SKYLINE LANDFILL

APPENDIX IIC

TRANSPORTATION STUDY

SKYLINE LANDFILL

< TRANSPORTATION STUDY >

First Submittal: February 22, 2012
Revised: August 3, 2012

SKYLINE LANDFILL

< TRANSPORTATION STUDY >

Prepared for

Waste Management of Texas, Inc.

Prepared by

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First Submittal: February 22, 2012
Revised: August 3, 2012

of vehicular traffic counts. Daily traffic volumes were obtained for the following roadways within one-mile of the proposed facility using 24-hour electronic tube counters:

- IH 45 Southbound Frontage Road, north of Malloy Bridge Road
- IH 45 Northbound Frontage Road, north of Malloy Bridge Road
- IH 45 Southbound Frontage Road, south of FM 660
- IH 45 Northbound Frontage Road, south of FM 660
- N Central Street (BR 45), north of Landfill Driveway
- N Central Street (BR 45), south of Landfill Driveway
- Malloy Bridge Road, east of IH 45
- FM 660, east of BR 45
- FM 983, west of BR 45
- FM 664, west of FM 983
- E 5th Street, east of BR 45
- Skyline Landfill Driveway, west of BR 45

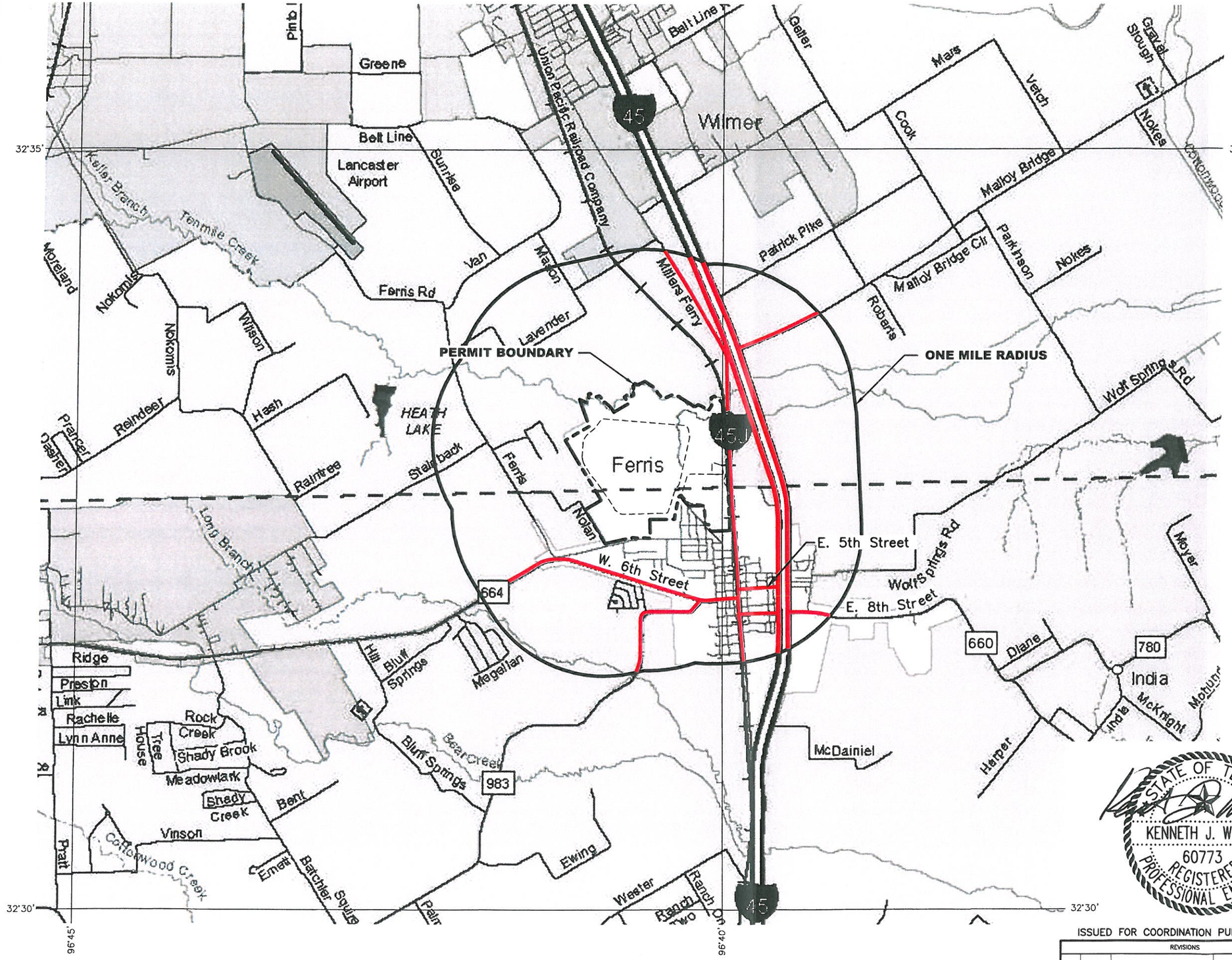
Turning movement counts were also collected at the following intersections:

- IH 45 and Malloy Bridge Road
- IH 45 and E 5th Street
- IH 45 and FM 660/E 8th Street
- N Central Street (BR 45)/~~S Dallas Avenue~~Miller's Ferry Road and Malloy Bridge Road
- N Central Street (BR 45) and Skyline Landfill Driveway
- Central Street (BR 45) and 5th Street
- S Central Street (BR 45) and FM 983/E 6th Street
- S Central Street (BR 45) and FM 660/W 8th Street
- FM 983 and FM 664

TxDOT, Dallas County, Ellis County, the City of Ferris, and the City of Wilmer were consulted regarding future roadway construction and load limits since area access roadways are under their jurisdictions. Information on population and traffic projections and proposed

A field study was conducted to note roadway conditions and intersection design for roadways which could be used by vehicles accessing the landfill. This information, combined with the roadway capacity analysis, was utilized to assess the availability and adequacy of the area roadway network. Descriptions of the following area roadways within one mile of the landfill site are provided:

- IH 45
- ~~S Dallas Avenue~~Miller's Ferry Road/BR 45 (Central Street)
- FM 660 (8th Street)
- FM 983 (6th Street)
- FM 664
- 5th Street
- Malloy Bridge Road
- Loop 9 (Future)



