	KKM				Intersection	I-71 NB Ramp & Big Walnut		
Agency or Co.	AECOM				E/W Street Name	Big Walnut Road		
Date Performed	5/21/2020				N/S Street Name	I-71 NB Ramps		
Analysis Year	2040				Analysis Time Period (hrs)	0.25		
Time Analyzed	PM Peak Hour				Peak Hour Factor	0.92		
Project Description	DEL-71-3.55 Big Walnut Inte...				Jurisdiction	Delaware County		

Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	2	0	0	0	2	0	0	1	1	0	0	0	0	0
Lane Assignment	LT		T		T		TR		L		LTR					
Volume (V), veh/h	0	210	710		0		1040	140	0	880	0	970				
Percent Heavy Vehicles, %	3	3	3		3		3	3	3	3	3	3				
Flow Rate (v _{PCE}), pc/h	0	235	795		0		1164	157	0	985	0	1086				
Right-Turn Bypass	None				None				Non-Yielding				None			
Conflicting Lanes	2				2				2							
Pedestrians Crossing, p/h	0				0				0							

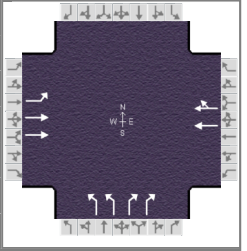
Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (s)	4.6453	4.3276		4.6453	4.3276		4.6453	4.3276					
Follow-Up Headway (s)	2.6667	2.5352		2.6667	2.5352		2.6667	2.5352					

Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (v _e), pc/h	484	546		621	700		985	0	1086				
Entry Volume, veh/h	470	530		603	680		956	0	1054				
Circulating Flow (v _c), pc/h	0			1220			1030			2149			
Exiting Flow (v _{ex}), pc/h	795			2149			392			0			
Capacity (C _{PCE}), pc/h	1350	1420		439	503		523	592					
Capacity (c), veh/h	1311	1379		427	489		508	574					
v/c Ratio (x)	0.36	0.38		1.41	1.39		1.88	0.00					

Delay and Level of Service													
Approach	EB			WB			NB			SB			
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Lane Control Delay (d), s/veh	6.1	6.2		224.7	211.4		423.6	6.3					
Lane LOS	A	A		F	F		F	A	A				
95% Queue, veh	1.7	1.8		29.6	31.9		61.8	0.0					
Approach Delay, s/veh	6.1			217.6			201.5						
Approach LOS	A			F			F						
Intersection Delay, s/veh LOS	160.8						F						

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	AECOM			Duration, h	0.25
Analyst	KKM	Analysis Date	May 12, 2020	Area Type	Other
Jurisdiction	Delaware County	Time Period	PM Peak Hour	PHF	0.92
Urban Street	Big Walnut Road	Analysis Year	2040	Analysis Period	1 > 7:00
Intersection	Big Walnut & I-71 NB R...	File Name	16-2040 Alt 3B PM BW-I-71 NB Ramp.xus		
Project Description	DEL-71-3.55 Big Walnut Interchange - Alternative3B				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	210	710			1040	140	880		970			

Signal Information													
Cycle, s	120.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	Yes	Simult. Gap E/W	On	Green	12.0	47.0	46.0	0.0	0.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.0	4.0	0.0	0.0	0.0			
				Red	1.0	1.0	1.0	0.0	0.0	0.0			

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6		8		
Case Number	1.0	4.0		8.3		9.0		
Phase Duration, s	17.0	69.0		52.0		51.0		
Change Period, (Y+R _c), s	5.0	5.0		5.0		5.0		
Max Allow Headway (MAH), s	3.0	2.9		2.9		3.1		
Queue Clearance Time (g _s), s	11.4	17.7		42.0		47.1		
Green Extension Time (g _e), s	0.0	5.0		2.5		0.0		
Phase Call Probability	1.00	1.00		1.00		1.00		
Max Out Probability	1.00	0.00		0.73		1.00		

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16	3		18			
Adjusted Flow Rate (v), veh/h	228	772			654	629	957		1054			
Adjusted Saturation Flow Rate (s), veh/h/ln	1767	1766			1856	1778	1716		1392			
Queue Service Time (g _s), s	9.4	15.7			39.6	40.0	28.6		45.1			
Cycle Queue Clearance Time (g _c), s	9.4	15.7			39.6	40.0	28.6		45.1			
Green Ratio (g/C)	0.51	0.53			0.39	0.39	0.38		0.38			
Capacity (c), veh/h	262	1884			727	696	1316		1067			
Volume-to-Capacity Ratio (X)	0.872	0.410			0.899	0.903	0.727		0.988			
Back of Queue (Q), ft/ln (95 th percentile)	227.6	254.1			688.8	657	439.3		640.4			
Back of Queue (Q), veh/ln (95 th percentile)	8.9	9.9			26.9	26.3	17.2		25.0			
Queue Storage Ratio (RQ) (95 th percentile)	0.46	0.12			1.15	1.12	0.88		1.02			
Uniform Delay (d ₁), s/veh	28.7	16.7			34.3	34.4	31.6		36.7			
Incremental Delay (d ₂), s/veh	25.0	0.1			13.8	14.8	1.8		24.6			
Initial Queue Delay (d ₃), s/veh	0.0	0.0			0.0	0.0	0.0		0.0			
Control Delay (d), s/veh	53.6	16.8			48.1	49.1	33.4		61.3			
Level of Service (LOS)	D	B			D	D	C		E			
Approach Delay, s/veh / LOS	25.2		C		48.6		D		48.0		D	0.0
Intersection Delay, s/veh / LOS	42.9						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.09	B	1.41	A	2.16	B	2.32	B
Bicycle LOS Score / LOS	1.31	A	1.55	B		F		

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Appendix F
SimTraffic Queuing Reports

Intersection: 1: Africa Road & Big Walnut Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	L	T	R
Maximum Queue (ft)	70	142	154	281	600	1148	1157	700	425	445	473	425
Average Queue (ft)	20	72	81	160	415	837	817	394	352	357	322	120
95th Queue (ft)	50	125	139	259	830	1489	1514	951	527	574	640	331
Link Distance (ft)		936	936			1113	1113					445
Upstream Blk Time (%)						25	21			32	54	
Queuing Penalty (veh)						135	116			0	0	
Storage Bay Dist (ft)	550			675	550			650	400	400		375
Storage Blk Time (%)					0	69	61	0	59	63	1	0
Queuing Penalty (veh)					0	110	55	0	112	119	3	0

Intersection: 1: Africa Road & Big Walnut Road

Movement	SB	SB	SB	SB	B10
Directions Served	L	L	T	R	T
Maximum Queue (ft)	163	326	580	358	472
Average Queue (ft)	81	150	322	245	140
95th Queue (ft)	144	340	658	418	727
Link Distance (ft)			590		1913
Upstream Blk Time (%)			11		
Queuing Penalty (veh)			79		
Storage Bay Dist (ft)	350	350		325	
Storage Blk Time (%)		0	9	16	
Queuing Penalty (veh)		0	39	78	

Intersection: 2: Worthington Road & Big Walnut Road

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	L	T	TR	L	T	TR	L	T	R	L	T
Maximum Queue (ft)	124	134	434	454	100	87	133	159	242	99	412	448
Average Queue (ft)	41	61	245	269	33	25	55	52	111	6	157	362
95th Queue (ft)	97	108	385	411	80	63	109	118	197	52	408	508
Link Distance (ft)			2077	2077		1054	1054		446			417
Upstream Blk Time (%)											4	18
Queuing Penalty (veh)											0	0
Storage Bay Dist (ft)	500	500			400			550		125	550	
Storage Blk Time (%)			0						7		4	18
Queuing Penalty (veh)			0						8		50	158

Intersection: 2: Worthington Road & Big Walnut Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	436
Average Queue (ft)	274
95th Queue (ft)	479
Link Distance (ft)	
Upstream Blk Time (%)	3
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	750
Storage Blk Time (%)	3
Queuing Penalty (veh)	27

Intersection: 3: SR-3 & Big Walnut Road

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	T	TR	L	T
Maximum Queue (ft)	203	302	308	315	237	123	179	116	225	214	313	508
Average Queue (ft)	94	195	207	173	118	50	81	39	127	84	84	328
95th Queue (ft)	171	283	294	283	204	102	148	88	202	178	183	475
Link Distance (ft)		1227	1227			754	754		734	734		1122
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	400			450	350			550			490	
Storage Blk Time (%)												0
Queuing Penalty (veh)												1

Intersection: 3: SR-3 & Big Walnut Road

Movement	SB
Directions Served	TR
Maximum Queue (ft)	500
Average Queue (ft)	308
95th Queue (ft)	459
Link Distance (ft)	1122
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: I-71 NB Ramp & Big Walnut Road

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	T	TR	L	L	R	R
Maximum Queue (ft)	157	252	255	532	531	214	221	262	226
Average Queue (ft)	64	100	118	235	246	98	114	157	136
95th Queue (ft)	122	211	223	513	513	175	195	228	202
Link Distance (ft)		1001	1001	509	509			558	558
Upstream Blk Time (%)				14	14				
Queuing Penalty (veh)				65	64				
Storage Bay Dist (ft)	475					500	500		
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 5: I-71 SB Ramp & Big Walnut Road

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	L	T	T	L	R
Maximum Queue (ft)	198	193	98	109	550	1034	1042	337	260
Average Queue (ft)	112	108	34	42	246	500	500	170	89
95th Queue (ft)	174	173	80	93	636	1228	1229	296	199
Link Distance (ft)	1113	1113				1001	1001		352
Upstream Blk Time (%)						18	18	3	1
Queuing Penalty (veh)						89	88	0	0
Storage Bay Dist (ft)			575	500	500			400	
Storage Blk Time (%)					0	44		3	1
Queuing Penalty (veh)					0	61		4	1

Intersection: 6: Africa Road & Jaycox Road

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (ft)	107	3	78
Average Queue (ft)	49	0	8
95th Queue (ft)	87	3	44
Link Distance (ft)	1124	131	432
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 11: St. Medan Drive/Whispering Ridge Drive & Big Walnut Road

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	34	5	103	627	625	65	50	49	101
Average Queue (ft)	4	0	8	108	109	20	16	9	35
95th Queue (ft)	22	5	52	505	508	55	44	35	105
Link Distance (ft)		509		754	754		193		172
Upstream Blk Time (%)				5	5				4
Queuing Penalty (veh)				20	22				0
Storage Bay Dist (ft)	125		125			50		50	
Storage Blk Time (%)				17		9	1	0	14
Queuing Penalty (veh)				2		2	0	0	1

Intersection: 12: Highland Hills Drive & Big Walnut Road

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	26	2	74	303	319	97	118	38	56
Average Queue (ft)	4	0	7	23	24	52	40	8	19
95th Queue (ft)	18	1	44	194	197	94	104	29	48
Link Distance (ft)		754		1151	1151		104		137
Upstream Blk Time (%)						3	10		
Queuing Penalty (veh)						0	0		
Storage Bay Dist (ft)	125		125			50		100	
Storage Blk Time (%)				5		37	3		0
Queuing Penalty (veh)				0		10	2		0

Intersection: 13: Willow Bend Lane/Grand Oak Blvd & Big Walnut Road

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	64	10	12	29	9	41	64	98	107
Average Queue (ft)	24	0	0	5	0	10	25	40	39
95th Queue (ft)	54	5	8	22	5	34	58	80	77
Link Distance (ft)		1151	1151		1509		165		144
Upstream Blk Time (%)									0
Queuing Penalty (veh)									0
Storage Bay Dist (ft)	125			125		125		75	
Storage Blk Time (%)								5	2
Queuing Penalty (veh)								4	1

Intersection: 14: Jeffries Court/Grandmere Blvd & Big Walnut Road

Movement	EB	EB	EB	WB	NB	SB
Directions Served	L	T	TR	L	LTR	LTR
Maximum Queue (ft)	30	9	2	30	36	91
Average Queue (ft)	4	0	0	5	8	36
95th Queue (ft)	21	4	2	21	29	74
Link Distance (ft)		1509	1509		117	103
Upstream Blk Time (%)						0
Queuing Penalty (veh)						0
Storage Bay Dist (ft)	125			125		
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 15: Ketterington Lane/Satinwood Drive & Big Walnut Road

Movement	EB	EB	WB	NB	SB
Directions Served	LT	TR	LT	LTR	LTR
Maximum Queue (ft)	27	8	64	54	49
Average Queue (ft)	1	0	6	22	18
95th Queue (ft)	13	6	32	50	45
Link Distance (ft)	403	403	318	156	164
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 21: Bale Kenyon Road & Big Walnut Road

Movement	EB	WB	B39	B39	NB
Directions Served	TR	LT	T		LR
Maximum Queue (ft)	569	1044	981	978	112
Average Queue (ft)	534	1001	885	839	46
95th Queue (ft)	556	1170	1237	1317	87
Link Distance (ft)	510	928	936	936	526
Upstream Blk Time (%)	100	88	42	17	
Queuing Penalty (veh)	0	1151	280	113	
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 3071

Intersection: 1: Africa Road & Big Walnut Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	L	T	R
Maximum Queue (ft)	125	225	246	79	600	1150	1162	700	425	445	495	425
Average Queue (ft)	49	124	149	19	428	925	917	542	377	383	407	95
95th Queue (ft)	98	201	231	55	852	1536	1563	1003	517	574	590	308
Link Distance (ft)		936	936			1113	1113					445
Upstream Blk Time (%)						34	30			32	60	
Queuing Penalty (veh)						272	240			0	0	
Storage Bay Dist (ft)	550			675	550			650	400	400		375
Storage Blk Time (%)					0	79	74	1	64	70	1	0
Queuing Penalty (veh)					0	135	206	3	282	310	9	0

Intersection: 1: Africa Road & Big Walnut Road

Movement	SB	SB	SB	SB	B10
Directions Served	L	L	T	R	T
Maximum Queue (ft)	116	145	194	278	16
Average Queue (ft)	39	57	64	112	1
95th Queue (ft)	85	135	190	239	18
Link Distance (ft)			590		1913
Upstream Blk Time (%)			1		
Queuing Penalty (veh)			2		
Storage Bay Dist (ft)	350	350		325	
Storage Blk Time (%)				2	
Queuing Penalty (veh)				3	

Intersection: 2: Worthington Road & Big Walnut Road

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	L	T	TR	L	T	TR	L	T	R	L	T
Maximum Queue (ft)	510	527	888	728	127	410	451	472	493	175	141	285
Average Queue (ft)	239	250	232	206	9	213	258	323	454	38	45	122
95th Queue (ft)	520	539	757	581	81	372	430	622	520	154	112	228
Link Distance (ft)			2077	2077		1054	1054		446			417
Upstream Blk Time (%)								16	59			
Queuing Penalty (veh)								0	0			
Storage Bay Dist (ft)	500	500			400			550		125	550	
Storage Blk Time (%)	3	8	1			2		16	62	0		
Queuing Penalty (veh)	12	31	12			0		105	111	0		

Intersection: 2: Worthington Road & Big Walnut Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	316
Average Queue (ft)	114
95th Queue (ft)	238
Link Distance (ft)	
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	750
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 3: SR-3 & Big Walnut Road

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	T	TR	L	T
Maximum Queue (ft)	208	131	145	142	126	270	312	457	633	576	305	301
Average Queue (ft)	82	51	67	43	51	142	177	160	371	348	153	164
95th Queue (ft)	171	108	127	106	103	237	278	328	549	514	314	252
Link Distance (ft)		1227	1227			754	754		734	734		1122
Upstream Blk Time (%)									0	0		
Queuing Penalty (veh)									0	0		
Storage Bay Dist (ft)	400			450	350			550			490	
Storage Blk Time (%)						0			1		0	0
Queuing Penalty (veh)						0			3		0	0

Intersection: 3: SR-3 & Big Walnut Road

Movement	SB
Directions Served	TR
Maximum Queue (ft)	240
Average Queue (ft)	141
95th Queue (ft)	219
Link Distance (ft)	1122
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: I-71 NB Ramp & Big Walnut Road

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	B46	B46
Directions Served	L	T	T	T	TR	L	L	R	R	T	T
Maximum Queue (ft)	205	245	261	536	542	525	550	699	603	435	416
Average Queue (ft)	91	43	65	399	398	412	440	516	178	255	197
95th Queue (ft)	173	145	168	666	669	652	687	858	429	584	518
Link Distance (ft)		999	999	509	509			601	601	394	394
Upstream Blk Time (%)				36	36			61	0	61	17
Queuing Penalty (veh)				191	191			0	0	0	0
Storage Bay Dist (ft)	475					500	500				
Storage Blk Time (%)						40	58	4			
Queuing Penalty (veh)						193	285	33			

Intersection: 5: I-71 SB Ramp & Big Walnut Road

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	L	T	T	L	R
Maximum Queue (ft)	243	237	157	191	550	1038	1040	383	378
Average Queue (ft)	113	110	50	87	407	741	746	288	227
95th Queue (ft)	196	194	116	168	746	1428	1425	466	490
Link Distance (ft)	1113	1113				999	999		352
Upstream Blk Time (%)						39	40	54	47
Queuing Penalty (veh)						355	366	0	0
Storage Bay Dist (ft)			575	500	500			400	
Storage Blk Time (%)					0	67		54	47
Queuing Penalty (veh)					0	285		60	107

Intersection: 6: Africa Road & Jaycox Road

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (ft)	83	9	75
Average Queue (ft)	39	0	19
95th Queue (ft)	66	6	57
Link Distance (ft)	1124	131	432
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 11: St. Medan Drive/Whispering Ridge Drive & Big Walnut Road

Movement	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	40	174	796	803	96	195	54	149
Average Queue (ft)	6	22	404	406	50	74	9	52
95th Queue (ft)	28	112	1013	1015	108	206	39	146
Link Distance (ft)			761	761		193		172
Upstream Blk Time (%)			26	27		25		10
Queuing Penalty (veh)			133	136		0		0
Storage Bay Dist (ft)	125	125			50		50	
Storage Blk Time (%)			50		53	1	1	33
Queuing Penalty (veh)			5		11	0	0	3

Intersection: 12: Highland Hills Drive & Big Walnut Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	24	8	8	174	1155	1159	87	116	56	86
Average Queue (ft)	2	0	0	30	395	397	51	46	7	31
95th Queue (ft)	15	6	4	126	1195	1198	102	117	31	76
Link Distance (ft)		761	761		1151	1151		104		75
Upstream Blk Time (%)					8	8	17	33	0	21
Queuing Penalty (veh)					37	39	0	0	0	0
Storage Bay Dist (ft)	125			125			50		50	
Storage Blk Time (%)					41		49	1	1	29
Queuing Penalty (veh)					8		10	0	0	3

Intersection: 13: Willow Bend Lane/Grand Oak Blvd & Big Walnut Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	60	10	2	139	502	523	86	77	75	124
Average Queue (ft)	14	0	0	22	67	68	23	24	25	38
95th Queue (ft)	43	7	2	89	367	372	61	55	60	94
Link Distance (ft)		1151	1151		1509	1509		165		144
Upstream Blk Time (%)								0		3
Queuing Penalty (veh)								0		0
Storage Bay Dist (ft)	125			125			125		50	
Storage Blk Time (%)					13		0	0	7	15
Queuing Penalty (veh)					4		0	0	3	4

Intersection: 14: Jeffries Court/Grandmere Blvd & Big Walnut Road

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	TR	L	TR	LTR	LTR
Maximum Queue (ft)	32	4	26	6	47	77
Average Queue (ft)	3	0	4	0	8	26
95th Queue (ft)	19	2	20	3	31	58
Link Distance (ft)		1509		2077	117	103
Upstream Blk Time (%)						0
Queuing Penalty (veh)						0
Storage Bay Dist (ft)	125		125			
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 15: Ketterington Lane/Satinwood Drive & Big Walnut Road

Movement	EB	EB	WB	NB	SB
Directions Served	LT	TR	LT	LTR	LTR
Maximum Queue (ft)	71	15	40	47	45
Average Queue (ft)	6	0	3	19	16
95th Queue (ft)	36	12	21	46	42
Link Distance (ft)	403	403	318	156	164
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 21: Bale Kenyon Road & Big Walnut Road

Movement	EB	WB	B39	B39	NB
Directions Served	TR	LT	T		LR
Maximum Queue (ft)	567	1043	976	979	548
Average Queue (ft)	502	926	844	823	361
95th Queue (ft)	685	1372	1337	1342	658
Link Distance (ft)	510	928	936	936	526
Upstream Blk Time (%)	88	85	47	19	33
Queuing Penalty (veh)	0	1470	413	165	0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 6251

Intersection: 1: Africa Road & Big Walnut Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	B44	B44	NB	NB
Directions Served	L	T	T	R	L	T	T	R	T	T	L	L
Maximum Queue (ft)	169	141	148	180	600	1244	1246	700	1044	1052	425	448
Average Queue (ft)	60	74	74	82	445	1035	1020	457	614	616	397	414
95th Queue (ft)	124	125	126	157	853	1565	1590	983	1392	1398	475	514
Link Distance (ft)		596	596			1143	1143		1011	1011		
Upstream Blk Time (%)						69	67		28	31		47
Queuing Penalty (veh)						376	365		150	166		0
Storage Bay Dist (ft)	550			750	550			650			400	400
Storage Blk Time (%)					0	82	72	0			78	83
Queuing Penalty (veh)					0	99	94	1			79	83

Intersection: 1: Africa Road & Big Walnut Road

Movement	NB	SB	SB	SB	B10	B34	B34
Directions Served	TR	L	T	R	T	T	
Maximum Queue (ft)	481	450	693	475	1155	902	654
Average Queue (ft)	398	157	568	373	589	273	156
95th Queue (ft)	628	467	839	623	1418	981	705
Link Distance (ft)	448		589		1051	1189	1189
Upstream Blk Time (%)	76		51		32	5	1
Queuing Penalty (veh)	0		338		210	16	4
Storage Bay Dist (ft)		400		425			
Storage Blk Time (%)	3		62	0			
Queuing Penalty (veh)	9		197	1			

Intersection: 2: Worthington Road & Big Walnut Road

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	L	T	TR	L	T	TR	L	T	R	L	T
Maximum Queue (ft)	100	107	360	390	92	130	155	120	246	126	430	444
Average Queue (ft)	33	55	220	248	32	51	77	46	115	8	145	361
95th Queue (ft)	83	97	326	357	78	106	136	95	203	61	380	501
Link Distance (ft)			2077	2077		1054	1054		446			417
Upstream Blk Time (%)											3	16
Queuing Penalty (veh)											0	0
Storage Bay Dist (ft)	500	500			225			550		125	550	
Storage Blk Time (%)									8		3	16
Queuing Penalty (veh)									9		33	144

Intersection: 2: Worthington Road & Big Walnut Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	445
Average Queue (ft)	284
95th Queue (ft)	488
Link Distance (ft)	
Upstream Blk Time (%)	6
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	750
Storage Blk Time (%)	6
Queuing Penalty (veh)	45

Intersection: 3: SR-3 & Big Walnut Road

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	T	TR	L	T
Maximum Queue (ft)	142	229	238	222	237	128	165	88	238	210	285	541
Average Queue (ft)	53	128	145	103	109	60	81	30	136	88	90	348
95th Queue (ft)	110	211	223	195	197	114	147	72	211	176	217	495
Link Distance (ft)		1227	1227			754	754		734	734		1122
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	450			475	350			550			490	
Storage Blk Time (%)					0						0	1
Queuing Penalty (veh)					0						0	2

Intersection: 3: SR-3 & Big Walnut Road

Movement	SB
Directions Served	TR
Maximum Queue (ft)	537
Average Queue (ft)	335
95th Queue (ft)	487
Link Distance (ft)	1122
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: I-71 NB Ramp & Big Walnut Road

