LANGAN

Addendum

2400 Ansys Drive, Suite 403 Canonsburg, PA 15317 T: 724.514.5100 F: 724.514.5101

To: Sunny Jacobs, P.E.

From: Christopher Prisk, P.E., PTOE
Christopher Westbrook, P.E.

Date: August 31, 2020

Re: Project Panda TIS - Addendum
City of Detroit, Michigan
Langan Project No.: 250095201

Through coordination and discussions with City of Detroit, the Project Panda TIS, dated August 21, 2020, received conditional approval pending the following items:

- Incorporate geometric measures to restrict entrance and exit movements in and out of the facility for discouraging use of W State Fair Avenue.
- Prohibit truck traffic to and from the facility along W State Fair Avenue.

Project Panda TIS – Addendum

Site Driveway C & Site Driveway D

Per the request of the City of Detroit, the two (2) proposed site driveways (western Site Driveway C & eastern Site Driveway D) along W State Fair Avenue are to only service employee vehicles. Another request was made to design these two (2) site driveway in a manner which deters site vehicles from traveling between the two driveways along W State Fair Avenue.

This would result in all vehicles from the west being required to access the site by turning left into Site Driveway C instead of a portion continuing on W State Fair Avenue to turn left into Site Driveway D. Similarly, all vehicles traveling from the east must access the site by turning right into Site Driveway D only rather than a portion continuing on W State Fair Avenue to turn right into Site Driveway C.

All vehicles destined to travel west along W State Fair Avenue would be forced to exit the property by turning right out of Site Driveway C rather than having a portion turning right out of Site Driveway D as well. Similarly, all vehicles destined to travel east along W State Fair Avenue would have to exit the property by turning left out of Site Driveway D rather than a portion turning left out of Site Driveway C.

To implement these travel restrictions, Site Driveway C and Site Driveway D must be designed in a manner to not only promote their respective preferred turning movements, but also to deter their respective undesired turning movements. Site Driveway C would be constructed with similar tangential radii or angles on its eastern and western curbs to "force" vehicles to enter the site by turning left and exit the site by turning right. Site Driveway D would be constructed with similar tangential radii or angles on its eastern and western curbs to "force" vehicles to enter the

site by turning right and exit the site by turning left. A conceptual sketch of Site Driveway C & Site Driveway D are included in the Appendix for illustrative purposes.

The following traffic volume figures have been revised to illustrate the reconfigured driveways and are included in the Appendix:

- Figure 9 – Total Phase I Site Trips
- Figure 9A – Phase I Employee Site Trips
- Figure 9B – Phase I Truck Site Trips
- Figure 10 – Total Phase II Site Trips
- Figure 10A – Phase II Employee Site Trips
- Figure 10B – Phase II Truck Site Trips
- Figure 11 – 2022 Phase I Build Peak Hour Traffic Volumes
- Figure 12 – 2032 Master Plan Build Peak Hour Traffic Volumes

The site driveways within the 2022 and 2032 Build Synchro models used in the Project Panda TIS were reconfigured to accommodate the aforementioned turning movements. The capacity analyses indicate that both reconfigured site driveways will continue to operate at an overall LOS A during both the AM and PM peak hours for the 2022 and 2032 Build conditions. The 2022 Build and 2032 Build Synchro printouts are included in the Appendix.

Truck Restrictions

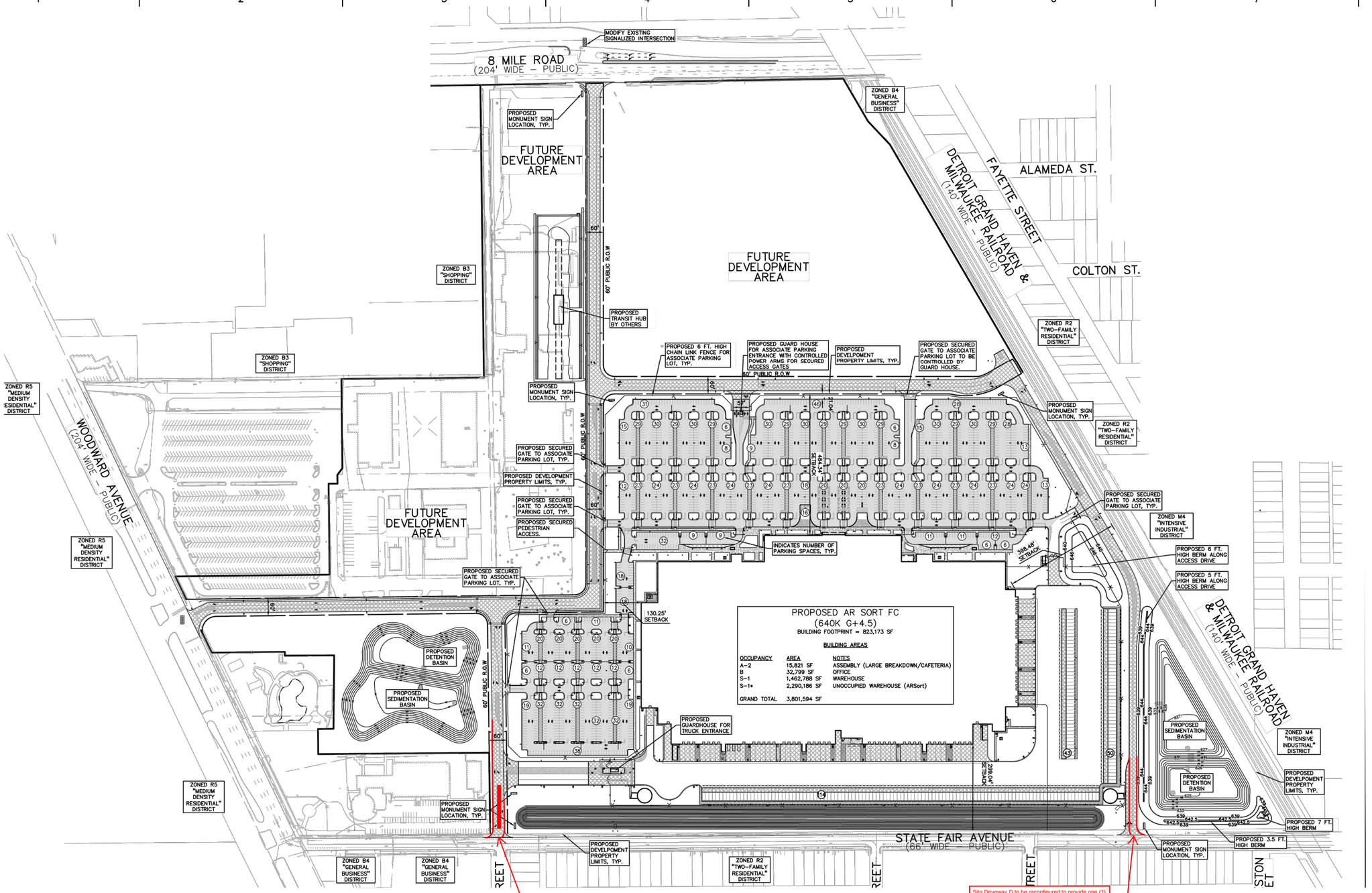
Per the request of the City of Detroit, site trucks are to be restricted from traveling along W State Fair Avenue to access the facility, resulting in trucks accessing the facility by using Site Driveway A along Eight Mile Road and Site Driveway B along Woodward Avenue. To accomplish this, signage will be placed along, but not limited to, Eight Mile Road, Woodward Avenue, and W State Fair Avenue within the City of Detroit / Michigan Department of Transportation (MDOT) public Right-of-Way. The signage will direct site trucks to enter the site using Site Driveway A and Site Driveway B.