Legend

- IH, BI
- US, BU, UA, UP
- SH, BS
- SL, SS, PR
- FM, BF, RM, RR, RE, RS, PA
- County Road
- City Street or other Non-County Maintained Road
- Railroad
- Incorporated City
- Unincorporated Community
- Airport
- Airport
- Airport Runway
- School
- Military Installation
- Prison
- National or State Park
- National or State Forest
- Other Public Land
- Cemetery
- Dam
- County Line
- District Line
- Canal
- Flowing Stream
- Intermittent Stream
- River
- Gulf Intracoastal Waterway
- Other Body of Water
- PERMIT BOUNDARY
- LANDFILL FOOTPRINT
- ONE MILE RADIUS
- ACCESS ROADS WITHIN 1-MILE RADIUS

NOTE:

1. GENERAL HIGHWAY MAP DOWNLOADED FROM TxDOT WEBSITE AS PART OF THE COUNTY MAPBOOK 2010 ON JANUARY 31, 2012.

STATE OF TEXAS
KENNETH J. WELCH
60773
REGISTERED PROFESSIONAL ENGINEER
8/03/12

ISSUED FOR COORDINATION PURPOSES ONLY

REVISIONS							
REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY	
1	8/12	TECH NOD 1 RESPONSE	SRC	KJW	KJW	KJW	

DETAILED HIGHWAY MAP
DALLAS AND ELLIS COUNTY

WASTE MANAGEMENT OF TEXAS, INC.
SKYLINE LANDFILL
MAJOR PERMIT AMENDMENT

BIGGS & MATHEWS ENVIRONMENTAL
CONSULTING ENGINEERS
MANSFIELD • WICHITA FALLS
817-563-1144

TBPE FIRM NO. F-256 | TBPG FIRM NO. 50222

DSN. SAB | DATE : 02/12
DWN. SRC | SCALE : GRAPHIC
CHK. KJW | DWG : II.C-1_DetHwyMap.dwg

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SCALE IN FEET

LEGEND

- PERMIT BOUNDARY
- LANDFILL FOOTPRINT
- 550 EXISTING GROUND CONTOUR
- N 323000 STATE PLANE GRID (NAD 27)
- PHASE BOUNDARY
- PRE-SUBTITLE D AREA WITH FINAL COVER

NOTE:

1. EXISTING CONTOURS COMPILED BY AEROMETRIC FROM AERIAL PHOTOGRAPHY. FLOWN MARCH 6, 2011. COORDINATE SYSTEM IS BASED ON TEXAS STATE PLANE NAD 27, TEXAS NORTH CENTRAL ZONE, US FEET.

SUBTITLE D LANDFILL FOOTPRINT	
PHASE NO.	PLAN AREA (AC)
1A	64.9
1B	53.7
2	40.1
3	125.7
5	4.2
TOTAL	288.6
PRE-SUBTITLE D LANDFILL FOOTPRINT	
	68.3
TOTAL	356.9

STATE OF TEXAS
KENNETH J. WELCH
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8/03/12

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GENERAL SITE PLAN

WASTE MANAGEMENT OF TEXAS, INC.
SKYLINE LANDFILL
MAJOR PERMIT AMENDMENT

BIGGS & MATHEWS ENVIRONMENTAL
CONSULTING ENGINEERS
MANSFIELD • WICHITA FALLS
817-563-1144

TBPE FIRM NO. F-256 | TBPG FIRM NO. 50222

REVISIONS							
REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY	
1	8/12	TECH MOD 1 RESPONSE	SRC	KJW	KJW	KJW	

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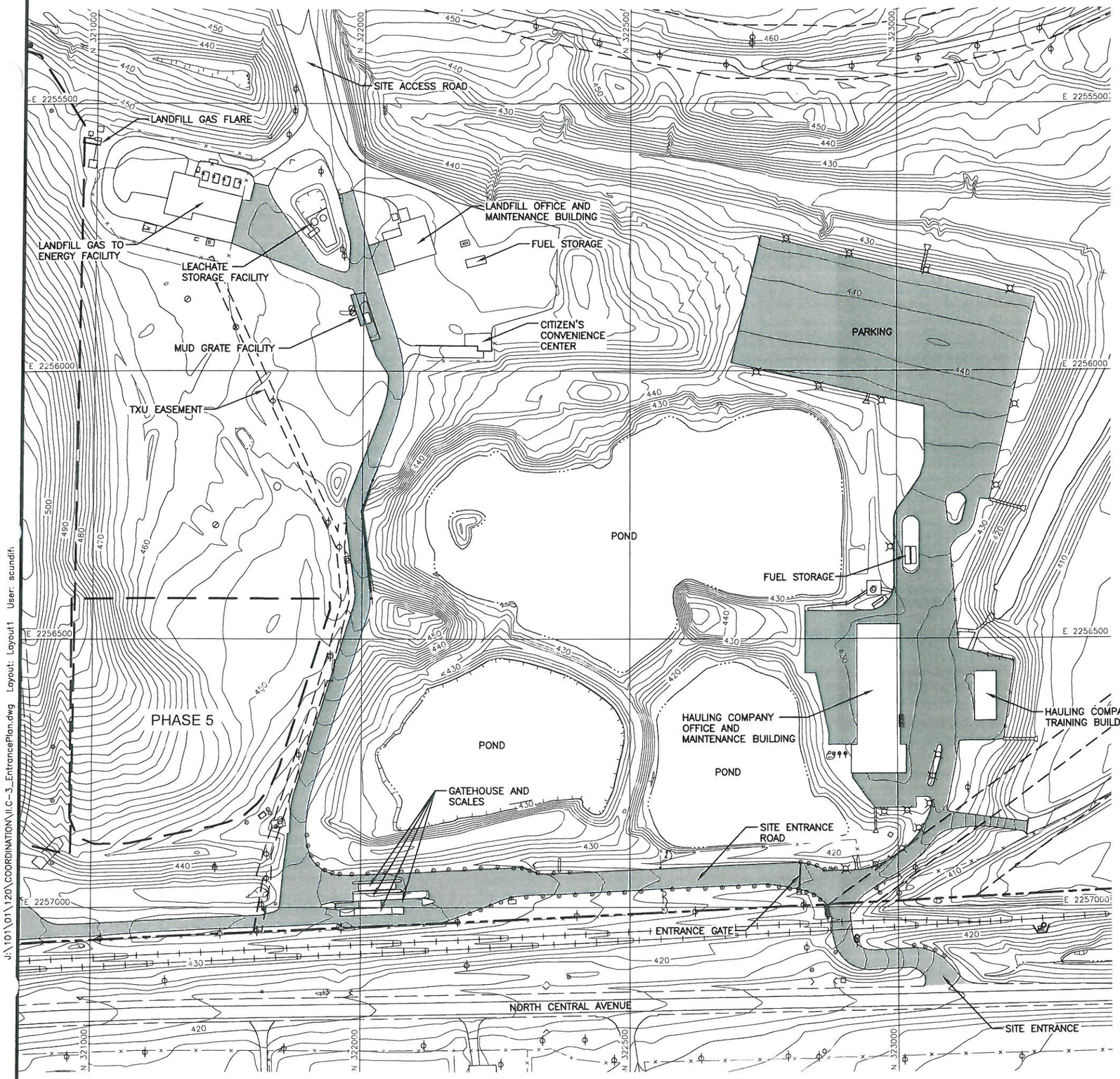

