



Hegan Lane Congestion Relief

Traffic Analysis Report | Appendices

City of Chico

March 9, 2022

➔ The Power of Commitment



Appendices

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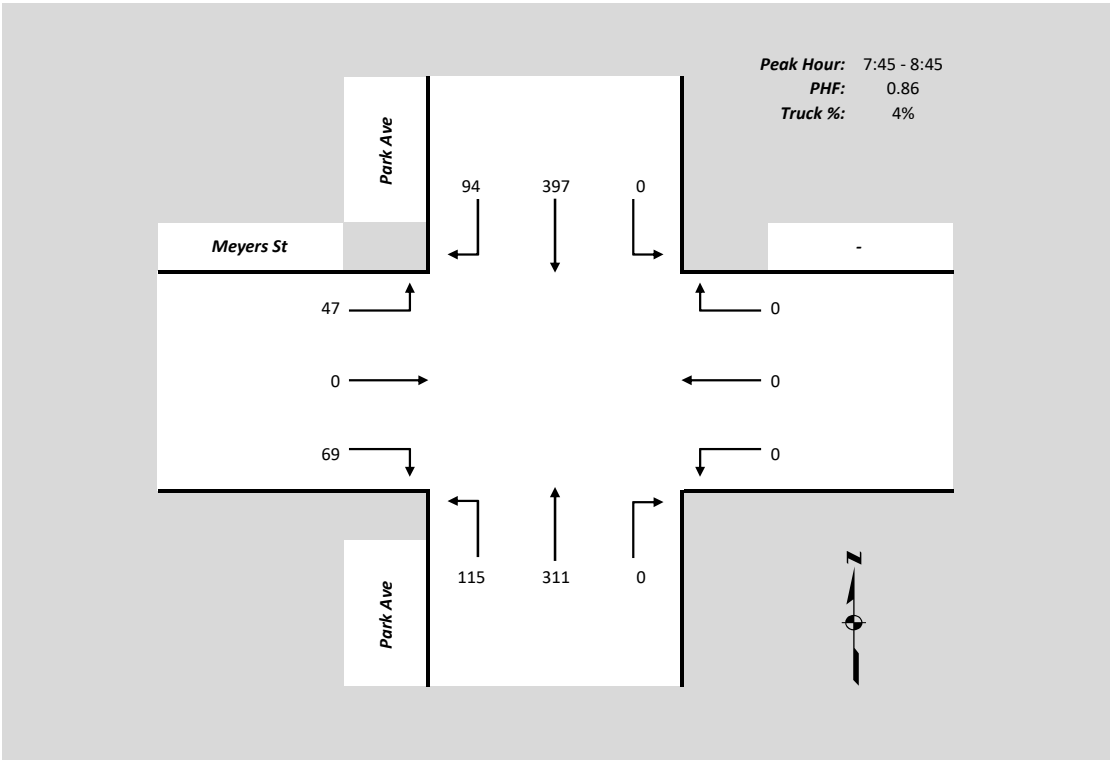
Appendix A

Traffic Volume Counts

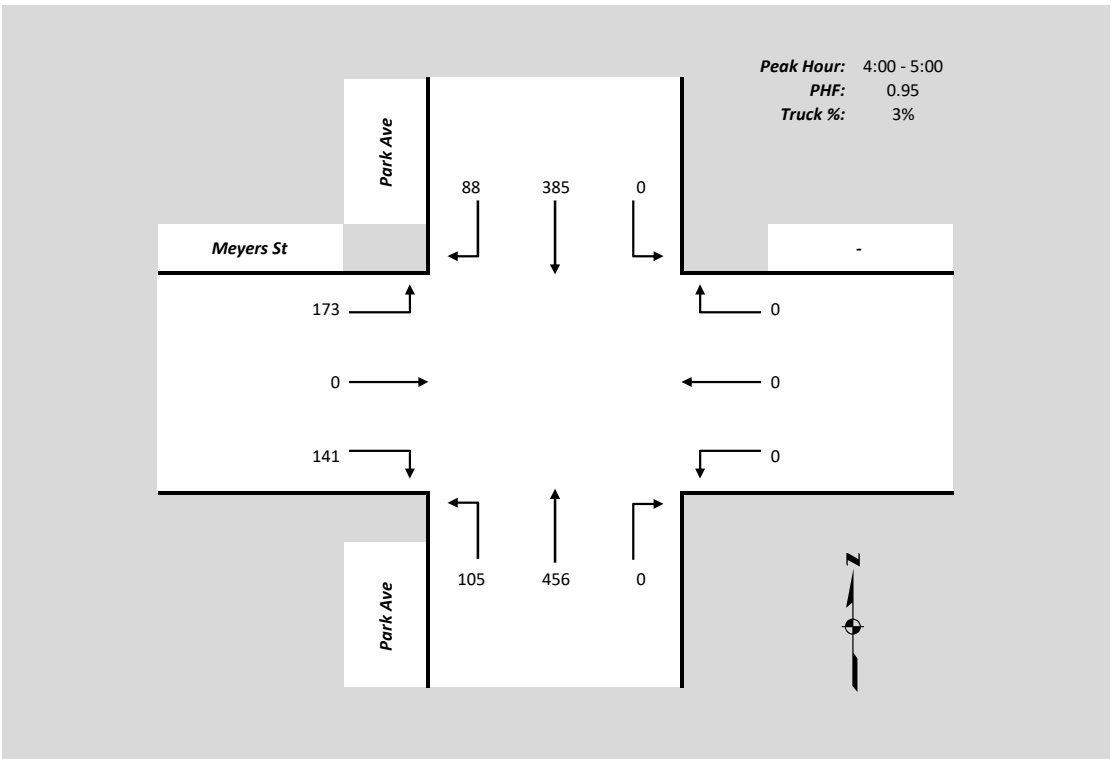


Date Collected: 1/9/2020
School In Session: Yes

AM PEAK HOUR TURNING MOVEMENT VOLUME



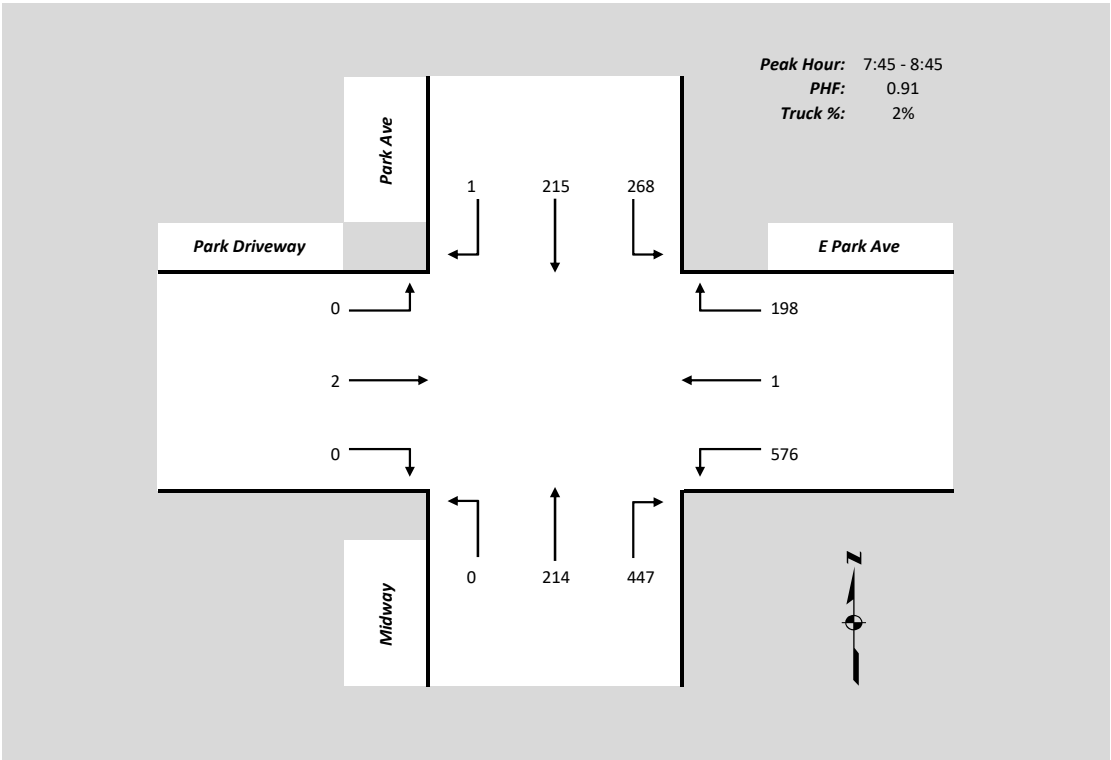
PM PEAK HOUR TURNING MOVEMENT VOLUME



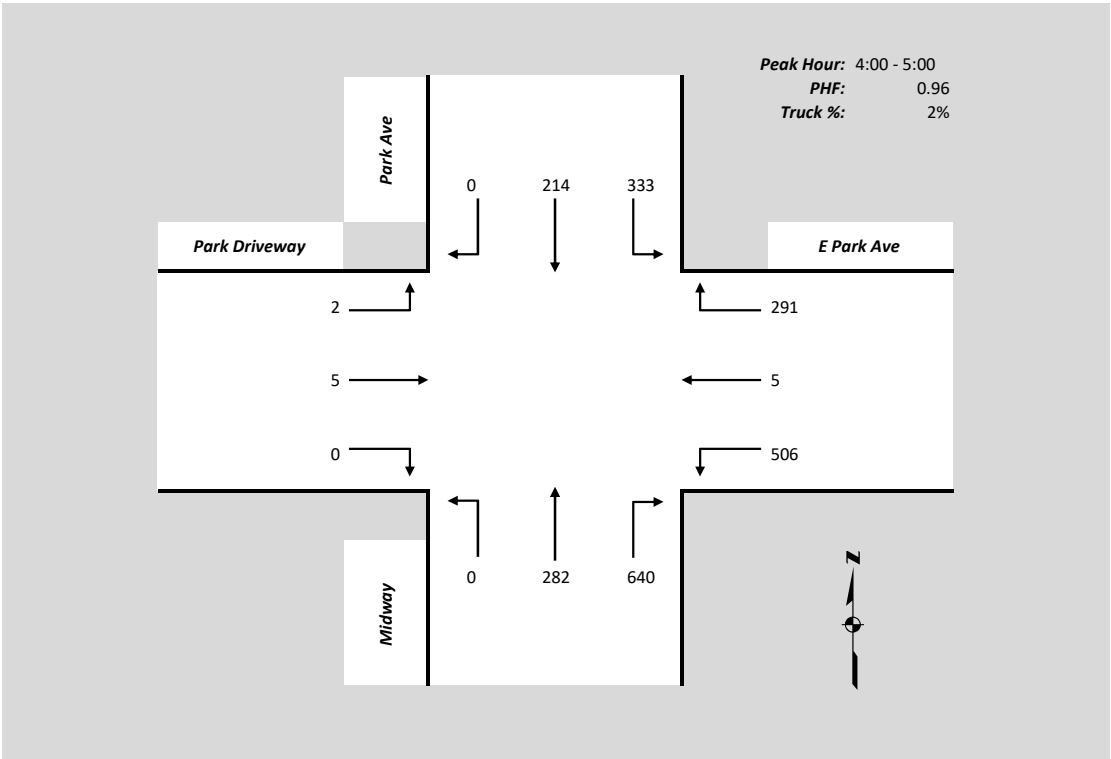


Date Collected: 1/9/2020
School In Session: Yes

AM PEAK HOUR TURNING MOVEMENT VOLUME



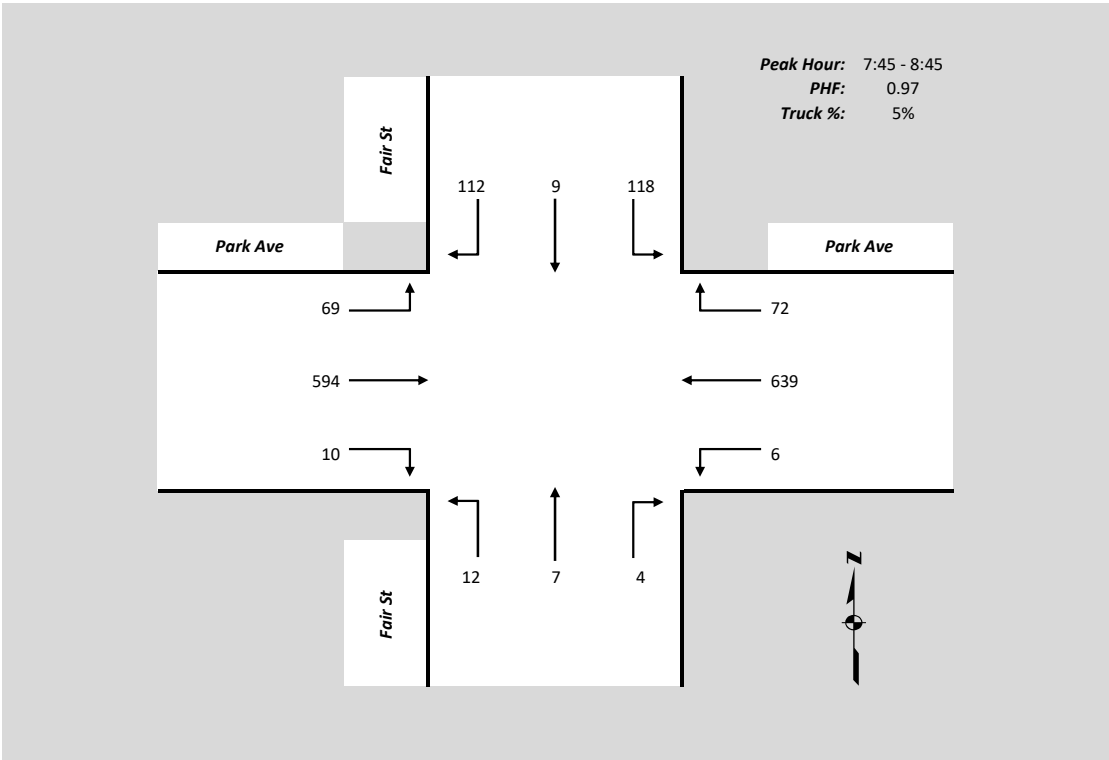
PM PEAK HOUR TURNING MOVEMENT VOLUME



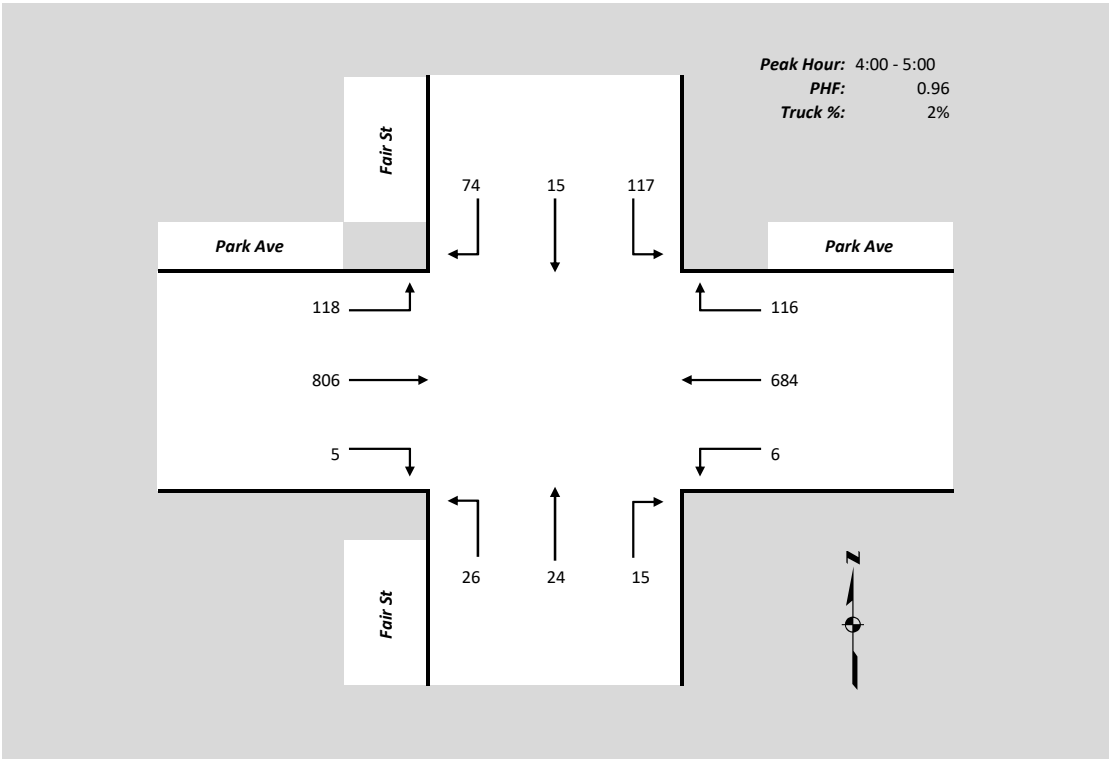


Date Collected: 1/9/2020
School In Session: Yes

AM PEAK HOUR TURNING MOVEMENT VOLUME



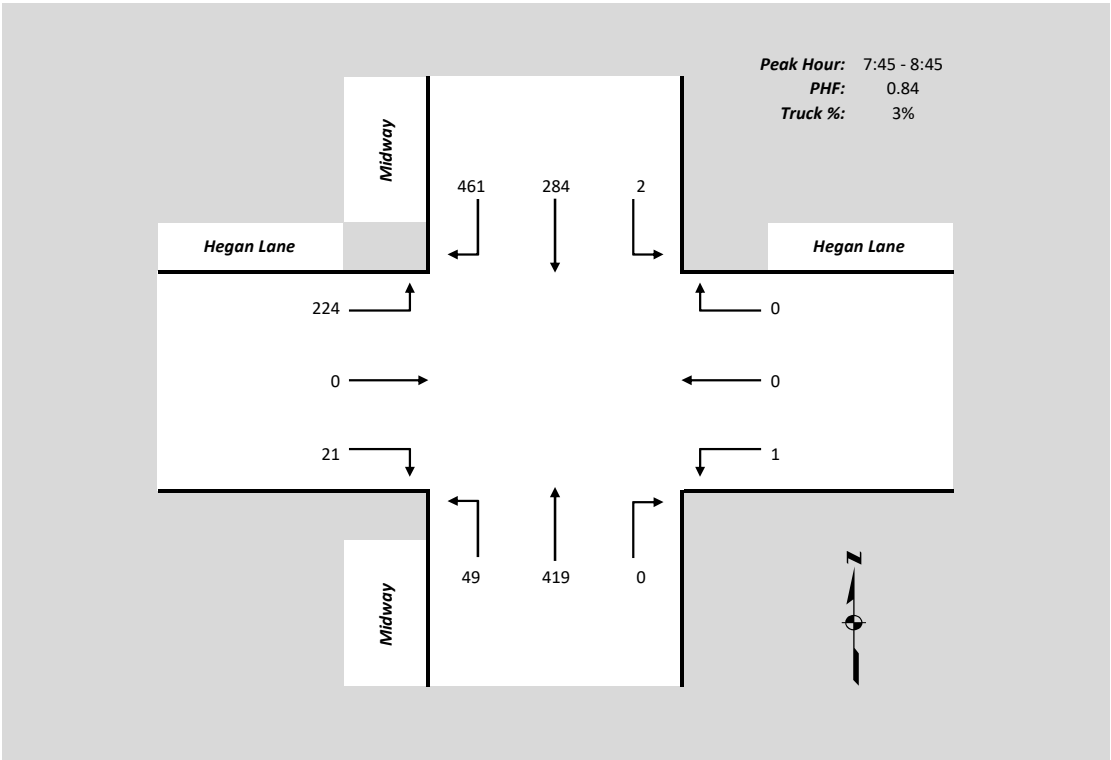
PM PEAK HOUR TURNING MOVEMENT VOLUME



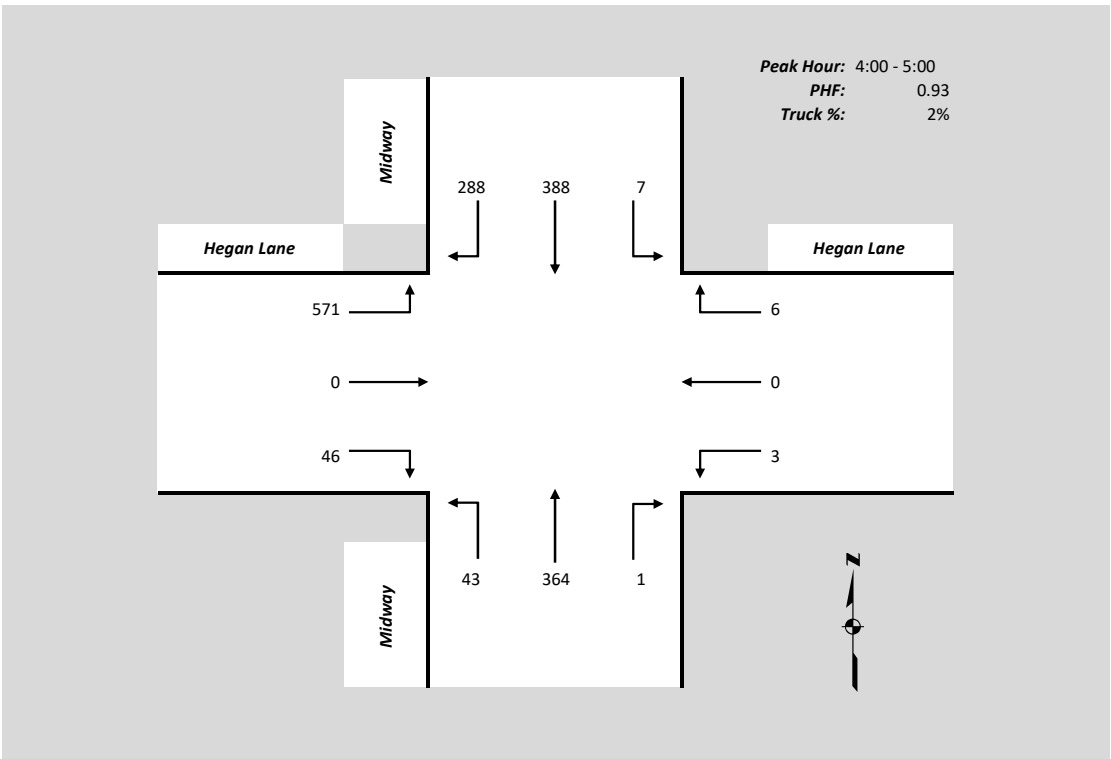


Date Collected: 1/9/2020
School In Session: Yes

AM PEAK HOUR TURNING MOVEMENT VOLUME



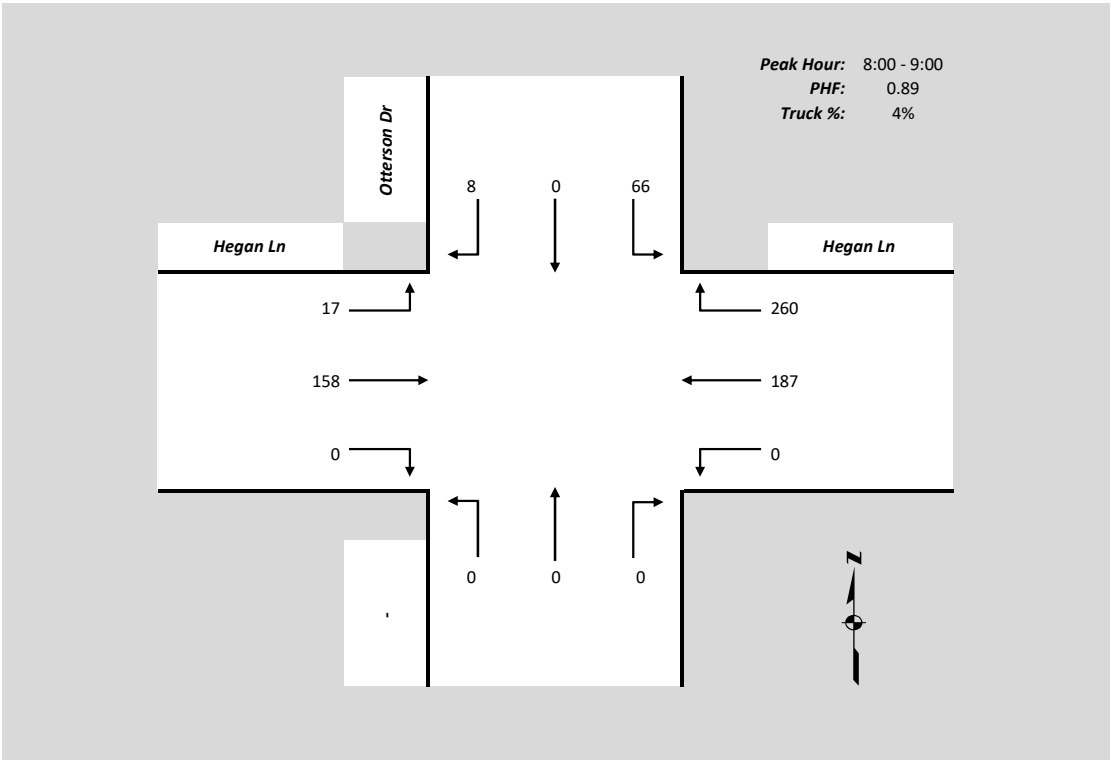
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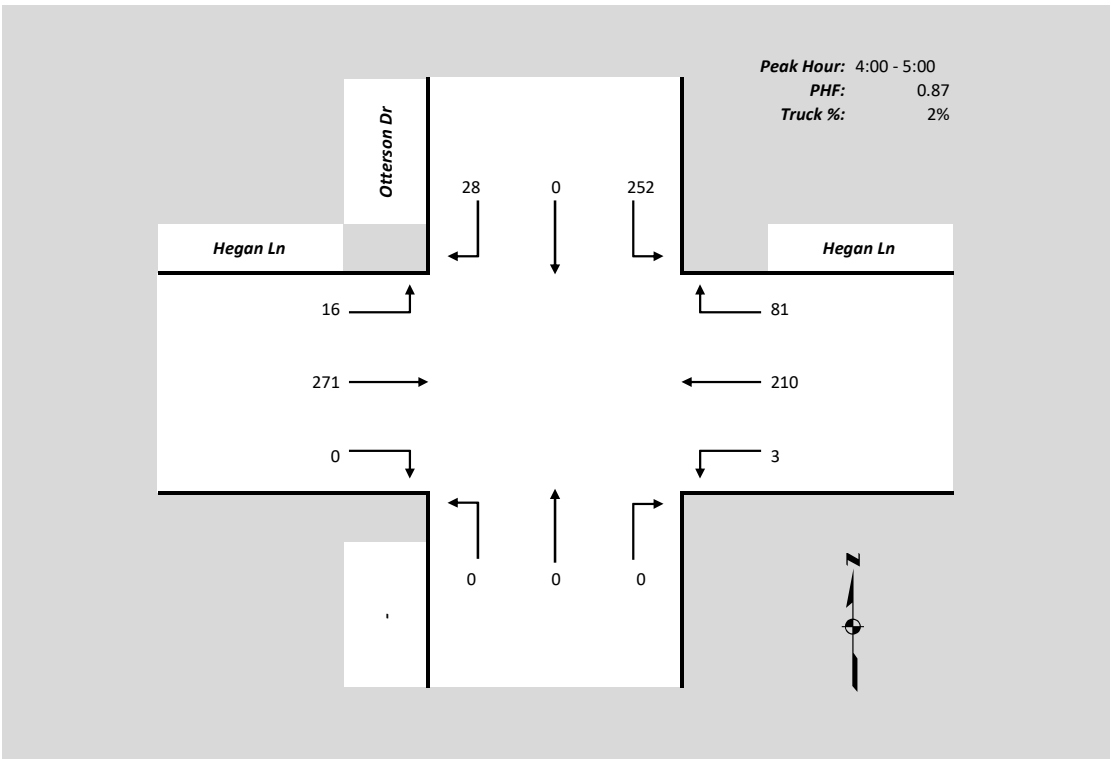


Date Collected: 1/9/2020
School In Session: Yes

AM PEAK HOUR TURNING MOVEMENT VOLUME



PM PEAK HOUR TURNING MOVEMENT VOLUME

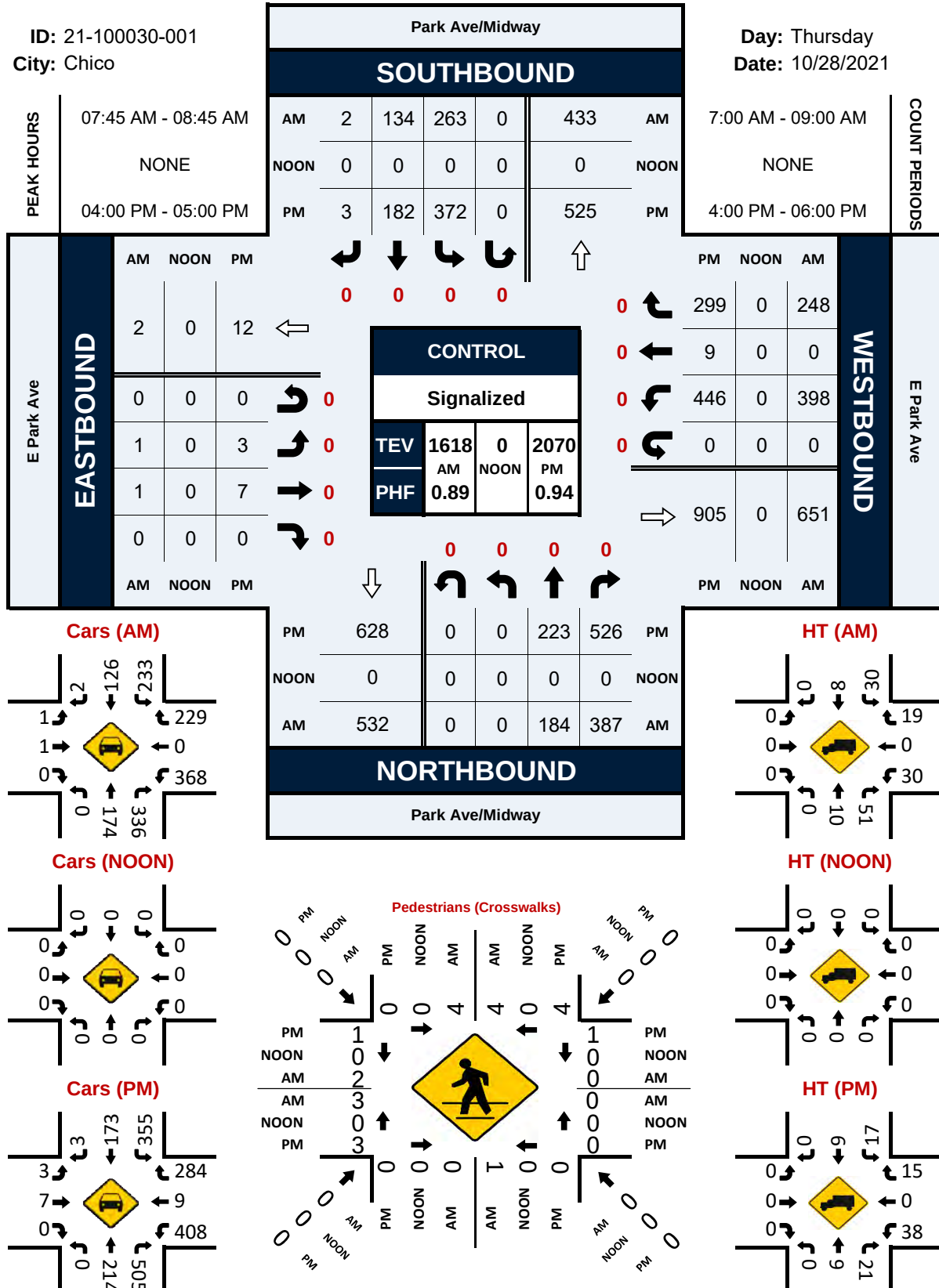


Park Ave/Midway & E Park Ave

Peak Hour Turning Movement Count

ID: 21-100030-001
City: Chico

Day: Thursday
Date: 10/28/2021

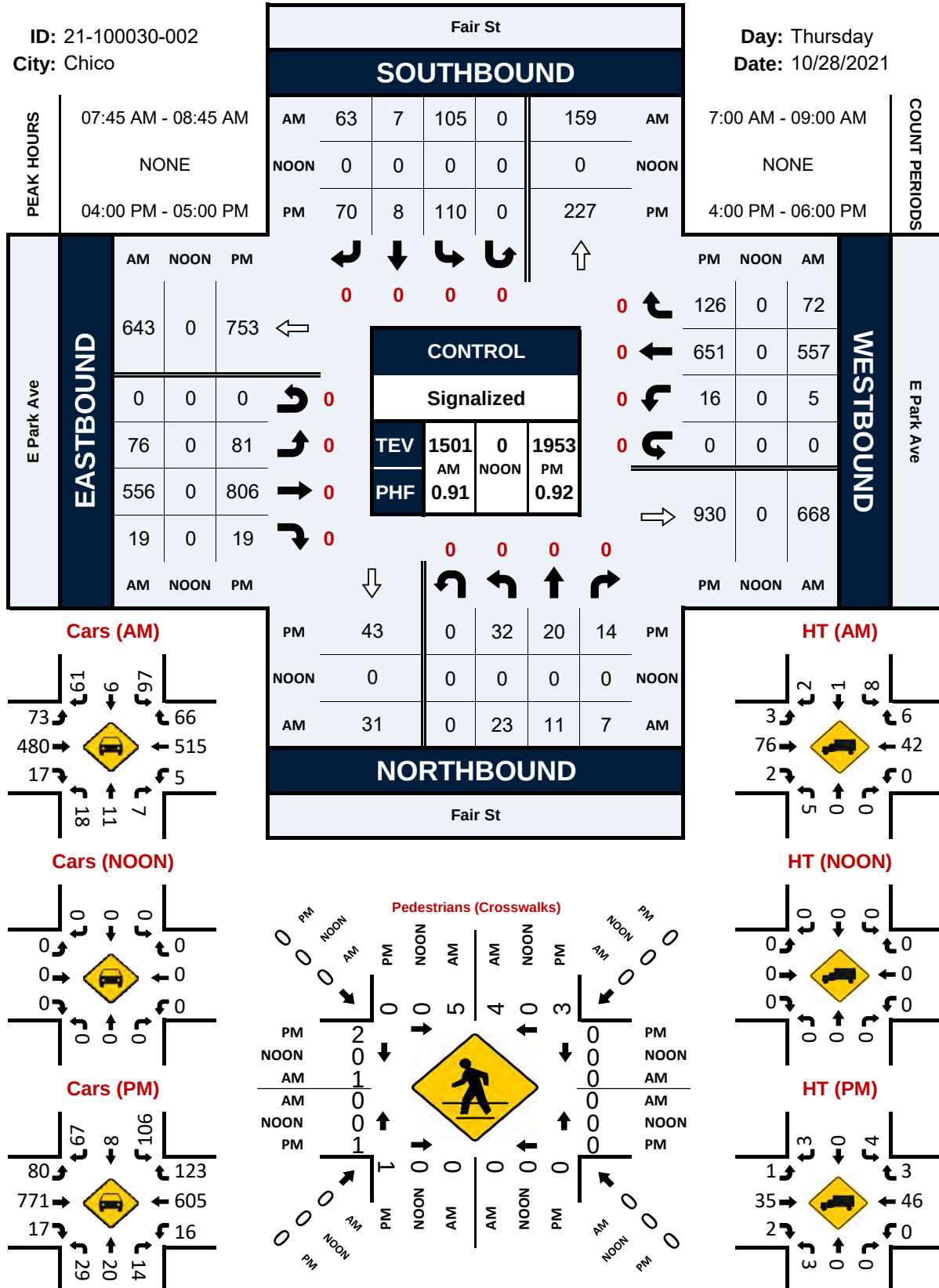


Fair St & E Park Ave

Peak Hour Turning Movement Count

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City: Chico

Day: Thursday
Date: 10/28/2021

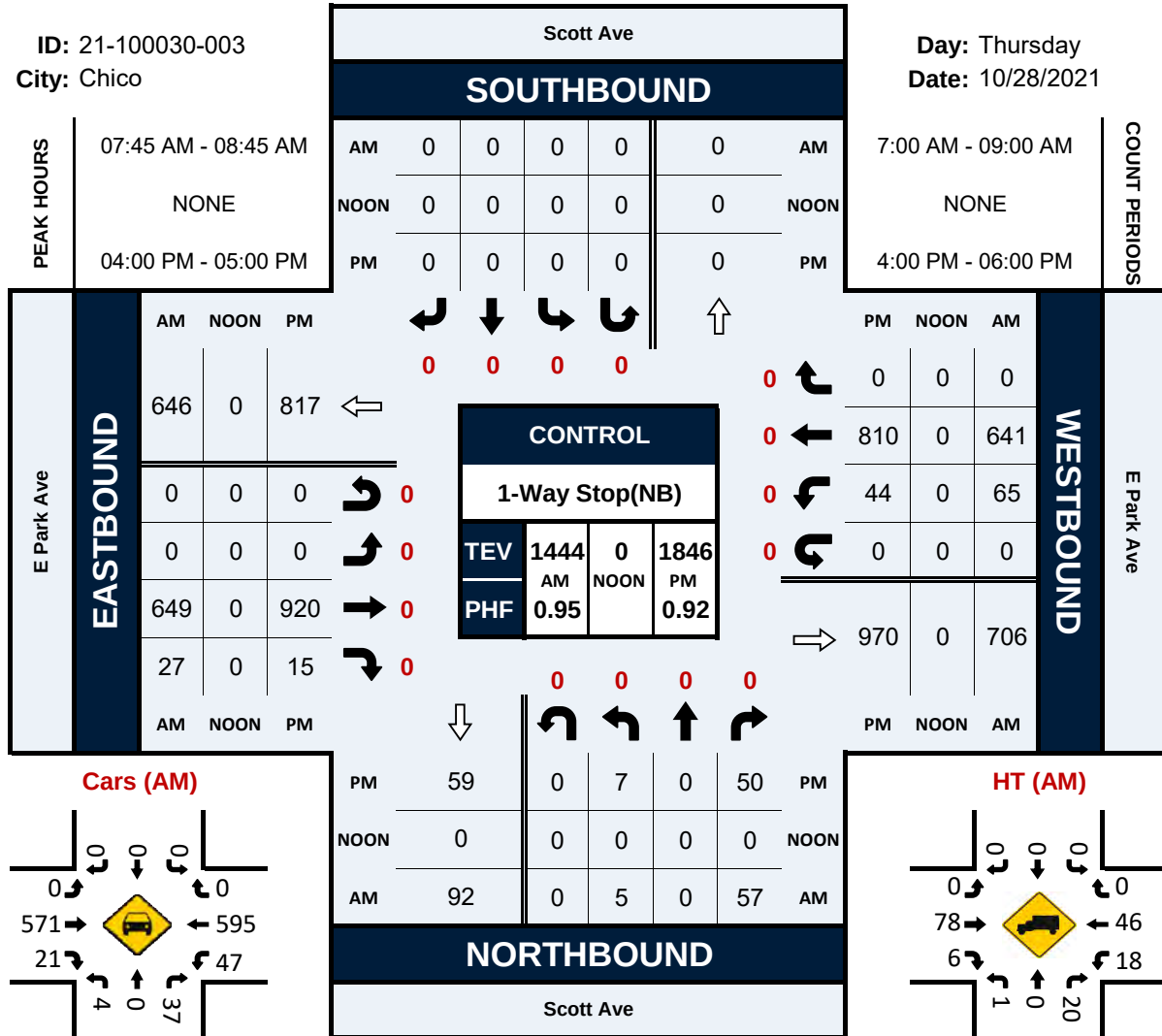


Scott Ave & E Park Ave

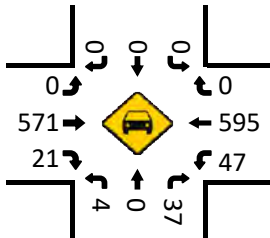
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ID: 21-100030-003
City: Chico

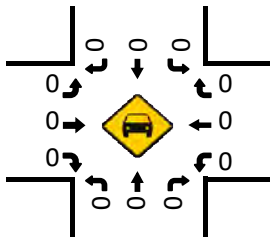
Day: Thursday
Date: 10/28/2021



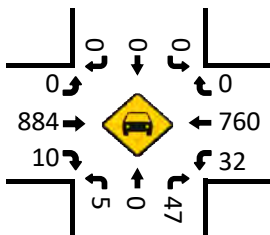
Cars (AM)



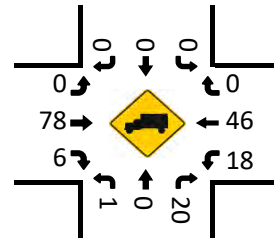
Cars (NOON)



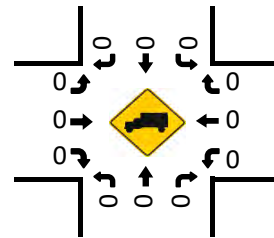
Cars (PM)



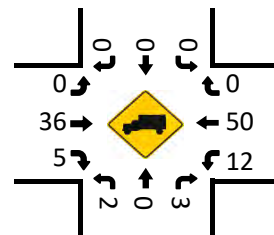
HT (AM)



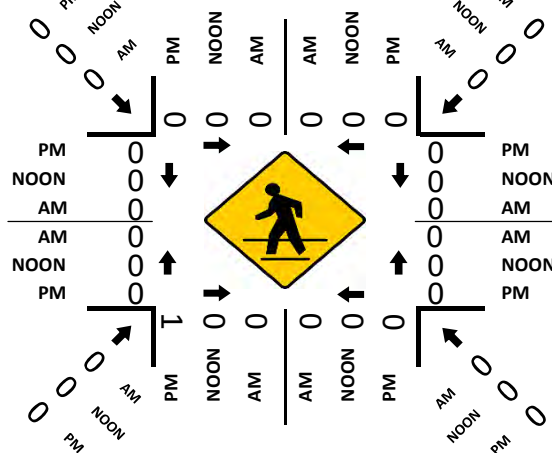
HT (NOON)

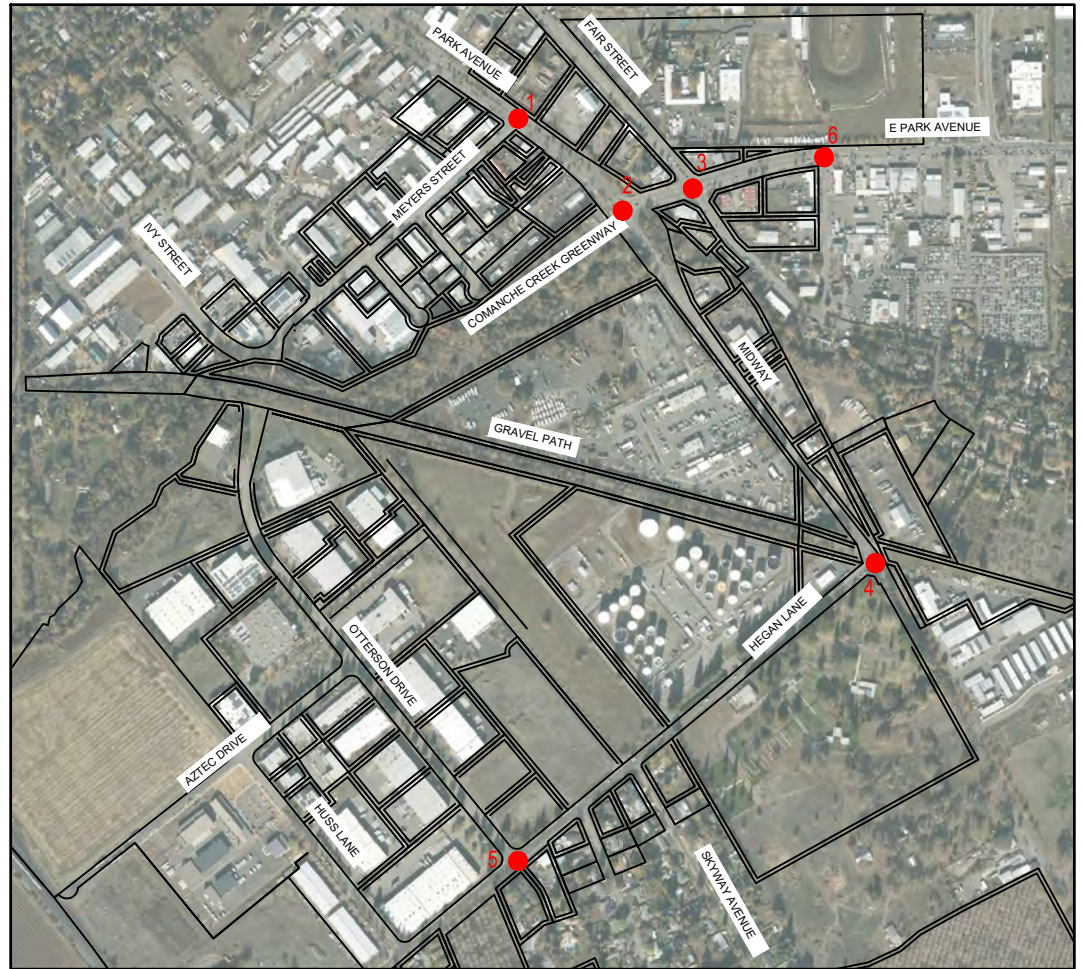
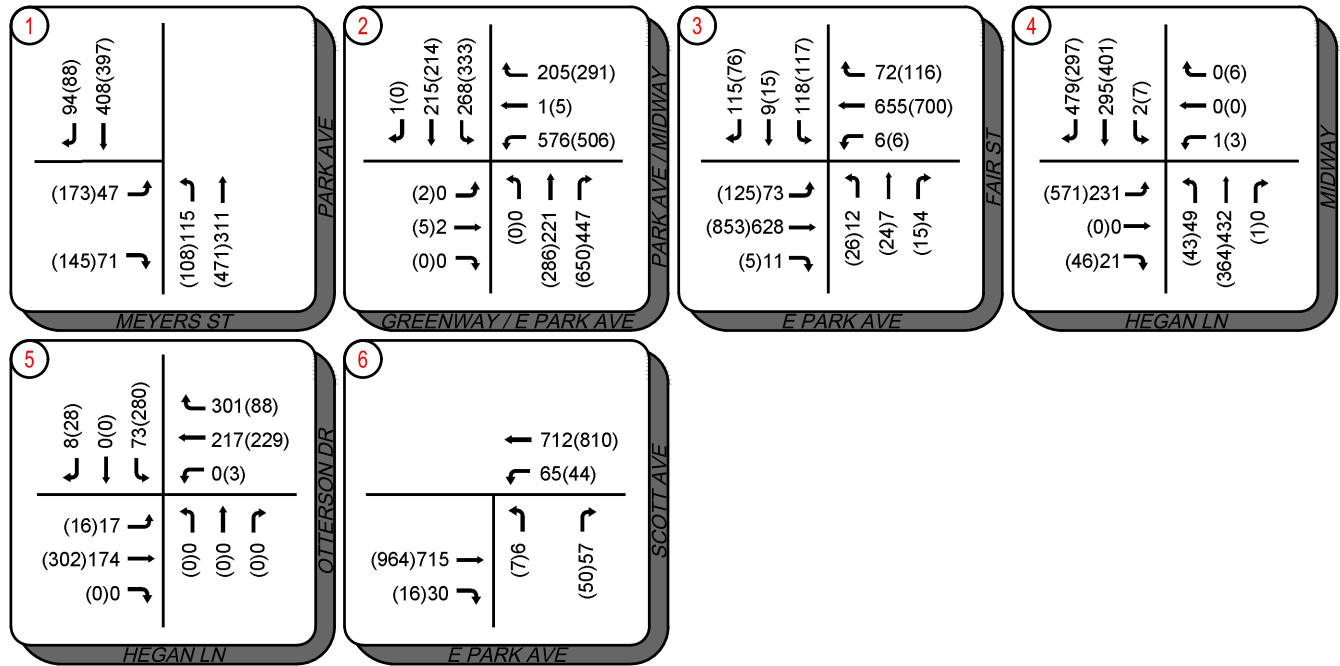


HT (PM)



Pedestrians (Crosswalks)





LEGEND:

XX - AM PEAK HOUR TRAFFIC VOLUMES
(XX) - PM PEAK HOUR TRAFFIC VOLUMES

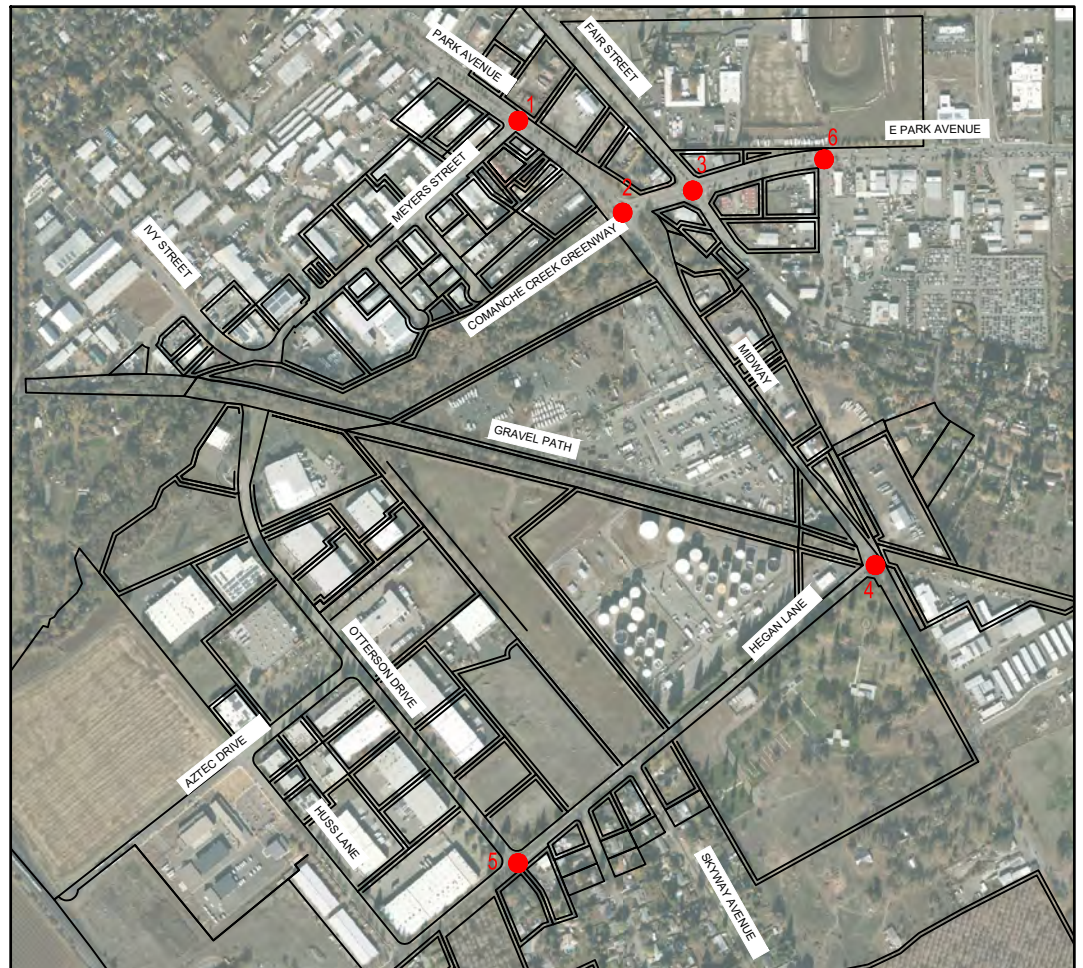
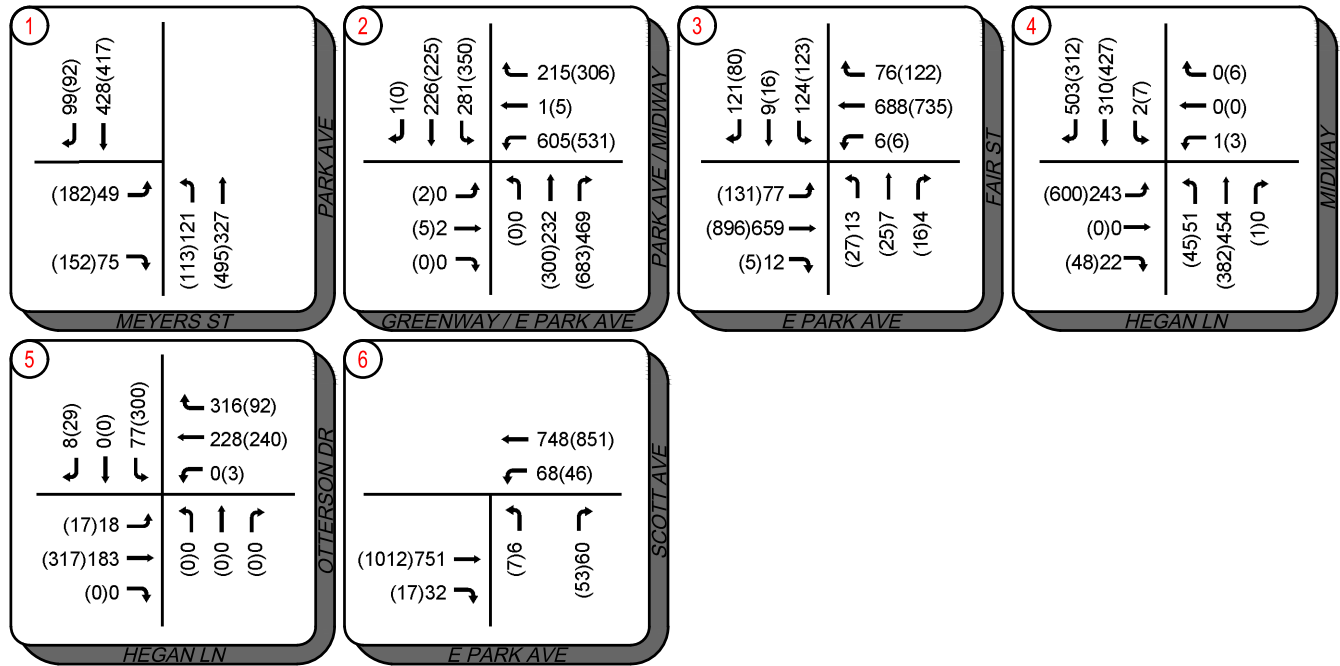


City of Chico
Hegan Lane Congestion Relief

Existing Peak Hour
Traffic Volumes

Project No. 11217309
Report No. -
Date MAR 2022

FIGURE 1



LEGEND:

XX - AM PEAK HOUR TRAFFIC VOLUMES
(XX) - PM PEAK HOUR TRAFFIC VOLUMES

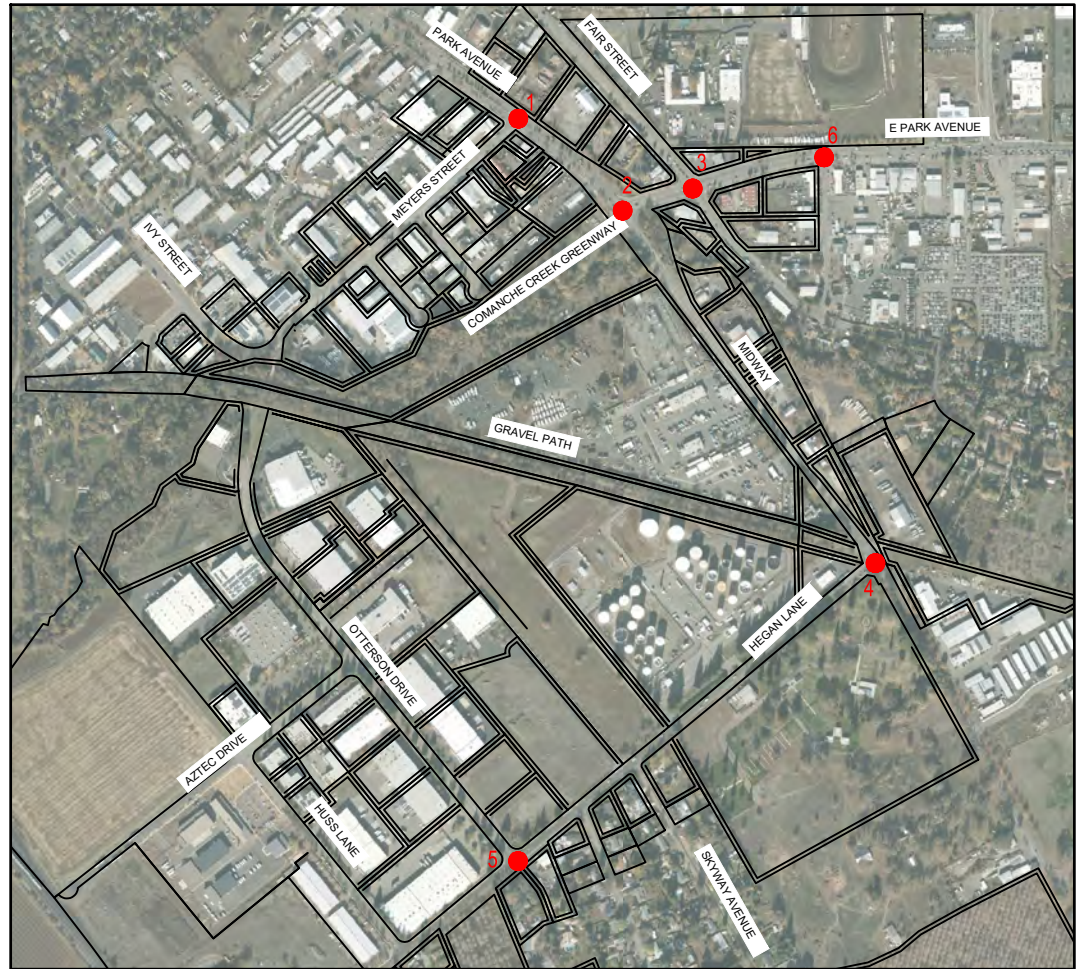
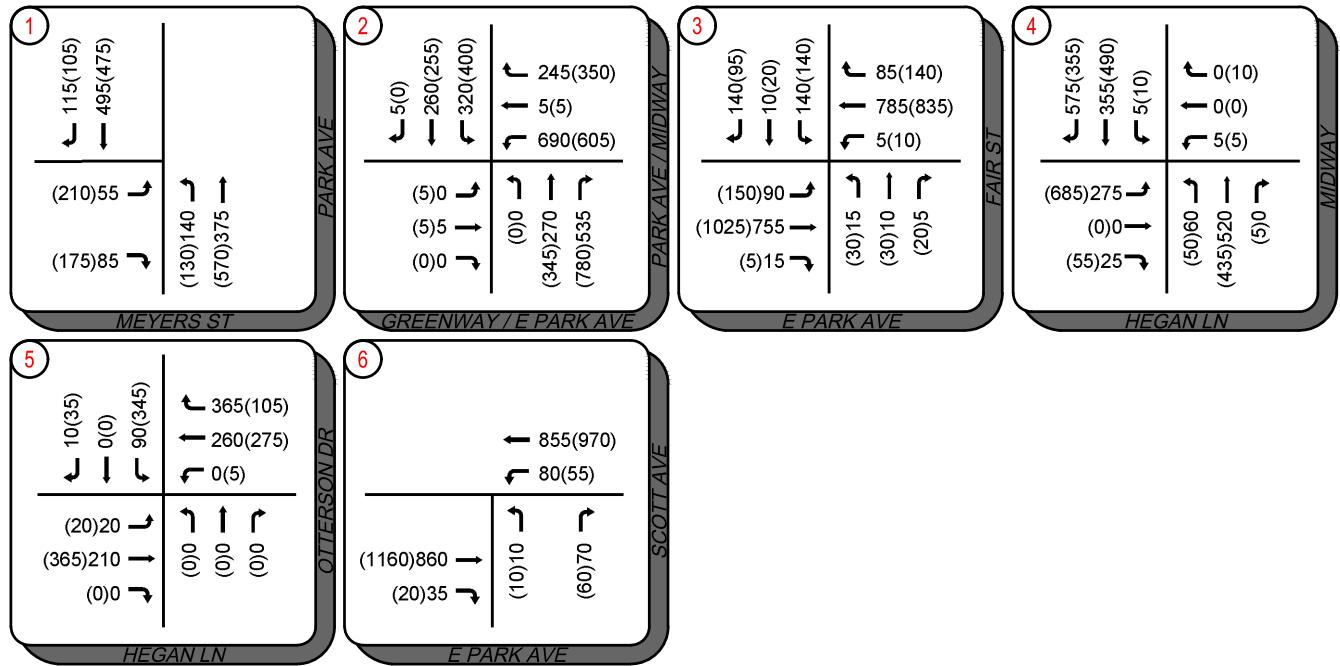


City of Chico
Hegan Lane Congestion Relief

2025 Peak Hour
Traffic Volumes

Project No. 11217309
Report No. -
Date MAR 2022

FIGURE 2



LEGEND:

XX - AM PEAK HOUR TRAFFIC VOLUMES
(XX) - PM PEAK HOUR TRAFFIC VOLUMES

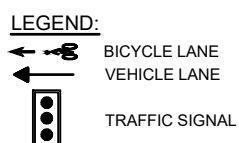
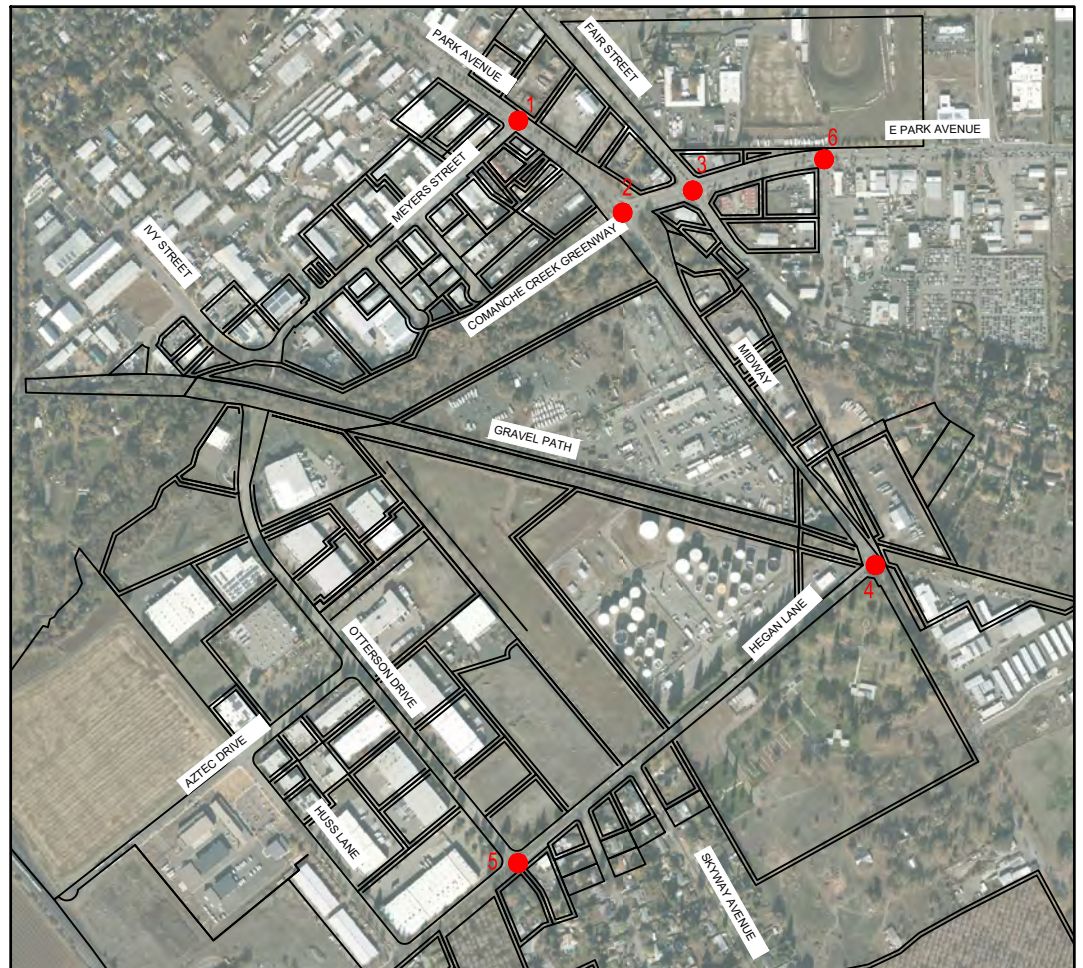
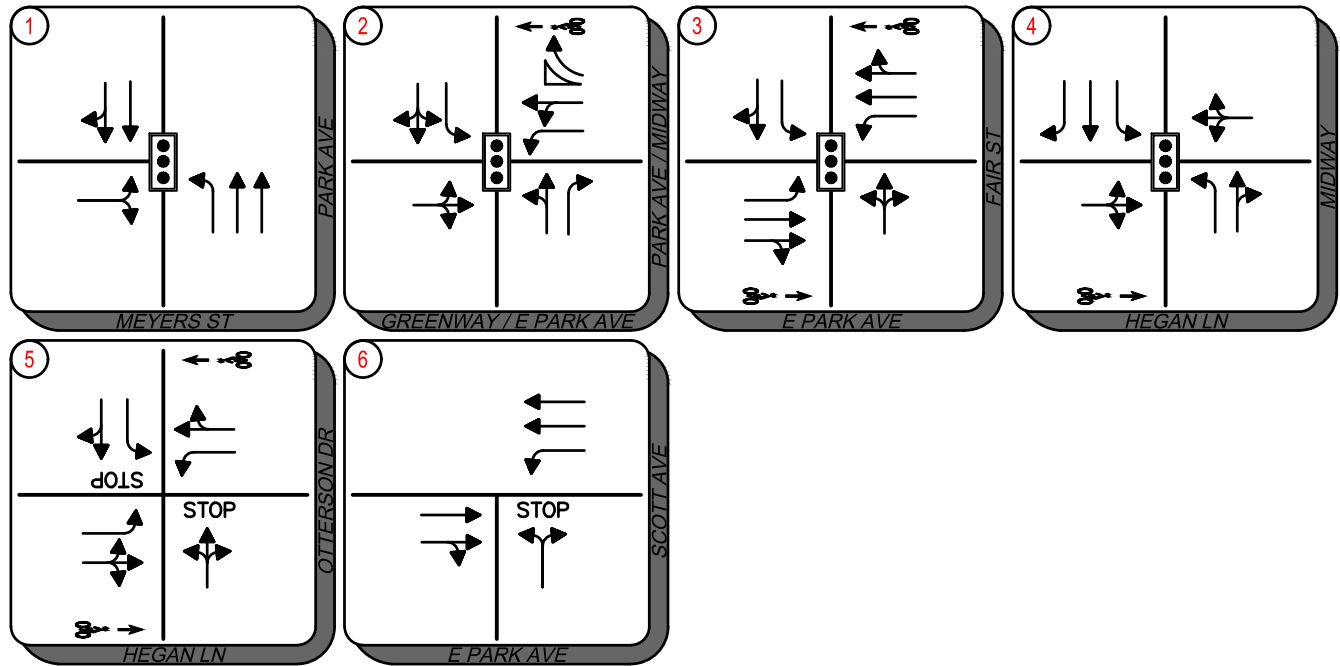


City of Chico
Hegan Lane Congestion Relief

2040 Peak Hour
Traffic Volumes

Project No. 11217309
Report No. -
Date MAR 2022

FIGURE 3



City of Chico
Hegan Lane Congestion Relief

Existing Lane Geometrics
& Control

Project No. 11217309
Report No. -
Date MAR 2022

FIGURE 4

Appendix B

Design Basis Memo

Technical Memorandum

March 08, 2022

To	City of Chico, Attn: Mike Cook	Tel	1 (916) 782-8688
Copy to	None	Email	Todd.Tregenza@gmail.com
From	Todd Tregenza, AICP Michael C. Pitcock, PE	Ref. No.	11217309
Subject	Hegan Lane Congestion Relief Basis of Design		

This memorandum is intended to outline the standards, concepts, and assumptions used in the geometric design of the various alternatives included in the Traffic Analysis Report prepared for the City of Chico (City) for the Hegan Lane Congestion Relief Project.

1. Standards

The proposed improvements conform to the City of Chico's development standards, wherever possible. It is anticipated that Curbs, Curb and Gutter, Sidewalks and other standard elements will conform to the City of Chico Standard Plans wherever possible.

Curb Returns will be designed to conform to the selected design vehicle but will not use a radius below the City Standard of 30 feet.

1.1 Standards Hierarchy

Multiple Standards were used in preparation of the designs included. See Table 1 for hierarchy of design standards used for each alternative type.

Table 1 *Hierarchy of Design Standards*

Corridors	Traffic Signals	Roundabouts
City of Chico Development Standards	City of Chico Development Standards	NCHRP Report 672: Roundabouts: An Informational Guide
AASHTO A Policy on Geometric Design of Highways and Streets	California Manual on Uniform Traffic Control Devices	State of Wisconsin Facilities Design Manual ¹
Caltrans Highway Design Manual	Caltrans Highway Design Manual	City of Chico Development Standards

Notes:

1: State of Wisconsin FDM contains one of the most comprehensive lists of geometric best practices and design check methodologies at the time this memo was prepared.

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1.2 Design Vehicles

Utilizing mapping provided by the city showing truck routes in the area, intersections were designed to accommodate the following movements listed in Table 2.