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	T	TR	L	L	R	R
Maximum Queue (ft)	100	177	182	531	550	284	316	329	276
Average Queue (ft)	39	64	76	302	321	121	151	165	138
95th Queue (ft)	82	136	145	625	631	263	290	271	229
Link Distance (ft)		1011	1011	510	510			533	533
Upstream Blk Time (%)				24	26				
Queuing Penalty (veh)				117	128				
Storage Bay Dist (ft)	525					500	500		
Storage Blk Time (%)								0	
Queuing Penalty (veh)								0	

Intersection: 5: I-71 SB Ramp & Africa Road

Movement	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	L	T	T	L	LR
Maximum Queue (ft)	114	117	291	139	112	234	234
Average Queue (ft)	49	59	141	40	24	153	136
95th Queue (ft)	96	110	242	113	88	226	211
Link Distance (ft)	1189	1189		856	856		256
Upstream Blk Time (%)						0	0
Queuing Penalty (veh)						0	2
Storage Bay Dist (ft)			550			325	
Storage Blk Time (%)						0	0
Queuing Penalty (veh)						0	1

Intersection: 6: Africa Road & Jaycox Road

Movement	WB	NB	NB	SB	SB
Directions Served	LR	T	R	L	T
Maximum Queue (ft)	96	129	17	53	172
Average Queue (ft)	41	20	1	15	77
95th Queue (ft)	81	75	10	43	148
Link Distance (ft)	1104	1334	1334		403
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)				225	
Storage Blk Time (%)					0
Queuing Penalty (veh)					0

Intersection: 11: St. Medan Drive/Whispering Ridge Drive & Big Walnut Road

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	30	2	160	768	776	82	102	62	144
Average Queue (ft)	4	0	11	246	248	28	24	9	45
95th Queue (ft)	21	2	74	794	798	74	75	37	131
Link Distance (ft)		510		764	764		193		172
Upstream Blk Time (%)				13	14		0		8
Queuing Penalty (veh)				64	68		0		0
Storage Bay Dist (ft)	125		125			50		50	
Storage Blk Time (%)				35		23	2	1	23
Queuing Penalty (veh)				3		5	0	0	2

Intersection: 12: Highland Hills Drive & Big Walnut Road

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	28	2	56	775	784	95	111	34	80
Average Queue (ft)	4	0	3	150	153	48	39	9	22
95th Queue (ft)	21	2	30	718	725	88	104	31	64
Link Distance (ft)		764		1151	1151		104		118
Upstream Blk Time (%)				4	4	3	15		2
Queuing Penalty (veh)				16	18	0	0		0
Storage Bay Dist (ft)	125		125			50		100	
Storage Blk Time (%)				17		33	1		3
Queuing Penalty (veh)				1		8	1		0

Intersection: 13: Willow Bend Lane/Grand Oak Blvd & Big Walnut Road

Movement	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	61	45	255	269	44	72	88	136
Average Queue (ft)	19	3	25	28	12	25	35	46
95th Queue (ft)	51	16	208	217	37	58	73	103
Link Distance (ft)			1509	1509		165		144
Upstream Blk Time (%)								3
Queuing Penalty (veh)								0
Storage Bay Dist (ft)	125	125			125		50	
Storage Blk Time (%)	0		5				10	10
Queuing Penalty (veh)	0		0				7	5

Intersection: 14: Jeffries Court/Grandmere Blvd & Big Walnut Road

Movement	EB	EB	WB	NB	SB
Directions Served	L	TR	L	LTR	LTR
Maximum Queue (ft)	35	2	25	34	90
Average Queue (ft)	5	0	3	9	33
95th Queue (ft)	25	2	15	31	74
Link Distance (ft)		1509		117	103
Upstream Blk Time (%)					1
Queuing Penalty (veh)					0
Storage Bay Dist (ft)	125		125		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 15: Ketterington Lane/Satinwood Drive & Big Walnut Road

Movement	EB	EB	WB	NB	SB
Directions Served	LT	TR	LT	LTR	LTR
Maximum Queue (ft)	40	9	62	55	50
Average Queue (ft)	2	0	8	22	19
95th Queue (ft)	19	0	35	48	46
Link Distance (ft)	403	403	318	156	164
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 21: Bale Kenyon Road & Big Walnut Road

Movement	EB	WB	B39	B55	B55	NB
Directions Served	TR	LT	T	T		LR
Maximum Queue (ft)	530	742	662	639	664	71
Average Queue (ft)	500	716	633	602	595	35
95th Queue (ft)	521	740	699	720	818	69
Link Distance (ft)	475	626	546	596	596	491
Upstream Blk Time (%)	100	99	98	30	14	
Queuing Penalty (veh)	0	1375	1357	208	98	
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 36:

Movement	SB	SB
Directions Served	T	T
Maximum Queue (ft)	749	749
Average Queue (ft)	720	718
95th Queue (ft)	763	763
Link Distance (ft)	652	652
Upstream Blk Time (%)	97	96
Queuing Penalty (veh)	1067	1052
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 43: I-71 SB Ramp

Movement	SB	SB	NW	NW
Directions Served	T	T	R	R
Maximum Queue (ft)	219	232	60	42
Average Queue (ft)	167	173	11	8
95th Queue (ft)	219	240	42	30
Link Distance (ft)	256	256	889	889
Upstream Blk Time (%)		0		
Queuing Penalty (veh)		0		
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 8025

Intersection: 1: Africa Road & Big Walnut Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	B44	B44	NB	NB
Directions Served	L	T	T	R	L	T	T	R	T	T	L	L
Maximum Queue (ft)	322	197	194	86	600	1245	1248	700	1044	1051	425	450
Average Queue (ft)	196	121	125	29	503	1212	1212	680	935	941	423	449
95th Queue (ft)	294	182	183	71	861	1282	1272	848	1353	1355	433	451
Link Distance (ft)		938	938			1142	1142		1009	1009		
Upstream Blk Time (%)						96	97		43	48		
Queuing Penalty (veh)						725	729		327	365		
Storage Bay Dist (ft)	550			750	550			650			400	400
Storage Blk Time (%)					0	99	99	1			41	94
Queuing Penalty (veh)					0	119	296	5			134	310

Intersection: 1: Africa Road & Big Walnut Road

Movement	NB	SB	SB	SB	B34	B34
Directions Served	TR	L	T	R	T	
Maximum Queue (ft)	824	116	321	257	8	9
Average Queue (ft)	790	45	184	132	0	0
95th Queue (ft)	823	93	313	221	7	7
Link Distance (ft)	769		594		1190	1190
Upstream Blk Time (%)	88					
Queuing Penalty (veh)	0					
Storage Bay Dist (ft)		400		425		
Storage Blk Time (%)	0		0			
Queuing Penalty (veh)	0		1			

Intersection: 2: Worthington Road & Big Walnut Road

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	L	T	TR	L	T	TR	L	T	R	L	T
Maximum Queue (ft)	363	374	298	297	33	165	327	459	481	175	103	266
Average Queue (ft)	168	178	136	166	5	58	173	128	371	39	34	114
95th Queue (ft)	330	336	245	267	20	127	286	371	528	156	82	215
Link Distance (ft)			2077	2077		1054	1054		446			417
Upstream Blk Time (%)								2	14			
Queuing Penalty (veh)								0	0			
Storage Bay Dist (ft)	500	500			225			550		125	550	
Storage Blk Time (%)	0	0					0	2	44	0		
Queuing Penalty (veh)	0	0					0	14	80	0		

Intersection: 2: Worthington Road & Big Walnut Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	228
Average Queue (ft)	94
95th Queue (ft)	188
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	750
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: SR-3 & Big Walnut Road

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	T	TR	L	T
Maximum Queue (ft)	169	141	167	143	119	204	279	230	586	551	184	203
Average Queue (ft)	69	55	73	51	48	69	148	63	343	303	91	120
95th Queue (ft)	134	115	140	114	94	145	248	155	509	465	165	191
Link Distance (ft)		1227	1227			754	754		734	734		1122
Upstream Blk Time (%)									0			
Queuing Penalty (veh)									0			
Storage Bay Dist (ft)	450			475	350			550			490	
Storage Blk Time (%)									0			
Queuing Penalty (veh)									0			

Intersection: 3: SR-3 & Big Walnut Road

Movement	SB
Directions Served	TR
Maximum Queue (ft)	183
Average Queue (ft)	92
95th Queue (ft)	167
Link Distance (ft)	1122
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: I-71 NB Ramp & Big Walnut Road

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	B46	B46
Directions Served	L	T	T	T	TR	L	L	R	R	T	T
Maximum Queue (ft)	226	172	178	520	545	525	550	663	492	494	476
Average Queue (ft)	87	63	76	410	427	465	496	563	136	371	298
95th Queue (ft)	173	138	149	635	637	658	681	808	351	682	653
Link Distance (ft)		1009	1009	510	510			560	560	451	451
Upstream Blk Time (%)				32	34		31	75	0	77	25
Queuing Penalty (veh)				121	130		0	0	0	0	0
Storage Bay Dist (ft)	525					500	500				
Storage Blk Time (%)						35	79	4			
Queuing Penalty (veh)						171	386	38			

Intersection: 5: I-71 SB Ramp & Africa Road

Movement	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	L	T	T	L	LR
Maximum Queue (ft)	187	198	450	56	37	182	204
Average Queue (ft)	89	92	245	13	5	140	134
95th Queue (ft)	153	161	386	41	23	184	199
Link Distance (ft)	1190	1190		786	786		186
Upstream Blk Time (%)						1	2
Queuing Penalty (veh)						0	8
Storage Bay Dist (ft)			550			325	
Storage Blk Time (%)						1	2
Queuing Penalty (veh)						2	4

Intersection: 6: Africa Road & Jaycox Road

Movement	WB	WB	NB	NB	SB	SB
Directions Served	L	R	T	R	L	T
Maximum Queue (ft)	109	56	227	37	59	145
Average Queue (ft)	44	16	50	3	19	61
95th Queue (ft)	85	41	166	20	50	117
Link Distance (ft)	1106	1106	1407	1407		391
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)					225	
Storage Blk Time (%)						0
Queuing Penalty (veh)						0

Intersection: 11: St. Medan Drive/Whispering Ridge Drive & Big Walnut Road

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	34	5	160	661	670	93	155	60	118
Average Queue (ft)	5	0	12	227	235	40	45	9	38
95th Queue (ft)	24	5	77	680	692	95	151	34	110
Link Distance (ft)		510		763	763		193		172
Upstream Blk Time (%)				3	4		13		3
Queuing Penalty (veh)				11	15		0		0
Storage Bay Dist (ft)	125		125			50		50	
Storage Blk Time (%)				36		38	2	0	25
Queuing Penalty (veh)				4		8	0	0	3

Intersection: 12: Highland Hills Drive & Big Walnut Road

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	32	11	51	86	107	66	61	44	59
Average Queue (ft)	3	0	12	19	20	25	17	9	19
95th Queue (ft)	19	8	51	164	170	56	52	33	47
Link Distance (ft)		763		1151	1151		104		82
Upstream Blk Time (%)						0	1		0
Queuing Penalty (veh)						0	0		0
Storage Bay Dist (ft)	125		125			50		100	
Storage Blk Time (%)				4		6	1		0
Queuing Penalty (veh)				1		1	0		0

Intersection: 13: Willow Bend Lane/Grand Oak Blvd & Big Walnut Road

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	36	4	8	50	2	58	64	59	63
Average Queue (ft)	11	0	0	13	0	19	24	24	27
95th Queue (ft)	35	5	4	40	2	49	54	54	54
Link Distance (ft)		1151	1151		1509		165		144
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	125			125		125		50	
Storage Blk Time (%)								3	1
Queuing Penalty (veh)								1	0

Intersection: 14: Jeffries Court/Grandmere Blvd & Big Walnut Road

Movement	EB	EB	WB	NB	SB
Directions Served	L	T	L	LTR	LTR
Maximum Queue (ft)	30	6	28	41	75
Average Queue (ft)	3	0	5	9	28
95th Queue (ft)	17	6	21	32	59
Link Distance (ft)		1509		117	103
Upstream Blk Time (%)					0
Queuing Penalty (veh)					0
Storage Bay Dist (ft)	125		125		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 15: Ketterington Lane/Satinwood Drive & Big Walnut Road

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	55	2	39	2	42	35
Average Queue (ft)	4	0	5	0	18	15
95th Queue (ft)	27	2	25	2	44	41
Link Distance (ft)	403	403	318	318	156	164
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 21: Bale Kenyon Road & Big Walnut Road

Movement	EB	WB	B39	NB
Directions Served	TR	LT	T	LR
Maximum Queue (ft)	566	1041	939	546
Average Queue (ft)	535	927	541	373
95th Queue (ft)	564	1231	1187	663
Link Distance (ft)	510	928	938	526
Upstream Blk Time (%)	97	73	0	35
Queuing Penalty (veh)	0	1301	7	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 43: I-71 SB Ramp

Movement	NW	NW
Directions Served	R	R
Maximum Queue (ft)	104	62
Average Queue (ft)	17	9
95th Queue (ft)	63	38
Link Distance (ft)	901	901
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 51:

Movement	SB	SB
Directions Served	T	T
Maximum Queue (ft)	83	98
Average Queue (ft)	54	60
95th Queue (ft)	77	80
Link Distance (ft)	793	793
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 5319

Intersection: 1: Africa Road & Big Walnut Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	B44	B44	NB
Directions Served	L	T	T	R	L	L	T	T	R	T	T	L
Maximum Queue (ft)	72	198	205	151	84	600	1242	1247	675	1036	1043	261
Average Queue (ft)	18	111	113	60	29	344	844	823	335	426	429	136
95th Queue (ft)	49	177	181	127	65	814	1590	1609	877	1183	1189	244
Link Distance (ft)		923	923				1142	1142		1010	1010	
Upstream Blk Time (%)							53	53		15	15	
Queuing Penalty (veh)							273	271		76	78	
Storage Bay Dist (ft)	550			575	550	550			625			450
Storage Blk Time (%)							0	63	57	0		
Queuing Penalty (veh)							0	82	51	0		

Intersection: 1: Africa Road & Big Walnut Road

Movement	NB	NB	SB	SB	SB	SB
Directions Served	L	TR	L	T	T	R
Maximum Queue (ft)	248	209	93	310	320	322
Average Queue (ft)	115	64	36	139	133	166
95th Queue (ft)	231	150	77	239	287	307
Link Distance (ft)		722		581	581	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	450		250			325
Storage Blk Time (%)				0	0	4
Queuing Penalty (veh)				0	0	8

Intersection: 2: Worthington Road & Big Walnut Road

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	T	R	L	T	R
Maximum Queue (ft)	96	105	329	347	121	94	64	60	104	135	262	114
Average Queue (ft)	32	52	191	206	44	25	21	16	42	54	118	8
95th Queue (ft)	77	95	294	308	93	70	52	43	86	115	221	61
Link Distance (ft)			2068	2068			1046	1046			431	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	500	500			400	350			350	550		125
Storage Blk Time (%)				0							10	
Queuing Penalty (veh)				0							11	

Intersection: 2: Worthington Road & Big Walnut Road

Movement	SB	SB	SB
Directions Served	L	T	R
Maximum Queue (ft)	419	444	433
Average Queue (ft)	188	380	325
95th Queue (ft)	452	503	521
Link Distance (ft)		402	
Upstream Blk Time (%)	7	32	14
Queuing Penalty (veh)	0	0	0
Storage Bay Dist (ft)	550		750
Storage Blk Time (%)	7	32	14
Queuing Penalty (veh)	91	286	102

Intersection: 3: SR-3 & Big Walnut Road

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	T	TR	L	T
Maximum Queue (ft)	117	213	226	186	216	115	176	116	229	199	502	871
Average Queue (ft)	45	96	110	64	122	41	84	50	131	89	243	562
95th Queue (ft)	94	180	197	143	200	90	155	100	202	177	597	944
Link Distance (ft)		1227	1227			754	754		734	734		1122
Upstream Blk Time (%)												2
Queuing Penalty (veh)												0
Storage Bay Dist (ft)	450			475	350			550			490	
Storage Blk Time (%)											0	23
Queuing Penalty (veh)											0	40

Intersection: 3: SR-3 & Big Walnut Road

Movement	SB
Directions Served	TR
Maximum Queue (ft)	828
Average Queue (ft)	537
95th Queue (ft)	897
Link Distance (ft)	1122
Upstream Blk Time (%)	1
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: I-71 NB Ramp & Big Walnut Road

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	B46	B46
Directions Served	L	T	T	T	TR	L	L	R	R	T	T
Maximum Queue (ft)	137	177	191	502	512	499	525	592	526	252	222
Average Queue (ft)	58	51	65	172	188	161	194	220	172	31	21
95th Queue (ft)	108	132	147	410	422	419	454	506	382	198	154
Link Distance (ft)		1010	1010	510	510			642	642	385	385
Upstream Blk Time (%)				2	3			9	0	5	1
Queuing Penalty (veh)				10	13			0	0	0	0
Storage Bay Dist (ft)	500					500	500				
Storage Blk Time (%)						5	11	1			
Queuing Penalty (veh)						11	23	1			

Intersection: 5: Africa Road & I-71 SB Ramp

Movement	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	T	T	R	L	L	T	T
Maximum Queue (ft)	475	1191	825	822	550	72	77	50	66
Average Queue (ft)	467	987	731	722	319	20	31	10	22
95th Queue (ft)	518	1522	953	970	660	55	69	37	54
Link Distance (ft)		1147	788	788				722	722
Upstream Blk Time (%)		65	56	61					
Queuing Penalty (veh)		0	0	0					
Storage Bay Dist (ft)	425				500	500	500		
Storage Blk Time (%)	92	0		32	0				
Queuing Penalty (veh)	55	0		78	1				

Intersection: 6: Africa Road & Jaycox Road

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (ft)	88	7	69
Average Queue (ft)	48	0	7
95th Queue (ft)	76	5	37
Link Distance (ft)	1124	131	432
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 11: St. Medan Drive/Whispering Ridge Drive & Big Walnut Road

Movement	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	32	29	146	160	49	58	45	67
Average Queue (ft)	5	4	8	9	16	20	10	25
95th Queue (ft)	24	20	72	71	44	49	35	59
Link Distance (ft)			764	764		193		172
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	125	125			50		50	
Storage Blk Time (%)			1		3	2	1	5
Queuing Penalty (veh)			0		1	0	0	0

Intersection: 12: Highland Hills Drive & Big Walnut Road

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	L	T	L	L	TR	L	TR
Maximum Queue (ft)	31	10	30	78	71	40	50
Average Queue (ft)	3	0	3	40	20	8	17
95th Queue (ft)	19	8	16	69	55	29	45
Link Distance (ft)		764			104		156
Upstream Blk Time (%)				0	0		
Queuing Penalty (veh)				0	0		
Storage Bay Dist (ft)	125		125	50		100	
Storage Blk Time (%)				12	1		
Queuing Penalty (veh)				3	1		

Intersection: 13: Willow Bend Lane/Grand Oak Blvd & Big Walnut Road

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	60	4	28	16	37	69	77	109
Average Queue (ft)	20	0	4	1	10	26	36	37
95th Queue (ft)	51	4	20	8	34	57	68	76
Link Distance (ft)		1151		1509		165		144
Upstream Blk Time (%)								0
Queuing Penalty (veh)								0
Storage Bay Dist (ft)	125		125		125		50	
Storage Blk Time (%)							10	3
Queuing Penalty (veh)							7	2

Intersection: 14: Jeffries Court/Grandmere Blvd & Big Walnut Road

Movement	EB	WB	NB	SB
Directions Served	L	L	LTR	LTR
Maximum Queue (ft)	27	29	36	87
Average Queue (ft)	3	4	9	31
95th Queue (ft)	16	20	32	67
Link Distance (ft)			117	103
Upstream Blk Time (%)				0
Queuing Penalty (veh)				0
Storage Bay Dist (ft)	125	125		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 15: Ketterington Lane/Satinwood Drive & Big Walnut Road

Movement	EB	EB	WB	NB	SB
Directions Served	LT	TR	LT	LTR	LTR
Maximum Queue (ft)	42	10	41	51	46
Average Queue (ft)	2	0	4	21	19
95th Queue (ft)	16	6	25	47	46
Link Distance (ft)	403	403	318	156	164
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 21: Bale Kenyon Road & Big Walnut Road

Movement	EB	WB	B39	B39	NB
Directions Served	TR	LT	T		LR
Maximum Queue (ft)	566	1048	966	970	112
Average Queue (ft)	536	992	830	785	48
95th Queue (ft)	558	1181	1284	1330	91
Link Distance (ft)	510	928	923	923	526
Upstream Blk Time (%)	100	84	35	15	
Queuing Penalty (veh)	0	1110	231	101	
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 3017

Intersection: 1: Africa Road & Big Walnut Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	B44	B44	NB
Directions Served	L	T	T	R	L	L	T	T	R	T	T	L
Maximum Queue (ft)	111	245	236	164	329	600	1250	1249	675	1041	1050	475
Average Queue (ft)	49	150	155	59	127	548	1134	1124	568	831	833	446
95th Queue (ft)	99	221	224	126	267	805	1523	1541	950	1459	1466	558
Link Distance (ft)		923	923				1142	1142		1009	1009	
Upstream Blk Time (%)							83	80		35	34	
Queuing Penalty (veh)							804	772		341	330	
Storage Bay Dist (ft)	550			575	550	550			625			450
Storage Blk Time (%)					0	0	88	76	1			64
Queuing Penalty (veh)					0	1	483	213	7			227

Intersection: 1: Africa Road & Big Walnut Road

Movement	NB	NB	SB	SB	SB	SB
Directions Served	L	TR	L	T	T	R
Maximum Queue (ft)	500	740	126	225	172	271
Average Queue (ft)	465	615	37	119	51	121
95th Queue (ft)	609	977	89	197	128	244
Link Distance (ft)		722		581	581	
Upstream Blk Time (%)		24				
Queuing Penalty (veh)		218				
Storage Bay Dist (ft)	450		250			325
Storage Blk Time (%)	75	1		0	0	1
Queuing Penalty (veh)	263	3		0	0	1

Intersection: 2: Worthington Road & Big Walnut Road

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	T	R	L	T	R
Maximum Queue (ft)	461	468	446	342	126	33	279	291	272	452	472	175
Average Queue (ft)	233	244	143	116	54	2	173	181	139	256	423	34
95th Queue (ft)	479	492	492	334	111	16	264	270	232	564	527	145
Link Distance (ft)			2068	2068			1046	1046				431
Upstream Blk Time (%)										10	47	
Queuing Penalty (veh)										0	0	
Storage Bay Dist (ft)	500	500			400	350			350	550		125
Storage Blk Time (%)	1	4	0	0			0	0		10	58	
Queuing Penalty (veh)	3	13	1	0			0	0		65	104	

Intersection: 2: Worthington Road & Big Walnut Road

Movement	SB	SB	SB
Directions Served	L	T	R
Maximum Queue (ft)	126	223	264
Average Queue (ft)	40	114	107
95th Queue (ft)	95	202	212
Link Distance (ft)		402	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	550		750
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: SR-3 & Big Walnut Road

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	T	TR	L	T
Maximum Queue (ft)	233	144	167	164	150	364	416	460	598	592	395	366
Average Queue (ft)	104	62	79	58	51	186	242	190	371	359	227	202
95th Queue (ft)	197	123	141	128	110	307	384	389	587	577	459	450
Link Distance (ft)		1227	1227			754	754		734	734		1122
Upstream Blk Time (%)									1	1		
Queuing Penalty (veh)									0	0		
Storage Bay Dist (ft)	450			475	350			550			490	
Storage Blk Time (%)						0			2		6	0
Queuing Penalty (veh)						0			7		14	0