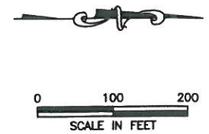

LEGEND

- PERMIT BOUNDARY
- LANDFILL FOOTPRINT
- 550 — EXISTING GROUND CONTOUR
- N 323000 — STATE PLANE GRID (NAD 27)
- CONCRETE PAVEMENT

NOTES:

1. EXISTING CONTOURS COMPILED BY AEROMETRIC FROM AERIAL PHOTOGRAPHY. FLOWN MARCH 6, 2011. COORDINATE SYSTEM IS BASED ON TEXAS STATE PLANE NAD 27, TEXAS NORTH CENTRAL ZONE, US FEET.

STATE OF TEXAS
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REVISIONS							
REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY	
1	8/12	TECH NOD 1 RESPONSE	SRC	KJW	KJW	KJW	

ENTRANCE ROAD AND ENTRANCE FACILITIES PLAN

WASTE MANAGEMENT OF TEXAS, INC.
SKYLINE LANDFILL
MAJOR PERMIT AMENDMENT

BIGGS & MATHEWS ENVIRONMENTAL
CONSULTING ENGINEERS
MANSFIELD • WICHITA FALLS
817-563-1144

TBPE FIRM NO. F-256 | TBPG FIRM NO. 50222

DSN. SAB | DATE : 02/12
DWN. SRC | SCALE : GRAPHIC
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volume data collected were reasonable, with the exception of the Skyline Landfill Driveway count. Based on discussions with Gram North Texas, the geometrics of this driveway did not provide for a reliable tube count; therefore, a supplemental turning movement count covering all of the operating hours of the facility was performed on November 10, 2011 in order to determine an accurate estimate of landfill trips.

Vehicle classification data were collected during the study at each of the study area intersections. This information was included in the visual turning movement counts to differentiate among the following vehicle types: waste vehicles, defined as waste collection vehicles, transfer trailers, open bed tractor/trailor trucks hauling solid waste, and pick-up trucks with trailers hauling waste; heavy vehicles that were not identified to be hauling solid waste; and all other vehicles, including passenger cars and buses. These vehicle classification counts are presented in Tables II.C-14 through II.C-24.

The traffic volume results described previously can be expected to vary throughout the year. As noted in AASHTO (Ref. 4), "The amount by which the volume of an average day is exceeded on certain days is appreciable and varied. At typical rural locations, the volume on certain days may be significantly higher than the ADT [average daily traffic]."

REFERENCES

1. Mobility 2035: The Metropolitan Transportation Plan for North Central Texas, North Central Texas Council of Governments, Arlington, Texas, March 2011.
2. 2011-2014 Transportation Improvement Program for North Central Texas, North Central Texas Council of Governments, Arlington, Texas, Approved on June 3, 2010, Amended on March 10, 2011.
3. 2000 - 2010 Traffic Maps, Dallas District, Texas Department of Transportation, http://www.txdot.gov/travel/planning_map.htm, Austin, Texas.
4. A Policy on Geometric Design of Highways and Streets, Sixth Edition, American Association of State Highway and Transportation Officials, Washington, D.C., 2011.
5. Highway Capacity Manual, Transportation Research Board, Washington, D.C., 2010.
6. HCS2000 Highway Capacity Software, v4.1f, McTrans Center, University of Florida, Gainesville, Florida, 2003.
7. David Husch, John Albeck, "Synchro 7.0", Trafficware, Albany, California, 2007
8. Skyline Landfill Traffic Projections, WMI Skyline Landfill Permit Amendment, Prepared by Biggs & Matthews Environmental, Appendix 12 to Appendix II.C, January 24, 2012.

APPENDIX

1. TxDOT-Dallas Coordination Letter ____ II.C-56
2. TxDOT-Ellis Coordination Letter ____ II.C-59
3. City of Ferris Coordination Letter ____ II.C-62
4. City of Wilmer Coordination Letter ____ II.C-65
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12. Skyline Landfill Traffic Projections ____ II.C-113
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HCM Unsignalized Intersection Capacity Analysis
1: MILLER'S FERRY RD & IH 45 SBFR

7/11/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	7	15	36	5	0	26	0	161	35	94	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	8	17	40	6	0	29	0	179	39	104	1

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	24	46	208	39	106
Volume Left (vph)	0	40	29	39	0
Volume Right (vph)	17	0	179	0	1
Hadj (s)	-0.17	0.41	-0.25	0.74	0.23
Departure Headway (s)	4.6	5.1	4.1	5.6	5.1
Degree Utilization, x	0.03	0.07	0.24	0.06	0.15
Capacity (veh/h)	717	648	855	627	692
Control Delay (s)	7.7	8.5	8.4	7.7	7.7
Approach Delay (s)	7.7	8.5	8.4	7.7	
Approach LOS	A	A	A	A	

Intersection Summary				
Delay	8.1			
HCM Level of Service	A			
Intersection Capacity Utilization	33.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	128	54	0	0	68	22	11	3	38	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.86	0.86	0.86
Hourly flow rate (vph)	135	57	0	0	72	23	12	3	40	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	192	95	55
Volume Left (vph)	135	0	12
Volume Right (vph)	0	23	40
Hadj (s)	0.31	0.02	-0.23
Departure Headway (s)	4.4	4.3	4.3
Degree Utilization, x	0.24	0.11	0.07
Capacity (veh/h)	797	827	776
Control Delay (s)	8.8	7.8	7.6
Approach Delay (s)	8.8	7.8	7.6
Approach LOS	A	A	A

Intersection Summary				
Delay		8.3		
HCM Level of Service		A		
Intersection Capacity Utilization		26.6%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	29	4	3	165	110	34
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	30	4	3	172	115	35
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	310	132	150			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	310	132	150			
tC, single (s)	6.6	6.4	4.3			
tC, 2 stage (s)						
tF (s)	3.7	3.5	2.4			
p0 queue free %	95	100	100			
cM capacity (veh/h)	647	874	1334			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	34	175	150
Volume Left	30	3	0
Volume Right	4	0	35
cSH	668	1334	1700
Volume to Capacity	0.05	0.00	0.09
Queue Length 95th (ft)	4	0	0
Control Delay (s)	10.7	0.2	0.0
Lane LOS	B	A	
Approach Delay (s)	10.7	0.2	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	21.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	38	136	15	87	72	13	19	111	155	8	93	18
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	43	153	17	98	81	15	21	125	174	9	104	20