Internal signage within the site will also be used to direct site trucks to exit using Site Driveway A and Site Driveway B. Similar to the modified design of Site Driveways C & D, the truck access driveways internal on the site will be modified to both promote the approved routes and restrict the movements not allowed. Additionally, the end user will be notified of these truck restrictions and information regarding the approved truck routes will be distributed to all truck drivers.

APPENDICES

Site Plan
Traffic Volume Figures
2022 Phase I Build Capacity & Queue Analyses
2032 Master Plan Build Capacity & Queue Analyses

Site Plan

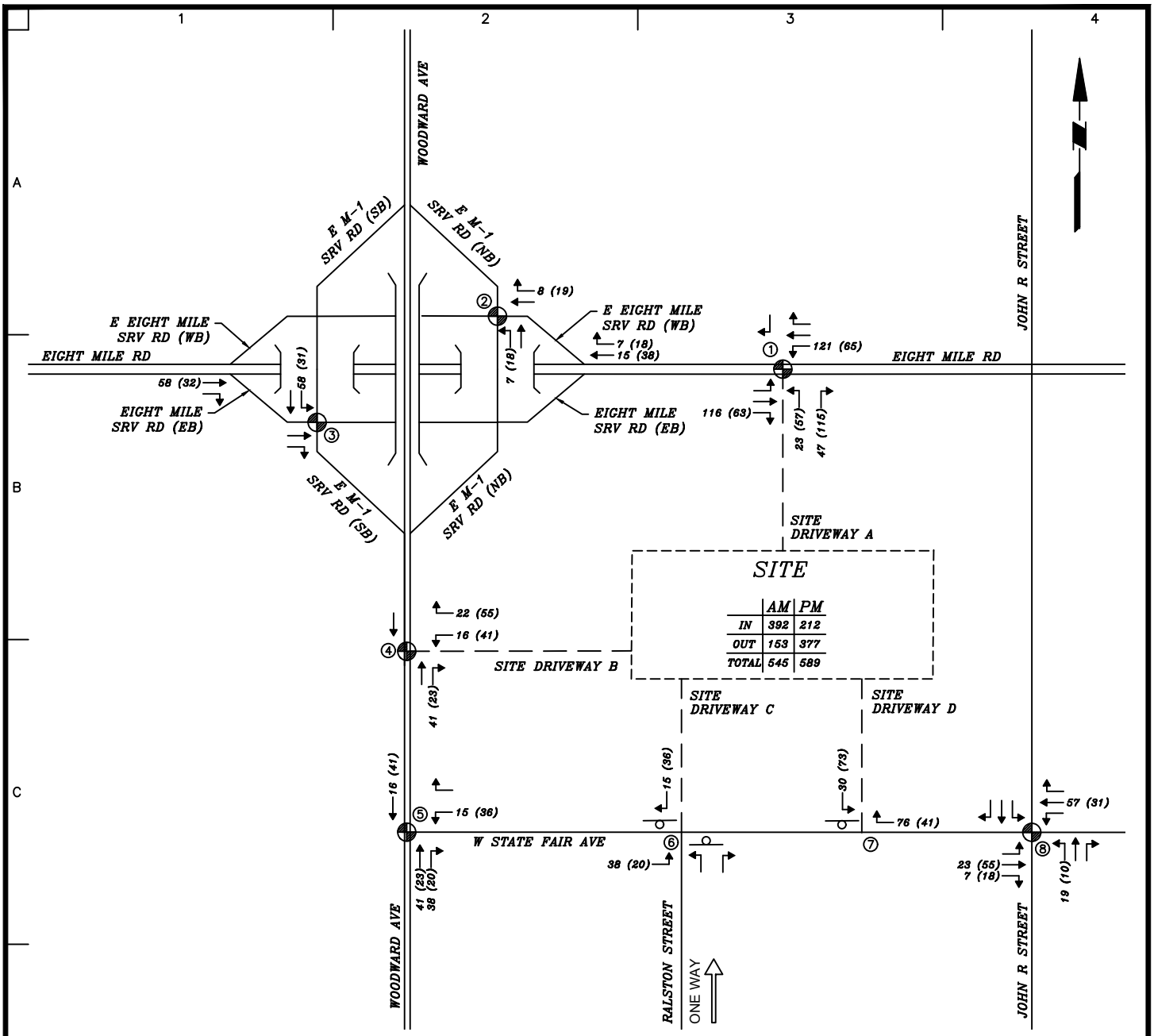


SITE PLAN PROVIDED BY PEA, INC. ON JULY 28, 2020.

LANGAN Langan Engineering and Environmental Services, Inc. 2400 Ansys Drive, Suite 403 Canonsburg, PA 15317 T: 724.514.5100 F: 724.514.5101 www.langan.com	Project **PROJECT PANDA** CITY OF DETROIT WAYNE COUNTY MICHIGAN	Drawing Title **SITE PLAN**	Project No. 250095201 Date JULY 2020 Drawn By JMK Checked By CAP	Figure **2**

Filename: \\langan.com\data\PIT\data2\250095201\Project Data\CAD\01\2D-DesignFiles\Traffic\250095201-K-TM0101.dwg Date: 8/17/2020 Time: 14:47 User: jkomp Style Table: Langan.stb Layout: FIG 2

Traffic Volume Figures



LEGEND

- XX – AM PEAK HOUR
- (XX) – PM PEAK HOUR
- – STOP SIGN
- – TRAFFIC SIGNAL
- # – INTERSECTION ID
- X% – TRIP DISTRIBUTION (IN | OUT)

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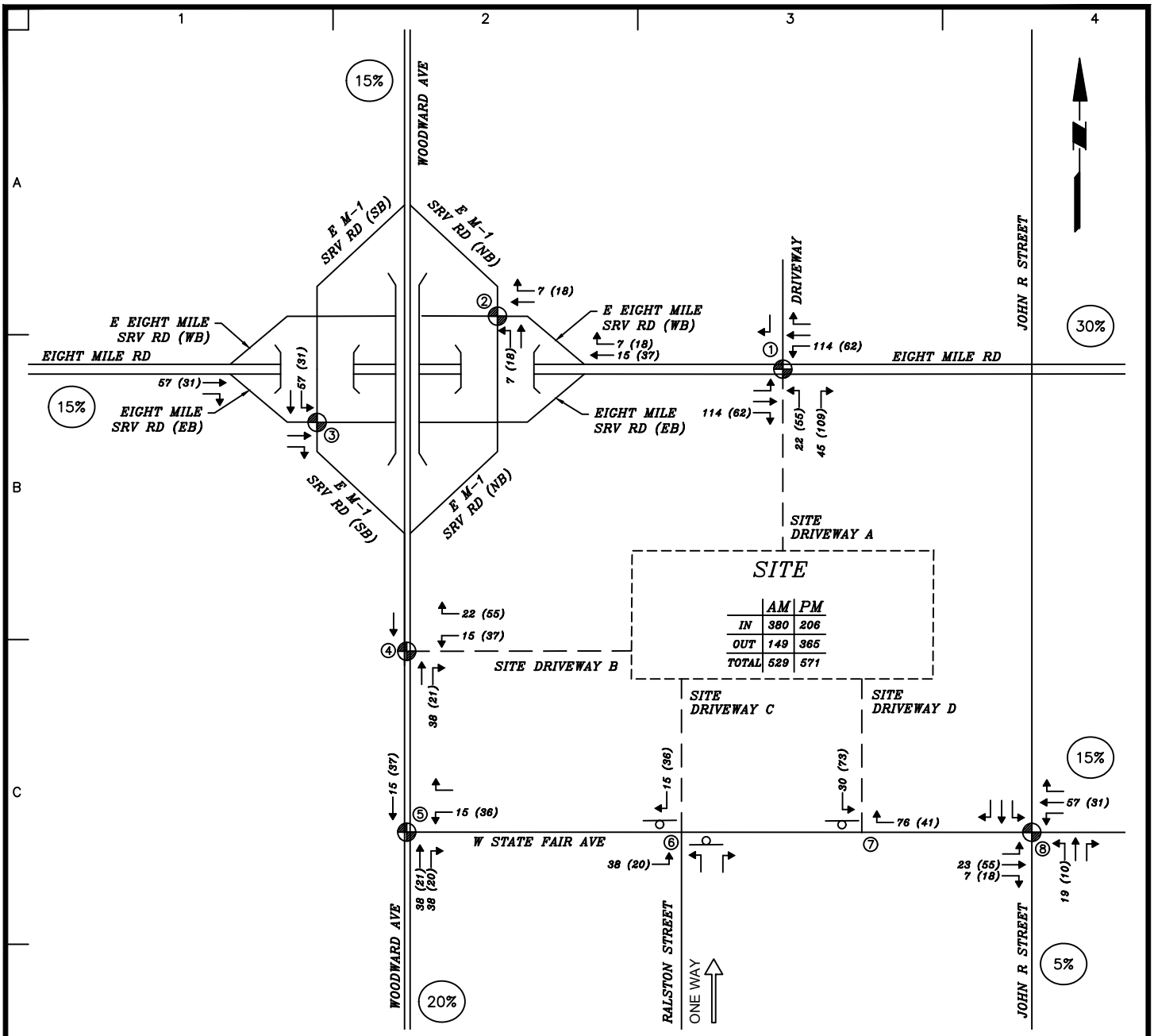
PROJECT PANDA
CITY OF DETROIT
WAYNE COUNTY MICHIGAN