Intersection: 3: SR-3 & Big Walnut Road

Movement	SB
Directions Served	TR
Maximum Queue (ft)	325
Average Queue (ft)	185
95th Queue (ft)	418
Link Distance (ft)	1122
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: I-71 NB Ramp & Big Walnut Road

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	B46	B46
Directions Served	L	T	T	T	TR	L	L	R	R	T	T
Maximum Queue (ft)	237	155	164	548	546	525	550	795	723	345	329
Average Queue (ft)	104	51	59	445	451	436	466	621	320	225	195
95th Queue (ft)	194	120	129	662	659	664	695	998	712	461	434
Link Distance (ft)		1009	1009	510	510			688	688	298	298
Upstream Blk Time (%)				42	43			61	1	64	20
Queuing Penalty (veh)				251	252			0	0	0	0
Storage Bay Dist (ft)	500					500	500				
Storage Blk Time (%)						35	63	2			
Queuing Penalty (veh)						171	306	19			

Intersection: 5: Africa Road & I-71 SB Ramp

Movement	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	T	T	R	L	L	T	T
Maximum Queue (ft)	296	168	831	830	550	202	213	77	79
Average Queue (ft)	156	50	784	776	295	110	125	22	34
95th Queue (ft)	265	131	900	914	733	178	185	62	67
Link Distance (ft)		1147	788	788				722	722
Upstream Blk Time (%)			85	78					
Queuing Penalty (veh)			0	0					
Storage Bay Dist (ft)	425				500	500	500		
Storage Blk Time (%)	0			74	0				
Queuing Penalty (veh)	0			82	0				

Intersection: 6: Africa Road & Jaycox Road

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (ft)	69	19	119
Average Queue (ft)	34	1	27
95th Queue (ft)	60	11	84
Link Distance (ft)	1124	131	432
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 11: St. Medan Drive/Whispering Ridge Drive & Big Walnut Road

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	49	2	160	799	794	97	206	53	120
Average Queue (ft)	6	0	18	517	518	60	97	10	45
95th Queue (ft)	30	2	101	1095	1095	117	241	37	129
Link Distance (ft)		510		764	764		193		172
Upstream Blk Time (%)				34	34		39		8
Queuing Penalty (veh)				191	195		0		0
Storage Bay Dist (ft)	125		125			50		50	
Storage Blk Time (%)	0			66		64	2	0	30
Queuing Penalty (veh)	0			7		13	0	0	3

Intersection: 12: Highland Hills Drive & Big Walnut Road

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	8	11	174	1180	1182	98	118	37	85
Average Queue (ft)	0	0	37	595	595	51	59	8	35
95th Queue (ft)	6	7	145	1487	1491	100	132	29	82
Link Distance (ft)	764	764		1151	1151		104		76
Upstream Blk Time (%)				21	23	9	40		26
Queuing Penalty (veh)				111	121	0	0		0
Storage Bay Dist (ft)			125			50		100	
Storage Blk Time (%)				55		56	5		26
Queuing Penalty (veh)				11		11	2		3

Intersection: 13: Willow Bend Lane/Grand Oak Blvd & Big Walnut Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	42	4	19	174	1530	1530	105	98	86	157
Average Queue (ft)	13	0	1	41	397	400	36	25	24	57
95th Queue (ft)	40	3	11	144	1341	1342	93	68	62	139
Link Distance (ft)		1151	1151		1509	1509		165		144
Upstream Blk Time (%)					6	6	0	1		12
Queuing Penalty (veh)					32	34	0	0		0
Storage Bay Dist (ft)	125			125			125		50	
Storage Blk Time (%)				0	37		5	0	5	34
Queuing Penalty (veh)				0	11		1	0	2	10

Intersection: 14: Jeffries Court/Grandmere Blvd & Big Walnut Road

Movement	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	TR	L	T	TR	LTR	LTR
Maximum Queue (ft)	34	2	76	601	605	49	92
Average Queue (ft)	5	0	8	41	43	12	32
95th Queue (ft)	24	2	49	290	295	38	75
Link Distance (ft)		1509		2068	2068	117	103
Upstream Blk Time (%)							2
Queuing Penalty (veh)							0
Storage Bay Dist (ft)	125		125				
Storage Blk Time (%)				8			
Queuing Penalty (veh)				1			

Intersection: 15: Ketterington Lane/Satinwood Drive & Big Walnut Road

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	74	18	51	7	53	44
Average Queue (ft)	7	1	5	0	18	17
95th Queue (ft)	38	13	26	8	46	43
Link Distance (ft)	403	403	318	318	156	164
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 21: Bale Kenyon Road & Big Walnut Road

Movement	EB	WB	B39	B39	NB
Directions Served	TR	LT	T		LR
Maximum Queue (ft)	567	1045	964	968	552
Average Queue (ft)	535	1019	943	935	416
95th Queue (ft)	558	1042	958	986	681
Link Distance (ft)	510	928	923	923	526
Upstream Blk Time (%)	99	95	50	22	45
Queuing Penalty (veh)	0	1681	441	191	0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 8023

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Appendix G

Turn Lane Storage Calculations

DEL-71-3.55 Big Walnut Interchange

L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 1 - AM Peak Hour	
Big Walnut/Africa	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	590 (vph)
Number of Through Lanes	2
Turning Volume	60 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	9%
Vehicles Per Cycle	2.0
Storage Length	100 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	225 (feet)
Through Queue Distance	375 (feet)
No Block Turn Lane Length	375 (feet)

2040 Alternative 1 - PM Peak Hour	
Big Walnut/Africa	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	990 (vph)
Number of Through Lanes	2
Turning Volume	140 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	12%
Vehicles Per Cycle	4.7
Storage Length	200 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	325 (feet)
Through Queue Distance	600 (feet)
No Block Turn Lane Length	600 (feet)

2040 Alternative 1 - AM Peak Hour	
Big Walnut/Africa	
Movement	EB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	590 (vph)
Number of Through Lanes	2
Turning Volume	520 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	47%
Vehicles Per Cycle	17.3
Storage Length	600 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	725 (feet)
Through Queue Distance	375 (feet)
No Block Turn Lane Length	725 (feet)

2040 Alternative 1 - PM Peak Hour	
Big Walnut/Africa	
Movement	EB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	990 (vph)
Number of Through Lanes	2
Turning Volume	180 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	15%
Vehicles Per Cycle	6.0
Storage Length	250 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	375 (feet)
Through Queue Distance	600 (feet)
No Block Turn Lane Length	600 (feet)

DEL-71-3.55 Big Walnut Interchange

L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 1 - AM Peak Hour	
Big Walnut/Africa	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	850 (vph)
Number of Through Lanes	2
Turning Volume	160 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	16%
Vehicles Per Cycle	5.3
Storage Length	200 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	325 (feet)
Through Queue Distance	500 (feet)
No Block Turn Lane Length	500 (feet)

2040 Alternative 1 - PM Peak Hour	
Big Walnut/Africa	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	1160 (vph)
Number of Through Lanes	2
Turning Volume	170 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	13%
Vehicles Per Cycle	5.7
Storage Length	250 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	375 (feet)
Through Queue Distance	650 (feet)
No Block Turn Lane Length	650 (feet)

2040 Alternative 1 - AM Peak Hour	
Big Walnut/Africa	
Movement	WB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	850 (vph)
Number of Through Lanes	2
Turning Volume	90 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	10%
Vehicles Per Cycle	3.0
Storage Length	150 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	275 (feet)
Through Queue Distance	500 (feet)
No Block Turn Lane Length	500 (feet)

2040 Alternative 1 - PM Peak Hour	
Big Walnut/Africa	
Movement	WB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	1160 (vph)
Number of Through Lanes	2
Turning Volume	280 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	19%
Vehicles Per Cycle	9.3
Storage Length	350 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	475 (feet)
Through Queue Distance	650 (feet)
No Block Turn Lane Length	650 (feet)

DEL-71-3.55 Big Walnut Interchange

L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 1 - AM Peak Hour		
Big Walnut/Africa		
Movement	NB Left	
Design Speed	45	(mph)
Cycle Length	120	(sec)
Type of Traffic Control	Signal	(Stop or Signal)
Through Volume	60	(vph)
Number of Through Lanes	1	
Turning Volume	270	(vph)
Number of Turning Lanes	2	
Design Condition	C	(A, B, or C)
Percent Turning	82%	
Vehicles Per Cycle	4.5	
Storage Length	200	(feet)
Deceleration/Taper Length	125	(feet)
Calculated Turn Lane Length	325	(feet)
Through Queue Distance	100	(feet)
No Block Turn Lane Length	325	(feet)

2040 Alternative 1 - PM Peak Hour		
Big Walnut/Africa		
Movement	NB Left	
Design Speed	45	(mph)
Cycle Length	120	(sec)
Type of Traffic Control	Signal	(Stop or Signal)
Through Volume	290	(vph)
Number of Through Lanes	1	
Turning Volume	470	(vph)
Number of Turning Lanes	2	
Design Condition	C	(A, B, or C)
Percent Turning	62%	
Vehicles Per Cycle	7.8	
Storage Length	325	(feet)
Deceleration/Taper Length	125	(feet)
Calculated Turn Lane Length	450	(feet)
Through Queue Distance	375	(feet)
No Block Turn Lane Length	450	(feet)

2040 Alternative 1 - AM Peak Hour		
Big Walnut/Africa		
Movement	NB Right	
Design Speed	45	(mph)
Cycle Length	120	(sec)
Type of Traffic Control	Signal	(Stop or Signal)
Through Volume	60	(vph)
Number of Through Lanes	1	
Turning Volume	130	(vph)
Number of Turning Lanes	1	
Design Condition	C	(A, B, or C)
Percent Turning	68%	
Vehicles Per Cycle	4.3	
Storage Length	175	(feet)
Deceleration/Taper Length	125	(feet)
Calculated Turn Lane Length	300	(feet)
Through Queue Distance	100	(feet)
No Block Turn Lane Length	300	(feet)

2040 Alternative 1 - PM Peak Hour		
Big Walnut/Africa		
Movement	NB Right	
Design Speed	45	(mph)
Cycle Length	120	(sec)
Type of Traffic Control	Signal	(Stop or Signal)
Through Volume	290	(vph)
Number of Through Lanes	1	
Turning Volume	150	(vph)
Number of Turning Lanes	1	
Design Condition	C	(A, B, or C)
Percent Turning	34%	
Vehicles Per Cycle	5.0	
Storage Length	200	(feet)
Deceleration/Taper Length	125	(feet)
Calculated Turn Lane Length	325	(feet)
Through Queue Distance	375	(feet)
No Block Turn Lane Length	375	(feet)

DEL-71-3.55 Big Walnut Interchange

L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 1 - AM Peak Hour	
Big Walnut/Africa	
Movement	SB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	270 (vph)
Number of Through Lanes	1
Turning Volume	230 (vph)
Number of Turning Lanes	2
Design Condition	C (A, B, or C)
Percent Turning	46%
Vehicles Per Cycle	3.8
Storage Length	175 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	300 (feet)
Through Queue Distance	350 (feet)
No Block Turn Lane Length	350 (feet)

2040 Alternative 1 - PM Peak Hour	
Big Walnut/Africa	
Movement	SB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	60 (vph)
Number of Through Lanes	1
Turning Volume	110 (vph)
Number of Turning Lanes	2
Design Condition	C (A, B, or C)
Percent Turning	65%
Vehicles Per Cycle	1.8
Storage Length	100 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	225 (feet)
Through Queue Distance	100 (feet)
No Block Turn Lane Length	225 (feet)

2040 Alternative 1 - AM Peak Hour	
Big Walnut/Africa	
Movement	SB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	270 (vph)
Number of Through Lanes	1
Turning Volume	190 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	41%
Vehicles Per Cycle	6.3
Storage Length	250 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	375 (feet)
Through Queue Distance	350 (feet)
No Block Turn Lane Length	375 (feet)

2040 Alternative 1 - PM Peak Hour	
Big Walnut/Africa	
Movement	SB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	60 (vph)
Number of Through Lanes	1
Turning Volume	110 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	65%
Vehicles Per Cycle	3.7
Storage Length	175 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	300 (feet)
Through Queue Distance	100 (feet)
No Block Turn Lane Length	300 (feet)

DEL-71-3.55 Big Walnut Interchange

L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 1 - AM Peak Hour	
I-71 SB Ramps/Big Walnut	
Movement	EB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	790 (vph)
Number of Through Lanes	2
Turning Volume	220 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	22%
Vehicles Per Cycle	7.3
Storage Length	275 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	400 (feet)
Through Queue Distance	475 (feet)
No Block Turn Lane Length	475 (feet)

2040 Alternative 1 - PM Peak Hour	
I-71 SB Ramps/Big Walnut	
Movement	EB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	820 (vph)
Number of Through Lanes	2
Turning Volume	430 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	34%
Vehicles Per Cycle	14.3
Storage Length	500 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	625 (feet)
Through Queue Distance	500 (feet)
No Block Turn Lane Length	625 (feet)

2040 Alternative 1 - AM Peak Hour	
I-71 SB Ramps/Big Walnut	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	880 (vph)
Number of Through Lanes	2
Turning Volume	140 (vph)
Number of Turning Lanes	2
Design Condition	C (A, B, or C)
Percent Turning	14%
Vehicles Per Cycle	2.3
Storage Length	100 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	225 (feet)
Through Queue Distance	525 (feet)
No Block Turn Lane Length	525 (feet)

2040 Alternative 1 - PM Peak Hour	
I-71 SB Ramps/Big Walnut	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	1380 (vph)
Number of Through Lanes	2
Turning Volume	420 (vph)
Number of Turning Lanes	2
Design Condition	C (A, B, or C)
Percent Turning	23%
Vehicles Per Cycle	7.0
Storage Length	275 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	400 (feet)
Through Queue Distance	775 (feet)
No Block Turn Lane Length	775 (feet)

DEL-71-3.55 Big Walnut Interchange

L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 1 - AM Peak Hour			2040 Alternative 1 - PM Peak Hour		
I-71 SB Ramps/Big Walnut			I-71 SB Ramps/Big Walnut		
Movement	NB Left		Movement	NB Left	
Design Speed	45	(mph)	Design Speed	45	(mph)
Cycle Length	120	(sec)	Cycle Length	120	(sec)
Type of Traffic Control	Signal	(Stop or Signal)	Type of Traffic Control	Signal	(Stop or Signal)
Through Volume	0	(vph)	Through Volume	0	(vph)
Number of Through Lanes	0		Number of Through Lanes	0	
Turning Volume	220	(vph)	Turning Volume	230	(vph)
Number of Turning Lanes	1		Number of Turning Lanes	1	
Design Condition	C	(A, B, or C)	Design Condition	C	(A, B, or C)
Percent Turning	100%		Percent Turning	100%	
Vehicles Per Cycle	7.3		Vehicles Per Cycle	7.7	
Storage Length	275	(feet)	Storage Length	325	(feet)
Deceleration/Taper Length	125	(feet)	Deceleration/Taper Length	125	(feet)
Calculated Turn Lane Length	400	(feet)	Calculated Turn Lane Length	450	(feet)
Through Queue Distance	#DIV/0!	(feet)	Through Queue Distance	#DIV/0!	(feet)
No Block Turn Lane Length	#DIV/0!	(feet)	No Block Turn Lane Length	#DIV/0!	(feet)

DEL-71-3.55 Big Walnut Interchange

L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 1 - AM Peak Hour	
I-71 NB Ramps/Big Walnut	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	790 (vph)
Number of Through Lanes	2
Turning Volume	160 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	17%
Vehicles Per Cycle	5.3
Storage Length	200 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	325 (feet)
Through Queue Distance	475 (feet)
No Block Turn Lane Length	475 (feet)

2040 Alternative 1 - PM Peak Hour	
I-71 NB Ramps/Big Walnut	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	720 (vph)
Number of Through Lanes	2
Turning Volume	210 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	23%
Vehicles Per Cycle	7.0
Storage Length	275 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	400 (feet)
Through Queue Distance	450 (feet)
No Block Turn Lane Length	450 (feet)

2040 Alternative 1 - AM Peak Hour	
I-71 NB Ramps/Big Walnut	
Movement	NB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	0 (vph)
Number of Through Lanes	0
Turning Volume	260 (vph)
Number of Turning Lanes	2
Design Condition	C (A, B, or C)
Percent Turning	100%
Vehicles Per Cycle	4.3
Storage Length	175 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	300 (feet)
Through Queue Distance	#DIV/0! (feet)
No Block Turn Lane Length	#DIV/0! (feet)

2040 Alternative 1 - PM Peak Hour	
I-71 NB Ramps/Big Walnut	
Movement	NB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	0 (vph)
Number of Through Lanes	0
Turning Volume	880 (vph)
Number of Turning Lanes	2
Design Condition	C (A, B, or C)
Percent Turning	100%
Vehicles Per Cycle	14.7
Storage Length	525 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	650 (feet)
Through Queue Distance	#DIV/0! (feet)
No Block Turn Lane Length	#DIV/0! (feet)

DEL-71-3.55 Big Walnut Interchange

L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 1 - AM Peak Hour	
I-71 NB Ramps/Big Walnut	
Movement	NB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	0 (vph)
Number of Through Lanes	0
Turning Volume	450 (vph)
Number of Turning Lanes	2
Design Condition	C (A, B, or C)
Percent Turning	100%
Vehicles Per Cycle	7.5
Storage Length	325 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	450 (feet)
Through Queue Distance	#DIV/0! (feet)
No Block Turn Lane Length	#DIV/0! (feet)

2040 Alternative 1 - PM Peak Hour	
I-71 NB Ramps/Big Walnut	
Movement	NB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	0 (vph)
Number of Through Lanes	0
Turning Volume	970 (vph)
Number of Turning Lanes	2
Design Condition	C (A, B, or C)
Percent Turning	100%
Vehicles Per Cycle	16.2
Storage Length	550 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	675 (feet)
Through Queue Distance	#DIV/0! (feet)
No Block Turn Lane Length	#DIV/0! (feet)

DEL-71-3.55 Big Walnut Interchange

L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 1 - AM Peak Hour	
Big Walnut/Medan/Whispering Ridge	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	1230 (vph)
Number of Through Lanes	2
Turning Volume	10 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	1%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 1 - PM Peak Hour	
Big Walnut/Medan/Whispering Ridge	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	1670 (vph)
Number of Through Lanes	2
Turning Volume	20 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	1%
Vehicles Per Cycle	0.3
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 1 - AM Peak Hour	
Big Walnut/Medan/Whispering Ridge	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	910 (vph)
Number of Through Lanes	2
Turning Volume	10 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	1%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 1 - PM Peak Hour	
Big Walnut/Medan/Whispering Ridge	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	1050 (vph)
Number of Through Lanes	2
Turning Volume	10 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	1%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

DEL-71-3.55 Big Walnut Interchange

L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 1 - AM Peak Hour	
Big Walnut/Medan/Whispering Ridge	
Movement	NB Left
Design Speed	25 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	20 (vph)
Number of Through Lanes	1
Turning Volume	20 (vph)
Number of Turning Lanes	1
Design Condition	A (A, B, or C)
Percent Turning	50%
Vehicles Per Cycle	0.3
Storage Length	50 (feet)
Deceleration/Taper Length	50 (feet)
Calculated Turn Lane Length	100 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 1 - PM Peak Hour	
Big Walnut/Medan/Whispering Ridge	
Movement	NB Left
Design Speed	25 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	20 (vph)
Number of Through Lanes	1
Turning Volume	20 (vph)
Number of Turning Lanes	1
Design Condition	A (A, B, or C)
Percent Turning	50%
Vehicles Per Cycle	0.3
Storage Length	50 (feet)
Deceleration/Taper Length	50 (feet)
Calculated Turn Lane Length	100 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 1 - AM Peak Hour	
Big Walnut/Medan/Whispering Ridge	
Movement	SB Left
Design Speed	25 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	30 (vph)
Number of Through Lanes	1
Turning Volume	10 (vph)
Number of Turning Lanes	1
Design Condition	A (A, B, or C)
Percent Turning	25%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	50 (feet)
Calculated Turn Lane Length	100 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 1 - PM Peak Hour	
Big Walnut/Medan/Whispering Ridge	
Movement	SB Left
Design Speed	25 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	20 (vph)
Number of Through Lanes	1
Turning Volume	10 (vph)
Number of Turning Lanes	1
Design Condition	A (A, B, or C)
Percent Turning	33%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	50 (feet)
Calculated Turn Lane Length	100 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

DEL-71-3.55 Big Walnut Interchange

L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 1 - AM Peak Hour	
Big Walnut/Highland Hills/Sedgewick	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	1276 (vph)
Number of Through Lanes	2
Turning Volume	10 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	1%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 1 - PM Peak Hour	
Big Walnut/Highland Hills/Sedgewick	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	1676 (vph)
Number of Through Lanes	2
Turning Volume	10 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	1%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 1 - AM Peak Hour	
Big Walnut/Highland Hills/Sedgewick	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	864 (vph)
Number of Through Lanes	2
Turning Volume	9 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	1%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 1 - PM Peak Hour	
Big Walnut/Highland Hills/Sedgewick	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	1014 (vph)
Number of Through Lanes	2
Turning Volume	20 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	2%
Vehicles Per Cycle	0.3
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

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L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2024 Alternative 1 - AM Peak Hour	
Big Walnut/Highland Hills/Sedgewick	
Movement	NB Left
Design Speed	25 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	25 (vph)
Number of Through Lanes	1
Turning Volume	66 (vph)
Number of Turning Lanes	1
Design Condition	A (A, B, or C)
Percent Turning	73%
Vehicles Per Cycle	1.1
Storage Length	50 (feet)
Deceleration/Taper Length	50 (feet)
Calculated Turn Lane Length	100 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 1 - PM Peak Hour	
Big Walnut/Highland Hills/Sedgewick	
Movement	NB Left
Design Speed	25 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	20 (vph)
Number of Through Lanes	1
Turning Volume	30 (vph)
Number of Turning Lanes	1
Design Condition	A (A, B, or C)
Percent Turning	60%
Vehicles Per Cycle	0.5
Storage Length	50 (feet)
Deceleration/Taper Length	50 (feet)
Calculated Turn Lane Length	100 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2024 Alternative 1 - AM Peak Hour	
Big Walnut/Highland Hills/Sedgewick	
Movement	SB Left
Design Speed	25 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	20 (vph)
Number of Through Lanes	1
Turning Volume	10 (vph)
Number of Turning Lanes	1
Design Condition	A (A, B, or C)
Percent Turning	33%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	50 (feet)
Calculated Turn Lane Length	100 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 1 - PM Peak Hour	
Big Walnut/Highland Hills/Sedgewick	
Movement	SB Left
Design Speed	25 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	20 (vph)
Number of Through Lanes	1
Turning Volume	10 (vph)
Number of Turning Lanes	1
Design Condition	A (A, B, or C)
Percent Turning	33%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	50 (feet)
Calculated Turn Lane Length	100 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

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L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 1 - AM Peak Hour	
Big Walnut/Willow Bend/Grand Oak	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	1180 (vph)
Number of Through Lanes	2
Turning Volume	61 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	5%
Vehicles Per Cycle	1.0
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 1 - PM Peak Hour	
Big Walnut/Willow Bend/Grand Oak	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	1621 (vph)
Number of Through Lanes	2
Turning Volume	40 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	2%
Vehicles Per Cycle	0.7
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 1 - AM Peak Hour	
Big Walnut/Willow Bend/Grand Oak	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	843 (vph)
Number of Through Lanes	2
Turning Volume	9 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	1%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 1 - PM Peak Hour	
Big Walnut/Willow Bend/Grand Oak	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	954 (vph)
Number of Through Lanes	2
Turning Volume	30 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	3%
Vehicles Per Cycle	0.5
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