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	212	193	320	134
Volume Left (vph)	43	98	21	9
Volume Right (vph)	17	15	174	20
Hadj (s)	0.01	0.07	-0.30	-0.06
Departure Headway (s)	5.4	5.5	5.0	5.5
Degree Utilization, x	0.32	0.30	0.44	0.20
Capacity (veh/h)	604	593	671	585
Control Delay (s)	11.0	10.9	11.9	9.9
Approach Delay (s)	11.0	10.9	11.9	9.9
Approach LOS	B	B	B	A

Intersection Summary				
Delay		11.1		
HCM Level of Service		B		
Intersection Capacity Utilization		48.1%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	199	23	151	2	39	5	212	64	1	1	54	112
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	226	26	172	2	44	6	241	73	1	1	61	127

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	424	52	315	190
Volume Left (vph)	226	2	241	1
Volume Right (vph)	172	6	1	127
Hadj (s)	-0.12	-0.04	0.17	-0.38
Departure Headway (s)	5.3	6.1	5.7	5.4
Degree Utilization, x	0.63	0.09	0.50	0.29
Capacity (veh/h)	645	490	585	595
Control Delay (s)	16.8	9.7	14.4	10.6
Approach Delay (s)	16.8	9.7	14.4	10.6
Approach LOS	C	A	B	B

Intersection Summary				
Delay		14.4		
HCM Level of Service		B		
Intersection Capacity Utilization	63.1%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	440	30	169	311	16	250
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	530	36	204	375	19	301
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			566		1330	548
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			566		1330	548
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			80		86	44
cM capacity (veh/h)			1011		137	538

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	566	204	375	320
Volume Left	0	204	0	19
Volume Right	36	0	0	301
cSH	1700	1011	1700	457
Volume to Capacity	0.33	0.20	0.22	0.70
Queue Length 95th (ft)	0	19	0	134
Control Delay (s)	0.0	9.5	0.0	29.3
Lane LOS		A		D
Approach Delay (s)	0.0	3.3		29.3
Approach LOS				D

Intersection Summary			
Average Delay	7.7		
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	3	38	22	42	26	84	15	94	39	102	111	6
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	3	42	24	46	29	92	16	103	43	112	122	7

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	69	167	163	241
Volume Left (vph)	3	46	16	112
Volume Right (vph)	24	92	43	7
Hadj (s)	-0.18	-0.26	-0.12	0.09
Departure Headway (s)	4.9	4.7	4.7	4.8
Degree Utilization, x	0.09	0.22	0.21	0.32
Capacity (veh/h)	653	698	722	711
Control Delay (s)	8.5	9.0	8.9	10.0
Approach Delay (s)	8.5	9.0	8.9	10.0
Approach LOS	A	A	A	B

Intersection Summary				
Delay		9.3		
HCM Level of Service		A		
Intersection Capacity Utilization	45.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	290	43	4	140	0	0	0	0	50	108	52
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	0	319	47	4	154	0	0	0	0	55	119	57

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total (vph)	366	158	114	116
Volume Left (vph)	0	4	55	0
Volume Right (vph)	47	0	0	57
Hadj (s)	-0.06	0.02	0.26	-0.33
Departure Headway (s)	4.7	5.0	6.0	5.4
Degree Utilization, x	0.48	0.22	0.19	0.18
Capacity (veh/h)	738	677	560	616
Control Delay (s)	11.9	9.4	9.2	8.4
Approach Delay (s)	11.9	9.4	8.8	
Approach LOS	B	A	A	

Intersection Summary				
Delay		10.4		
HCM Level of Service		B		
Intersection Capacity Utilization		30.6%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	289	51	0	0	52	37	92	194	3	0	0	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	328	58	0	0	59	42	105	220	3	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total (vph)	386	101	215	114
Volume Left (vph)	328	0	105	0
Volume Right (vph)	0	42	0	3
Hadj (s)	0.19	-0.23	0.26	0.00
Departure Headway (s)	5.1	5.1	6.0	5.8
Degree Utilization, x	0.55	0.14	0.36	0.18
Capacity (veh/h)	676	650	568	590
Control Delay (s)	14.2	9.0	11.2	8.8
Approach Delay (s)	14.2	9.0	10.4	
Approach LOS	B	A	B	

Intersection Summary				
Delay	12.0			
HCM Level of Service	B			
Intersection Capacity Utilization	40.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	241	23	27	234	0	0	0	0	107	27	36
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	0	326	31	36	316	0	0	0	0	145	36	49

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total (vph)	357	353	163	67
Volume Left (vph)	0	36	145	0
Volume Right (vph)	31	0	0	49
Hadj (s)	-0.04	0.04	0.46	-0.49
Departure Headway (s)	5.1	5.2	6.7	5.8
Degree Utilization, x	0.51	0.51	0.31	0.11
Capacity (veh/h)	678	672	488	572
Control Delay (s)	13.2	13.3	11.5	8.3
Approach Delay (s)	13.2	13.3	10.6	
Approach LOS	B	B	B	

Intersection Summary			
Delay	12.6		
HCM Level of Service	B		
Intersection Capacity Utilization	43.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	39	309	0	0	211	197	50	37	47	0	0	0
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	50	396	0	0	271	253	64	47	60	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total (vph)	446	523	64	108
Volume Left (vph)	50	0	64	0
Volume Right (vph)	0	253	0	60
Hadj (s)	0.04	-0.27	0.52	-0.37
Departure Headway (s)	5.2	4.8	7.3	6.4
Degree Utilization, x	0.64	0.70	0.13	0.19
Capacity (veh/h)	673	733	437	503
Control Delay (s)	17.0	18.2	10.2	9.7
Approach Delay (s)	17.0	18.2	9.9	
Approach LOS	C	C	A	

Intersection Summary				
Delay	16.5			
HCM Level of Service	C			
Intersection Capacity Utilization	56.4%	ICU Level of Service	B	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
1: MILLER'S FERRY RD & IH 45 SBFR

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	7	14	24	3	0	14	0	84	42	123	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	8	15	26	3	0	15	0	91	46	134	1