Table 2 *Design Vehicle Accommodations*

Movement	Midway & E Park Ave	Fair St & E Park Ave	Midway & Hegan Ln	Otterson Dr & Hegan Ln	E Park Ave & Scott Ave
NB/SB Thru	CA Legal	CA Legal	STAA	N/A	N/A
EB/WB Thru	N/A	STAA	CA Legal	STAA	STAA
NB Right Turn	STAA	CA Legal	CA Legal	N/A	CA Legal
SB Right Turn	N/A	CA Legal	STAA	STAA	N/A
EB Right Turn	N/A	CA Legal	STAA	N/A	CA Legal
WB Right Turn	CA Legal	CA Legal	CA Legal	STAA	N/A
NB Left Turn	N/A	CA Legal	STAA	N/A	CA Legal
SB Left Turn	CA Legal	CA Legal	CA Legal	STAA	N/A
EB Left Turn	N/A	CA Legal	STAA	STAA	N/A
WB Left Turn	STAA	CA Legal	CA Legal	N/A	CA Legal

Notes:

1: Where roundabout spacing is limited, reduced design speeds between the roundabouts were used to better approximate travel speeds in these locations

2. Design Elements

2.1 Corridors

Table 3 summarizes the design features of each roadway used in design:

Table 3 *Corridor Design Features*

Intersection	Design Speed¹	Lane Width	Shoulder Width (Where Applicable)	Sidewalk Width (Where Applicable)
E Park Ave	50 mph	11' Min	4' Min	5' Min
Fair St	35 mph	11' Min	4' Min	5' Min
Scott Ave	35 mph	11' Min	4' Min	5' Min
Midway	50 mph	11' Min	4' Min	5' Min
Hegan Ln	50 mph	11' Min	4' Min	5' Min
Otterson Dr	25 mph	11' Min	4' Min	5' Min

2.2 Traffic Signals

All proposed traffic signals have been designed to accommodate all the design vehicle movements shown in Table 2 above. Location of signal poles, lighting and other appurtenances have not been determined yet. However, wherever signal poles are affected, they should be replaced in accordance with the most up to date Caltrans standards, or standards of the City's choice. Additionally, all signal heads should be relocated or placed in the correct orientation per the MUTCD.

Traffic signal design checks were performed for each intersection. these design checks included truck turns, sight distance, and corner sight distance. Sight distance calculations follow the AASHTO Standards for stopping sight distance length, while corner sight distance checks were performed using the Caltrans methodology, but utilized the values established in AASHTO manuals.

2.3 Roundabouts

All proposed roundabouts are classified as modern roundabouts and are designed will all required features, including deflected entries, slower speeds, truck accommodation and separated facilities for cyclists and pedestrians. Shared Use Paths are proposed at all intersections and are offset 3-5 feet from the face of curb to provide adequate separation between the roadway and multimodal users. Roundabouts would be striped similarly to other roundabouts in the area including the Eaton Road Roundabout. Signing and Striping is primarily based on MUTCD Guidance and other best practices determined by years of experience to provide, simple to understand demarcations to improve circulation. Stripe and Sign types and locations will be determined during the preparation of project plans.

Roundabout design checks were performed in conformance with NCHRP 672. Because NCHRP does not provide a fastest path drafting methodology, the Wisconsin spline curve methodology (FDM Figure 50.1) was used to approximate fastest vehicle paths. However, NCHRP measuring methodology was used and the NCHRP equations 6-1 and 6-2 were used to calculate the fastest path recorded. Pursuant to the guidelines set in NCHRP and the standards set in the Caltrans HDM, fastest path entries were limited to 25 mph on single lane approaches and 30 mph on multi lane approaches.

3. Conclusions

All Corridors and intersections were designed to provide the same or improved design features (lane width, shoulder width, etc.) as the existing roadway, while improving on the access of design vehicles and the performance in peak hour conditions. All intersections were designed using the latest standards and best practices available to provide safe travel for all users.

Regards

Todd Tregenza, AICP
Senior Transportation Project Manager

Michael C. Pitcock, PE
Design Engineer

Appendix C

Phase I Alternatives Exhibits



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & FAIR St ROUNDABOUT ALTERNATIVE



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Project No. 11217309
Date 2/28/22

SHEET 1 OF 1

LEGEND:

PAVEMENT

SIDEWALK/ SUP

LANDSCAPE/ HARDSCAPE

STAMPED CONCRETE

R/W LINE

EASEMENT LINE

PROPERTY LINE



PRELIMINARY
SUBJECT TO CHANGE

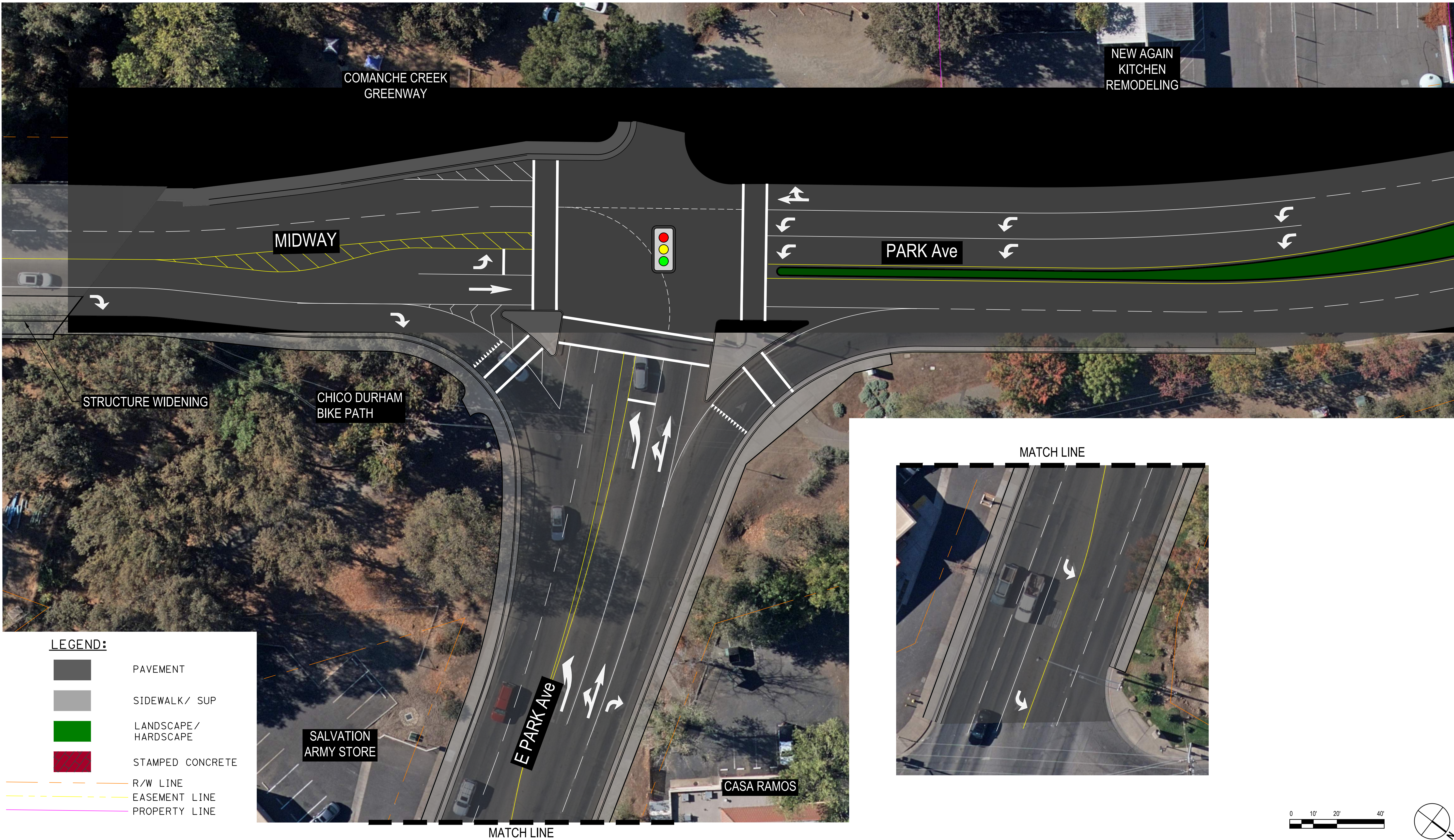
HEGAN Ln CONGESTION RELIEF PROJECT
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Project No. 11217309
Date 2/28/22

SHEET 1 OF 1



LEGEND:

- PAVEMENT
- SIDEWALK/ SUP
- LANDSCAPE / HARDSCAPE
- STAMPED CONCRETE
- R/W LINE
- EASEMENT LINE
- PROPERTY LINE

PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & MIDWAY SIGNAL Mod ALTERNATIVE



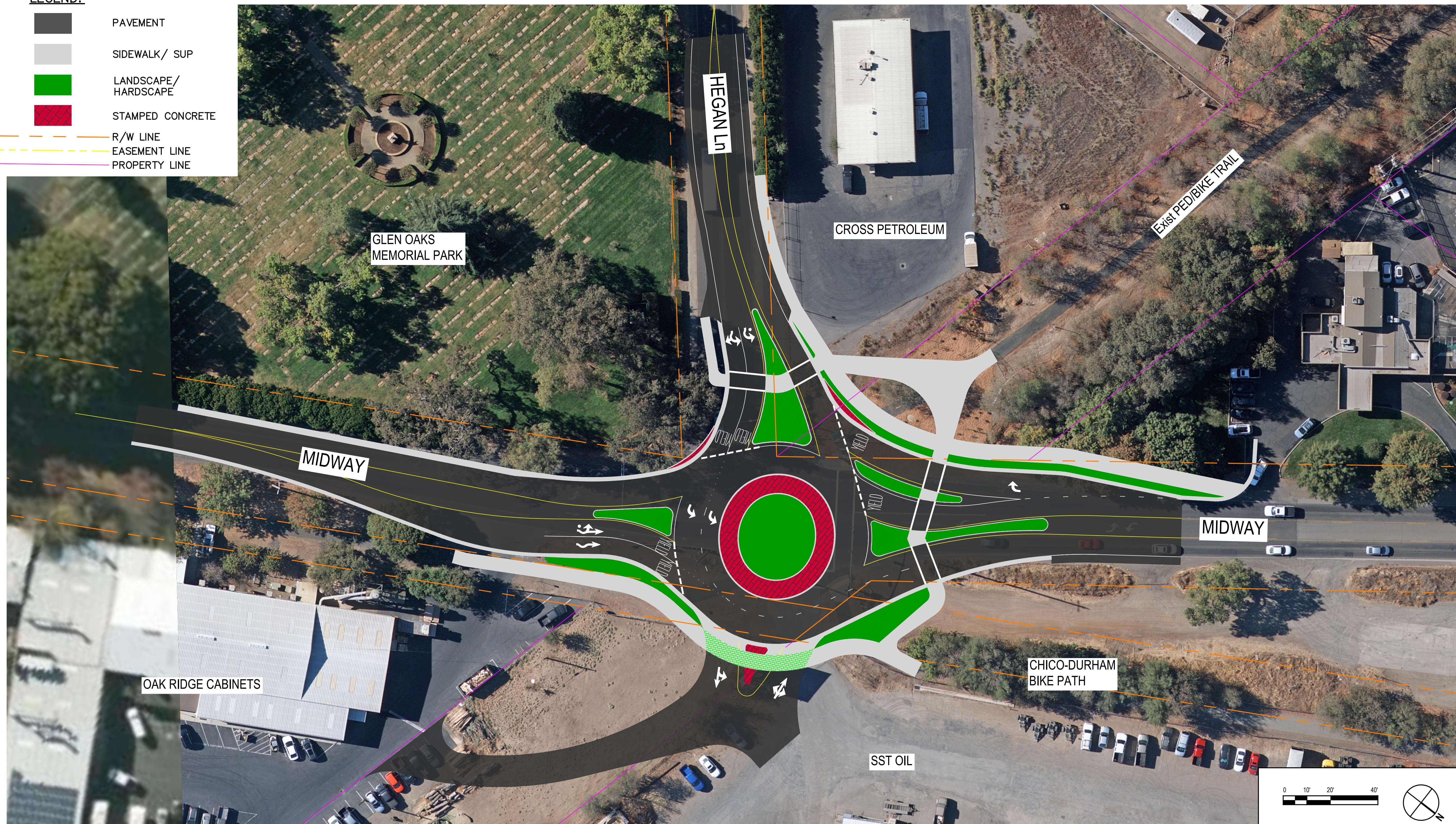
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Project No. 11217309
Date 2/28/22

SHEET 1 OF 1

LEGEND:

- PAVEMENT
- SIDEWALK/ SUP
- LANDSCAPE/ HARDSCAPE
- STAMPED CONCRETE
- R/W LINE
- EASEMENT LINE
- PROPERTY LINE



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT HEGAN Ln & MIDWAY ROUNDABOUT ALTERNATIVE



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Project No. 11217309
Date 2/28/22

SHEET 1 OF 1

LEGEND:



PAVEMENT



SIDEWALK/ SUP



LANDSCAPE/
HARDSCAPE

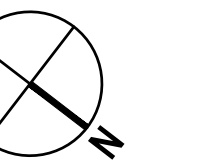
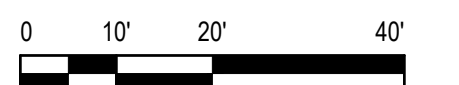


STAMPED CONCRETE

--- R/W LINE

--- EASEMENT LINE

--- PROPERTY LINE



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT MIDWAY & HEGAN Ln SIGNAL Mod ALTERNATIVE



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Date 2/28/22

SHEET 1 OF 1

LEGEND:

PAVEMENT

SIDEWALK/ SUP

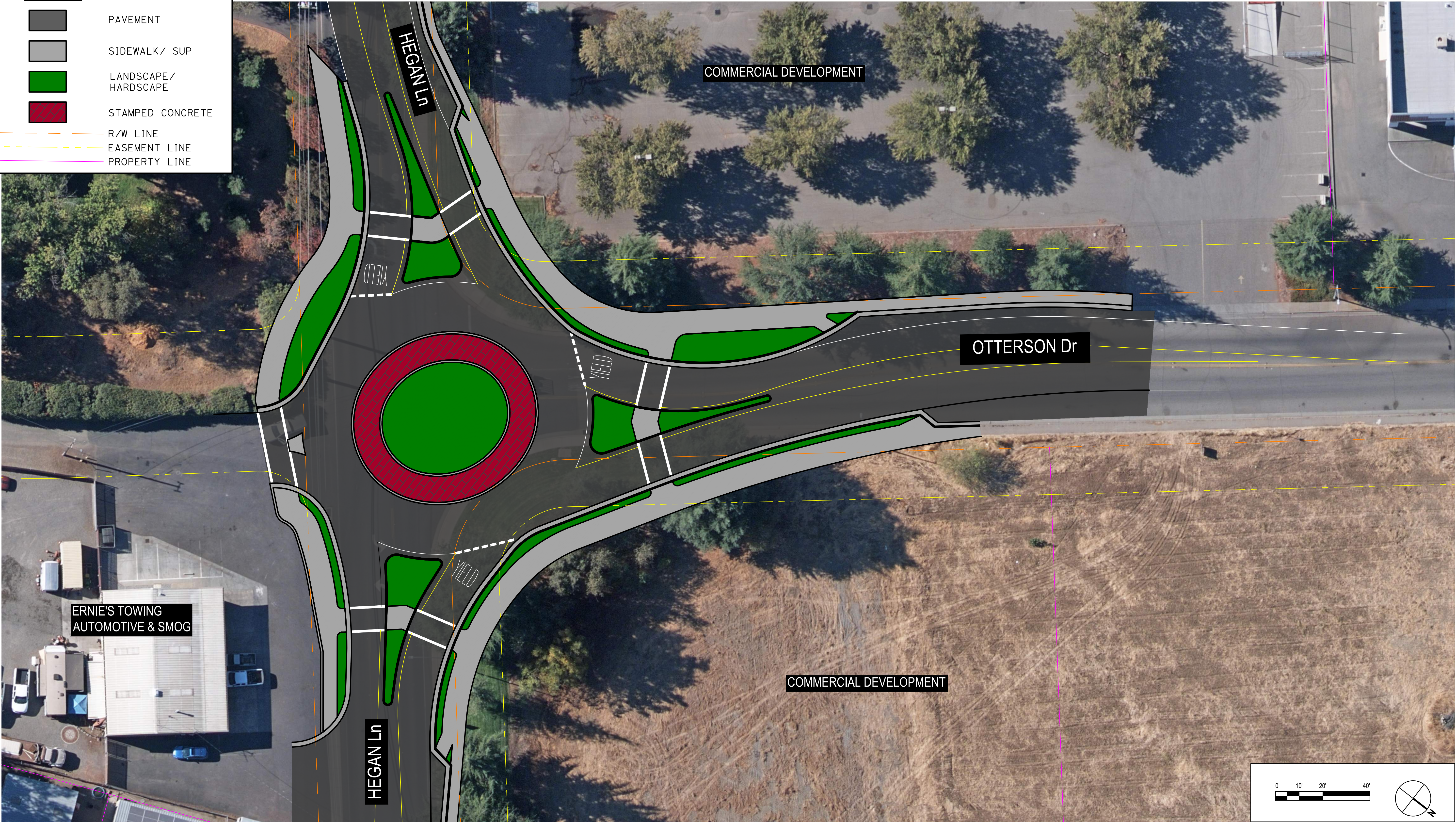
LANDSCAPE/ HARDSCAPE

STAMPED CONCRETE

R/W LINE

EASEMENT LINE

PROPERTY LINE



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
HEGAN Ln & OTTERSON Dr ROUNDABOUT ALTERNATIVE



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Project No. 11217309
Date 2/28/22

SHEET 1 OF 1

LEGEND:

-  PAVEMENT
-  SIDEWALK/ SUP
-  LANDSCAPE/ HARDSCAPE
-  STAMPED CONCRETE
-  R/W LINE
-  EASEMENT LINE
-  PROPERTY LINE



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT OTTERSON Dr & HEGAN Ln SIGNAL ALTERNATIVE



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Date 2/28/22

SHEET 1 OF 1

LEGEND:

- PAVEMENT
- SIDEWALK / SUP
- LANDSCAPE / HARDSCAPE
- STAMPED CONCRETE
- R/W LINE
- EASEMENT LINE
- PROPERTY LINE

OTTERSON Dr

HEGAN Ln

STOP

ERIE'S TOWING AUTOMOTIVE & SMOG

COMMERCIAL DEVELOPMENT

0 10' 20' 40'

PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT OTTERSON Dr & HEGAN Ln STOP CONTROL ALTERNATIVE



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SHEET 1 OF 1



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT

FAIR St RIGHT IN RIGHT OUT ROUNDABOUT ALTERNATIVE



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Project No. 11217309
Date 2/28/22
SHEET 1 OF 1



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT

FAIR St RIGHT IN RIGHT OUT AND SCOTT SIGNAL ALTERNATIVE

CITY OF CHICO
INC. 1872

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Project No. 11217309
Date 2/28/22

SHEET 1 OF 1



Appendix D

Phase I Design Check Exhibits

LEGEND:

FAST PATH

D#

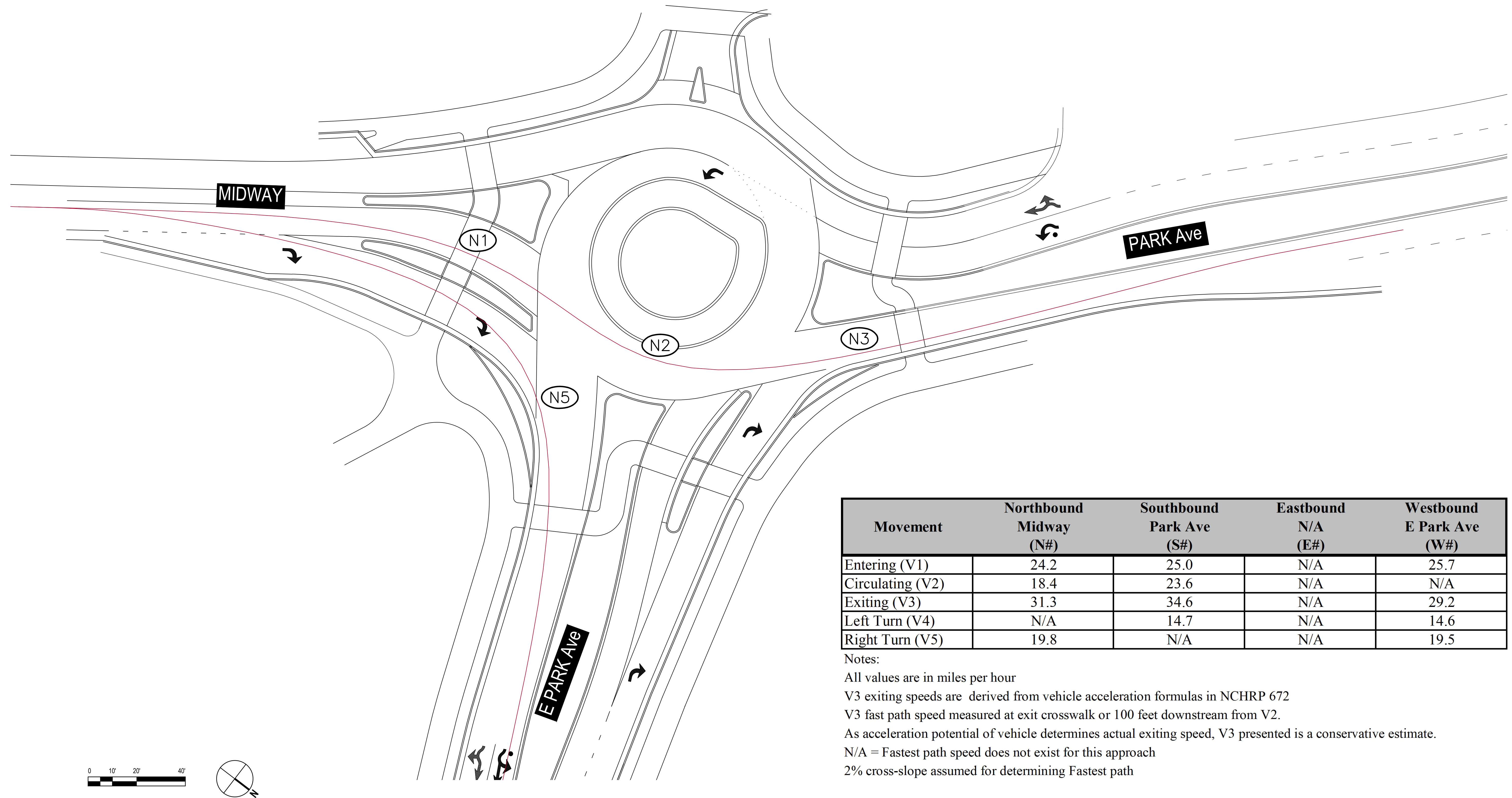
FAST PATH SPEED IDENTIFIER

NOTE:

N4

NOT USED

NORTHBOUND FASTEST PATH



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & MIDWAY ROUNDABOUT ALTERNATIVE



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Date 2/28/22

FIGURE 1

SOUTHBOUND FASTEST PATH

LEGEND:

FAST PATH

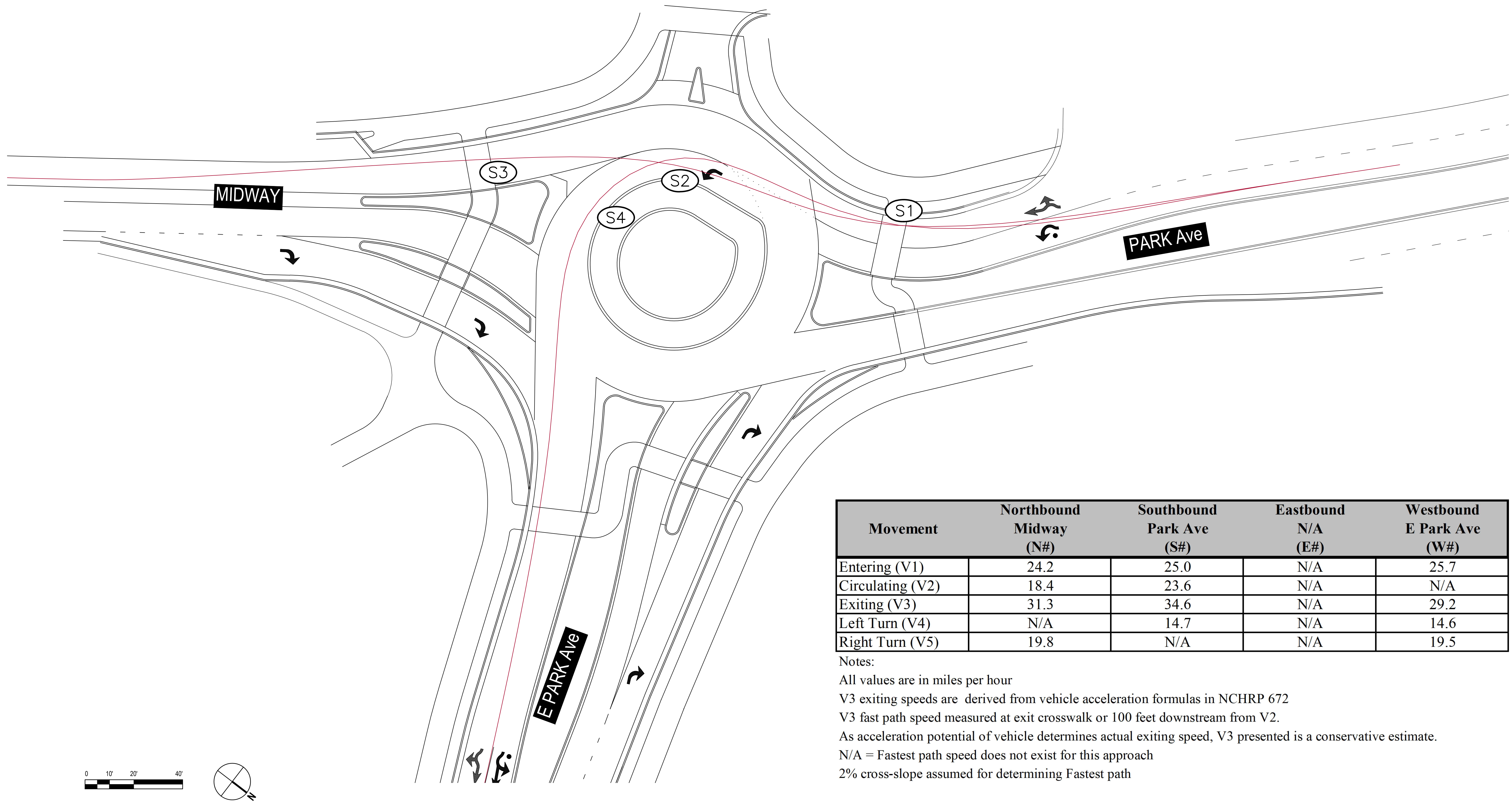
D#

FAST PATH SPEED IDENTIFIER

NOTE:

S5

NOT USED



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
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Date 2/28/22

FIGURE 2

LEGEND:

FAST PATH

D#

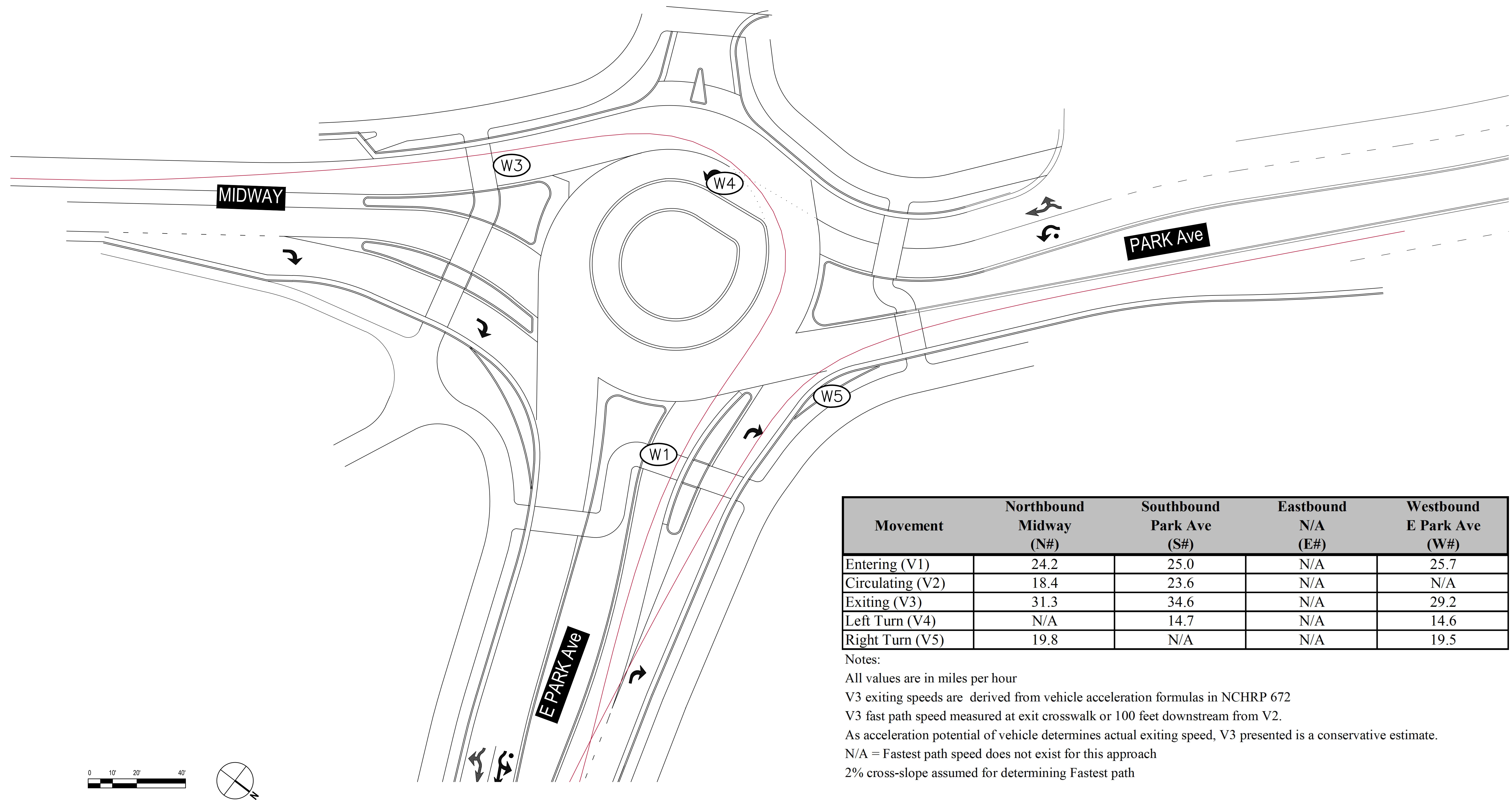
FAST PATH SPEED IDENTIFIER

NOTE:

W2

NOT USED

WESTBOUND FASTEST PATH



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
E PARK Ave & MIDWAY ROUNDABOUT ALTERNATIVE



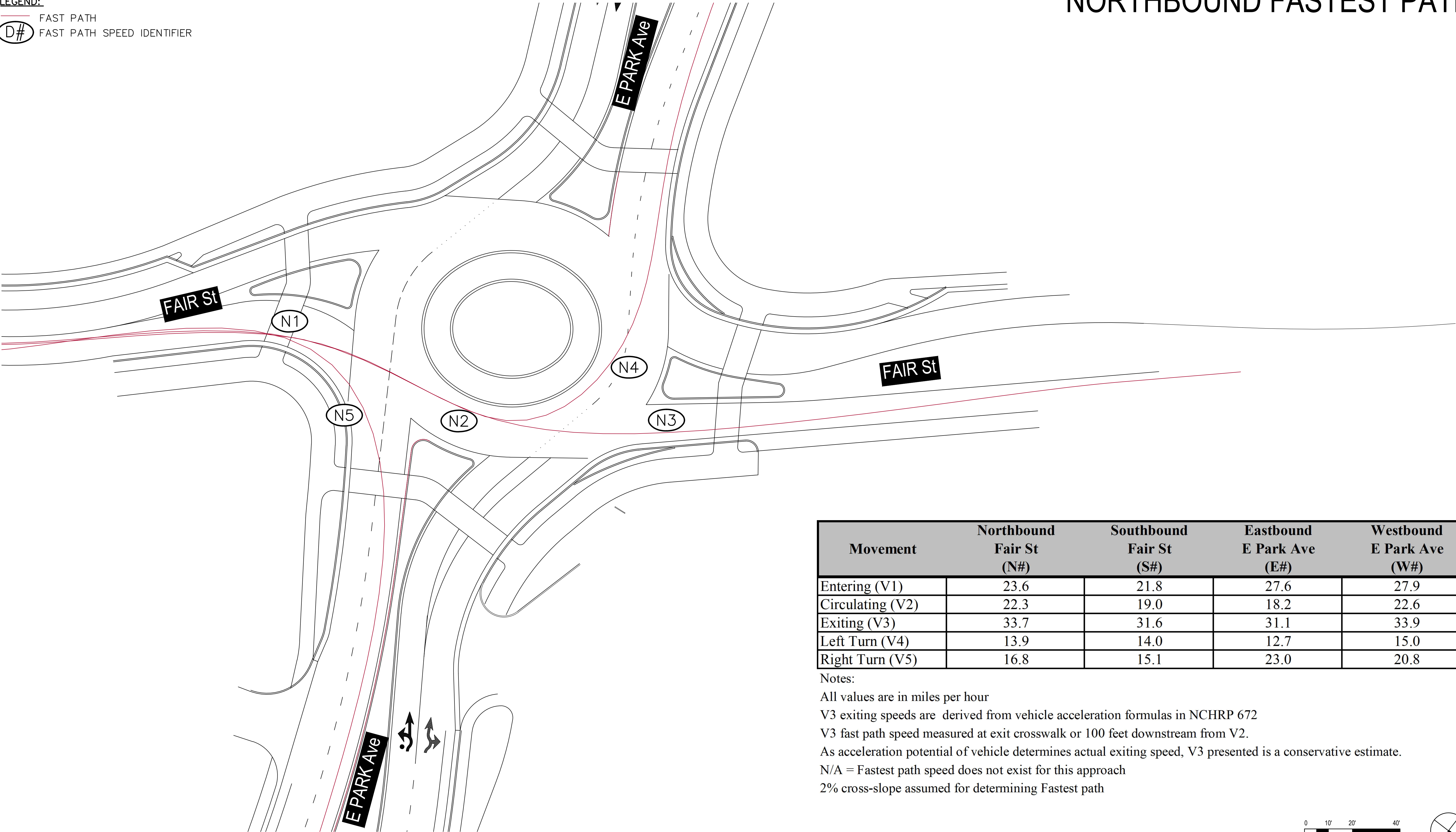
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Date 2/28/22

FIGURE 3

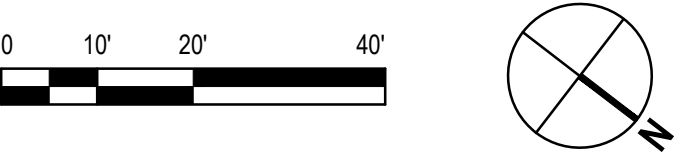
LEGEND:
FAST PATH
FAST PATH SPEED IDENTIFIER

NORTHBOUND FASTEST PATH



Movement	Northbound Fair St (N#)	Southbound Fair St (S#)	Eastbound E Park Ave (E#)	Westbound E Park Ave (W#)
Entering (V1)	23.6	21.8	27.6	27.9
Circulating (V2)	22.3	19.0	18.2	22.6
Exiting (V3)	33.7	31.6	31.1	33.9
Left Turn (V4)	13.9	14.0	12.7	15.0
Right Turn (V5)	16.8	15.1	23.0	20.8

Notes:
All values are in miles per hour
V3 exiting speeds are derived from vehicle acceleration formulas in NCHRP 672
V3 fast path speed measured at exit crosswalk or 100 feet downstream from V2.
As acceleration potential of vehicle determines actual exiting speed, V3 presented is a conservative estimate.
N/A = Fastest path speed does not exist for this approach
2% cross-slope assumed for determining Fastest path



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
E PARK Ave & FAIR St ROUNDABOUT ALTERNATIVE



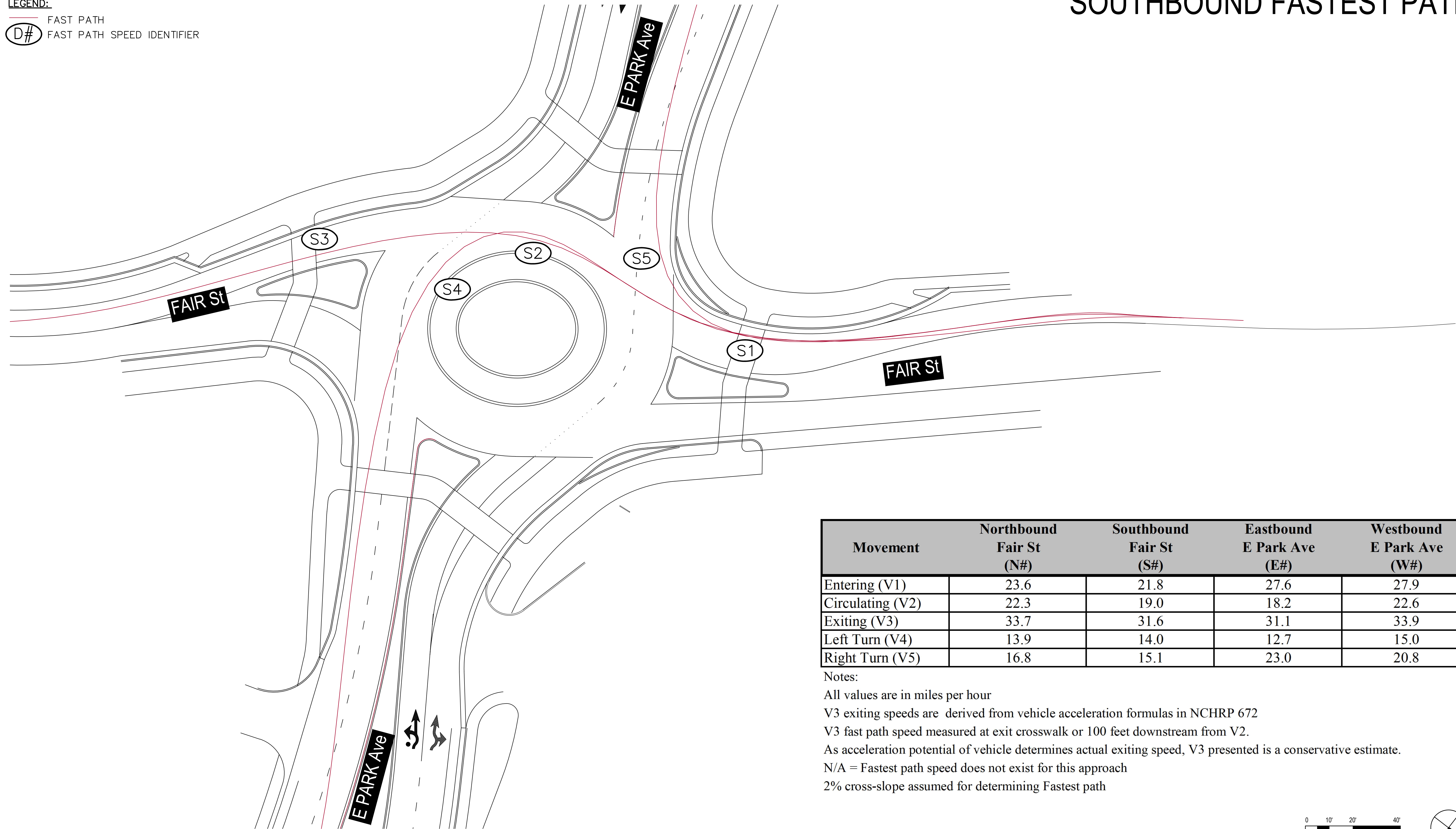
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FIGURE 4

LEGEND:
FAST PATH
FAST PATH SPEED IDENTIFIER

SOUTHBOUND FASTEST PATH



Movement	Northbound Fair St (N#)	Southbound Fair St (S#)	Eastbound E Park Ave (E#)	Westbound E Park Ave (W#)
Entering (V1)	23.6	21.8	27.6	27.9
Circulating (V2)	22.3	19.0	18.2	22.6
Exiting (V3)	33.7	31.6	31.1	33.9
Left Turn (V4)	13.9	14.0	12.7	15.0
Right Turn (V5)	16.8	15.1	23.0	20.8

Notes:
All values are in miles per hour
V3 exiting speeds are derived from vehicle acceleration formulas in NCHRP 672
V3 fast path speed measured at exit crosswalk or 100 feet downstream from V2.
As acceleration potential of vehicle determines actual exiting speed, V3 presented is a conservative estimate.
N/A = Fastest path speed does not exist for this approach
2% cross-slope assumed for determining Fastest path



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
E PARK Ave & FAIR St ROUNDABOUT ALTERNATIVE



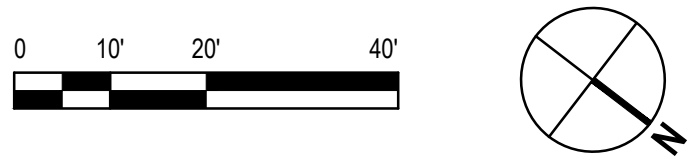
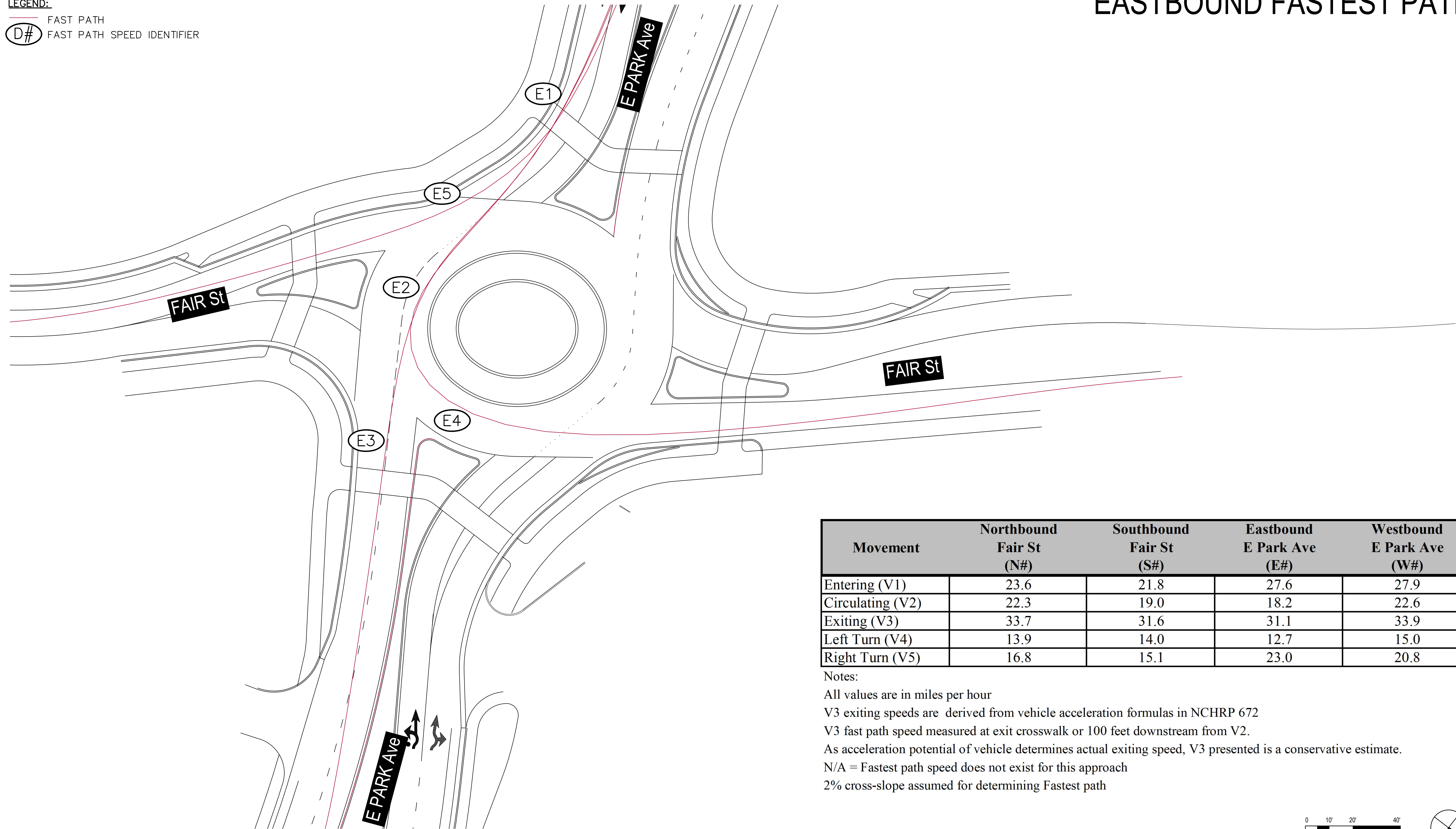
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FIGURE 5

LEGEND:
FAST PATH
FAST PATH SPEED IDENTIFIER

EASTBOUND FASTEST PATH



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
E PARK Ave & FAIR St ROUNDABOUT ALTERNATIVE



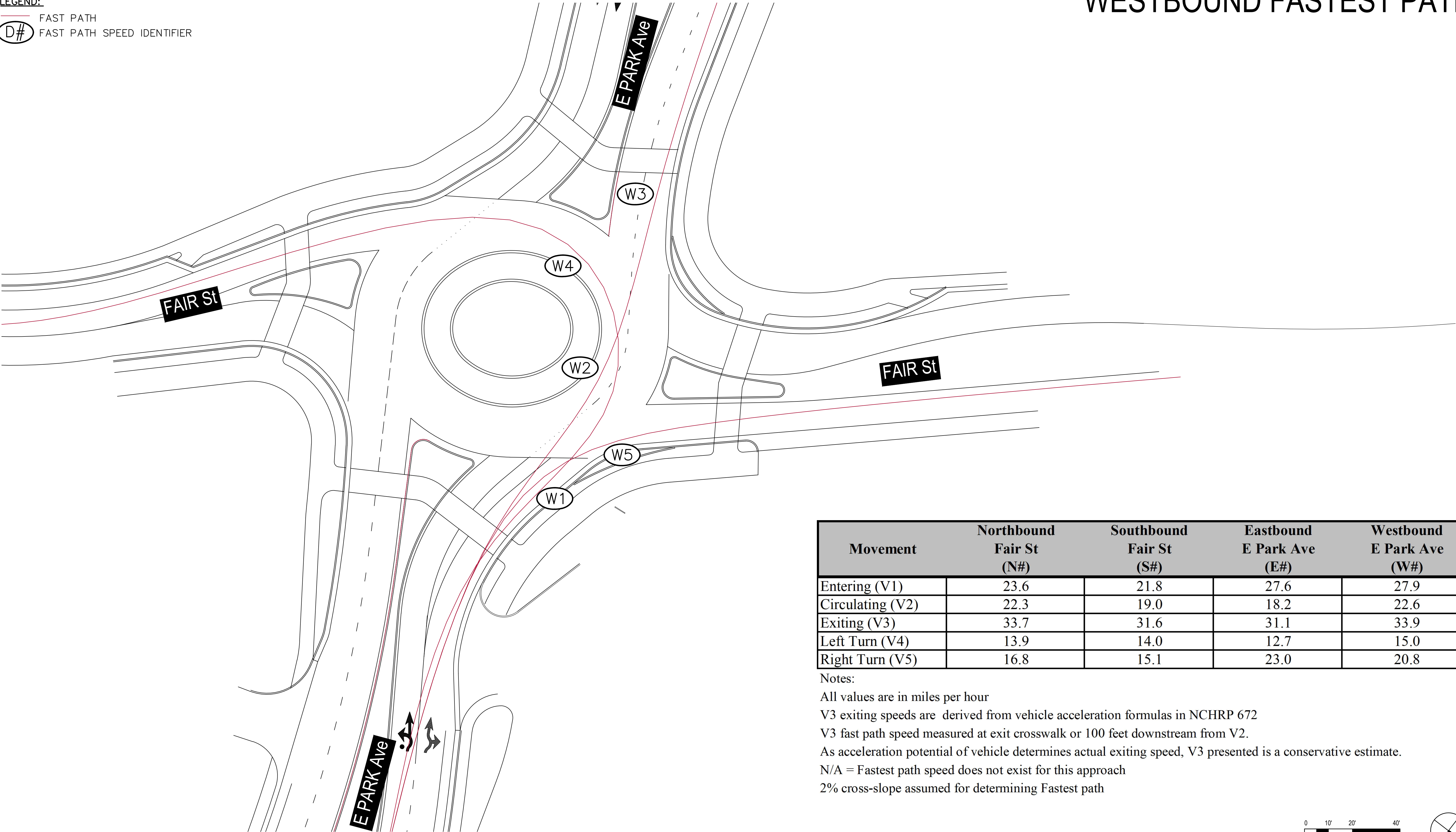
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FIGURE 6

LEGEND:
FAST PATH
FAST PATH SPEED IDENTIFIER

WESTBOUND FASTEST PATH



Movement	Northbound Fair St (N#)	Southbound Fair St (S#)	Eastbound E Park Ave (E#)	Westbound E Park Ave (W#)
Entering (V1)	23.6	21.8	27.6	27.9
Circulating (V2)	22.3	19.0	18.2	22.6
Exiting (V3)	33.7	31.6	31.1	33.9
Left Turn (V4)	13.9	14.0	12.7	15.0
Right Turn (V5)	16.8	15.1	23.0	20.8

Notes:
All values are in miles per hour
V3 exiting speeds are derived from vehicle acceleration formulas in NCHRP 672
V3 fast path speed measured at exit crosswalk or 100 feet downstream from V2.
As acceleration potential of vehicle determines actual exiting speed, V3 presented is a conservative estimate.
N/A = Fastest path speed does not exist for this approach
2% cross-slope assumed for determining Fastest path



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
E PARK Ave & FAIR St ROUNDABOUT ALTERNATIVE

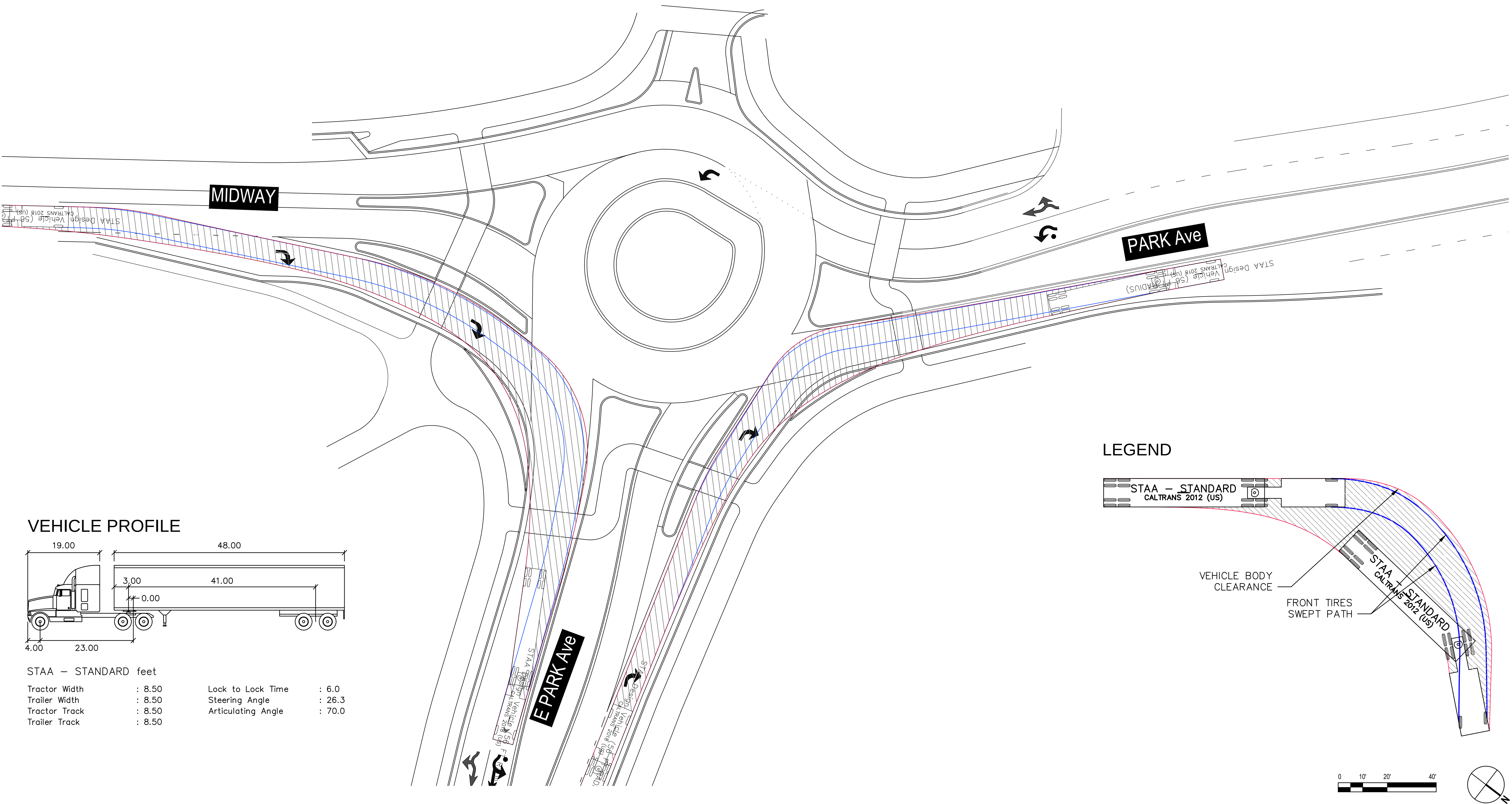


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FIGURE 7

TRUCK TURN - STAA - RIGHT TURNS



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SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
E PARK Ave & MIDWAY ROUNDABOUT ALTERNATIVE

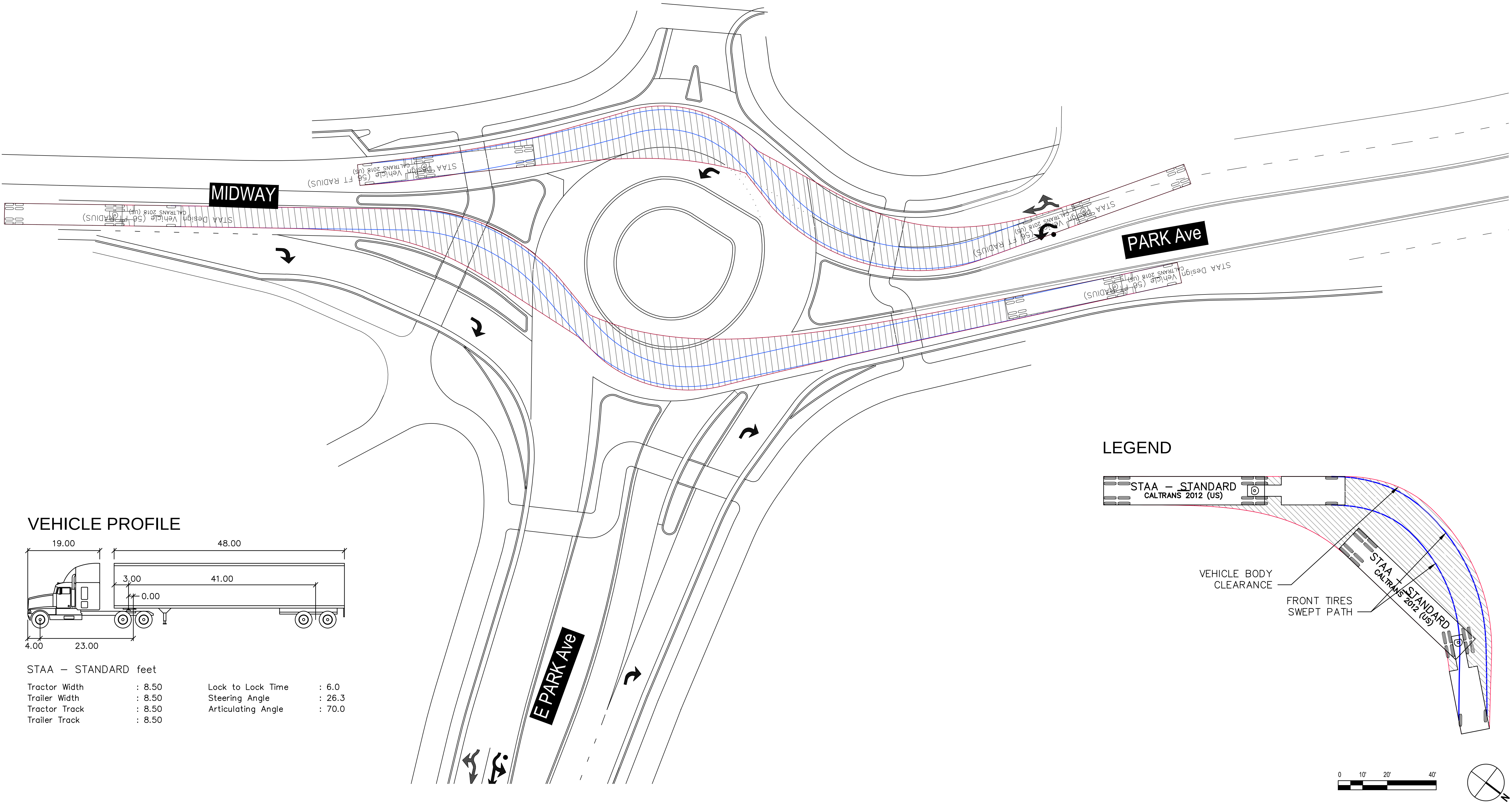


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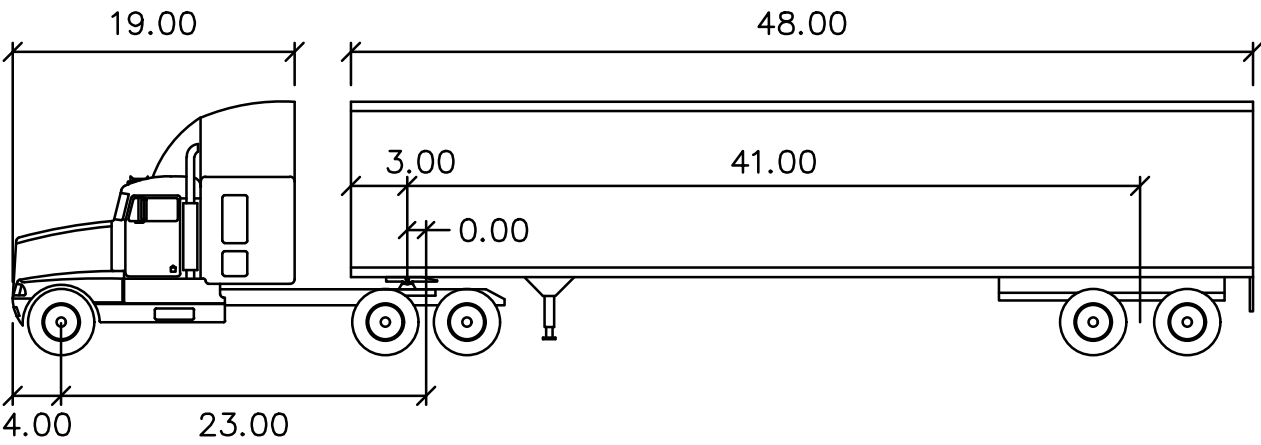
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FIGURE 8

TRUCK TURN - STAA - NB/SB THRUS



VEHICLE PROFILE



STAA - STANDARD feet			
Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
E PARK Ave & MIDWAY ROUNDABOUT ALTERNATIVE

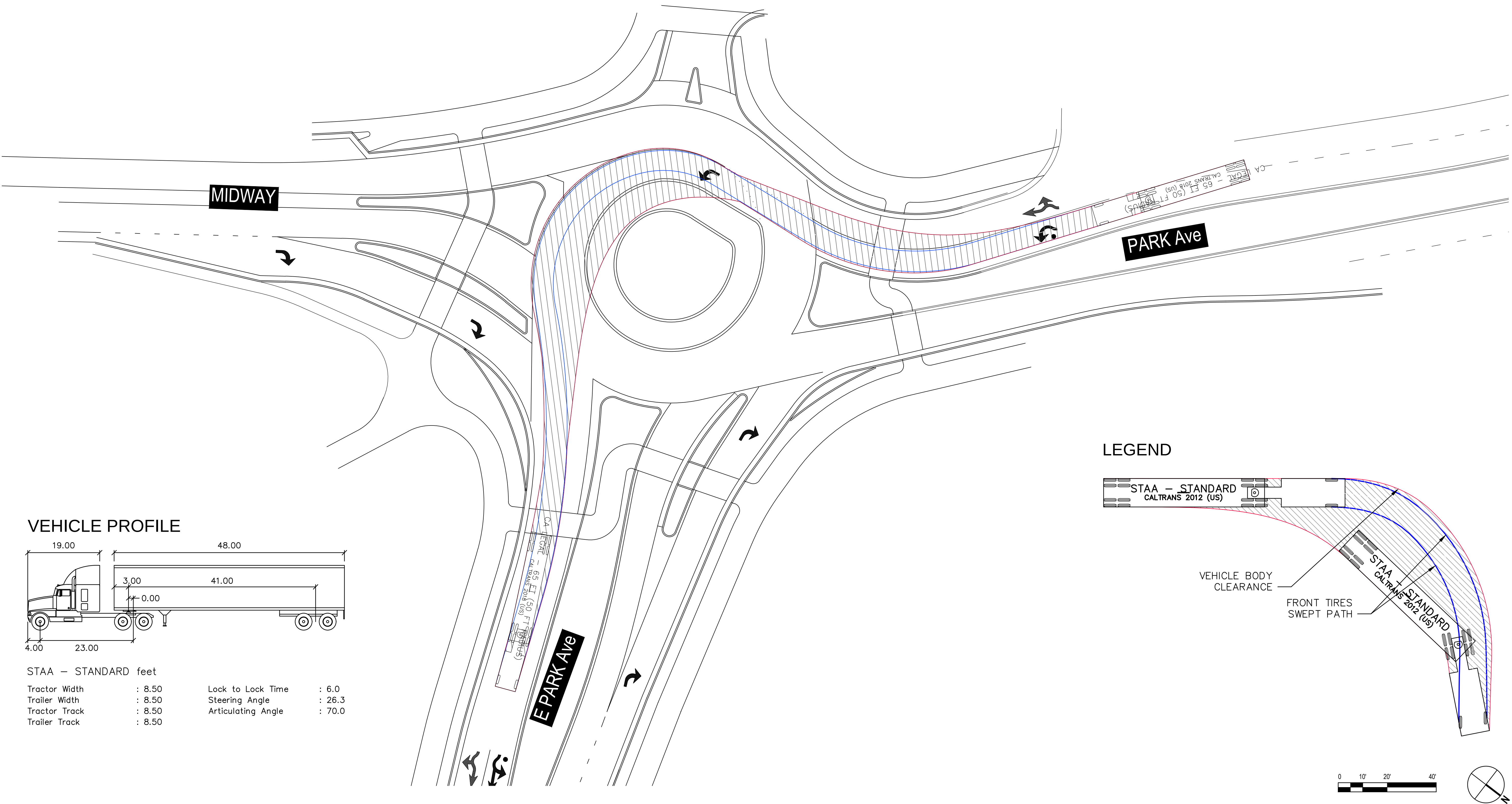


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FIGURE 9

TRUCK TURN - STAA - SB LEFT TURN



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SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
E PARK Ave & MIDWAY ROUNDABOUT ALTERNATIVE

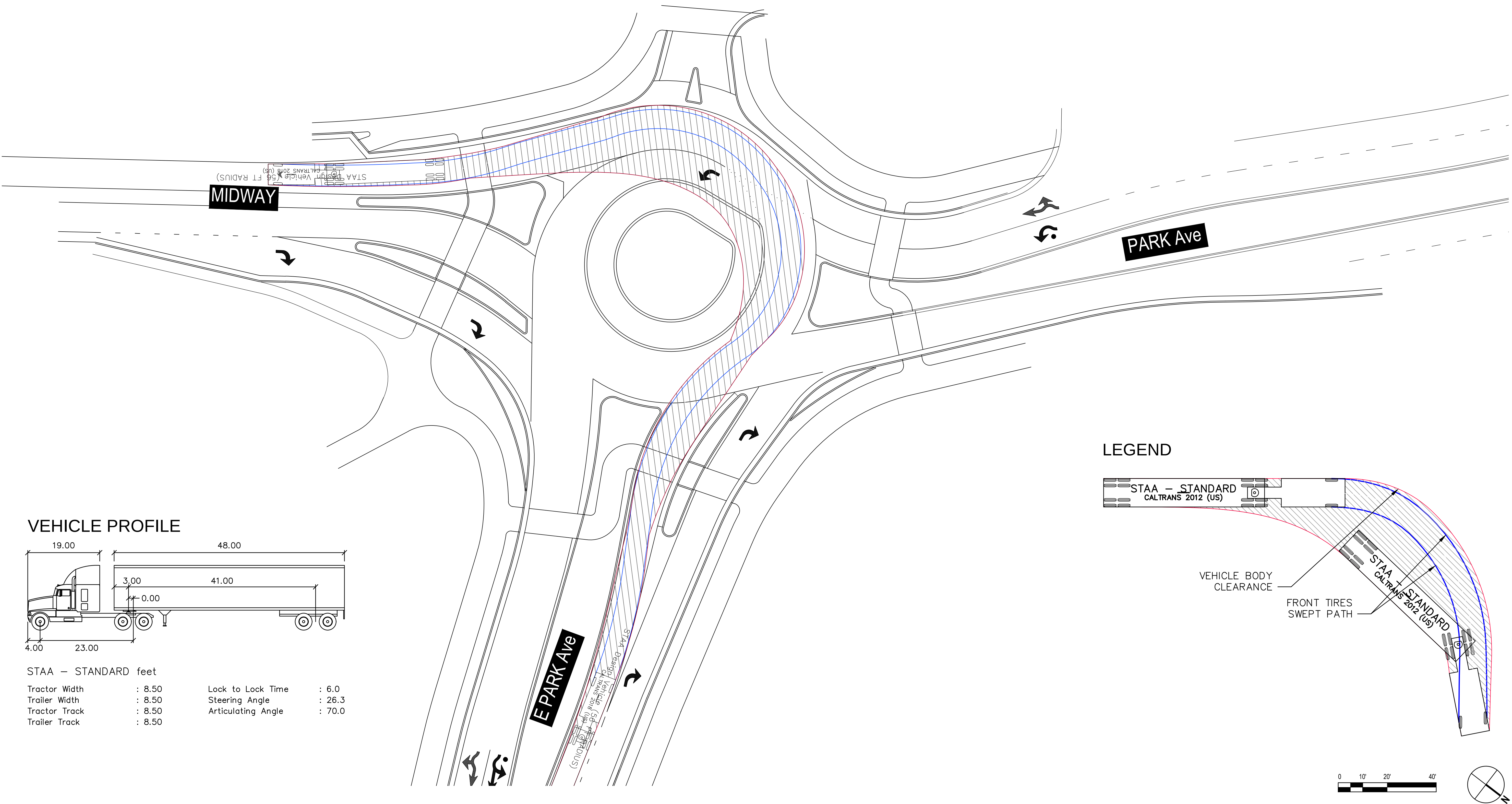


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FIGURE 10

TRUCK TURN - STAA - WB LEFT TURN



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SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
E PARK Ave & MIDWAY ROUNDABOUT ALTERNATIVE

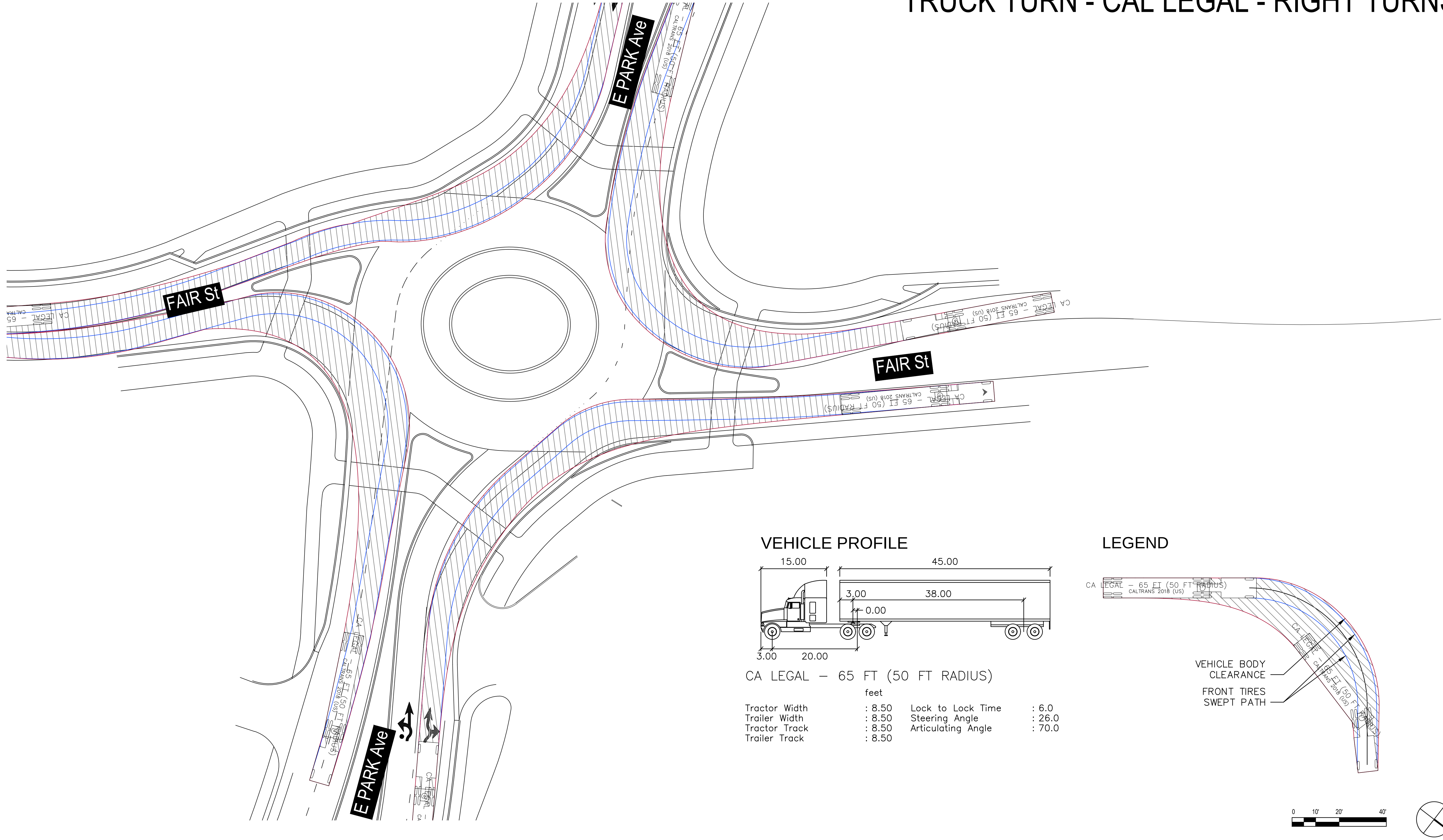


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FIGURE 11

TRUCK TURN - CAL LEGAL - RIGHT TURNS



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
E PARK Ave & FAIR St ROUNDABOUT ALTERNATIVE