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L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 1 - AM Peak Hour	
Big Walnut/Willow Bend/Grand Oak	
Movement	NB Left
Design Speed	25 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	34 (vph)
Number of Through Lanes	1
Turning Volume	12 (vph)
Number of Turning Lanes	1
Design Condition	A (A, B, or C)
Percent Turning	26%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	50 (feet)
Calculated Turn Lane Length	100 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 1 - PM Peak Hour	
Big Walnut/Willow Bend/Grand Oak	
Movement	NB Left
Design Speed	25 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	30 (vph)
Number of Through Lanes	1
Turning Volume	20 (vph)
Number of Turning Lanes	1
Design Condition	A (A, B, or C)
Percent Turning	40%
Vehicles Per Cycle	0.3
Storage Length	50 (feet)
Deceleration/Taper Length	50 (feet)
Calculated Turn Lane Length	100 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 1 - AM Peak Hour	
Big Walnut/Willow Bend/Grand Oak	
Movement	SB Left
Design Speed	25 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	72 (vph)
Number of Through Lanes	1
Turning Volume	55 (vph)
Number of Turning Lanes	1
Design Condition	A (A, B, or C)
Percent Turning	43%
Vehicles Per Cycle	0.9
Storage Length	50 (feet)
Deceleration/Taper Length	50 (feet)
Calculated Turn Lane Length	100 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 1 - PM Peak Hour	
Big Walnut/Willow Bend/Grand Oak	
Movement	SB Left
Design Speed	25 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	40 (vph)
Number of Through Lanes	1
Turning Volume	30 (vph)
Number of Turning Lanes	1
Design Condition	A (A, B, or C)
Percent Turning	43%
Vehicles Per Cycle	0.5
Storage Length	50 (feet)
Deceleration/Taper Length	50 (feet)
Calculated Turn Lane Length	100 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

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2040 Alternative 1 - AM Peak Hour	
Big Walnut/Jeffries/Grandmere	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	1234 (vph)
Number of Through Lanes	2
Turning Volume	7 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	1%
Vehicles Per Cycle	0.1
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 1 - PM Peak Hour	
Big Walnut/Jeffries/Grandmere	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	1641 (vph)
Number of Through Lanes	2
Turning Volume	10 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	1%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 1 - AM Peak Hour	
Big Walnut/Jeffries/Grandmere	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	849 (vph)
Number of Through Lanes	2
Turning Volume	9 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	1%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 1 - PM Peak Hour	
Big Walnut/Jeffries/Grandmere	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	1014 (vph)
Number of Through Lanes	2
Turning Volume	10 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	1%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

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2040 Alternative 1 - AM Peak Hour	
Big Walnut/Worthington	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	1021 (vph)
Number of Through Lanes	2
Turning Volume	250 (vph)
Number of Turning Lanes	2
Design Condition	C (A, B, or C)
Percent Turning	20%
Vehicles Per Cycle	4.2
Storage Length	175 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	300 (feet)
Through Queue Distance	600 (feet)
No Block Turn Lane Length	600 (feet)

2040 Alternative 1 - PM Peak Hour	
Big Walnut/Worthington	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	913 (vph)
Number of Through Lanes	2
Turning Volume	762 (vph)
Number of Turning Lanes	2
Design Condition	C (A, B, or C)
Percent Turning	45%
Vehicles Per Cycle	12.7
Storage Length	475 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	600 (feet)
Through Queue Distance	525 (feet)
No Block Turn Lane Length	600 (feet)

2040 Alternative 1 - AM Peak Hour	
Big Walnut/Worthington	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	145 (vph)
Number of Through Lanes	2
Turning Volume	83 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	36%
Vehicles Per Cycle	2.8
Storage Length	150 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	275 (feet)
Through Queue Distance	100 (feet)
No Block Turn Lane Length	275 (feet)

2040 Alternative 1 - PM Peak Hour	
Big Walnut/Worthington	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	630 (vph)
Number of Through Lanes	2
Turning Volume	24 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	4%
Vehicles Per Cycle	0.8
Storage Length	50 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	400 (feet)
No Block Turn Lane Length	400 (feet)

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2040 Alternative 1 - AM Peak Hour	
Big Walnut/Worthington	
Movement	NB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	250 (vph)
Number of Through Lanes	1
Turning Volume	83 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	25%
Vehicles Per Cycle	2.8
Storage Length	150 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	275 (feet)
Through Queue Distance	325 (feet)
No Block Turn Lane Length	325 (feet)

2040 Alternative 1 - PM Peak Hour	
Big Walnut/Worthington	
Movement	NB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	631 (vph)
Number of Through Lanes	1
Turning Volume	143 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	18%
Vehicles Per Cycle	4.8
Storage Length	200 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	325 (feet)
Through Queue Distance	725 (feet)
No Block Turn Lane Length	725 (feet)

2040 Alternative 1 - AM Peak Hour	
Big Walnut/Worthington	
Movement	NB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	250 (vph)
Number of Through Lanes	1
Turning Volume	24 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	9%
Vehicles Per Cycle	0.8
Storage Length	50 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	325 (feet)
No Block Turn Lane Length	325 (feet)

2040 Alternative 1 - PM Peak Hour	
Big Walnut/Worthington	
Movement	NB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	631 (vph)
Number of Through Lanes	1
Turning Volume	36 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	5%
Vehicles Per Cycle	1.2
Storage Length	50 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	725 (feet)
No Block Turn Lane Length	725 (feet)

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2040 Alternative 1 - AM Peak Hour	
Big Walnut/Worthington	
Movement	SB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	571 (vph)
Number of Through Lanes	1
Turning Volume	179 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	24%
Vehicles Per Cycle	6.0
Storage Length	250 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	375 (feet)
Through Queue Distance	650 (feet)
No Block Turn Lane Length	650 (feet)

2040 Alternative 1 - PM Peak Hour	
Big Walnut/Worthington	
Movement	SB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	274 (vph)
Number of Through Lanes	1
Turning Volume	83 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	23%
Vehicles Per Cycle	2.8
Storage Length	150 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	275 (feet)
Through Queue Distance	350 (feet)
No Block Turn Lane Length	350 (feet)

2040 Alternative 1 - AM Peak Hour	
Big Walnut/Worthington	
Movement	SB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	571 (vph)
Number of Through Lanes	1
Turning Volume	702 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	55%
Vehicles Per Cycle	23.4
Storage Length	775 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	900 (feet)
Through Queue Distance	650 (feet)
No Block Turn Lane Length	900 (feet)

2040 Alternative 1 - PM Peak Hour	
Big Walnut/Worthington	
Movement	SB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	274 (vph)
Number of Through Lanes	1
Turning Volume	428 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	61%
Vehicles Per Cycle	14.3
Storage Length	500 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	625 (feet)
Through Queue Distance	350 (feet)
No Block Turn Lane Length	625 (feet)

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2040 Alternative 1 - AM Peak Hour	
Big Walnut/SR 3	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	656 (vph)
Number of Through Lanes	2
Turning Volume	162 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	20%
Vehicles Per Cycle	5.4
Storage Length	200 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	325 (feet)
Through Queue Distance	400 (feet)
No Block Turn Lane Length	400 (feet)

2040 Alternative 1 - PM Peak Hour	
Big Walnut/SR 3	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	402 (vph)
Number of Through Lanes	2
Turning Volume	225 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	36%
Vehicles Per Cycle	7.5
Storage Length	325 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	450 (feet)
Through Queue Distance	275 (feet)
No Block Turn Lane Length	450 (feet)

2040 Alternative 1 - AM Peak Hour	
Big Walnut/SR 3	
Movement	EB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	656 (vph)
Number of Through Lanes	2
Turning Volume	301 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	31%
Vehicles Per Cycle	10.0
Storage Length	375 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	500 (feet)
Through Queue Distance	400 (feet)
No Block Turn Lane Length	500 (feet)

2040 Alternative 1 - PM Peak Hour	
Big Walnut/SR 3	
Movement	EB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	402 (vph)
Number of Through Lanes	2
Turning Volume	203 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	34%
Vehicles Per Cycle	6.8
Storage Length	275 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	400 (feet)
Through Queue Distance	275 (feet)
No Block Turn Lane Length	400 (feet)

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2040 Alternative 1 - AM Peak Hour		
Big Walnut/SR 3		
Movement	WB Left	
Design Speed	45	(mph)
Cycle Length	120	(sec)
Type of Traffic Control	Signal	(Stop or Signal)
Through Volume	279	(vph)
Number of Through Lanes	2	
Turning Volume	220	(vph)
Number of Turning Lanes	1	
Design Condition	C	(A, B, or C)
Percent Turning	44%	
Vehicles Per Cycle	7.3	
Storage Length	275	(feet)
Deceleration/Taper Length	125	(feet)
Calculated Turn Lane Length	400	(feet)
Through Queue Distance	200	(feet)
No Block Turn Lane Length	400	(feet)

2040 Alternative 1 - PM Peak Hour		
Big Walnut/SR 3		
Movement	WB Left	
Design Speed	45	(mph)
Cycle Length	120	(sec)
Type of Traffic Control	Signal	(Stop or Signal)
Through Volume	541	(vph)
Number of Through Lanes	2	
Turning Volume	88	(vph)
Number of Turning Lanes	1	
Design Condition	C	(A, B, or C)
Percent Turning	14%	
Vehicles Per Cycle	2.9	
Storage Length	150	(feet)
Deceleration/Taper Length	125	(feet)
Calculated Turn Lane Length	275	(feet)
Through Queue Distance	350	(feet)
No Block Turn Lane Length	350	(feet)

2040 Alternative 1 - AM Peak Hour		
Big Walnut/SR 3		
Movement	NB Left	
Design Speed	55	(mph)
Cycle Length	120	(sec)
Type of Traffic Control	Signal	(Stop or Signal)
Through Volume	396	(vph)
Number of Through Lanes	2	
Turning Volume	45	(vph)
Number of Turning Lanes	1	
Design Condition	C	(A, B, or C)
Percent Turning	10%	
Vehicles Per Cycle	1.5	
Storage Length	100	(feet)
Deceleration/Taper Length	165	(feet)
Calculated Turn Lane Length	265	(feet)
Through Queue Distance	275	(feet)
No Block Turn Lane Length	275	(feet)

2040 Alternative 1 - PM Peak Hour		
Big Walnut/SR 3		
Movement	NB Left	
Design Speed	55	(mph)
Cycle Length	120	(sec)
Type of Traffic Control	Signal	(Stop or Signal)
Through Volume	1306	(vph)
Number of Through Lanes	2	
Turning Volume	268	(vph)
Number of Turning Lanes	1	
Design Condition	C	(A, B, or C)
Percent Turning	17%	
Vehicles Per Cycle	8.9	
Storage Length	350	(feet)
Deceleration/Taper Length	165	(feet)
Calculated Turn Lane Length	515	(feet)
Through Queue Distance	750	(feet)
No Block Turn Lane Length	750	(feet)

DEL-71-3.55 Big Walnut Interchange

L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 1 - AM Peak Hour			2040 Alternative 1 - PM Peak Hour		
Big Walnut/SR 3			Big Walnut/SR 3		
Movement	SB Left		Movement	SB Left	
Design Speed	55	(mph)	Design Speed	55	(mph)
Cycle Length	120	(sec)	Cycle Length	120	(sec)
Type of Traffic Control	Signal	(Stop or Signal)	Type of Traffic Control	Signal	(Stop or Signal)
Through Volume	1195	(vph)	Through Volume	582	(vph)
Number of Through Lanes	2		Number of Through Lanes	2	
Turning Volume	170	(vph)	Turning Volume	152	(vph)
Number of Turning Lanes	1		Number of Turning Lanes	1	
Design Condition	C	(A, B, or C)	Design Condition	C	(A, B, or C)
Percent Turning	12%		Percent Turning	21%	
Vehicles Per Cycle	5.7		Vehicles Per Cycle	5.1	
Storage Length	250	(feet)	Storage Length	200	(feet)
Deceleration/Taper Length	165	(feet)	Deceleration/Taper Length	165	(feet)
Calculated Turn Lane Length	415	(feet)	Calculated Turn Lane Length	365	(feet)
Through Queue Distance	675	(feet)	Through Queue Distance	375	(feet)
No Block Turn Lane Length	675	(feet)	No Block Turn Lane Length	375	(feet)

DEL-71-3.55 Big Walnut Interchange

L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 2 - AM Peak Hour	
Big Walnut/Africa	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	930 (vph)
Number of Through Lanes	2
Turning Volume	140 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	13%
Vehicles Per Cycle	4.7
Storage Length	200 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	325 (feet)
Through Queue Distance	550 (feet)
No Block Turn Lane Length	550 (feet)

2040 Alternative 2 - PM Peak Hour	
Big Walnut/Africa	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	830 (vph)
Number of Through Lanes	2
Turning Volume	300 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	27%
Vehicles Per Cycle	10.0
Storage Length	375 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	500 (feet)
Through Queue Distance	500 (feet)
No Block Turn Lane Length	500 (feet)

2040 Alternative 2 - AM Peak Hour	
Big Walnut/Africa	
Movement	EB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	930 (vph)
Number of Through Lanes	2
Turning Volume	620 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	40%
Vehicles Per Cycle	20.7
Storage Length	725 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	850 (feet)
Through Queue Distance	550 (feet)
No Block Turn Lane Length	850 (feet)

2040 Alternative 2 - PM Peak Hour	
Big Walnut/Africa	
Movement	EB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	830 (vph)
Number of Through Lanes	2
Turning Volume	180 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	18%
Vehicles Per Cycle	6.0
Storage Length	250 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	375 (feet)
Through Queue Distance	500 (feet)
No Block Turn Lane Length	500 (feet)

DEL-71-3.55 Big Walnut Interchange

L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 2 - AM Peak Hour	
Big Walnut/Africa	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	860 (vph)
Number of Through Lanes	2
Turning Volume	120 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	12%
Vehicles Per Cycle	4.0
Storage Length	175 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	300 (feet)
Through Queue Distance	500 (feet)
No Block Turn Lane Length	500 (feet)

2040 Alternative 2 - PM Peak Hour	
Big Walnut/Africa	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	1140 (vph)
Number of Through Lanes	2
Turning Volume	120 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	10%
Vehicles Per Cycle	4.0
Storage Length	175 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	300 (feet)
Through Queue Distance	650 (feet)
No Block Turn Lane Length	650 (feet)

2040 Alternative 2 - AM Peak Hour	
Big Walnut/Africa	
Movement	WB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	860 (vph)
Number of Through Lanes	2
Turning Volume	130 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	13%
Vehicles Per Cycle	4.3
Storage Length	175 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	300 (feet)
Through Queue Distance	500 (feet)
No Block Turn Lane Length	500 (feet)

2040 Alternative 2 - PM Peak Hour	
Big Walnut/Africa	
Movement	WB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	1140 (vph)
Number of Through Lanes	2
Turning Volume	300 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	21%
Vehicles Per Cycle	10.0
Storage Length	375 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	500 (feet)
Through Queue Distance	650 (feet)
No Block Turn Lane Length	650 (feet)

DEL-71-3.55 Big Walnut Interchange

L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 2 - AM Peak Hour	
Big Walnut/Africa	
Movement	NB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	100 (vph)
Number of Through Lanes	1
Turning Volume	270 (vph)
Number of Turning Lanes	2
Design Condition	C (A, B, or C)
Percent Turning	73%
Vehicles Per Cycle	4.5
Storage Length	200 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	325 (feet)
Through Queue Distance	150 (feet)
No Block Turn Lane Length	325 (feet)

2040 Alternative 2 - PM Peak Hour	
Big Walnut/Africa	
Movement	NB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	330 (vph)
Number of Through Lanes	1
Turning Volume	470 (vph)
Number of Turning Lanes	2
Design Condition	C (A, B, or C)
Percent Turning	59%
Vehicles Per Cycle	7.8
Storage Length	325 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	450 (feet)
Through Queue Distance	400 (feet)
No Block Turn Lane Length	450 (feet)

2040 Alternative 2 - AM Peak Hour	
Big Walnut/Africa	
Movement	SB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	340 (vph)
Number of Through Lanes	1
Turning Volume	60 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	15%
Vehicles Per Cycle	2.0
Storage Length	100 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	225 (feet)
Through Queue Distance	400 (feet)
No Block Turn Lane Length	400 (feet)

2040 Alternative 2 - PM Peak Hour	
Big Walnut/Africa	
Movement	SB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	210 (vph)
Number of Through Lanes	1
Turning Volume	60 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	22%
Vehicles Per Cycle	2.0
Storage Length	100 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	225 (feet)
Through Queue Distance	275 (feet)
No Block Turn Lane Length	275 (feet)

DEL-71-3.55 Big Walnut Interchange

L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 2 - AM Peak Hour	
Big Walnut/Africa	
Movement	SB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	340 (vph)
Number of Through Lanes	1
Turning Volume	260 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	43%
Vehicles Per Cycle	8.7
Storage Length	350 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	475 (feet)
Through Queue Distance	400 (feet)
No Block Turn Lane Length	475 (feet)

2040 Alternative 2 - PM Peak Hour	
Big Walnut/Africa	
Movement	SB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	210 (vph)
Number of Through Lanes	1
Turning Volume	180 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	46%
Vehicles Per Cycle	6.0
Storage Length	250 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	375 (feet)
Through Queue Distance	275 (feet)
No Block Turn Lane Length	375 (feet)

DEL-71-3.55 Big Walnut Interchange

L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 2 - AM Peak Hour	
I-71 SB Ramps/Africa	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	10 (vph)
Number of Through Lanes	1
Turning Volume	360 (vph)
Number of Turning Lanes	2
Design Condition	C (A, B, or C)
Percent Turning	97%
Vehicles Per Cycle	6.0
Storage Length	250 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	375 (feet)
Through Queue Distance	0 (feet)
No Block Turn Lane Length	375 (feet)

2040 Alternative 2 - PM Peak Hour	
I-71 SB Ramps/Africa	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	10 (vph)
Number of Through Lanes	1
Turning Volume	360 (vph)
Number of Turning Lanes	2
Design Condition	C (A, B, or C)
Percent Turning	97%
Vehicles Per Cycle	6.0
Storage Length	250 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	375 (feet)
Through Queue Distance	0 (feet)
No Block Turn Lane Length	375 (feet)

2040 Alternative 2 - AM Peak Hour	
I-71 SB Ramps/Africa	
Movement	NB Right
Design Speed	55 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	270 (vph)
Number of Through Lanes	2
Turning Volume	60 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	18%
Vehicles Per Cycle	2.0
Storage Length	100 (feet)
Deceleration/Taper Length	165 (feet)
Calculated Turn Lane Length	265 (feet)
Through Queue Distance	200 (feet)
No Block Turn Lane Length	265 (feet)

2040 Alternative 2 - PM Peak Hour	
I-71 SB Ramps/Africa	
Movement	NB Right
Design Speed	55 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	760 (vph)
Number of Through Lanes	2
Turning Volume	130 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	15%
Vehicles Per Cycle	4.3
Storage Length	175 (feet)
Deceleration/Taper Length	165 (feet)
Calculated Turn Lane Length	340 (feet)
Through Queue Distance	475 (feet)
No Block Turn Lane Length	475 (feet)

DEL-71-3.55 Big Walnut Interchange

L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 2 - AM Peak Hour	
I-71 SB Ramps/Africa	
Movement	SB Left
Design Speed	55 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	300 (vph)
Number of Through Lanes	2
Turning Volume	300 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	50%
Vehicles Per Cycle	10.0
Storage Length	375 (feet)
Deceleration/Taper Length	165 (feet)
Calculated Turn Lane Length	540 (feet)
Through Queue Distance	200 (feet)
No Block Turn Lane Length	540 (feet)

2040 Alternative 2 - PM Peak Hour	
I-71 SB Ramps/Africa	
Movement	SB Left
Design Speed	55 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	90 (vph)
Number of Through Lanes	2
Turning Volume	450 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	83%
Vehicles Per Cycle	15.0
Storage Length	525 (feet)
Deceleration/Taper Length	165 (feet)
Calculated Turn Lane Length	690 (feet)
Through Queue Distance	100 (feet)
No Block Turn Lane Length	690 (feet)

DEL-71-3.55 Big Walnut Interchange

L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 2 - AM Peak Hour	
Africa/Jaycox	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	50 (vph)
Number of Through Lanes	1
Turning Volume	40 (vph)
Number of Turning Lanes	1
Design Condition	A (A, B, or C)
Percent Turning	44%
Vehicles Per Cycle	0.7
Storage Length	50 (feet)
Deceleration/Taper Length	50 (feet)
Calculated Turn Lane Length	100 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 2 - PM Peak Hour	
Africa/Jaycox	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	30 (vph)
Number of Through Lanes	1
Turning Volume	90 (vph)
Number of Turning Lanes	1
Design Condition	A (A, B, or C)
Percent Turning	75%
Vehicles Per Cycle	1.5
Storage Length	100 (feet)
Deceleration/Taper Length	50 (feet)
Calculated Turn Lane Length	150 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 2 - AM Peak Hour	
Africa/Jaycox	
Movement	SB Left
Design Speed	55 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	560 (vph)
Number of Through Lanes	1
Turning Volume	40 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	7%
Vehicles Per Cycle	0.7
Storage Length	50 (feet)
Deceleration/Taper Length	285 (feet)
Calculated Turn Lane Length	285 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 2 - PM Peak Hour	
Africa/Jaycox	
Movement	SB Left
Design Speed	55 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	450 (vph)
Number of Through Lanes	1
Turning Volume	40 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	8%
Vehicles Per Cycle	0.7
Storage Length	50 (feet)
Deceleration/Taper Length	285 (feet)
Calculated Turn Lane Length	285 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

DEL-71-3.55 Big Walnut Interchange

L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 2 - AM Peak Hour	
I-71 NB Ramps/Big Walnut	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	870 (vph)
Number of Through Lanes	2
Turning Volume	160 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	16%
Vehicles Per Cycle	5.3
Storage Length	200 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	325 (feet)
Through Queue Distance	525 (feet)
No Block Turn Lane Length	525 (feet)

2040 Alternative 2 - PM Peak Hour	
I-71 NB Ramps/Big Walnut	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	720 (vph)
Number of Through Lanes	2
Turning Volume	210 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	23%
Vehicles Per Cycle	7.0
Storage Length	275 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	400 (feet)
Through Queue Distance	450 (feet)
No Block Turn Lane Length	450 (feet)

2040 Alternative 2 - AM Peak Hour	
I-71 NB Ramps/Big Walnut	
Movement	NB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	0 (vph)
Number of Through Lanes	0
Turning Volume	260 (vph)
Number of Turning Lanes	2
Design Condition	C (A, B, or C)
Percent Turning	100%
Vehicles Per Cycle	4.3
Storage Length	175 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	300 (feet)
Through Queue Distance	#DIV/0! (feet)
No Block Turn Lane Length	#DIV/0! (feet)

2040 Alternative 2 - PM Peak Hour	
I-71 NB Ramps/Big Walnut	
Movement	NB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	0 (vph)
Number of Through Lanes	0
Turning Volume	880 (vph)
Number of Turning Lanes	2
Design Condition	C (A, B, or C)
Percent Turning	100%
Vehicles Per Cycle	14.7
Storage Length	525 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	650 (feet)
Through Queue Distance	#DIV/0! (feet)
No Block Turn Lane Length	#DIV/0! (feet)

DEL-71-3.55 Big Walnut Interchange

L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 2 - AM Peak Hour	
I-71 NB Ramps/Big Walnut	
Movement	NB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	0 (vph)
Number of Through Lanes	0
Turning Volume	450 (vph)
Number of Turning Lanes	2
Design Condition	C (A, B, or C)
Percent Turning	100%
Vehicles Per Cycle	7.5
Storage Length	325 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	450 (feet)
Through Queue Distance	#DIV/0! (feet)
No Block Turn Lane Length	#DIV/0! (feet)