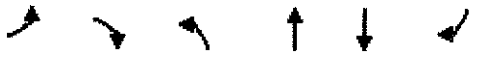
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	23	29	107	46	135
Volume Left (vph)	0	26	15	46	0
Volume Right (vph)	15	0	91	0	1
Hadj (s)	-0.21	0.36	-0.30	0.69	0.18
Departure Headway (s)	4.4	4.9	4.0	5.4	4.9
Degree Utilization, x	0.03	0.04	0.12	0.07	0.18
Capacity (veh/h)	760	679	869	650	721
Control Delay (s)	7.5	8.2	7.6	7.6	7.8
Approach Delay (s)	7.5	8.2	7.6	7.7	
Approach LOS	A	A	A	A	

Intersection Summary				
Delay	7.7			
HCM Level of Service	A			
Intersection Capacity Utilization	30.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	58	55	0	0	75	33	6	1	28	0	0	0
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	72	69	0	0	94	41	8	1	35	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	141	135	44
Volume Left (vph)	73	0	8
Volume Right (vph)	0	41	35
Hadj (s)	0.20	-0.08	-0.34
Departure Headway (s)	4.3	4.1	4.2
Degree Utilization, x	0.17	0.15	0.05
Capacity (veh/h)	815	869	806
Control Delay (s)	8.2	7.8	7.4
Approach Delay (s)	8.2	7.8	7.4
Approach LOS	A	A	A

Intersection Summary			
Delay	7.9		
HCM Level of Service	A		
Intersection Capacity Utilization	22.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	24	7	6	70	184	15
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	27	8	7	80	209	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	311	218	226			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	311	218	226			
tC, single (s)	6.5	6.3	4.2			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.3			
p0 queue free %	96	99	99			
cM capacity (veh/h)	658	798	1285			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	35	86	226
Volume Left	27	7	0
Volume Right	8	0	17
cSH	685	1285	1700
Volume to Capacity	0.05	0.01	0.13
Queue Length 95th (ft)	4	0	0
Control Delay (s)	10.5	0.7	0.0
Lane LOS	B	A	
Approach Delay (s)	10.5	0.7	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	20.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	9	39	9	170	71	5	14	72	80	9	140	22
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	10	42	10	183	76	5	15	77	86	10	151	24

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	61	265	178	184
Volume Left (vph)	10	183	15	10
Volume Right (vph)	10	5	86	24
Hadj (s)	-0.05	0.14	-0.26	-0.05
Departure Headway (s)	5.2	5.0	4.8	4.9
Degree Utilization, x	0.09	0.37	0.24	0.25
Capacity (veh/h)	624	671	700	673
Control Delay (s)	8.6	11.0	9.2	9.6
Approach Delay (s)	8.6	11.0	9.2	9.6
Approach LOS	A	B	A	A

Intersection Summary				
Delay		9.9		
HCM Level of Service		A		
Intersection Capacity Utilization	40.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	107	15	148	1	10	3	131	53	1	4	58	246
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	114	16	157	1	11	3	139	56	1	4	62	262

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	287	15	197	328
Volume Left (vph)	114	1	139	4
Volume Right (vph)	157	3	1	262
Hadj (s)	-0.23	-0.10	0.16	-0.46
Departure Headway (s)	5.0	5.6	5.3	4.5
Degree Utilization, x	0.40	0.02	0.29	0.41
Capacity (veh/h)	673	548	638	750
Control Delay (s)	11.2	8.7	10.4	10.7
Approach Delay (s)	11.2	8.7	10.4	10.7
Approach LOS	B	A	B	B

Intersection Summary				
Delay	10.8			
HCM Level of Service	B			
Intersection Capacity Utilization	61.0%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	239	4	113	343	6	69
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	246	4	116	354	6	71
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			251		835	248
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			251		835	248
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			91		98	91
cM capacity (veh/h)			1321		309	793

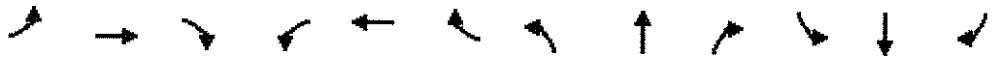
Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	251	116	354	77
Volume Left	0	116	0	6
Volume Right	4	0	0	71
cSH	1700	1321	1700	705
Volume to Capacity	0.15	0.09	0.21	0.11
Queue Length 95th (ft)	0	7	0	9
Control Delay (s)	0.0	8.0	0.0	10.7
Lane LOS		A		B
Approach Delay (s)	0.0	2.0		10.7
Approach LOS				B

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	33.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	10	104	64	64	21	130	11	146	50	97	131	7
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	13	137	84	84	28	171	14	192	66	128	172	9

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	234	283	272	309
Volume Left (vph)	13	84	14	128
Volume Right (vph)	84	171	66	9
Hadj (s)	-0.19	-0.29	-0.12	0.08
Departure Headway (s)	6.1	5.9	6.1	6.2
Degree Utilization, x	0.40	0.47	0.46	0.53
Capacity (veh/h)	514	548	538	532
Control Delay (s)	13.2	14.0	14.1	15.9
Approach Delay (s)	13.2	14.0	14.1	15.9
Approach LOS	B	B	B	C

Intersection Summary				
Delay			14.4	
HCM Level of Service			B	
Intersection Capacity Utilization		59.9%	ICU Level of Service	B
Analysis Period (min)			15	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	78	45	15	53	0	0	0	0	40	263	180
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	88	51	17	60	0	0	0	0	45	296	202

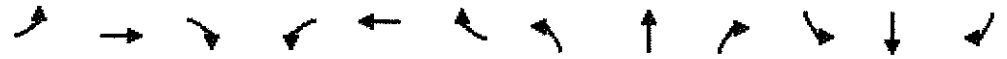
Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total (vph)	138	76	193	350
Volume Left (vph)	0	17	45	0
Volume Right (vph)	51	0	0	202
Hadj (s)	-0.20	0.06	0.13	-0.39
Departure Headway (s)	5.0	5.3	5.2	4.7
Degree Utilization, x	0.19	0.11	0.28	0.45
Capacity (veh/h)	675	626	675	751
Control Delay (s)	9.1	9.0	9.0	10.3
Approach Delay (s)	9.1	9.0	9.9	
Approach LOS	A	A	A	

Intersection Summary				
Delay			9.6	
HCM Level of Service			A	
Intersection Capacity Utilization		34.7%	ICU Level of Service	A
Analysis Period (min)			15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	83	35	0	0	24	4	44	76	14	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	90	38	0	0	26	4	48	83	15	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total (vph)	128	30	89	57
Volume Left (vph)	90	0	48	0
Volume Right (vph)	0	4	0	15
Hadj (s)	0.16	-0.07	0.29	-0.17
Departure Headway (s)	4.5	4.3	5.2	4.7
Degree Utilization, x	0.16	0.04	0.13	0.07
Capacity (veh/h)	784	796	674	737
Control Delay (s)	8.3	7.5	7.7	6.9
Approach Delay (s)	8.3	7.5	7.4	
Approach LOS	A	A	A	