Drawing Title
TOTAL PHASE 1 SITE TRIPS

Project No.	250095201
Date	AUGUST 2020
Drawn By	JMK
Checked By	CAP

Figure **9**

Filename: \\langan.com\data\PIT\data2\250095201\Project Data\CAD\01\2D-DesignFiles\Traffic\250095201-K-TC0104 - TIS - Public - Approved Scope.dwg Date: 8/31/2020 Time: 14:19 User: mkrushinsky Style Table: Langan.stb Layout: FIG 9



LEGEND

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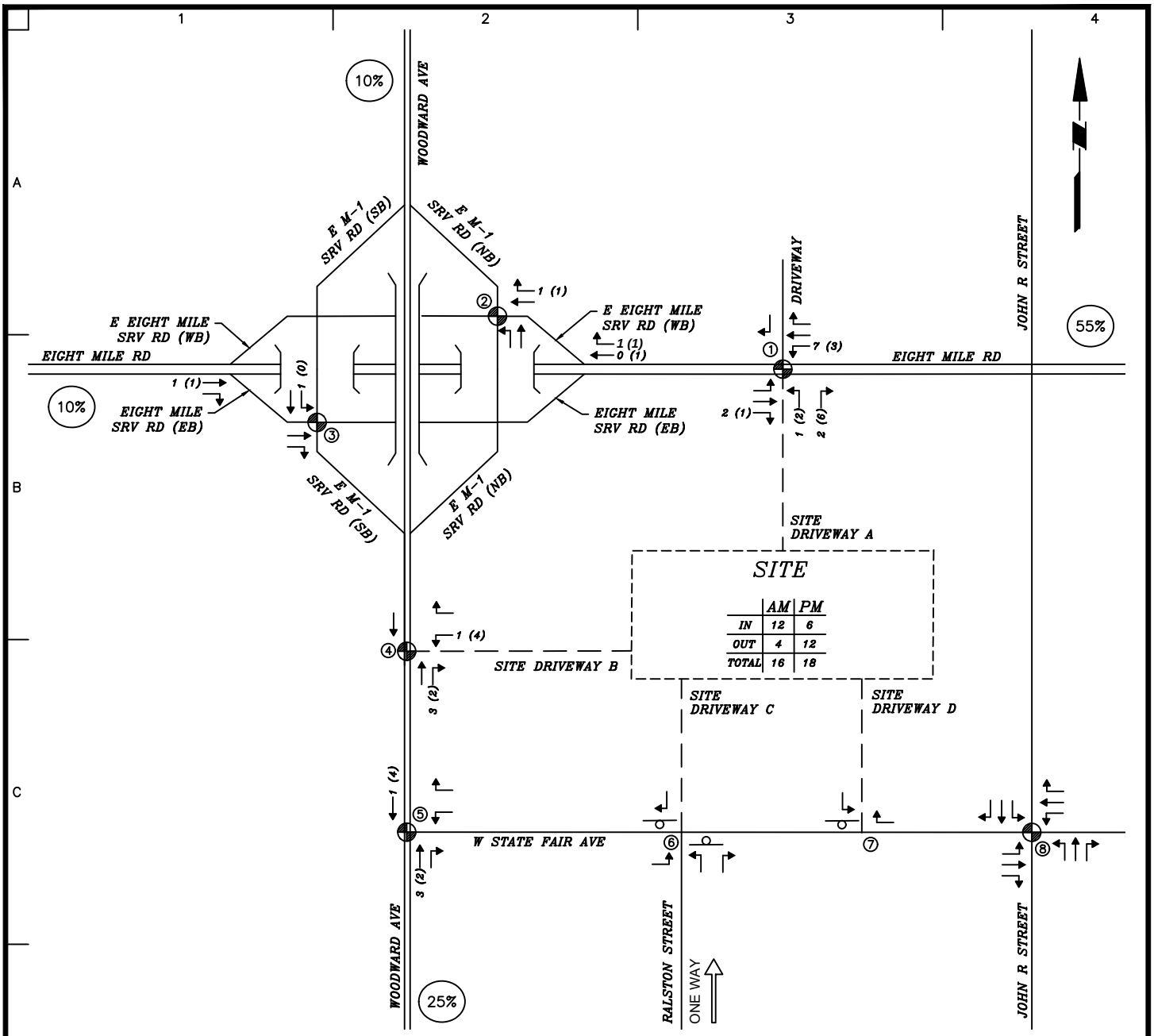
WAYNE COUNTY MICHIGAN

Drawing Title
PHASE 1 EMPLOYEE SITE TRIPS

Project No.	250095201
Date	AUGUST 2020
Drawn By	JMK
Checked By	CAP

Figure
9A

Filename: \\langan.com\data\PIT\data2\250095201\Project Data\CAD\01\2D-DesignFiles\Traffic\250095201-K-TC0104 - TIS - Public - Approved Scope.dwg Date: 8/31/2020 Time: 14:19 User: mkrushinsky Style Table: Langan.stb Layout: FIG 9A