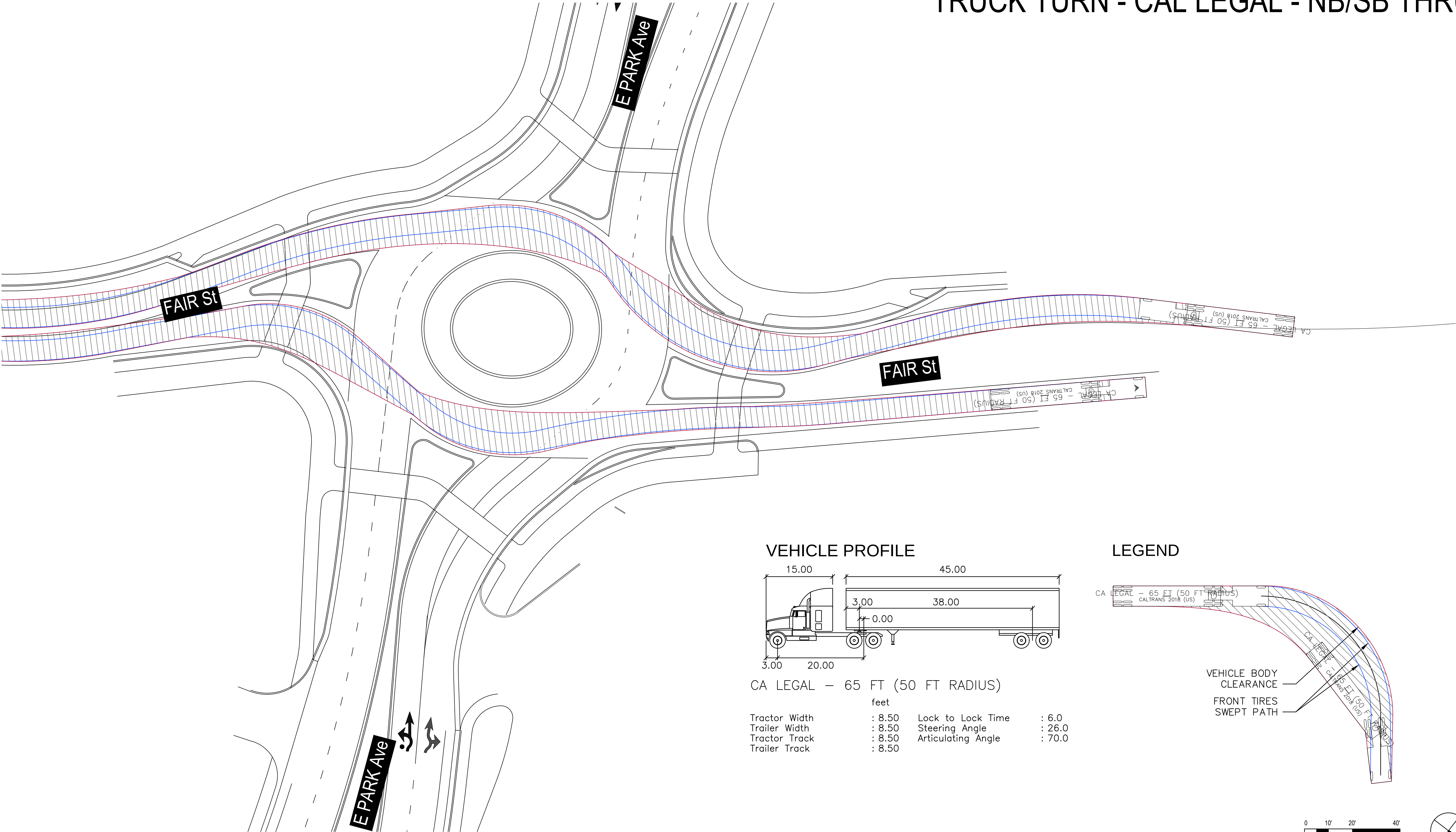


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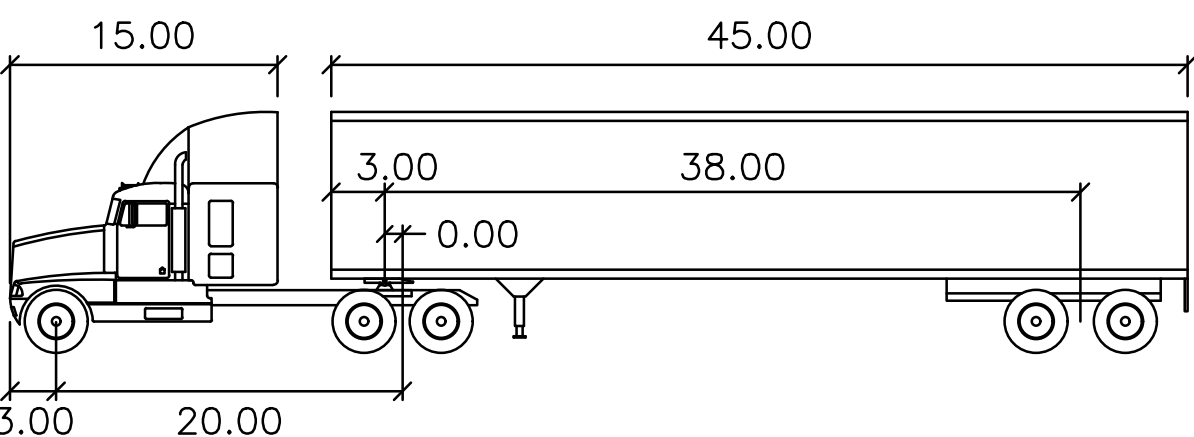
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FIGURE 12

TRUCK TURN - CAL LEGAL - NB/SB THRU



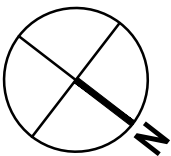
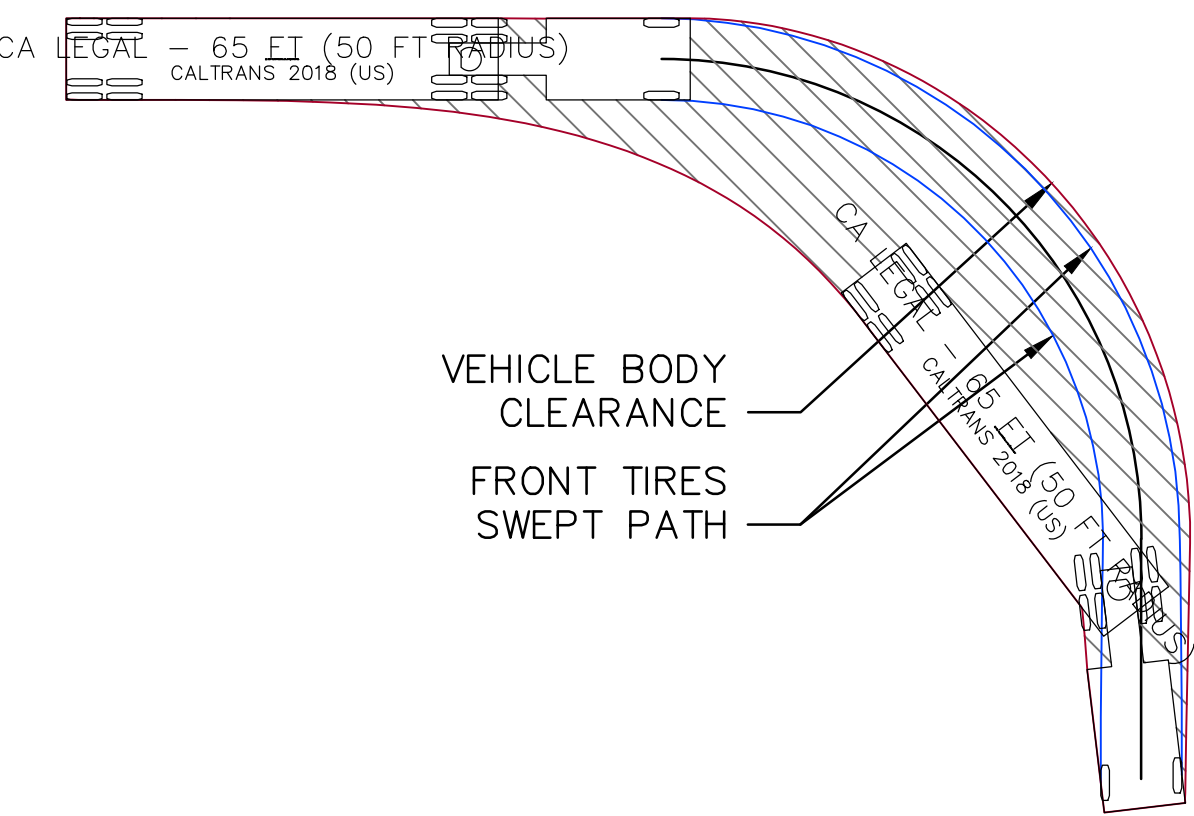
VEHICLE PROFILE



CA LEGAL — 65 FT (50 FT RADIUS)

	feet		
Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.0
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

LEGEND



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
E PARK Ave & FAIR St ROUNDABOUT ALTERNATIVE

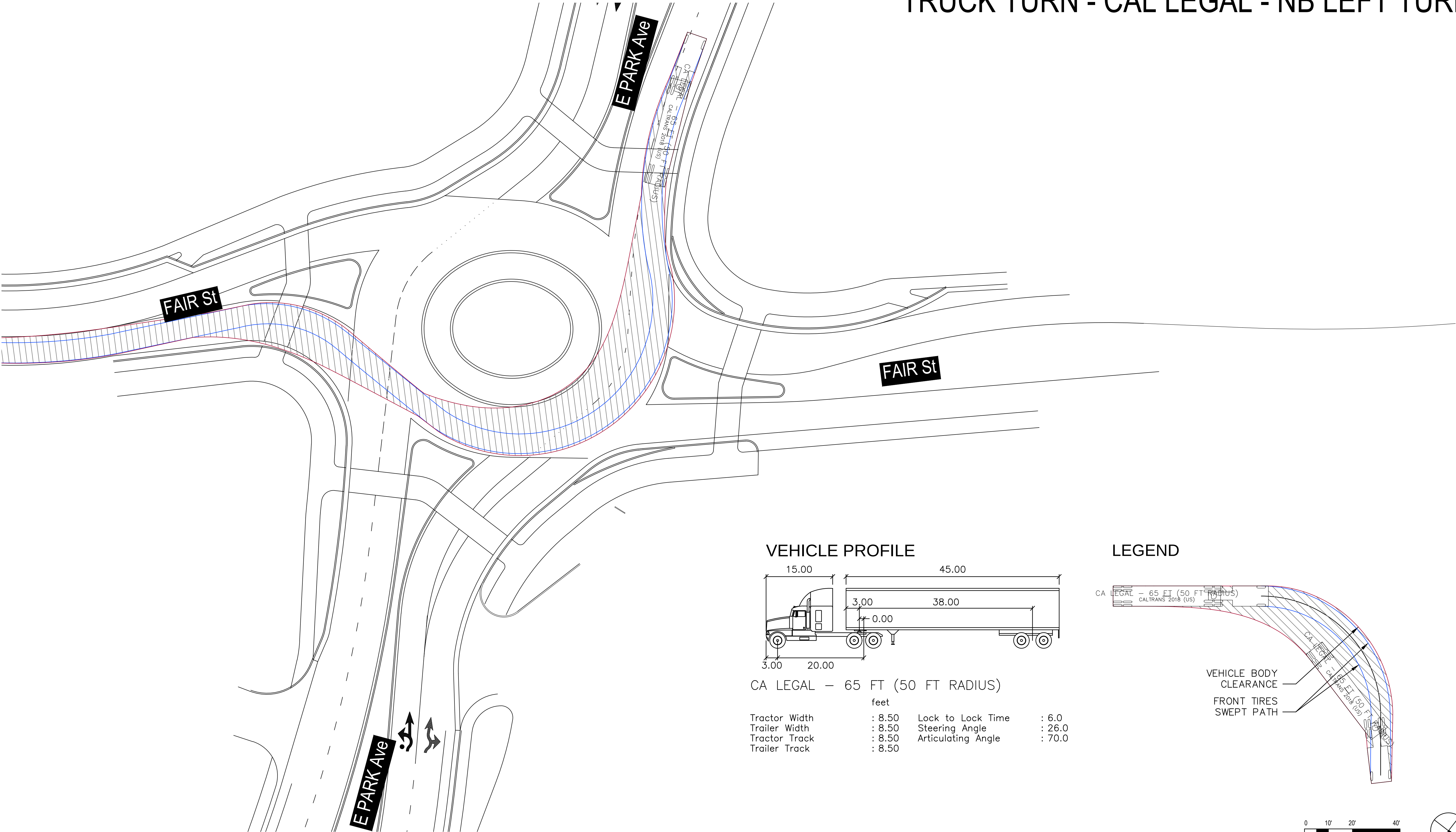


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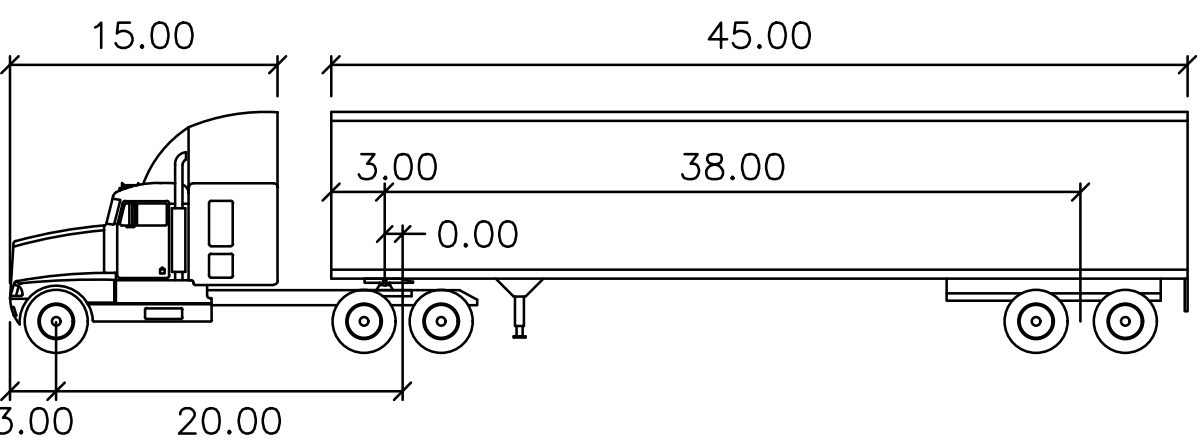
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FIGURE 13

TRUCK TURN - CAL LEGAL - NB LEFT TURN



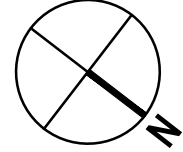
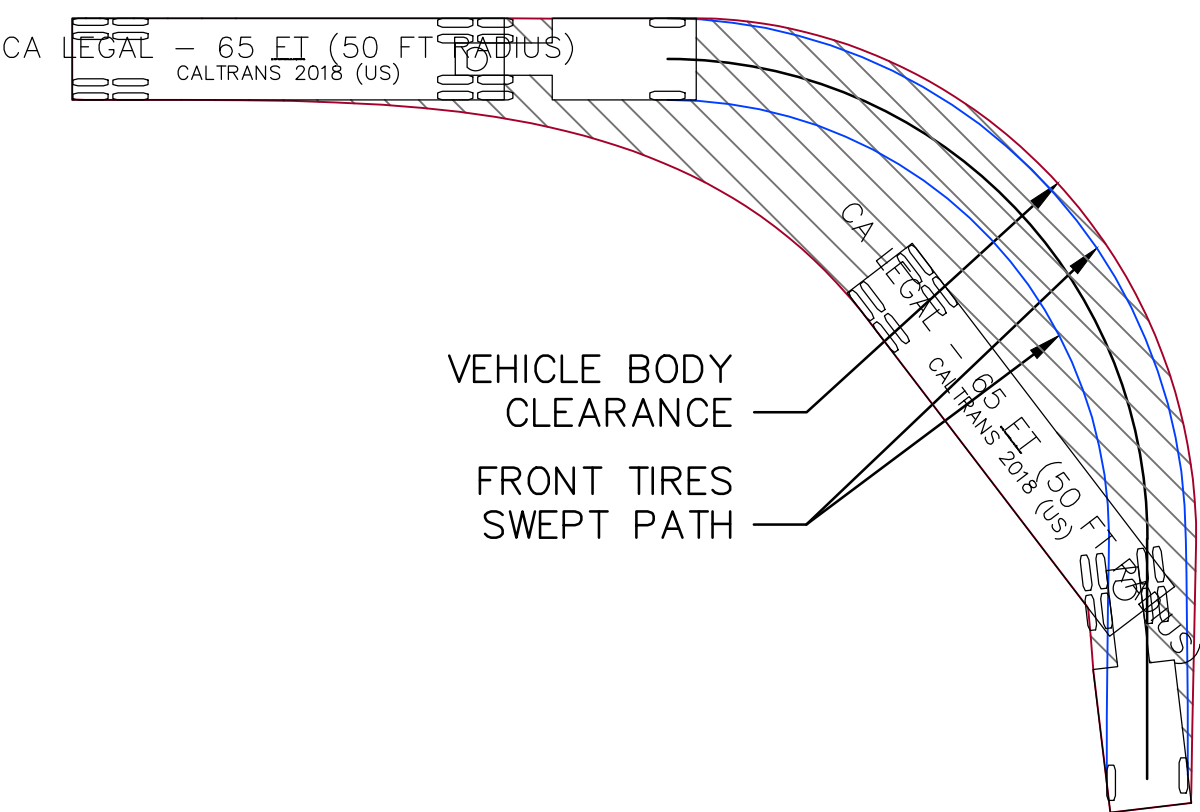
VEHICLE PROFILE



CA LEGAL - 65 FT (50 FT RADIUS)

	feet		
Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.0
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

LEGEND



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
E PARK Ave & FAIR St ROUNDABOUT ALTERNATIVE

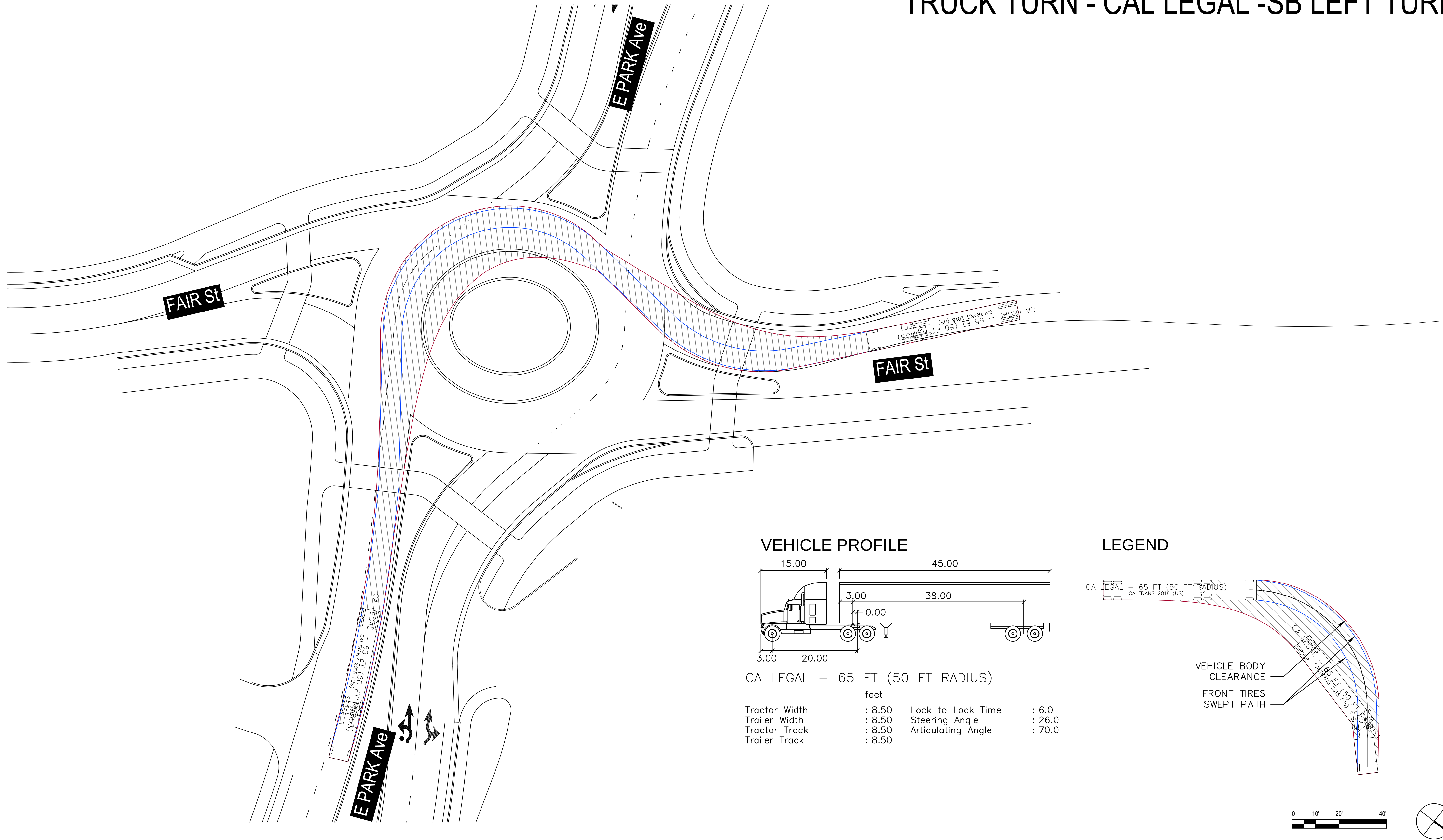


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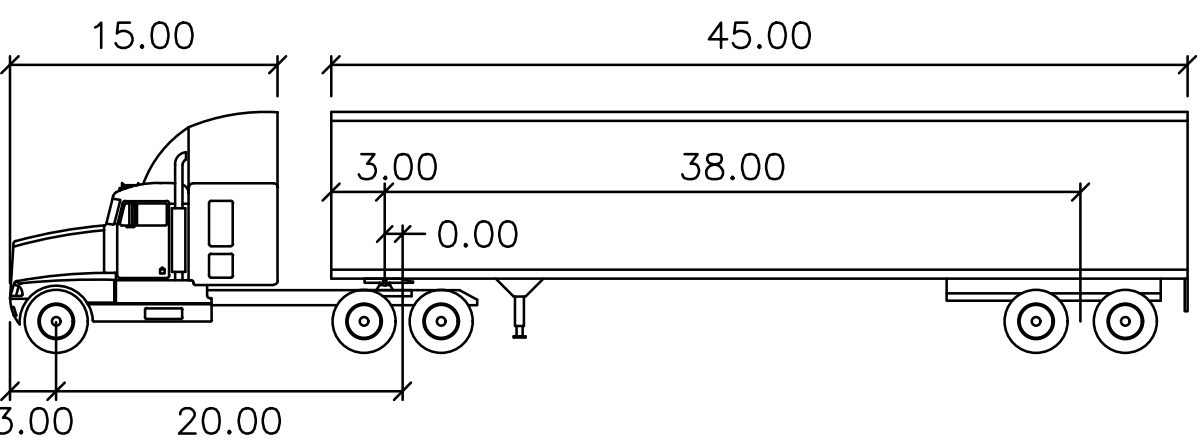
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FIGURE 14

TRUCK TURN - CAL LEGAL -SB LEFT TURN



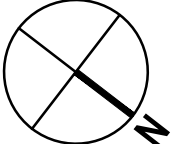
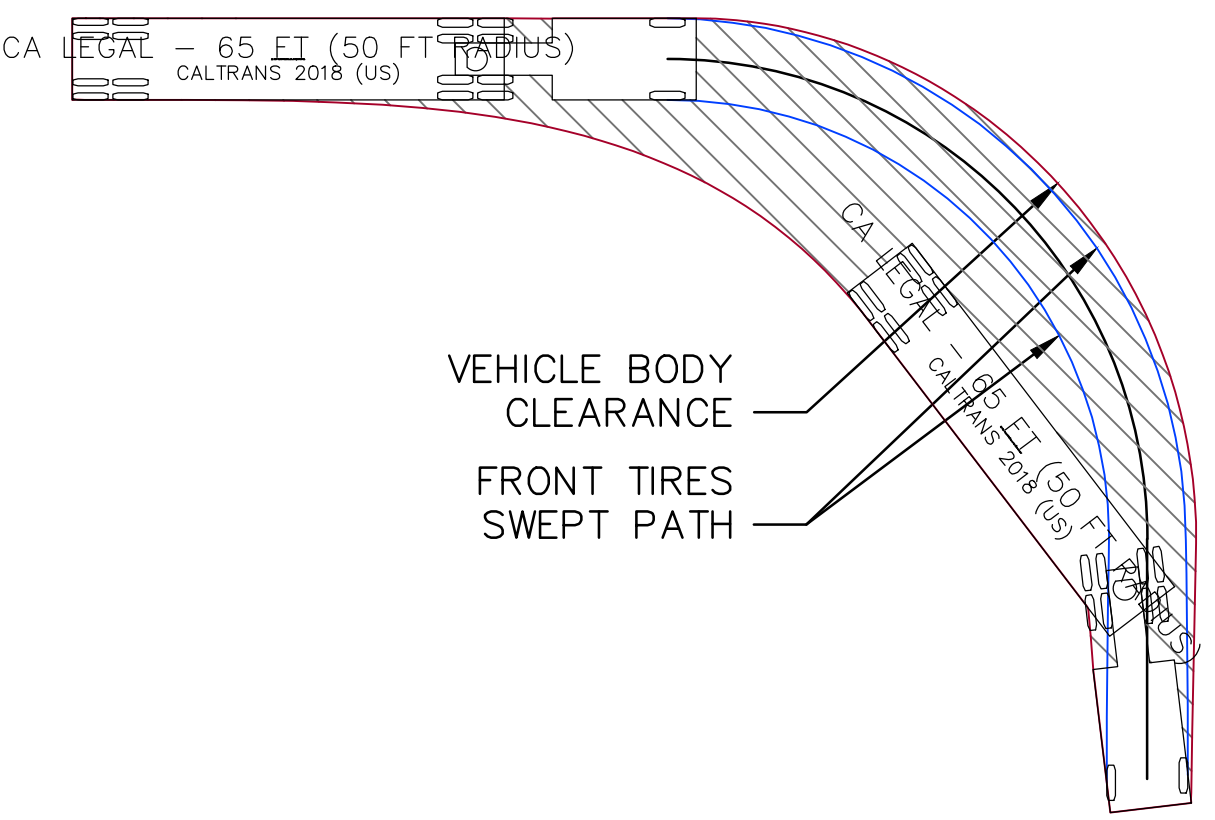
VEHICLE PROFILE



CA LEGAL - 65 FT (50 FT RADIUS)

	feet		
Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.0
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

LEGEND



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & FAIR St ROUNDABOUT ALTERNATIVE

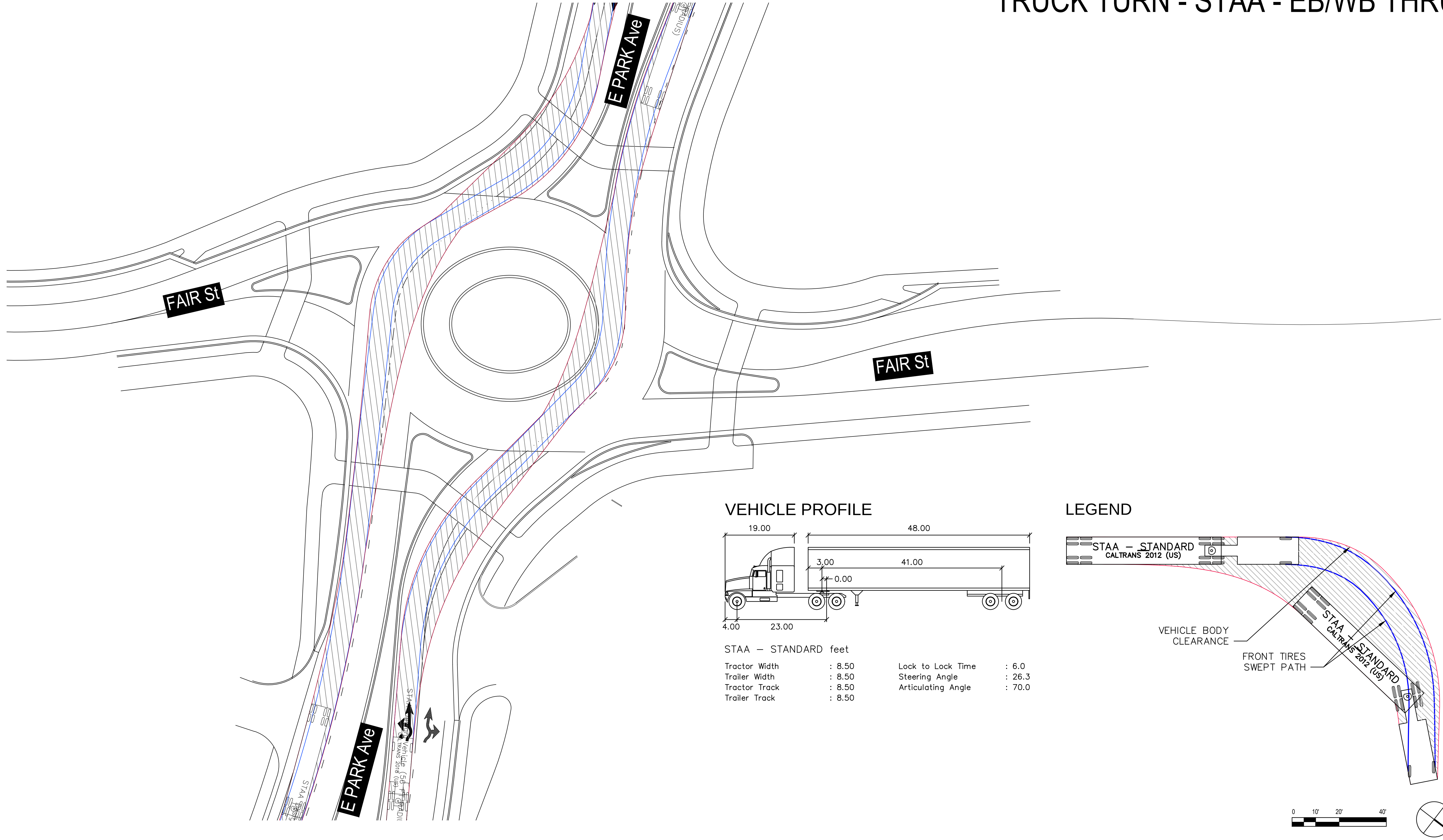


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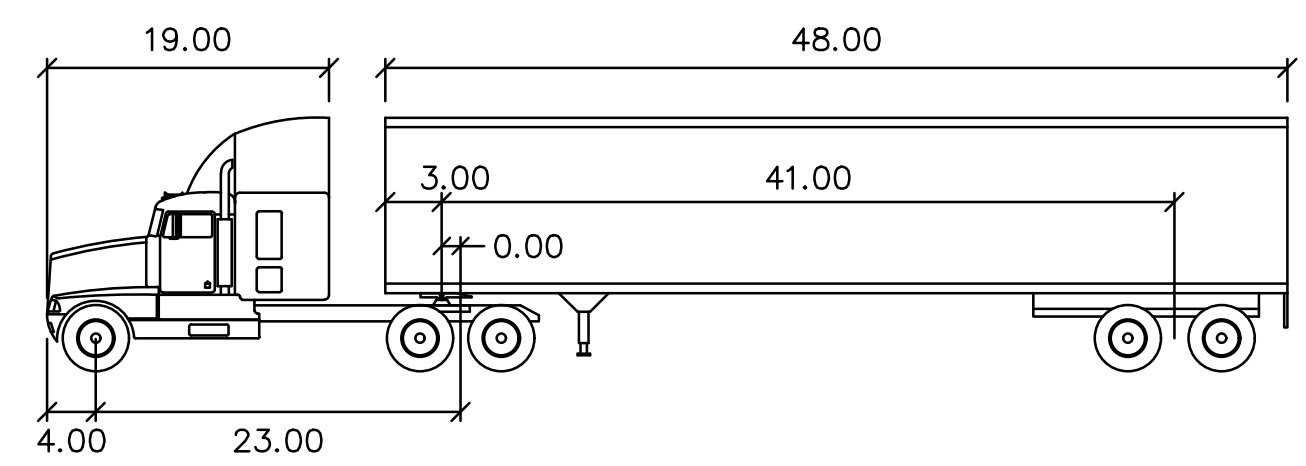
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FIGURE 15

TRUCK TURN - STAA - EB/WB THRU

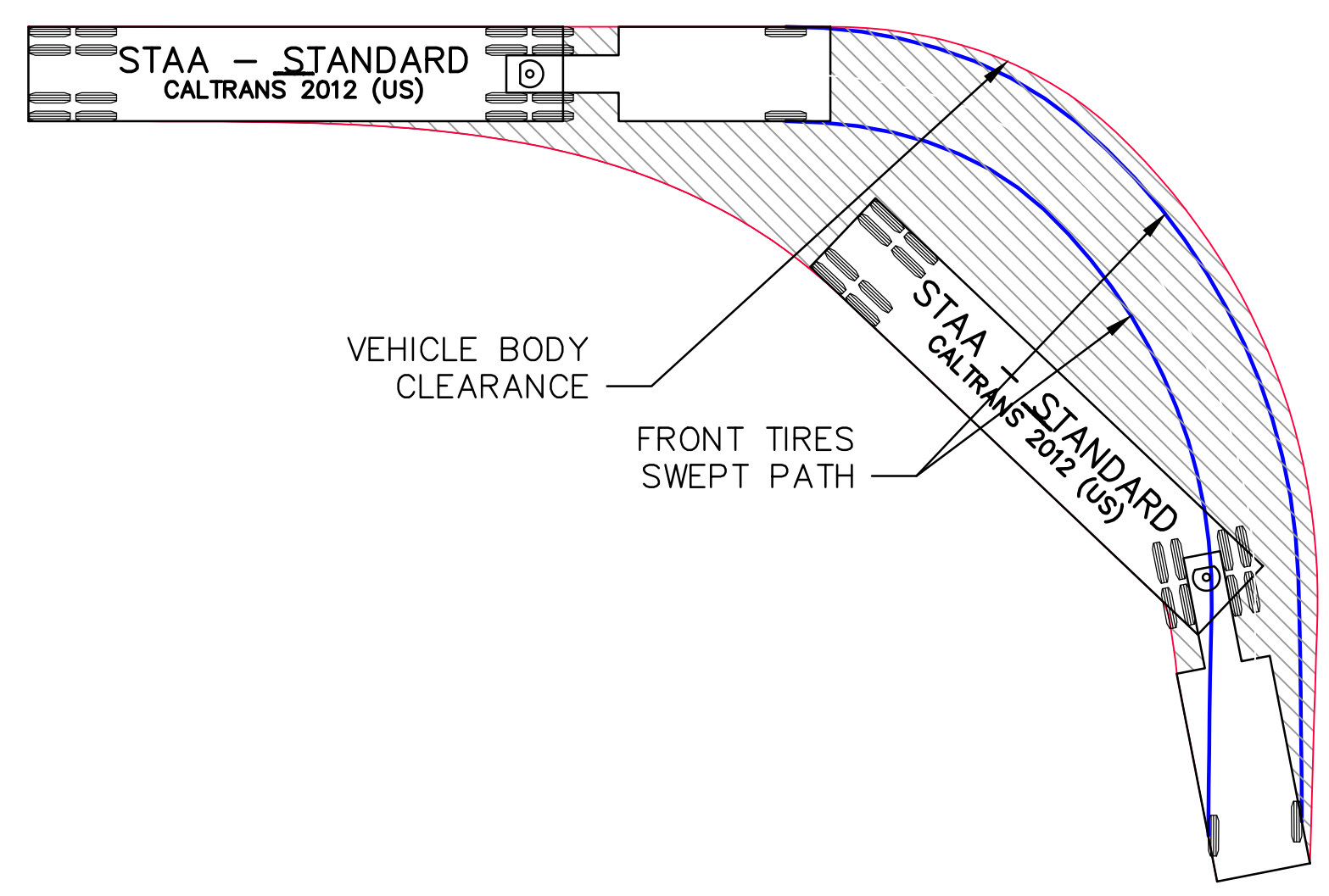


VEHICLE PROFILE



STAA - STANDARD feet			
Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

LEGEND



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
E PARK Ave & FAIR St ROUNDABOUT ALTERNATIVE

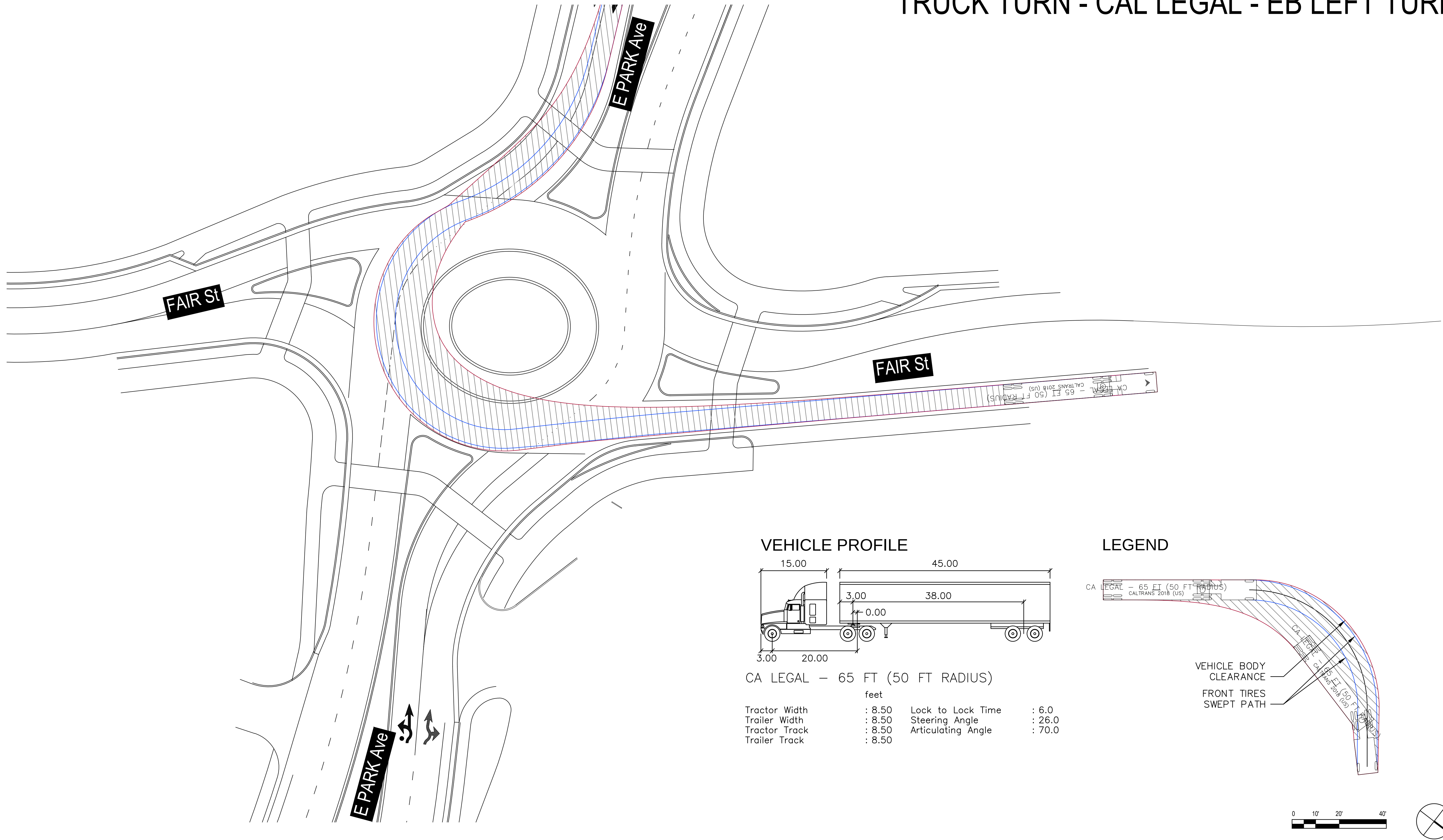


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FIGURE 16

TRUCK TURN - CAL LEGAL - EB LEFT TURN



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HEGAN Ln CONGESTION RELIEF PROJECT
E PARK Ave & FAIR St ROUNDABOUT ALTERNATIVE

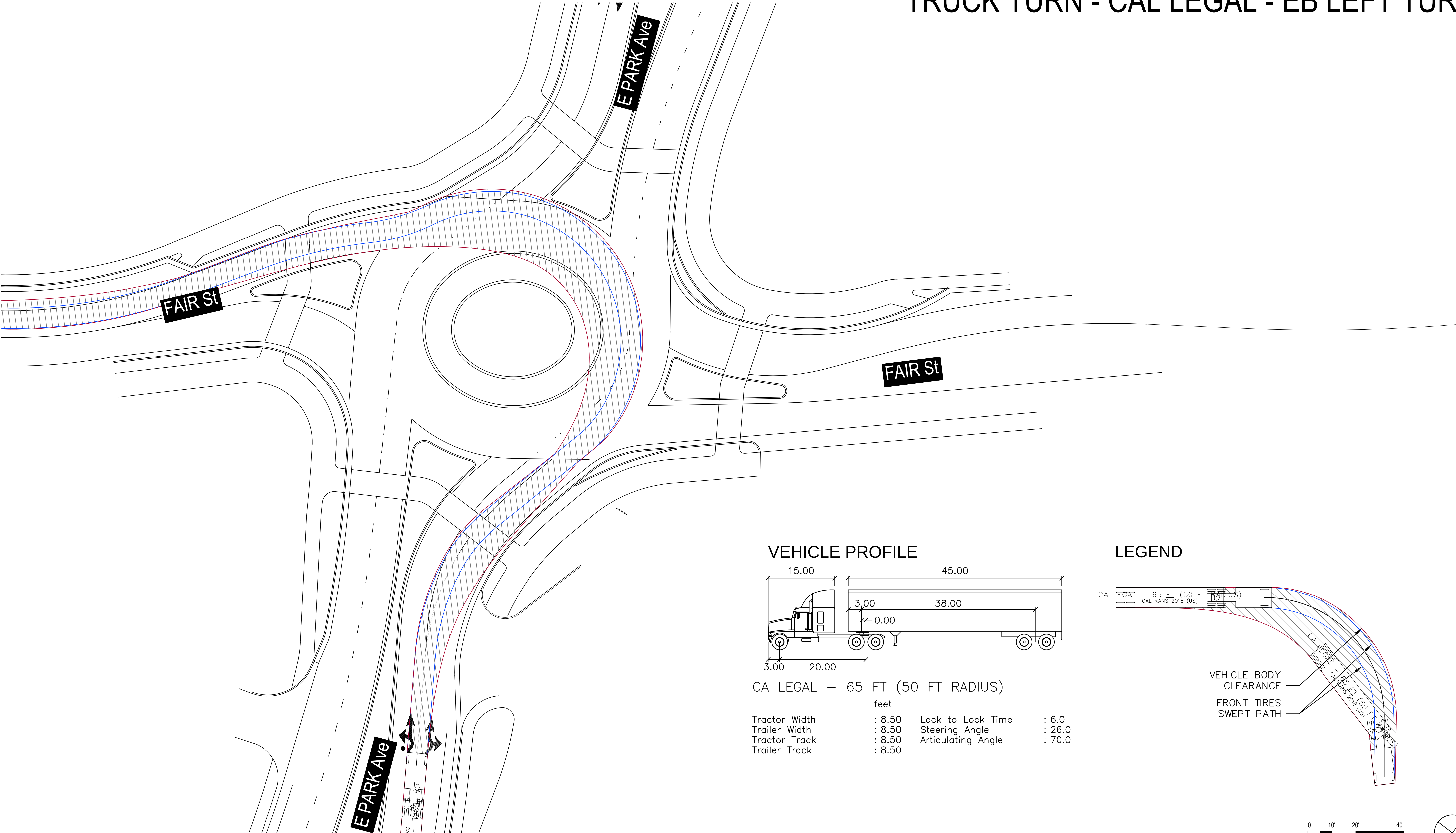


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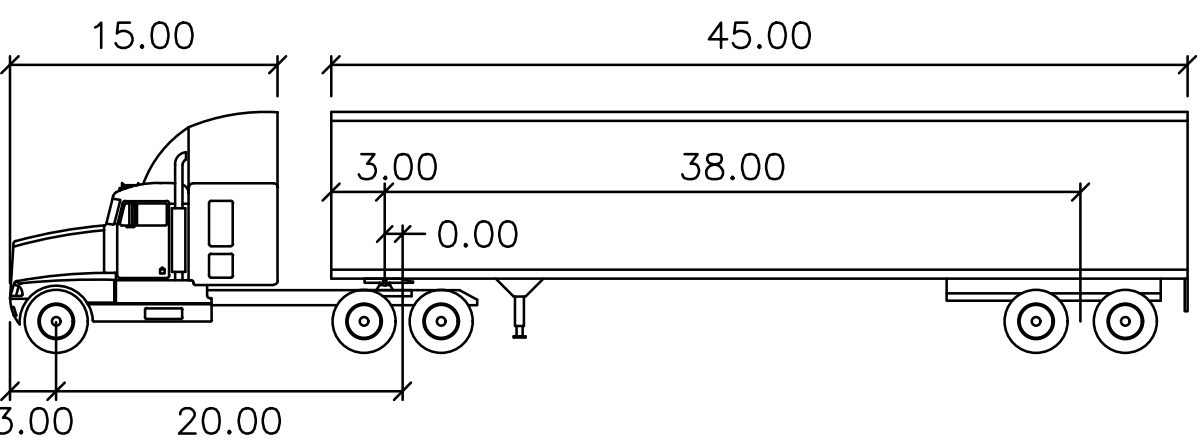
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FIGURE 17

TRUCK TURN - CAL LEGAL - EB LEFT TURN



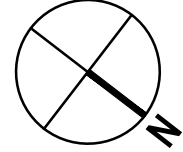
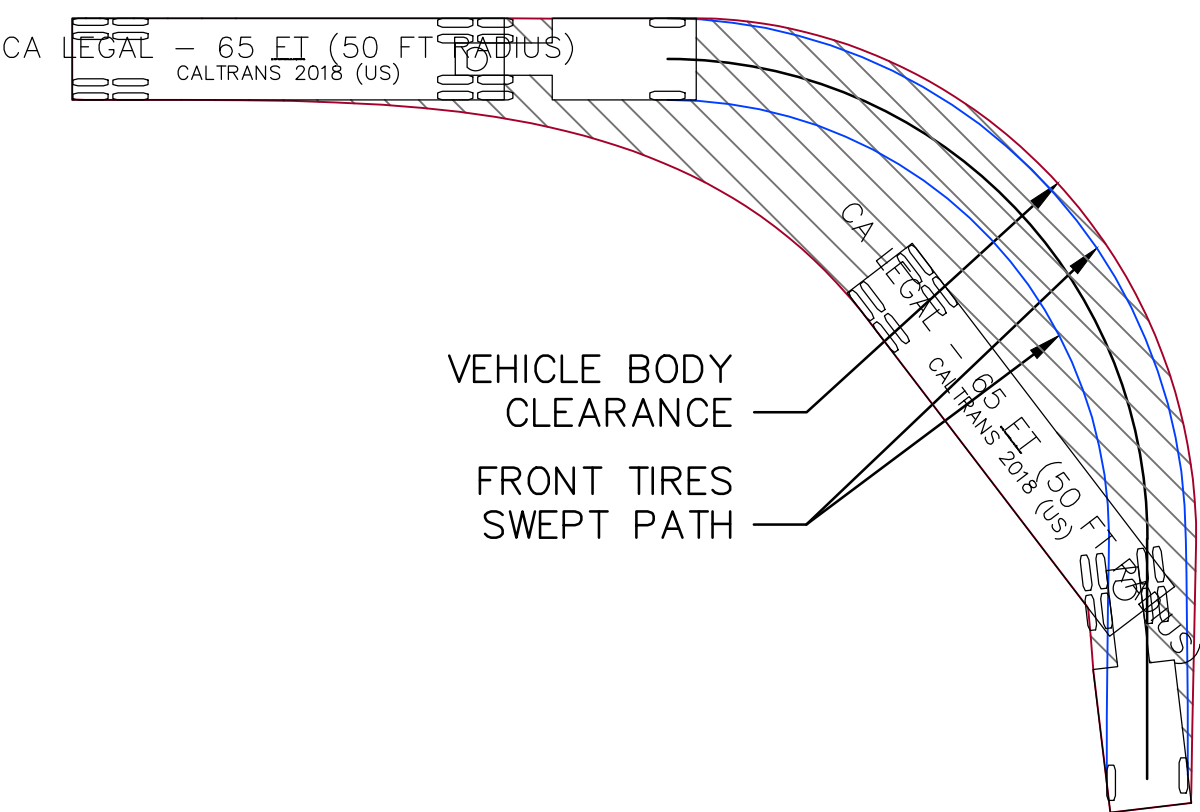
VEHICLE PROFILE



CA LEGAL — 65 FT (50 FT RADIUS)

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.0
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

LEGEND



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
E PARK Ave & FAIR St ROUNDABOUT ALTERNATIVE

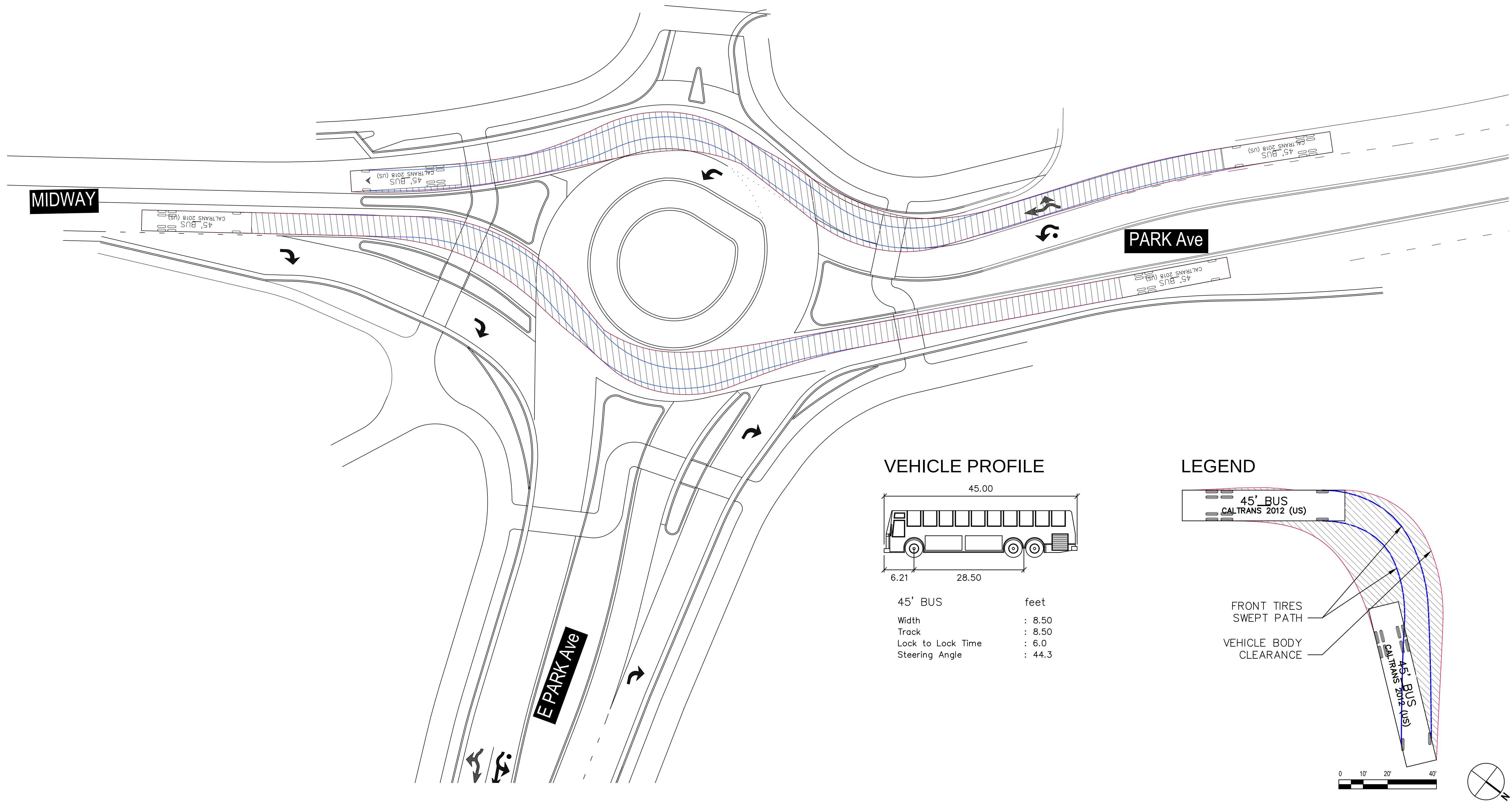


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FIGURE 18

BUS TURN - NB/SB THRUS



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SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
E PARK Ave & MIDWAY ROUNDABOUT ALTERNATIVE

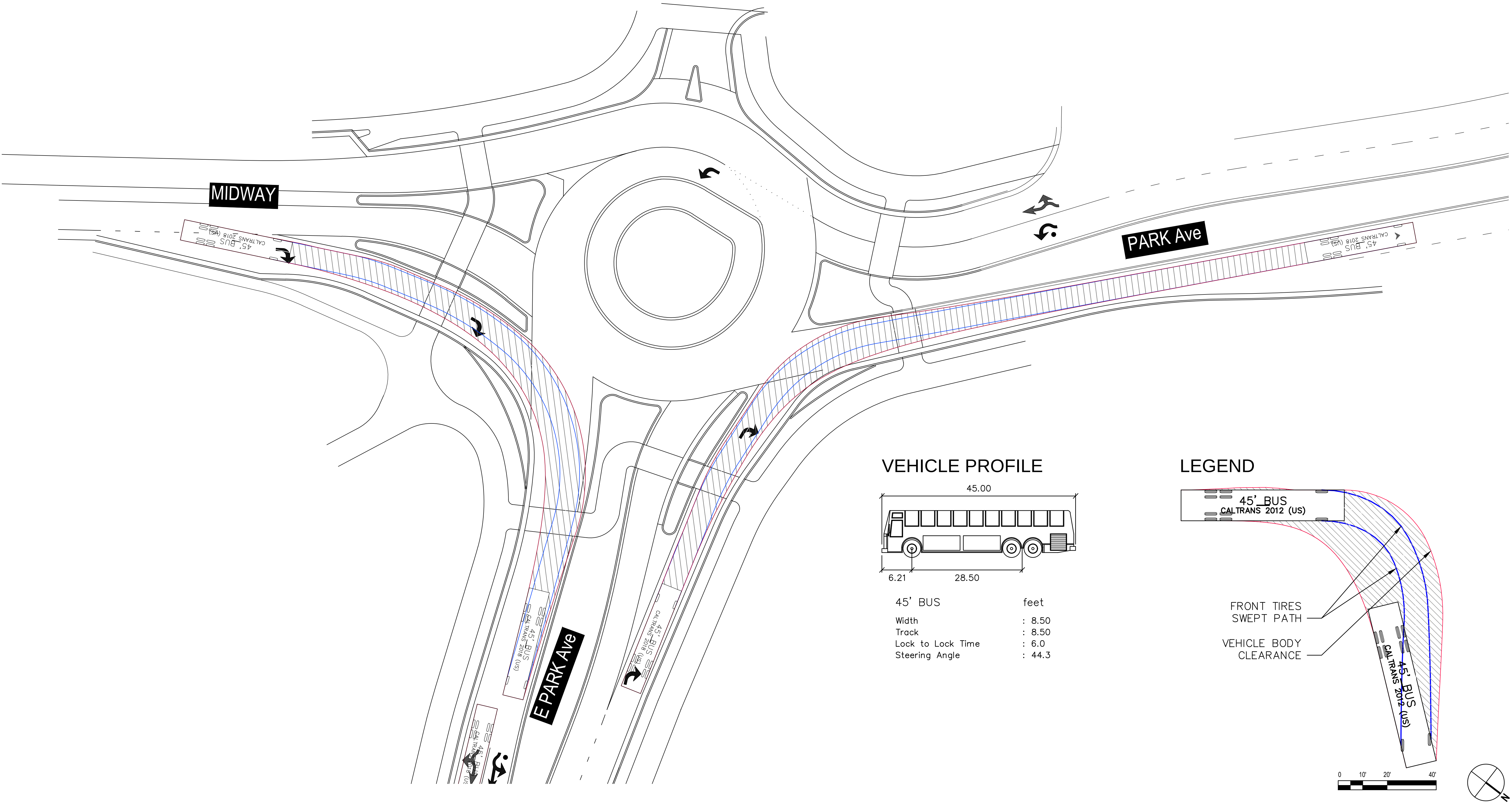


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FIGURE 19

BUS TURN - NB/SB THRUS



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SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
E PARK Ave & MIDWAY ROUNDABOUT ALTERNATIVE

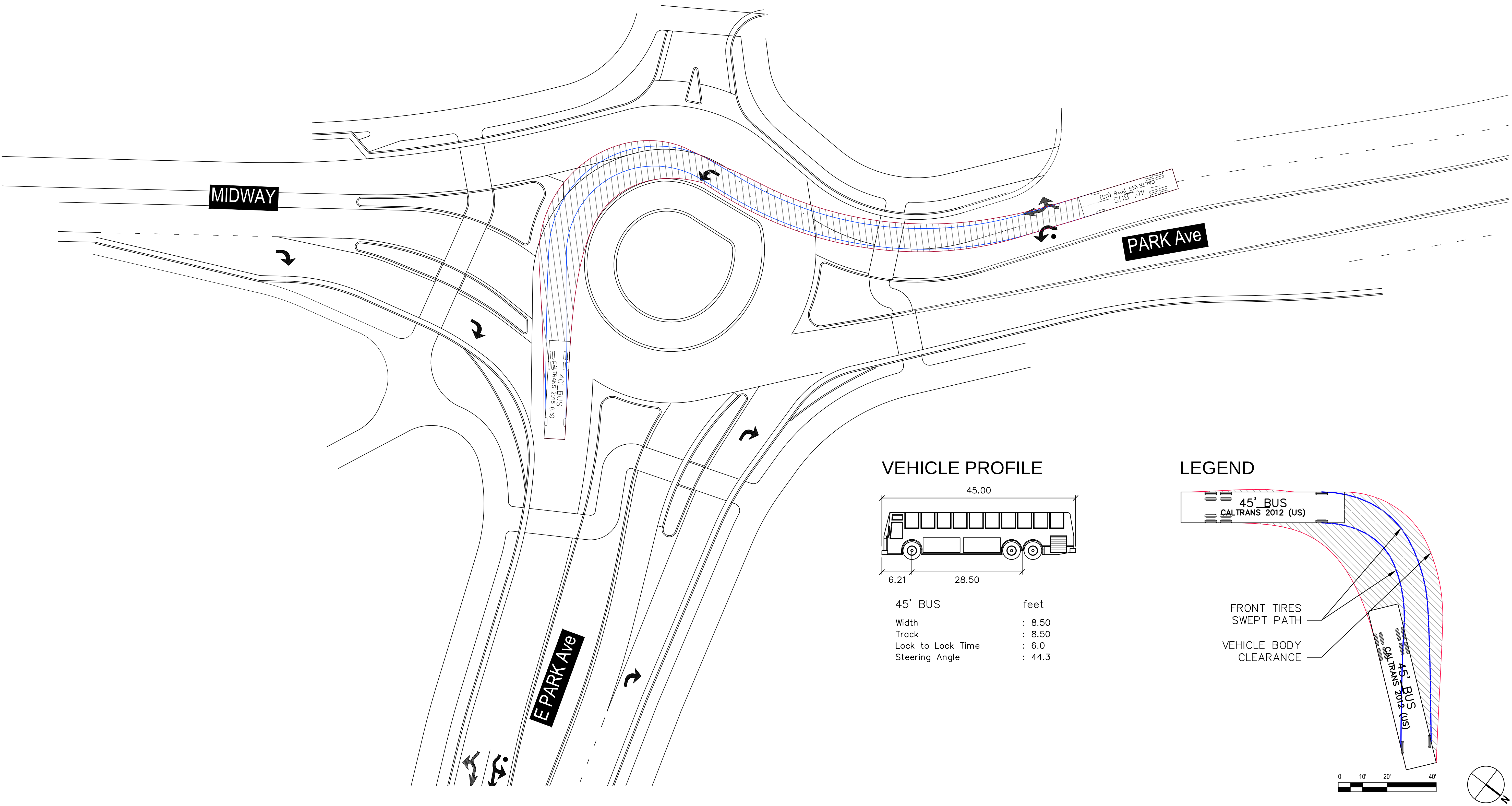


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FIGURE 20

BUS TURN - SB LEFT TURN



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SUBJECT TO CHANGE

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E PARK Ave & MIDWAY ROUNDABOUT ALTERNATIVE

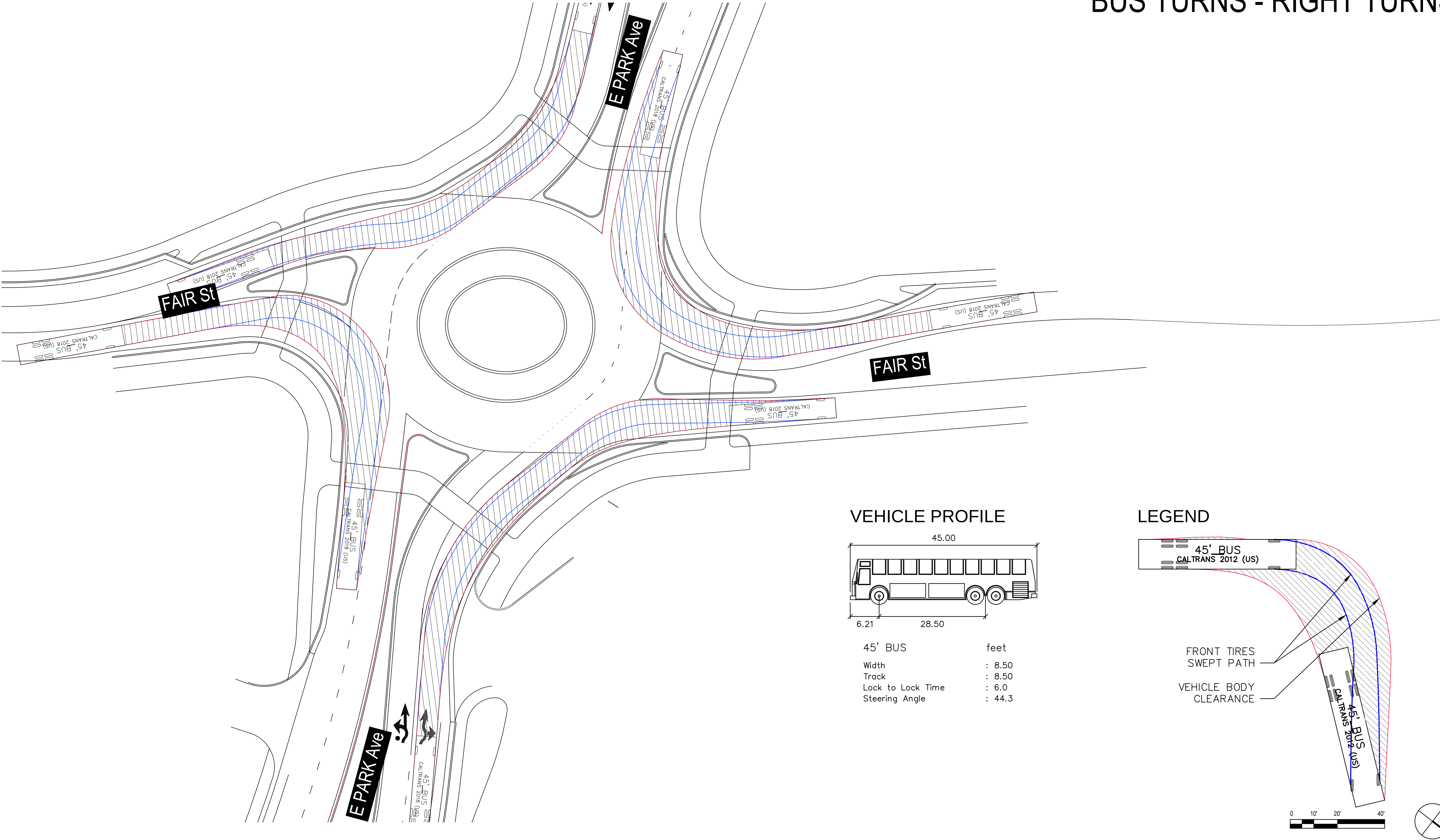


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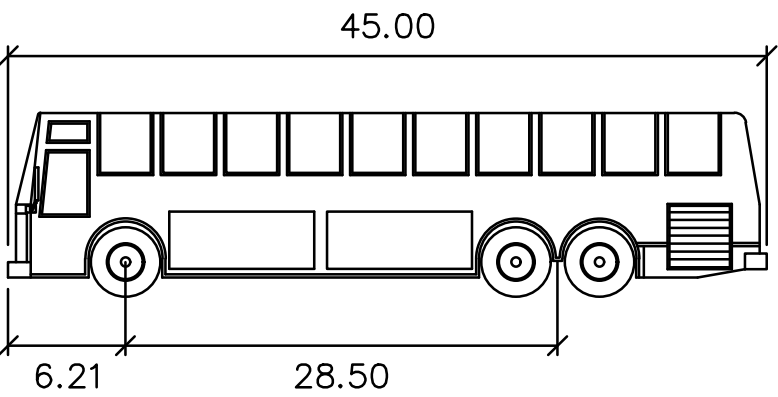
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FIGURE 21

BUS TURNS - RIGHT TURNS

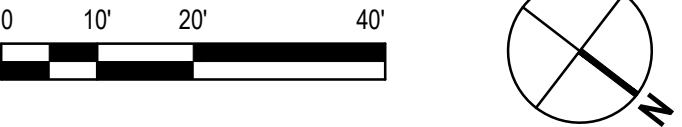
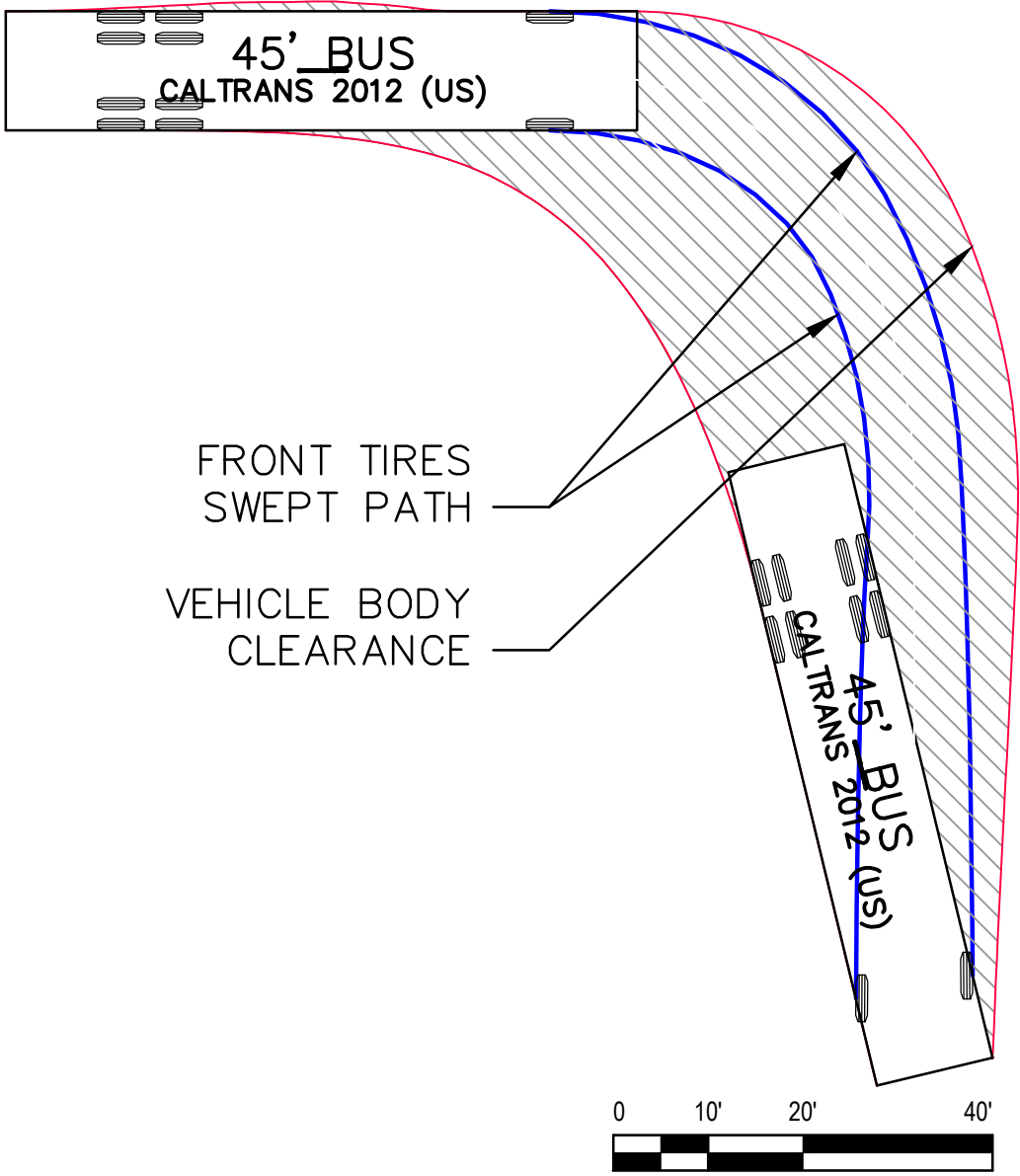