Intersection Summary				
Delay		7.8		
HCM Level of Service		A		
Intersection Capacity Utilization	23.6%		ICU Level of Service	A
Analysis Period (min)		15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	194	14	30	123	0	0	0	0	217	41	50
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	204	15	32	129	0	0	0	0	228	43	53

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total (vph)	219	161	250	74
Volume Left (vph)	0	32	228	0
Volume Right (vph)	15	0	0	53
Hadj (s)	-0.02	0.06	0.47	-0.48
Departure Headway (s)	5.0	5.2	6.0	5.0
Degree Utilization, x	0.30	0.23	0.41	0.10
Capacity (veh/h)	678	653	581	683
Control Delay (s)	10.2	9.7	11.9	7.4
Approach Delay (s)	10.2	9.7	10.9	
Approach LOS	B	A	B	

Intersection Summary				
Delay		10.4		
HCM Level of Service		B		
Intersection Capacity Utilization		41.2%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	49	362	0	0	118	37	35	18	39	0	0	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	51	377	0	0	123	39	36	19	41	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total (vph)	428	161	36	59
Volume Left (vph)	51	0	36	0
Volume Right (vph)	0	39	0	41
Hadj (s)	0.04	-0.13	0.52	-0.46
Departure Headway (s)	4.4	4.5	6.3	5.4
Degree Utilization, x	0.52	0.20	0.06	0.09
Capacity (veh/h)	804	761	520	607
Control Delay (s)	12.1	8.7	8.6	7.7
Approach Delay (s)	12.1	8.7	8.0	
Approach LOS	B	A	A	

Intersection Summary				
Delay	10.7			
HCM Level of Service	B			
Intersection Capacity Utilization	43.6%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
1: MILLER'S FERRY RD & IH 45 SBFR

7/11/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	10	21	51	7	0	36	0	227	49	135	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	11	23	57	8	0	40	0	252	54	150	1

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	34	64	292	54	151
Volume Left (vph)	0	57	40	54	0
Volume Right (vph)	23	0	252	0	1
Hadj (s)	-0.17	0.41	-0.25	0.74	0.23
Departure Headway (s)	5.0	5.5	4.3	5.7	5.2
Degree Utilization, x	0.05	0.10	0.35	0.09	0.22
Capacity (veh/h)	646	594	818	605	666
Control Delay (s)	8.2	9.1	9.5	8.1	8.5
Approach Delay (s)	8.2	9.1	9.5	8.4	
Approach LOS	A	A	A	A	

Intersection Summary			
Delay	9.0		
HCM Level of Service	A		
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	180	76	0	0	95	31	16	4	53	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	189	80	0	0	100	33	17	4	56	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	269	133	77
Volume Left (vph)	189	0	17
Volume Right (vph)	0	33	56
Hadj (s)	0.31	0.02	-0.22
Departure Headway (s)	4.5	4.4	4.6
Degree Utilization, x	0.34	0.16	0.10
Capacity (veh/h)	776	783	719
Control Delay (s)	9.9	8.3	8.1
Approach Delay (s)	9.9	8.3	8.1
Approach LOS	A	A	A

Intersection Summary				
Delay		9.1		
HCM Level of Service		A		
Intersection Capacity Utilization	35.2%	ICU Level of Service		A
Analysis Period (min)		15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	45	6	5	229	153	53
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	47	6	5	239	159	55
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	436	187	215			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	436	187	215			
tC, single (s)	6.6	6.4	4.3			
tC, 2 stage (s)						
tF (s)	3.7	3.5	2.4			
p0 queue free %	91	99	100			
cM capacity (veh/h)	545	813	1261			

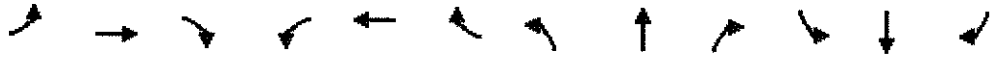
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	53	244	215
Volume Left	47	5	0
Volume Right	6	0	55
cSH	567	1261	1700
Volume to Capacity	0.09	0.00	0.13
Queue Length 95th (ft)	8	0	0
Control Delay (s)	12.0	0.2	0.0
Lane LOS	B	A	
Approach Delay (s)	12.0	0.2	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	26.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	53	189	21	121	100	18	26	154	215	11	129	25
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	60	212	24	136	112	20	29	173	242	12	145	28

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	296	269	444	185
Volume Left (vph)	60	136	29	12
Volume Right (vph)	24	20	242	28
Hadj (s)	0.01	0.07	-0.30	-0.06
Departure Headway (s)	6.6	6.7	6.0	6.8
Degree Utilization, x	0.54	0.50	0.73	0.35
Capacity (veh/h)	489	479	576	449
Control Delay (s)	17.1	16.3	23.6	13.4
Approach Delay (s)	17.1	16.3	23.6	13.4
Approach LOS	C	C	C	B

Intersection Summary				
Delay			18.7	
HCM Level of Service			C	
Intersection Capacity Utilization			64.1%	ICU Level of Service
Analysis Period (min)			15	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	276	32	210	3	54	7	294	89	1	1	75	156
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	314	36	239	3	61	8	334	101	1	1	85	177

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	589	73	436	264
Volume Left (vph)	314	3	334	1
Volume Right (vph)	239	8	1	177
Hadj (s)	-0.12	-0.04	0.17	-0.39
Departure Headway (s)	6.4	7.8	6.8	6.8
Degree Utilization, x	1.04	0.16	0.83	0.49
Capacity (veh/h)	557	403	519	514
Control Delay (s)	73.2	12.3	34.8	16.2
Approach Delay (s)	73.2	12.3	34.8	16.2
Approach LOS	F	B	D	C

Intersection Summary			
Delay	46.6		
HCM Level of Service	E		
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	611	42	235	432	22	347
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	736	51	283	520	27	418
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			787		1848	761
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			787		1848	761
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			66		51	0
cM capacity (veh/h)			837		55	407

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	787	283	520	445
Volume Left	0	283	0	27
Volume Right	51	0	0	418
cSH	1700	837	1700	294
Volume to Capacity	0.46	0.34	0.31	1.51
Queue Length 95th (ft)	0	38	0	636
Control Delay (s)	0.0	11.5	0.0	280.3
Lane LOS		B		F
Approach Delay (s)	0.0	4.0		280.3
Approach LOS				F