2040 Alternative 2 - PM Peak Hour	
I-71 NB Ramps/Big Walnut	
Movement	NB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	0 (vph)
Number of Through Lanes	0
Turning Volume	970 (vph)
Number of Turning Lanes	2
Design Condition	C (A, B, or C)
Percent Turning	100%
Vehicles Per Cycle	16.2
Storage Length	550 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	675 (feet)
Through Queue Distance	#DIV/0! (feet)
No Block Turn Lane Length	#DIV/0! (feet)

DEL-71-3.55 Big Walnut Interchange

L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 2 - AM Peak Hour	
Big Walnut/Medan/Whispering Ridge	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	1310 (vph)
Number of Through Lanes	2
Turning Volume	10 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	1%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 2 - PM Peak Hour	
Big Walnut/Medan/Whispering Ridge	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	1670 (vph)
Number of Through Lanes	2
Turning Volume	20 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	1%
Vehicles Per Cycle	0.3
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 2 - AM Peak Hour	
Big Walnut/Medan/Whispering Ridge	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	980 (vph)
Number of Through Lanes	2
Turning Volume	10 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	1%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 2 - PM Peak Hour	
Big Walnut/Medan/Whispering Ridge	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	750 (vph)
Number of Through Lanes	2
Turning Volume	10 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	1%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

DEL-71-3.55 Big Walnut Interchange

L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 2 - AM Peak Hour	
Big Walnut/Medan/Whispering Ridge	
Movement	NB Left
Design Speed	25 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	20 (vph)
Number of Through Lanes	1
Turning Volume	20 (vph)
Number of Turning Lanes	1
Design Condition	A (A, B, or C)
Percent Turning	50%
Vehicles Per Cycle	0.3
Storage Length	50 (feet)
Deceleration/Taper Length	50 (feet)
Calculated Turn Lane Length	100 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 2 - PM Peak Hour	
Big Walnut/Medan/Whispering Ridge	
Movement	NB Left
Design Speed	25 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	20 (vph)
Number of Through Lanes	1
Turning Volume	20 (vph)
Number of Turning Lanes	1
Design Condition	A (A, B, or C)
Percent Turning	50%
Vehicles Per Cycle	0.3
Storage Length	50 (feet)
Deceleration/Taper Length	50 (feet)
Calculated Turn Lane Length	100 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 2 - AM Peak Hour	
Big Walnut/Medan/Whispering Ridge	
Movement	SB Left
Design Speed	25 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	30 (vph)
Number of Through Lanes	1
Turning Volume	10 (vph)
Number of Turning Lanes	1
Design Condition	A (A, B, or C)
Percent Turning	25%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	50 (feet)
Calculated Turn Lane Length	100 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 2 - PM Peak Hour	
Big Walnut/Medan/Whispering Ridge	
Movement	SB Left
Design Speed	25 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	20 (vph)
Number of Through Lanes	1
Turning Volume	10 (vph)
Number of Turning Lanes	1
Design Condition	A (A, B, or C)
Percent Turning	33%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	50 (feet)
Calculated Turn Lane Length	100 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

DEL-71-3.55 Big Walnut Interchange

L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 2 - AM Peak Hour	
Big Walnut/Highland Hills/Sedgewick	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	1320 (vph)
Number of Through Lanes	2
Turning Volume	10 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	1%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 2 - PM Peak Hour	
Big Walnut/Highland Hills/Sedgewick	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	1676 (vph)
Number of Through Lanes	2
Turning Volume	10 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	1%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 2 - AM Peak Hour	
Big Walnut/Highland Hills/Sedgewick	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	934 (vph)
Number of Through Lanes	2
Turning Volume	5 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	1%
Vehicles Per Cycle	0.1
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 2 - PM Peak Hour	
Big Walnut/Highland Hills/Sedgewick	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	714 (vph)
Number of Through Lanes	2
Turning Volume	20 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	3%
Vehicles Per Cycle	0.3
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

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L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2024 Alternative 2 - AM Peak Hour	
Big Walnut/Highland Hills/Sedgewick	
Movement	NB Left
Design Speed	25 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	25 (vph)
Number of Through Lanes	1
Turning Volume	66 (vph)
Number of Turning Lanes	1
Design Condition	A (A, B, or C)
Percent Turning	73%
Vehicles Per Cycle	1.1
Storage Length	50 (feet)
Deceleration/Taper Length	50 (feet)
Calculated Turn Lane Length	100 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 2 - PM Peak Hour	
Big Walnut/Highland Hills/Sedgewick	
Movement	NB Left
Design Speed	25 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	25 (vph)
Number of Through Lanes	1
Turning Volume	30 (vph)
Number of Turning Lanes	1
Design Condition	A (A, B, or C)
Percent Turning	55%
Vehicles Per Cycle	0.5
Storage Length	50 (feet)
Deceleration/Taper Length	50 (feet)
Calculated Turn Lane Length	100 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2024 Alternative 2 - AM Peak Hour	
Big Walnut/Highland Hills/Sedgewick	
Movement	SB Left
Design Speed	25 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	20 (vph)
Number of Through Lanes	1
Turning Volume	10 (vph)
Number of Turning Lanes	1
Design Condition	A (A, B, or C)
Percent Turning	33%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	50 (feet)
Calculated Turn Lane Length	100 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 2 - PM Peak Hour	
Big Walnut/Highland Hills/Sedgewick	
Movement	SB Left
Design Speed	25 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	20 (vph)
Number of Through Lanes	1
Turning Volume	10 (vph)
Number of Turning Lanes	1
Design Condition	A (A, B, or C)
Percent Turning	33%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	50 (feet)
Calculated Turn Lane Length	100 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

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2040 Alternative 2 - AM Peak Hour	
Big Walnut/Willow Bend/Grand Oak	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	1259 (vph)
Number of Through Lanes	2
Turning Volume	62 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	5%
Vehicles Per Cycle	1.0
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 2 - PM Peak Hour	
Big Walnut/Willow Bend/Grand Oak	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	1626 (vph)
Number of Through Lanes	2
Turning Volume	40 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	2%
Vehicles Per Cycle	0.7
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 2 - AM Peak Hour	
Big Walnut/Willow Bend/Grand Oak	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	909 (vph)
Number of Through Lanes	2
Turning Volume	7 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	1%
Vehicles Per Cycle	0.1
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 2 - PM Peak Hour	
Big Walnut/Willow Bend/Grand Oak	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	663 (vph)
Number of Through Lanes	2
Turning Volume	30 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	4%
Vehicles Per Cycle	0.5
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

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2040 Alternative 2 - AM Peak Hour	
Big Walnut/Willow Bend/Grand Oak	
Movement	NB Left
Design Speed	25 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	34 (vph)
Number of Through Lanes	1
Turning Volume	12 (vph)
Number of Turning Lanes	1
Design Condition	A (A, B, or C)
Percent Turning	26%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	50 (feet)
Calculated Turn Lane Length	100 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 2 - PM Peak Hour	
Big Walnut/Willow Bend/Grand Oak	
Movement	NB Left
Design Speed	25 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	30 (vph)
Number of Through Lanes	1
Turning Volume	20 (vph)
Number of Turning Lanes	1
Design Condition	A (A, B, or C)
Percent Turning	40%
Vehicles Per Cycle	0.3
Storage Length	50 (feet)
Deceleration/Taper Length	50 (feet)
Calculated Turn Lane Length	100 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 2 - AM Peak Hour	
Big Walnut/Willow Bend/Grand Oak	
Movement	SB Left
Design Speed	25 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	72 (vph)
Number of Through Lanes	1
Turning Volume	55 (vph)
Number of Turning Lanes	1
Design Condition	A (A, B, or C)
Percent Turning	43%
Vehicles Per Cycle	0.9
Storage Length	50 (feet)
Deceleration/Taper Length	50 (feet)
Calculated Turn Lane Length	100 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 2 - PM Peak Hour	
Big Walnut/Willow Bend/Grand Oak	
Movement	SB Left
Design Speed	25 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	40 (vph)
Number of Through Lanes	1
Turning Volume	30 (vph)
Number of Turning Lanes	1
Design Condition	A (A, B, or C)
Percent Turning	43%
Vehicles Per Cycle	0.5
Storage Length	50 (feet)
Deceleration/Taper Length	50 (feet)
Calculated Turn Lane Length	100 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

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2040 Alternative 2 - AM Peak Hour	
Big Walnut/Jeffries/Grandmere	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	1313 (vph)
Number of Through Lanes	2
Turning Volume	13 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	1%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 2 - PM Peak Hour	
Big Walnut/Jeffries/Grandmere	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	1646 (vph)
Number of Through Lanes	2
Turning Volume	10 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	1%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 2 - AM Peak Hour	
Big Walnut/Jeffries/Grandmere	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	913 (vph)
Number of Through Lanes	2
Turning Volume	5 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	1%
Vehicles Per Cycle	0.1
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 2 - PM Peak Hour	
Big Walnut/Jeffries/Grandmere	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	709 (vph)
Number of Through Lanes	2
Turning Volume	10 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	1%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

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2040 Alternative 2 - AM Peak Hour	
Big Walnut/Worthington	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	1094 (vph)
Number of Through Lanes	2
Turning Volume	250 (vph)
Number of Turning Lanes	2
Design Condition	C (A, B, or C)
Percent Turning	19%
Vehicles Per Cycle	4.2
Storage Length	175 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	300 (feet)
Through Queue Distance	625 (feet)
No Block Turn Lane Length	625 (feet)

2040 Alternative 2 - PM Peak Hour	
Big Walnut/Worthington	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	918 (vph)
Number of Through Lanes	2
Turning Volume	762 (vph)
Number of Turning Lanes	2
Design Condition	C (A, B, or C)
Percent Turning	45%
Vehicles Per Cycle	12.7
Storage Length	475 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	600 (feet)
Through Queue Distance	525 (feet)
No Block Turn Lane Length	600 (feet)

2040 Alternative 2 - AM Peak Hour	
Big Walnut/Worthington	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	204 (vph)
Number of Through Lanes	2
Turning Volume	83 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	29%
Vehicles Per Cycle	2.8
Storage Length	150 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	275 (feet)
Through Queue Distance	150 (feet)
No Block Turn Lane Length	275 (feet)

2040 Alternative 2 - PM Peak Hour	
Big Walnut/Worthington	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	324 (vph)
Number of Through Lanes	2
Turning Volume	24 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	7%
Vehicles Per Cycle	0.8
Storage Length	50 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	200 (feet)
No Block Turn Lane Length	200 (feet)

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2040 Alternative 2 - AM Peak Hour	
Big Walnut/Worthington	
Movement	NB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	250 (vph)
Number of Through Lanes	1
Turning Volume	83 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	25%
Vehicles Per Cycle	2.8
Storage Length	150 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	275 (feet)
Through Queue Distance	325 (feet)
No Block Turn Lane Length	325 (feet)

2040 Alternative 2 - PM Peak Hour	
Big Walnut/Worthington	
Movement	NB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	631 (vph)
Number of Through Lanes	1
Turning Volume	143 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	18%
Vehicles Per Cycle	4.8
Storage Length	200 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	325 (feet)
Through Queue Distance	725 (feet)
No Block Turn Lane Length	725 (feet)

2040 Alternative 2 - AM Peak Hour	
Big Walnut/Worthington	
Movement	NB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	250 (vph)
Number of Through Lanes	1
Turning Volume	24 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	9%
Vehicles Per Cycle	0.8
Storage Length	50 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	325 (feet)
No Block Turn Lane Length	325 (feet)

2040 Alternative 2 - PM Peak Hour	
Big Walnut/Worthington	
Movement	NB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	631 (vph)
Number of Through Lanes	1
Turning Volume	36 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	5%
Vehicles Per Cycle	1.2
Storage Length	50 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	725 (feet)
No Block Turn Lane Length	725 (feet)

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2040 Alternative 2 - AM Peak Hour	
Big Walnut/Worthington	
Movement	SB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	571 (vph)
Number of Through Lanes	1
Turning Volume	179 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	24%
Vehicles Per Cycle	6.0
Storage Length	250 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	375 (feet)
Through Queue Distance	650 (feet)
No Block Turn Lane Length	650 (feet)

2040 Alternative 2 - PM Peak Hour	
Big Walnut/Worthington	
Movement	SB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	274 (vph)
Number of Through Lanes	1
Turning Volume	83 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	23%
Vehicles Per Cycle	2.8
Storage Length	150 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	275 (feet)
Through Queue Distance	350 (feet)
No Block Turn Lane Length	350 (feet)

2040 Alternative 2 - AM Peak Hour	
Big Walnut/Worthington	
Movement	SB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	571 (vph)
Number of Through Lanes	1
Turning Volume	702 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	55%
Vehicles Per Cycle	23.4
Storage Length	775 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	900 (feet)
Through Queue Distance	650 (feet)
No Block Turn Lane Length	900 (feet)

2040 Alternative 2 - PM Peak Hour	
Big Walnut/Worthington	
Movement	SB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	274 (vph)
Number of Through Lanes	1
Turning Volume	428 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	61%
Vehicles Per Cycle	14.3
Storage Length	500 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	625 (feet)
Through Queue Distance	350 (feet)
No Block Turn Lane Length	625 (feet)

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2040 Alternative 2 - AM Peak Hour	
Big Walnut/SR 3	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	700 (vph)
Number of Through Lanes	2
Turning Volume	172 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	20%
Vehicles Per Cycle	5.7
Storage Length	250 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	375 (feet)
Through Queue Distance	450 (feet)
No Block Turn Lane Length	450 (feet)

2040 Alternative 2 - PM Peak Hour	
Big Walnut/SR 3	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	398 (vph)
Number of Through Lanes	2
Turning Volume	223 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	36%
Vehicles Per Cycle	7.4
Storage Length	275 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	400 (feet)
Through Queue Distance	275 (feet)
No Block Turn Lane Length	400 (feet)

2040 Alternative 2 - AM Peak Hour	
Big Walnut/SR 3	
Movement	EB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	700 (vph)
Number of Through Lanes	2
Turning Volume	320 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	31%
Vehicles Per Cycle	10.7
Storage Length	400 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	525 (feet)
Through Queue Distance	450 (feet)
No Block Turn Lane Length	525 (feet)

2040 Alternative 2 - PM Peak Hour	
Big Walnut/SR 3	
Movement	EB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	398 (vph)
Number of Through Lanes	2
Turning Volume	214 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	35%
Vehicles Per Cycle	7.1
Storage Length	275 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	400 (feet)
Through Queue Distance	275 (feet)
No Block Turn Lane Length	400 (feet)

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2040 Alternative 2 - AM Peak Hour	
Big Walnut/SR 3	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	320 (vph)
Number of Through Lanes	2
Turning Volume	220 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	41%
Vehicles Per Cycle	7.3
Storage Length	275 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	400 (feet)
Through Queue Distance	200 (feet)
No Block Turn Lane Length	400 (feet)

2040 Alternative 2 - PM Peak Hour	
Big Walnut/SR 3	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	343 (vph)
Number of Through Lanes	2
Turning Volume	88 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	20%
Vehicles Per Cycle	2.9
Storage Length	150 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	275 (feet)
Through Queue Distance	250 (feet)
No Block Turn Lane Length	275 (feet)

2040 Alternative 2 - AM Peak Hour	
Big Walnut/SR 3	
Movement	NB Left
Design Speed	55 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	396 (vph)
Number of Through Lanes	2
Turning Volume	40 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	9%
Vehicles Per Cycle	1.3
Storage Length	50 (feet)
Deceleration/Taper Length	285 (feet)
Calculated Turn Lane Length	285 (feet)
Through Queue Distance	275 (feet)
No Block Turn Lane Length	285 (feet)

2040 Alternative 2 - PM Peak Hour	
Big Walnut/SR 3	
Movement	NB Left
Design Speed	55 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	1306 (vph)
Number of Through Lanes	2
Turning Volume	113 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	8%
Vehicles Per Cycle	3.8
Storage Length	175 (feet)
Deceleration/Taper Length	165 (feet)
Calculated Turn Lane Length	340 (feet)
Through Queue Distance	750 (feet)
No Block Turn Lane Length	750 (feet)

DEL-71-3.55 Big Walnut Interchange

L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 2 - AM Peak Hour	
Big Walnut/SR 3	
Movement	SB Left
Design Speed	55 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	1219 (vph)
Number of Through Lanes	2
Turning Volume	170 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	12%
Vehicles Per Cycle	5.7
Storage Length	250 (feet)
Deceleration/Taper Length	165 (feet)
Calculated Turn Lane Length	415 (feet)
Through Queue Distance	675 (feet)
No Block Turn Lane Length	675 (feet)

2040 Alternative 2 - PM Peak Hour	
Big Walnut/SR 3	
Movement	SB Left
Design Speed	55 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	549 (vph)
Number of Through Lanes	2
Turning Volume	152 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	22%
Vehicles Per Cycle	5.1
Storage Length	200 (feet)
Deceleration/Taper Length	165 (feet)
Calculated Turn Lane Length	365 (feet)
Through Queue Distance	350 (feet)
No Block Turn Lane Length	365 (feet)

DEL-71-3.55 Big Walnut Interchange

L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 3 - AM Peak Hour	
Big Walnut/Africa	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	930 (vph)
Number of Through Lanes	2
Turning Volume	60 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	6%
Vehicles Per Cycle	2.0
Storage Length	100 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	225 (feet)
Through Queue Distance	550 (feet)
No Block Turn Lane Length	550 (feet)

2040 Alternative 3 - PM Peak Hour	
Big Walnut/Africa	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	830 (vph)
Number of Through Lanes	2
Turning Volume	140 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	14%
Vehicles Per Cycle	4.7
Storage Length	200 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	325 (feet)
Through Queue Distance	500 (feet)
No Block Turn Lane Length	500 (feet)

2040 Alternative 3 - AM Peak Hour	
Big Walnut/Africa	
Movement	EB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	930 (vph)
Number of Through Lanes	2
Turning Volume	430 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	32%
Vehicles Per Cycle	14.3
Storage Length	500 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	625 (feet)
Through Queue Distance	550 (feet)
No Block Turn Lane Length	625 (feet)

2040 Alternative 3 - PM Peak Hour	
Big Walnut/Africa	
Movement	EB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	830 (vph)
Number of Through Lanes	2
Turning Volume	340 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	29%
Vehicles Per Cycle	11.3
Storage Length	400 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	525 (feet)
Through Queue Distance	500 (feet)
No Block Turn Lane Length	525 (feet)

DEL-71-3.55 Big Walnut Interchange

L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 3 - AM Peak Hour	
Big Walnut/Africa	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	830 (vph)
Number of Through Lanes	2
Turning Volume	130 (vph)
Number of Turning Lanes	2
Design Condition	C (A, B, or C)
Percent Turning	14%
Vehicles Per Cycle	2.2
Storage Length	100 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	225 (feet)
Through Queue Distance	500 (feet)
No Block Turn Lane Length	500 (feet)

2040 Alternative 3 - PM Peak Hour	
Big Walnut/Africa	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	1090 (vph)
Number of Through Lanes	2
Turning Volume	550 (vph)
Number of Turning Lanes	2
Design Condition	C (A, B, or C)
Percent Turning	34%
Vehicles Per Cycle	9.2
Storage Length	350 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	475 (feet)
Through Queue Distance	625 (feet)
No Block Turn Lane Length	625 (feet)

2040 Alternative 3 - AM Peak Hour	
Big Walnut/Africa	
Movement	WB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	830 (vph)
Number of Through Lanes	2
Turning Volume	90 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	10%
Vehicles Per Cycle	3.0
Storage Length	150 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	275 (feet)
Through Queue Distance	500 (feet)
No Block Turn Lane Length	500 (feet)

2040 Alternative 3 - PM Peak Hour	
Big Walnut/Africa	
Movement	WB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	1090 (vph)
Number of Through Lanes	2
Turning Volume	280 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	20%
Vehicles Per Cycle	9.3
Storage Length	350 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	475 (feet)
Through Queue Distance	625 (feet)
No Block Turn Lane Length	625 (feet)

DEL-71-3.55 Big Walnut Interchange

L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 3 - AM Peak Hour		
Big Walnut/Africa		
Movement	NB Left	
Design Speed	45	(mph)
Cycle Length	120	(sec)
Type of Traffic Control	Signal	(Stop or Signal)
Through Volume	120	(vph)
Number of Through Lanes	1	
Turning Volume	290	(vph)
Number of Turning Lanes	2	
Design Condition	C	(A, B, or C)
Percent Turning	71%	
Vehicles Per Cycle	4.8	
Storage Length	200	(feet)
Deceleration/Taper Length	125	(feet)
Calculated Turn Lane Length	325	(feet)
Through Queue Distance	175	(feet)
No Block Turn Lane Length	325	(feet)

2040 Alternative 3 - PM Peak Hour		
Big Walnut/Africa		
Movement	NB Left	
Design Speed	45	(mph)
Cycle Length	120	(sec)
Type of Traffic Control	Signal	(Stop or Signal)
Through Volume	350	(vph)
Number of Through Lanes	1	
Turning Volume	570	(vph)
Number of Turning Lanes	2	
Design Condition	C	(A, B, or C)
Percent Turning	62%	
Vehicles Per Cycle	9.5	
Storage Length	375	(feet)
Deceleration/Taper Length	125	(feet)
Calculated Turn Lane Length	500	(feet)
Through Queue Distance	450	(feet)
No Block Turn Lane Length	500	(feet)

2040 Alternative 3 - AM Peak Hour		
Big Walnut/Africa		
Movement	SB Left	
Design Speed	45	(mph)
Cycle Length	120	(sec)
Type of Traffic Control	Signal	(Stop or Signal)
Through Volume	350	(vph)
Number of Through Lanes	2	
Turning Volume	40	(vph)
Number of Turning Lanes	1	
Design Condition	C	(A, B, or C)
Percent Turning	10%	
Vehicles Per Cycle	1.3	
Storage Length	50	(feet)
Deceleration/Taper Length	125	(feet)
Calculated Turn Lane Length	175	(feet)
Through Queue Distance	250	(feet)
No Block Turn Lane Length	250	(feet)

2040 Alternative 3 - PM Peak Hour		
Big Walnut/Africa		
Movement	SB Left	
Design Speed	45	(mph)
Cycle Length	120	(sec)
Type of Traffic Control	Signal	(Stop or Signal)
Through Volume	190	(vph)
Number of Through Lanes	2	
Turning Volume	40	(vph)
Number of Turning Lanes	1	
Design Condition	C	(A, B, or C)
Percent Turning	17%	
Vehicles Per Cycle	1.3	
Storage Length	50	(feet)
Deceleration/Taper Length	125	(feet)
Calculated Turn Lane Length	175	(feet)
Through Queue Distance	150	(feet)
No Block Turn Lane Length	175	(feet)

DEL-71-3.55 Big Walnut Interchange

L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 3 - AM Peak Hour			2040 Alternative 3 - PM Peak Hour		
Big Walnut/Africa			Big Walnut/Africa		
Movement	SB Right		Movement	SB Right	
Design Speed	45	(mph)	Design Speed	45	(mph)
Cycle Length	120	(sec)	Cycle Length	120	(sec)
Type of Traffic Control	Signal	(Stop or Signal)	Type of Traffic Control	Signal	(Stop or Signal)
Through Volume	350	(vph)	Through Volume	190	(vph)
Number of Through Lanes	2		Number of Through Lanes	2	
Turning Volume	190	(vph)	Turning Volume	110	(vph)
Number of Turning Lanes	1		Number of Turning Lanes	1	
Design Condition	C	(A, B, or C)	Design Condition	C	(A, B, or C)
Percent Turning	35%		Percent Turning	37%	
Vehicles Per Cycle	6.3		Vehicles Per Cycle	3.7	
Storage Length	250	(feet)	Storage Length	175	(feet)
Deceleration/Taper Length	125	(feet)	Deceleration/Taper Length	125	(feet)
Calculated Turn Lane Length	375	(feet)	Calculated Turn Lane Length	300	(feet)
Through Queue Distance	250	(feet)	Through Queue Distance	150	(feet)
No Block Turn Lane Length	375	(feet)	No Block Turn Lane Length	300	(feet)