LEGEND

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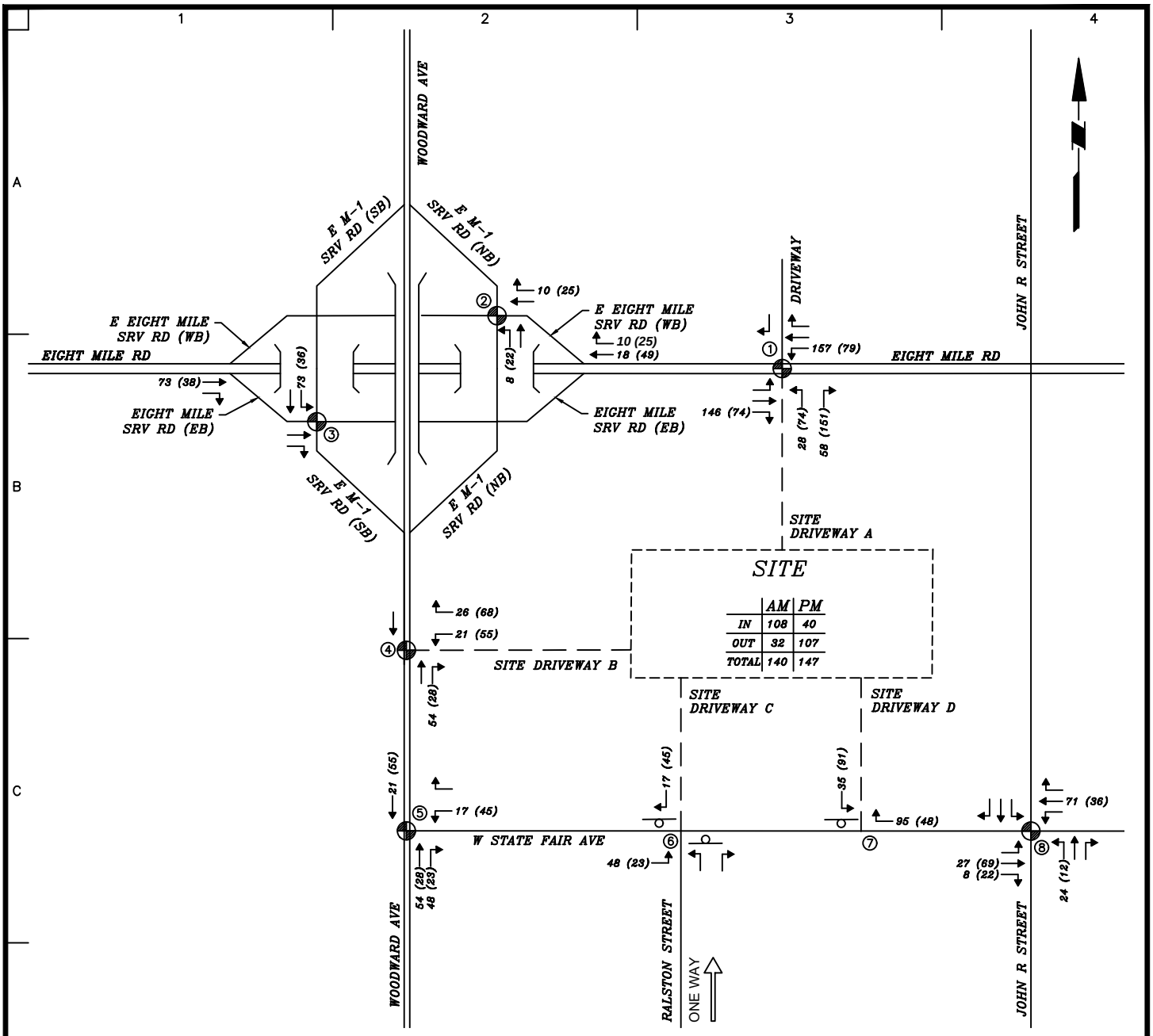
Drawing Title
PHASE 1 TRUCK SITE TRIPS

Project No.	250095201
Date	AUGUST 2020
Drawn By	JMK
Checked By	CAP

Figure
9B

Filename: \\langan.com\data\PIT\data2\250095201\Project Data\CAD\01\2D-DesignFiles\Traffic\250095201-K-TC0104 - TIS - Public - Approved Scope.dwg Date: 8/31/2020 Time: 14:19 User: mkrushinsky Style Table: Langan.stb Layout: FIG 9B



LEGEND

- XX – AM PEAK HOUR
- (XX) – PM PEAK HOUR
- – STOP SIGN
- – TRAFFIC SIGNAL
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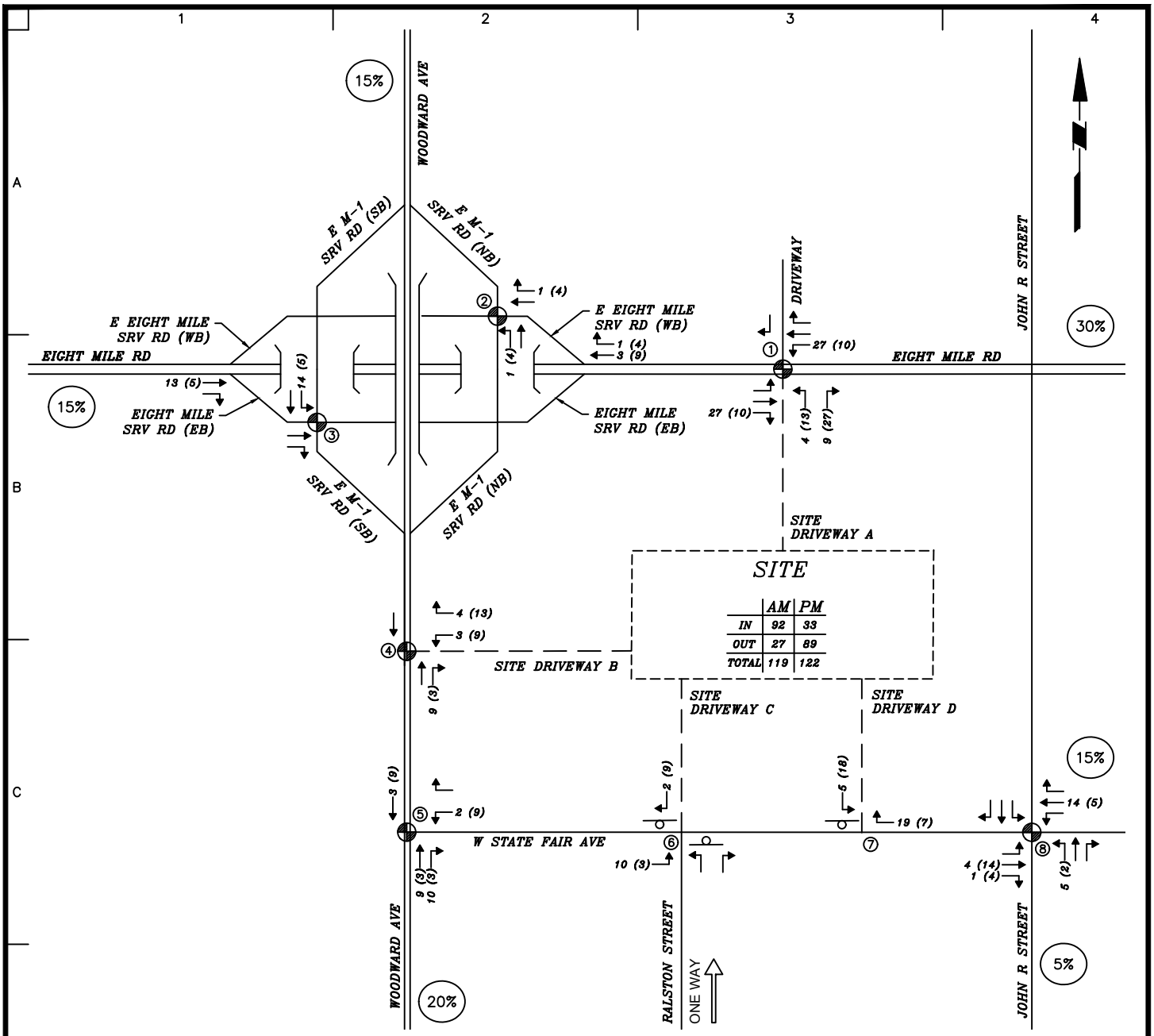
Drawing Title
TOTAL PHASE 2 SITE TRIPS

Project No.	250095201
Date	AUGUST 2020
Drawn By	JMK
Checked By	CAP

Figure
10

Filename: \\langan.com\data\PIT\data2\250095201\Project Data\CAD\01\2D-DesignFiles\Traffic\250095201-K-TC0104 - TIS - Public - Approved Scope.dwg Date: 8/31/2020 Time: 14:19 User: mkrushinsky Style Table: Langan.stb Layout: FIG 10