VEHICLE PROFILE



45' BUS	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 44.3

LEGEND



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
E PARK Ave & FAIR St ROUNDABOUT ALTERNATIVE

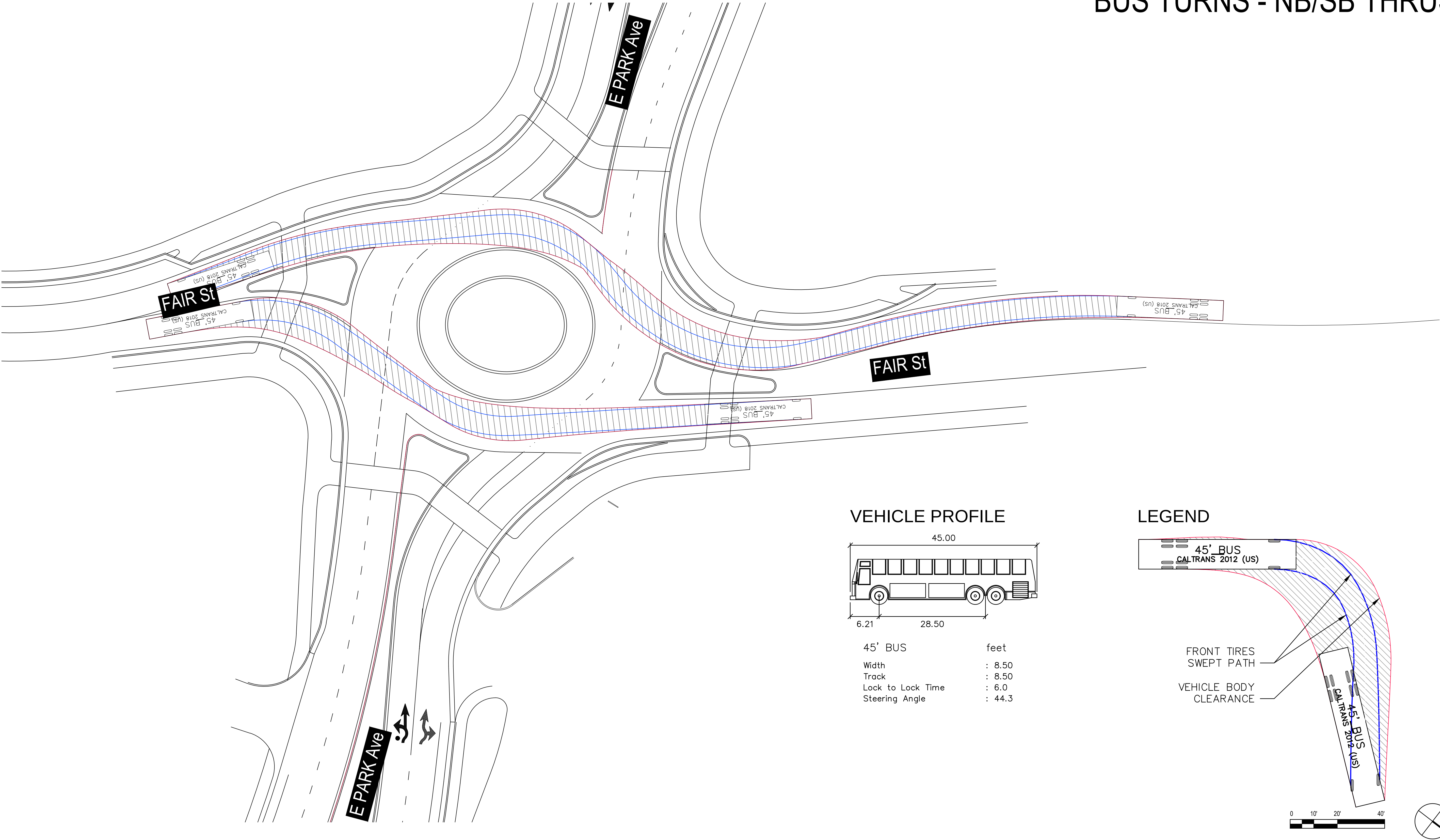


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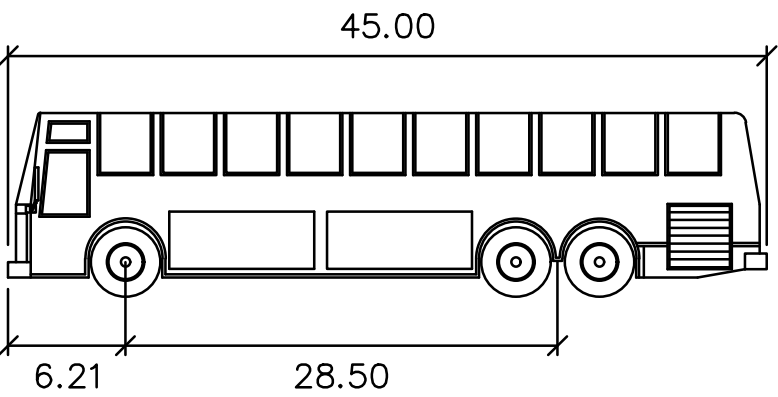
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FIGURE 22

BUS TURNS - NB/SB THRUS

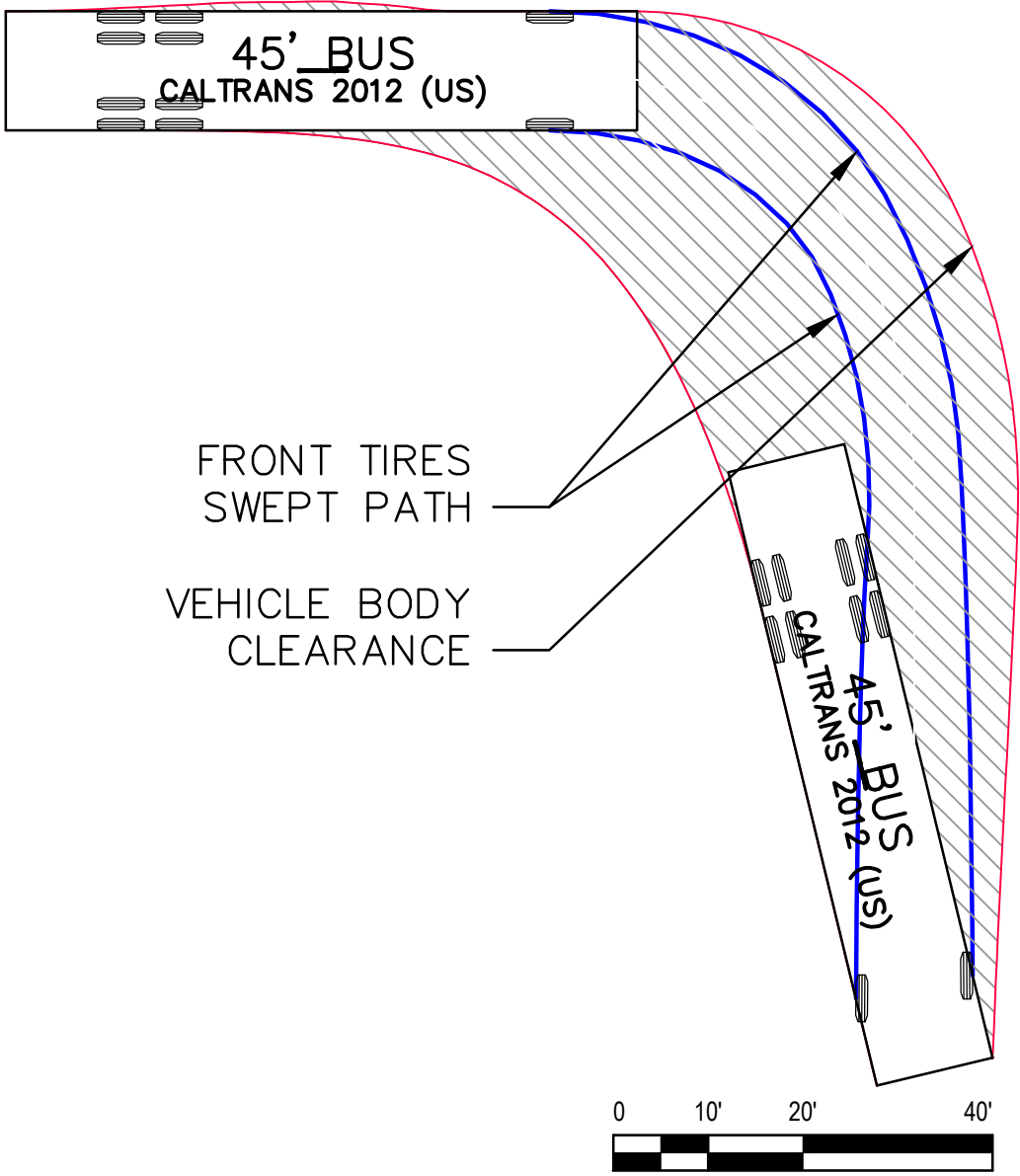


VEHICLE PROFILE



45' BUS	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 44.3

LEGEND



PRELIMINARY
SUBJECT TO CHANGE

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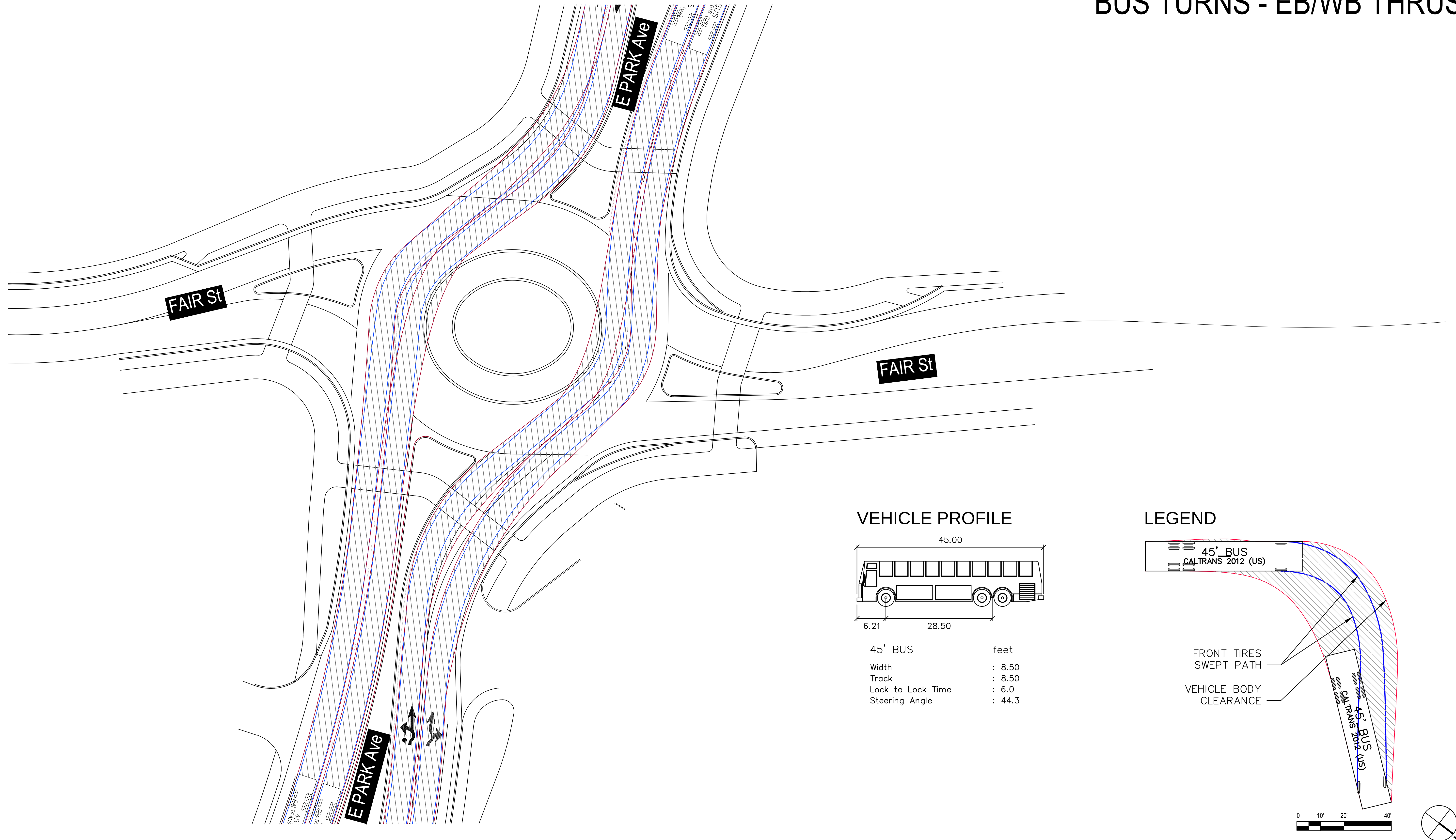


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FIGURE 23

BUS TURNS - EB/WB THRUS



PRELIMINARY
SUBJECT TO CHANGE

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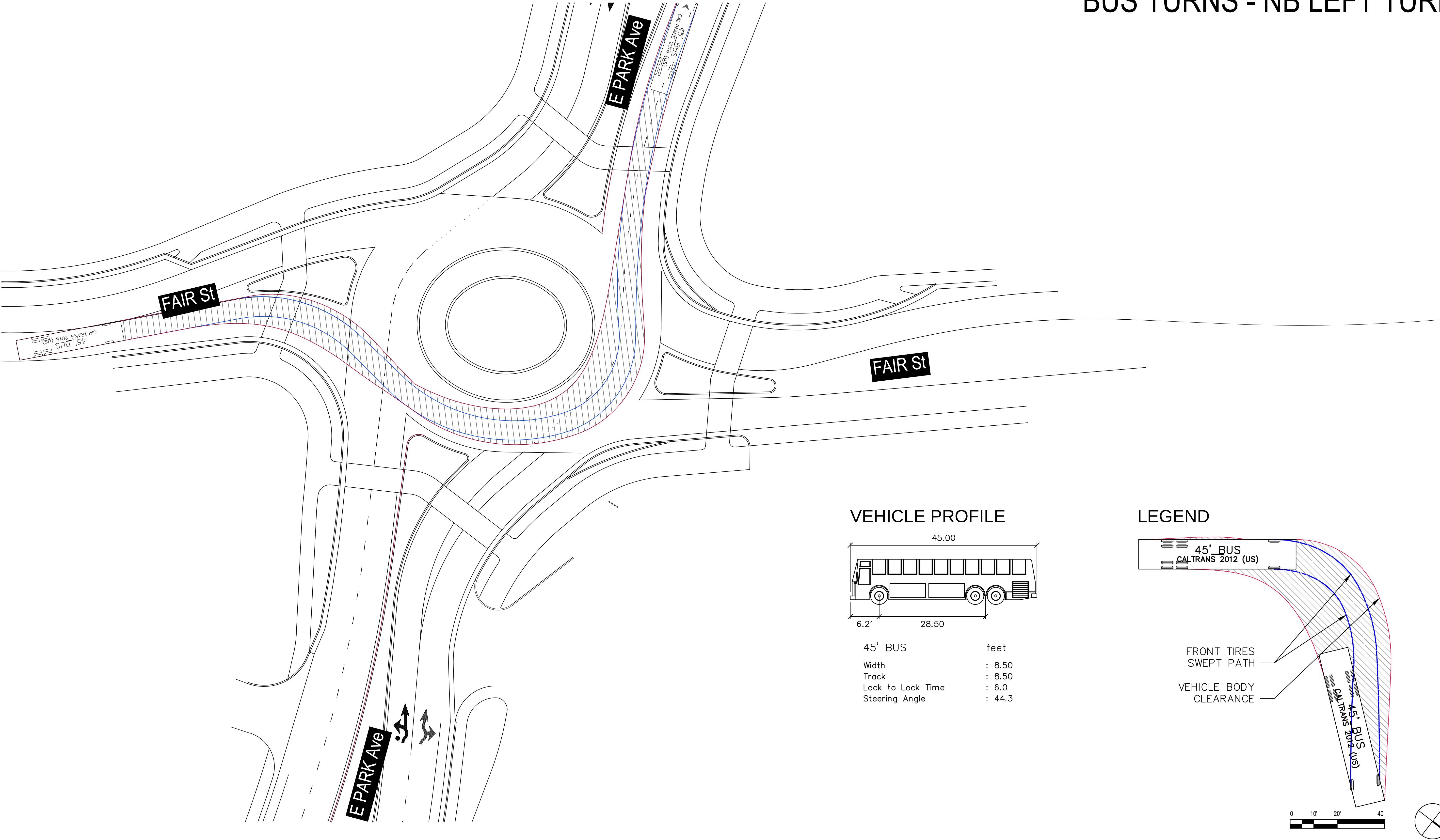


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FIGURE 24

BUS TURNS - NB LEFT TURN



PRELIMINARY
SUBJECT TO CHANGE

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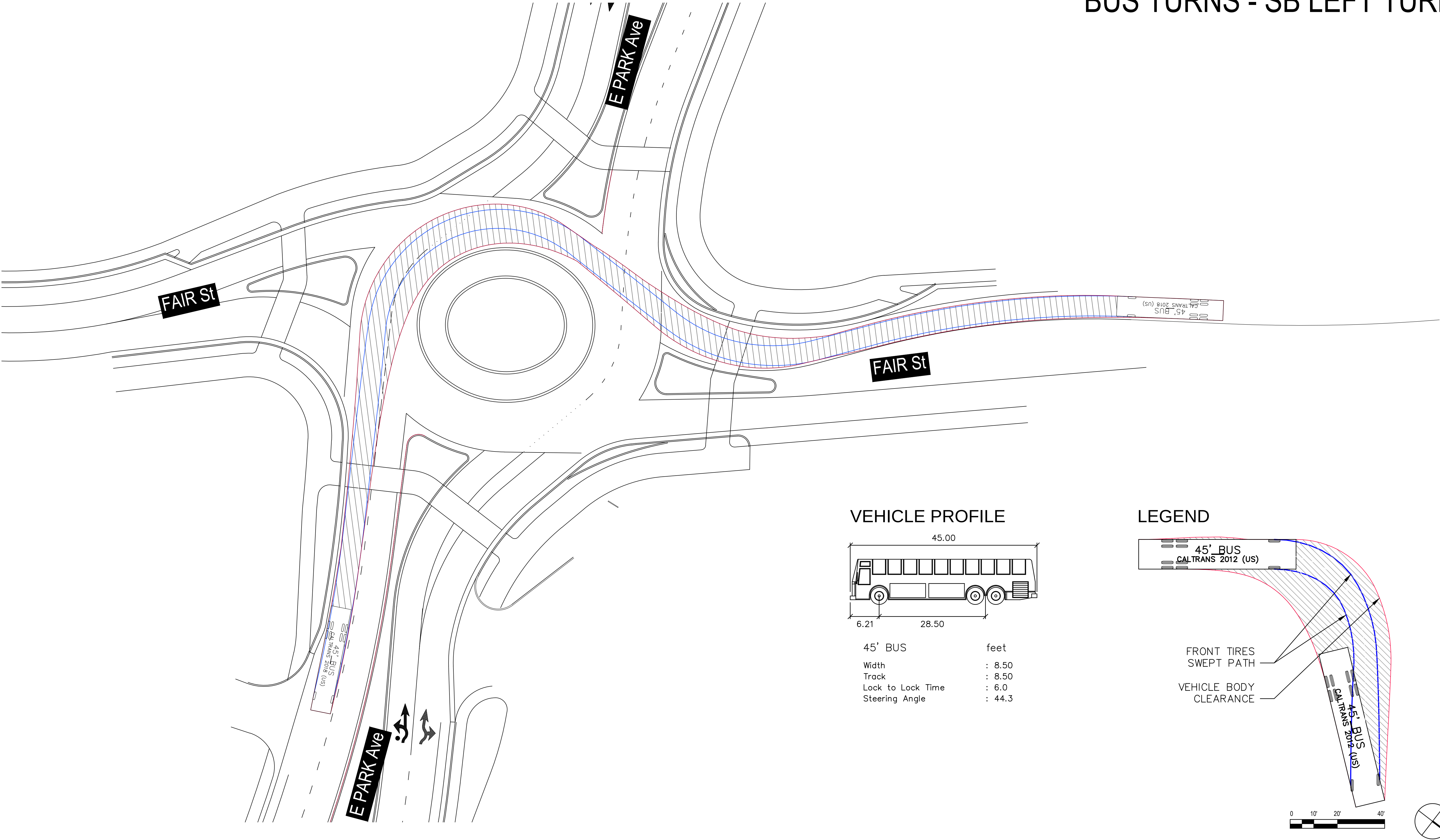


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FIGURE 25

BUS TURNS - SB LEFT TURN



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
E PARK Ave & FAIR St ROUNDABOUT ALTERNATIVE

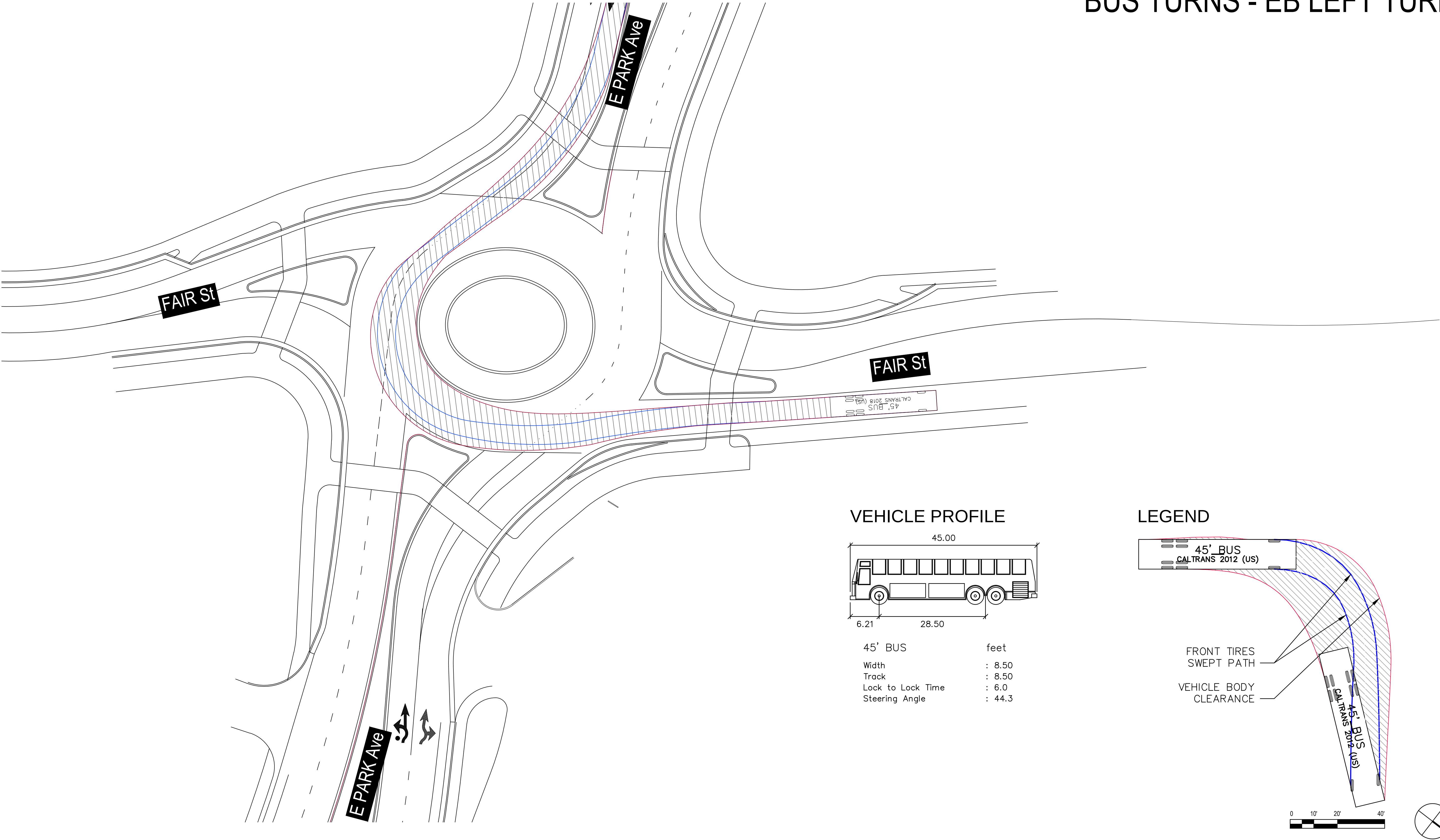


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FIGURE 26

BUS TURNS - EB LEFT TURN



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
E PARK Ave & FAIR St ROUNDABOUT ALTERNATIVE

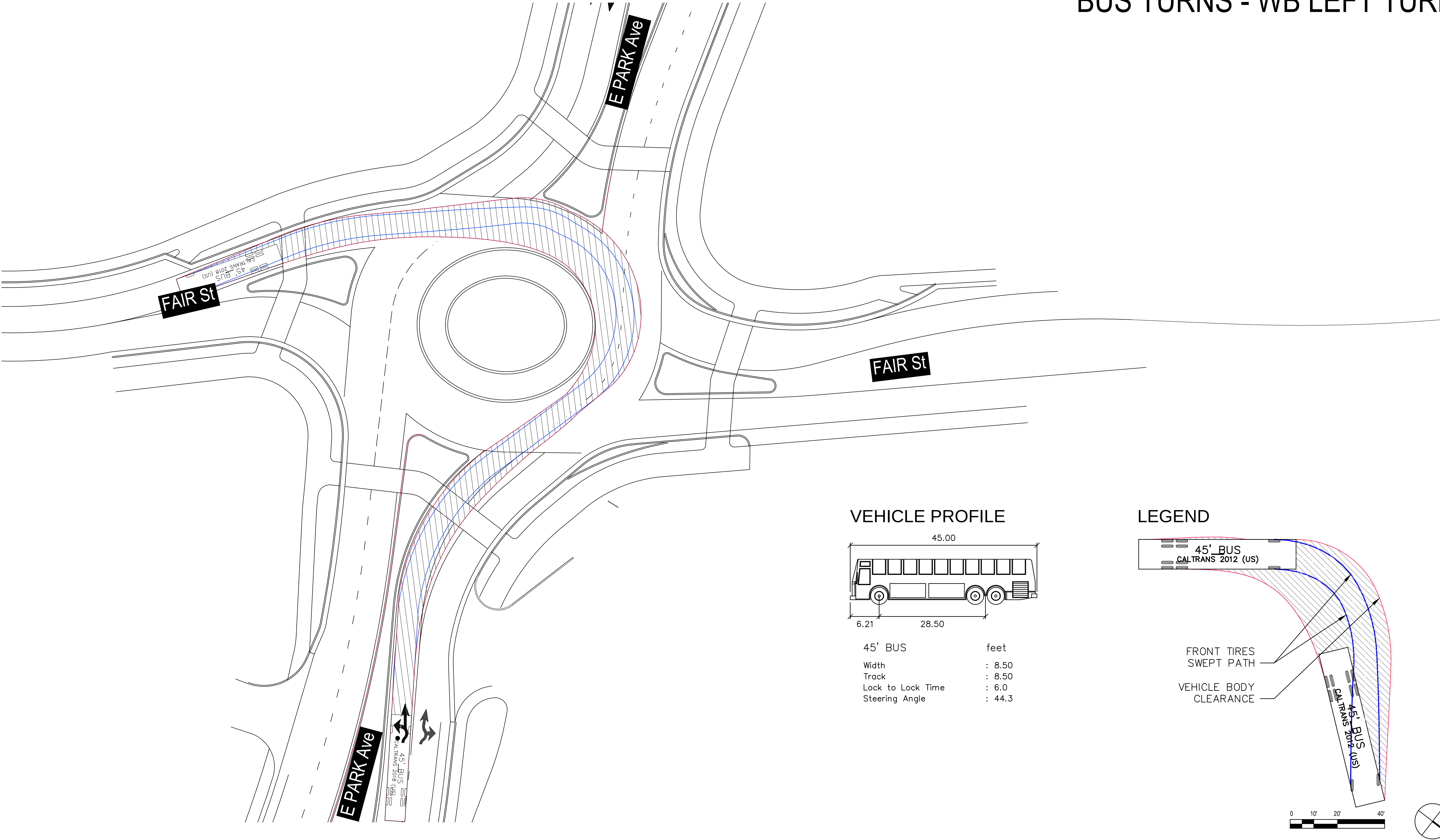


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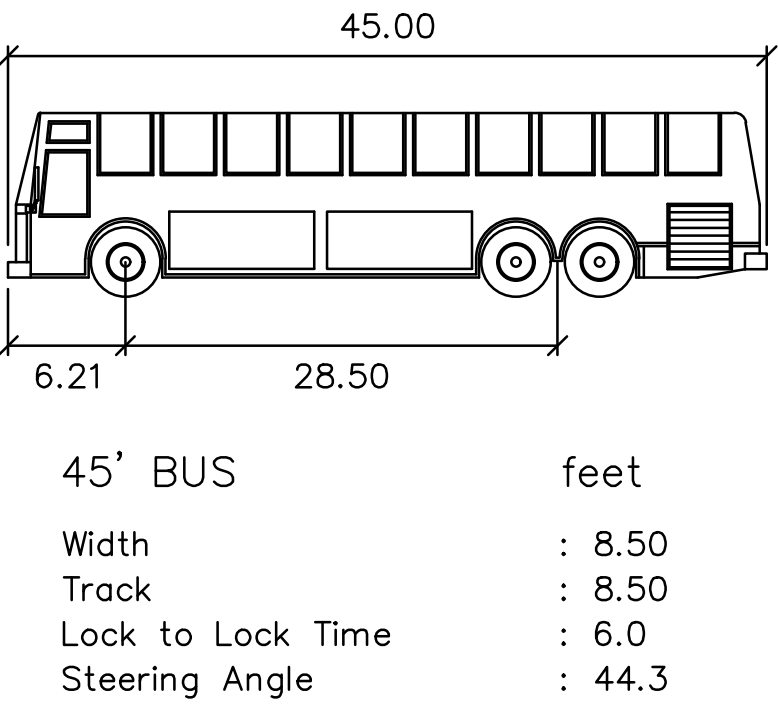
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FIGURE 27

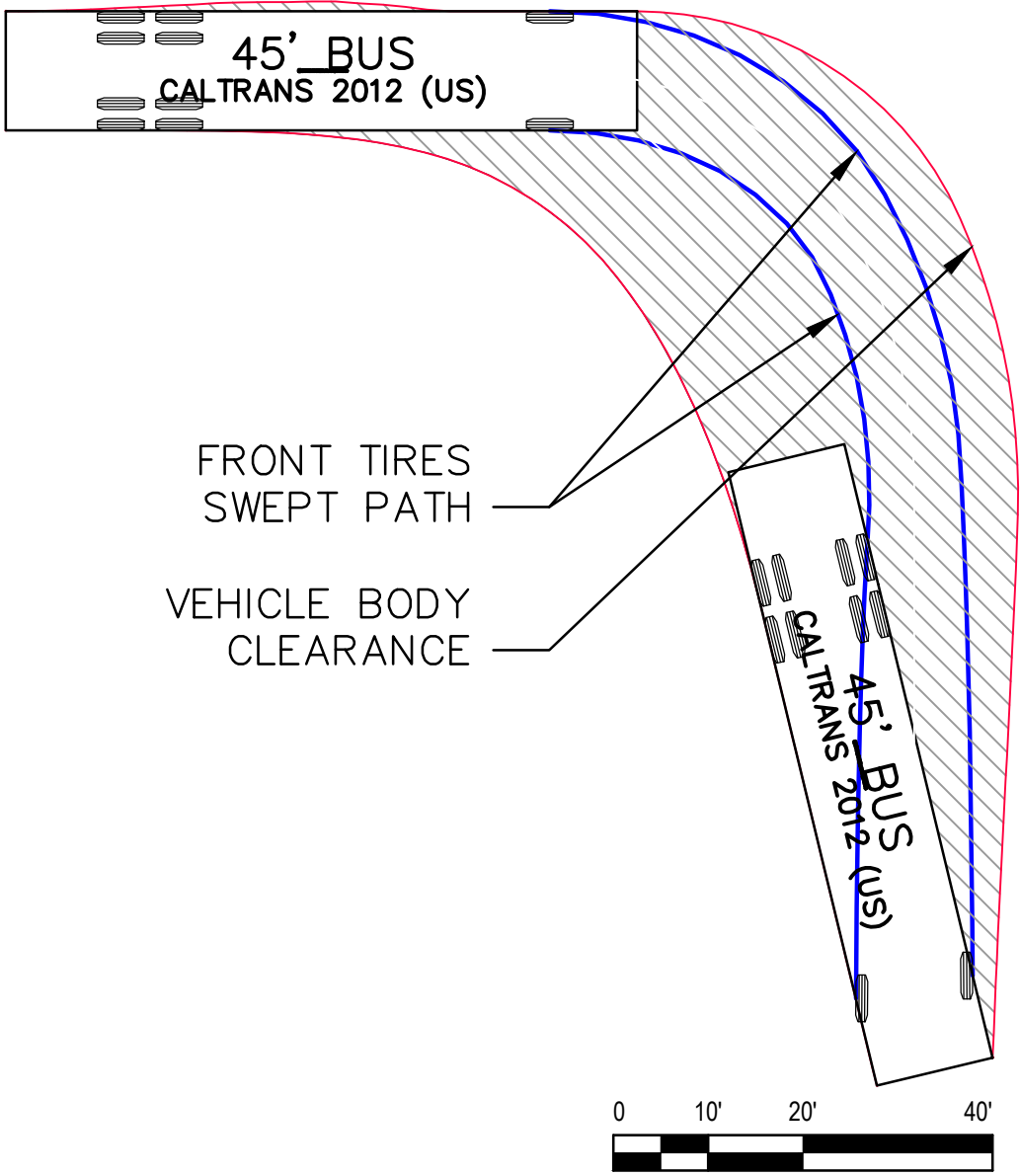
BUS TURNS - WB LEFT TURN



VEHICLE PROFILE



LEGEND



PRELIMINARY
SUBJECT TO CHANGE

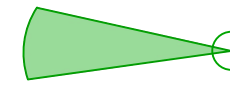
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E PARK Ave & FAIR St ROUNDABOUT ALTERNATIVE



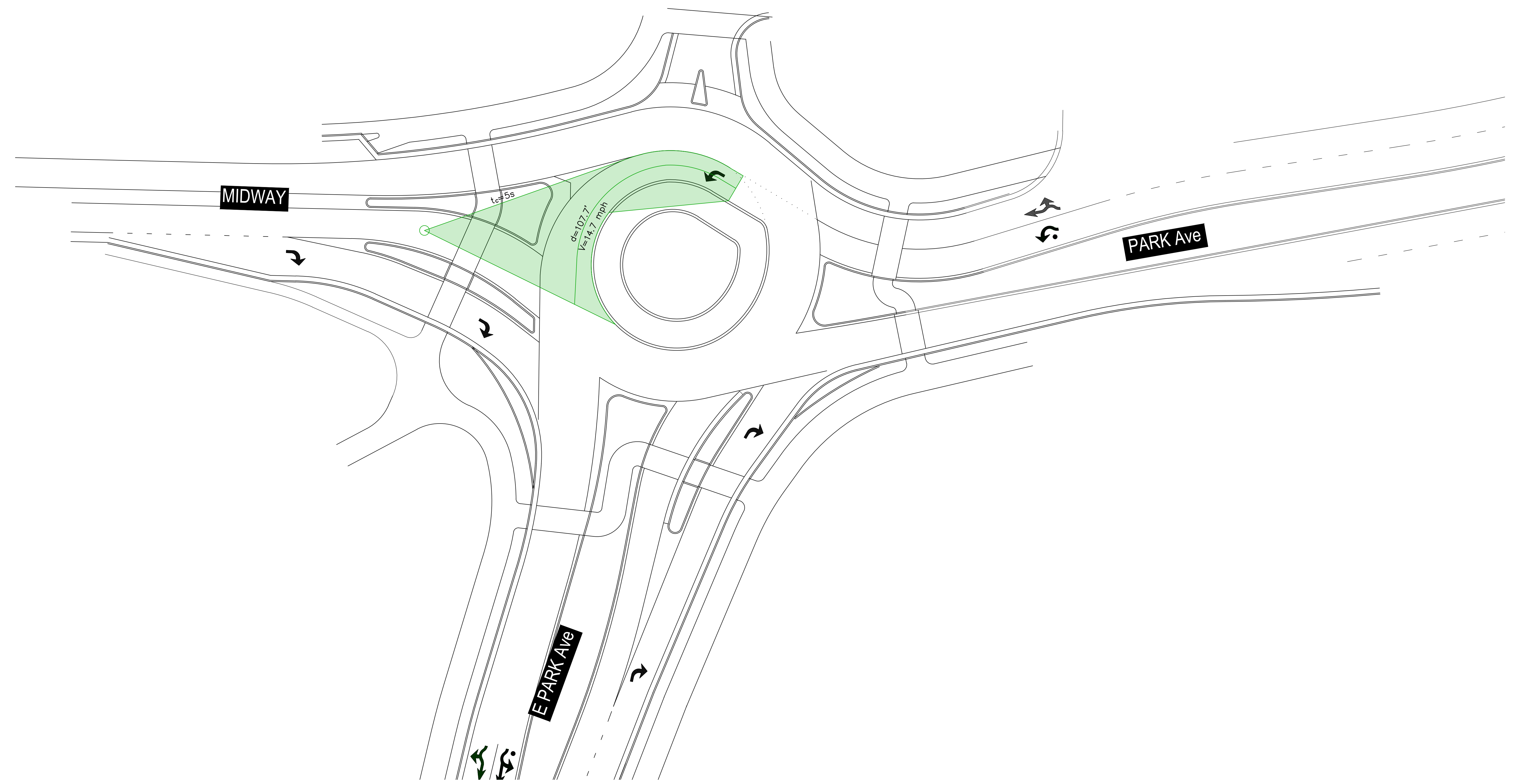
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FIGURE 28

LEGEND:
 INTERSECTION SIGHT TRIANGLE

INTERSECTION SIGHT DISTANCE -NB LANE 1



PRELIMINARY
SUBJECT TO CHANGE

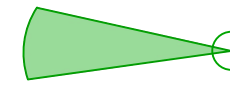
HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & MIDWAY ROUNDABOUT ALTERNATIVE



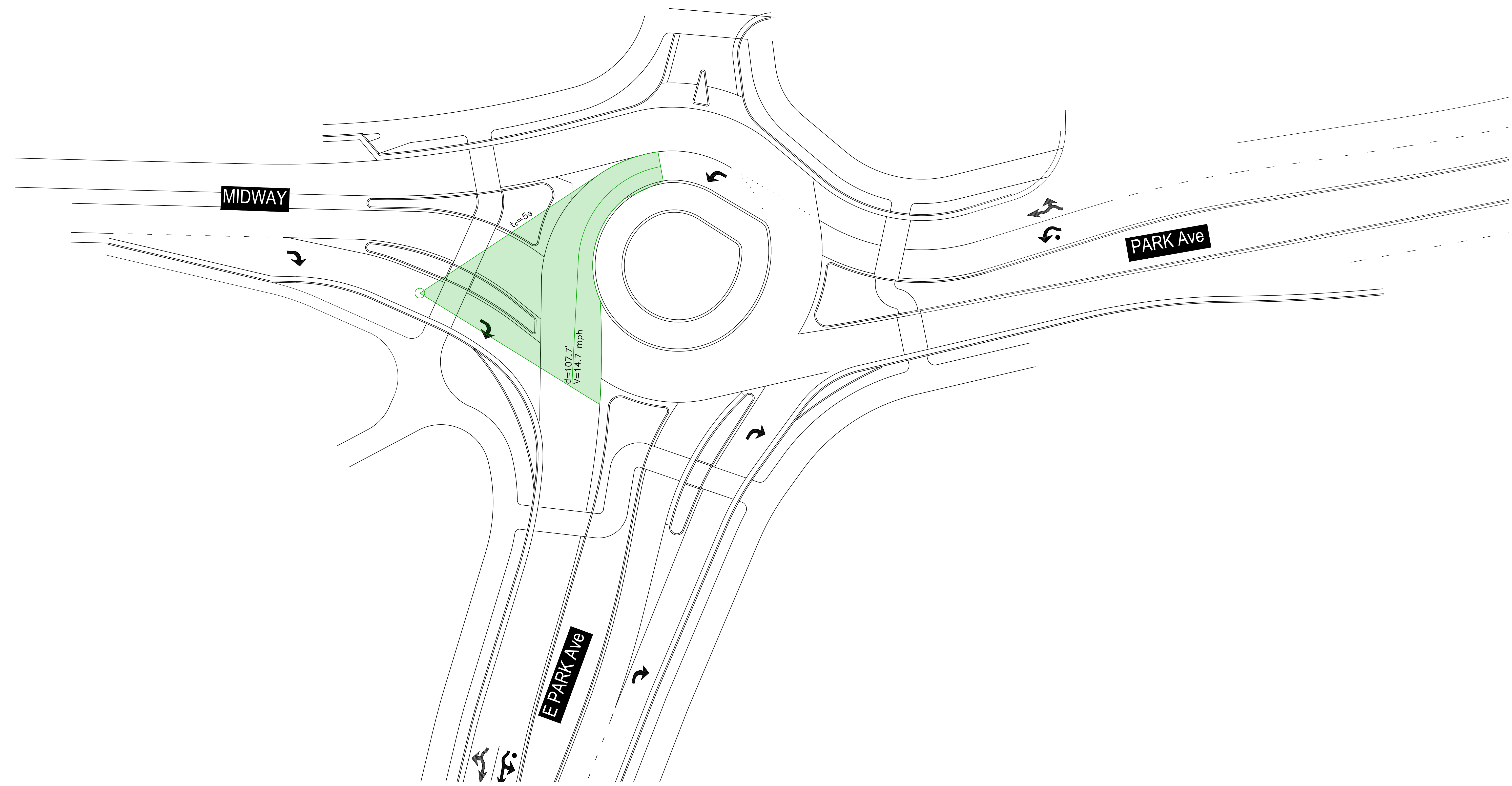
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FIGURE 29

LEGEND:
 INTERSECTION SIGHT TRIANGLE

INTERSECTION SIGHT DISTANCE -NB LANE 2



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & MIDWAY ROUNDABOUT ALTERNATIVE



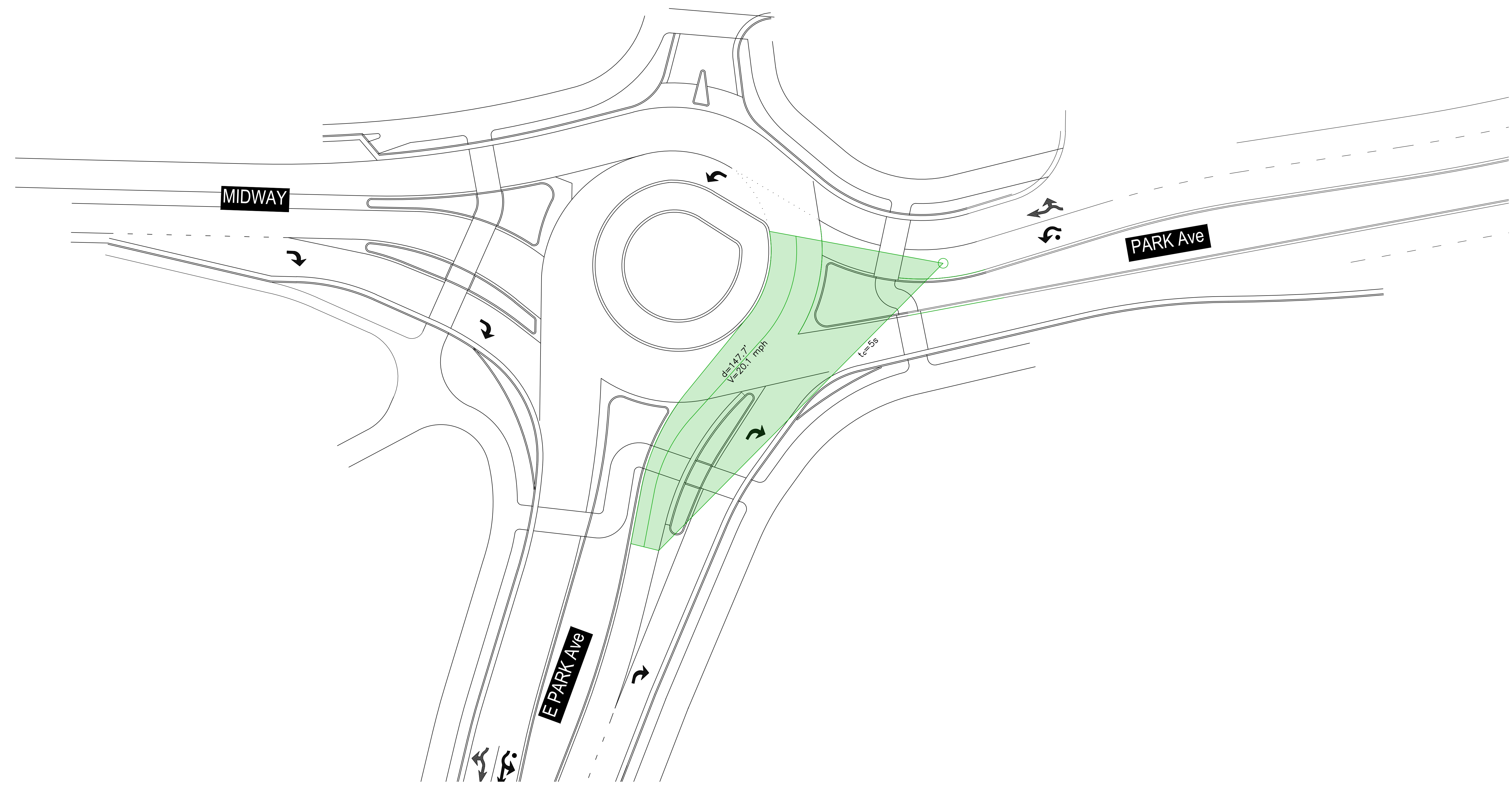
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FIGURE 30

LEGEND:
INTERSECTION SIGHT TRIANGLE

INTERSECTION SIGHT DISTANCE - SB LANE 1



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & MIDWAY ROUNDABOUT ALTERNATIVE



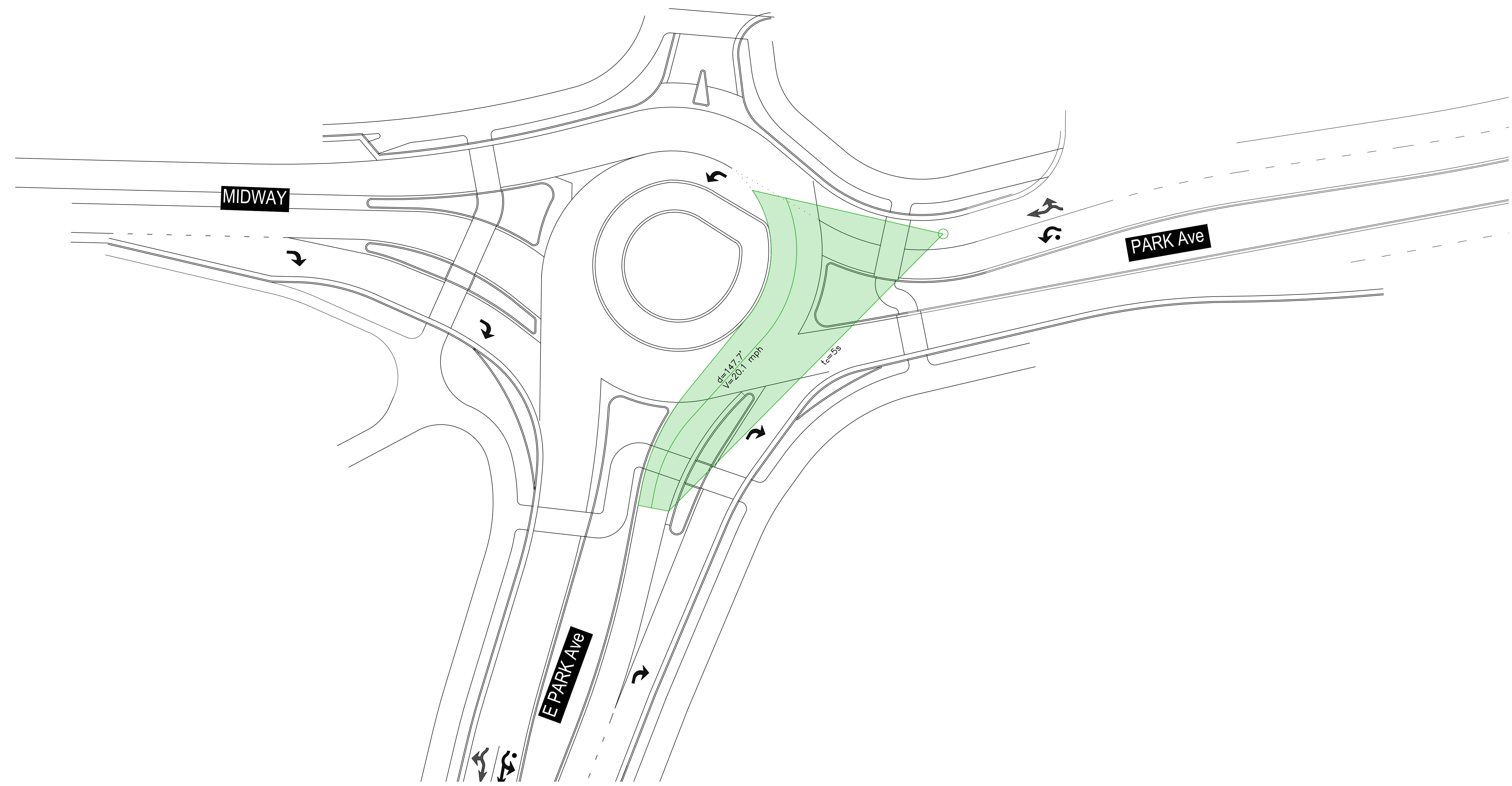
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FIGURE 31

LEGEND:
INTERSECTION SIGHT TRIANGLE

INTERSECTION SIGHT DISTANCE - SB LANE 2



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & MIDWAY ROUNDABOUT ALTERNATIVE

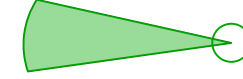


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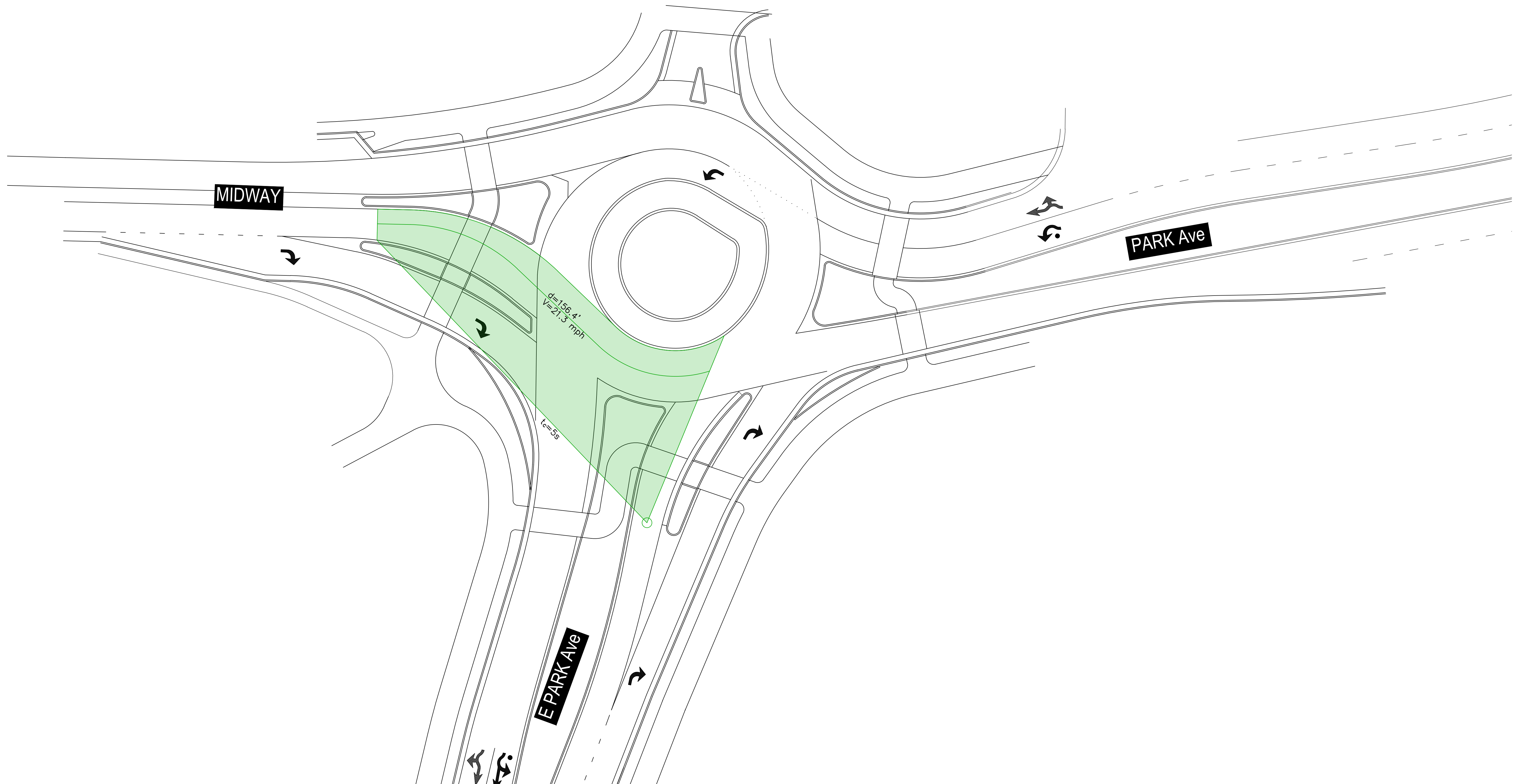
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FIGURE 32

LEGEND:

 INTERSECTION SIGHT TRIANGLE

INTERSECTION SIGHT DISTANCE - WB LANE 1



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & MIDWAY ROUNDABOUT ALTERNATIVE



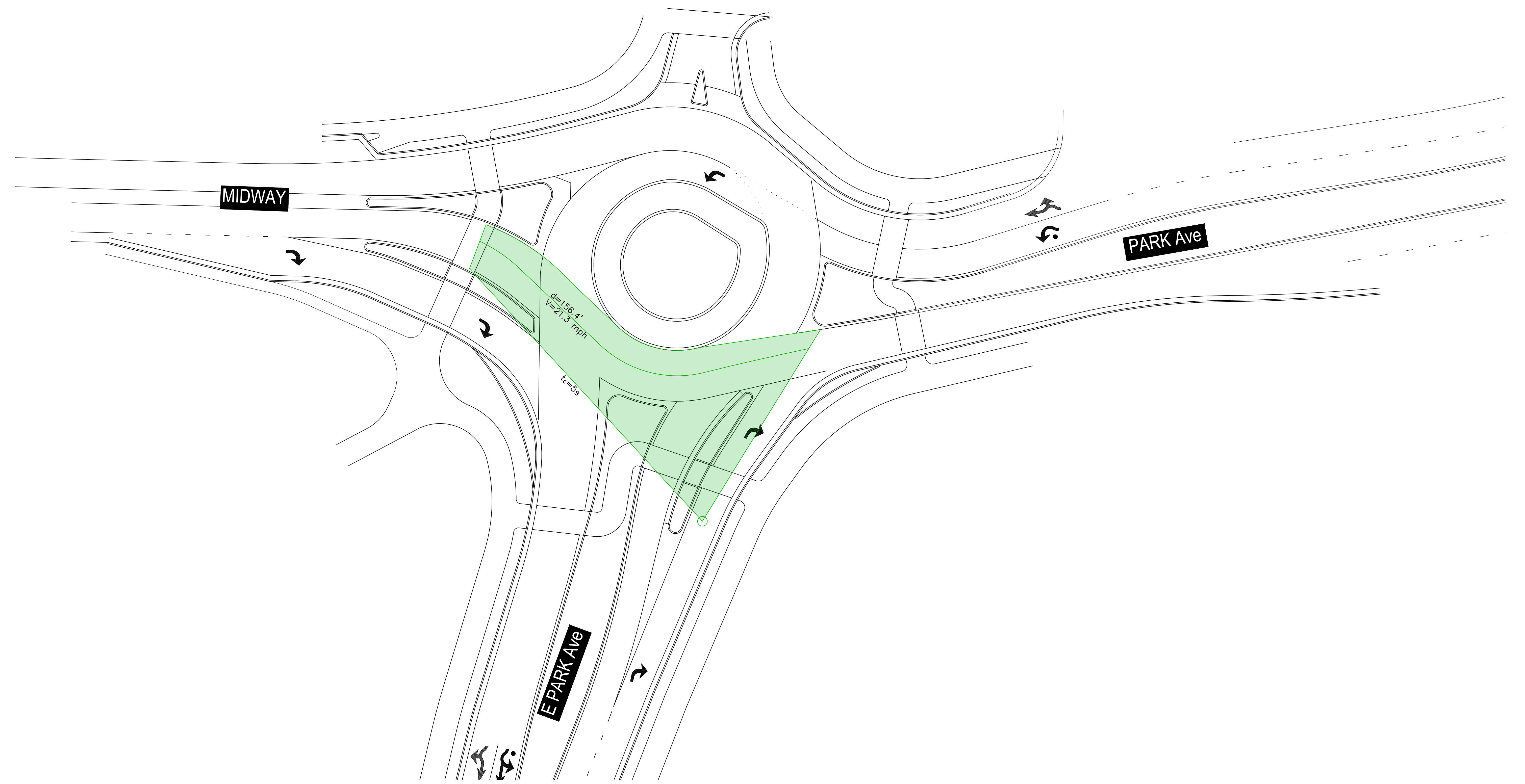
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FIGURE 33

LEGEND:
INTERSECTION SIGHT TRIANGLE

INTERSECTION SIGHT DISTANCE - WB LANE 2



PRELIMINARY
SUBJECT TO CHANGE

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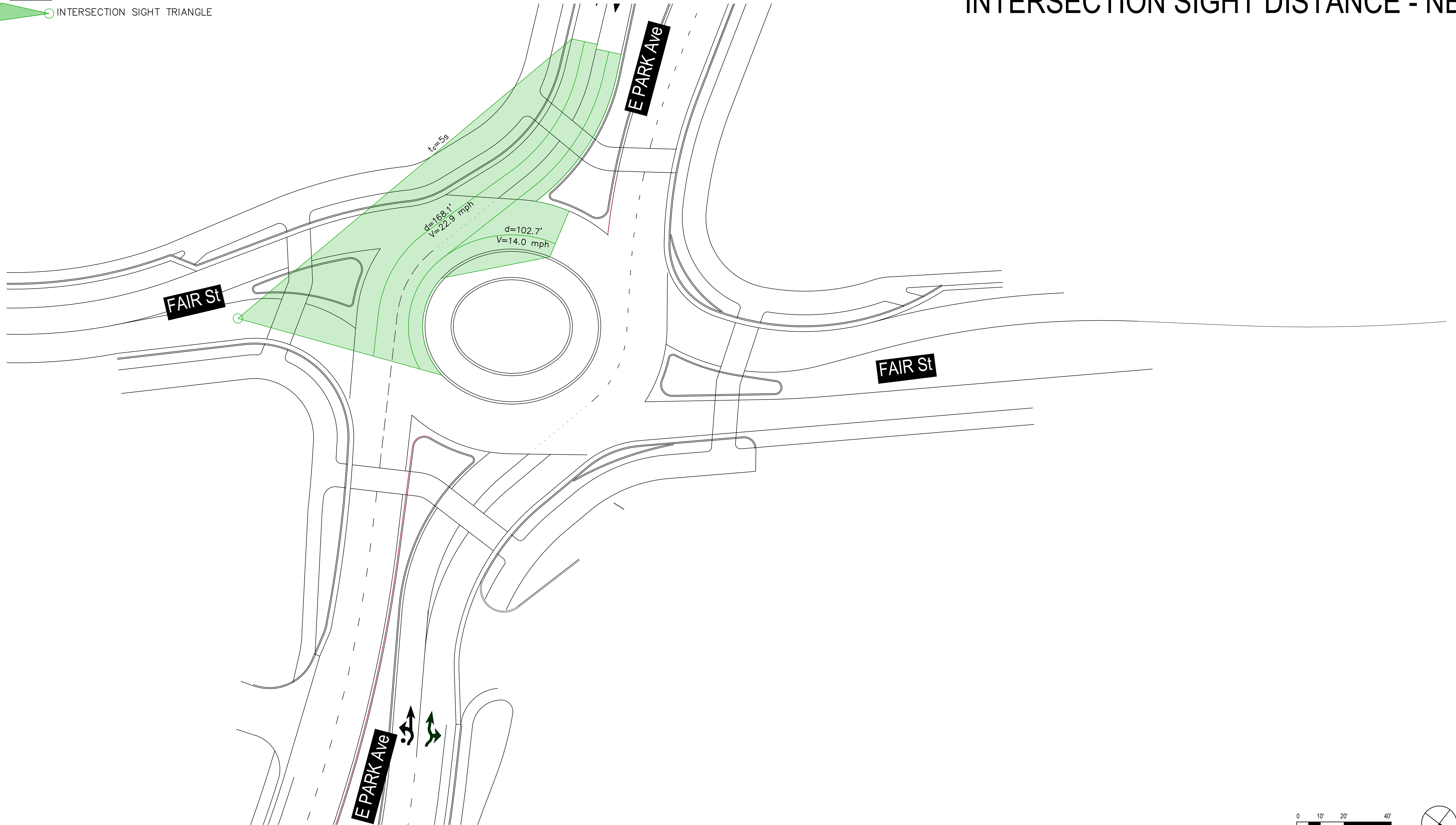
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FIGURE 34

LEGEND:

INTERSECTION SIGHT TRIANGLE

INTERSECTION SIGHT DISTANCE - NB



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & FAIR St ROUNDABOUT ALTERNATIVE



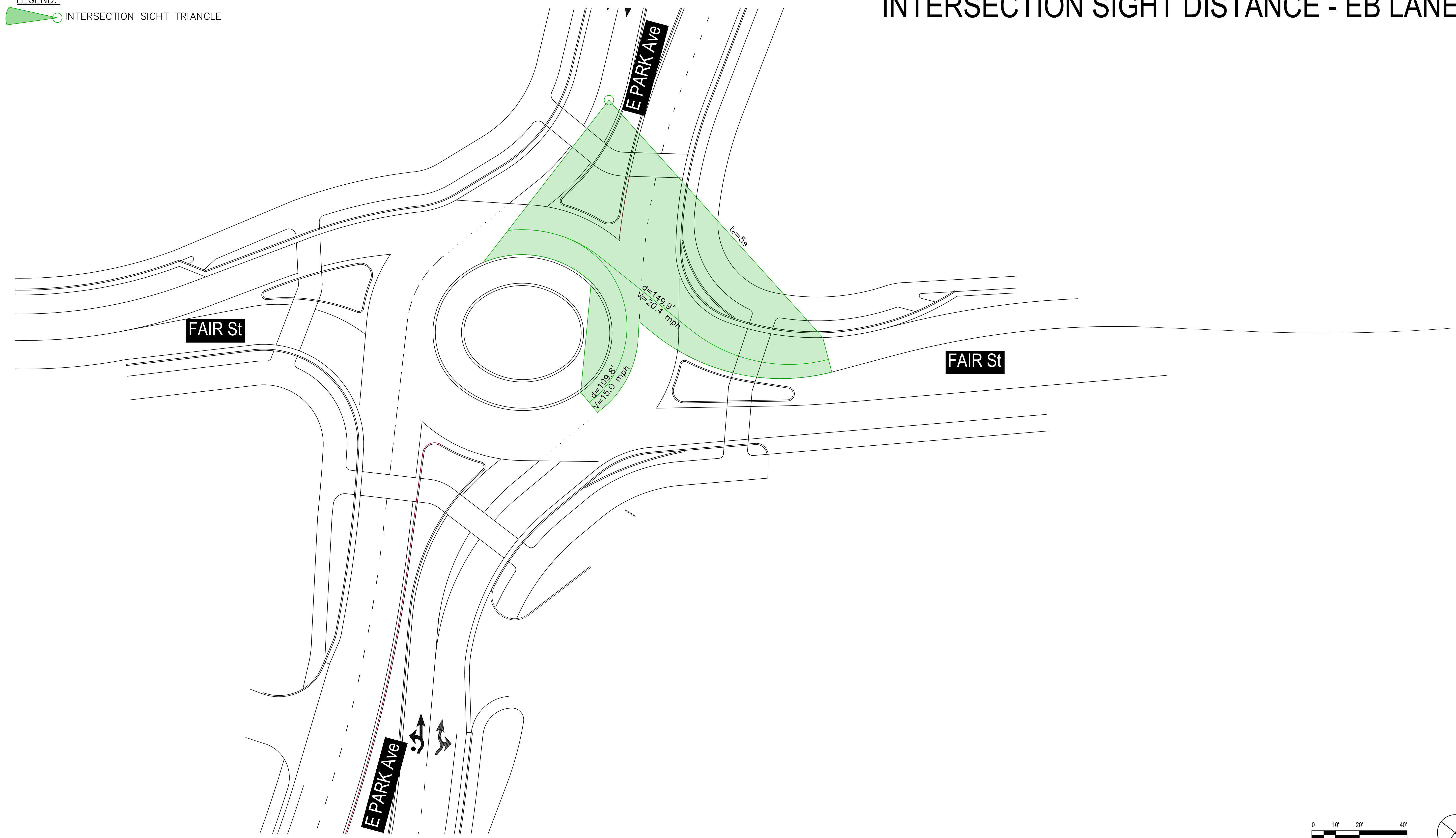
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FIGURE 35

LEGEND:
INTERSECTION SIGHT TRIANGLE

INTERSECTION SIGHT DISTANCE - EB LANE 1



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & FAIR St ROUNDABOUT ALTERNATIVE



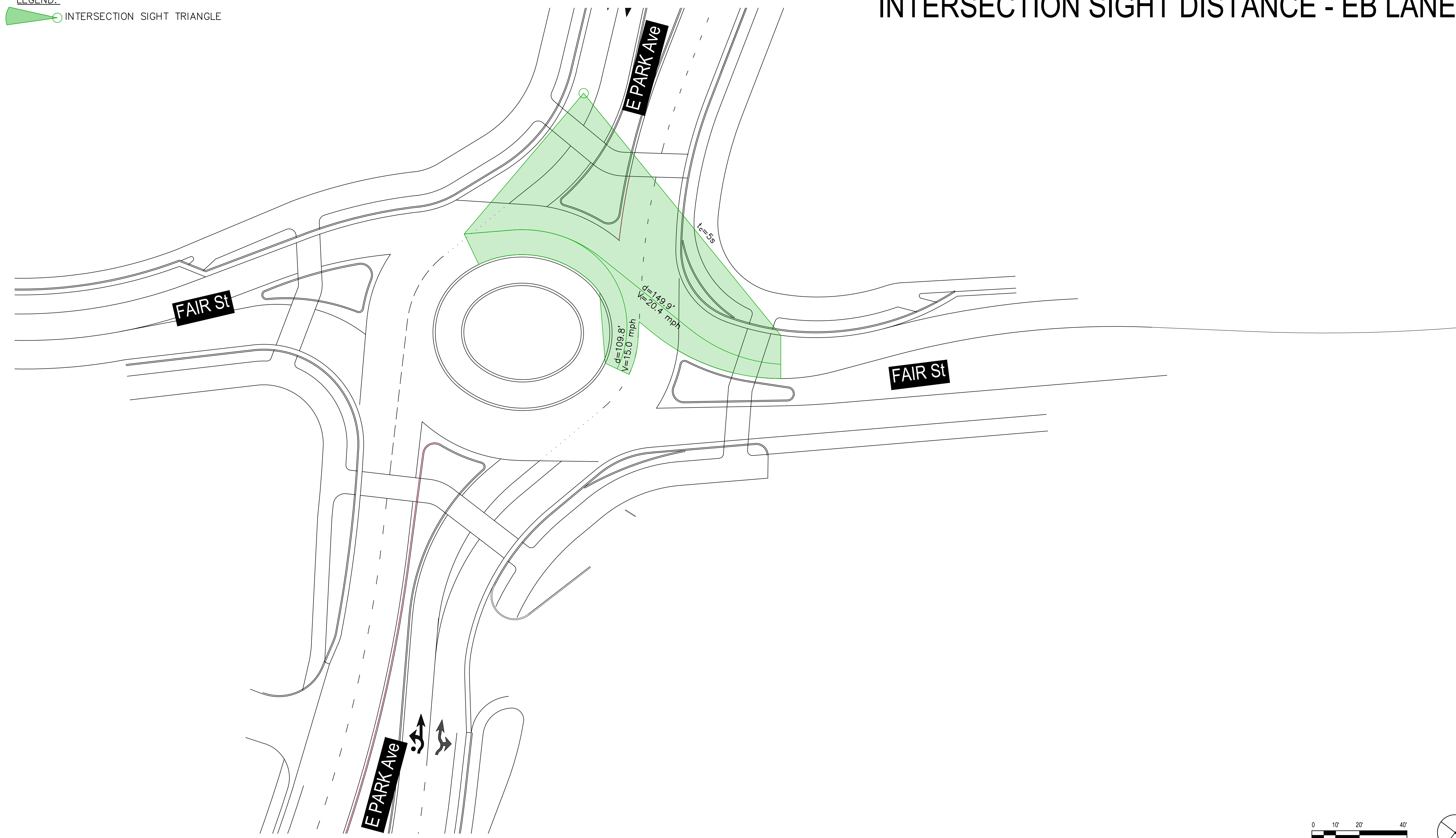
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FIGURE 36