DEL-71-3.55 Big Walnut Interchange

L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 3 - AM Peak Hour	
I-71 SB Ramps/Africa	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	0 (vph)
Number of Through Lanes	0
Turning Volume	260 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	100%
Vehicles Per Cycle	8.7
Storage Length	350 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	475 (feet)
Through Queue Distance	#DIV/0! (feet)
No Block Turn Lane Length	#DIV/0! (feet)

2040 Alternative 3 - PM Peak Hour	
I-71 SB Ramps/Africa	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	0 (vph)
Number of Through Lanes	0
Turning Volume	190 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	100%
Vehicles Per Cycle	6.3
Storage Length	250 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	375 (feet)
Through Queue Distance	#DIV/0! (feet)
No Block Turn Lane Length	#DIV/0! (feet)

2040 Alternative 3 - AM Peak Hour	
I-71 SB Ramps/Africa	
Movement	WB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	0 (vph)
Number of Through Lanes	0
Turning Volume	60 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	100%
Vehicles Per Cycle	2.0
Storage Length	100 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	225 (feet)
Through Queue Distance	#DIV/0! (feet)
No Block Turn Lane Length	#DIV/0! (feet)

2040 Alternative 3 - PM Peak Hour	
I-71 SB Ramps/Africa	
Movement	WB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	0 (vph)
Number of Through Lanes	0
Turning Volume	80 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	100%
Vehicles Per Cycle	2.7
Storage Length	150 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	275 (feet)
Through Queue Distance	#DIV/0! (feet)
No Block Turn Lane Length	#DIV/0! (feet)

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L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 3 - AM Peak Hour	
I-71 SB Ramps/Africa	
Movement	NB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	350 (vph)
Number of Through Lanes	2
Turning Volume	240 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	41%
Vehicles Per Cycle	8.0
Storage Length	325 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	450 (feet)
Through Queue Distance	250 (feet)
No Block Turn Lane Length	450 (feet)

2040 Alternative 3 - PM Peak Hour	
I-71 SB Ramps/Africa	
Movement	NB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	840 (vph)
Number of Through Lanes	2
Turning Volume	110 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	12%
Vehicles Per Cycle	3.7
Storage Length	175 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	300 (feet)
Through Queue Distance	500 (feet)
No Block Turn Lane Length	500 (feet)

2040 Alternative 3 - AM Peak Hour	
I-71 SB Ramps/Africa	
Movement	SB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	600 (vph)
Number of Through Lanes	2
Turning Volume	310 (vph)
Number of Turning Lanes	2
Design Condition	C (A, B, or C)
Percent Turning	34%
Vehicles Per Cycle	5.2
Storage Length	200 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	325 (feet)
Through Queue Distance	375 (feet)
No Block Turn Lane Length	375 (feet)

2040 Alternative 3 - PM Peak Hour	
I-71 SB Ramps/Africa	
Movement	SB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	330 (vph)
Number of Through Lanes	2
Turning Volume	750 (vph)
Number of Turning Lanes	2
Design Condition	C (A, B, or C)
Percent Turning	69%
Vehicles Per Cycle	12.5
Storage Length	475 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	600 (feet)
Through Queue Distance	250 (feet)
No Block Turn Lane Length	600 (feet)

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L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 3 - AM Peak Hour	
I-71 NB Ramps/Big Walnut	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	860 (vph)
Number of Through Lanes	2
Turning Volume	160 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	16%
Vehicles Per Cycle	5.3
Storage Length	200 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	325 (feet)
Through Queue Distance	500 (feet)
No Block Turn Lane Length	500 (feet)

2040 Alternative 3 - PM Peak Hour	
I-71 NB Ramps/Big Walnut	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	710 (vph)
Number of Through Lanes	2
Turning Volume	210 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	23%
Vehicles Per Cycle	7.0
Storage Length	275 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	400 (feet)
Through Queue Distance	450 (feet)
No Block Turn Lane Length	450 (feet)

2040 Alternative 3 - AM Peak Hour	
I-71 NB Ramps/Big Walnut	
Movement	NB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	0 (vph)
Number of Through Lanes	0
Turning Volume	260 (vph)
Number of Turning Lanes	2
Design Condition	C (A, B, or C)
Percent Turning	100%
Vehicles Per Cycle	4.3
Storage Length	175 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	300 (feet)
Through Queue Distance	#DIV/0! (feet)
No Block Turn Lane Length	#DIV/0! (feet)

2040 Alternative 3 - PM Peak Hour	
I-71 NB Ramps/Big Walnut	
Movement	NB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	0 (vph)
Number of Through Lanes	0
Turning Volume	880 (vph)
Number of Turning Lanes	2
Design Condition	C (A, B, or C)
Percent Turning	100%
Vehicles Per Cycle	14.7
Storage Length	525 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	650 (feet)
Through Queue Distance	#DIV/0! (feet)
No Block Turn Lane Length	#DIV/0! (feet)

DEL-71-3.55 Big Walnut Interchange

L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 3 - AM Peak Hour		2040 Alternative 3 - PM Peak Hour	
I-71 NB Ramps/Big Walnut		I-71 NB Ramps/Big Walnut	
Movement	NB Right	Movement	NB Right
Design Speed	45 (mph)	Design Speed	45 (mph)
Cycle Length	120 (sec)	Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)	Type of Traffic Control	Signal (Stop or Signal)
Through Volume	0 (vph)	Through Volume	0 (vph)
Number of Through Lanes	0	Number of Through Lanes	0
Turning Volume	450 (vph)	Turning Volume	970 (vph)
Number of Turning Lanes	2	Number of Turning Lanes	2
Design Condition	C (A, B, or C)	Design Condition	C (A, B, or C)
Percent Turning	100%	Percent Turning	100%
Vehicles Per Cycle	7.5	Vehicles Per Cycle	16.2
Storage Length	325 (feet)	Storage Length	550 (feet)
Deceleration/Taper Length	125 (feet)	Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	450 (feet)	Calculated Turn Lane Length	675 (feet)
Through Queue Distance	#DIV/0! (feet)	Through Queue Distance	#DIV/0! (feet)
No Block Turn Lane Length	#DIV/0! (feet)	No Block Turn Lane Length	#DIV/0! (feet)

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L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 3 - AM Peak Hour	
Big Walnut/Medan/Whispering Ridge	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	1300 (vph)
Number of Through Lanes	2
Turning Volume	10 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	1%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 3 - PM Peak Hour	
Big Walnut/Medan/Whispering Ridge	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	1660 (vph)
Number of Through Lanes	2
Turning Volume	20 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	1%
Vehicles Per Cycle	0.3
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 3 - AM Peak Hour	
Big Walnut/Medan/Whispering Ridge	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	940 (vph)
Number of Through Lanes	2
Turning Volume	10 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	1%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 3 - PM Peak Hour	
Big Walnut/Medan/Whispering Ridge	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	1170 (vph)
Number of Through Lanes	2
Turning Volume	10 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	1%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

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L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 3 - AM Peak Hour	
Big Walnut/Medan/Whispering Ridge	
Movement	NB Left
Design Speed	25 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	20 (vph)
Number of Through Lanes	1
Turning Volume	20 (vph)
Number of Turning Lanes	1
Design Condition	A (A, B, or C)
Percent Turning	50%
Vehicles Per Cycle	0.3
Storage Length	50 (feet)
Deceleration/Taper Length	50 (feet)
Calculated Turn Lane Length	100 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 3 - PM Peak Hour	
Big Walnut/Medan/Whispering Ridge	
Movement	NB Left
Design Speed	25 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	20 (vph)
Number of Through Lanes	1
Turning Volume	20 (vph)
Number of Turning Lanes	1
Design Condition	A (A, B, or C)
Percent Turning	50%
Vehicles Per Cycle	0.3
Storage Length	50 (feet)
Deceleration/Taper Length	50 (feet)
Calculated Turn Lane Length	100 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 3 - AM Peak Hour	
Big Walnut/Medan/Whispering Ridge	
Movement	SB Left
Design Speed	25 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	30 (vph)
Number of Through Lanes	1
Turning Volume	10 (vph)
Number of Turning Lanes	1
Design Condition	A (A, B, or C)
Percent Turning	25%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	50 (feet)
Calculated Turn Lane Length	100 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 3 - PM Peak Hour	
Big Walnut/Medan/Whispering Ridge	
Movement	SB Left
Design Speed	25 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	20 (vph)
Number of Through Lanes	1
Turning Volume	10 (vph)
Number of Turning Lanes	1
Design Condition	A (A, B, or C)
Percent Turning	33%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	50 (feet)
Calculated Turn Lane Length	100 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

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L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 3 - AM Peak Hour	
Big Walnut/Highland Hills/Sedgewick	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	1310 (vph)
Number of Through Lanes	2
Turning Volume	10 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	1%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 3 - PM Peak Hour	
Big Walnut/Highland Hills/Sedgewick	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	1666 (vph)
Number of Through Lanes	2
Turning Volume	10 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	1%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 3 - AM Peak Hour	
Big Walnut/Highland Hills/Sedgewick	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	894 (vph)
Number of Through Lanes	2
Turning Volume	4 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	0%
Vehicles Per Cycle	0.1
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 3 - PM Peak Hour	
Big Walnut/Highland Hills/Sedgewick	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	1124 (vph)
Number of Through Lanes	2
Turning Volume	20 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	2%
Vehicles Per Cycle	0.3
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

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2024 Alternative 3 - AM Peak Hour		
Big Walnut/Highland Hills/Sedgewick		
Movement	NB Left	
Design Speed	25	(mph)
Cycle Length	60	(sec)
Type of Traffic Control	Stop	(Stop or Signal)
Through Volume	25	(vph)
Number of Through Lanes	1	
Turning Volume	66	(vph)
Number of Turning Lanes	1	
Design Condition	A	(A, B, or C)
Percent Turning	73%	
Vehicles Per Cycle	1.1	
Storage Length	50	(feet)
Deceleration/Taper Length	50	(feet)
Calculated Turn Lane Length	100	(feet)
Through Queue Distance	N.A.	(feet)
No Block Turn Lane Length	N.A.	(feet)

2040 Alternative 3 - PM Peak Hour		
Big Walnut/Highland Hills/Sedgewick		
Movement	NB Left	
Design Speed	25	(mph)
Cycle Length	60	(sec)
Type of Traffic Control	Stop	(Stop or Signal)
Through Volume	20	(vph)
Number of Through Lanes	1	
Turning Volume	30	(vph)
Number of Turning Lanes	1	
Design Condition	A	(A, B, or C)
Percent Turning	60%	
Vehicles Per Cycle	0.5	
Storage Length	50	(feet)
Deceleration/Taper Length	50	(feet)
Calculated Turn Lane Length	100	(feet)
Through Queue Distance	N.A.	(feet)
No Block Turn Lane Length	N.A.	(feet)

2024 Alternative 3 - AM Peak Hour		
Big Walnut/Highland Hills/Sedgewick		
Movement	SB Left	
Design Speed	25	(mph)
Cycle Length	60	(sec)
Type of Traffic Control	Stop	(Stop or Signal)
Through Volume	20	(vph)
Number of Through Lanes	1	
Turning Volume	10	(vph)
Number of Turning Lanes	1	
Design Condition	A	(A, B, or C)
Percent Turning	33%	
Vehicles Per Cycle	0.2	
Storage Length	50	(feet)
Deceleration/Taper Length	50	(feet)
Calculated Turn Lane Length	100	(feet)
Through Queue Distance	N.A.	(feet)
No Block Turn Lane Length	N.A.	(feet)

2040 Alternative 3 - PM Peak Hour		
Big Walnut/Highland Hills/Sedgewick		
Movement	SB Left	
Design Speed	25	(mph)
Cycle Length	60	(sec)
Type of Traffic Control	Stop	(Stop or Signal)
Through Volume	20	(vph)
Number of Through Lanes	1	
Turning Volume	10	(vph)
Number of Turning Lanes	1	
Design Condition	A	(A, B, or C)
Percent Turning	33%	
Vehicles Per Cycle	0.2	
Storage Length	50	(feet)
Deceleration/Taper Length	50	(feet)
Calculated Turn Lane Length	100	(feet)
Through Queue Distance	N.A.	(feet)
No Block Turn Lane Length	N.A.	(feet)

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2040 Alternative 3 - AM Peak Hour	
Big Walnut/Willow Bend/Grand Oak	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	1257 (vph)
Number of Through Lanes	2
Turning Volume	61 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	5%
Vehicles Per Cycle	1.0
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 3 - PM Peak Hour	
Big Walnut/Willow Bend/Grand Oak	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	1611 (vph)
Number of Through Lanes	2
Turning Volume	40 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	2%
Vehicles Per Cycle	0.7
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 3 - AM Peak Hour	
Big Walnut/Willow Bend/Grand Oak	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	868 (vph)
Number of Through Lanes	2
Turning Volume	7 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	1%
Vehicles Per Cycle	0.1
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 3 - PM Peak Hour	
Big Walnut/Willow Bend/Grand Oak	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	1080 (vph)
Number of Through Lanes	2
Turning Volume	30 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	3%
Vehicles Per Cycle	0.5
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

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2040 Alternative 3 - AM Peak Hour	
Big Walnut/Willow Bend/Grand Oak	
Movement	NB Left
Design Speed	25 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	34 (vph)
Number of Through Lanes	1
Turning Volume	12 (vph)
Number of Turning Lanes	1
Design Condition	A (A, B, or C)
Percent Turning	26%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	50 (feet)
Calculated Turn Lane Length	100 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 3 - PM Peak Hour	
Big Walnut/Willow Bend/Grand Oak	
Movement	NB Left
Design Speed	25 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	30 (vph)
Number of Through Lanes	1
Turning Volume	20 (vph)
Number of Turning Lanes	1
Design Condition	A (A, B, or C)
Percent Turning	40%
Vehicles Per Cycle	0.3
Storage Length	50 (feet)
Deceleration/Taper Length	50 (feet)
Calculated Turn Lane Length	100 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 3 - AM Peak Hour	
Big Walnut/Willow Bend/Grand Oak	
Movement	SB Left
Design Speed	25 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	72 (vph)
Number of Through Lanes	1
Turning Volume	55 (vph)
Number of Turning Lanes	1
Design Condition	A (A, B, or C)
Percent Turning	43%
Vehicles Per Cycle	0.9
Storage Length	50 (feet)
Deceleration/Taper Length	50 (feet)
Calculated Turn Lane Length	100 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 3 - PM Peak Hour	
Big Walnut/Willow Bend/Grand Oak	
Movement	SB Left
Design Speed	25 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	40 (vph)
Number of Through Lanes	1
Turning Volume	30 (vph)
Number of Turning Lanes	1
Design Condition	A (A, B, or C)
Percent Turning	43%
Vehicles Per Cycle	0.5
Storage Length	50 (feet)
Deceleration/Taper Length	50 (feet)
Calculated Turn Lane Length	100 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

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2040 Alternative 3 - AM Peak Hour	
Big Walnut/Jeffries/Grandmere	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	1312 (vph)
Number of Through Lanes	2
Turning Volume	6 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	0%
Vehicles Per Cycle	0.1
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 3 - PM Peak Hour	
Big Walnut/Jeffries/Grandmere	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	1631 (vph)
Number of Through Lanes	2
Turning Volume	10 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	1%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 3 - AM Peak Hour	
Big Walnut/Jeffries/Grandmere	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	872 (vph)
Number of Through Lanes	2
Turning Volume	9 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	1%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

2040 Alternative 3 - PM Peak Hour	
Big Walnut/Jeffries/Grandmere	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	60 (sec)
Type of Traffic Control	Stop (Stop or Signal)
Through Volume	1143 (vph)
Number of Through Lanes	2
Turning Volume	10 (vph)
Number of Turning Lanes	1
Design Condition	B (A, B, or C)
Percent Turning	1%
Vehicles Per Cycle	0.2
Storage Length	50 (feet)
Deceleration/Taper Length	175 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	N.A. (feet)
No Block Turn Lane Length	N.A. (feet)

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2040 Alternative 3 - AM Peak Hour	
Big Walnut/Worthington	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	981 (vph)
Number of Through Lanes	2
Turning Volume	250 (vph)
Number of Turning Lanes	2
Design Condition	C (A, B, or C)
Percent Turning	20%
Vehicles Per Cycle	4.2
Storage Length	175 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	300 (feet)
Through Queue Distance	550 (feet)
No Block Turn Lane Length	550 (feet)

2040 Alternative 3 - PM Peak Hour	
Big Walnut/Worthington	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	689 (vph)
Number of Through Lanes	2
Turning Volume	762 (vph)
Number of Turning Lanes	2
Design Condition	C (A, B, or C)
Percent Turning	53%
Vehicles Per Cycle	12.7
Storage Length	475 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	600 (feet)
Through Queue Distance	400 (feet)
No Block Turn Lane Length	600 (feet)

2040 Alternative 3 - AM Peak Hour	
Big Walnut/Worthington	
Movement	EB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	981 (vph)
Number of Through Lanes	2
Turning Volume	119 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	11%
Vehicles Per Cycle	4.0
Storage Length	175 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	300 (feet)
Through Queue Distance	550 (feet)
No Block Turn Lane Length	550 (feet)

2040 Alternative 3 - PM Peak Hour	
Big Walnut/Worthington	
Movement	EB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	689 (vph)
Number of Through Lanes	2
Turning Volume	214 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	24%
Vehicles Per Cycle	7.1
Storage Length	275 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	400 (feet)
Through Queue Distance	400 (feet)
No Block Turn Lane Length	400 (feet)

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2040 Alternative 3 - AM Peak Hour	
Big Walnut/Worthington	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	97 (vph)
Number of Through Lanes	2
Turning Volume	83 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	46%
Vehicles Per Cycle	2.8
Storage Length	150 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	275 (feet)
Through Queue Distance	100 (feet)
No Block Turn Lane Length	275 (feet)

2040 Alternative 3 - PM Peak Hour	
Big Walnut/Worthington	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	546 (vph)
Number of Through Lanes	2
Turning Volume	24 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	4%
Vehicles Per Cycle	0.8
Storage Length	50 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	350 (feet)
No Block Turn Lane Length	350 (feet)

2040 Alternative 3 - AM Peak Hour	
Big Walnut/Worthington	
Movement	WB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	97 (vph)
Number of Through Lanes	2
Turning Volume	71 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	42%
Vehicles Per Cycle	2.4
Storage Length	100 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	225 (feet)
Through Queue Distance	100 (feet)
No Block Turn Lane Length	225 (feet)

2040 Alternative 3 - PM Peak Hour	
Big Walnut/Worthington	
Movement	WB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	546 (vph)
Number of Through Lanes	2
Turning Volume	214 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	28%
Vehicles Per Cycle	7.1
Storage Length	275 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	400 (feet)
Through Queue Distance	350 (feet)
No Block Turn Lane Length	400 (feet)

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2040 Alternative 3 - AM Peak Hour	
Big Walnut/Worthington	
Movement	NB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	250 (vph)
Number of Through Lanes	1
Turning Volume	83 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	25%
Vehicles Per Cycle	2.8
Storage Length	150 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	275 (feet)
Through Queue Distance	325 (feet)
No Block Turn Lane Length	325 (feet)

2040 Alternative 3 - PM Peak Hour	
Big Walnut/Worthington	
Movement	NB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	631 (vph)
Number of Through Lanes	1
Turning Volume	143 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	18%
Vehicles Per Cycle	4.8
Storage Length	200 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	325 (feet)
Through Queue Distance	725 (feet)
No Block Turn Lane Length	725 (feet)

2040 Alternative 3 - AM Peak Hour	
Big Walnut/Worthington	
Movement	NB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	250 (vph)
Number of Through Lanes	1
Turning Volume	24 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	9%
Vehicles Per Cycle	0.8
Storage Length	50 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	325 (feet)
No Block Turn Lane Length	325 (feet)

2040 Alternative 3 - PM Peak Hour	
Big Walnut/Worthington	
Movement	NB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	631 (vph)
Number of Through Lanes	1
Turning Volume	36 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	5%
Vehicles Per Cycle	1.2
Storage Length	50 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	175 (feet)
Through Queue Distance	725 (feet)
No Block Turn Lane Length	725 (feet)

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2040 Alternative 3 - AM Peak Hour	
Big Walnut/Worthington	
Movement	SB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	571 (vph)
Number of Through Lanes	1
Turning Volume	179 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	24%
Vehicles Per Cycle	6.0
Storage Length	250 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	375 (feet)
Through Queue Distance	650 (feet)
No Block Turn Lane Length	650 (feet)

2040 Alternative 3 - PM Peak Hour	
Big Walnut/Worthington	
Movement	SB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	274 (vph)
Number of Through Lanes	1
Turning Volume	83 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	23%
Vehicles Per Cycle	2.8
Storage Length	150 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	275 (feet)
Through Queue Distance	350 (feet)
No Block Turn Lane Length	350 (feet)

2040 Alternative 3 - AM Peak Hour	
Big Walnut/Worthington	
Movement	SB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	571 (vph)
Number of Through Lanes	1
Turning Volume	702 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	55%
Vehicles Per Cycle	23.4
Storage Length	775 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	900 (feet)
Through Queue Distance	650 (feet)
No Block Turn Lane Length	900 (feet)

2040 Alternative 3 - PM Peak Hour	
Big Walnut/Worthington	
Movement	SB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	274 (vph)
Number of Through Lanes	1
Turning Volume	428 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	61%
Vehicles Per Cycle	14.3
Storage Length	500 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	625 (feet)
Through Queue Distance	350 (feet)
No Block Turn Lane Length	625 (feet)

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2040 Alternative 3 - AM Peak Hour	
Big Walnut/SR 3	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	709 (vph)
Number of Through Lanes	2
Turning Volume	171 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	19%
Vehicles Per Cycle	5.7
Storage Length	250 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	375 (feet)
Through Queue Distance	450 (feet)
No Block Turn Lane Length	450 (feet)

2040 Alternative 3 - PM Peak Hour	
Big Walnut/SR 3	
Movement	EB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	394 (vph)
Number of Through Lanes	2
Turning Volume	226 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	36%
Vehicles Per Cycle	7.5
Storage Length	325 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	450 (feet)
Through Queue Distance	275 (feet)
No Block Turn Lane Length	450 (feet)

2040 Alternative 3 - AM Peak Hour	
Big Walnut/SR 3	
Movement	EB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	709 (vph)
Number of Through Lanes	2
Turning Volume	318 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	31%
Vehicles Per Cycle	10.6
Storage Length	400 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	525 (feet)
Through Queue Distance	450 (feet)
No Block Turn Lane Length	525 (feet)

2040 Alternative 3 - PM Peak Hour	
Big Walnut/SR 3	
Movement	EB Right
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	394 (vph)
Number of Through Lanes	2
Turning Volume	200 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	34%
Vehicles Per Cycle	6.7
Storage Length	275 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	400 (feet)
Through Queue Distance	275 (feet)
No Block Turn Lane Length	400 (feet)

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2040 Alternative 3 - AM Peak Hour	
Big Walnut/SR 3	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	265 (vph)
Number of Through Lanes	2
Turning Volume	220 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	45%
Vehicles Per Cycle	7.3
Storage Length	275 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	400 (feet)
Through Queue Distance	175 (feet)
No Block Turn Lane Length	400 (feet)