LEGEND

- XX – AM PEAK HOUR
- (XX) – PM PEAK HOUR
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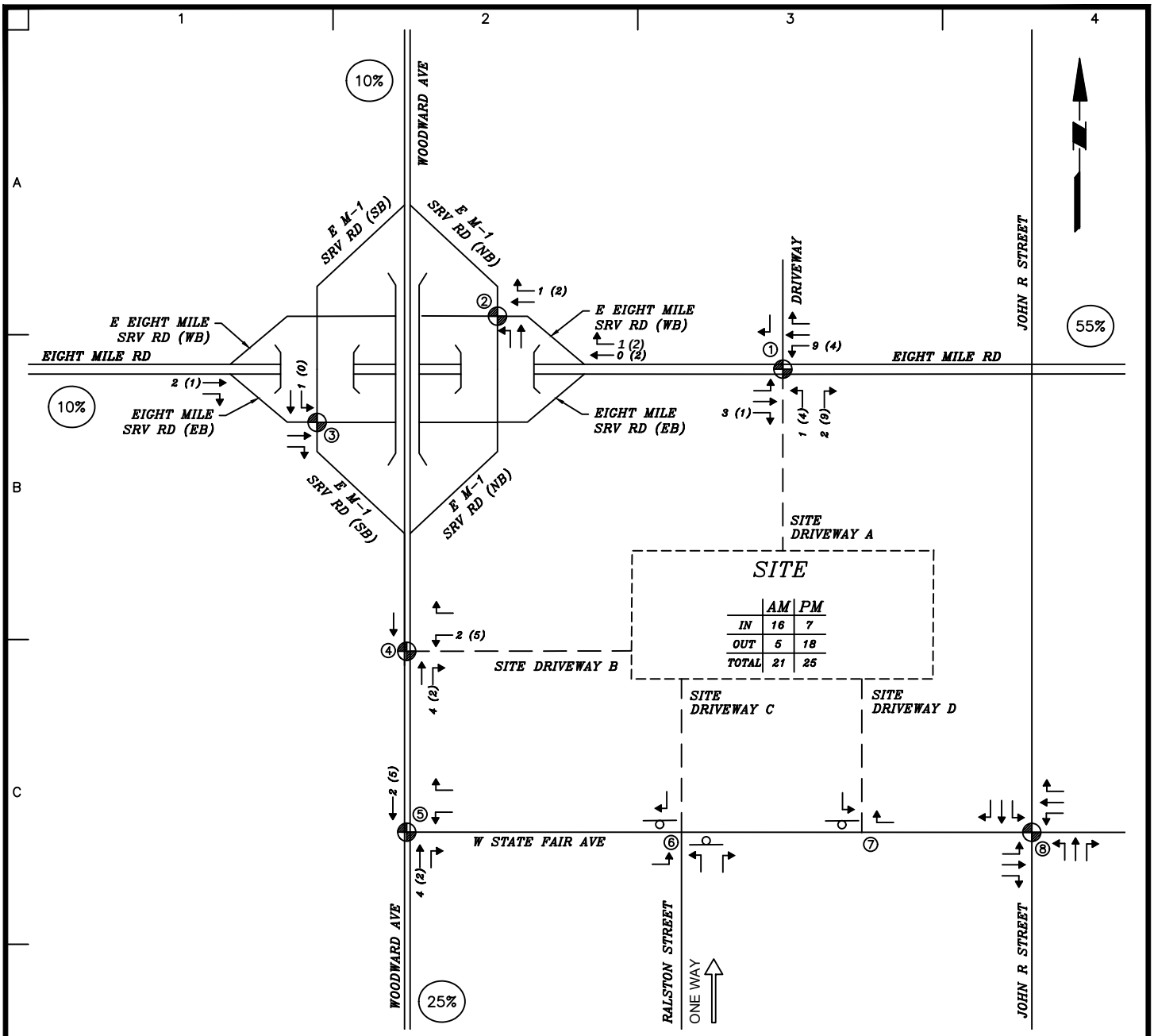
Drawing Title
PHASE 2 EMPLOYEE SITE TRIPS

Project No.	250095201
Date	AUGUST 2020
Drawn By	JMK
Checked By	CAP

Figure
10A

Filename: \\langan.com\data\PIT\data2\250095201\Project Data\CAD\01\2D-DesignFiles\Traffic\250095201-K-TC0104 - TIS - Public - Approved Scope.dwg Date: 8/31/2020 Time: 14:19 User: mkrushinsky Style Table: Langan.stb Layout: FIG 10A



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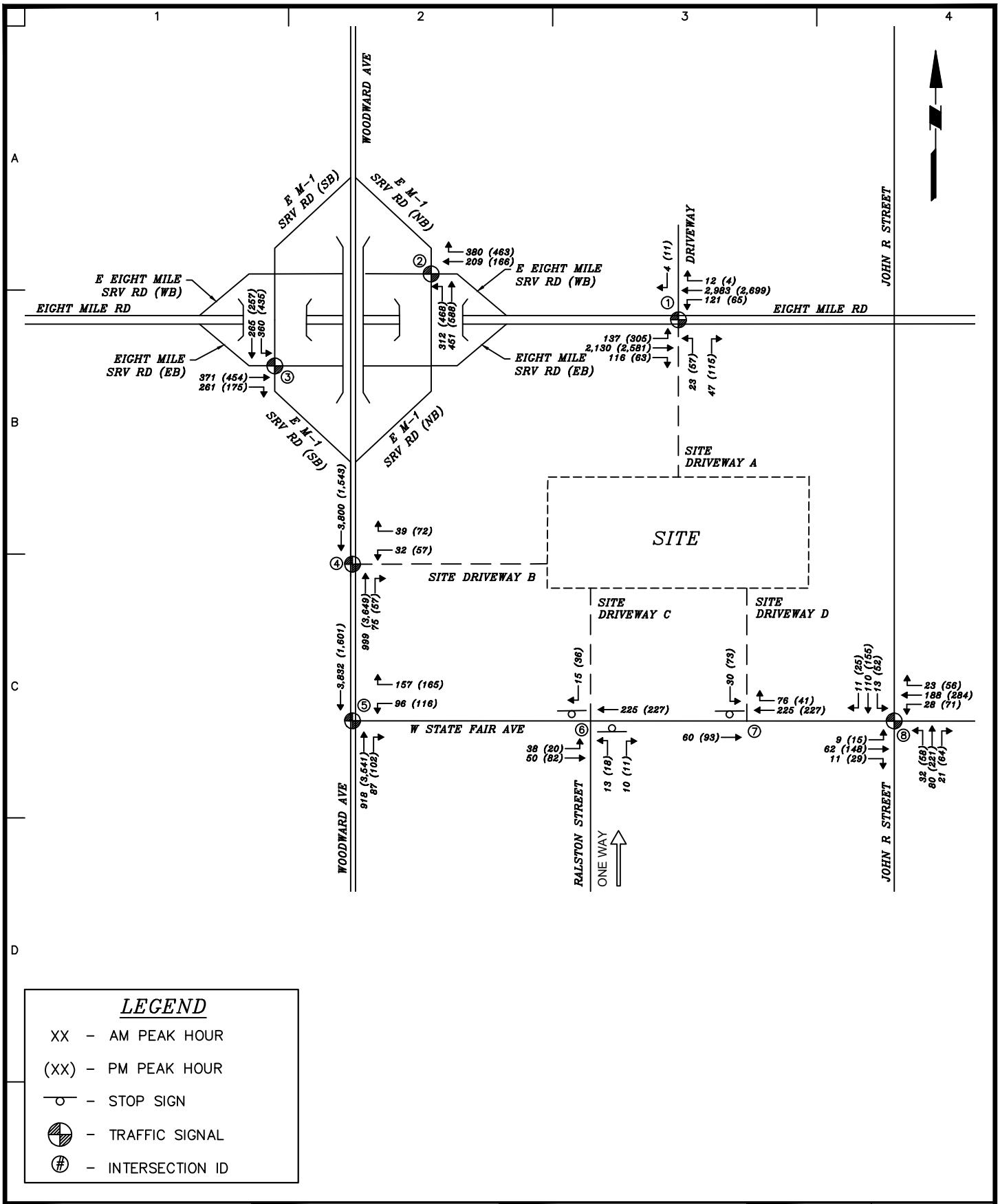
WAYNE COUNTY MICHIGAN