LEGEND:
INTERSECTION SIGHT TRIANGLE

INTERSECTION SIGHT DISTANCE - EB LANE 2



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & FAIR St ROUNDABOUT ALTERNATIVE



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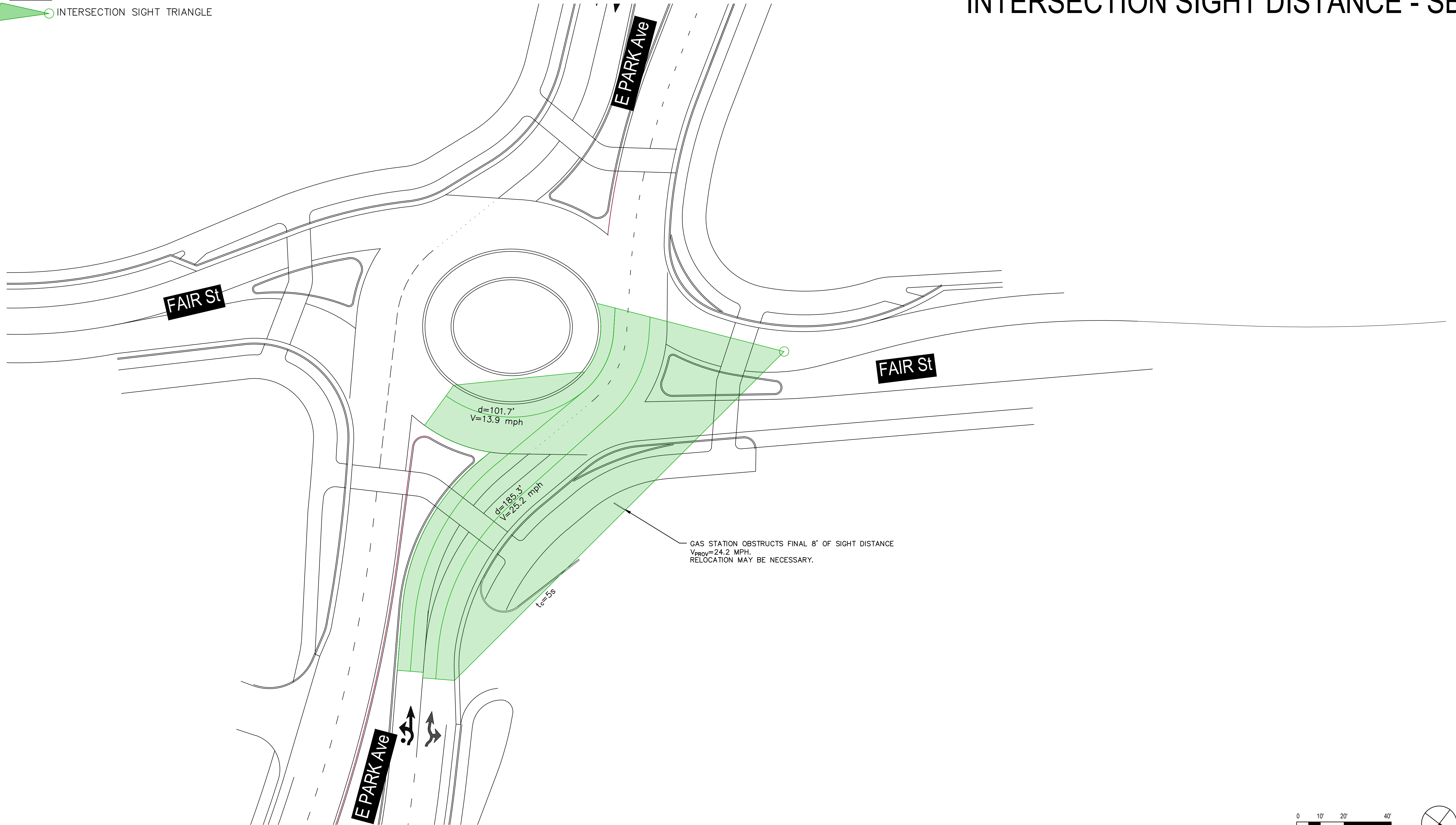
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Date 2/28/22

FIGURE 37

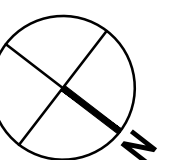
LEGEND:

INTERSECTION SIGHT TRIANGLE

INTERSECTION SIGHT DISTANCE - SB



0 10' 20' 40'



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & FAIR St ROUNDABOUT ALTERNATIVE



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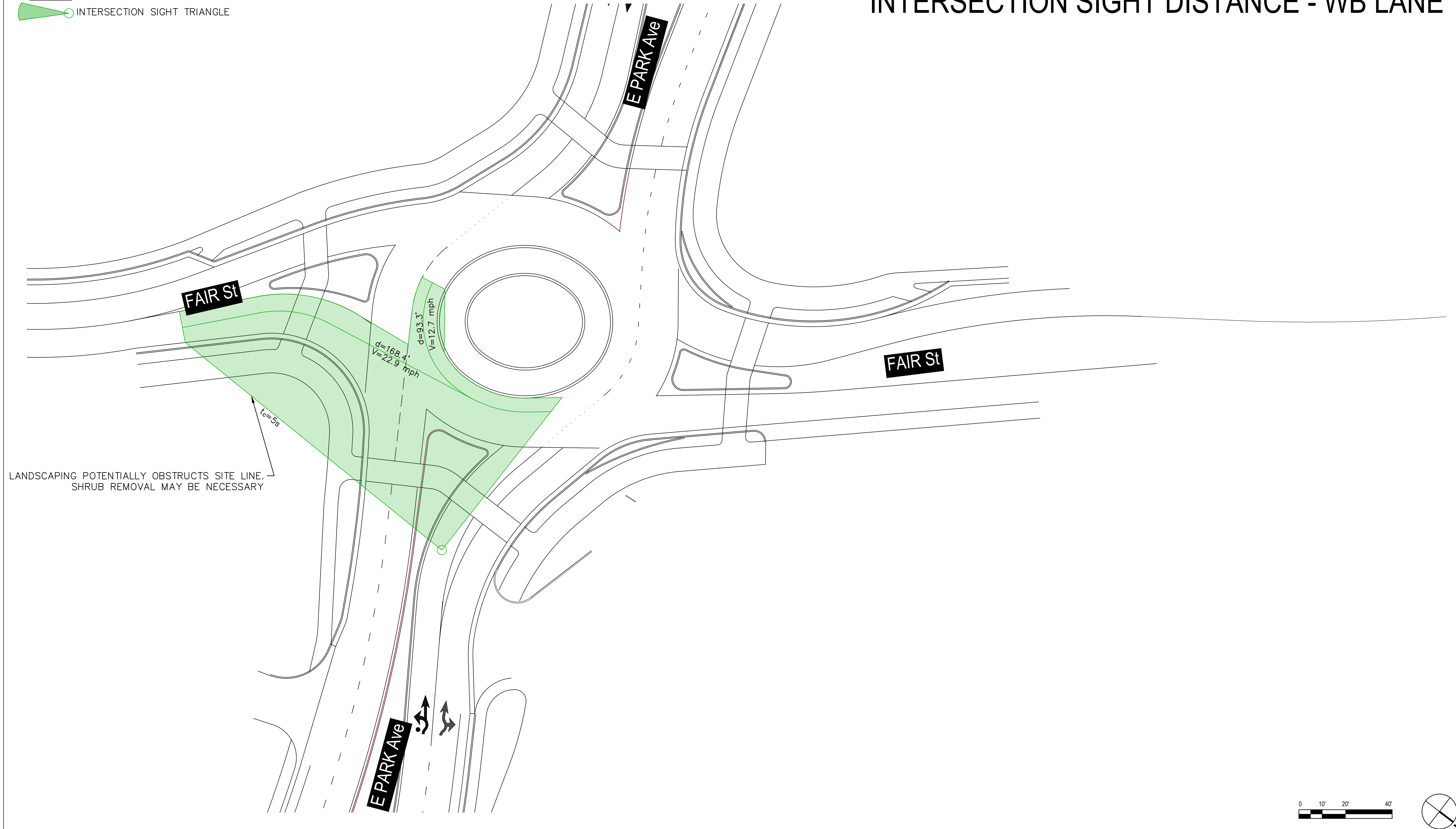
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FIGURE 38

LEGEND:

INTERSECTION SIGHT TRIANGLE

INTERSECTION SIGHT DISTANCE - WB LANE 1



PRELIMINARY
SUBJECT TO CHANGE

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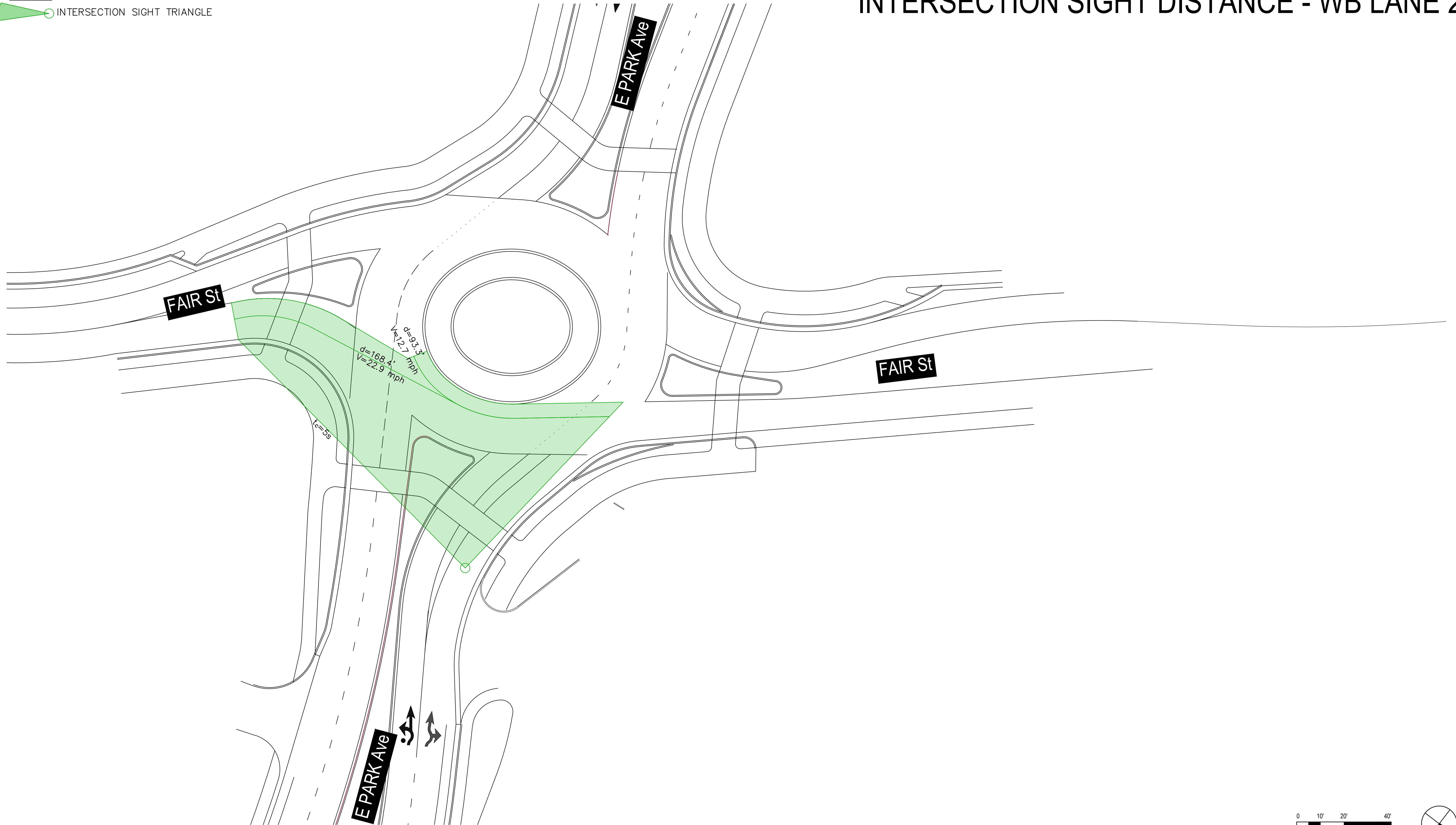
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FIGURE 39

LEGEND:

INTERSECTION SIGHT TRIANGLE

INTERSECTION SIGHT DISTANCE - WB LANE 2



PRELIMINARY
SUBJECT TO CHANGE

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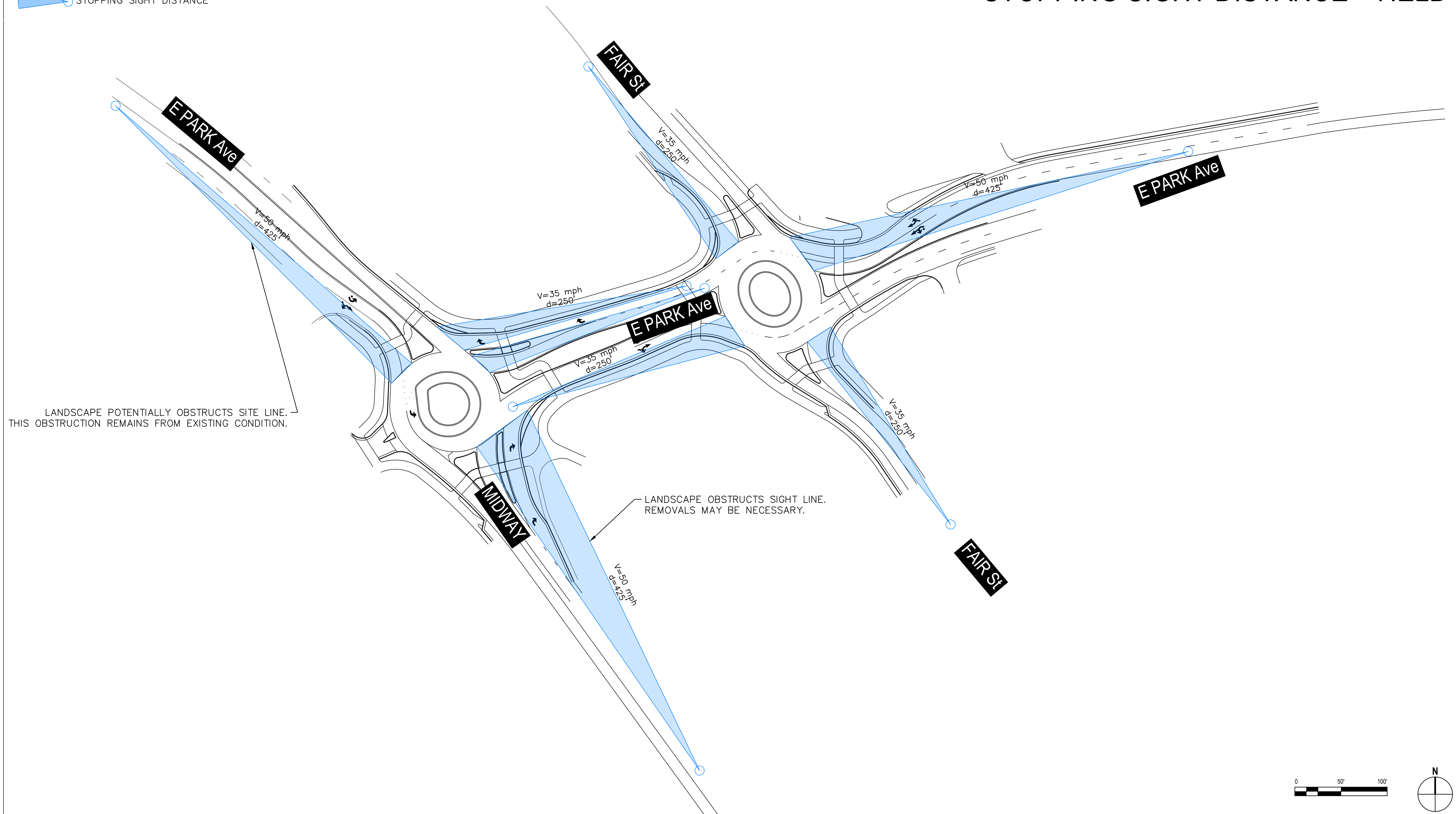
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FIGURE 40

LEGEND:

STOPPING SIGHT DISTANCE

STOPPING SIGHT DISTANCE - YIELD



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave, MIDWAY & FAIR St ROUNDABOUTS ALTERNATIVE



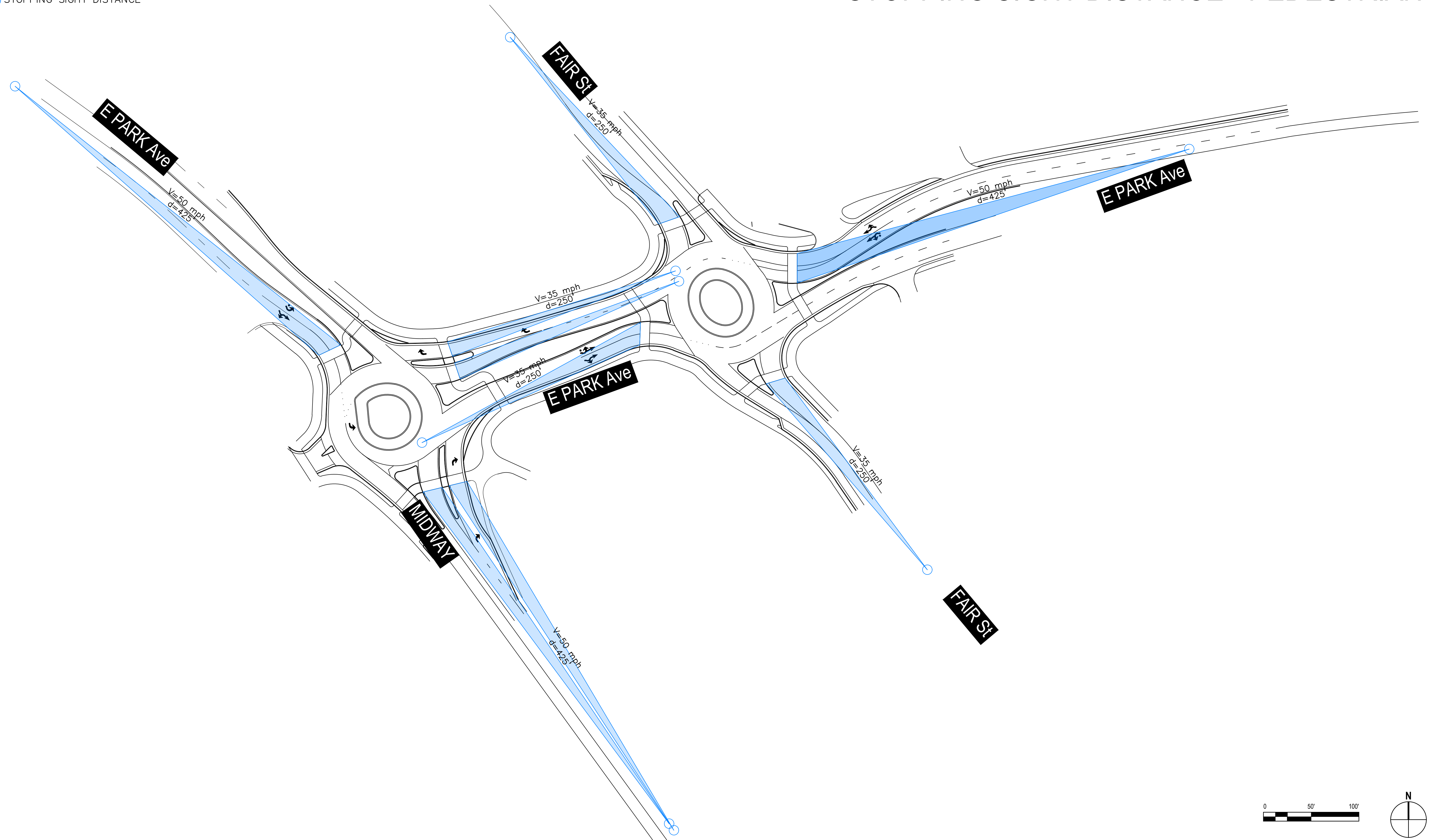
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FIGURE 41

LEGEND:
STOPPING SIGHT DISTANCE

STOPPING SIGHT DISTANCE - PEDESTRIAN



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & MIDWAY ROUNDABOUT ALTERNATIVE



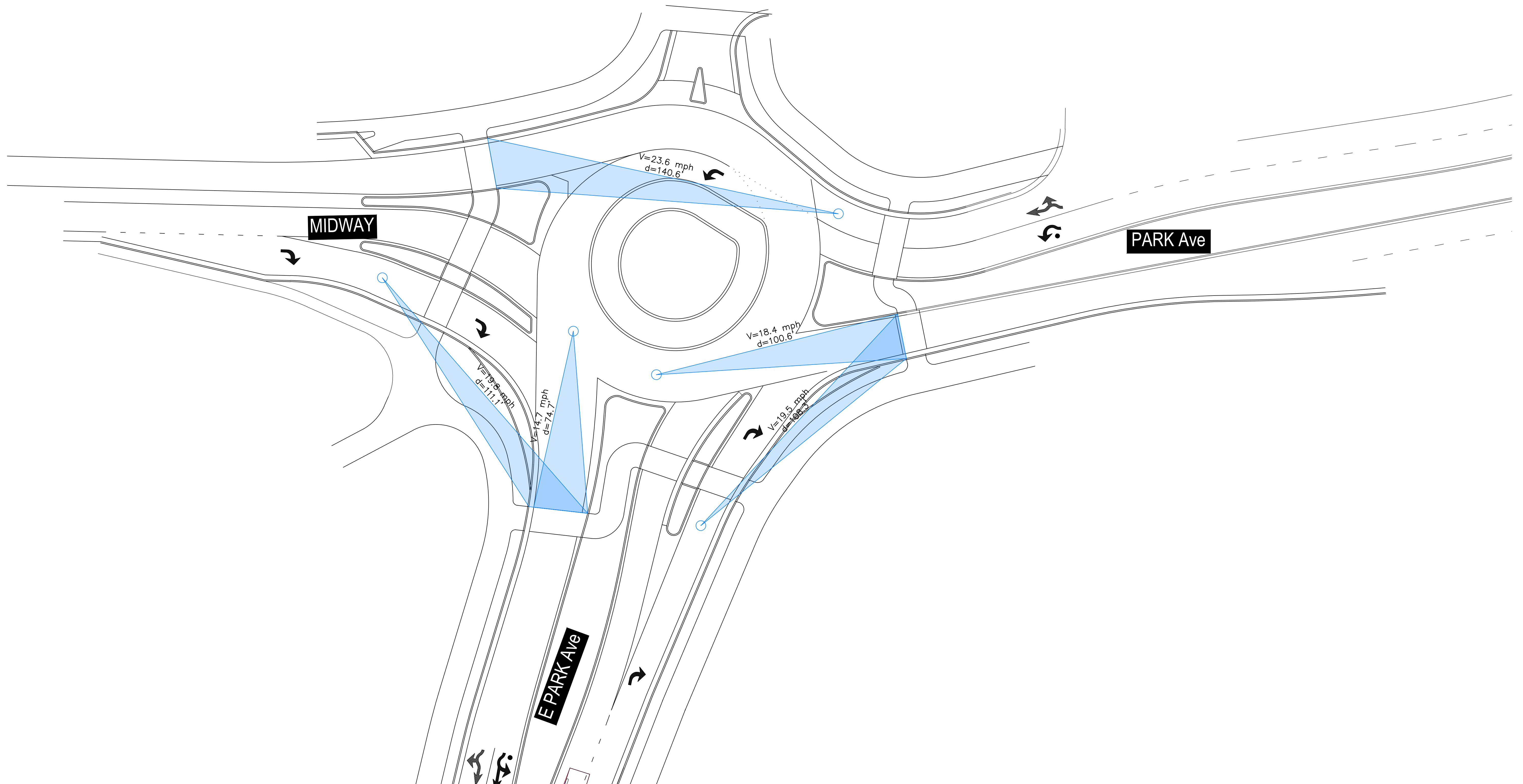
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Date 2/28/22

FIGURE 42

LEGEND:
STOPPING SIGHT DISTANCE

STOPPING SIGHT DISTANCE - CIRCULATING/RIGHT TURNS



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & MIDWAY ROUNDABOUT ALTERNATIVE



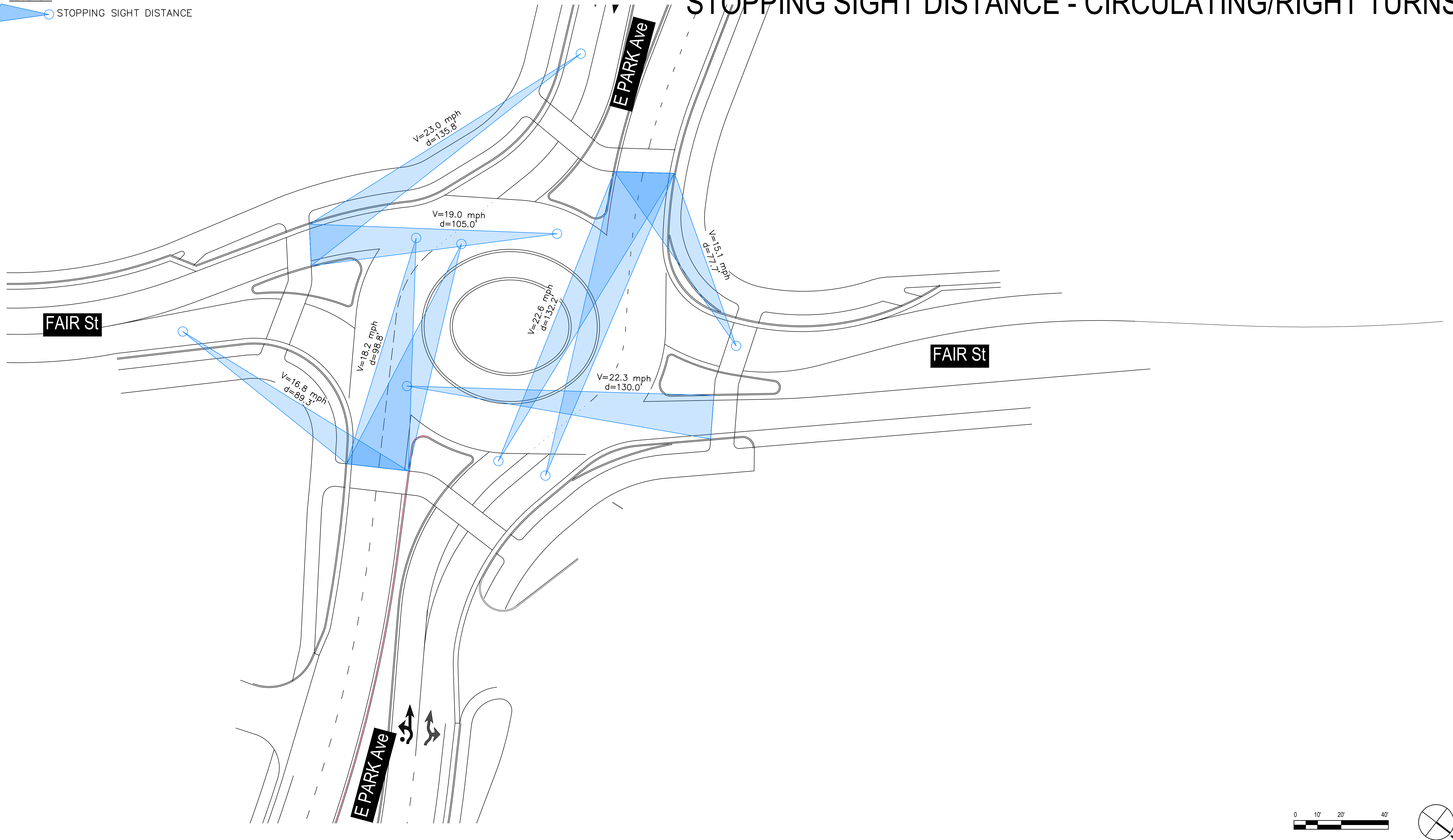
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Date 2/28/22

FIGURE 43

LEGEND:
STOPPING SIGHT DISTANCE

STOPPING SIGHT DISTANCE - CIRCULATING/RIGHT TURNS



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & FAIR St ROUNDABOUT ALTERNATIVE

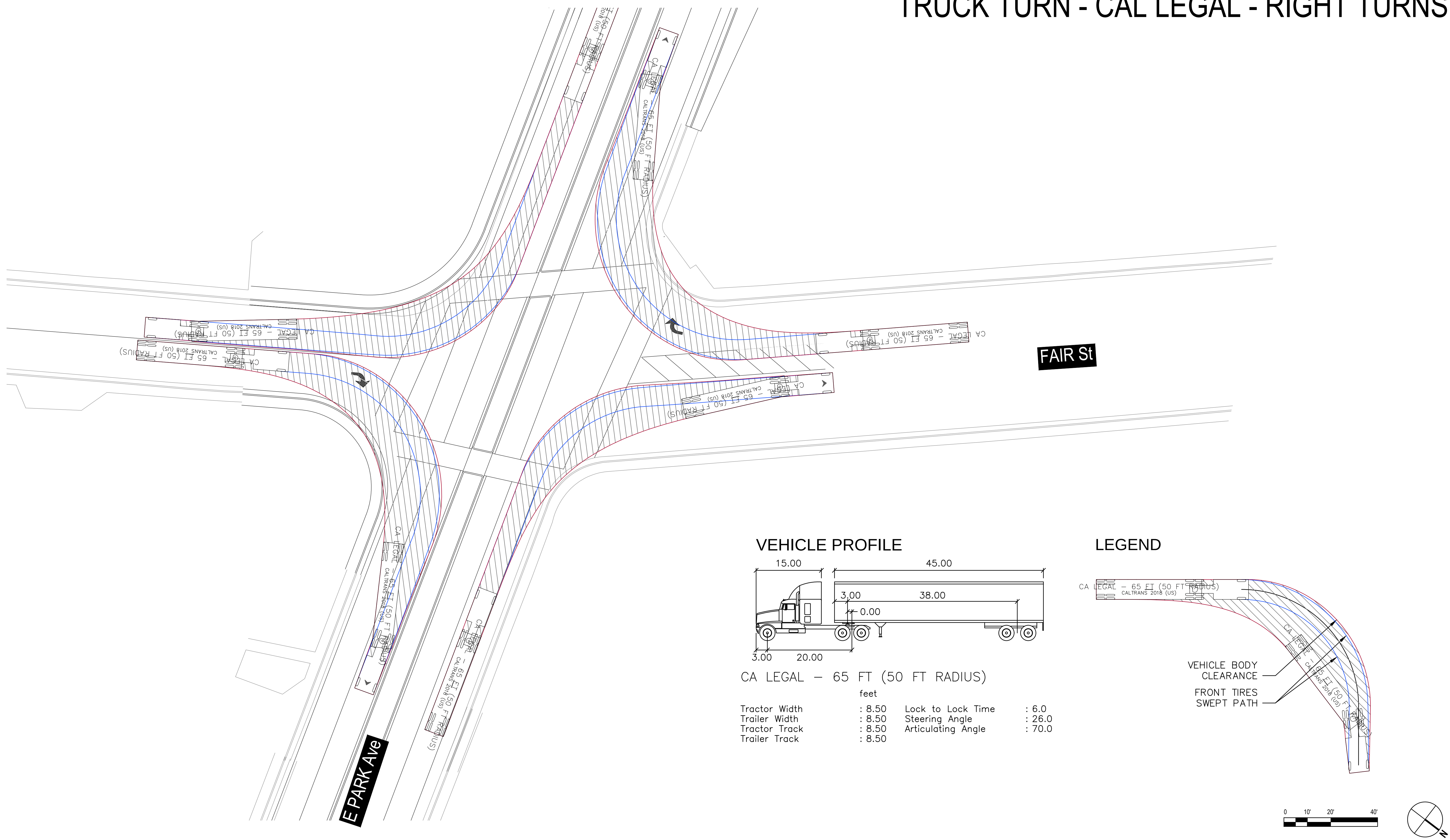


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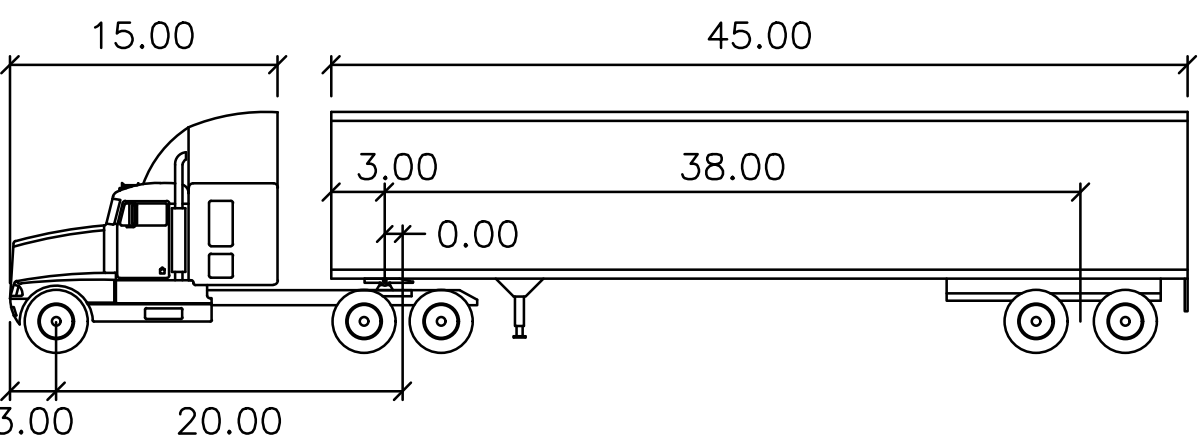
Project No. 11217309
Date 2/28/22

FIGURE 44

TRUCK TURN - CAL LEGAL - RIGHT TURNS



VEHICLE PROFILE

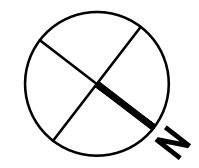
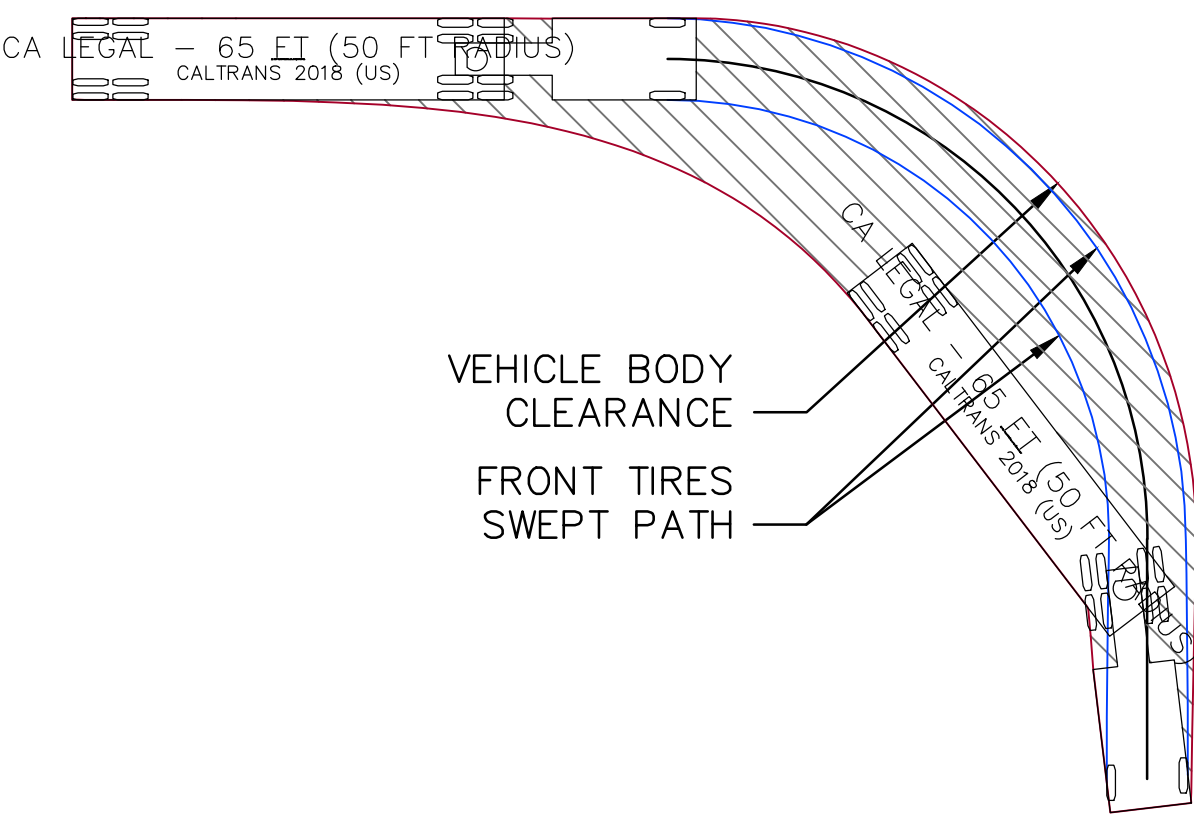


CA LEGAL - 65 FT (50 FT RADIUS)

feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.0
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

LEGEND



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & FAIR St RIGHT IN RIGHT OUT ALTERNATIVE

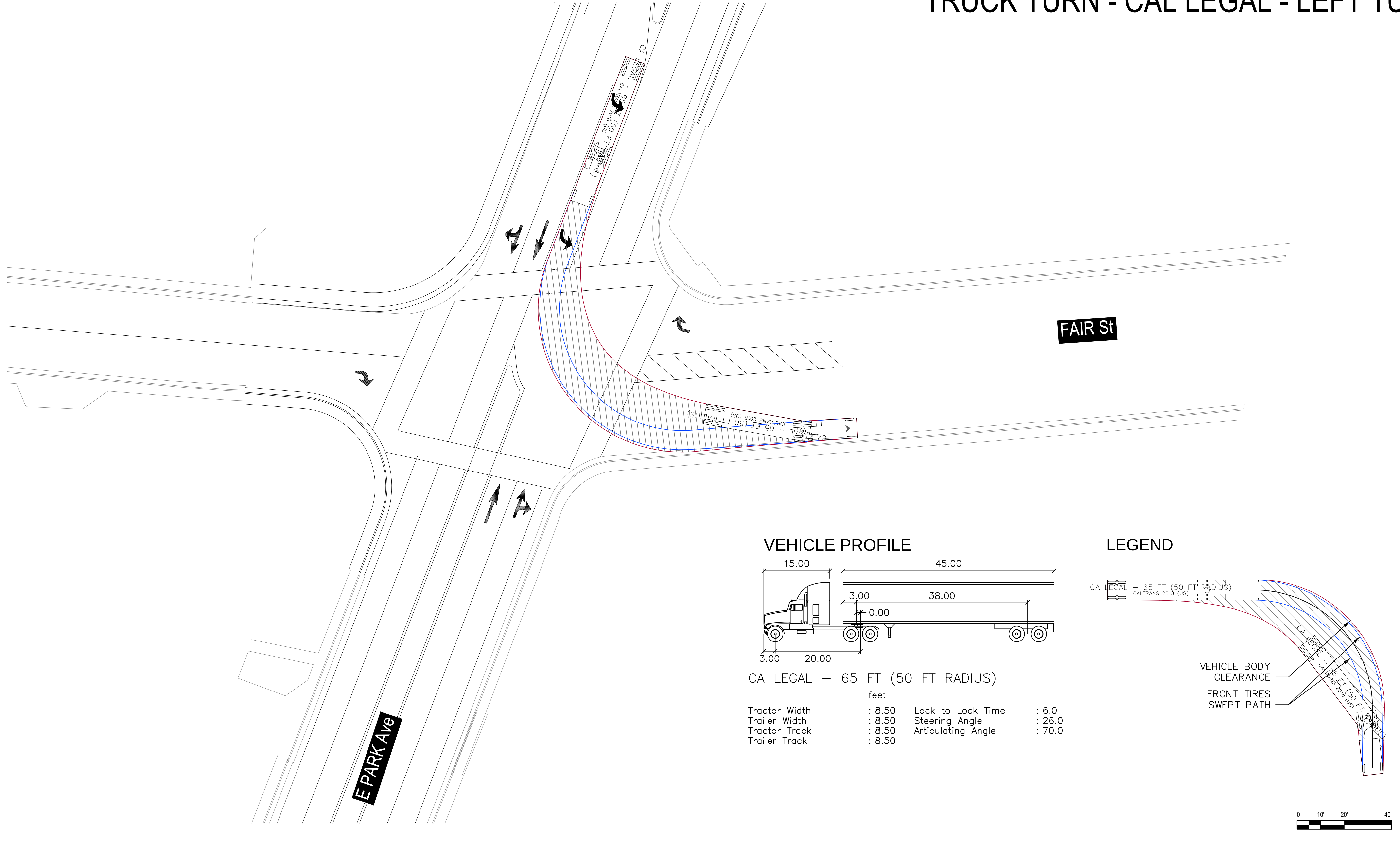


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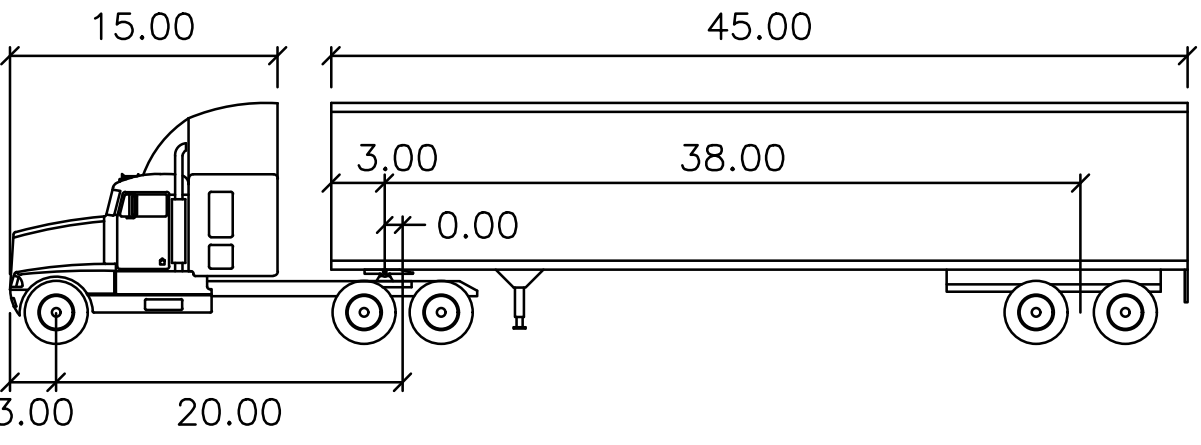
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FIGURE 1

TRUCK TURN - CAL LEGAL - LEFT TURNS



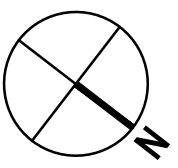
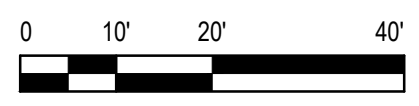
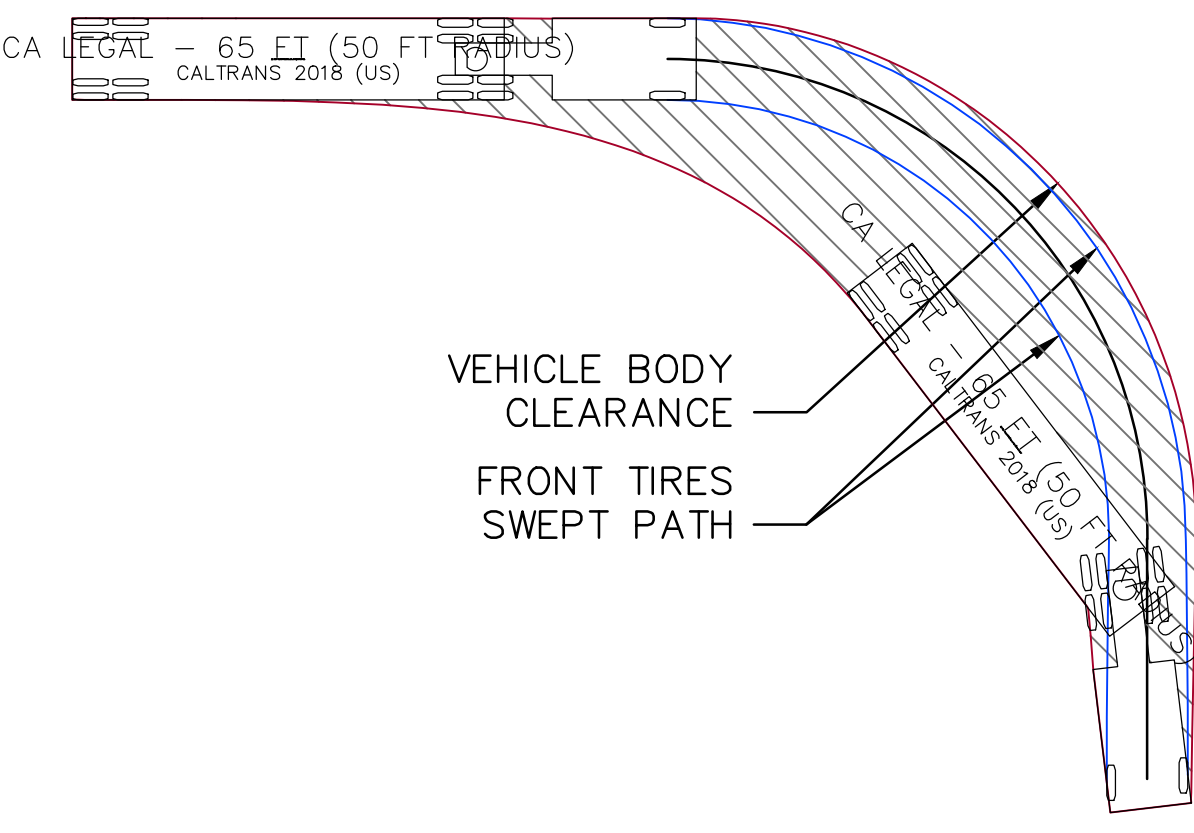
VEHICLE PROFILE



CA LEGAL - 65 FT (50 FT RADIUS)

	feet		
Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.0
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

LEGEND



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
E PARK Ave & FAIR St PARTIAL RIGHT IN RIGHT OUT ALTERNATIVE



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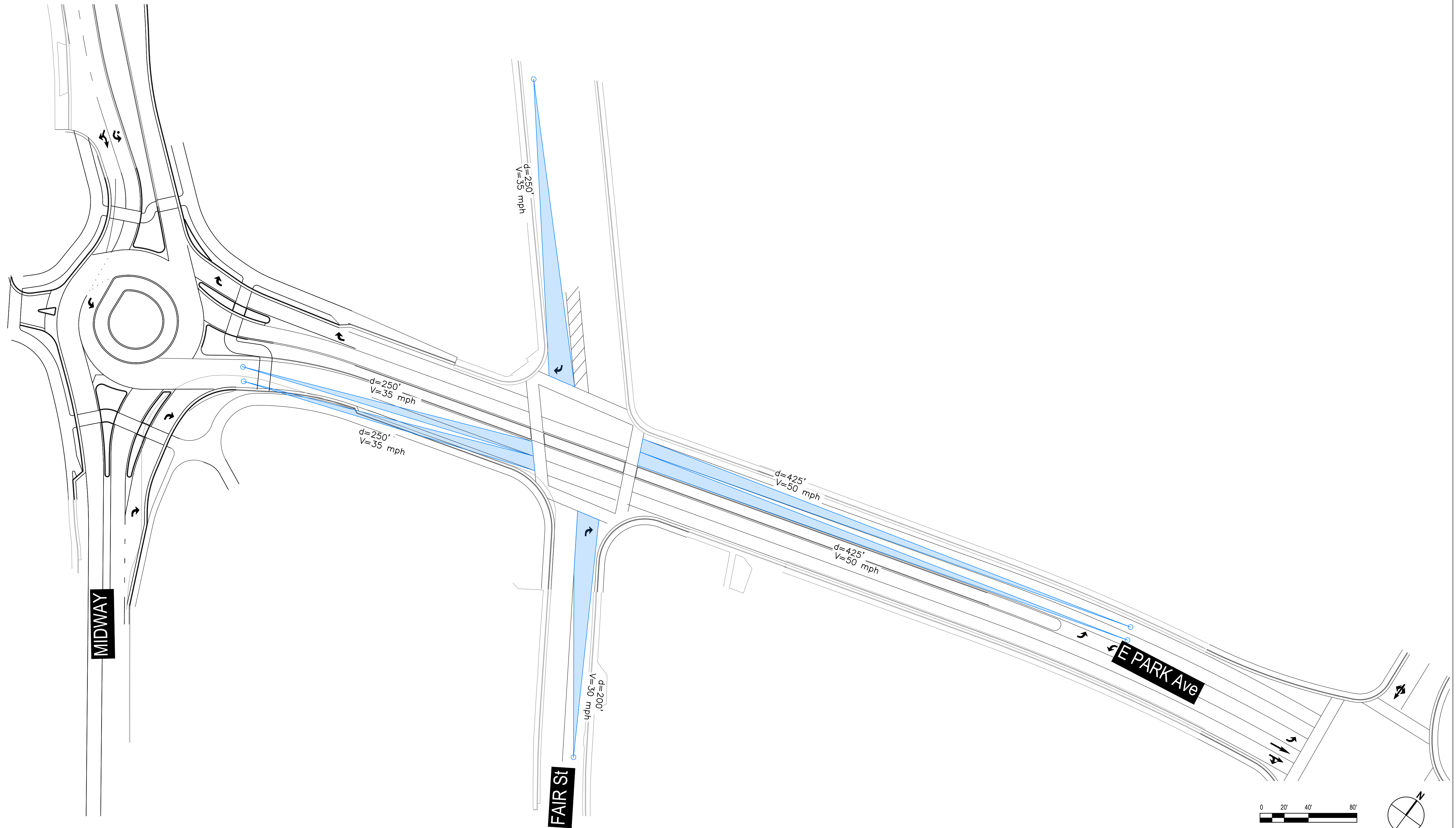
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FIGURE 2

LEGEND:

INTERSECTION SIGHT TRIANGLE

INTERSECTION SIGHT DISTANCE - EB/WB



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & FAIR St RIGHT IN RIGHT OUT ALTERNATIVE



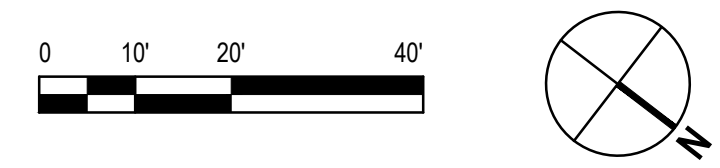
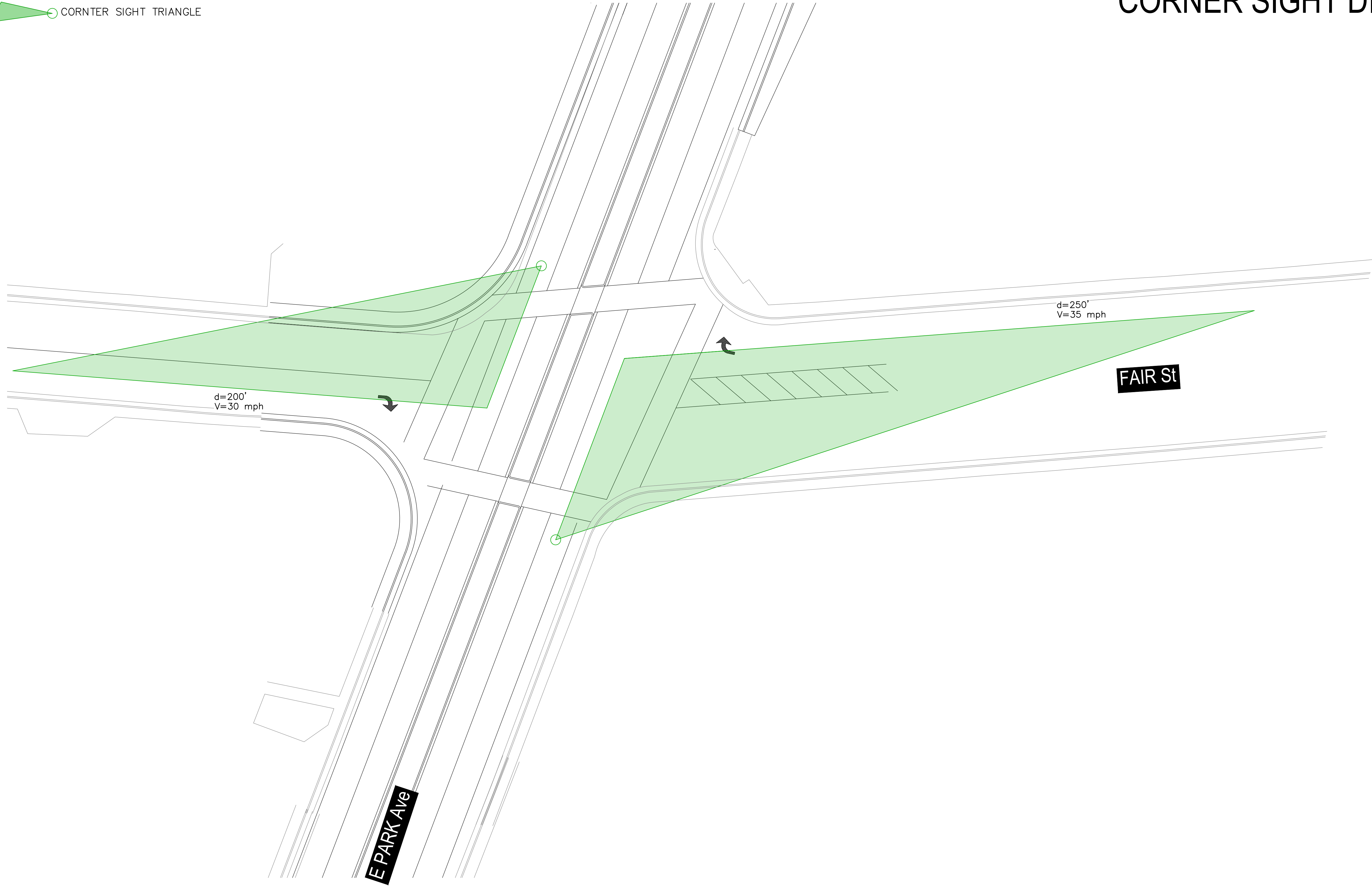
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FIGURE 3

LEGEND:
CORNER SIGHT TRIANGLE

CORNER SIGHT DISTANCE - NB



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & FAIR St RIGHT IN RIGHT OUT ALTERNATIVE



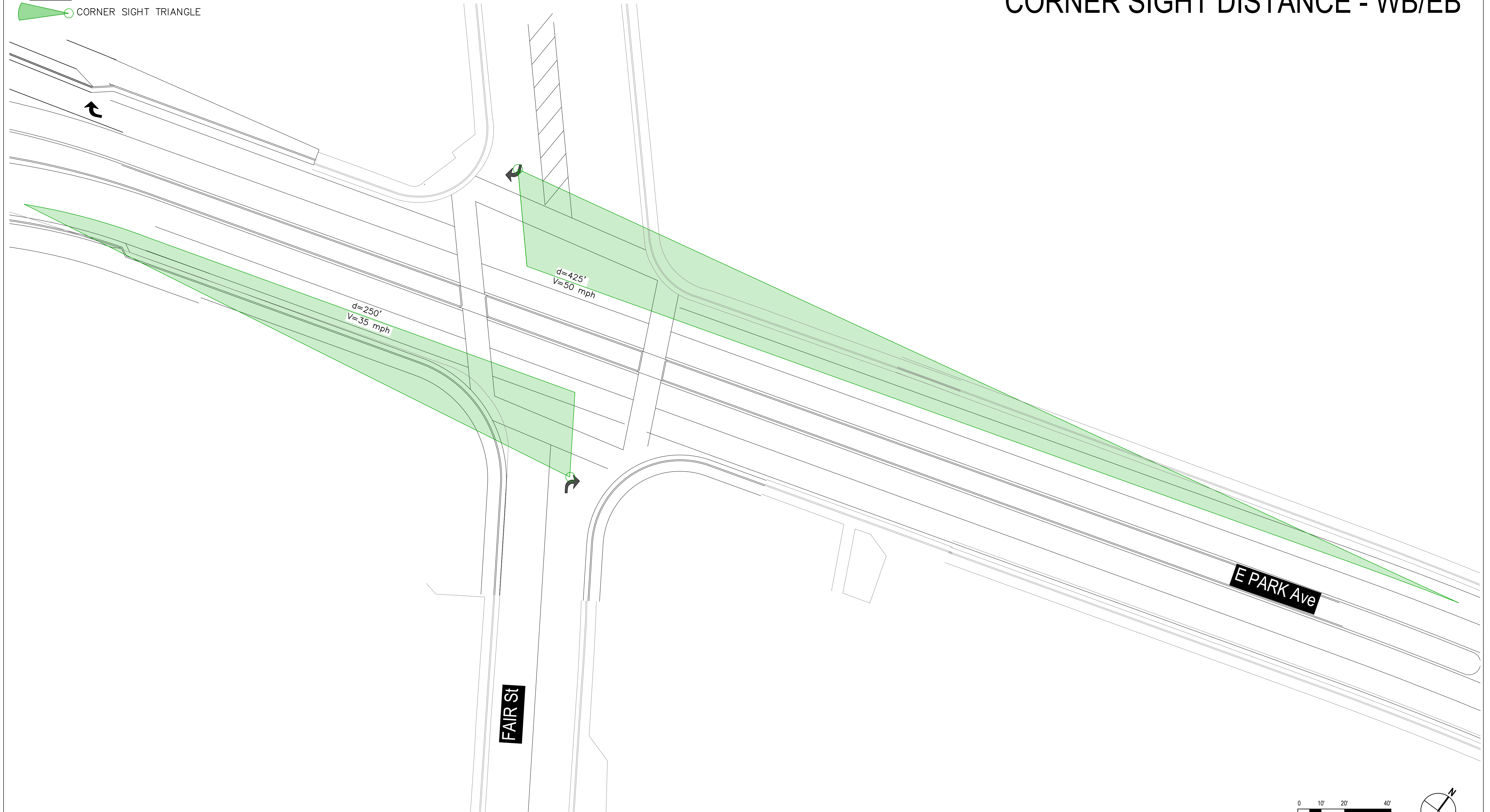
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FIGURE 4

LEGEND:
CORNER SIGHT TRIANGLE

CORNER SIGHT DISTANCE - WB/EB



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & FAIR St RIGHT IN RIGHT OUT ALTERNATIVE

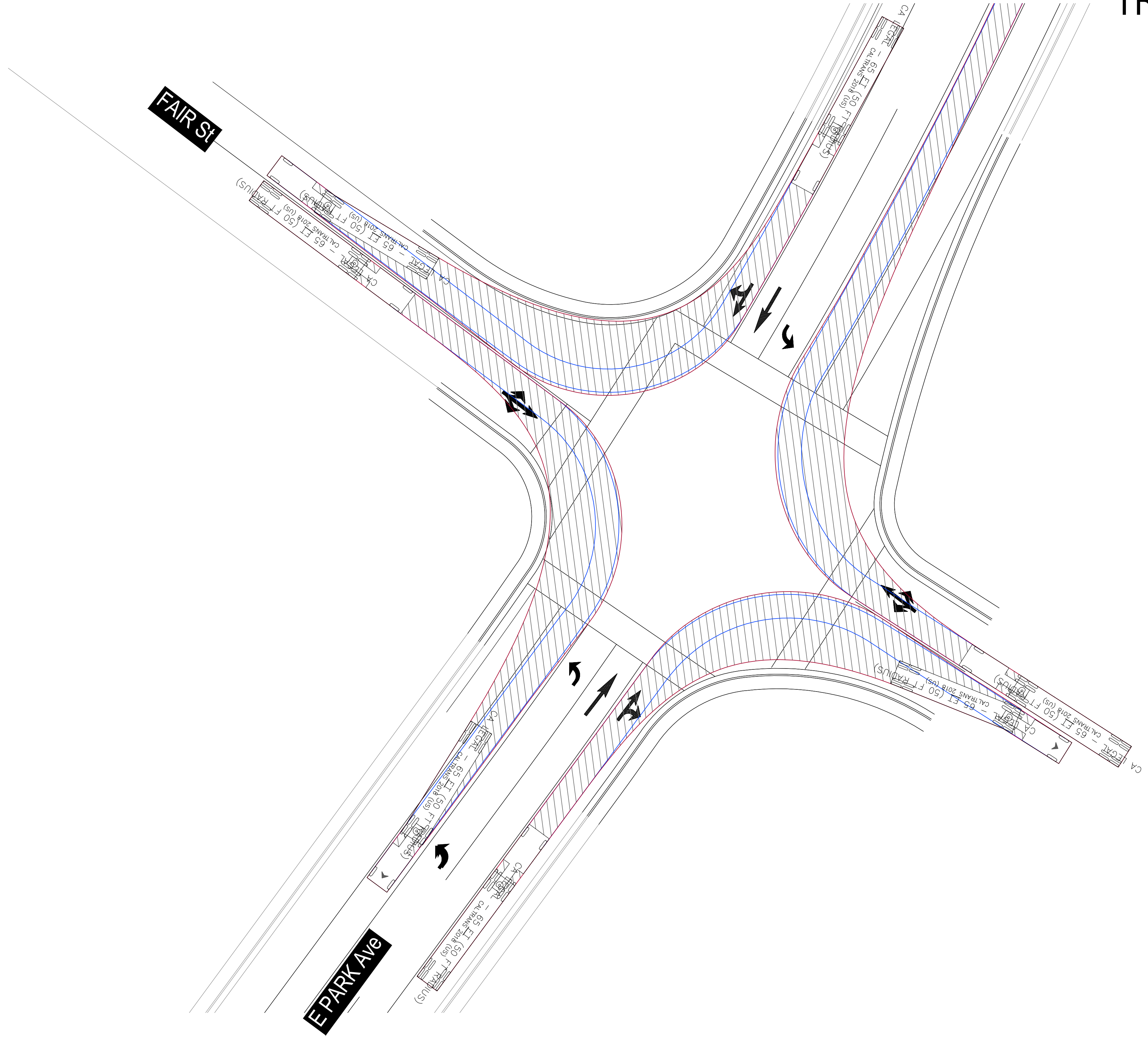


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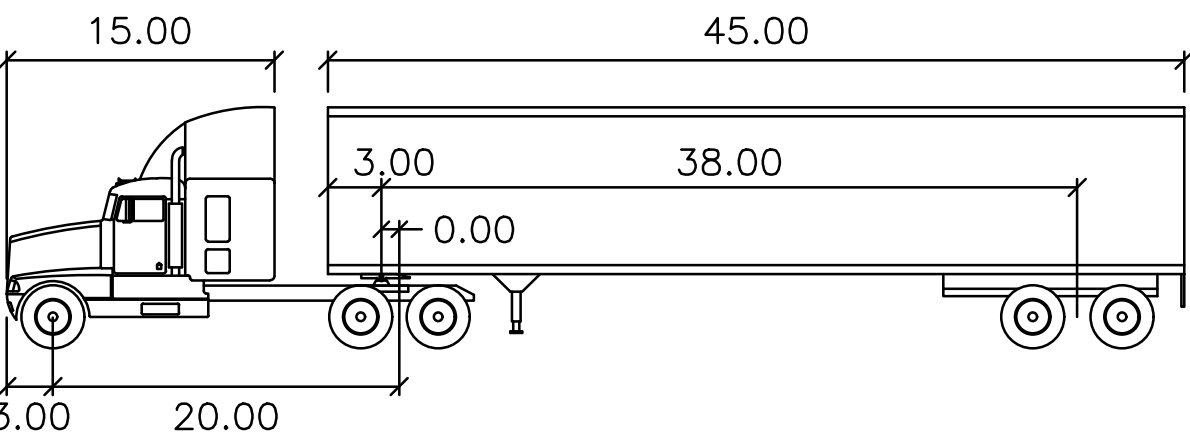
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FIGURE 5

TRUCK TURN - CAL LEGAL - RIGHT TURNS



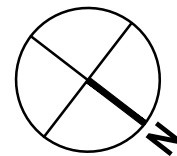
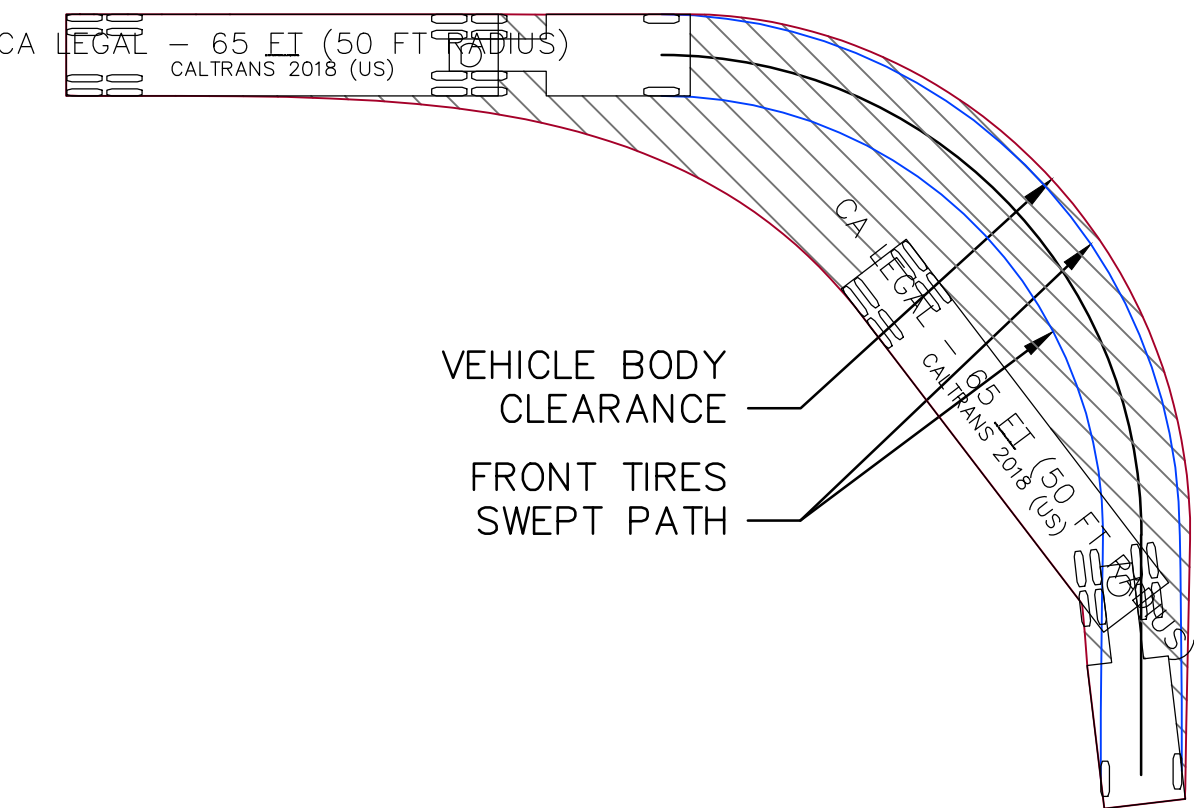
VEHICLE PROFILE



CA LEGAL - 65 FT (50 FT RADIUS)

	feet		
Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.0
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

LEGEND



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & SCOTT Ave SIGNAL ALTERNATIVE