2040 Alternative 3 - PM Peak Hour	
Big Walnut/SR 3	
Movement	WB Left
Design Speed	45 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	604 (vph)
Number of Through Lanes	2
Turning Volume	88 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	13%
Vehicles Per Cycle	2.9
Storage Length	150 (feet)
Deceleration/Taper Length	125 (feet)
Calculated Turn Lane Length	275 (feet)
Through Queue Distance	375 (feet)
No Block Turn Lane Length	375 (feet)

2040 Alternative 3 - AM Peak Hour	
Big Walnut/SR 3	
Movement	NB Left
Design Speed	55 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	396 (vph)
Number of Through Lanes	2
Turning Volume	59 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	13%
Vehicles Per Cycle	2.0
Storage Length	100 (feet)
Deceleration/Taper Length	165 (feet)
Calculated Turn Lane Length	265 (feet)
Through Queue Distance	275 (feet)
No Block Turn Lane Length	275 (feet)

2040 Alternative 3 - PM Peak Hour	
Big Walnut/SR 3	
Movement	NB Left
Design Speed	55 (mph)
Cycle Length	120 (sec)
Type of Traffic Control	Signal (Stop or Signal)
Through Volume	1306 (vph)
Number of Through Lanes	2
Turning Volume	324 (vph)
Number of Turning Lanes	1
Design Condition	C (A, B, or C)
Percent Turning	20%
Vehicles Per Cycle	10.8
Storage Length	400 (feet)
Deceleration/Taper Length	165 (feet)
Calculated Turn Lane Length	565 (feet)
Through Queue Distance	750 (feet)
No Block Turn Lane Length	750 (feet)

DEL-71-3.55 Big Walnut Interchange

L&D Sections 401.6.1, 401.6.3: Turn Lane Length Calculations

2040 Alternative 3 - AM Peak Hour			2040 Alternative 3 - PM Peak Hour		
Big Walnut/SR 3			Big Walnut/SR 3		
Movement	SB Left		Movement	SB Left	
Design Speed	55	(mph)	Design Speed	55	(mph)
Cycle Length	120	(sec)	Cycle Length	120	(sec)
Type of Traffic Control	Signal	(Stop or Signal)	Type of Traffic Control	Signal	(Stop or Signal)
Through Volume	1218	(vph)	Through Volume	593	(vph)
Number of Through Lanes	2		Number of Through Lanes	2	
Turning Volume	170	(vph)	Turning Volume	152	(vph)
Number of Turning Lanes	1		Number of Turning Lanes	1	
Design Condition	C	(A, B, or C)	Design Condition	C	(A, B, or C)
Percent Turning	12%		Percent Turning	20%	
Vehicles Per Cycle	5.7		Vehicles Per Cycle	5.1	
Storage Length	250	(feet)	Storage Length	200	(feet)
Deceleration/Taper Length	165	(feet)	Deceleration/Taper Length	165	(feet)
Calculated Turn Lane Length	415	(feet)	Calculated Turn Lane Length	365	(feet)
Through Queue Distance	675	(feet)	Through Queue Distance	375	(feet)
No Block Turn Lane Length	675	(feet)	No Block Turn Lane Length	375	(feet)

Appendix H
Crash Analysis

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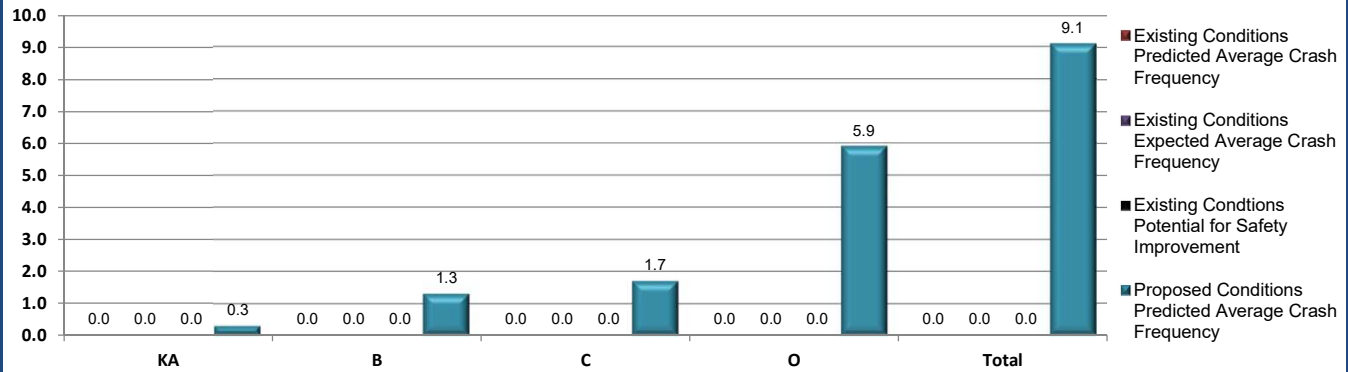


Project Safety Performance Report

General Information

Project Name	DEL-71-3.55	Contact Email	george.mohan@aecom.com
Project Description	Big Walnut Interchange - Alternative 1	Contact Phone	(216) 622-2300
Reference Number	PID 79608	Date Performed	6/3/2020
Analyst	GM	Analysis Year	2020
Agency/Company	AECOM		

Summary of Anticipated Safety Performance of the Project (average crashes/year)



Project Summary Results (Without Animal Crashes)

	KA	B	C	O	Total
N_{predicted} - Existing Conditions					0.0000
N_{expected} - Existing Conditions					0.0000
N_{potential for improvement} - Existing Conditions	0.0000	0.0000	0.0000	0.0000	0.0000
N_{expected} - Proposed Conditions	0.2616	1.3104	1.6610	5.8812	9.1142

Proposed Conditions Project Element Predicted Crash Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
RA1: 0-0.24	NB Off Ramp	0.081	0.3687	0.4811	0.7539	1.6847
RA2: 0-0.17	NB On Ramp	0.012	0.0991	0.1202	0.3251	0.5564
RA3: 0-0.28	SB Off Ramp	0.0702	0.2345	0.3343	1.8349	2.4739
RA4: 0-0.32	SB On Ramp	0.0984	0.6081	0.7254	2.9673	4.3992

Summary by Crash Type

Crash Type	Existing			Proposed
	Predicted Crash Frequency	Expected Crash Frequency	PSI	Predicted Crash Frequency
Unknown				0.0790
Head On				0.0000
Rear End				4.5951
Backing				0.0549
Sideswipe - Meeting				0.0901
Sideswipe - Passing				2.2365
Angle				0.1525
Parked Vehicle				0.4121
Pedestrian				0.0355
Animal				10.8733
Train				0.0000
Pedalcycles				0.0279
Other Non-Vehicle				0.0000
Fixed Object				4.9430
Other Object				0.1669
Overturning				0.2759
Other Non-Collision				0.3529
Left Turn				0.0434
Right Turn				0.0000

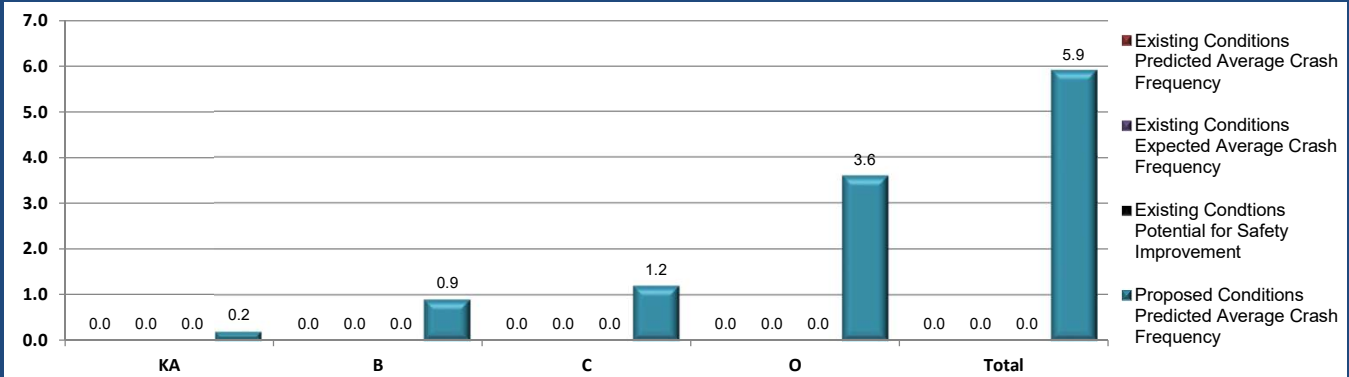


Project Safety Performance Report

General Information

Project Name	DEL-71-3.55	Contact Email	george.mohan@aecom.com
Project Description	Big Walnut Interchange - Alternative 2	Contact Phone	(216) 622-2300
Reference Number	PID 79608	Date Performed	6/3/2020
Analyst	GM	Analysis Year	2020
Agency/Company	AECOM		

Summary of Anticipated Safety Performance of the Project (average crashes/year)



Project Summary Results (Without Animal Crashes)

	KA	B	C	O	Total
N_{predicted} - Existing Conditions					0.0000
N_{expected} - Existing Conditions					0.0000
N_{potential for improvement} - Existing Conditions	0.0000	0.0000	0.0000	0.0000	0.0000
N_{expected} - Proposed Conditions	0.1734	0.9439	1.2379	3.5822	5.9374

Proposed Conditions Project Element Predicted Crash Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
RA1: 0-0.24	NB Off Ramp	0.081	0.3687	0.4811	0.7539	1.6847
RA2: 0-0.17	NB On Ramp	0.012	0.0991	0.1202	0.3251	0.5564
RA3: 0-0.27	SB Off Ramp	0.0368	0.1216	0.2067	0.8709	1.236
RA4: 0-0.3	SB On Ramp	0.0436	0.3545	0.4299	1.6323	2.4603

Summary by Crash Type

Crash Type	Existing			Proposed
	Predicted Crash Frequency	Expected Crash Frequency	PSI	Predicted Crash Frequency
Unknown				0.0299
Head On				0.0000
Rear End				2.2213
Backing				0.0232
Sideswipe - Meeting				0.0334
Sideswipe - Passing				1.0314
Angle				0.0640
Parked Vehicle				0.1769
Pedestrian				0.0161
Animal				4.1107
Train				0.0000
Pedalcycles				0.0153
Other Non-Vehicle				0.0000
Fixed Object				2.0065
Other Object				0.0542
Overturning				0.1133
Other Non-Collision				0.1372
Left Turn				0.0147
Right Turn				0.0000

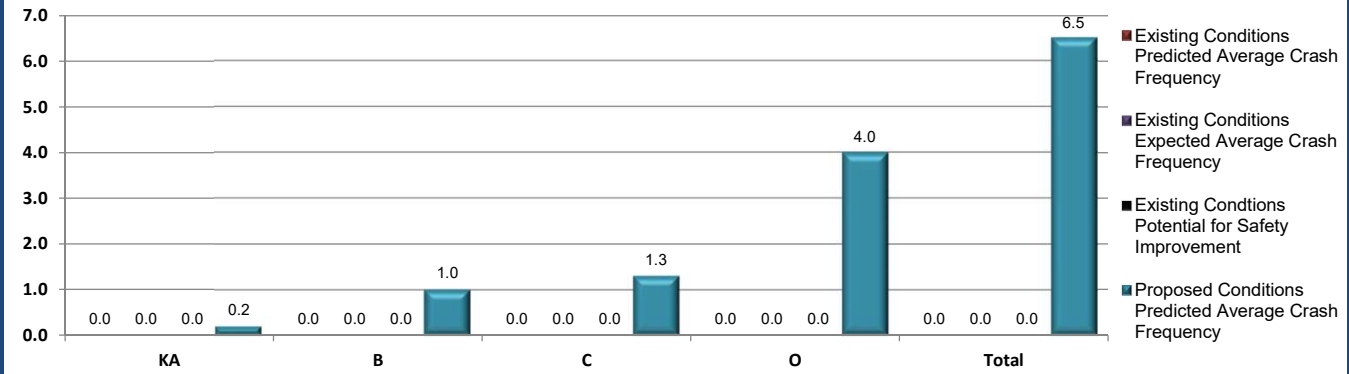


Project Safety Performance Report

General Information

Project Name	DEL-71-3.55	Contact Email	george.mohan@aecom.com
Project Description	Big Walnut Interchange - Alternative 3	Contact Phone	(216) 622-2300
Reference Number	PID 79608	Date Performed	6/3/2020
Analyst	GM	Analysis Year	2020
Agency/Company	AECOM		

Summary of Anticipated Safety Performance of the Project (average crashes/year)



Project Summary Results (Without Animal Crashes)

	KA	B	C	O	Total
N_{predicted} - Existing Conditions					0.0000
N_{expected} - Existing Conditions					0.0000
N_{potential for improvement} - Existing Conditions	0.0000	0.0000	0.0000	0.0000	0.0000
N_{expected} - Proposed Conditions	0.1887	1.0156	1.3415	3.9657	6.5115

Proposed Conditions Project Element Predicted Crash Summary (Without Animal Crashes)

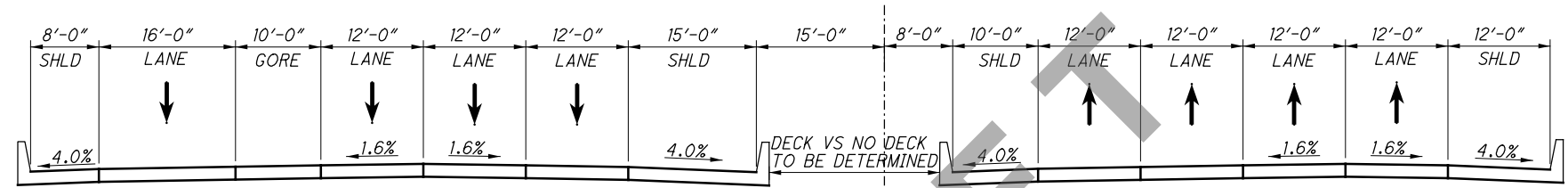
Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
RA1: 0-0.24	NB Off Ramp	0.081	0.3687	0.4811	0.7539	1.6847
RA2: 0-0.17	NB On Ramp	0.012	0.0991	0.1202	0.3251	0.5564
RA3: 0-0.32	SB Off Ramp	0.0342	0.1125	0.2165	0.8314	1.1946
RA4: 0-0.3	SB On Ramp	0.0615	0.4353	0.5237	2.0553	3.0758

Summary by Crash Type

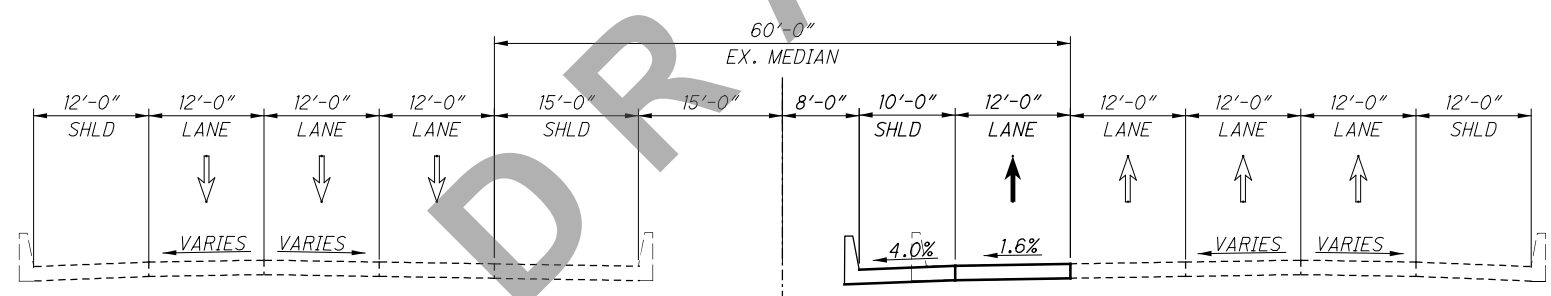
Crash Type	Existing			Proposed
	Predicted Crash Frequency	Expected Crash Frequency	PSI	Predicted Crash Frequency
Unknown				0.0416
Head On				0.0000
Rear End				3.9902
Backing				0.0481
Sideswipe - Meeting				0.0784
Sideswipe - Passing				1.9443
Angle				0.1340
Parked Vehicle				0.2649
Pedestrian				0.0126
Animal				6.3701
Train				0.0000
Pedalcycles				0.0136
Other Non-Vehicle				0.0000
Fixed Object				2.8967
Other Object				0.1092
Overturning				0.1883
Other Non-Collision				0.2287
Left Turn				0.0374
Right Turn				0.0000

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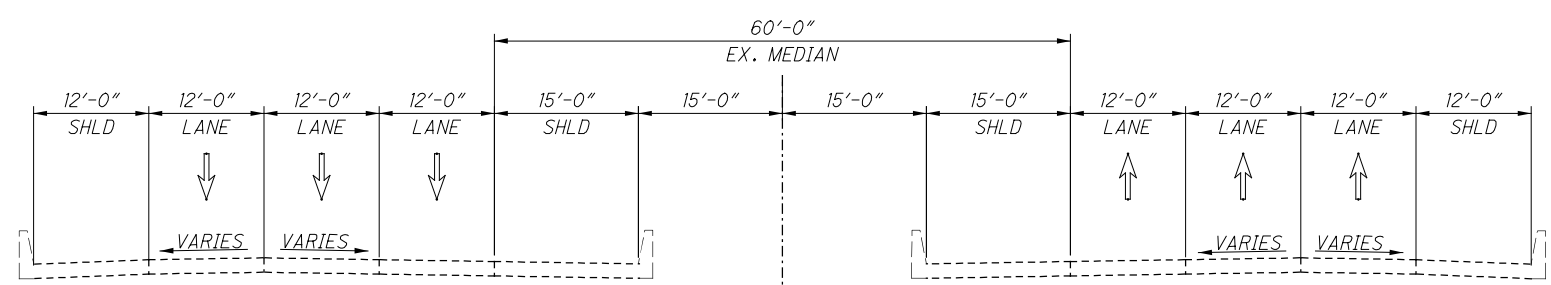
Appendix I
Bridge Drawings



I-71 PROPOSED BRIDGE TYPICAL - BIG WALNUT RD



I-71 PROPOSED BRIDGE TYPICAL - NB LANE WIDENING

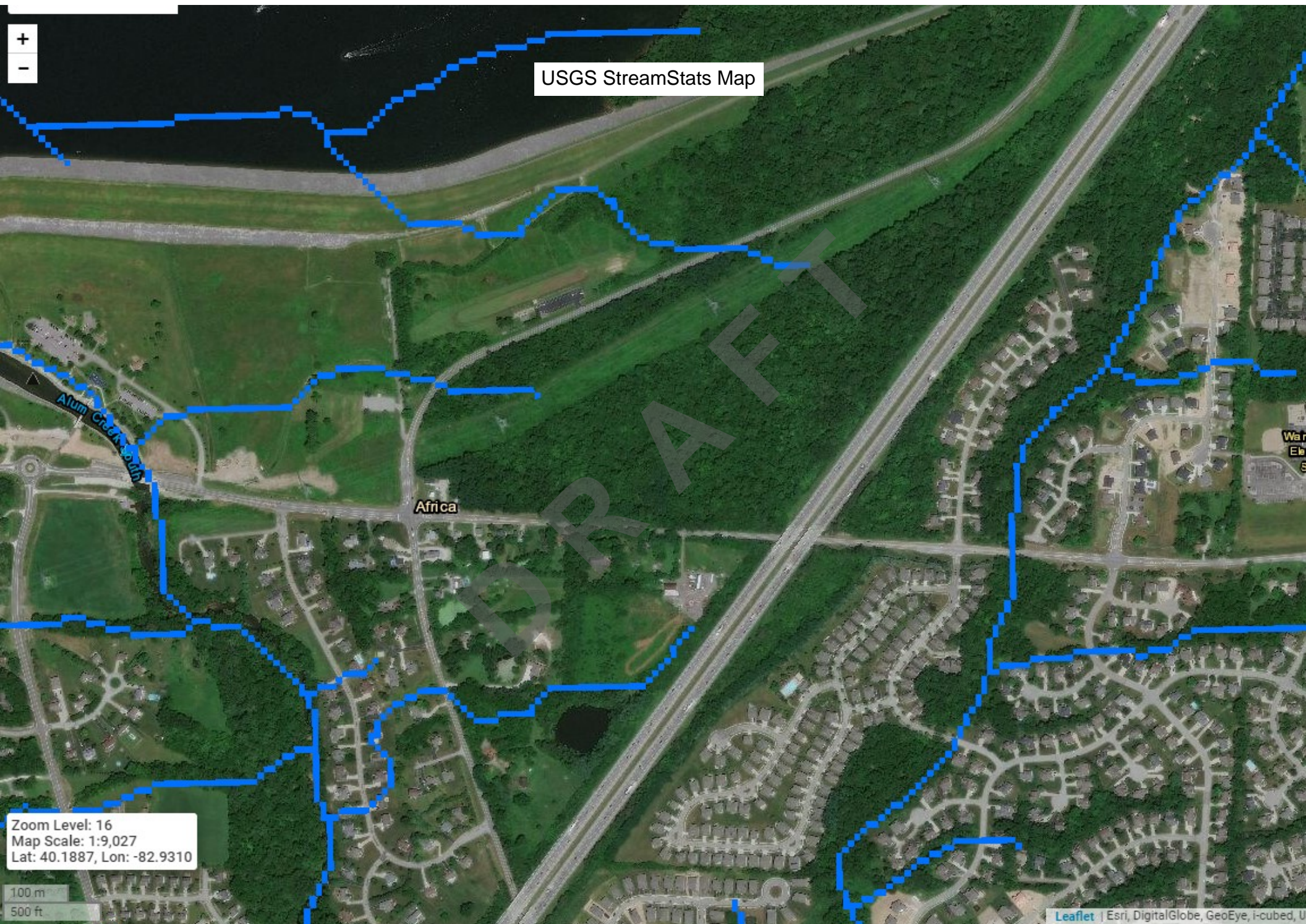


I-71 EXISTING BRIDGE TYPICAL

c:\pwworking\pitt\d171963\79608_GY1002.dgn 4/13/2017 4:16:33 PM BMCCUTCH

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Appendix J
Cultural Resources