Drawing Title
PHASE 2 TRUCK SITE TRIPS

Project No. 250095201
Date AUGUST 2020
Drawn By JMK
Checked By CAP

Figure
10B

Filename: \\langan.com\data\PIT\data2\250095201\Project Data\CAD\01\2D-DesignFiles\Traffic\250095201-K-TC0104 - TIS - Public - Approved Scope.dwg Date: 8/31/2020 Time: 14:19 User: mkrushinsky Style Table: Langan.stb Layout: FIG 10B



LEGEND

XX – AM PEAK HOUR

(XX) – PM PEAK HOUR

– STOP SIGN

– TRAFFIC SIGNAL

– INTERSECTION ID

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CITY OF DETROIT

WAYNE COUNTY MICHIGAN

Drawing Title

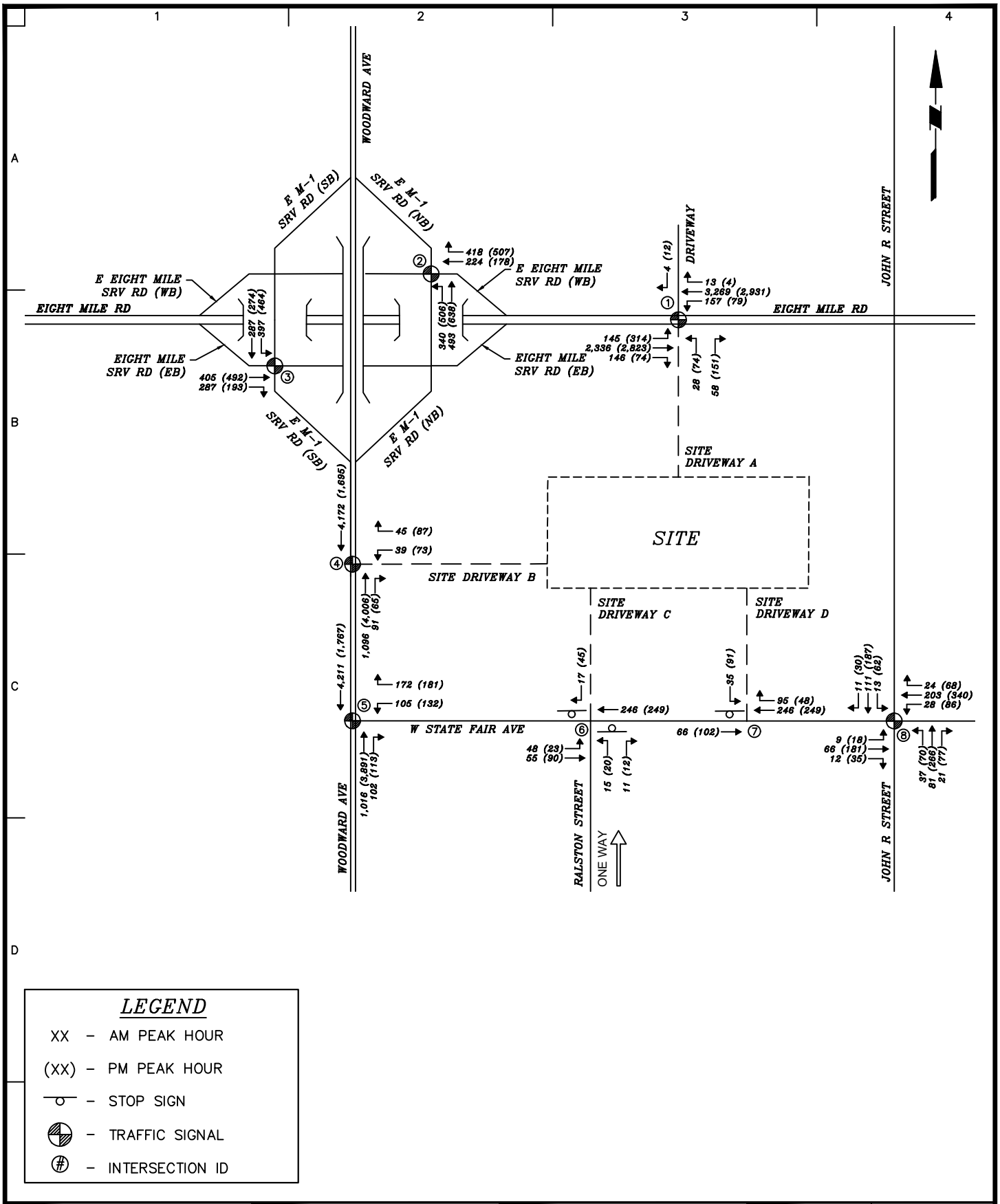
2022 PHASE 1 BUILD PEAK HOUR TRAFFIC VOLUMES

Project No.	250095201
Date	AUGUST 2020
Drawn By	JMK
Checked By	CAP

Figure

11

Filename: \\langan.com\data\PIT\data2\250095201\Project Data\CAD\01\2D-DesignFiles\Traffic\250095201-K-TC0104 - TIS - Public - Approved Scope.dwg Date: 8/31/2020 Time: 14:16 User: mkrushinsky Style Table: Langan.stb Layout: FIG 11



LEGEND

XX – AM PEAK HOUR

(XX) – PM PEAK HOUR

– STOP SIGN

– TRAFFIC SIGNAL

– INTERSECTION ID

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Drawing Title
2032 MASTER PLAN BUILD PEAK HOUR TRAFFIC VOLUMES

Project No.	250095201
Date	AUGUST 2020
Drawn By	JMK
Checked By	CAP

Figure
12

Filename: \\langan.com\data\PIT\data2\250095201\Project Data\CAD\01\2D-DesignFiles\Traffic\250095201-K-TC0104 - TIS - Public - Approved Scope.dwg Date: 8/31/2020 Time: 14:16 User: mkrushinsky Style Table: Langan.stb Layout: FIG 12

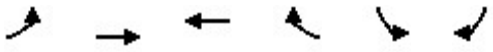
2022 Phase I Build Capacity & Queue Analyses

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	50	0	0	225	0	13	0	10	0	1	15
Future Volume (Veh/h)	38	50	0	0	225	0	13	0	10	0	1	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			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)	41	54	0	0	245	0	14	0	11	0	1	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		772										
pX, platoon unblocked												
vC, conflicting volume	245			54			398	381	54	392	381	245
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	245			54			398	381	54	392	381	245
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			97	100	99	100	100	98
cM capacity (veh/h)	1321			1551			537	535	1013	548	535	794

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	95	245	25	17
Volume Left	41	0	14	0
Volume Right	0	0	11	16
cSH	1321	1700	677	772
Volume to Capacity	0.03	0.14	0.04	0.02
Queue Length 95th (ft)	2	0	3	2
Control Delay (s)	3.5	0.0	10.5	9.8
Lane LOS	A		B	A
Approach Delay (s)	3.5	0.0	10.5	9.8
Approach LOS			B	A

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	33.7%	ICU Level of Service	A
Analysis Period (min)	15		

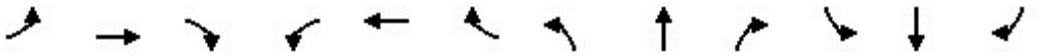
Used pseudo SBT volume of 1 to prevent fatal error from occurring in SimTraffic.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	60	225	76	30	0
Future Volume (Veh/h)	0	60	225	76	30	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	65	245	83	33	0
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	328				352	286
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	328				352	286
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				95	100
cM capacity (veh/h)	1232				646	753

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	65	328	33
Volume Left	0	0	33
Volume Right	0	83	0
cSH	1700	1700	646
Volume to Capacity	0.04	0.19	0.05
Queue Length 95th (ft)	0	0	4
Control Delay (s)	0.0	0.0	10.9
Lane LOS			B
Approach Delay (s)	0.0	0.0	10.9
Approach LOS			B