Intersection Summary			
Average Delay	62.8		
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	4	53	31	58	36	117	21	131	54	142	154	8
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	4	58	34	64	40	129	23	144	59	156	169	9

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	97	232	226	334
Volume Left (vph)	4	64	23	156
Volume Right (vph)	34	129	59	9
Hadj (s)	-0.19	-0.26	-0.12	0.09
Departure Headway (s)	5.6	5.3	5.2	5.3
Degree Utilization, x	0.15	0.34	0.33	0.49
Capacity (veh/h)	552	617	630	647
Control Delay (s)	9.6	11.0	10.8	13.2
Approach Delay (s)	9.6	11.0	10.8	13.2
Approach LOS	A	B	B	B

Intersection Summary				
Delay	11.6			
HCM Level of Service	B			
Intersection Capacity Utilization	56.7%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	403	60	6	194	0	0	0	0	69	150	72
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	0	443	66	7	213	0	0	0	0	76	165	79

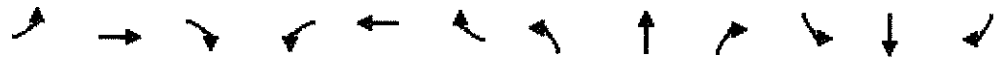
Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total (vph)	509	220	158	162
Volume Left (vph)	0	7	76	0
Volume Right (vph)	66	0	0	79
Hadj (s)	-0.06	0.02	0.26	-0.33
Departure Headway (s)	5.1	5.6	6.7	6.1
Degree Utilization, x	0.72	0.34	0.29	0.27
Capacity (veh/h)	686	609	498	554
Control Delay (s)	20.3	11.5	11.2	10.1
Approach Delay (s)	20.3	11.5	10.6	
Approach LOS	C	B	B	

Intersection Summary				
Delay		15.5		
HCM Level of Service		C		
Intersection Capacity Utilization	40.0%		ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	401	71	0	0	72	51	128	269	4	0	0	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	456	81	0	0	82	58	145	306	5	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total (vph)	536	140	298	157
Volume Left (vph)	456	0	145	0
Volume Right (vph)	0	58	0	5
Hadj (s)	0.19	-0.23	0.26	0.00
Departure Headway (s)	5.6	5.9	6.7	6.4
Degree Utilization, x	0.84	0.23	0.55	0.28
Capacity (veh/h)	629	564	513	537
Control Delay (s)	31.3	10.7	16.5	10.7
Approach Delay (s)	31.3	10.7	14.5	
Approach LOS	D	B	B	

Intersection Summary				
Delay		22.0		
HCM Level of Service		C		
Intersection Capacity Utilization		54.1%	ICU Level of Service	A
Analysis Period (min)		15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	335	32	37	325	0	0	0	0	149	37	50
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	0	453	43	50	439	0	0	0	0	201	50	68

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total (vph)	496	489	226	93
Volume Left (vph)	0	50	201	0
Volume Right (vph)	43	0	0	68
Hadj (s)	-0.04	0.04	0.46	-0.49
Departure Headway (s)	5.8	5.9	7.6	6.7
Degree Utilization, x	0.80	0.80	0.48	0.17
Capacity (veh/h)	605	595	439	501
Control Delay (s)	28.0	28.2	16.3	9.8
Approach Delay (s)	28.0	28.2	14.4	
Approach LOS	D	D	B	

Intersection Summary				
Delay		24.8		
HCM Level of Service		C		
Intersection Capacity Utilization		57.0%	ICU Level of Service	B
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	54	429	0	0	293	274	69	51	65	0	0	0
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	69	550	0	0	376	351	88	65	83	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total (vph)	619	727	88	149
Volume Left (vph)	69	0	88	0
Volume Right (vph)	0	351	0	83
Hadj (s)	0.04	-0.27	0.52	-0.38
Departure Headway (s)	5.7	5.5	8.1	7.2
Degree Utilization, x	0.98	1.11	0.20	0.30
Capacity (veh/h)	624	660	439	494
Control Delay (s)	55.8	89.6	11.9	12.0
Approach Delay (s)	55.8	89.6	12.0	
Approach LOS	F	F	B	

Intersection Summary			
Delay	64.8		
HCM Level of Service	F		
Intersection Capacity Utilization	74.4%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1: MILLER'S FERRY RD & IH 45 SBFR

7/11/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	10	19	34	4	0	19	0	119	58	174	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	11	21	37	4	0	21	0	129	63	189	1

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	32	41	150	63	190
Volume Left (vph)	0	37	21	63	0
Volume Right (vph)	21	0	129	0	1
Hadj (s)	-0.21	0.37	-0.30	0.69	0.18
Departure Headway (s)	4.7	5.2	4.2	5.5	5.0
Degree Utilization, x	0.04	0.06	0.17	0.10	0.26
Capacity (veh/h)	702	634	836	637	706
Control Delay (s)	7.9	8.6	8.0	7.9	8.6
Approach Delay (s)	7.9	8.6	8.0	8.4	
Approach LOS	A	A	A	A	

Intersection Summary				
Delay	8.3			
HCM Level of Service	A			
Intersection Capacity Utilization	36.4%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	82	77	0	0	104	46	9	1	39	0	0	0
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	102	96	0	0	130	58	11	1	49	0	0	0

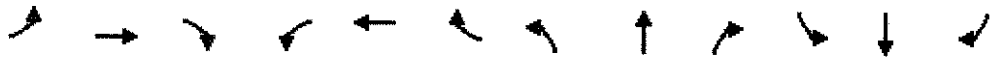
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	199	188	61
Volume Left (vph)	103	0	11
Volume Right (vph)	0	58	49
Hadj (s)	0.21	-0.08	-0.34
Departure Headway (s)	4.4	4.2	4.4
Degree Utilization, x	0.25	0.22	0.08
Capacity (veh/h)	793	843	749
Control Delay (s)	8.9	8.3	7.8
Approach Delay (s)	8.9	8.3	7.8
Approach LOS	A	A	A

Intersection Summary				
Delay		8.5		
HCM Level of Service		A		
Intersection Capacity Utilization		30.2%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	37	11	9	97	256	23
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	42	12	10	110	291	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	435	304	317			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	435	304	317			
tC, single (s)	6.5	6.3	4.2			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.3			
p0 queue free %	92	98	99			
cM capacity (veh/h)	555	713	1189			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	55	120	317
Volume Left	42	10	0
Volume Right	12	0	26
cSH	585	1189	1700
Volume to Capacity	0.09	0.01	0.19
Queue Length 95th (ft)	8	1	0
Control Delay (s)	11.8	0.8	0.0
Lane LOS	B	A	
Approach Delay (s)	11.8	0.8	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	24.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	12	54	12	236	99	7	19	100	111	12	195	31
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	13	58	13	254	106	8	20	108	119	13	210	33