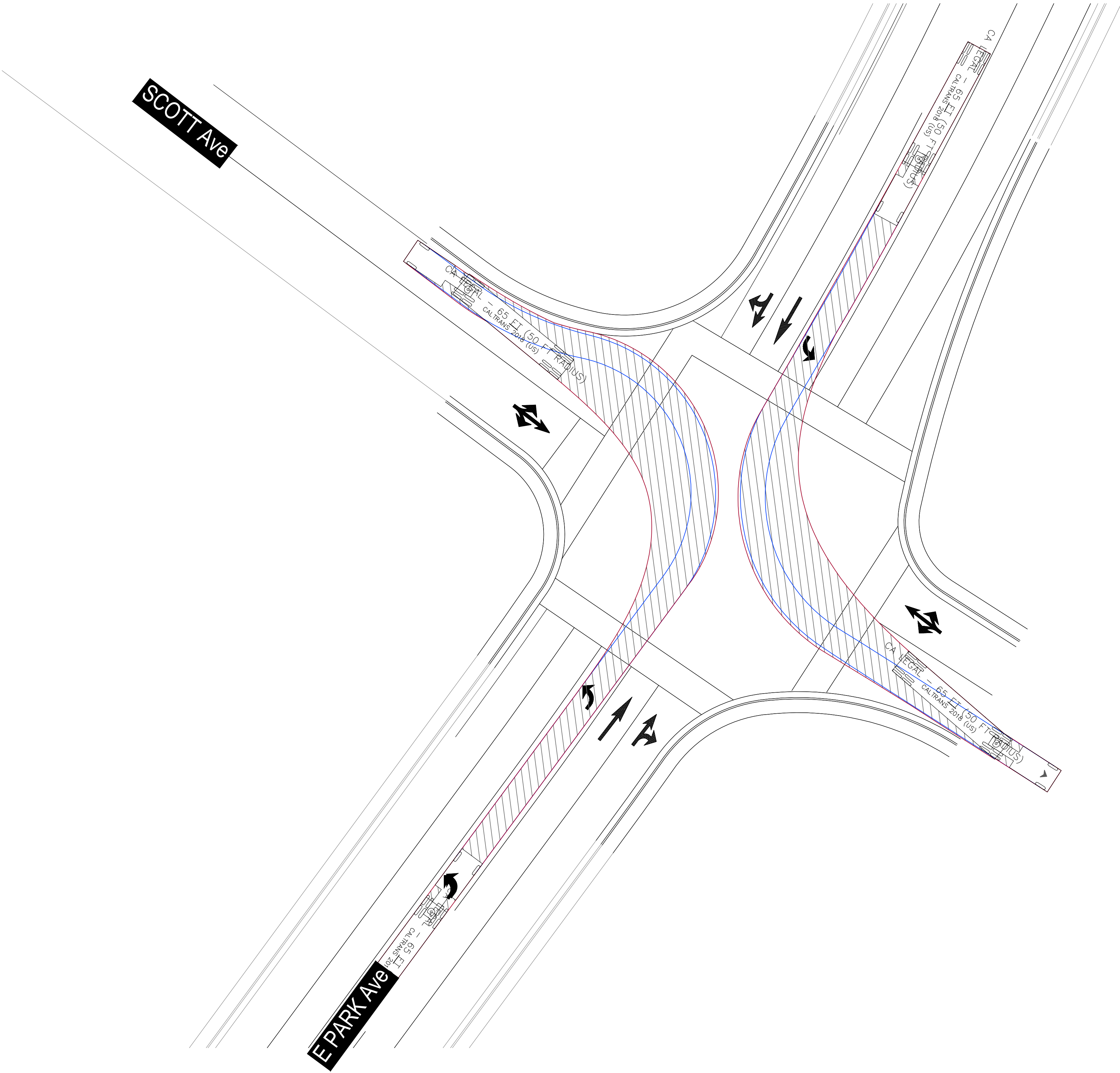


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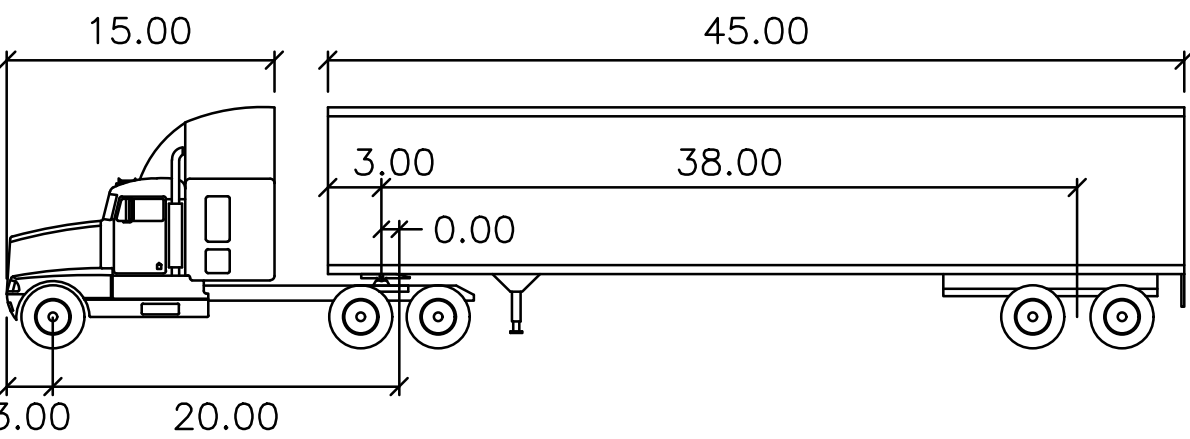
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FIGURE 6

TRUCK TURN - CAL LEGAL - LEFT TURNS



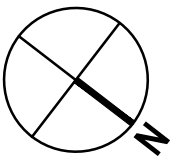
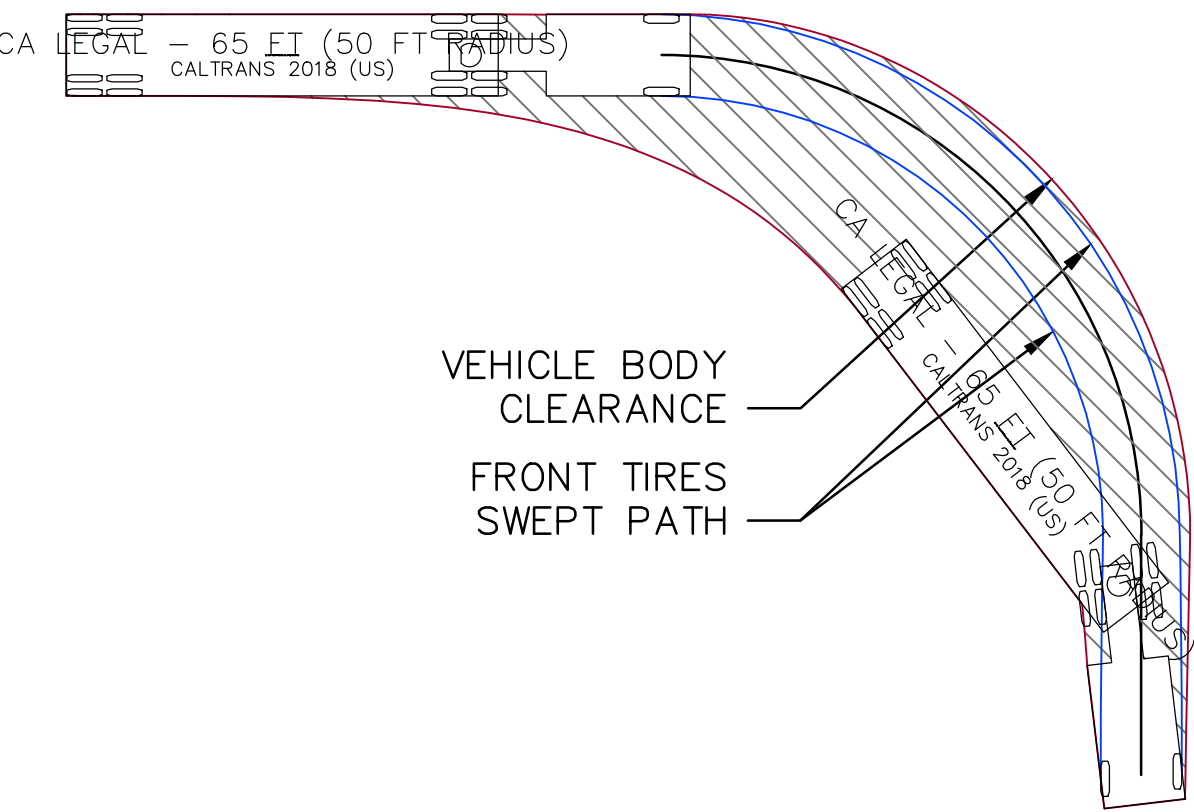
VEHICLE PROFILE



CA LEGAL - 65 FT (50 FT RADIUS)

	feet	
Tractor Width	: 8.50	Lock to Lock Time : 6.0
Trailer Width	: 8.50	Steering Angle : 26.0
Tractor Track	: 8.50	Articulating Angle : 70.0
Trailer Track	: 8.50	

LEGEND



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & SCOTT Ave RIGHT TURNS



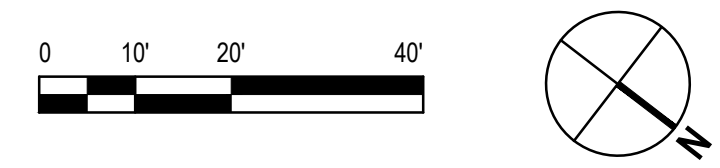
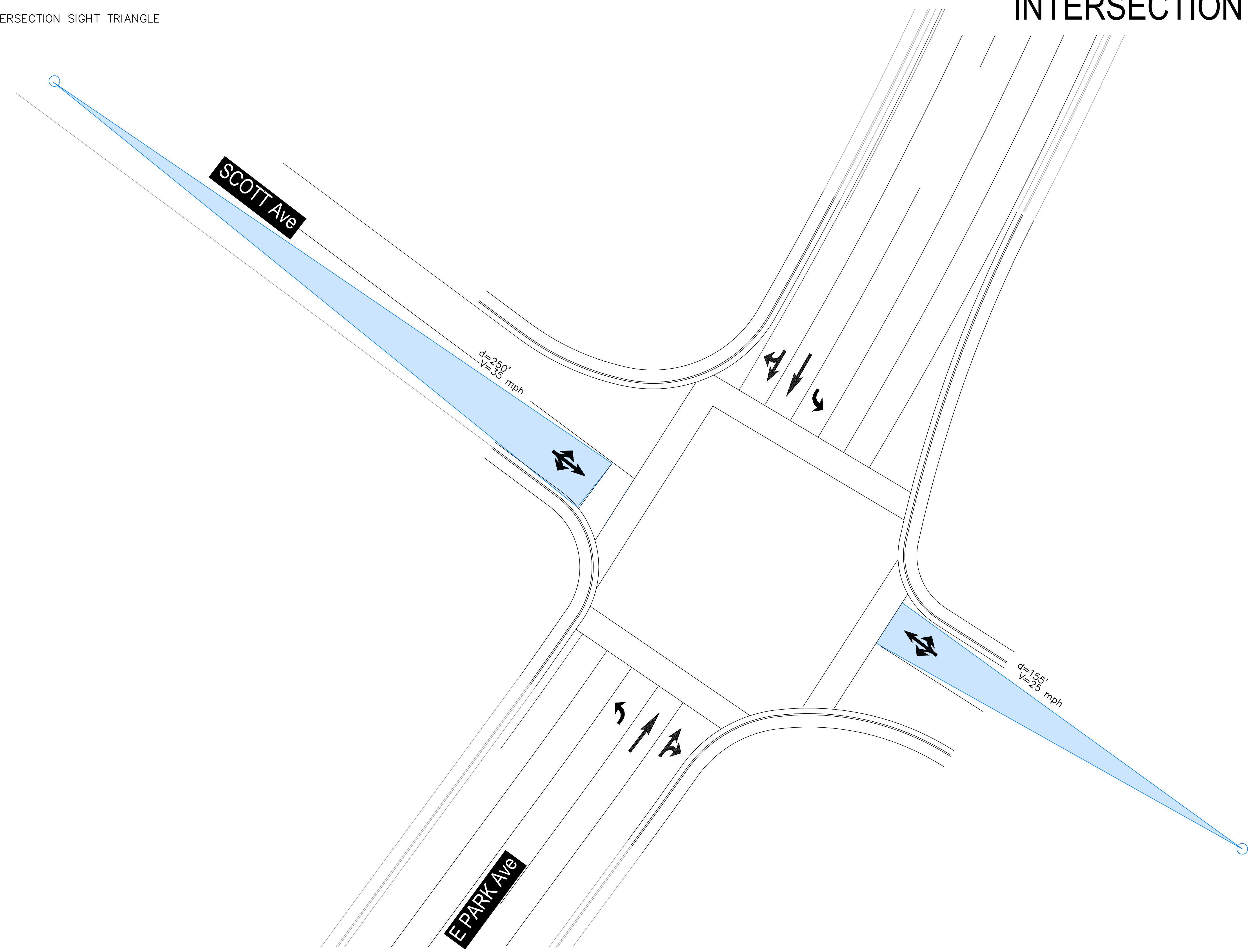
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FIGURE 7

LEGEND:
INTERSECTION SIGHT TRIANGLE

INTERSECTION SIGHT DISTANCE - WB



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & SCOTT St SIGNAL ALTERNATIVE



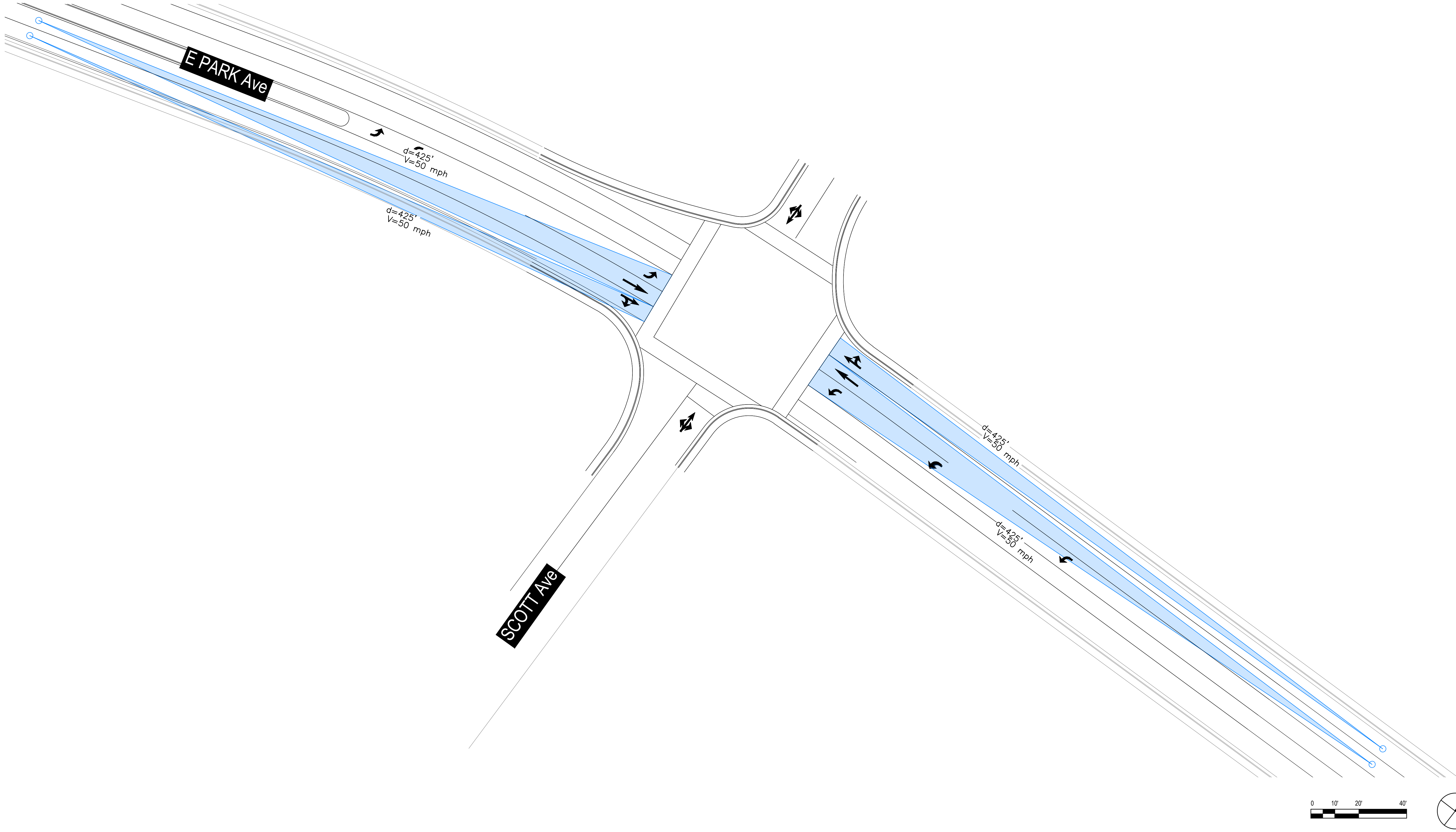
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FIGURE 8

LEGEND:
INTERSECTION SIGHT TRIANGLE

INTERSECTION SIGHT DISTANCE - EB/WB



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & FAIR St SCOTT SIGNAL ALTERNATIVE



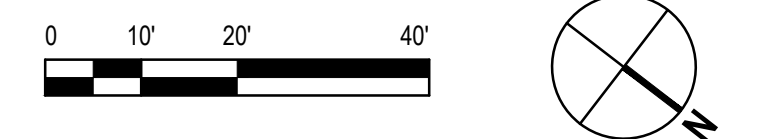
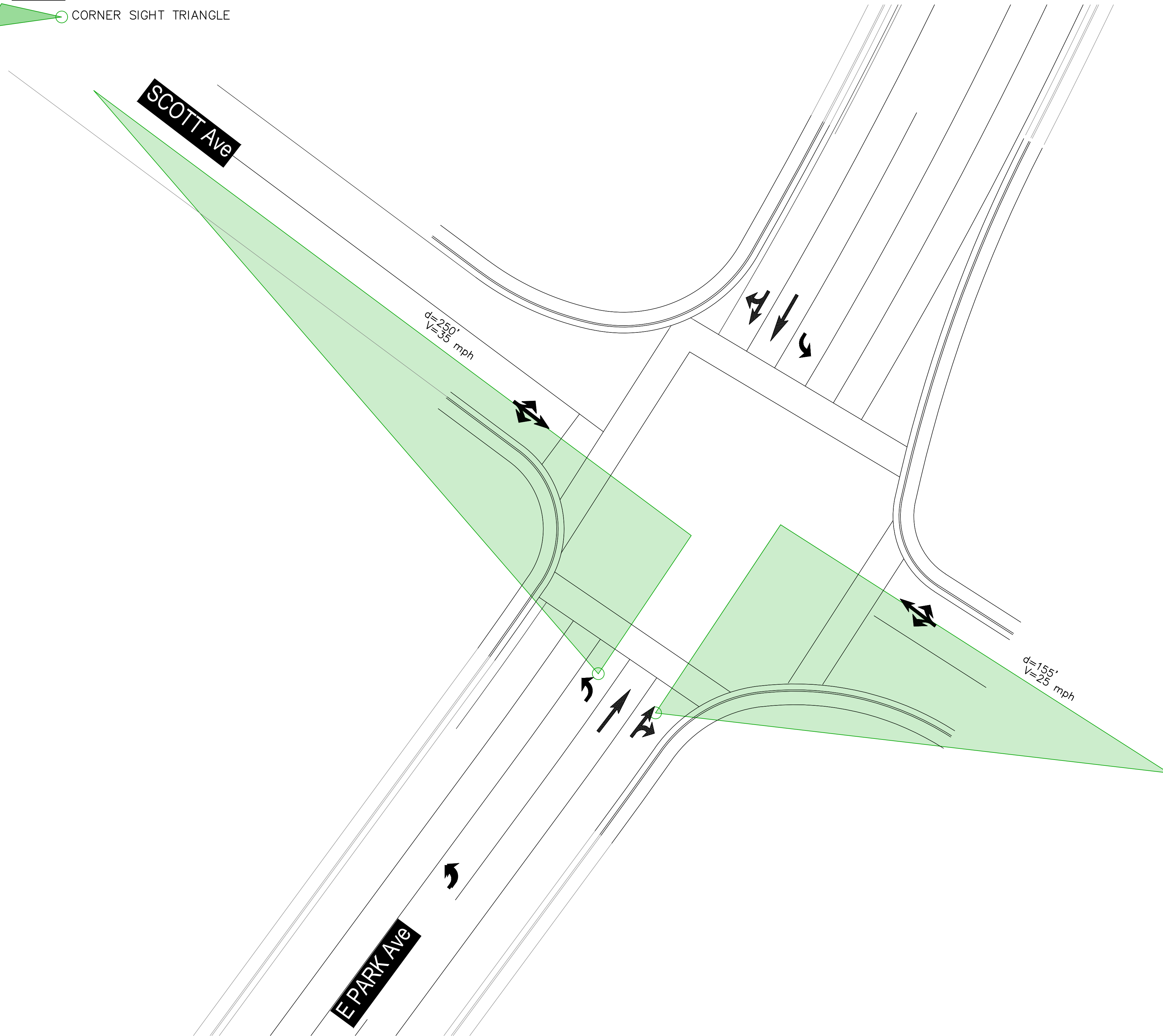
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FIGURE 9

LEGEND:
CORNER SIGHT TRIANGLE

CORNER SIGHT DISTANCE - NB/SB



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & SCOTT St SIGNAL ALTERNATIVE



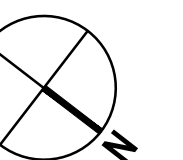
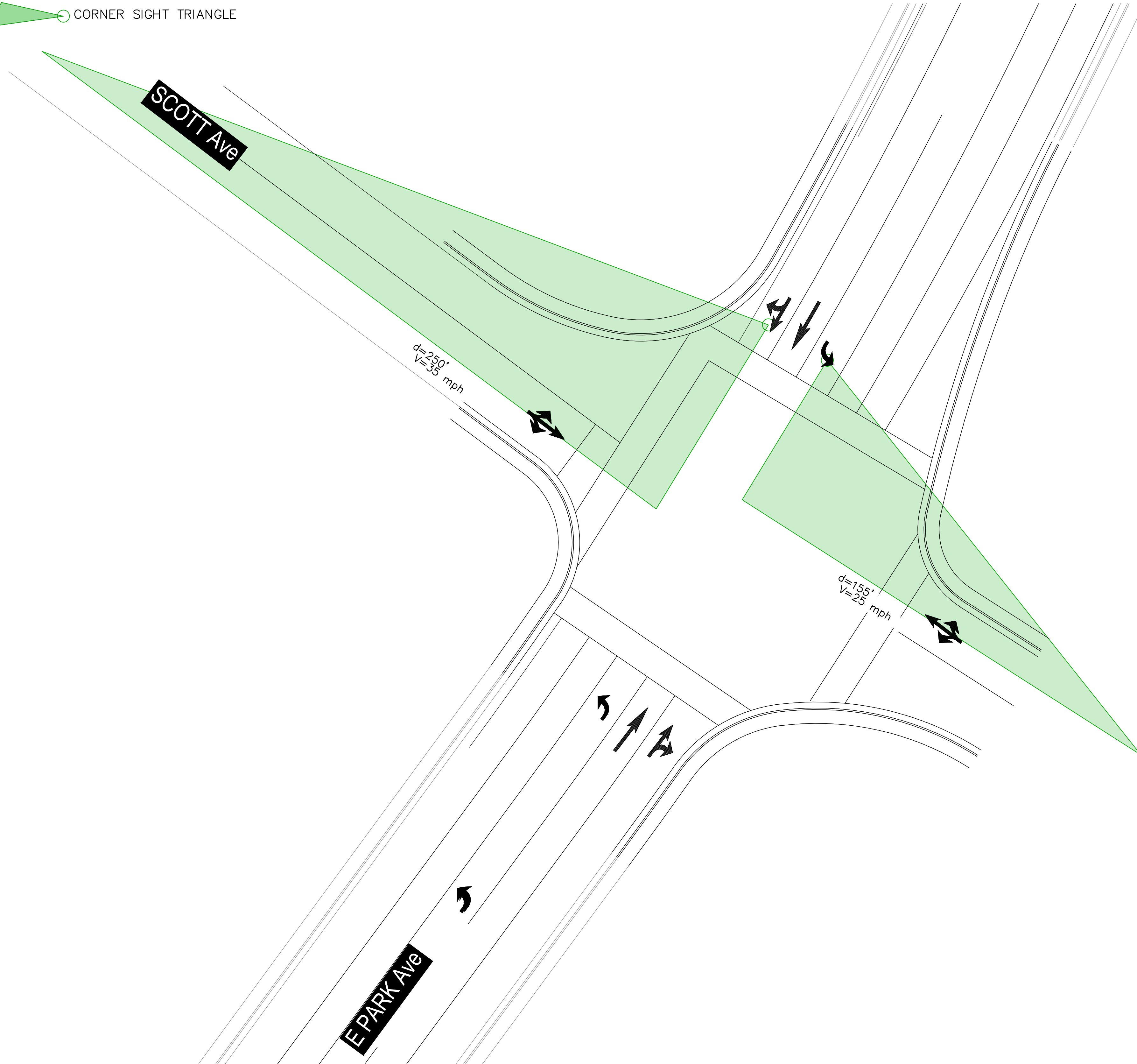
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FIGURE 10

LEGEND:
CORNER SIGHT TRIANGLE

CORNER SIGHT DISTANCE - NB/SB



PRELIMINARY
SUBJECT TO CHANGE

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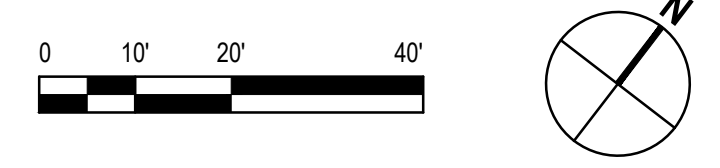
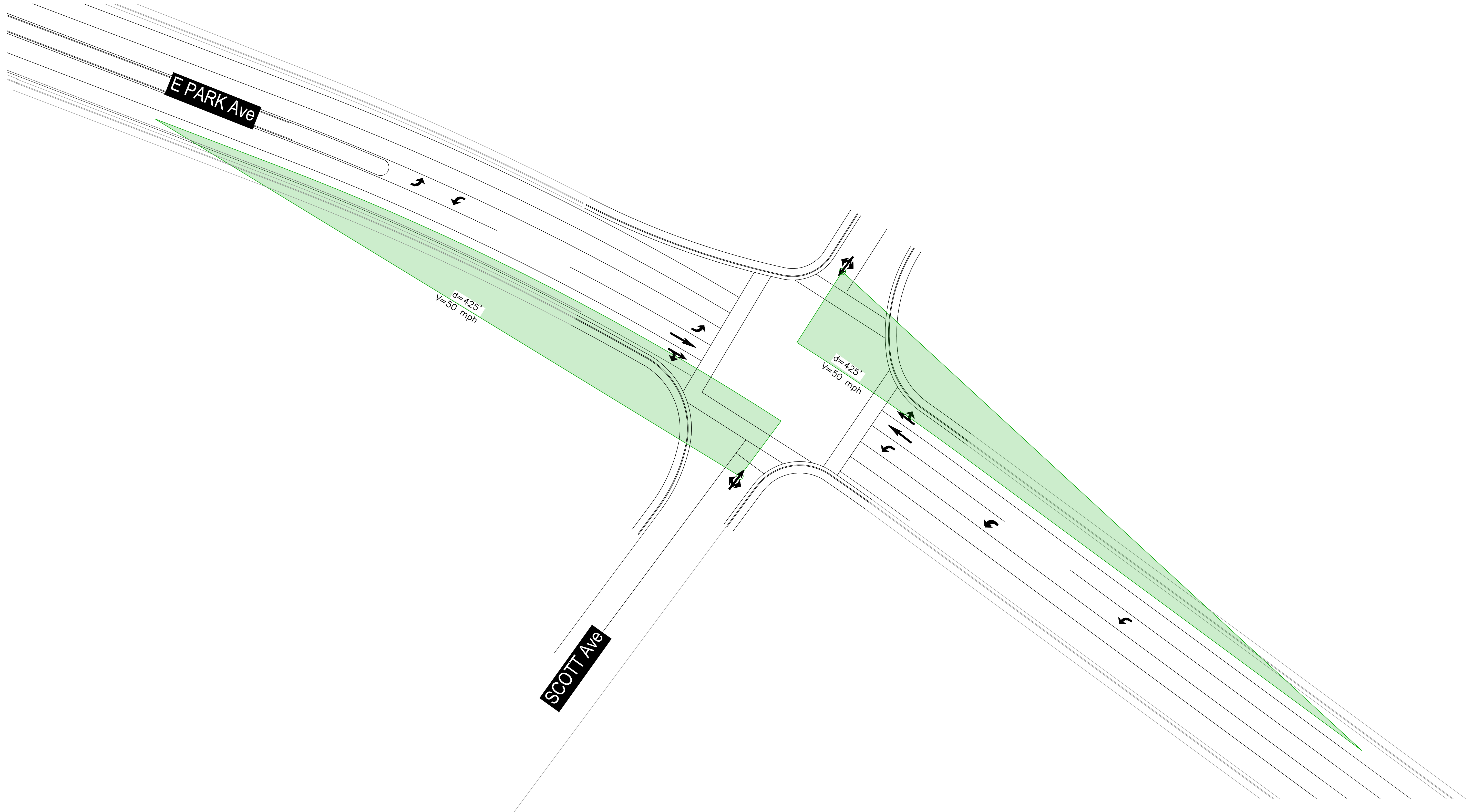
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FIGURE 11

LEGEND:
CORNER SIGHT TRIANGLE

CORNER SIGHT DISTANCE - EB/WB



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & SCOTT St SCOTT SIGNAL ALTERNATIVE



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FIGURE 12

Technical drawing of a truck with dimensions in meters:

- Tractor unit width: 19.00
- Tractor unit height: 4.00
- Trailer total length: 48.00
- Trailer height: 3.00
- Trailer width: 41.00
- Distance from tractor front to trailer front: 23.00
- Distance from tractor front to trailer front: 0.00

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

STAA - STANDARD feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

MIDWAY

PARK Ave

E PARK Ave

LEGEND

- STAA - STANDARD CALTRANS 2012 (US)
- VEHICLE BODY CLEARANCE
- FRONT TIRES SWEEP PATH
- STANDARD CALTRANS 2012 (US)

MATCH LINE

EXISTING GEOMETRY MAINTAINED. CURB RETURN DOES NOT PROVIDE ENOUGH CLEARANCE FOR STAA TURN.

Scale: 0 10' 20' 45'

North arrow pointing towards the top right.

STAA - STANDARD
CALTRANS 2012 (US)

VEHICLE BODY CLEARANCE

FRONT TIRES
SWEEP PATH

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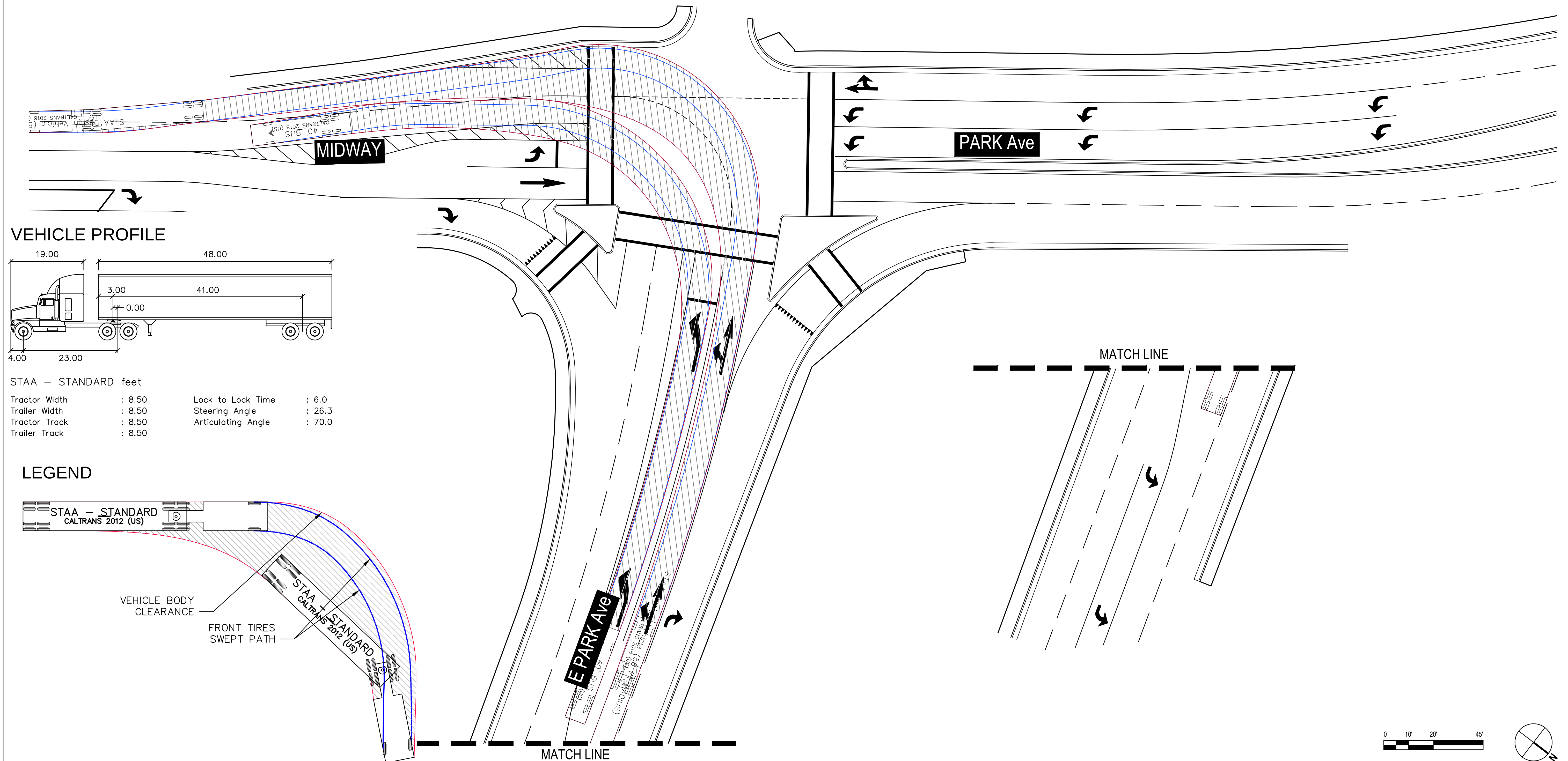
Project No. 11217309
Date 2/28/22

FIGURE 1

LEGEND:

45' BUS TURN SHOWN INSIDE OF STAA VEHICLE TO SHOW MULTIPLE VEHICLES CAN TURN SIMULTANEOUSLY. ADDITIONAL BUS TURNS PROVIDED.

TRUCK TURN - STAA/40' BUS - WESTBOUND SIMULTANEOUS LEFTS



PRELIMINARY
SUBJECT TO CHANGE

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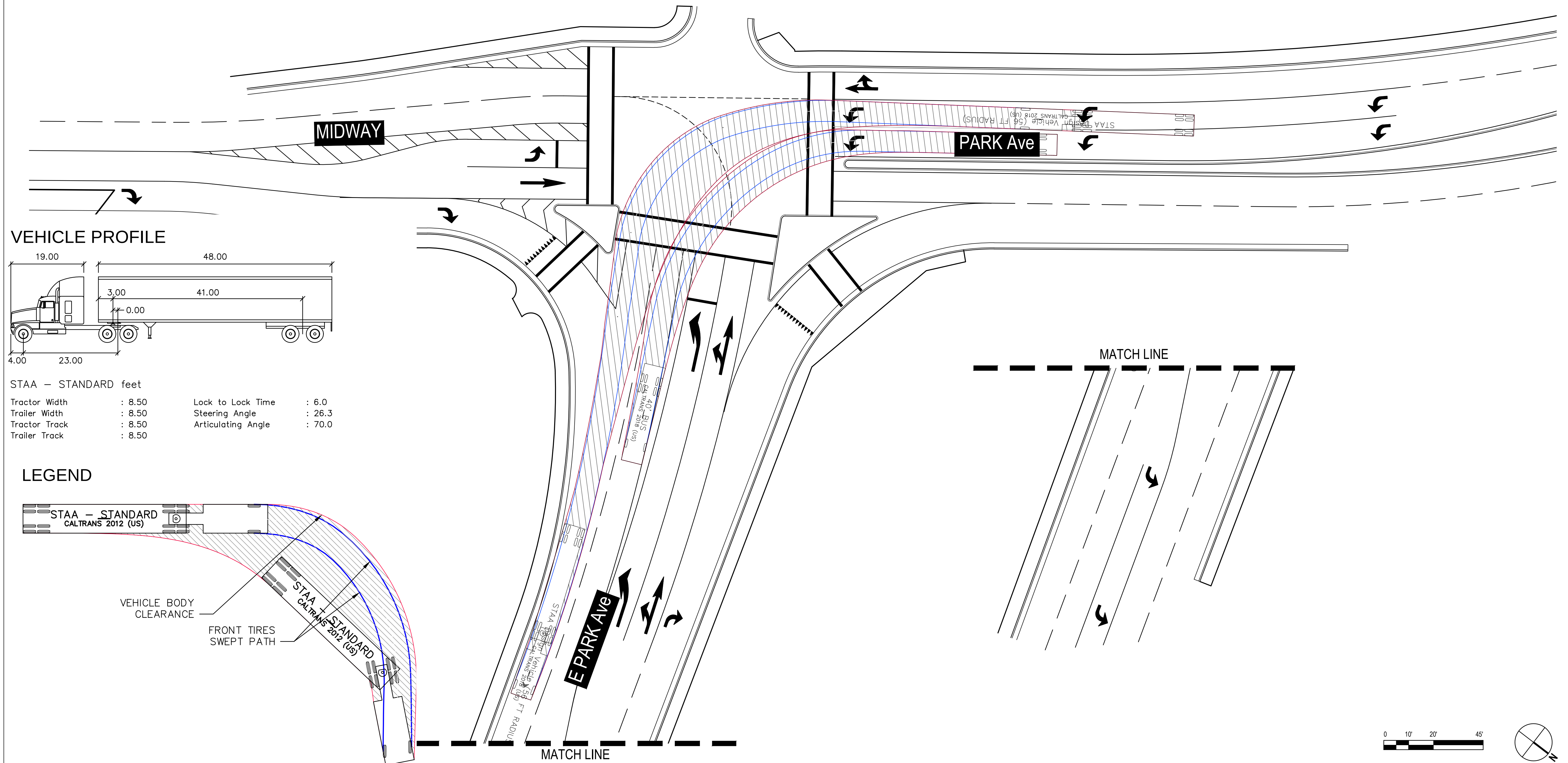
Project No. 11217309
Date 2/28/22

FIGURE 2

LEGEND:

45' BUS TURN SHOWN INSIDE OF STAA VEHICLE TO SHOW MULTIPLE VEHICLES CAN TURN SIMULTANEOUSLY. ADDITIONAL BUS TURNS PROVIDED.

TRUCK TURN - STAA/40' BUS - SOUTHBOUND SIMULTANEOUS LEFTS



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & MIDWAY SIGNAL Mod ALTERNATIVE

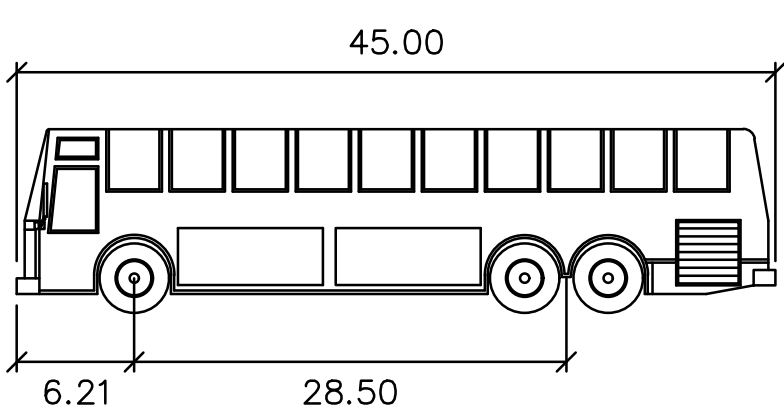


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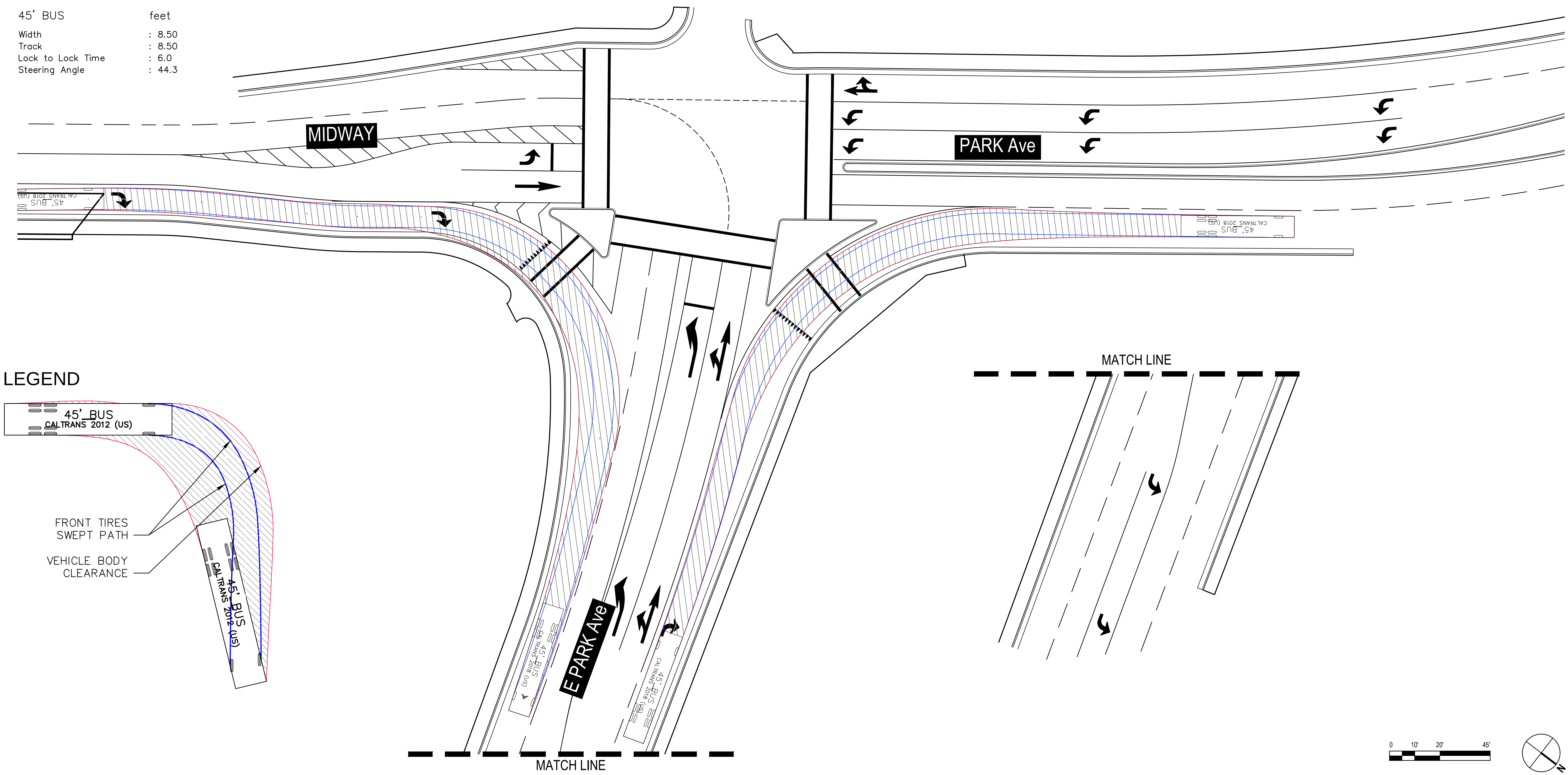
FIGURE 3

VEHICLE PROFILE

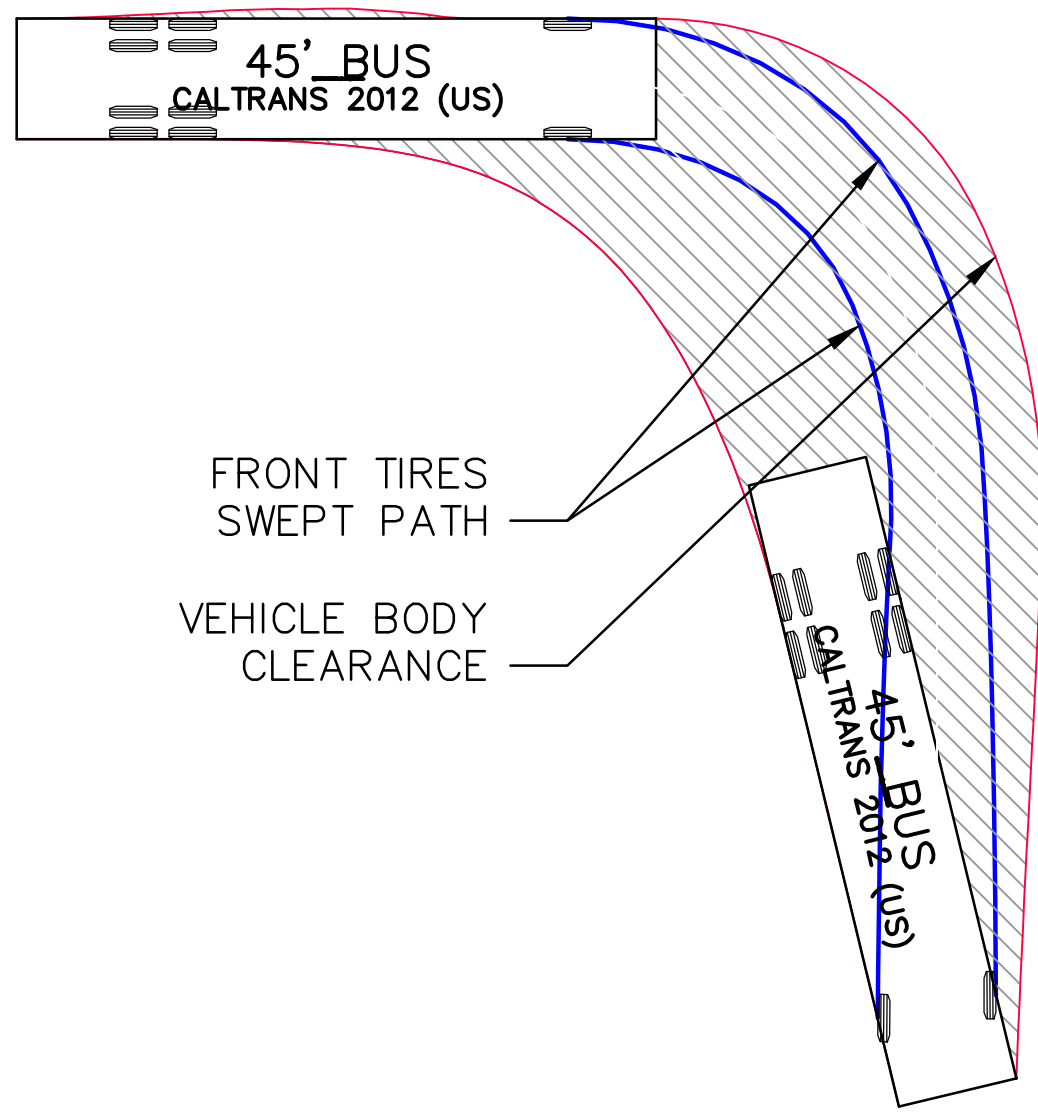


45' BUS	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 44.3

TRUCK TURN - 45' BUS - RIGHT TURNS



LEGEND

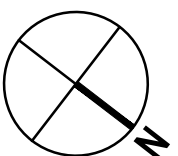


FRONT TIRES
SWEPT PATH

VEHICLE BODY
CLEARANCE

MATCH LINE

MATCH LINE



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
E PARK Ave & MIDWAY SIGNAL Mod ALTERNATIVE

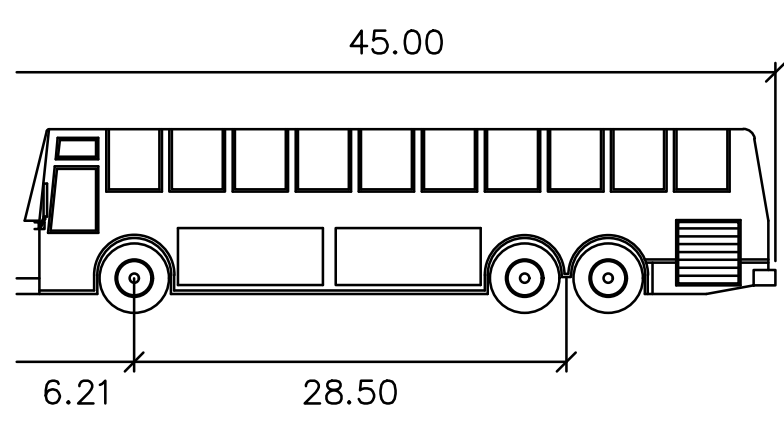


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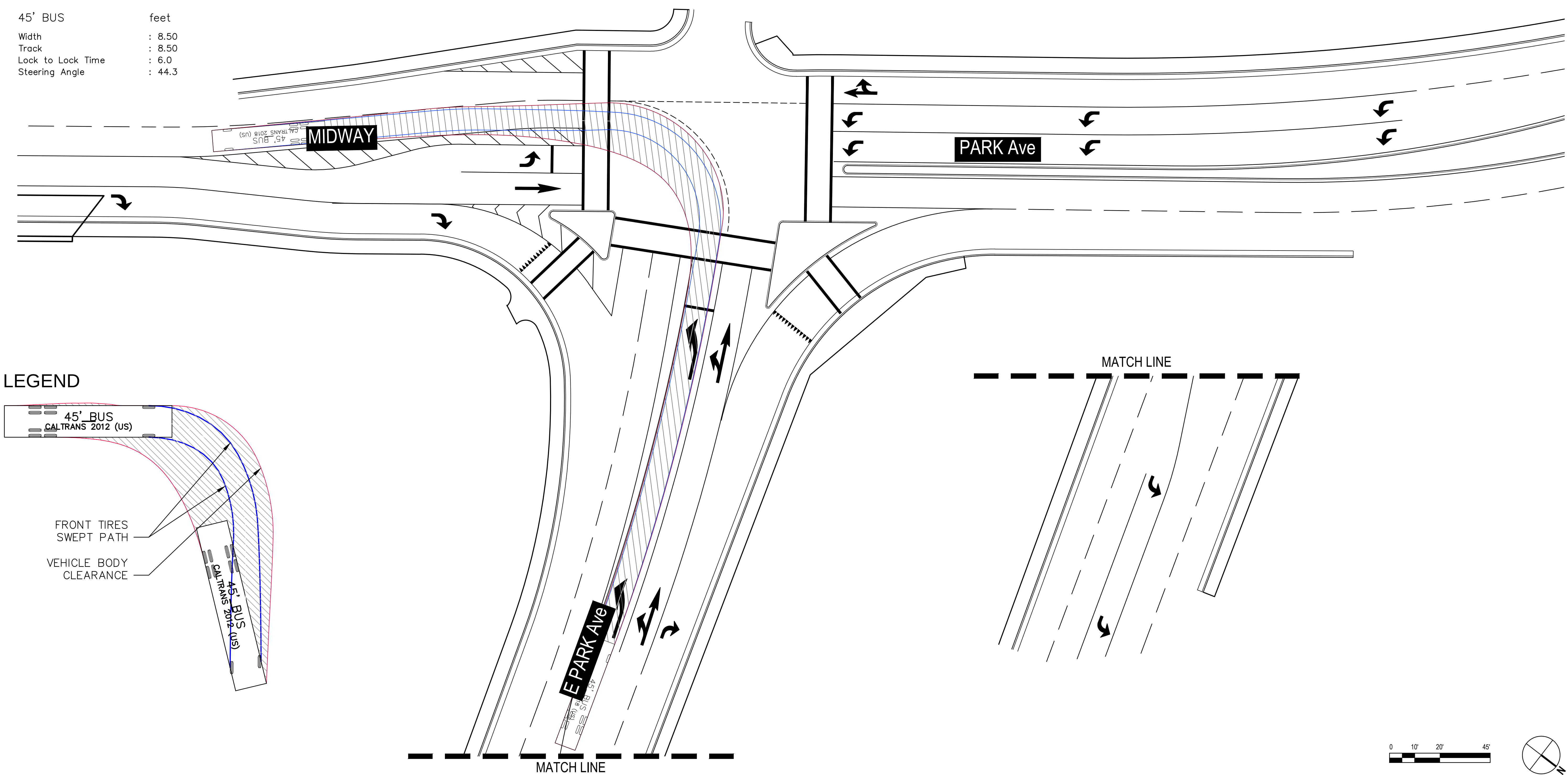
FIGURE 4

VEHICLE PROFILE



45' BUS	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 44.3

TRUCK TURN - 45' BUS - WB LEFT TURN-INSIDE LANE



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
E PARK Ave & MIDWAY SIGNAL Mod ALTERNATIVE

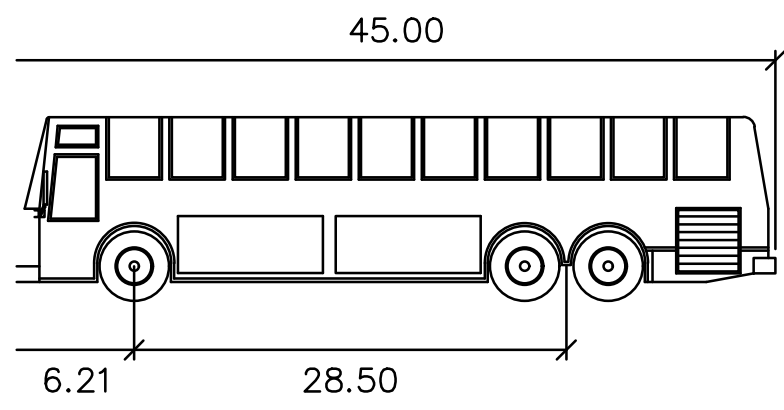


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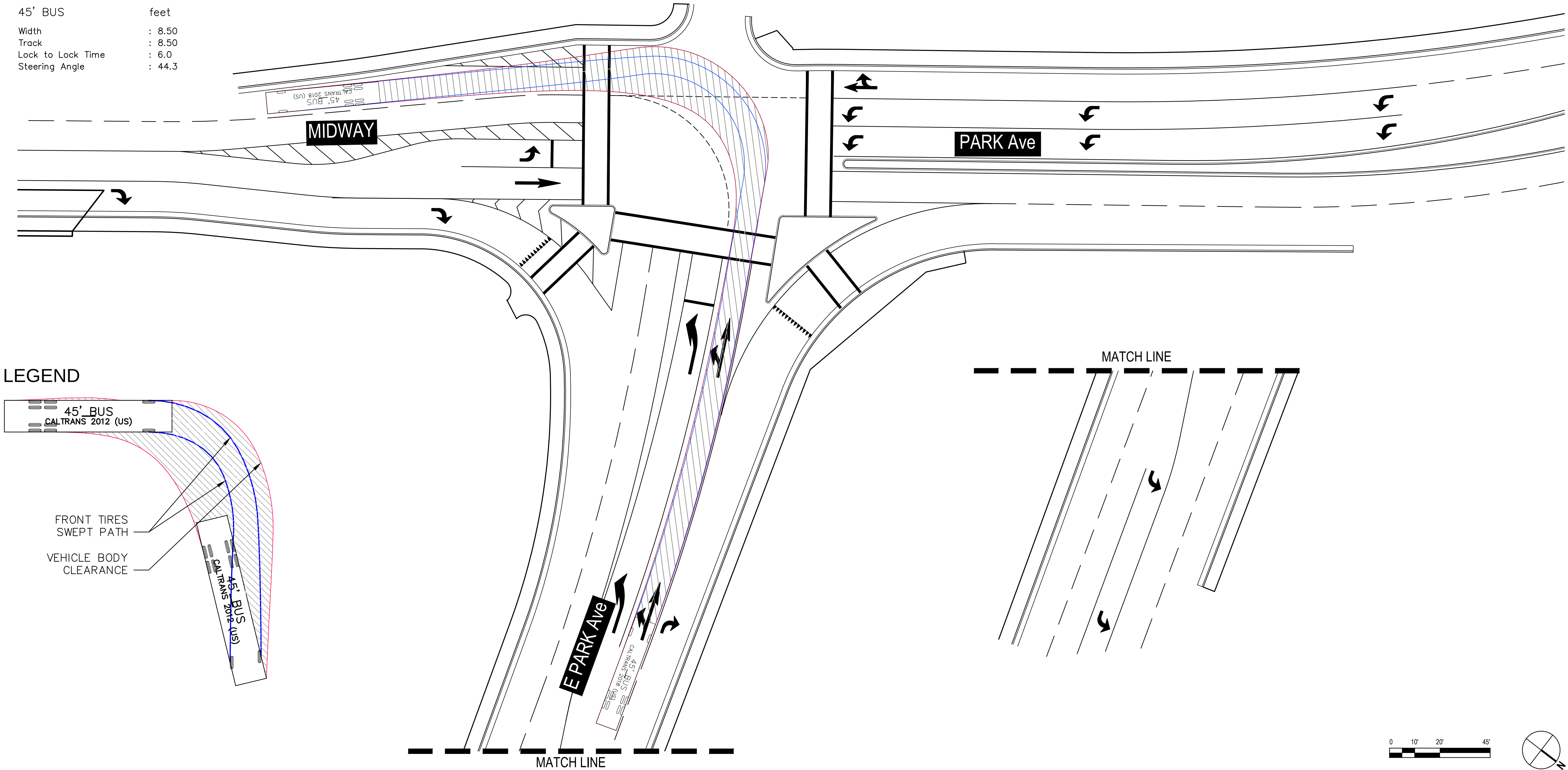
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FIGURE 5

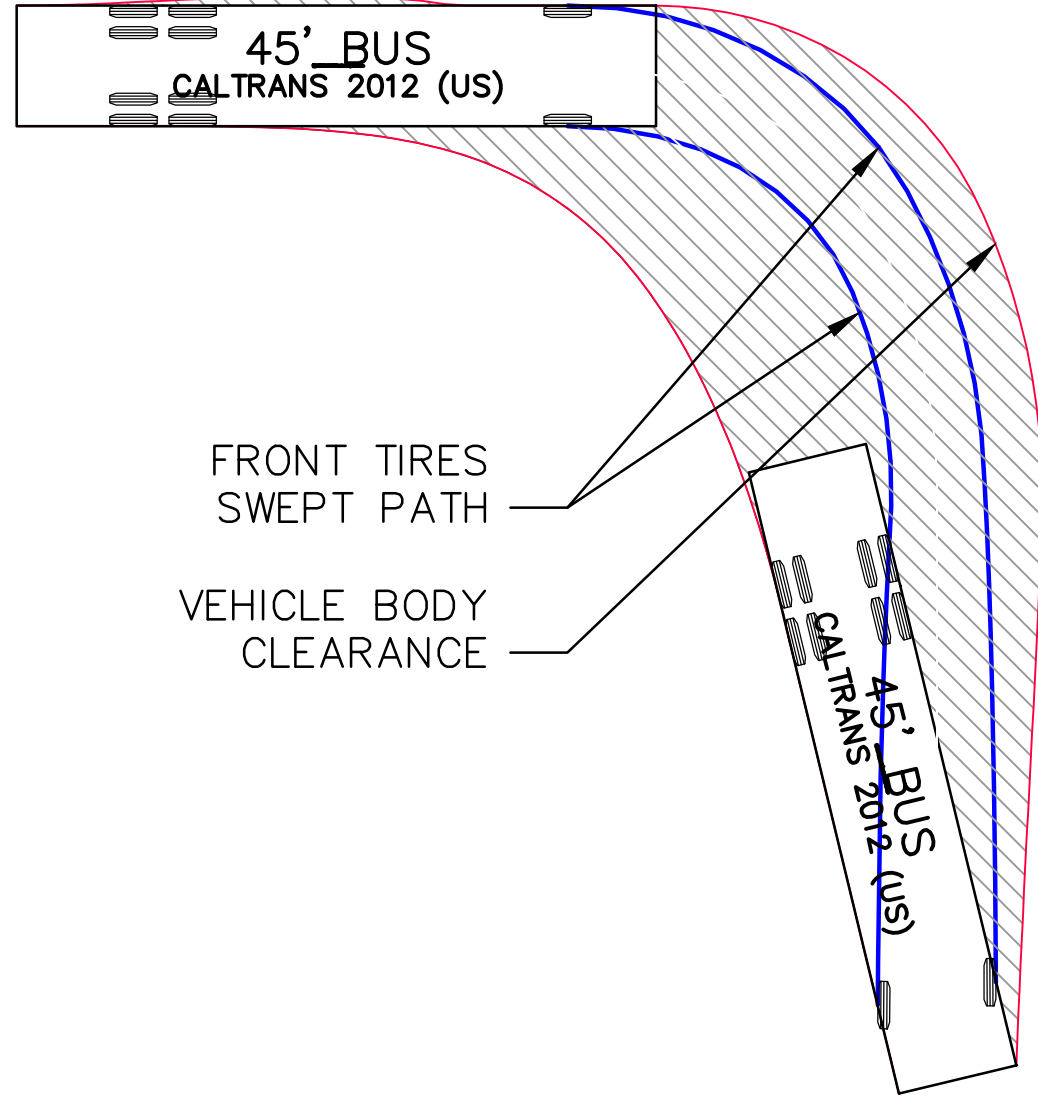
VEHICLE PROFILE



45' BUS	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 44.3



LEGEND



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
E PARK Ave & MIDWAY SIGNAL Mod ALTERNATIVE

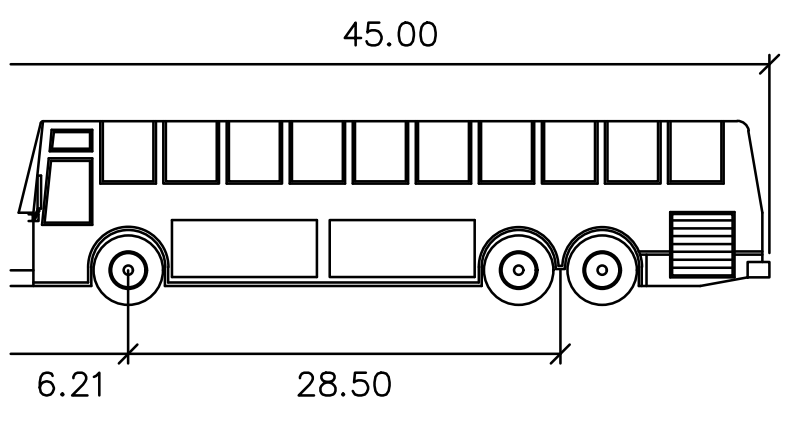


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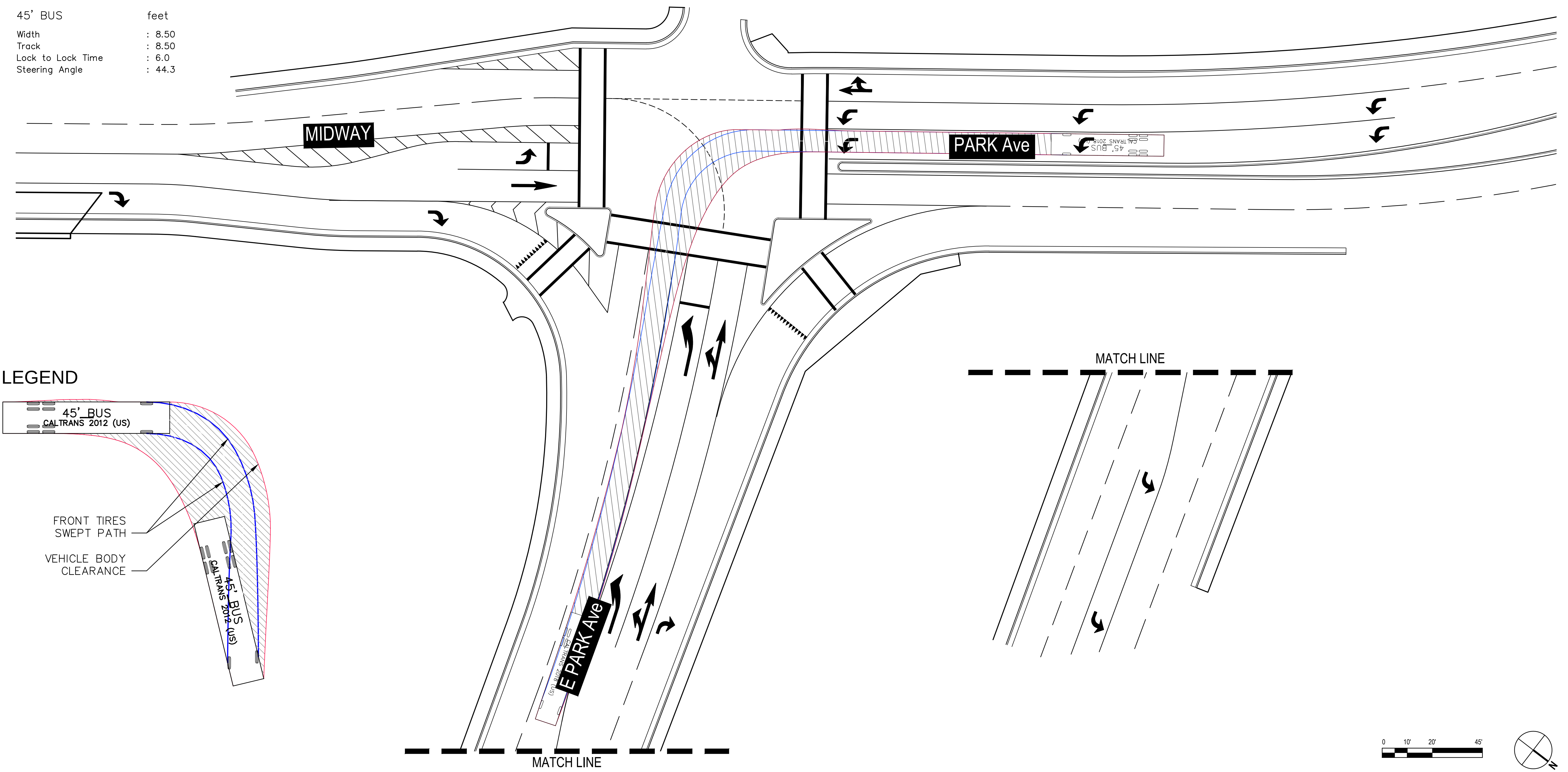
FIGURE 6

VEHICLE PROFILE

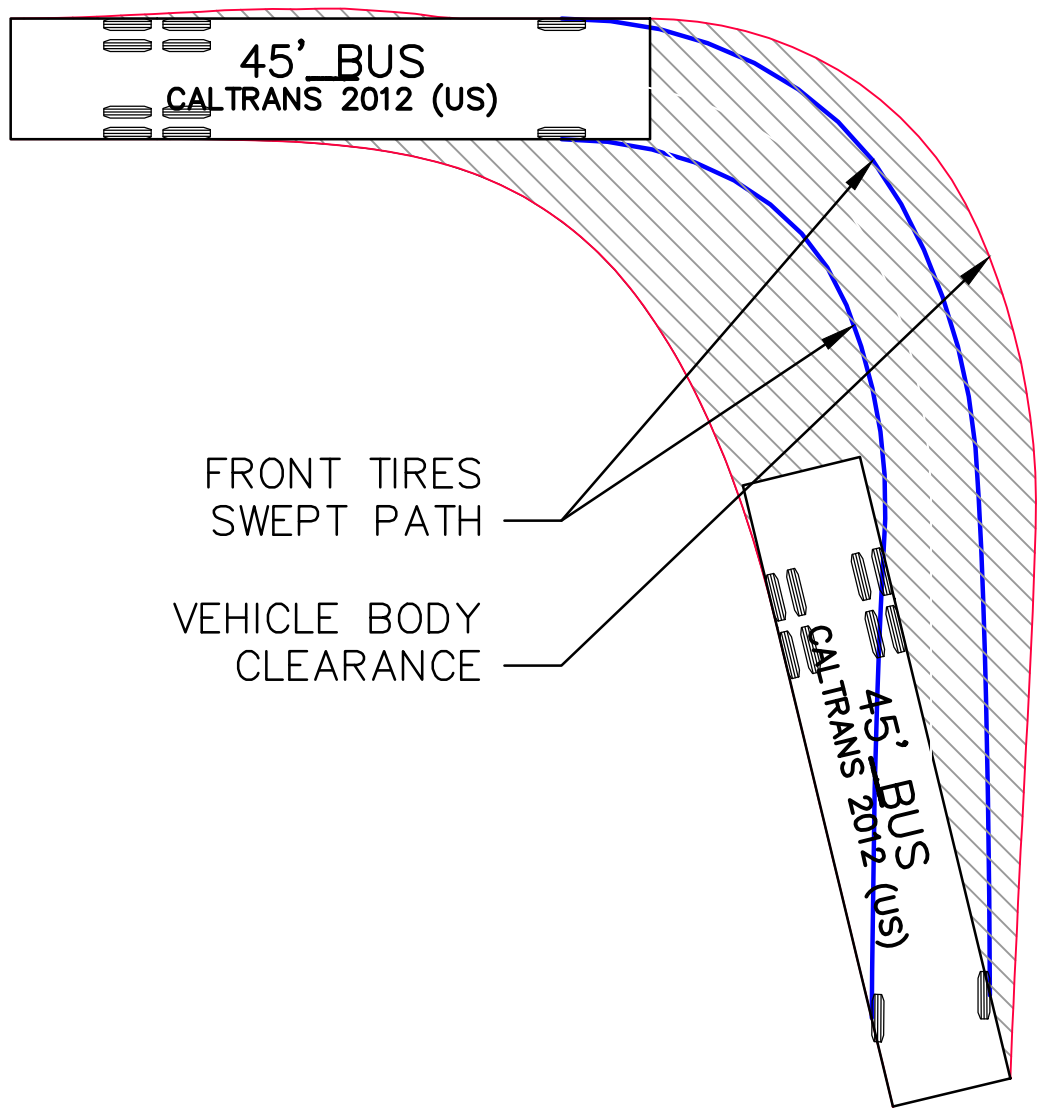


45' BUS	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 44.3

TRUCK TURN - 45' BUS - SB LEFT TURN-INSIDE LANE



LEGEND



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
E PARK Ave & MIDWAY SIGNAL Mod ALTERNATIVE