Intersection Summary			
Average Delay		0.8	
Intersection Capacity Utilization		25.6%	ICU Level of Service A
Analysis Period (min)		15	

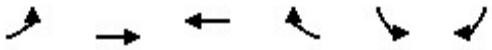


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	82	0	0	227	0	18	0	11	0	1	36
Future Volume (Veh/h)	20	82	0	0	227	0	18	0	11	0	1	36
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	89	0	0	247	0	20	0	12	0	1	39
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		772										
pX, platoon unblocked												
vC, conflicting volume	247			89			420	380	89	392	380	247
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	247			89			420	380	89	392	380	247
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			96	100	99	100	100	95
cM capacity (veh/h)	1319			1506			510	543	969	553	543	792

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	111	247	32	40
Volume Left	22	0	20	0
Volume Right	0	0	12	39
cSH	1319	1700	620	783
Volume to Capacity	0.02	0.15	0.05	0.05
Queue Length 95th (ft)	1	0	4	4
Control Delay (s)	1.7	0.0	11.1	9.8
Lane LOS	A		B	A
Approach Delay (s)	1.7	0.0	11.1	9.8
Approach LOS			B	A

Intersection Summary				
Average Delay	2.2			
Intersection Capacity Utilization	34.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Used pseudo SBT volume of 1 to prevent fatal error from occurring in SimTraffic.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	93	227	41	73	0
Future Volume (Veh/h)	0	93	227	41	73	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	101	247	45	79	0
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	292				370	270
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	292				370	270
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				87	100
cM capacity (veh/h)	1270				630	769

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	101	292	79
Volume Left	0	0	79
Volume Right	0	45	0
cSH	1700	1700	630
Volume to Capacity	0.06	0.17	0.13
Queue Length 95th (ft)	0	0	11
Control Delay (s)	0.0	0.0	11.5
Lane LOS			B
Approach Delay (s)	0.0	0.0	11.5
Approach LOS			B

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	24.2%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	38	50	0	0	225	0	13	0	10	0	1	15
Future Vol, veh/h	38	50	0	0	225	0	13	0	10	0	1	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	41	54	0	0	245	0	14	0	11	0	1	16

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	245	0	-	-	-	0	390	381	54	-	381	245
Stage 1	-	-	-	-	-	-	136	136	-	-	245	-
Stage 2	-	-	-	-	-	-	254	245	-	-	136	-
Critical Hdwy	4.12	-	-	-	-	-	7.12	6.52	6.22	-	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	-	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	-	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318	-	4.018	3.318
Pot Cap-1 Maneuver	1321	-	0	0	-	0	569	552	1013	0	552	794
Stage 1	-	-	0	0	-	0	867	784	-	0	703	-
Stage 2	-	-	0	0	-	0	750	703	-	0	784	-
Platoon blocked, %		-			-							
Mov Cap-1 Maneuver	1321	-	-	-	-	-	543	534	1013	-	534	794
Mov Cap-2 Maneuver	-	-	-	-	-	-	543	534	-	-	534	-
Stage 1	-	-	-	-	-	-	839	759	-	-	703	-
Stage 2	-	-	-	-	-	-	733	703	-	-	759	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.4	0	10.5	9.8
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	SBLn1
Capacity (veh/h)	680	1321	-	-	771
HCM Lane V/C Ratio	0.037	0.031	-	-	0.023
HCM Control Delay (s)	10.5	7.8	0	-	9.8
HCM Lane LOS	B	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0.1

Used pseudo SBT volume of 1 to prevent fatal error from occurring in SimTraffic.

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	60	225	76	30	0
Future Vol, veh/h	0	60	225	76	30	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	65	245	83	33	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	352	-
Stage 1	-	-	-	-	287	-
Stage 2	-	-	-	-	65	-
Critical Hdwy	-	-	-	-	6.42	-
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	-	-	3.518	-
Pot Cap-1 Maneuver	0	-	-	-	646	0
Stage 1	0	-	-	-	762	0
Stage 2	0	-	-	-	958	0
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	646	-
Mov Cap-2 Maneuver	-	-	-	-	646	-
Stage 1	-	-	-	-	762	-
Stage 2	-	-	-	-	958	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.9
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	646
HCM Lane V/C Ratio	-	-	-	0.05
HCM Control Delay (s)	-	-	-	10.9
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.2

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	82	0	0	227	0	18	0	11	0	1	36
Future Vol, veh/h	20	82	0	0	227	0	18	0	11	0	1	36
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	89	0	0	247	0	20	0	12	0	1	39

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	247	0	-	-	-	0	400	380	89	-	380	247
Stage 1	-	-	-	-	-	-	133	133	-	-	247	-
Stage 2	-	-	-	-	-	-	267	247	-	-	133	-
Critical Hdwy	4.12	-	-	-	-	-	7.12	6.52	6.22	-	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	-	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	-	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318	-	4.018	3.318
Pot Cap-1 Maneuver	1319	-	0	0	-	0	560	552	969	0	552	792
Stage 1	-	-	0	0	-	0	870	786	-	0	702	-
Stage 2	-	-	0	0	-	0	738	702	-	0	786	-
Platoon blocked, %		-			-							
Mov Cap-1 Maneuver	1319	-	-	-	-	-	524	542	969	-	542	792
Mov Cap-2 Maneuver	-	-	-	-	-	-	524	542	-	-	542	-
Stage 1	-	-	-	-	-	-	854	772	-	-	702	-
Stage 2	-	-	-	-	-	-	700	702	-	-	772	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.5	0	11	9.9
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	SBLn1
Capacity (veh/h)	635	1319	-	-	782
HCM Lane V/C Ratio	0.05	0.016	-	-	0.051
HCM Control Delay (s)	11	7.8	0	-	9.9
HCM Lane LOS	B	A	A	-	A
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0.2

Used pseudo SBT volume of 1 to prevent fatal error from occurring in SimTraffic.

Intersection	
Int Delay, s/veh	1.9

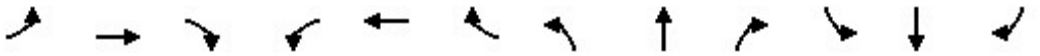
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	93	227	41	73	0
Future Vol, veh/h	0	93	227	41	73	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	101	247	45	79	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	371	-
Stage 1	-	-	-	-	270	-
Stage 2	-	-	-	-	101	-
Critical Hdwy	-	-	-	-	6.42	-
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	-	-	3.518	-
Pot Cap-1 Maneuver	0	-	-	-	630	0
Stage 1	0	-	-	-	775	0
Stage 2	0	-	-	-	923	0
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	630	-
Mov Cap-2 Maneuver	-	-	-	-	630	-
Stage 1	-	-	-	-	775	-
Stage 2	-	-	-	-	923	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11.5
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	630
HCM Lane V/C Ratio	-	-	-	0.126
HCM Control Delay (s)	-	-	-	11.5
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.4

2032 Master Plan Build Capacity & Queue Analyses

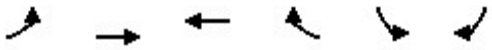


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	48	55	0	0	246	0	15	0	11	0	1	17
Future Volume (Veh/h)	48	55	0	0	246	0	15	0	11	0	1	17
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	52	60	0	0	267	0	16	0	12	0	1	18
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		772										
pX, platoon unblocked												
vC, conflicting volume	267			60			450	431	60	443	431	267
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	267			60			450	431	60	443	431	267
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			100			97	100	99	100	100	98
cM capacity (veh/h)	1297			1544			491	496	1005	503	496	772