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	84	368	247	256
Volume Left (vph)	13	254	20	13
Volume Right (vph)	13	8	119	33
Hadj (s)	-0.04	0.14	-0.26	-0.05
Departure Headway (s)	6.0	5.6	5.4	5.6
Degree Utilization, x	0.14	0.57	0.37	0.40
Capacity (veh/h)	501	606	603	590
Control Delay (s)	10.0	15.9	11.6	12.3
Approach Delay (s)	10.0	15.9	11.6	12.3
Approach LOS	A	C	B	B

Intersection Summary				
Delay		13.3		
HCM Level of Service		B		
Intersection Capacity Utilization	51.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	149	21	206	1	14	4	182	74	1	6	81	342
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	159	22	219	1	15	4	194	79	1	6	86	364

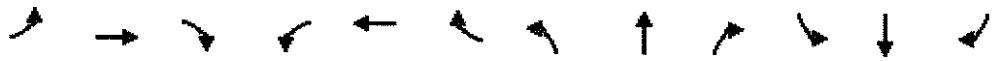
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	400	20	273	456
Volume Left (vph)	159	1	194	6
Volume Right (vph)	219	4	1	364
Hadj (s)	-0.23	-0.10	0.16	-0.46
Departure Headway (s)	5.7	6.8	6.1	5.2
Degree Utilization, x	0.63	0.04	0.46	0.66
Capacity (veh/h)	591	414	547	659
Control Delay (s)	18.0	10.1	14.3	18.0
Approach Delay (s)	18.0	10.1	14.3	18.0
Approach LOS	C	B	B	C

Intersection Summary				
Delay		17.0		
HCM Level of Service		C		
Intersection Capacity Utilization	78.4%	ICU Level of Service		D
Analysis Period (min)		15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	332	6	157	476	8	96
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	342	6	162	491	8	99
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			348		1160	345
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			348		1160	345
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			87		96	86
cM capacity (veh/h)			1216		188	700

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	348	162	491	107
Volume Left	0	162	0	8
Volume Right	6	0	0	99
cSH	1700	1216	1700	579
Volume to Capacity	0.20	0.13	0.29	0.19
Queue Length 95th (ft)	0	11	0	17
Control Delay (s)	0.0	8.4	0.0	12.6
Lane LOS		A		B
Approach Delay (s)	0.0	2.1		12.6
Approach LOS				B

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	42.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	14	144	89	89	29	181	15	203	69	135	182	10
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	18	189	117	117	38	238	20	267	91	178	239	13

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	325	393	378	430
Volume Left (vph)	18	117	20	178
Volume Right (vph)	117	238	91	13
Hadj (s)	-0.19	-0.29	-0.12	0.08
Departure Headway (s)	9.0	8.6	8.8	9.0
Degree Utilization, x	0.82	0.94	0.93	1.08
Capacity (veh/h)	376	393	400	397
Control Delay (s)	41.6	60.6	58.5	99.0
Approach Delay (s)	41.6	60.6	58.5	99.0
Approach LOS	E	F	F	F

Intersection Summary				
Delay		66.9		
HCM Level of Service		F		
Intersection Capacity Utilization		78.1%	ICU Level of Service	D
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	108	62	21	74	0	0	0	0	56	365	250
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	121	70	24	83	0	0	0	0	63	410	281

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total (vph)	191	107	268	486
Volume Left (vph)	0	24	63	0
Volume Right (vph)	70	0	0	281
Hadj (s)	-0.20	0.06	0.13	-0.39
Departure Headway (s)	5.4	5.8	5.5	5.0
Degree Utilization, x	0.29	0.17	0.41	0.67
Capacity (veh/h)	625	574	644	704
Control Delay (s)	10.6	10.0	11.0	16.2
Approach Delay (s)	10.6	10.0	14.3	
Approach LOS	B	B	B	

Intersection Summary				
Delay		13.2		
HCM Level of Service		B		
Intersection Capacity Utilization		44.2%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	115	49	0	0	33	6	61	106	19	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	125	53	0	0	36	7	66	115	21	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total (vph)	178	42	124	78
Volume Left (vph)	125	0	66	0
Volume Right (vph)	0	7	0	21
Hadj (s)	0.16	-0.08	0.28	-0.17
Departure Headway (s)	4.6	4.6	5.3	4.9
Degree Utilization, x	0.23	0.05	0.18	0.11
Capacity (veh/h)	743	743	651	708
Control Delay (s)	9.0	7.8	8.3	7.2
Approach Delay (s)	9.0	7.8	7.9	
Approach LOS	A	A	A	

Intersection Summary				
Delay			8.3	
HCM Level of Service			A	
Intersection Capacity Utilization		27.6%	ICU Level of Service	A
Analysis Period (min)			15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	269	19	42	171	0	0	0	0	301	57	69
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	283	20	44	180	0	0	0	0	317	60	73

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total (vph)	303	224	347	103
Volume Left (vph)	0	44	317	0
Volume Right (vph)	20	0	0	73
Hadj (s)	-0.02	0.06	0.47	-0.48
Departure Headway (s)	5.6	5.8	6.5	5.5
Degree Utilization, x	0.47	0.36	0.62	0.16
Capacity (veh/h)	613	585	535	627
Control Delay (s)	13.5	12.0	18.3	8.3
Approach Delay (s)	13.5	12.0	16.1	
Approach LOS	B	B	C	

Intersection Summary				
Delay		14.3		
HCM Level of Service		B		
Intersection Capacity Utilization		53.3%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	68	503	0	0	164	51	49	25	54	0	0	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	71	524	0	0	171	53	51	26	56	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total (vph)	595	224	51	82
Volume Left (vph)	71	0	51	0
Volume Right (vph)	0	53	0	56
Hadj (s)	0.04	-0.13	0.52	-0.46
Departure Headway (s)	4.6	4.9	6.9	6.0
Degree Utilization, x	0.77	0.31	0.10	0.14
Capacity (veh/h)	759	700	481	553
Control Delay (s)	21.2	10.1	9.5	8.7
Approach Delay (s)	21.2	10.1	9.0	
Approach LOS	C	B	A	

Intersection Summary				
Delay		16.9		
HCM Level of Service		C		
Intersection Capacity Utilization		56.6%	ICU Level of Service	B
Analysis Period (min)		15		