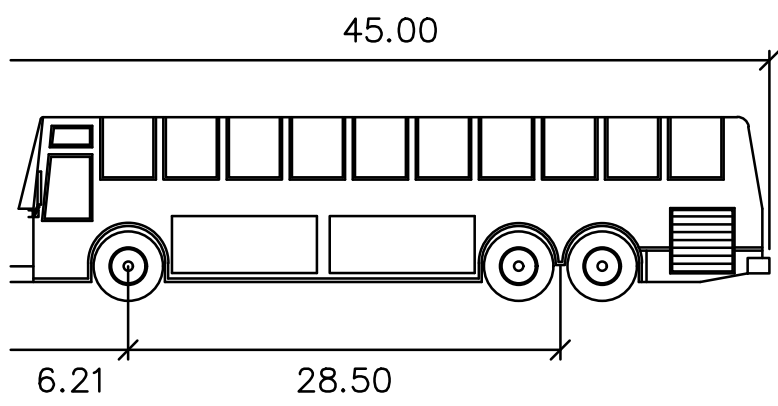
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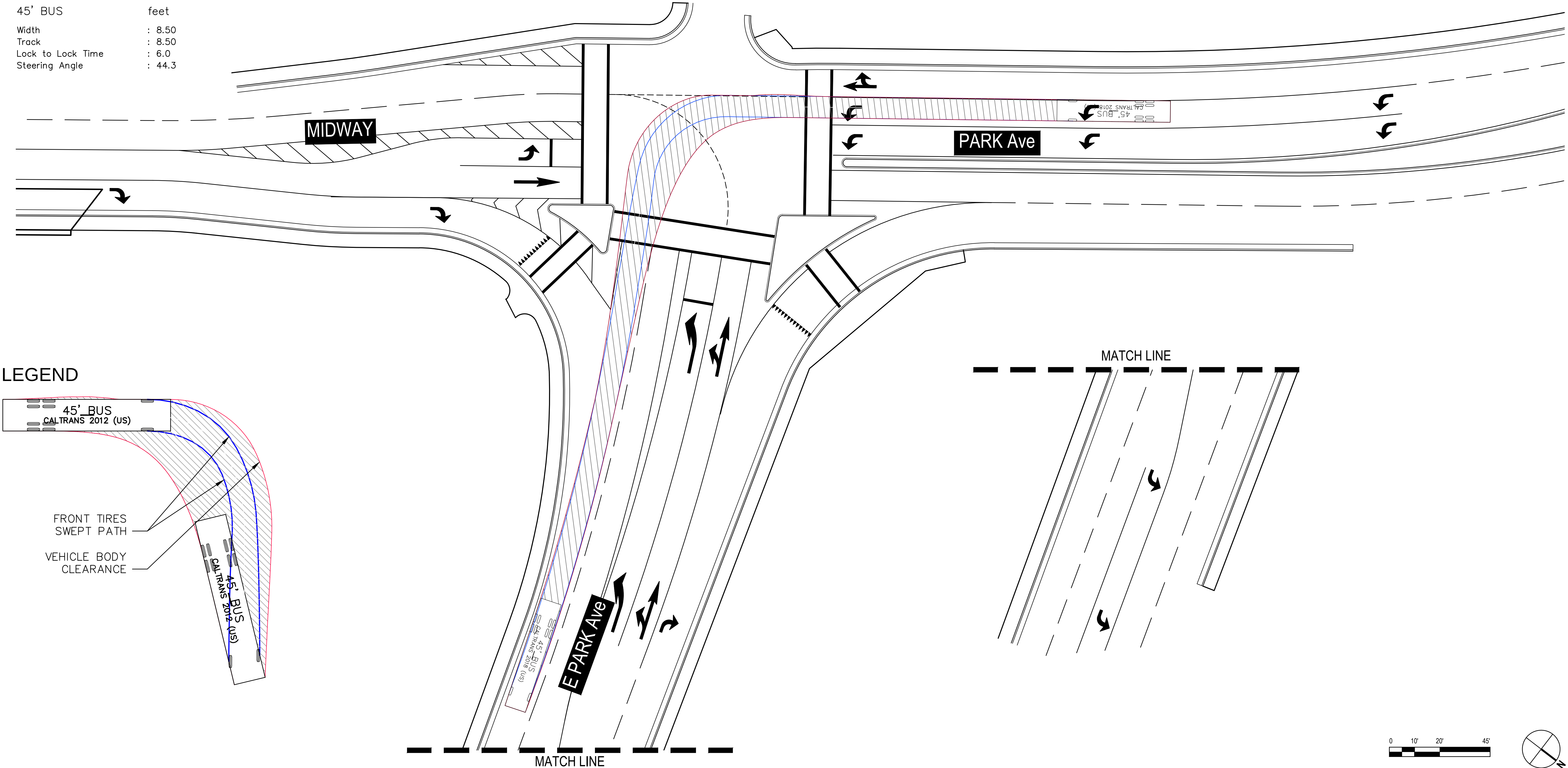
FIGURE 7

TRUCK TURN - 45' BUS - SB LEFT TURN-OUTSIDE LANE

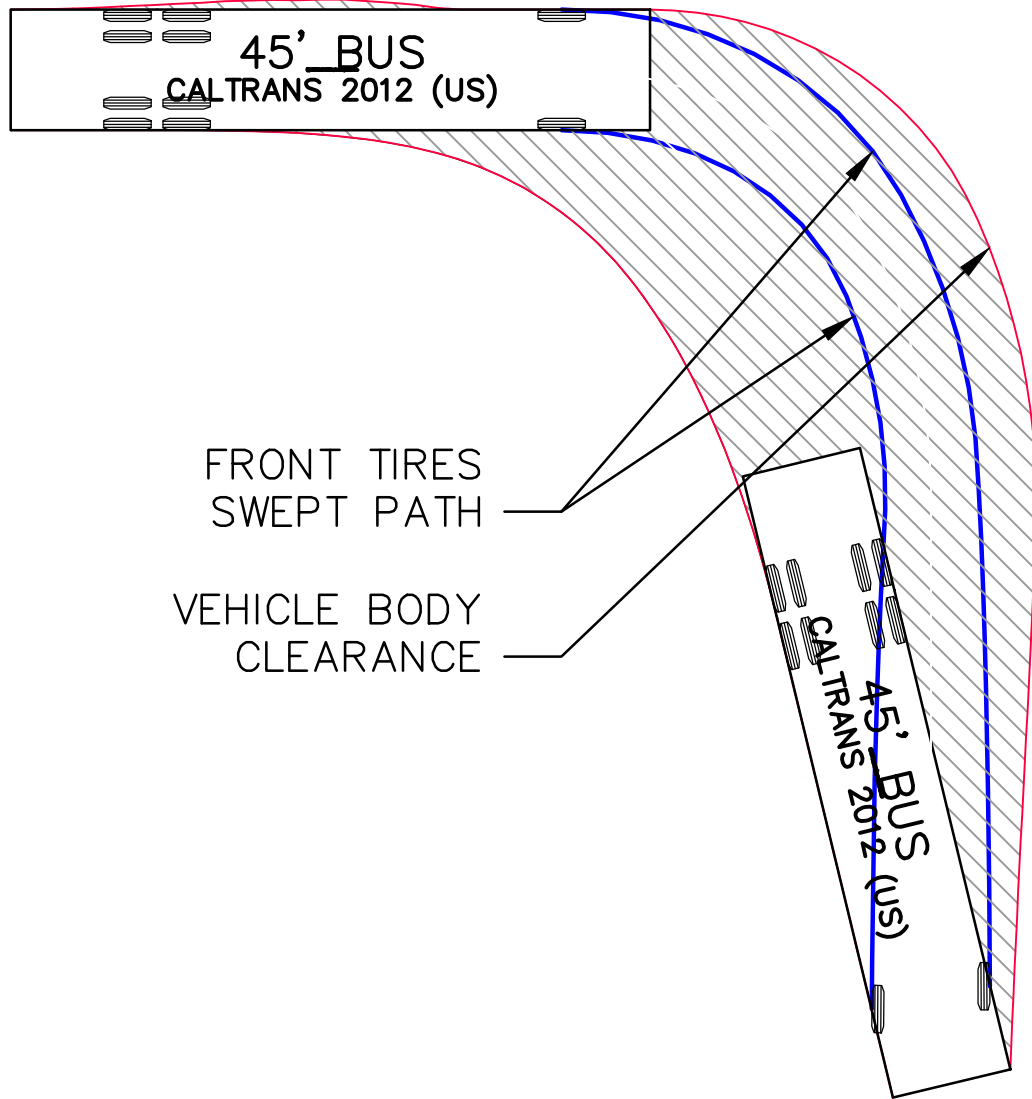
VEHICLE PROFILE



45' BUS	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 44.3



LEGEND



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
E PARK Ave & MIDWAY SIGNAL Mod ALTERNATIVE



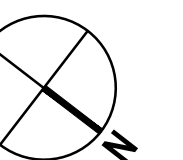
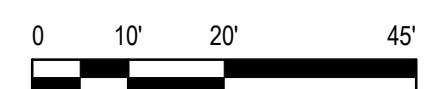
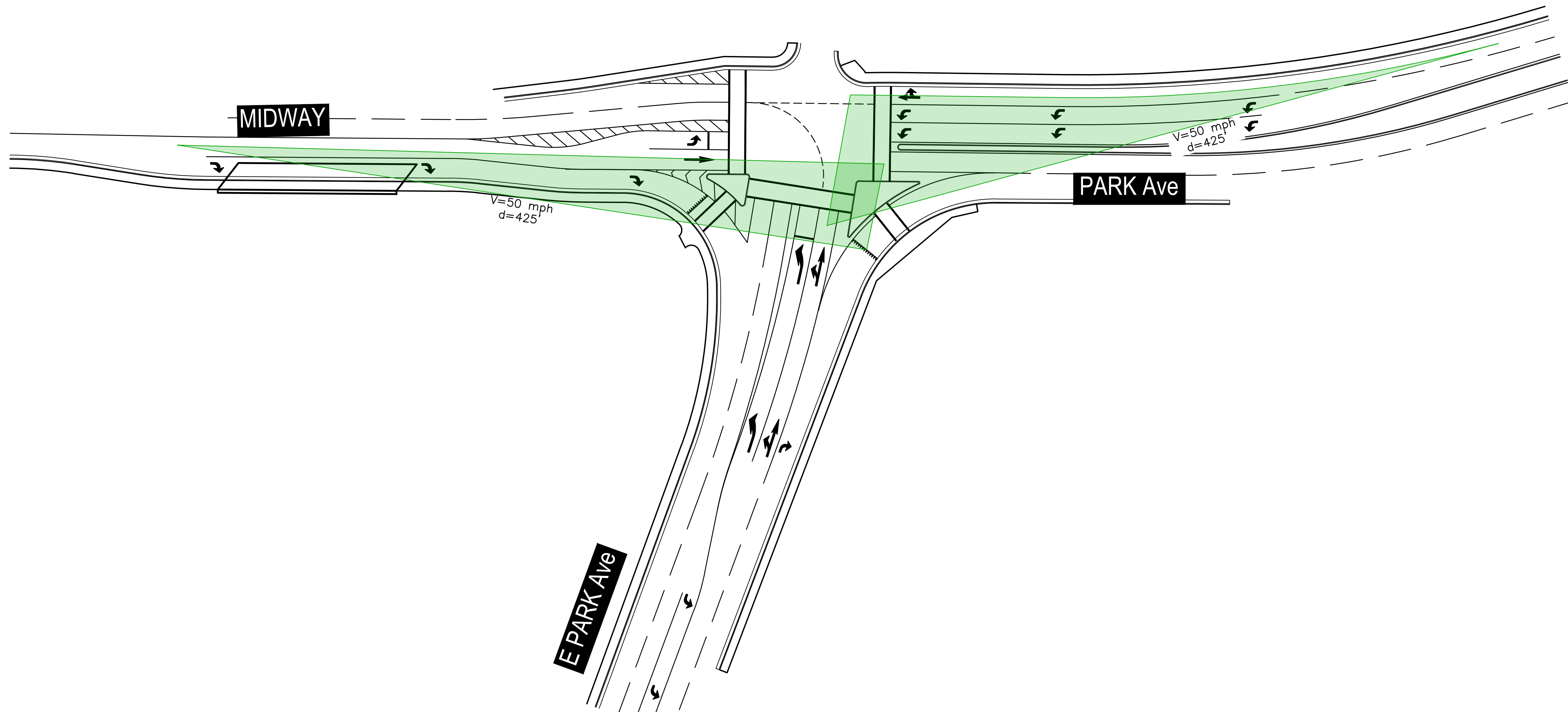
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FIGURE 8

LEGEND:
CORNER SIGHT DISTANCE

INTERSECTION SIGHT DISTANCE- WESTBOUND CORNER SIGHT DISTANCE



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & MIDWAY SIGNAL Mod ALTERNATIVE



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FIGURE 9

LEGEND:
CORNER SIGHT DISTANCE

INTERSECTION SIGHT DISTANCE- NORTHBOUND & SOUTHBOUND CORNER SIGHT DISTANCE



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & MIDWAY SIGNAL Mod ALTERNATIVE



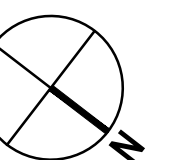
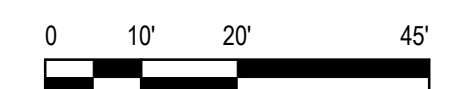
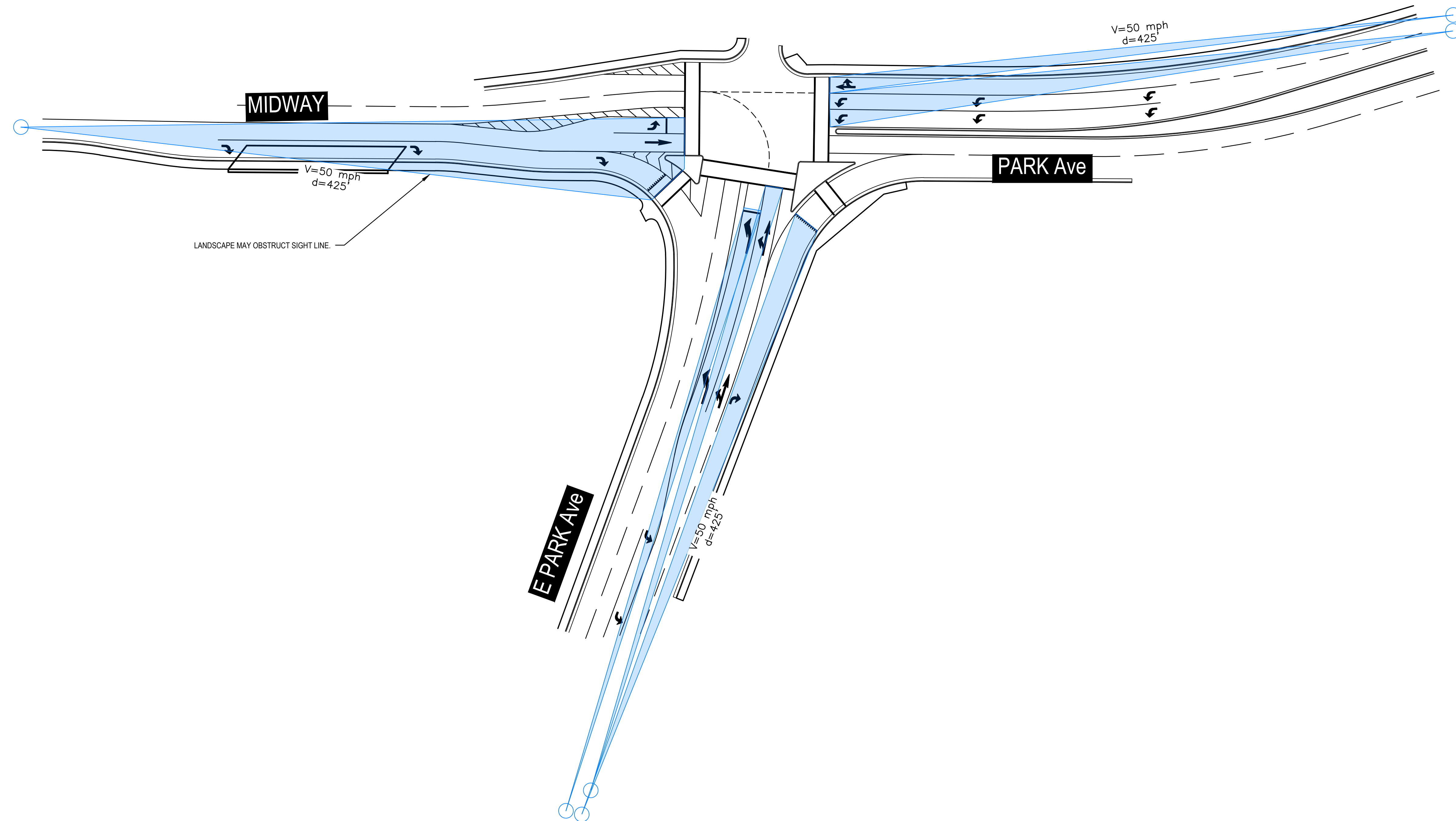
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FIGURE 10

LEGEND:
STOPPING SIGHT DISTANCE

STOPPING SIGHT DISTANCE - APPROACH



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & MIDWAY SIGNAL Mod ALTERNATIVE



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FIGURE 11

LEGEND:

FAST PATH

D#

FAST PATH SPEED IDENTIFIER

NOTE:

N5

NOT USED

NORTHBOUND FASTEST PATH

Movement	Northbound Midway (N#)	Southbound Midway (S#)	Eastbound Hegan (E#)	Westbound 0 (W#)
Distance	90	85	100	N/A
Entering (V1)	25.7	25.5	24.3	N/A
Circulating (V2)	17.7	17.9	N/A	N/A
Exiting (V3)	30.8	30.3	29.0	N/A
Left Turn (V4)	14.3	N/A	14.3	N/A
Right Turn (V5)	N/A	22.6	17.6	N/A

Notes:

All values are in miles per hour

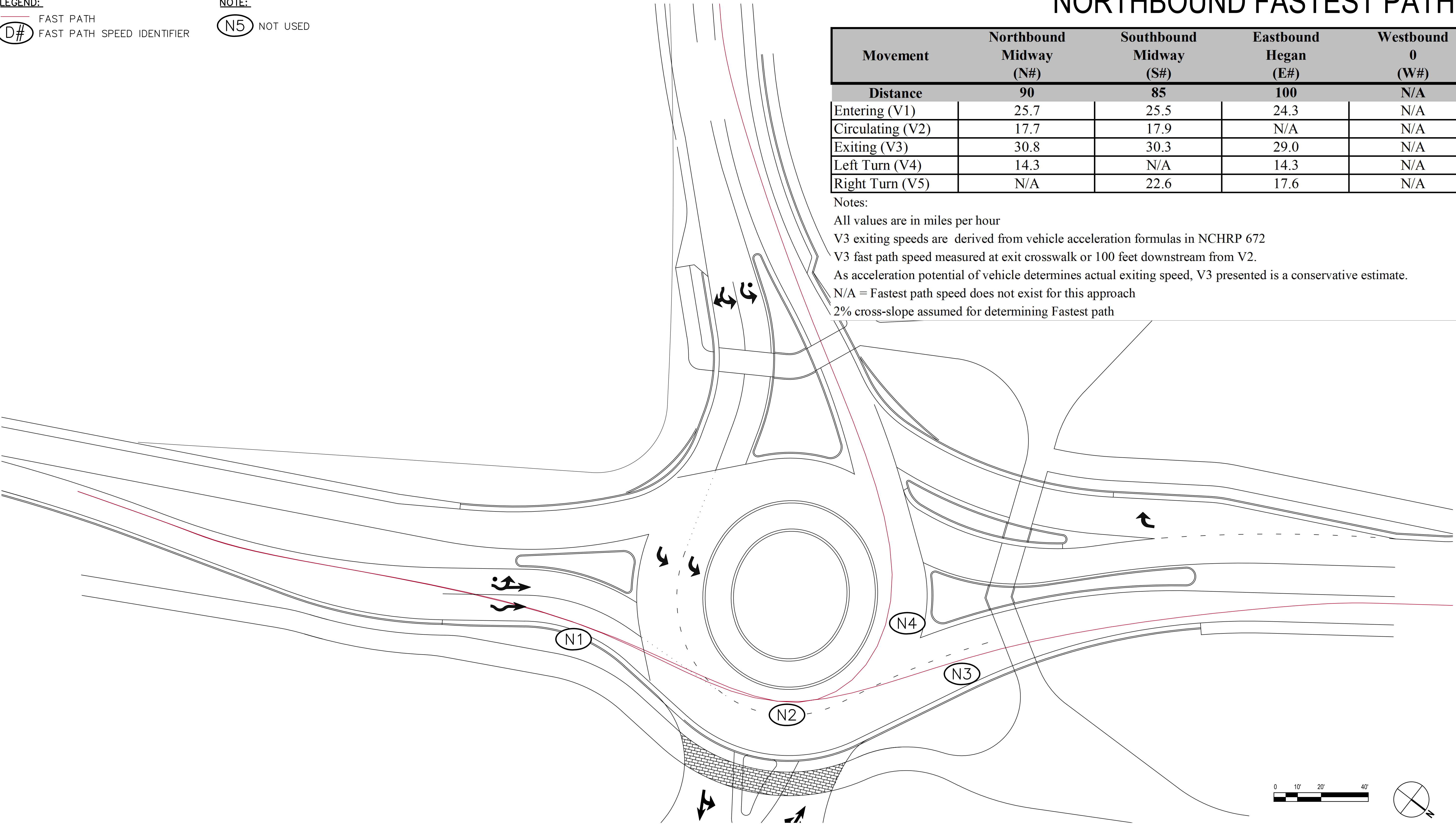
V3 exiting speeds are derived from vehicle acceleration formulas in NCHRP 672

V3 fast path speed measured at exit crosswalk or 100 feet downstream from V2.

As acceleration potential of vehicle determines actual exiting speed, V3 presented is a conservative estimate.

N/A = Fastest path speed does not exist for this approach

2% cross-slope assumed for determining Fastest path



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT MIDWAY & HEGAN Ln ROUNDABOUT



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Date 2/28/22

FIGURE 1

LEGEND:

D#

FAST PATH

FAST PATH SPEED IDENTIFIER

NOTE:

S4

NOT USED

SOUTHBOUND FASTEST PATH

Movement	Northbound Midway (N#)	Southbound Midway (S#)	Eastbound Hegan (E#)	Westbound 0 (W#)
Distance	90	85	100	N/A
Entering (V1)	25.7	25.5	24.3	N/A
Circulating (V2)	17.7	17.9	N/A	N/A
Exiting (V3)	30.8	30.3	29.0	N/A
Left Turn (V4)	14.3	N/A	14.3	N/A
Right Turn (V5)	N/A	22.6	17.6	N/A

Notes:

All values are in miles per hour

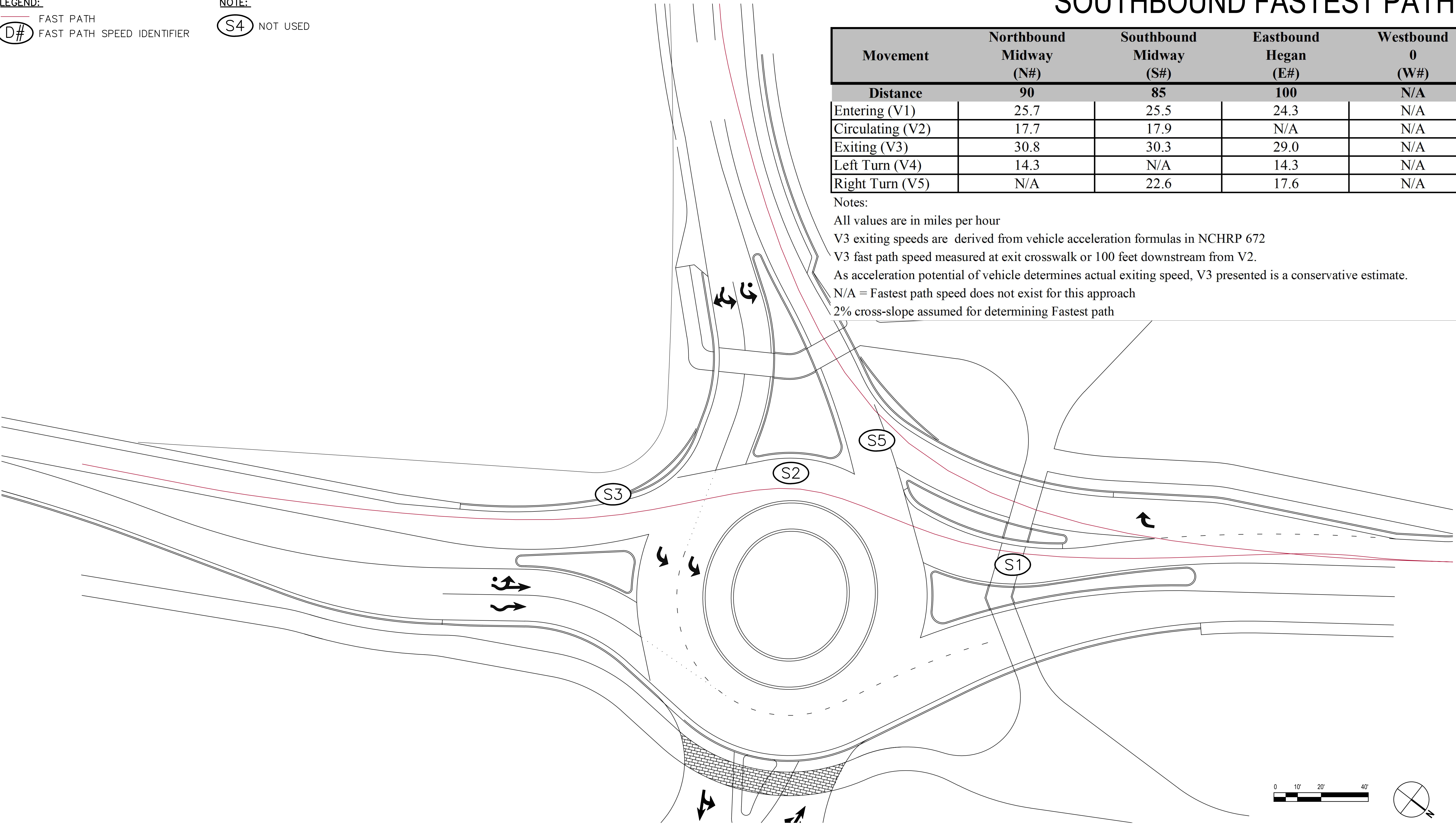
V3 exiting speeds are derived from vehicle acceleration formulas in NCHRP 672

V3 fast path speed measured at exit crosswalk or 100 feet downstream from V2.

As acceleration potential of vehicle determines actual exiting speed, V3 presented is a conservative estimate.

N/A = Fastest path speed does not exist for this approach

2% cross-slope assumed for determining Fastest path



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT MIDWAY & HEGAN Ln ROUNDABOUT



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FIGURE 2

LEGEND:

D#

FAST PATH

FAST PATH SPEED IDENTIFIER

NOTE:

E2

NOT USED

EASTBOUND FASTEST PATH

Movement	Northbound Midway (N#)	Southbound Midway (S#)	Eastbound Hegan (E#)	Westbound 0 (W#)
Distance	90	85	100	N/A
Entering (V1)	25.7	25.5	24.3	N/A
Circulating (V2)	17.7	17.9	N/A	N/A
Exiting (V3)	30.8	30.3	29.0	N/A
Left Turn (V4)	14.3	N/A	14.3	N/A
Right Turn (V5)	N/A	22.6	17.6	N/A

Notes:

All values are in miles per hour

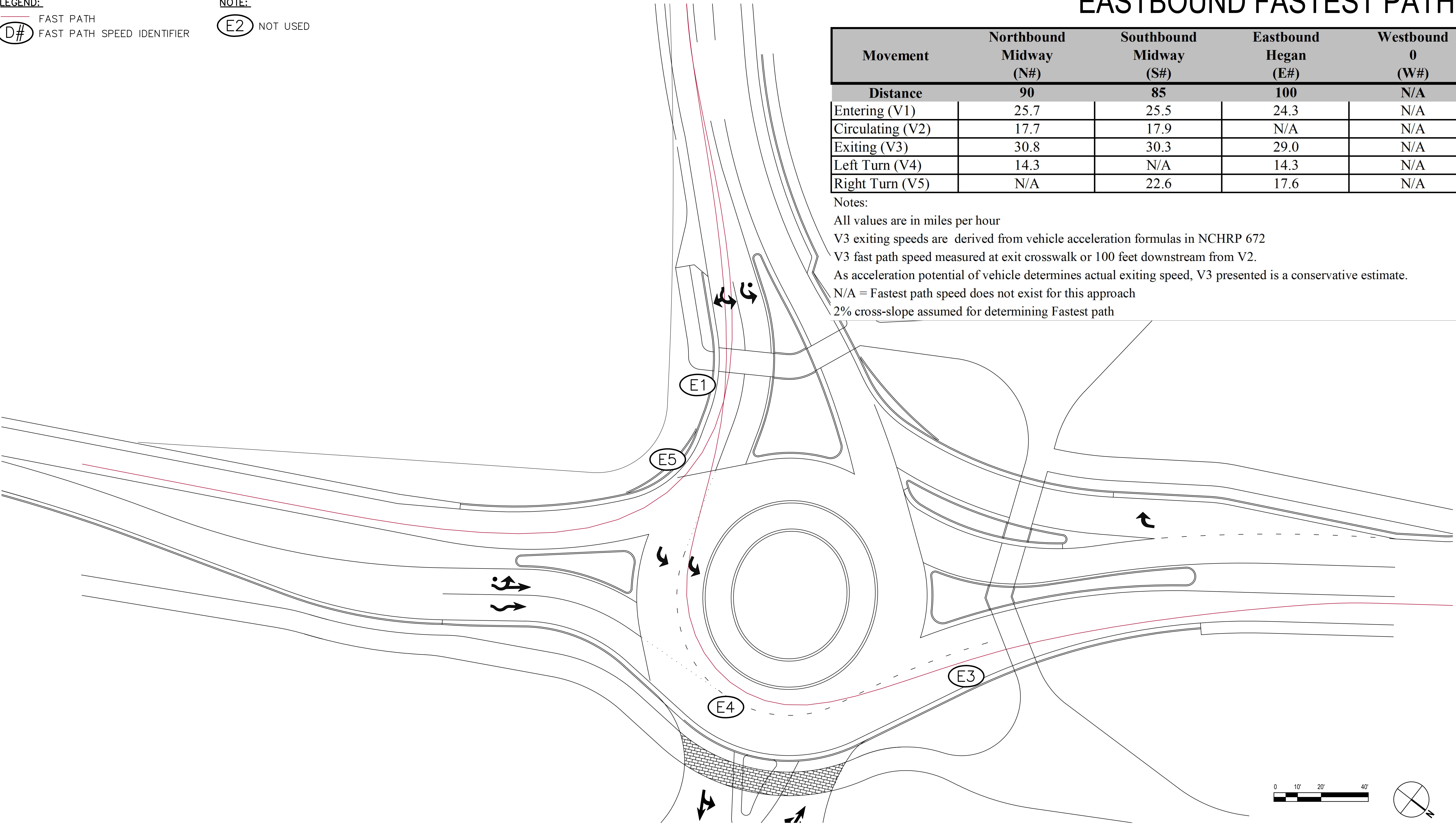
V3 exiting speeds are derived from vehicle acceleration formulas in NCHRP 672

V3 fast path speed measured at exit crosswalk or 100 feet downstream from V2.

As acceleration potential of vehicle determines actual exiting speed, V3 presented is a conservative estimate.

N/A = Fastest path speed does not exist for this approach

2% cross-slope assumed for determining Fastest path



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT MIDWAY & HEGAN Ln ROUNDABOUT

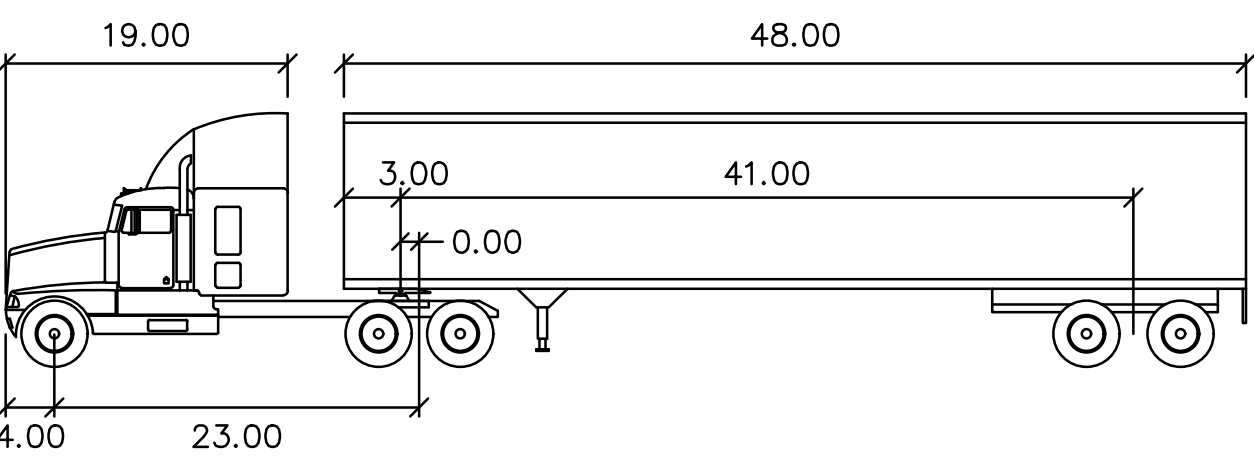


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FIGURE 3

VEHICLE PROFILE

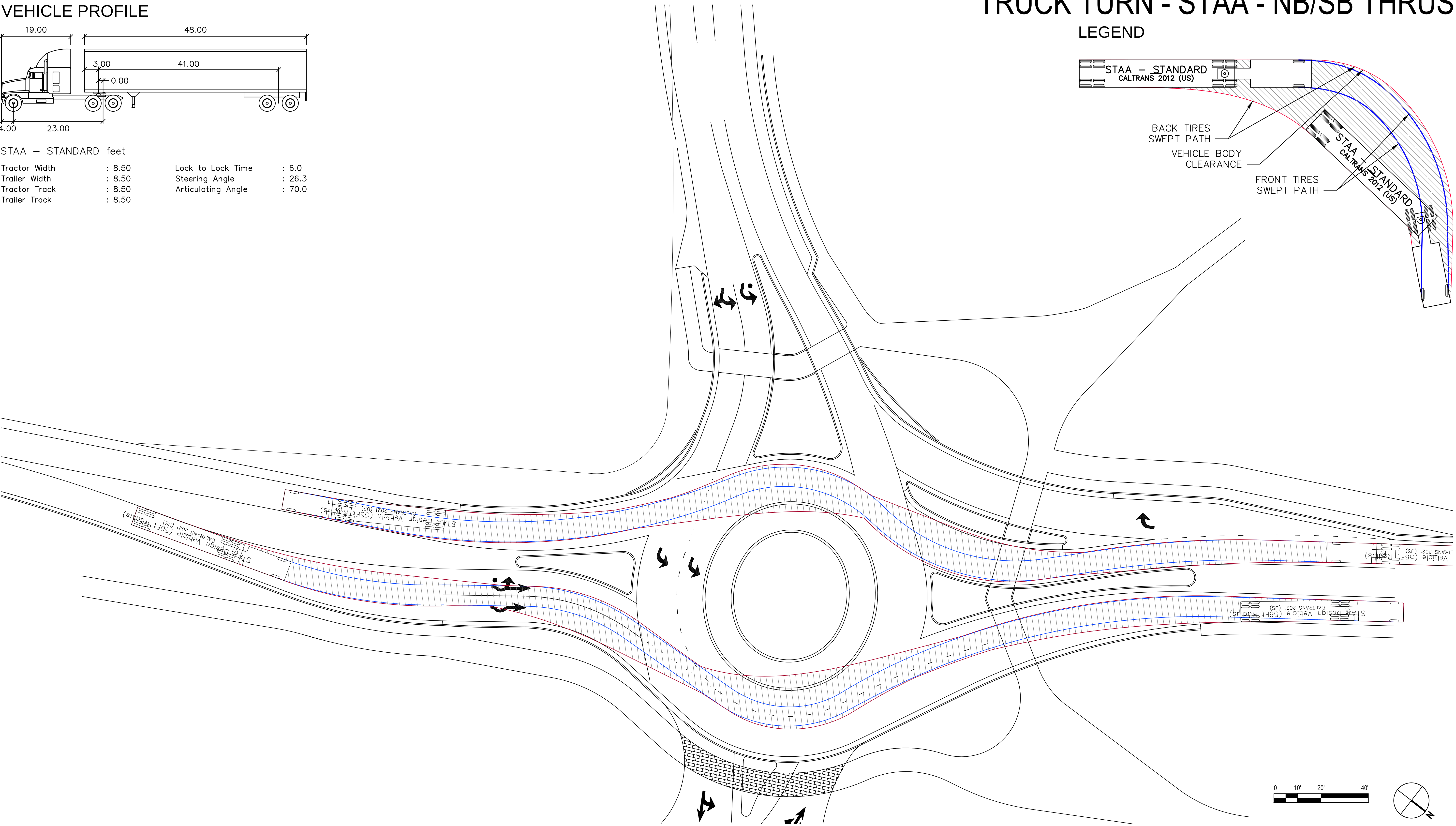
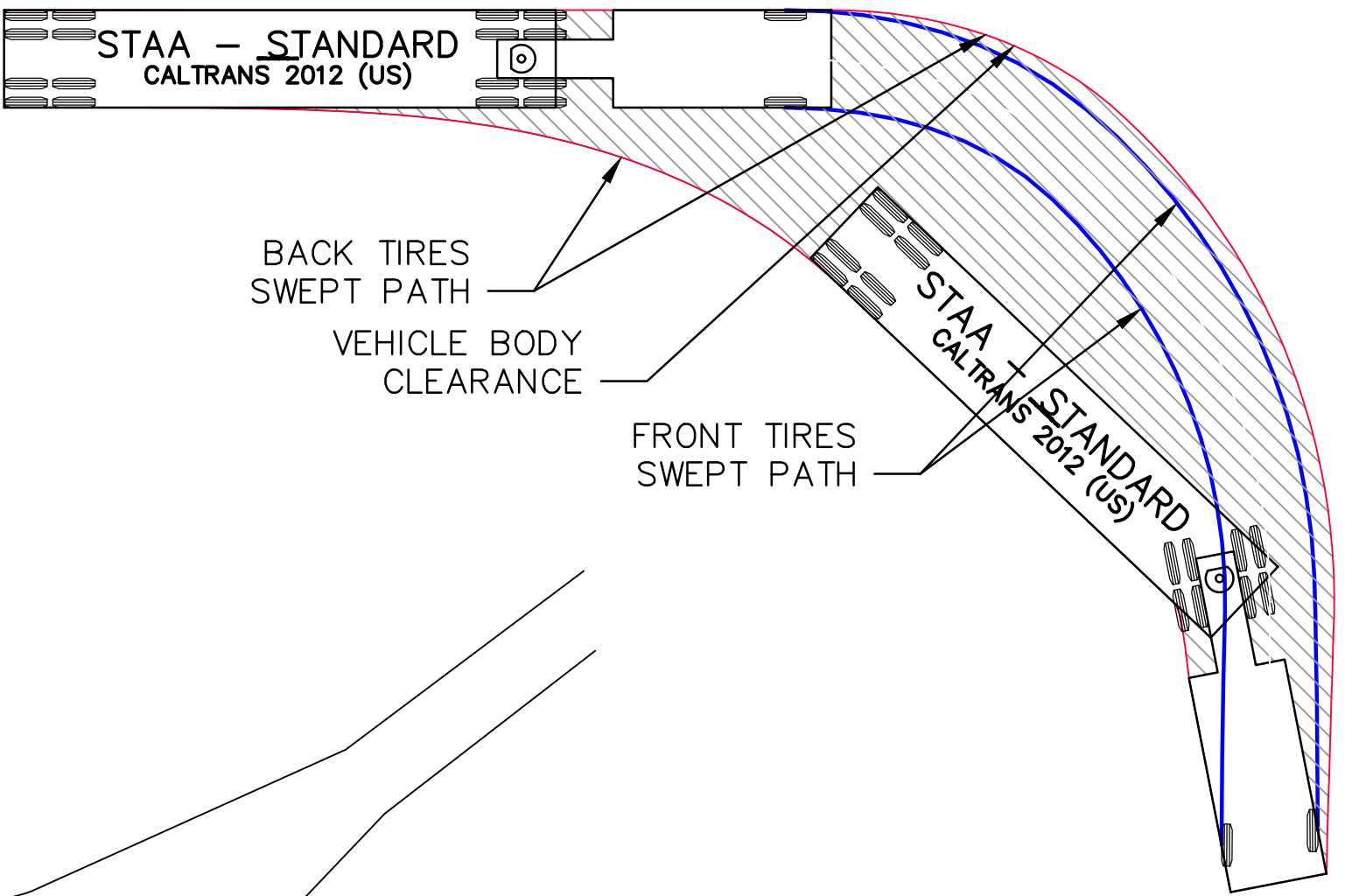


STAA - STANDARD feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

TRUCK TURN - STAA - NB/SB THRUS

LEGEND



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
MIDWAY & HEGAN Ln ROUNDABOUT

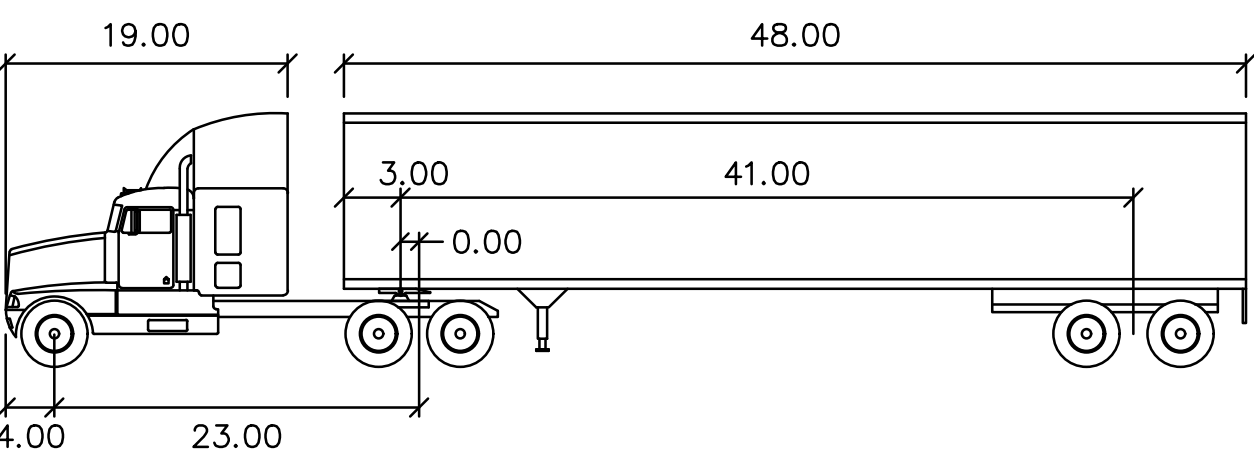


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FIGURE 4

VEHICLE PROFILE

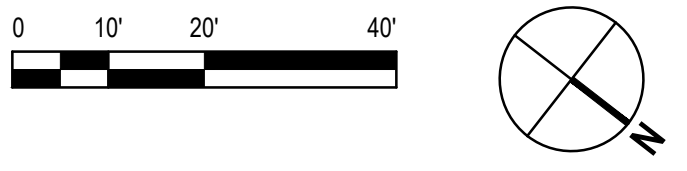
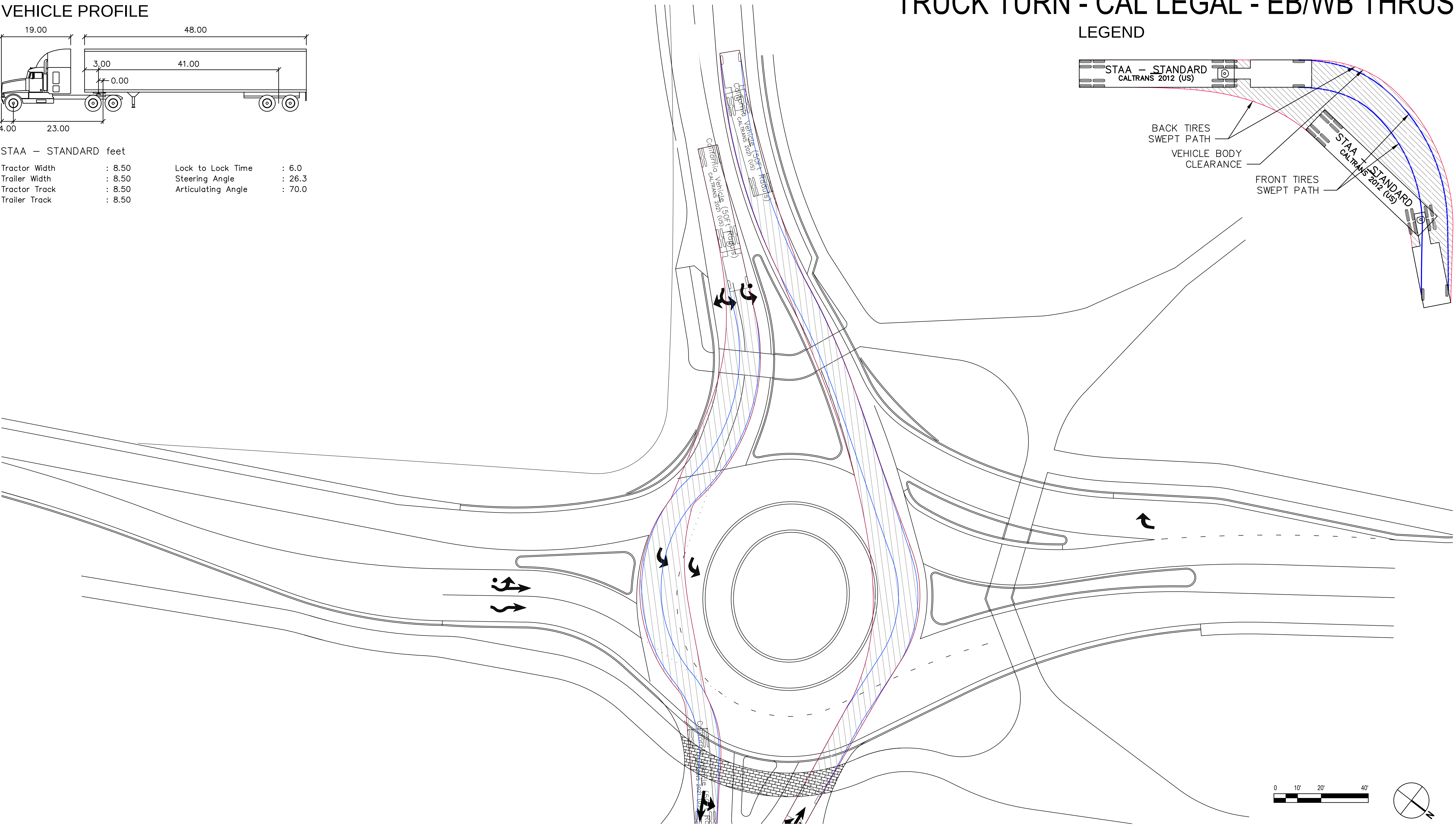
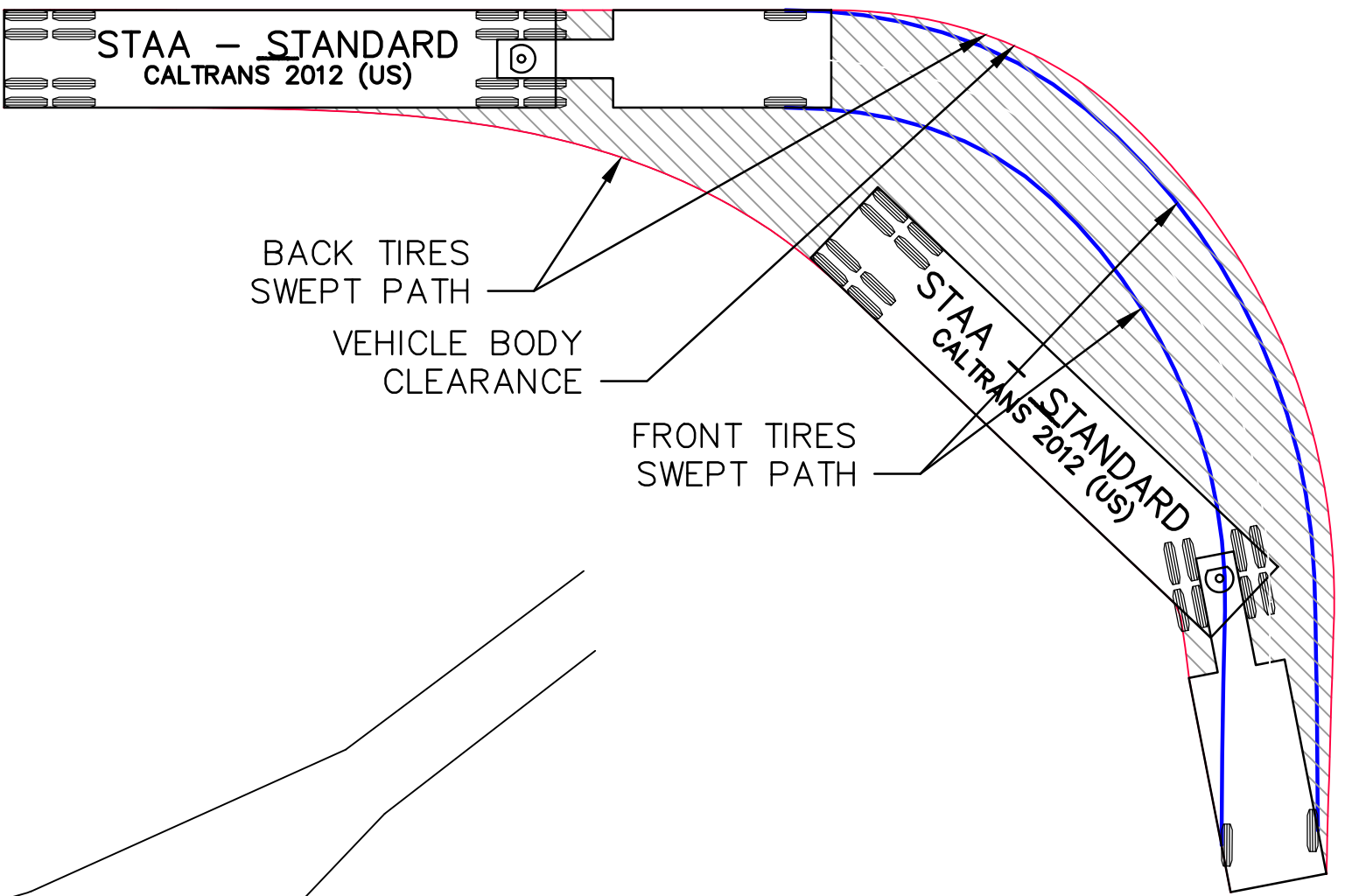


STAA - STANDARD feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

TRUCK TURN - CAL LEGAL - EB/WB THRUS

LEGEND



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
MIDWAY & HEGAN Ln ROUNDABOUT

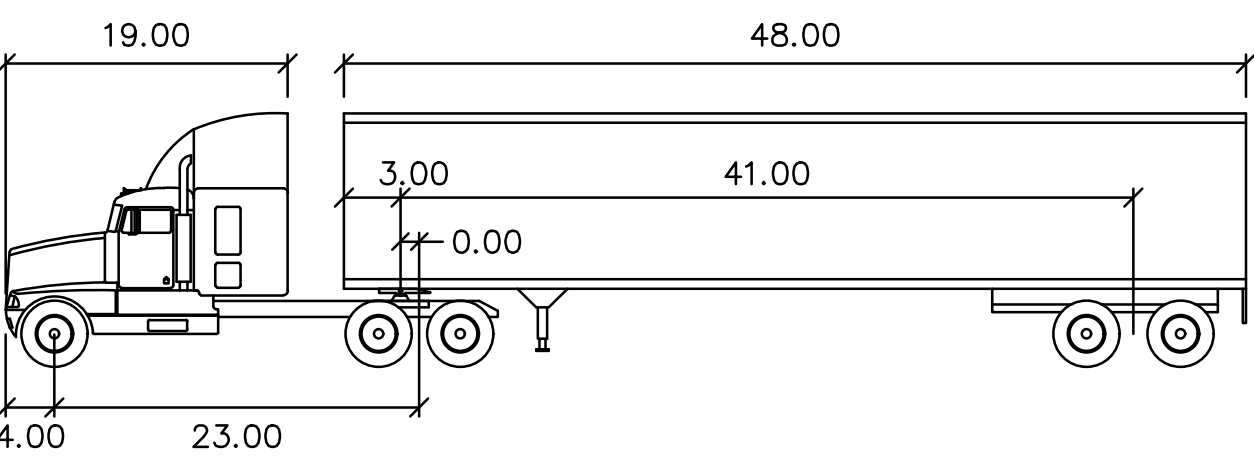


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FIGURE 4

VEHICLE PROFILE

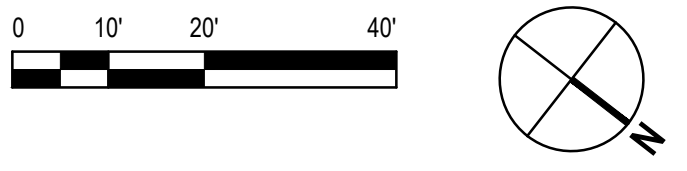
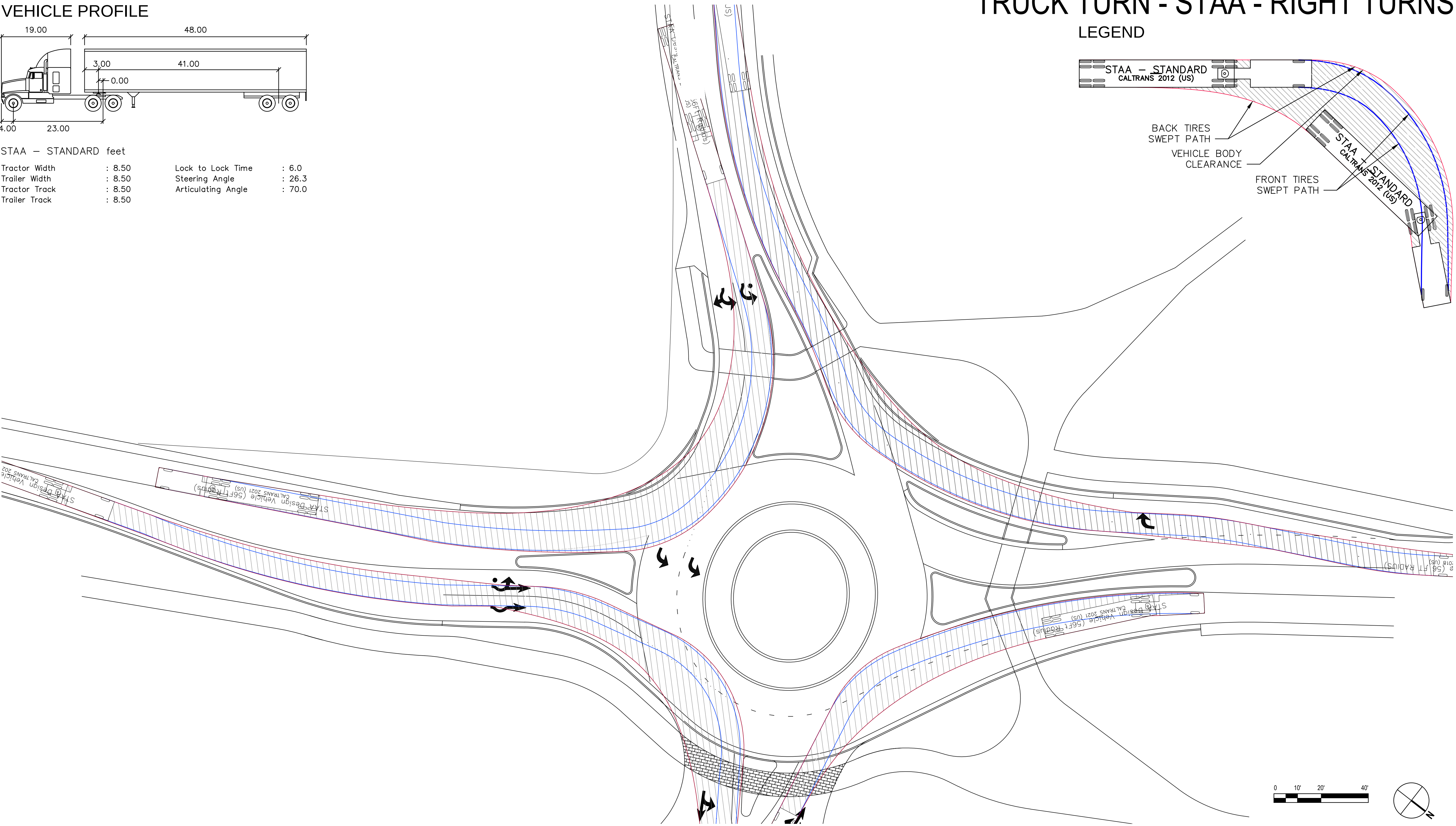
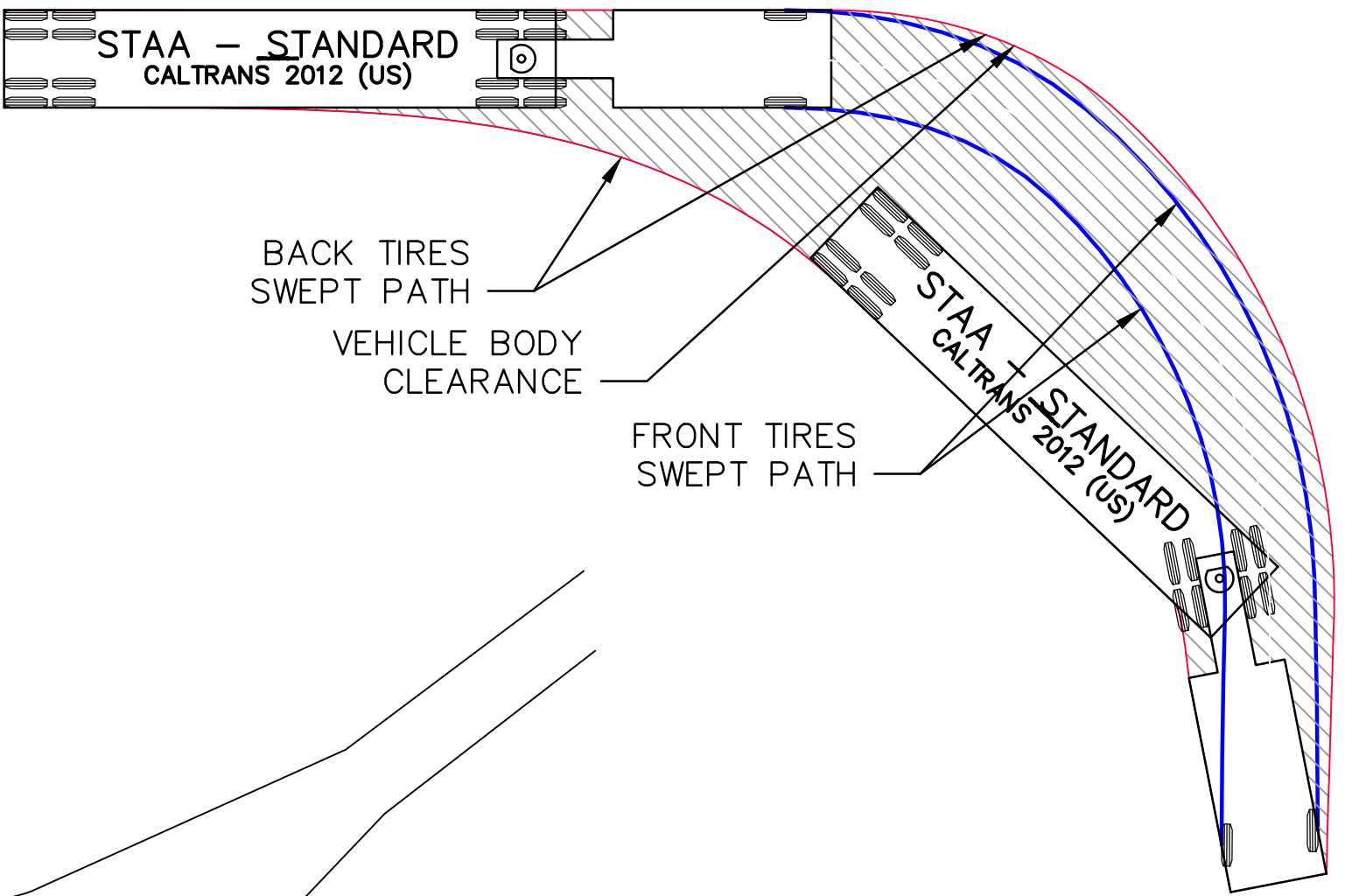


STAA - STANDARD feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

TRUCK TURN - STAA - RIGHT TURNS

LEGEND



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
MIDWAY & HEGAN Ln ROUNDABOUT

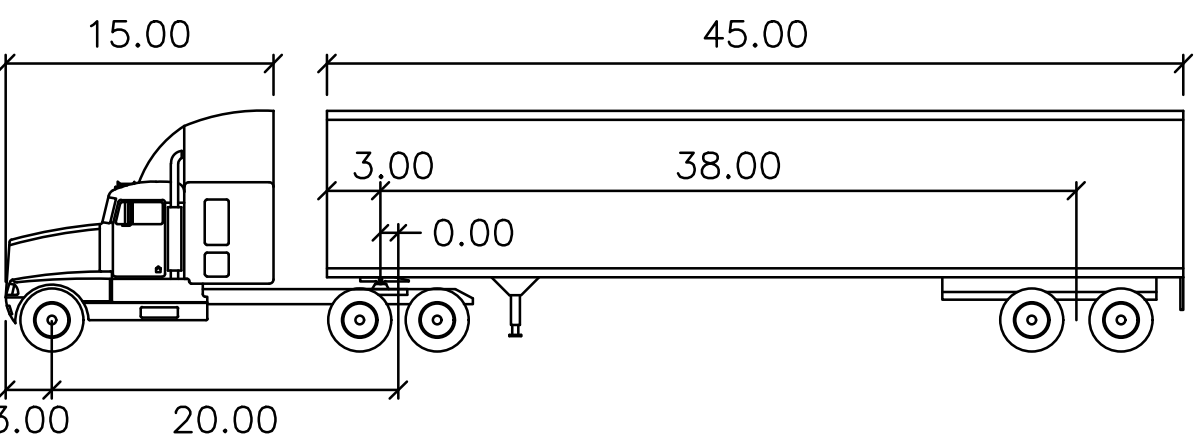


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FIGURE 5

VEHICLE PROFILE

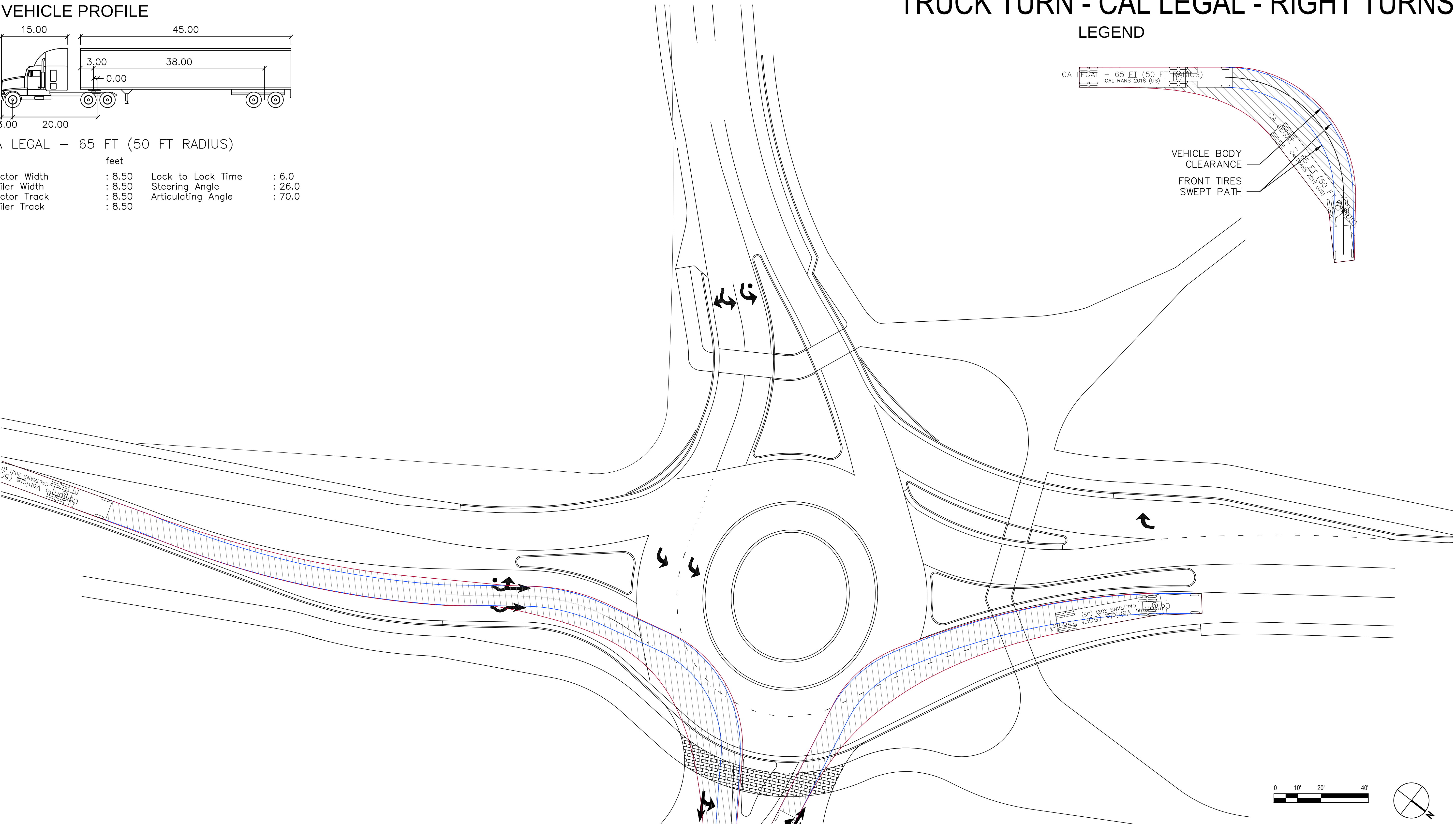
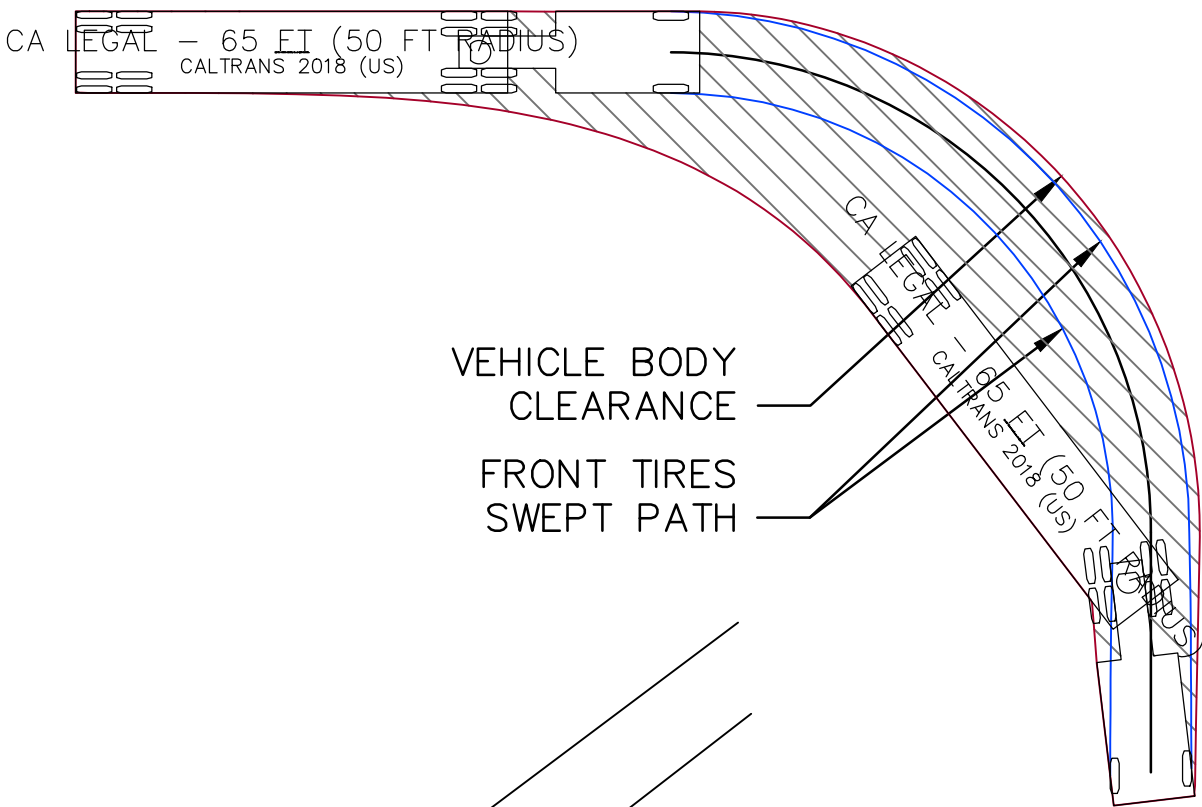


CA LEGAL – 65 FT (50 FT RADIUS)

	feet		
Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.0
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

TRUCK TURN - CAL LEGAL - RIGHT TURNS

LEGEND



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
MIDWAY & HEGAN Ln ROUNDABOUT