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	112	267	28	19
Volume Left	52	0	16	0
Volume Right	0	0	12	18
cSH	1297	1700	629	750
Volume to Capacity	0.04	0.16	0.04	0.03
Queue Length 95th (ft)	3	0	3	2
Control Delay (s)	3.8	0.0	11.0	9.9
Lane LOS	A		B	A
Approach Delay (s)	3.8	0.0	11.0	9.9
Approach LOS			B	A

Intersection Summary				
Average Delay	2.2			
Intersection Capacity Utilization	35.7%	ICU Level of Service	A	
Analysis Period (min)	15			

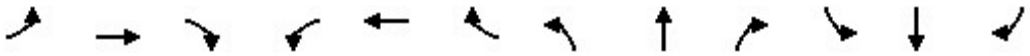
Used pseudo SBT volume of 1 to prevent fatal error from occurring in SimTraffic.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	66	246	95	35	0
Future Volume (Veh/h)	0	66	246	95	35	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	72	267	103	38	0
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	370				390	318
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	370				390	318
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				94	100
cM capacity (veh/h)	1189				613	722

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	72	370	38
Volume Left	0	0	38
Volume Right	0	103	0
cSH	1700	1700	613
Volume to Capacity	0.04	0.22	0.06
Queue Length 95th (ft)	0	0	5
Control Delay (s)	0.0	0.0	11.3
Lane LOS			B
Approach Delay (s)	0.0	0.0	11.3
Approach LOS			B

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	27.8%	ICU Level of Service	A
Analysis Period (min)	15		

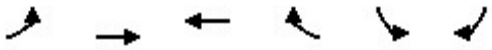


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	90	0	0	249	0	20	0	12	0	1	45
Future Volume (Veh/h)	23	90	0	0	249	0	20	0	12	0	1	45
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	98	0	0	271	0	22	0	13	0	1	49
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		771										
pX, platoon unblocked												
vC, conflicting volume	271			98			468	419	98	432	419	271
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	271			98			468	419	98	432	419	271
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			95	100	99	100	100	94
cM capacity (veh/h)	1292			1495			465	515	958	519	515	768

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	123	271	35	50
Volume Left	25	0	22	0
Volume Right	0	0	13	49
cSH	1292	1700	575	760
Volume to Capacity	0.02	0.16	0.06	0.07
Queue Length 95th (ft)	1	0	5	5
Control Delay (s)	1.7	0.0	11.7	10.1
Lane LOS	A		B	B
Approach Delay (s)	1.7	0.0	11.7	10.1
Approach LOS			B	B

Intersection Summary				
Average Delay	2.3			
Intersection Capacity Utilization	36.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Used pseudo SBT volume of 1 to prevent fatal error from occurring in SimTraffic.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	102	249	48	91	0
Future Volume (Veh/h)	0	102	249	48	91	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	111	271	52	99	0
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	323				408	297
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	323				408	297
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				83	100
cM capacity (veh/h)	1237				599	742

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	111	323	99
Volume Left	0	0	99
Volume Right	0	52	0
cSH	1700	1700	599
Volume to Capacity	0.07	0.19	0.17
Queue Length 95th (ft)	0	0	15
Control Delay (s)	0.0	0.0	12.2
Lane LOS			B
Approach Delay (s)	0.0	0.0	12.2
Approach LOS			B

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	26.7%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	48	55	0	0	246	0	15	0	11	0	1	17
Future Vol, veh/h	48	55	0	0	246	0	15	0	11	0	1	17
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	52	60	0	0	267	0	16	0	12	0	1	18

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	267	0	-	-	-	0	441	431	60	-	431	267
Stage 1	-	-	-	-	-	-	164	164	-	-	267	-
Stage 2	-	-	-	-	-	-	277	267	-	-	164	-
Critical Hdwy	4.12	-	-	-	-	-	7.12	6.52	6.22	-	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	-	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	-	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318	-	4.018	3.318
Pot Cap-1 Maneuver	1297	-	0	0	-	0	527	517	1005	0	517	772
Stage 1	-	-	0	0	-	0	838	762	-	0	688	-
Stage 2	-	-	0	0	-	0	729	688	-	0	762	-
Platoon blocked, %		-			-							
Mov Cap-1 Maneuver	1297	-	-	-	-	-	497	496	1005	-	496	772
Mov Cap-2 Maneuver	-	-	-	-	-	-	497	496	-	-	496	-
Stage 1	-	-	-	-	-	-	804	731	-	-	688	-
Stage 2	-	-	-	-	-	-	710	688	-	-	731	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.7	0	11	9.9
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	SBLn1
Capacity (veh/h)	632	1297	-	-	749
HCM Lane V/C Ratio	0.045	0.04	-	-	0.026
HCM Control Delay (s)	11	7.9	0	-	9.9
HCM Lane LOS	B	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0.1

Used pseudo SBT volume of 1 to prevent fatal error from occurring in SimTraffic.

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	66	246	95	35	0
Future Vol, veh/h	0	66	246	95	35	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	72	267	103	38	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	391	-
Stage 1	-	-	-	-	319	-
Stage 2	-	-	-	-	72	-
Critical Hdwy	-	-	-	-	6.42	-
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	-	-	3.518	-
Pot Cap-1 Maneuver	0	-	-	-	613	0
Stage 1	0	-	-	-	737	0
Stage 2	0	-	-	-	951	0
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	613	-
Mov Cap-2 Maneuver	-	-	-	-	613	-
Stage 1	-	-	-	-	737	-
Stage 2	-	-	-	-	951	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11.3
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	613
HCM Lane V/C Ratio	-	-	-	0.062
HCM Control Delay (s)	-	-	-	11.3
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.2

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	23	90	0	0	249	0	20	0	12	0	1	45
Future Vol, veh/h	23	90	0	0	249	0	20	0	12	0	1	45
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	25	98	0	0	271	0	22	0	13	0	1	49

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	271	0	-	-	-	0	444	419	98	-	419	271
Stage 1	-	-	-	-	-	-	148	148	-	-	271	-
Stage 2	-	-	-	-	-	-	296	271	-	-	148	-
Critical Hdwy	4.12	-	-	-	-	-	7.12	6.52	6.22	-	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	-	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	-	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318	-	4.018	3.318
Pot Cap-1 Maneuver	1292	-	0	0	-	0	524	525	958	0	525	768
Stage 1	-	-	0	0	-	0	855	775	-	0	685	-
Stage 2	-	-	0	0	-	0	712	685	-	0	775	-
Platoon blocked, %		-			-							
Mov Cap-1 Maneuver	1292	-	-	-	-	-	483	515	958	-	515	768
Mov Cap-2 Maneuver	-	-	-	-	-	-	483	515	-	-	515	-
Stage 1	-	-	-	-	-	-	838	760	-	-	685	-
Stage 2	-	-	-	-	-	-	666	685	-	-	760	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.6	0	11.4	10.1
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	SBLn1
Capacity (veh/h)	593	1292	-	-	760
HCM Lane V/C Ratio	0.059	0.019	-	-	0.066
HCM Control Delay (s)	11.4	7.8	0	-	10.1
HCM Lane LOS	B	A	A	-	B
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0.2

Used pseudo SBT volume of 1 to prevent fatal error from occurring in SimTraffic.

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	102	249	48	91	0
Future Vol, veh/h	0	102	249	48	91	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	111	271	52	99	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	408	-
Stage 1	-	-	-	-	297	-
Stage 2	-	-	-	-	111	-
Critical Hdwy	-	-	-	-	6.42	-
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	-	-	3.518	-
Pot Cap-1 Maneuver	0	-	-	-	599	0
Stage 1	0	-	-	-	754	0
Stage 2	0	-	-	-	914	0
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	599	-
Mov Cap-2 Maneuver	-	-	-	-	599	-
Stage 1	-	-	-	-	754	-
Stage 2	-	-	-	-	914	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	12.2
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	599
HCM Lane V/C Ratio	-	-	-	0.165
HCM Control Delay (s)	-	-	-	12.2
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.6