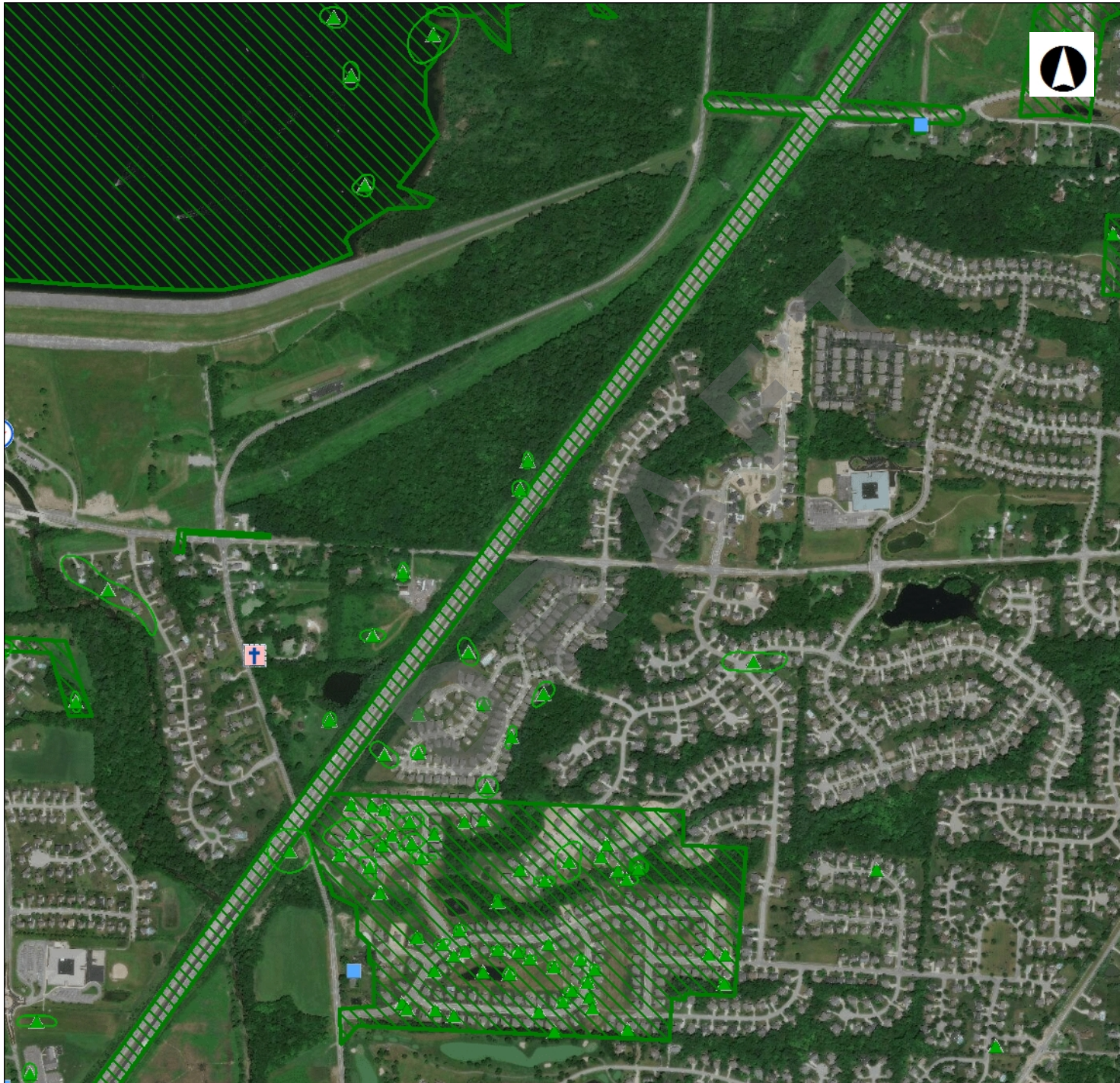
USGS StreamStats Map

Africa

Alum Creek South

Zoom Level: 16
Map Scale: 1:9,027
Lat: 40.1887, Lon: -82.9310

100 m
500 ft



State Historic
Preservation Office

Legend

NR Listings

- Listed
- National Historic Landmark
- ✕ Delisted

- ◆ NR Determinations of Eligibi
- ▲ Archaeological Sites
- Historic Structures
- Historic Bridges
- Historic Tax Credit Projects

OGS Cemeteries

- + Confident
- + Not Confident

Historic Markers

- ★ Historic Markers

UTM Zone Split

- UTM Zone Split

NR Boundaries

- OAI Site Boundaries

Phase1

- Phase1

Phase2

- Phase2

0 0.22 0.44 Miles



1: 17,358

Copyright/Disclaimer

This map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

Datum: [Datum]

Projection: WGS_1984_Web_Mercator_Auxiliary_Sphere



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Appendix K
Construction Cost Estimate
(Alternative 2)

Estimate

Estimated Cost:\$36,736,537.74

Contingency: 18.18%

Estimated Total: \$43,415,240.30

Big Walnut Road Interchange Feasibility Study Cost Estimate
Phase 1 - Big Walnut & Africa Road & Bridge Over Big Walnut

Base Date: 04/01/22

Spec Year: 16

Unit System: E

Work Type: ASPHALT

Highway Type: 441 (448) ON 301

Urban/Rural Type: RURAL CLASS

Season: SPRING

County: DELAWARE

Latitude of Midpoint: 0

Longitude of Midpoint: 0

District: 06

Federal/State Project Number: 79608

Prepared by AECOM on 01/04/19

Estimate:

<u>Line #</u>	<u>Item Number</u>	<u>Quantity</u>	<u>Units</u>	<u>Unit Price</u>	<u>Extension</u>
<u>Description</u>					
<u>Supplemental Description</u>					

Group 0001: ROADWAY

0001	201E11000 CLEARING AND GRUBBING	1.000	LS	\$20,000.00000	\$20,000.00
0003	202E23000 PAVEMENT REMOVED	74,910.000	SY	\$6.95207	\$520,779.56
0004	202E32500 CURB AND GUTTER REMOVED	6,276.000	FT	\$3.62176	\$22,730.17
0008	203E10000 EXCAVATION	205,468.000	CY	\$8.13853	\$1,672,207.48
0009	203E20000 EMBANKMENT	97,927.000	CY	\$6.25852	\$612,878.09
0010	204E10000 SUBGRADE COMPACTION	153,015.000	SY	\$1.15570	\$176,839.44
0091	204E45000 PROOF ROLLING	49.000	HOURL	\$178.02987	\$8,723.46

Total for Group 0001:\$3,034,158.20

Group 0002: EROSION CONTROL

0016	659E10000 SEEDING AND MULCHING	70,823.000	SY	\$0.56091	\$39,725.33
0017	659E14000 REPAIR SEEDING AND MULCHING	3,542.000	SY	\$0.55921	\$1,980.72
0018	659E15000 INTER-SEEDING	3,542.000	SY	\$0.19938	\$706.20
0019	659E20000 COMMERCIAL FERTILIZER	16.100	TON	\$554.26585	\$8,923.68
0020	659E31000 LIME	14.800	ACRE	\$30.44199	\$450.54
0021	659E35000 WATER	575.000	MGAL	\$0.78255	\$449.97
0022	832E15000 STORM WATER POLLUTION PREVENTION PLAN	1.000	LS	\$30,000.00000	\$30,000.00
0023	832E30000 EROSION CONTROL	300,000.000	EACH	\$1.00000	\$300,000.00

Total for Group 0002:\$382,236.44

Group 0003: DRAINAGE

0024	602E20000 CONCRETE MASONRY	3.000	CY	\$1,853.75497	\$5,561.26
0025	605E11100 6" SHALLOW PIPE UNDERDRAINS	14,297.000	FT	\$8.94237	\$127,849.06
0026	605E14000 6" BASE PIPE UNDERDRAINS	44,393.000	FT	\$6.17179	\$273,984.27

Estimate:

<u>Line #</u>	<u>Item Number</u>	<u>Quantity</u>	<u>Units</u>	<u>Unit Price</u>	<u>Extension</u>
<u>Description</u>					
<u>Supplemental Description</u>					
0027	611E00510 6" CONDUIT, TYPE F FOR UNDERDRAIN OUTLETS	140.000	FT	\$17.59944	\$2,463.92
0028	611E00900 6" CONDUIT, TYPE B	335.000	FT	\$35.64317	\$11,940.46
0029	611E04400 12" CONDUIT, TYPE B	3,150.000	FT	\$59.50850	\$187,451.78
0030	611E04600 12" CONDUIT, TYPE C	16.000	FT	\$62.08607	\$993.38
0031	611E05700 15" CONDUIT, TYPE A	58.000	FT	\$75.25611	\$4,364.85
0032	611E05900 15" CONDUIT, TYPE B	612.000	FT	\$67.75118	\$41,463.72
0033	611E07200 18" CONDUIT, TYPE A	75.000	FT	\$96.49592	\$7,237.19
0034	611E07400 18" CONDUIT, TYPE B	1,761.000	FT	\$63.06027	\$111,049.14
0035	611E08900 21" CONDUIT, TYPE B	290.000	FT	\$98.40929	\$28,538.69
0036	611E10200 24" CONDUIT, TYPE A	306.000	FT	\$73.23672	\$22,410.44
0037	611E10400 24" CONDUIT, TYPE B	2,552.000	FT	\$75.20413	\$191,920.94
0038	611E10600 24" CONDUIT, TYPE C	15.000	FT	\$122.15681	\$1,832.35
0039	611E98150 CATCH BASIN, NO. 3	9.000	EACH	\$3,018.29027	\$27,164.61
0040	611E98180 CATCH BASIN, NO. 3A	58.000	EACH	\$2,173.45818	\$126,060.57
0042	611E98470 CATCH BASIN, NO. 2-2B	1.000	EACH	\$1,515.94371	\$1,515.94
0043	611E99574 MANHOLE, NO. 3	31.000	EACH	\$3,020.39248	\$93,632.17
0044	611E99710 PRECAST REINFORCED CONCRETE OUTLET	17.000	EACH	\$282.04469	\$4,794.76
0087	611E99854 WATER QUALITY BASIN, DETENTION	15.000	EACH	\$30,000.00000	\$450,000.00

Total for Group 0003:\$1,722,229.50

Group 0004: PAVEMENT

0049	252E01500 FULL DEPTH PAVEMENT SAWING	11,235.000	FT	\$1.44105	\$16,190.20
0051	301E46000 ASPHALT CONCRETE BASE, PG64-22	29,995.000	CY	\$67.72336	\$2,031,362.18
0052	302E46000	10,787.000	CY	\$96.73662	\$1,043,497.92

Estimate:

<u>Line #</u>	<u>Item Number</u>	<u>Quantity</u>	<u>Units</u>	<u>Unit Price</u>	<u>Extension</u>
<u>Description</u>					
<u>Supplemental Description</u>					
ASPHALT CONCRETE BASE, PG64-22					
0053	304E20000 AGGREGATE BASE	28,235.000	CY	\$37.66636	\$1,063,509.67
0054	407E98010 TACK COAT, MISC.:	17,501.000	GAL	\$3.59110	\$62,847.84
0055	441E50000 ASPHALT CONCRETE SURFACE COURSE, TYPE 1, (448), PG64-22	4,971.000	CY	\$106.83206	\$531,062.17
0057	441E50300 ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, (448)	6,959.000	CY	\$103.11055	\$717,546.32
0059	452E10010 6" NON-REINFORCED CONCRETE PAVEMENT, CLASS QC1	6,355.000	SY	\$75.00000	\$476,625.00
0061	609E12000 COMBINATION CURB AND GUTTER, TYPE 2	15,865.000	FT	\$16.96639	\$269,171.78

Total for Group 0004:\$6,211,813.08

Group 0005: MAINTENANCE OF TRAFFIC

0064		1.000		\$1,276,559.22645	\$1,276,559.23
MOT - 4.5% of ESTIMATE					

Total for Group 0005:\$1,276,559.23

Group 0006: TRAFFIC CONTROL

0065	630E95000 SIGNING, MISC.:	1.000	LS	\$200,000.00000	\$200,000.00
0066	644E00104 EDGE LINE, 6"	10.000	MILE	\$2,858.63138	\$28,586.31
0067	644E00204 LANE LINE, 6"	7.000	MILE	\$1,445.70634	\$10,119.94
0068	644E00300 CENTER LINE	4.000	MILE	\$3,212.35888	\$12,849.44
0069	644E00400 CHANNELIZING LINE, 8"	10,020.000	FT	\$1.11748	\$11,197.15
0071	644E00700 TRANSVERSE/DIAGONAL LINE	3,532.000	FT	\$5.26505	\$18,596.16
0072	644E00900 ISLAND MARKING	67.000	SF	\$3.09222	\$207.18
0073	644E01300 LANE ARROW	79.000	EACH	\$1.27052	\$100.37
0086	644E01510 DOTTED LINE, 6"	1,210.000	FT	\$1.35008	\$1,633.60
0090	644E00500 STOP LINE	28.000	FT	\$5.04821	\$141.35

Total for Group 0006:\$283,431.50

Estimate:

<u>Line #</u>	<u>Item Number</u>	<u>Quantity</u>	<u>Units</u>	<u>Unit Price</u>	<u>Extension</u>
<u>Description</u>					
<u>Supplemental Description</u>					

Group 0007: STRUCTURE

0074	511E46610 CLASS QC1 CONCRETE, HEADWALL	54.000	CY	\$817.67879	\$44,154.65
0089	644E00500 STOP LINE	810.000	FT	\$5.04821	\$4,089.05
0092	530E00600 SPECIAL - STRUCTURES DEL-71-0355, OVER BIG WALNUT ROAD, NB/SB REPLACEMENT	47,000.000	SF	\$265.00000	\$12,455,000.00

Total for Group 0007:\$12,503,243.70

Group 0008: LIGHTING

0079	625E99000 SPECIAL - LIGHTING	1.000	LS	\$300,000.00000	\$300,000.00
------	---------------------------------	-------	----	-----------------	--------------

Total for Group 0008:\$300,000.00

Group 0009: RETAINING WALL

0093	610E60000 RETAINING WALL, MISC.:	1.000	LS	\$3,000,000.00000	\$3,000,000.00
------	-------------------------------------	-------	----	-------------------	----------------

Total for Group 0009:\$3,000,000.00

Group 0010: MISC.

0081	614E11000 MAINTAINING TRAFFIC	1.000	LS	\$75,000.00000	\$75,000.00
0083	623E10000 CONSTRUCTION LAYOUT STAKES AND SURVEYING	1.000	LS	\$20,000.00000	\$20,000.00
0084	624E10000 MOBILIZATION	1.000	LS	\$800,000.00000	\$800,000.00
0088	619E16020 FIELD OFFICE, TYPE C	16.000	MNTH	\$2,241.89936	\$35,870.39

Total for Group 0010:\$930,870.39

Group 0011: CONTINGENCY

0094	25% CONTINGENCY	1.000		\$7,091,995.70250	\$7,091,995.70
------	-----------------	-------	--	-------------------	----------------

Total for Group 0011:\$7,091,995.70

Estimate

Estimated Cost:\$18,017,735.96

Contingency: 37.00%

Estimated Total: \$24,684,298.27

Big Walnut Road Interchange Feasibility Study Cost Estimate
Phase 2 - I-71 Widening & Median Barrier

Base Date: 04/01/27

Spec Year: 16

Unit System: E

Work Type: ASPHALT

Highway Type: 441 (448) ON 301

Urban/Rural Type: RURAL CLASS

Season: SPRING

County: DELAWARE

Latitude of Midpoint: 0

Longitude of Midpoint: 0

District: 06

Federal/State Project Number: 79608

Prepared by AECOM on 01/04/19

Estimate:

<u>Line #</u>	<u>Item Number</u>	<u>Quantity</u>	<u>Units</u>	<u>Unit Price</u>	<u>Extension</u>
<u>Description</u>					
<u>Supplemental Description</u>					

Group 0001: ROADWAY

0001	201E11000 CLEARING AND GRUBBING	1.000	LS	\$10,000.00000	\$10,000.00
0002	202E22900 APPROACH SLAB REMOVED	606.000	SY	\$30.59013	\$18,537.62
0003	202E38000 GUARDRAIL REMOVED	1,672.000	FT	\$1.83890	\$3,074.64
0004	202E23000 PAVEMENT REMOVED	1,681.000	SY	\$11.03948	\$18,557.37
0006	202E42206 ANCHOR ASSEMBLY REMOVED	4.000	EACH	\$207.04712	\$828.19
0007	202E48000 CABLE BARRIER REMOVED	11,774.000	FT	\$1.30000	\$15,306.20
0008	203E10000 EXCAVATION	4,809.000	CY	\$15.26528	\$73,410.73
0009	203E20000 EMBANKMENT	3,740.000	CY	\$12.16242	\$45,487.45
0010	204E10000 SUBGRADE COMPACTION	13,633.000	SY	\$1.43600	\$19,576.99
0011	204E45000 PROOF ROLLING	7.000	HOUR	\$162.49566	\$1,137.47
0012	606E15050 GUARDRAIL, TYPE MGS	1,672.000	FT	\$16.16149	\$27,022.01
0013	606E26500 ANCHOR ASSEMBLY, TYPE T	7.000	EACH	\$690.26594	\$4,831.86
0014	606E35100 BRIDGE TERMINAL ASSEMBLY, TYPE 2	7.000	EACH	\$333.30990	\$2,333.17
0015	606E55000 SPECIAL - CABLE BARRIER	11,774.000	FT	\$15.00000	\$176,610.00
0086	622E23404 CONCRETE BARRIER, TYPE B1	14,000.000	FT	\$105.00000	\$1,470,000.00
0088	204E10000 SUBGRADE COMPACTION	37,334.000	SY	\$1.43600	\$53,611.62

Total for Group 0001:\$1,940,325.32

Group 0002: EROSION CONTROL

0016	659E10000 SEEDING AND MULCHING	9,177.000	SY	\$1.25911	\$11,554.85
0017	659E14000 REPAIR SEEDING AND MULCHING	458.000	SY	\$0.73272	\$335.59
0018	659E15000 INTER-SEEDING	458.000	SY	\$0.37526	\$171.87
0020	659E31000 LIME	1.700	ACRE	\$61.38144	\$104.35

Estimate:

<u>Line #</u>	<u>Item Number</u>	<u>Quantity</u>	<u>Units</u>	<u>Unit Price</u>	<u>Extension</u>
0022	832E15000 STORM WATER POLLUTION PREVENTION PLAN	1.000	LS	\$30,000.00000	\$30,000.00
0023	832E30000 EROSION CONTROL	50,000.000	EACH	\$1.00000	\$50,000.00

Total for Group 0002:\$92,166.66

Group 0003: DRAINAGE

0025	605E11100 6" SHALLOW PIPE UNDERDRAINS	14,426.000	FT	\$8.93496	\$128,895.73
0032	611E05900 15" CONDUIT, TYPE B	210.000	FT	\$70.76170	\$14,859.96
0041	611E98410 CATCH BASIN, NO. 8	14.000	EACH	\$3,501.87053	\$49,026.19
0045	611E16200 36" CONDUIT, TYPE A	41.000	FT	\$164.10600	\$6,728.35
0046	611E16400 36" CONDUIT, TYPE B	596.000	FT	\$126.08026	\$75,143.83
0047	611E16600 36" CONDUIT, TYPE C	21.000	FT	\$192.15559	\$4,035.27
0048	611E99854 WATER QUALITY BASIN, DETENTION	4.000	EACH	\$30,000.00000	\$120,000.00
0087	611E99100 INLET, NO. 3 FOR SINGLE SLOPE BARRIER, TYPE B1	28.000	EACH	\$10,000.00000	\$280,000.00

Total for Group 0003:\$678,689.33

Group 0004: PAVEMENT

0049	252E01500 FULL DEPTH PAVEMENT SAWING	13,197.000	FT	\$1.14093	\$15,056.85
0050	254E01000 PAVEMENT PLANING, ASPHALT CONCRETE	18,843.000	SY	\$2.70341	\$50,940.35
0051	301E46000 ASPHALT CONCRETE BASE, PG64-22	1,162.000	CY	\$82.32794	\$95,665.07
0052	302E46000 ASPHALT CONCRETE BASE, PG64-22	4,647.000	CY	\$106.76638	\$496,143.37
0053	304E20000 AGGREGATE BASE	3,885.000	CY	\$41.33751	\$160,596.23
0054	407E98010 TACK COAT, MISC.:	4,179.000	GAL	\$3.59110	\$15,007.21
0056	441E50100 ASPHALT CONCRETE SURFACE COURSE, TYPE 1, (448), PG70-22M	1,116.000	CY	\$157.48005	\$175,747.74
0057	441E50300 ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, (448)	1,563.000	CY	\$103.11055	\$161,161.79
0058	452E09010	554.000	SY	\$45.00000	\$24,930.00

Estimate:

<u>Line #</u>	<u>Item Number</u>	<u>Quantity</u>	<u>Units</u>	<u>Unit Price</u>	<u>Extension</u>
Description <u>Supplemental Description</u>					
4" NON-REINFORCED CONCRETE PAVEMENT, CLASS QC1					
0060	526E30000	489.000	SY	\$242.20360	\$118,437.56
REINFORCED CONCRETE APPROACH SLABS (T=17")					
0062	609E14000	946.000	FT	\$9.54693	\$9,031.40
CURB, TYPE 2-A					
0089	252E01500	14,000.000	FT	\$1.14093	\$15,973.02
FULL DEPTH PAVEMENT SAWING					
0090	301E46000	9,334.000	CY	\$82.32794	\$768,448.99
ASPHALT CONCRETE BASE, PG64-22					
0091	304E20000	6,223.000	CY	\$41.33751	\$257,243.32
AGGREGATE BASE					
0092	407E20000	2,240.000	GAL	\$3.69260	\$8,271.42
NON-TRACKING TACK COAT					
0093	441E50000	1,297.000	CY	\$134.62785	\$174,612.32
ASPHALT CONCRETE SURFACE COURSE, TYPE 1, (448), PG64-22					
0094	441E50300	1,815.000	CY	\$93.21761	\$169,189.96
ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, (448)					

Total for Group 0004:\$2,716,456.60

Group 0005: NOISE BARRIER

0063	606E10930	3,080.000	FT	\$500.00000	\$1,540,000.00
SPECIAL - NOISE BARRIER					

Total for Group 0005:\$1,540,000.00

Group 0006: MAINTENANCE OF TRAFFIC

0064		1.000		\$626,098.93290	\$626,098.93
MOT - 4.5% of ESTIMATE					

Total for Group 0006:\$626,098.93

Group 0007: TRAFFIC CONTROL

0065	630E95000	1.000	LS	\$100,000.00000	\$100,000.00
SIGNING, MISC.:					
0066	644E00104	5.000	MILE	\$2,960.76304	\$14,803.82
EDGE LINE, 6"					
0067	644E00204	4.000	MILE	\$1,589.29035	\$6,357.16
LANE LINE, 6"					
0073	644E01510	840.000	FT	\$1.43802	\$1,207.94
DOTTED LINE, 6"					

Total for Group 0007:\$122,368.92

Group 0008: STRUCTURE

0075	515E12050	1.000	EACH	\$11,000.00000	\$11,000.00
PRESTRESSED CONCRETE COMPOSITE BOX BEAM BRIDGE MEMBERS, LEVE L 1, CB21-48					

Estimate:

<u>Line #</u>	<u>Item Number</u>	<u>Quantity</u>	<u>Units</u>	<u>Unit Price</u>	<u>Extension</u>
0076	530E00600 SPECIAL - STRUCTURES DEL-71-0287, OVER ALUM CREEK, NB WIDENING	6,400.000	SF	\$265.00000	\$1,696,000.00
0077	530E00600 SPECIAL - STRUCTURES DEL-71-0287, OVER ALUM CREEK, NB WIDENING	11,040.000	SF	\$265.00000	\$2,925,600.00
0078	530E00600 SPECIAL - STRUCTURES DEL-71-307, OVER AFRICA ROAD, NB WIDENING	5,920.000	SF	\$265.00000	\$1,568,800.00
Total for Group 0008:\$6,201,400.00					

Group 0009: LIGHTING

0080	625E99000 SPECIAL - LIGHTING	1.000	LS	\$100,000.00000	\$100,000.00
Total for Group 0009:\$100,000.00					

Group 0010: MISC.

0082	614E11000 MAINTAINING TRAFFIC	1.000	LS	\$75,000.00000	\$75,000.00
0083	619E16020 FIELD OFFICE, TYPE C	12.000	MNTH	\$2,241.89936	\$26,902.79
0084	623E10000 CONSTRUCTION LAYOUT STAKES AND SURVEYING	1.000	LS	\$20,000.00000	\$20,000.00
0085	624E10000 MOBILIZATION	1.000	LS	\$400,000.00000	\$400,000.00
Total for Group 0010:\$521,902.79					

Group 0011: CONTINGENCY

0095	25% CONTINGENCY	1.000		\$3,478,327.40500	\$3,478,327.41
Total for Group 0011:\$3,478,327.41					