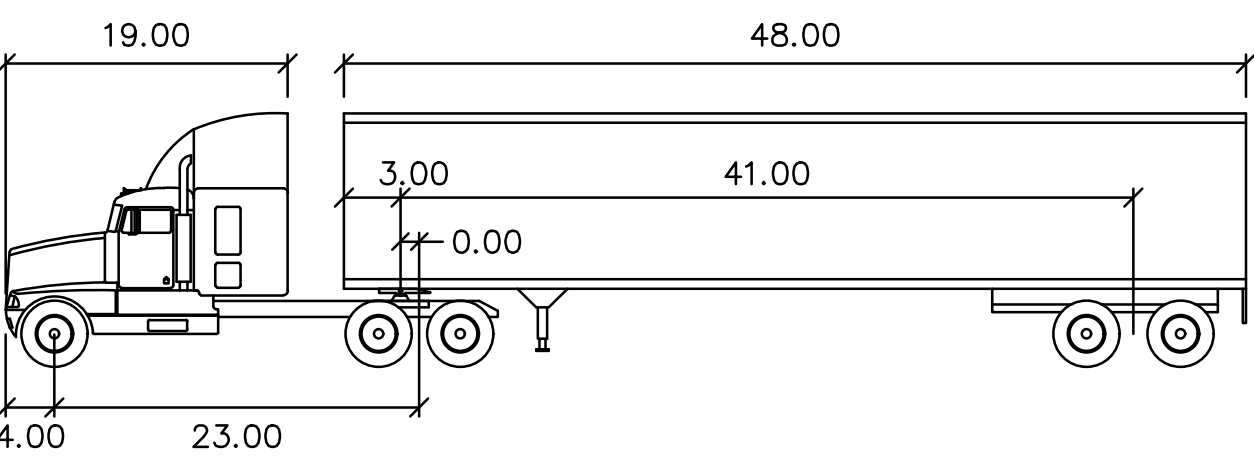


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FIGURE 5

VEHICLE PROFILE

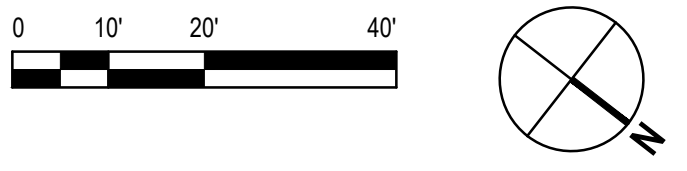
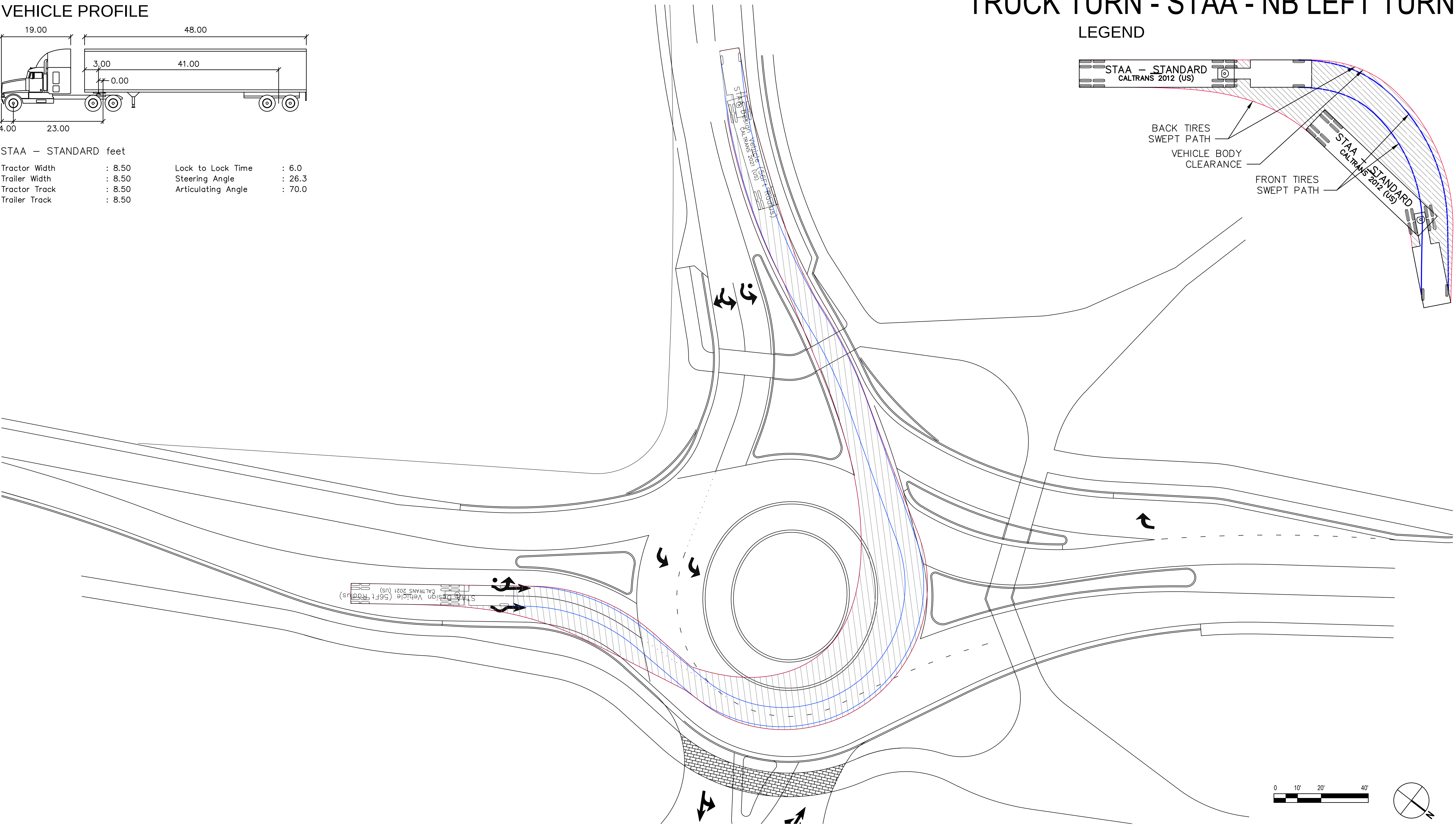
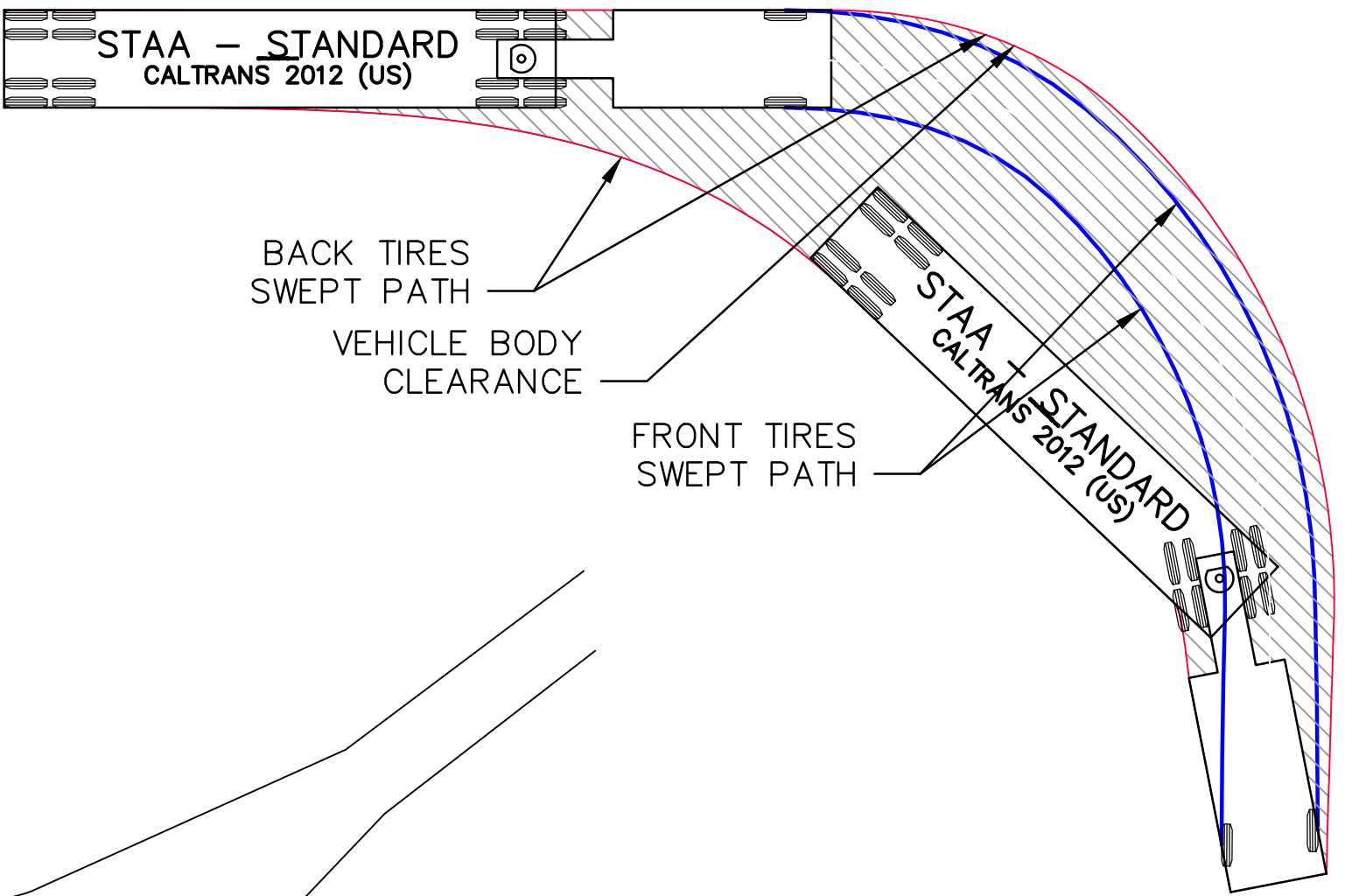


STAA - STANDARD feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

TRUCK TURN - STAA - NB LEFT TURN

LEGEND



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
MIDWAY & HEGAN Ln ROUNDABOUT

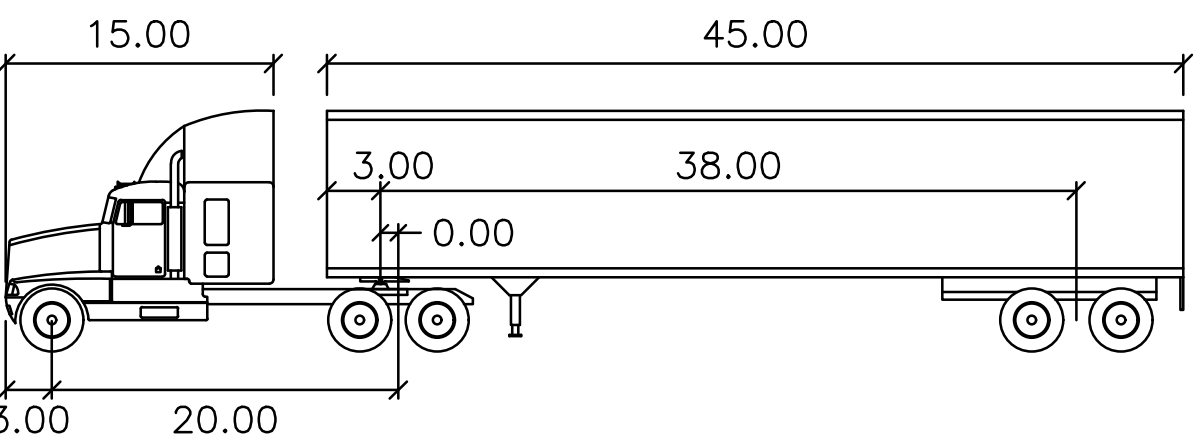


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FIGURE 6

VEHICLE PROFILE

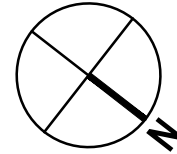
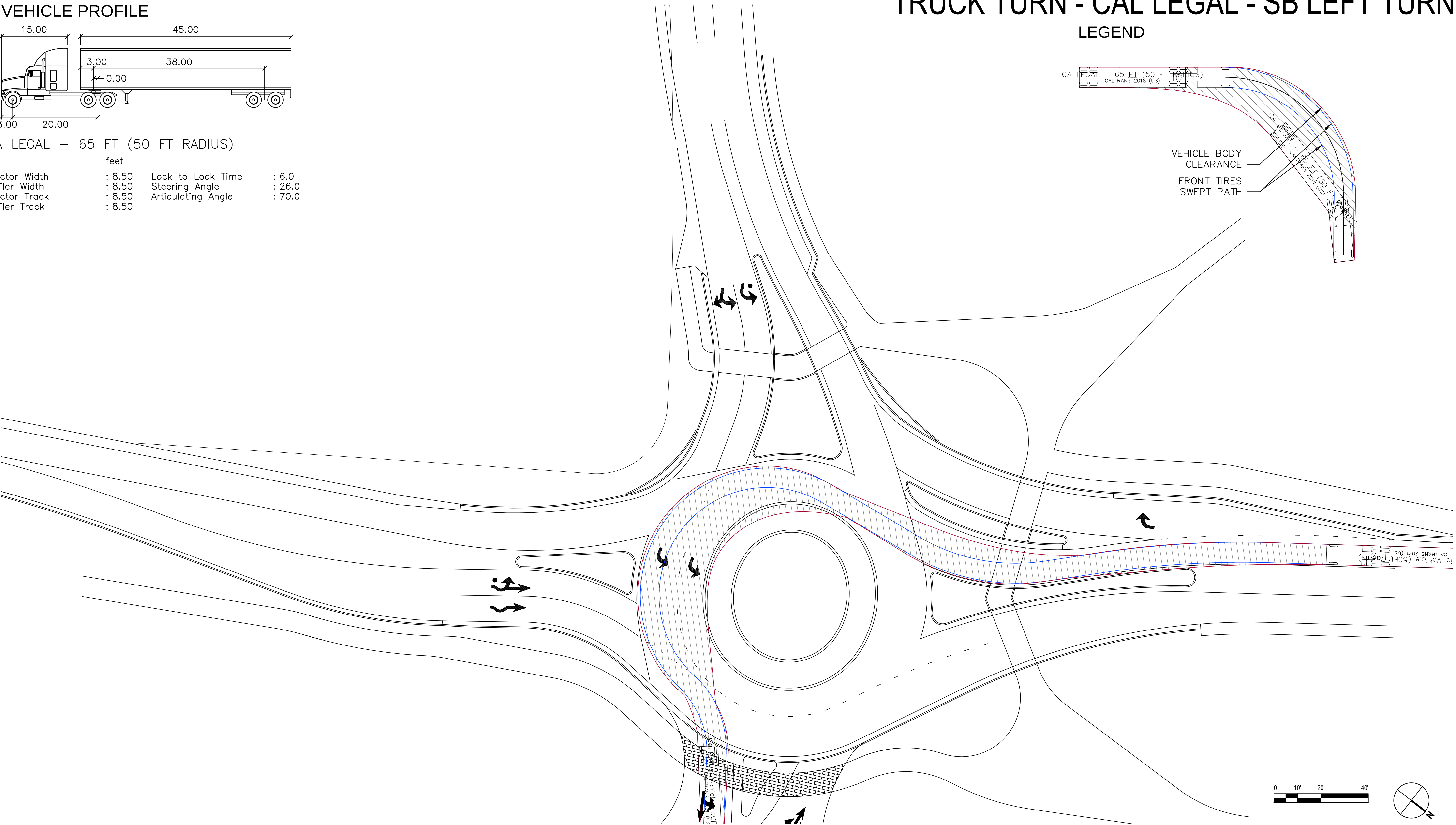
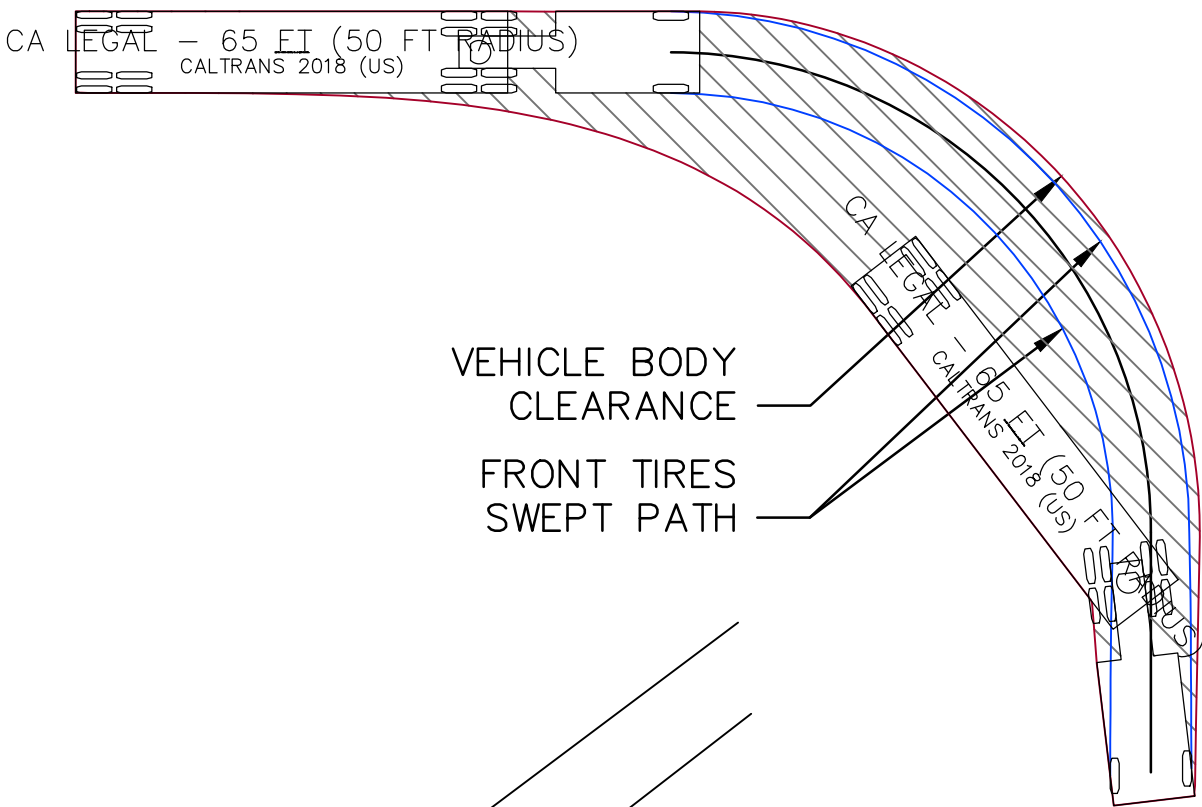


CA LEGAL - 65 FT (50 FT RADIUS)

	feet		
Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.0
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

TRUCK TURN - CAL LEGAL - SB LEFT TURN

LEGEND



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
MIDWAY & HEGAN Ln ROUNDABOUT

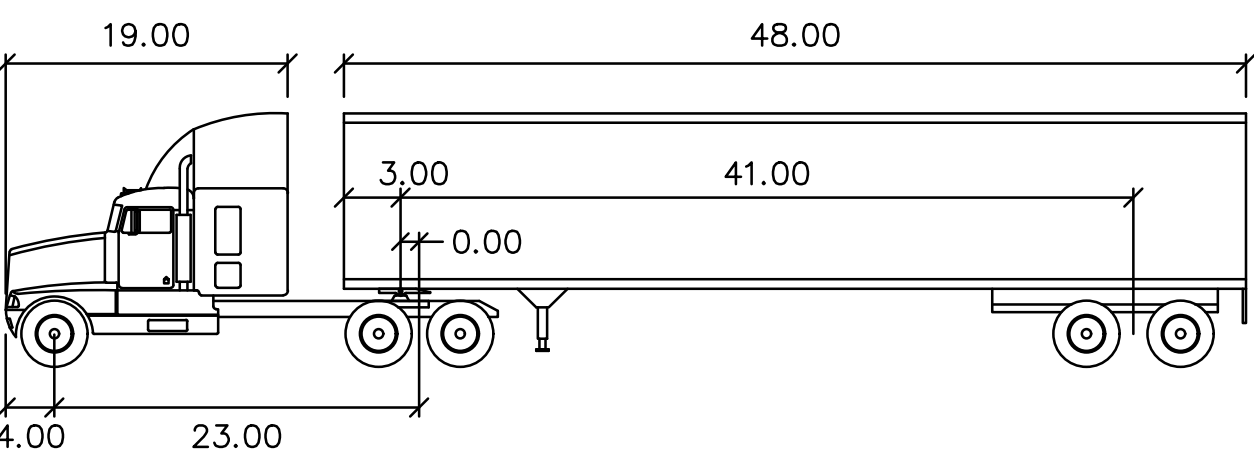


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FIGURE 6

VEHICLE PROFILE

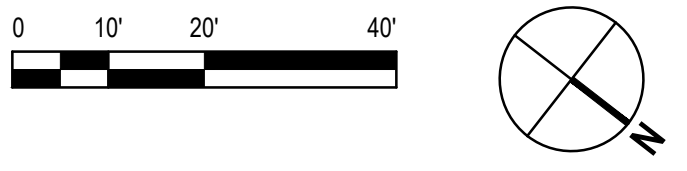
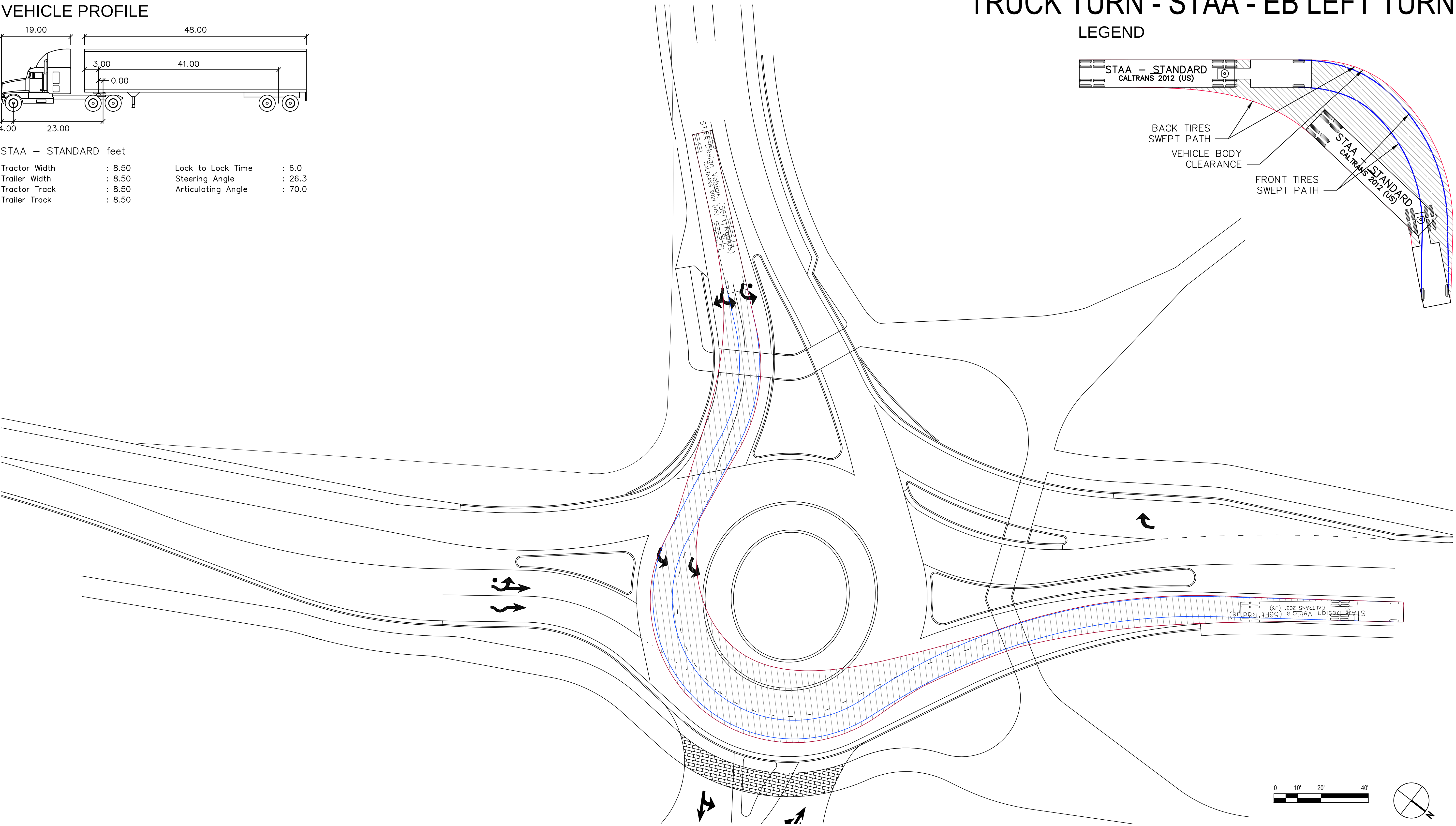
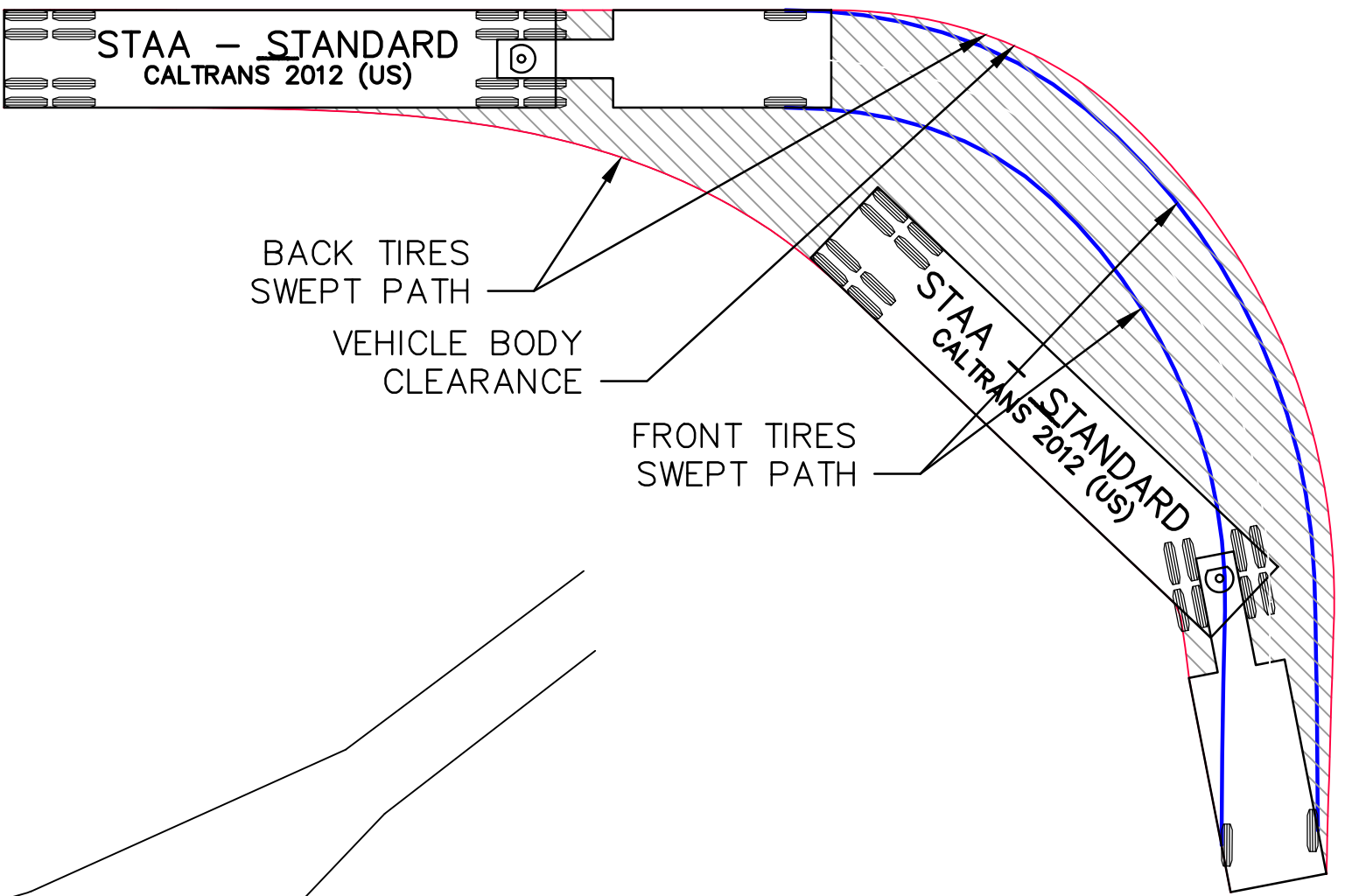


STAA - STANDARD feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

TRUCK TURN - STAA - EB LEFT TURN

LEGEND



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
MIDWAY & HEGAN Ln ROUNDABOUT

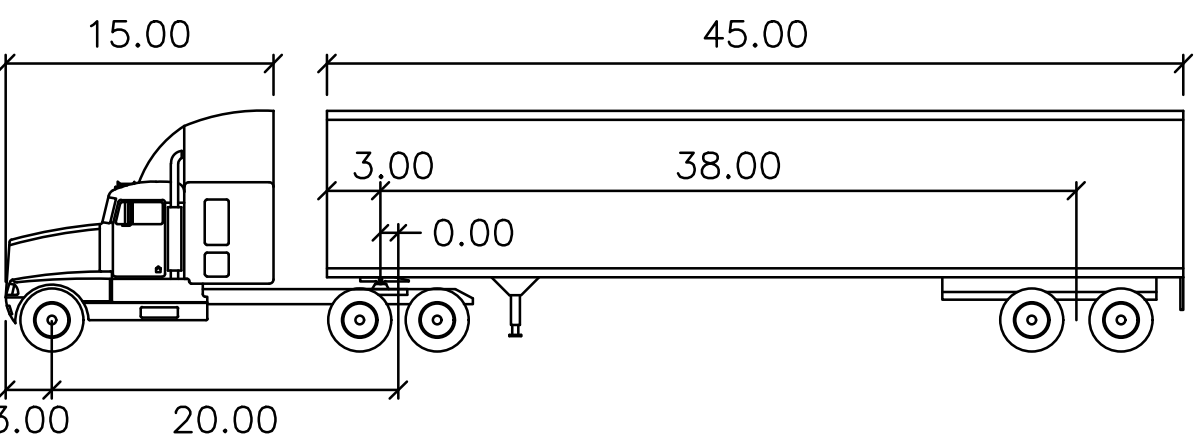


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FIGURE 7

VEHICLE PROFILE

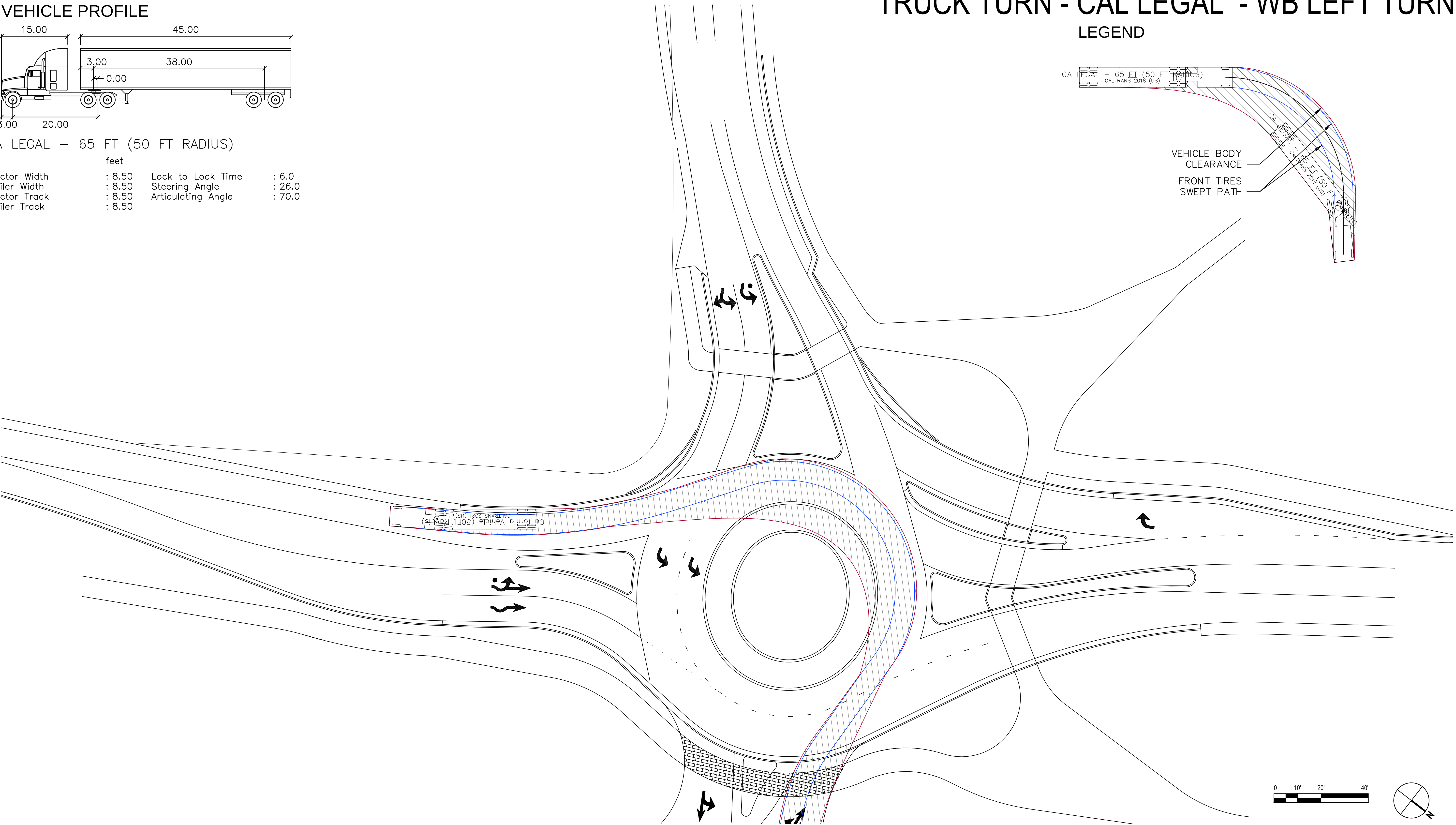
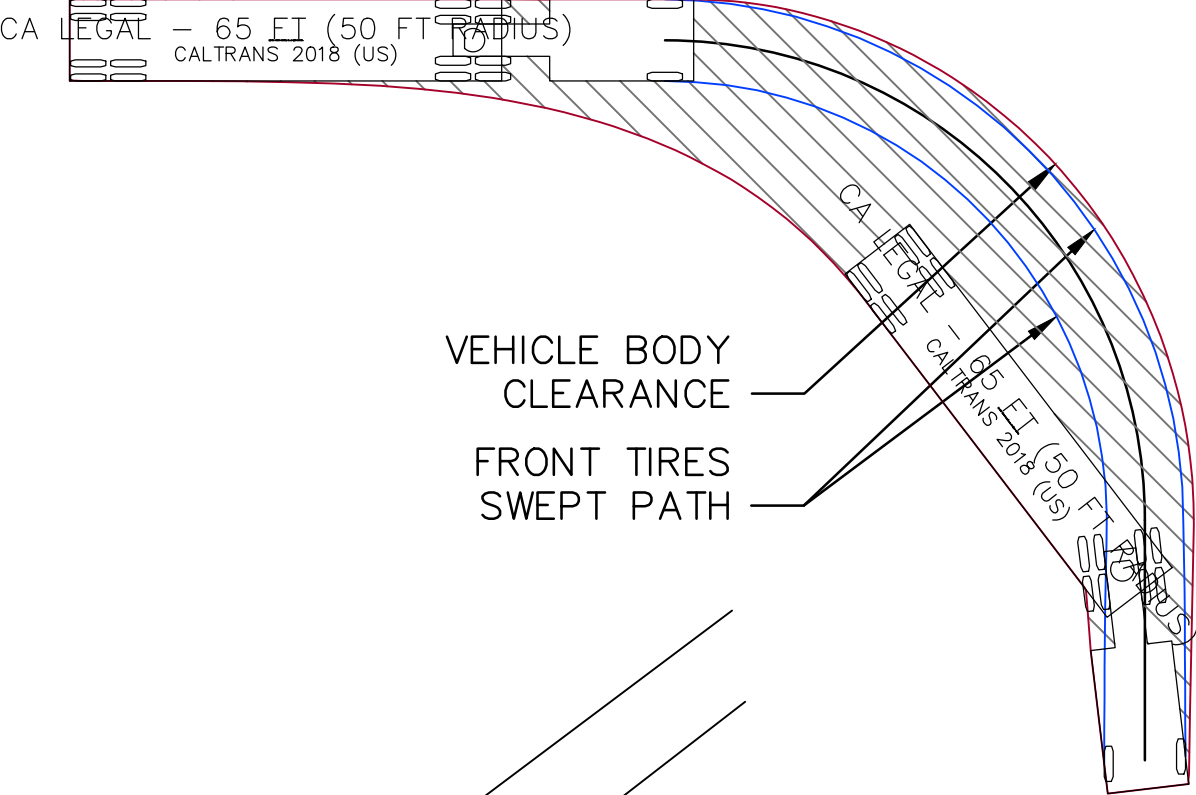


CA LEGAL - 65 FT (50 FT RADIUS)

	feet		
Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.0
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

TRUCK TURN - CAL LEGAL - WB LEFT TURN

LEGEND



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
MIDWAY & HEGAN Ln ROUNDABOUT

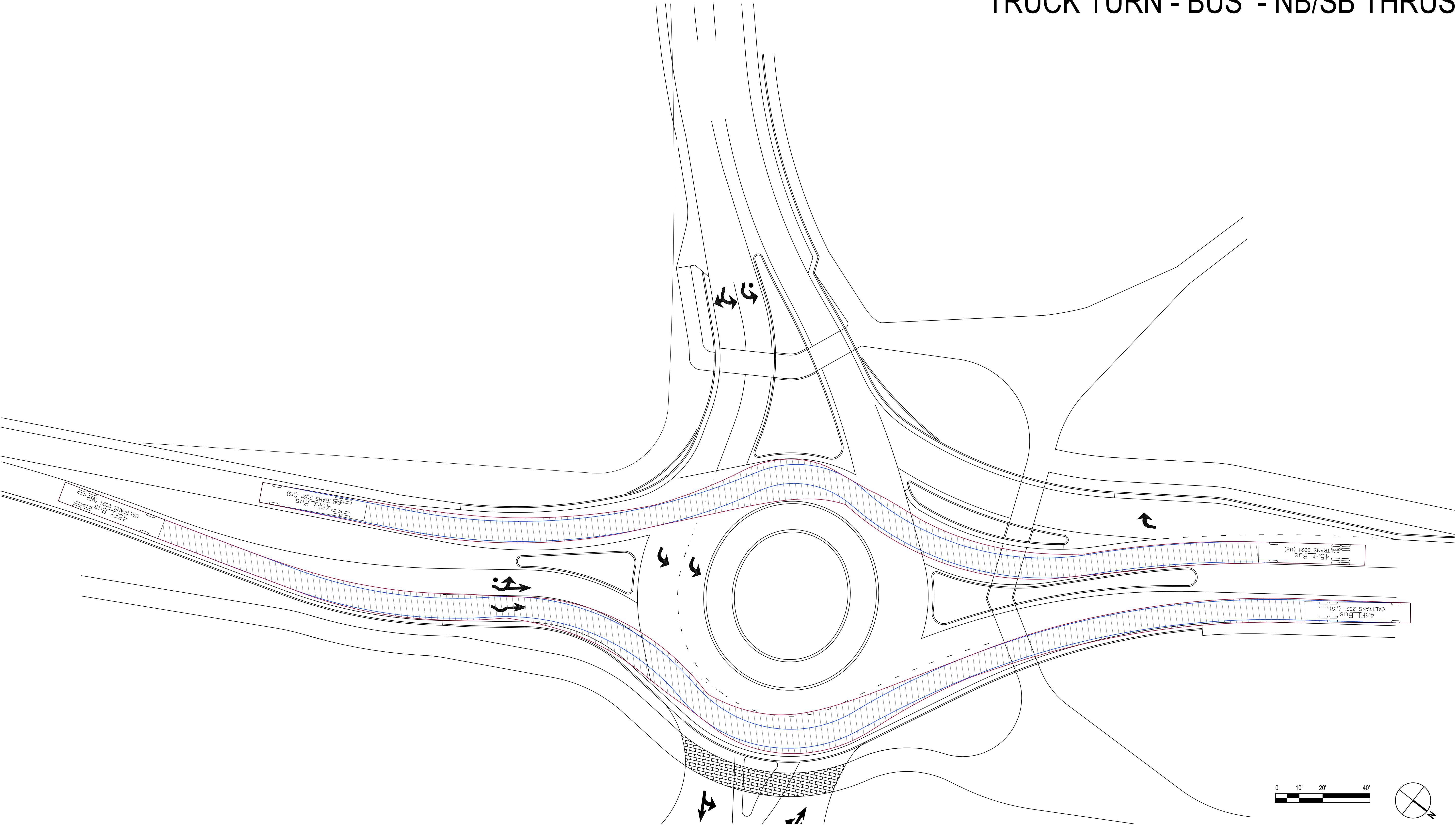


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FIGURE 8

TRUCK TURN - BUS - NB/SB THRUS



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
MIDWAY & HEGAN Ln ROUNDABOUT



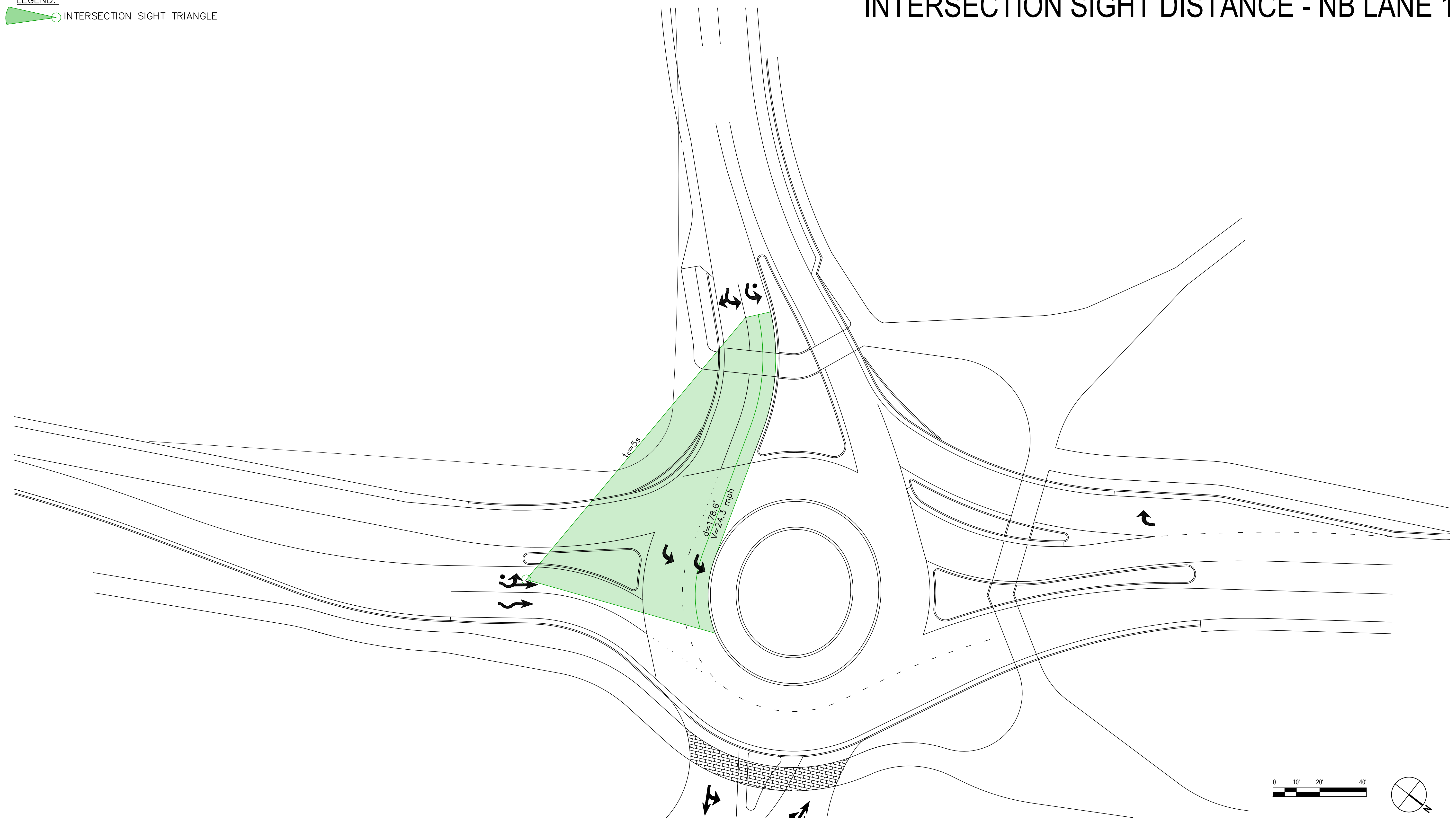
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FIGURE 9

LEGEND:
INTERSECTION SIGHT TRIANGLE

INTERSECTION SIGHT DISTANCE - NB LANE 1



PRELIMINARY
SUBJECT TO CHANGE

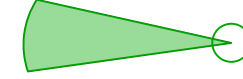
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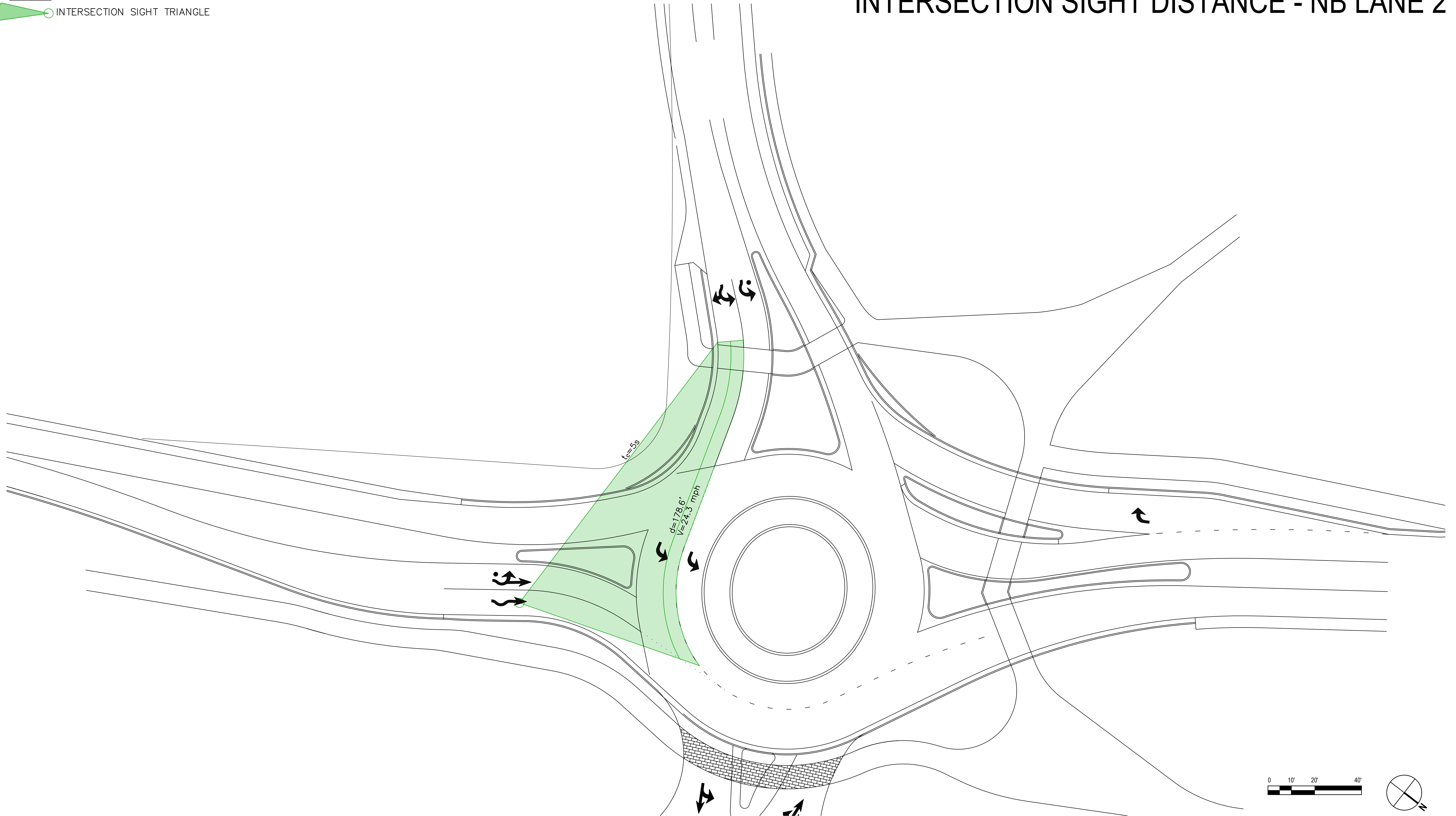
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FIGURE 10

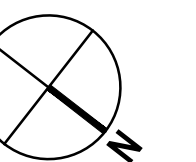
LEGEND:

 INTERSECTION SIGHT TRIANGLE

INTERSECTION SIGHT DISTANCE - NB LANE 2



0 10' 20' 40'



PRELIMINARY
SUBJECT TO CHANGE

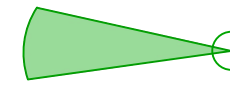
HEGAN Ln CONGESTION RELIEF PROJECT MIDWAY & HEGAN Ln ROUNDABOUT



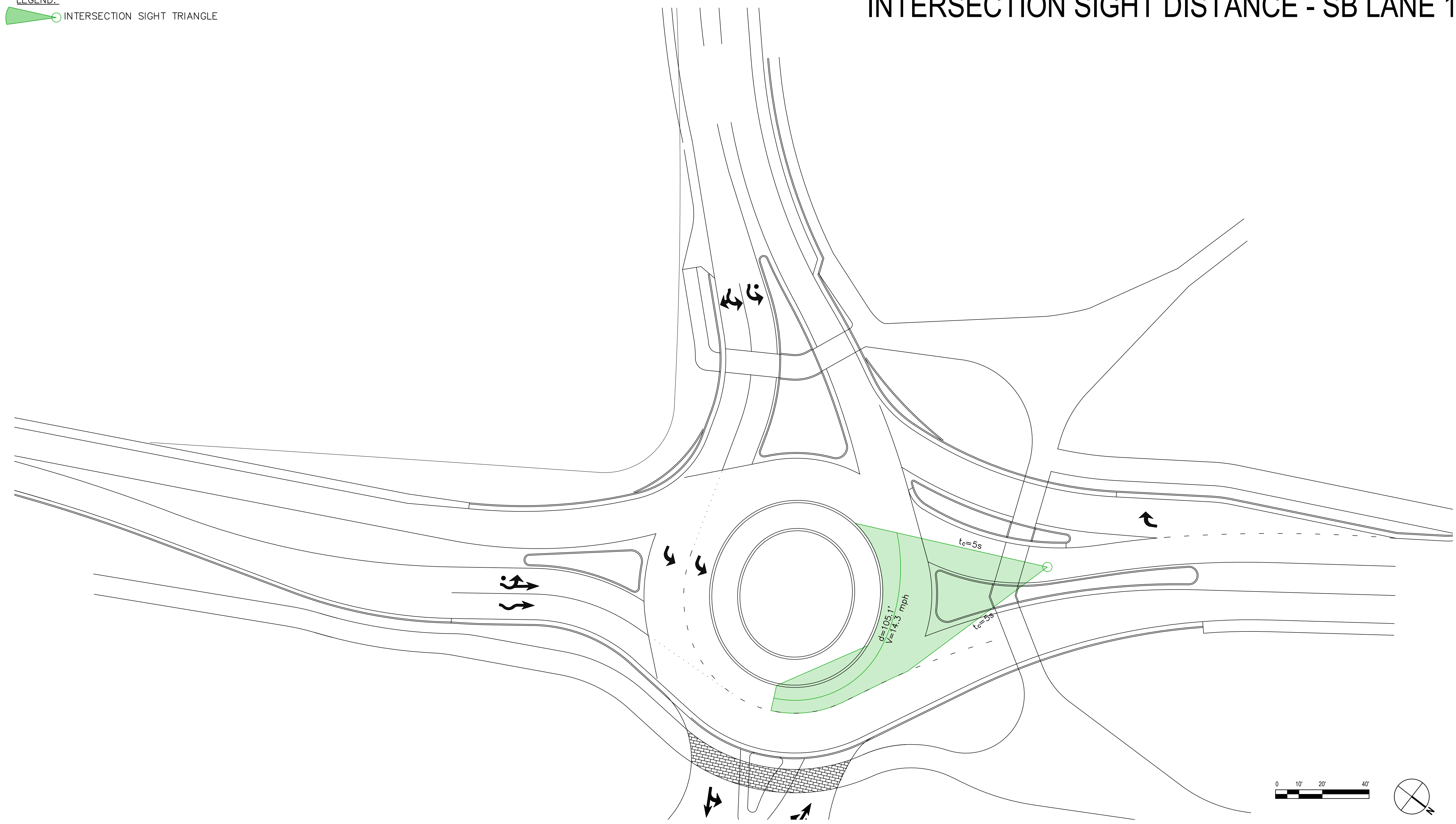
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FIGURE 11

LEGEND:
 INTERSECTION SIGHT TRIANGLE

INTERSECTION SIGHT DISTANCE - SB LANE 1



PRELIMINARY
SUBJECT TO CHANGE

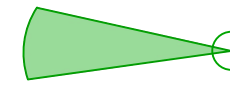
HEGAN Ln CONGESTION RELIEF PROJECT MIDWAY & HEGAN Ln ROUNDABOUT



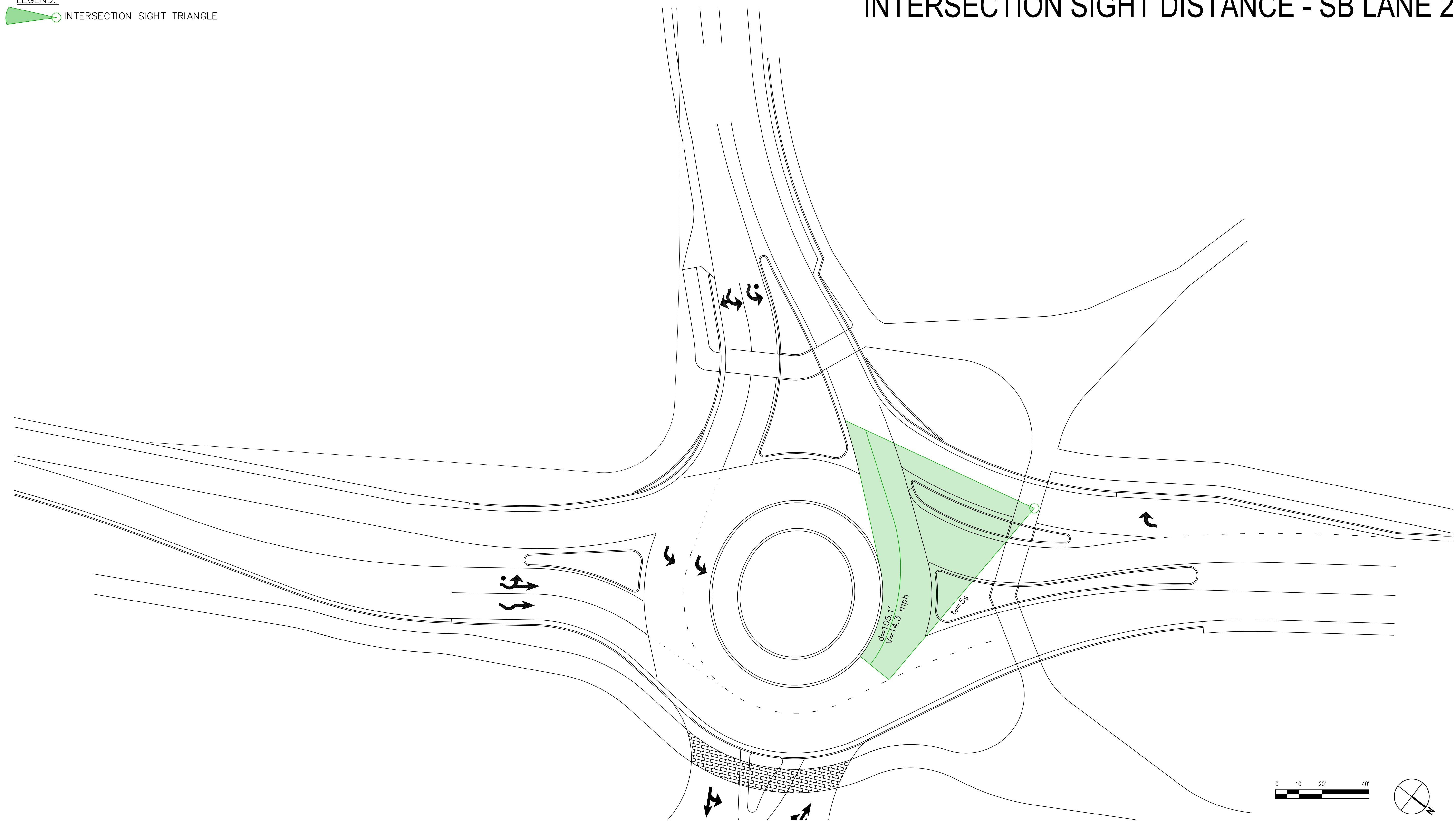
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FIGURE 12

LEGEND:
 INTERSECTION SIGHT TRIANGLE

INTERSECTION SIGHT DISTANCE - SB LANE 2



PRELIMINARY
SUBJECT TO CHANGE

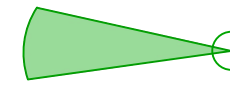
HEGAN Ln CONGESTION RELIEF PROJECT MIDWAY & HEGAN Ln ROUNDABOUT



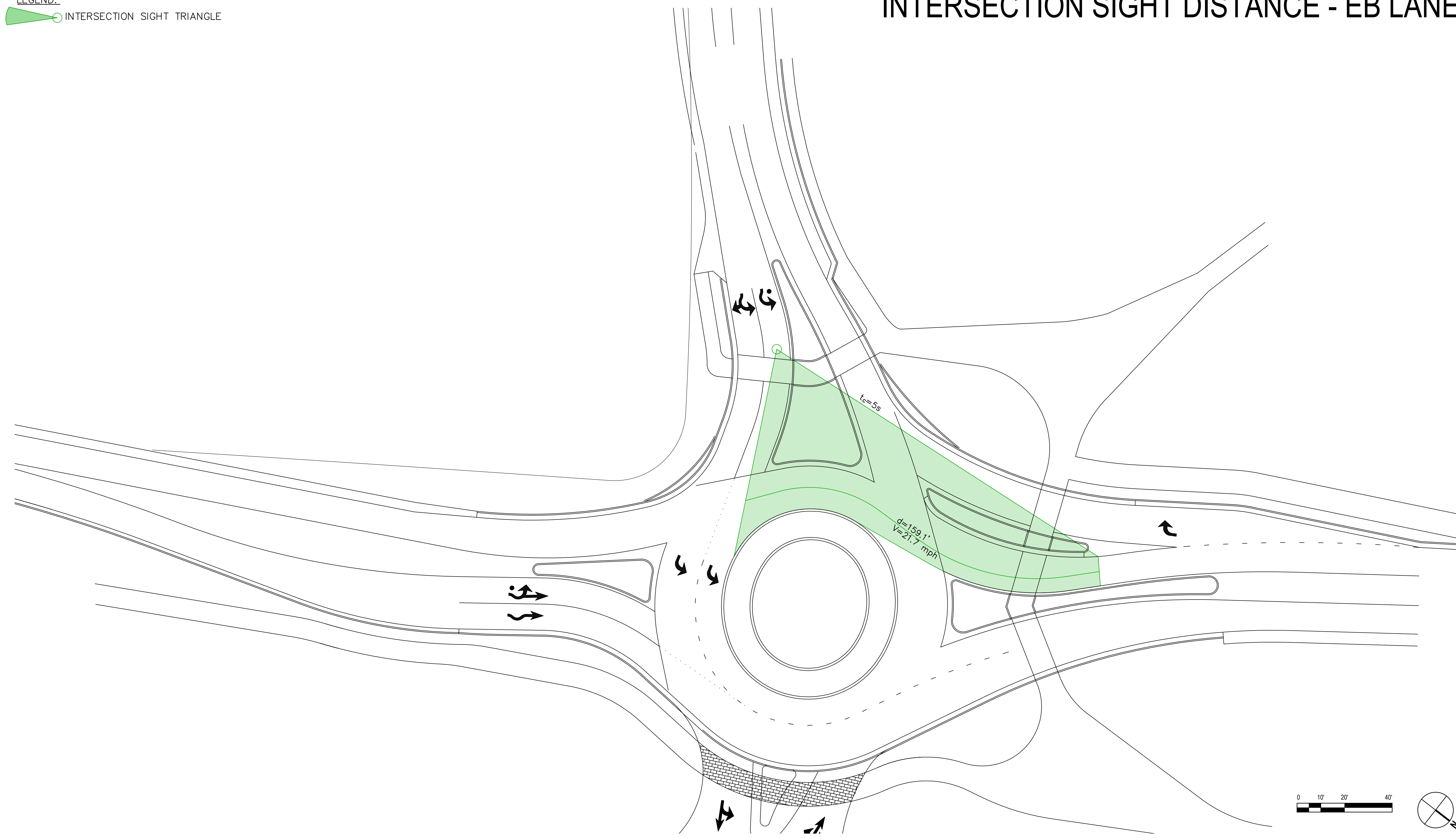
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FIGURE 13

LEGEND:
 INTERSECTION SIGHT TRIANGLE

INTERSECTION SIGHT DISTANCE - EB LANE 1



PRELIMINARY
SUBJECT TO CHANGE

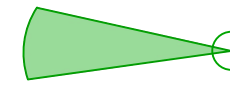
HEGAN Ln CONGESTION RELIEF PROJECT MIDWAY & HEGAN Ln ROUNDABOUT



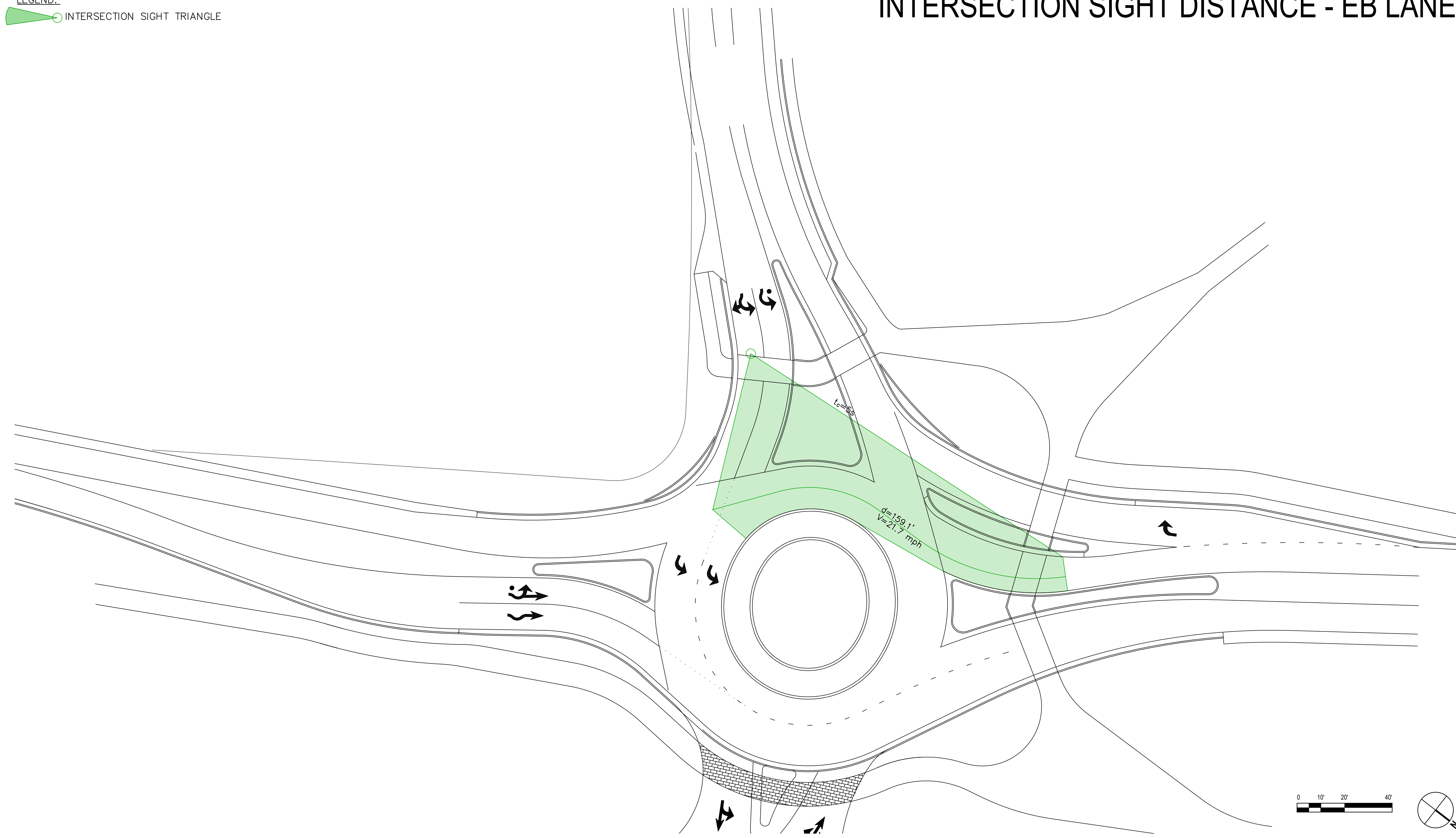
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FIGURE 14

LEGEND:
 INTERSECTION SIGHT TRIANGLE

INTERSECTION SIGHT DISTANCE - EB LANE 2



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SUBJECT TO CHANGE

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FIGURE 15

LEGEND:

INTERSECTION SIGHT TRIANGLE

INTERSECTION SIGHT DISTANCE - WB DRIVEWAY



PRELIMINARY
SUBJECT TO CHANGE

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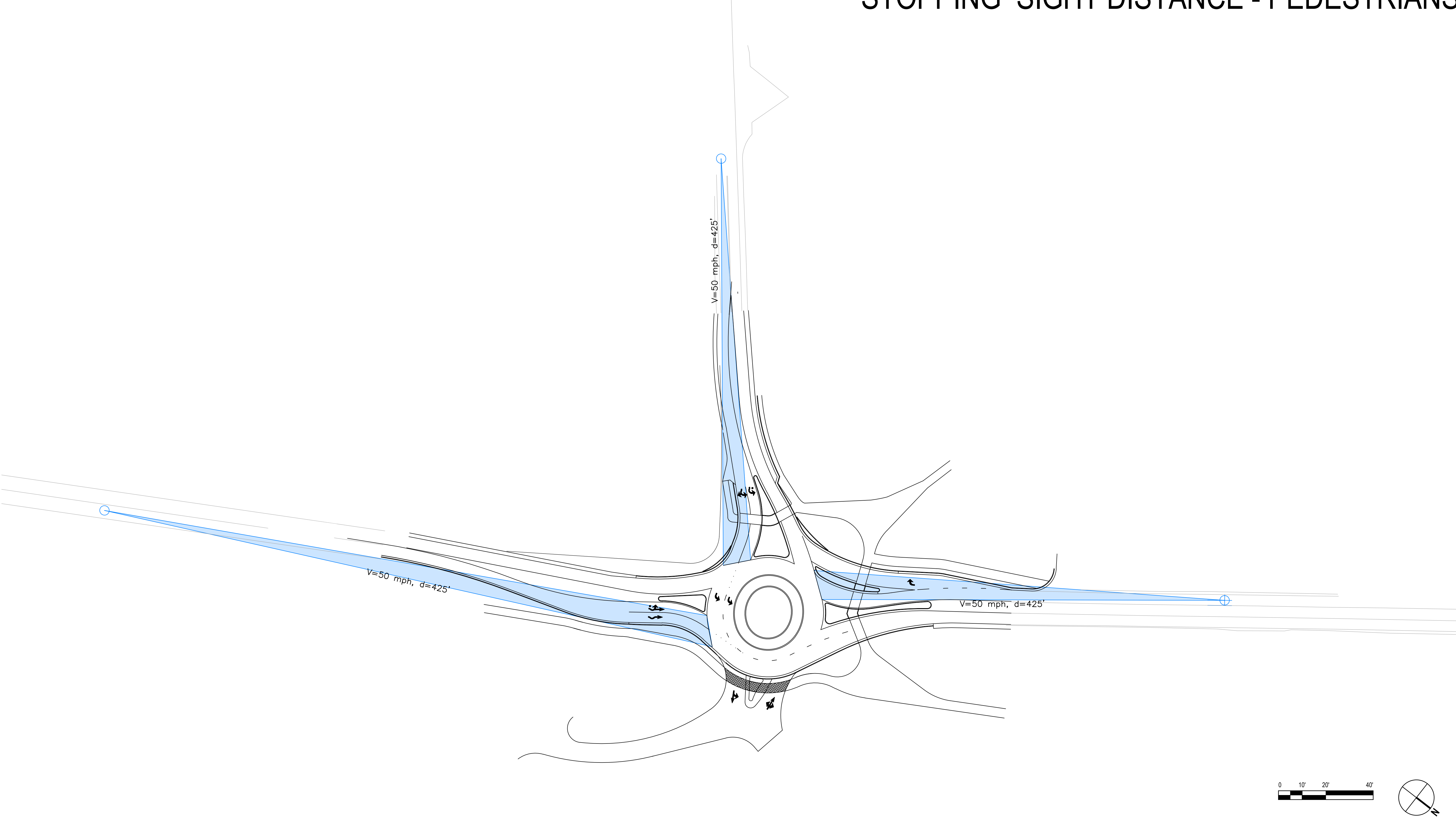


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FIGURE 16

STOPPING SIGHT DISTANCE - PEDESTRIANS



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
MIDWAY & HEGAN Ln ROUNDABOUT



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FIGURE 18

Technical drawing of a truck with dimensions in meters. The drawing shows the side profile of the truck, including the cab and the trailer. The dimensions are as follows:

- Overall length: 45.00
- Overall width: 3.00
- Cab width: 15.00
- Cab height: 3.00
- Trailer length: 38.00
- Trailer height: 0.00
- Trailer width: 20.00

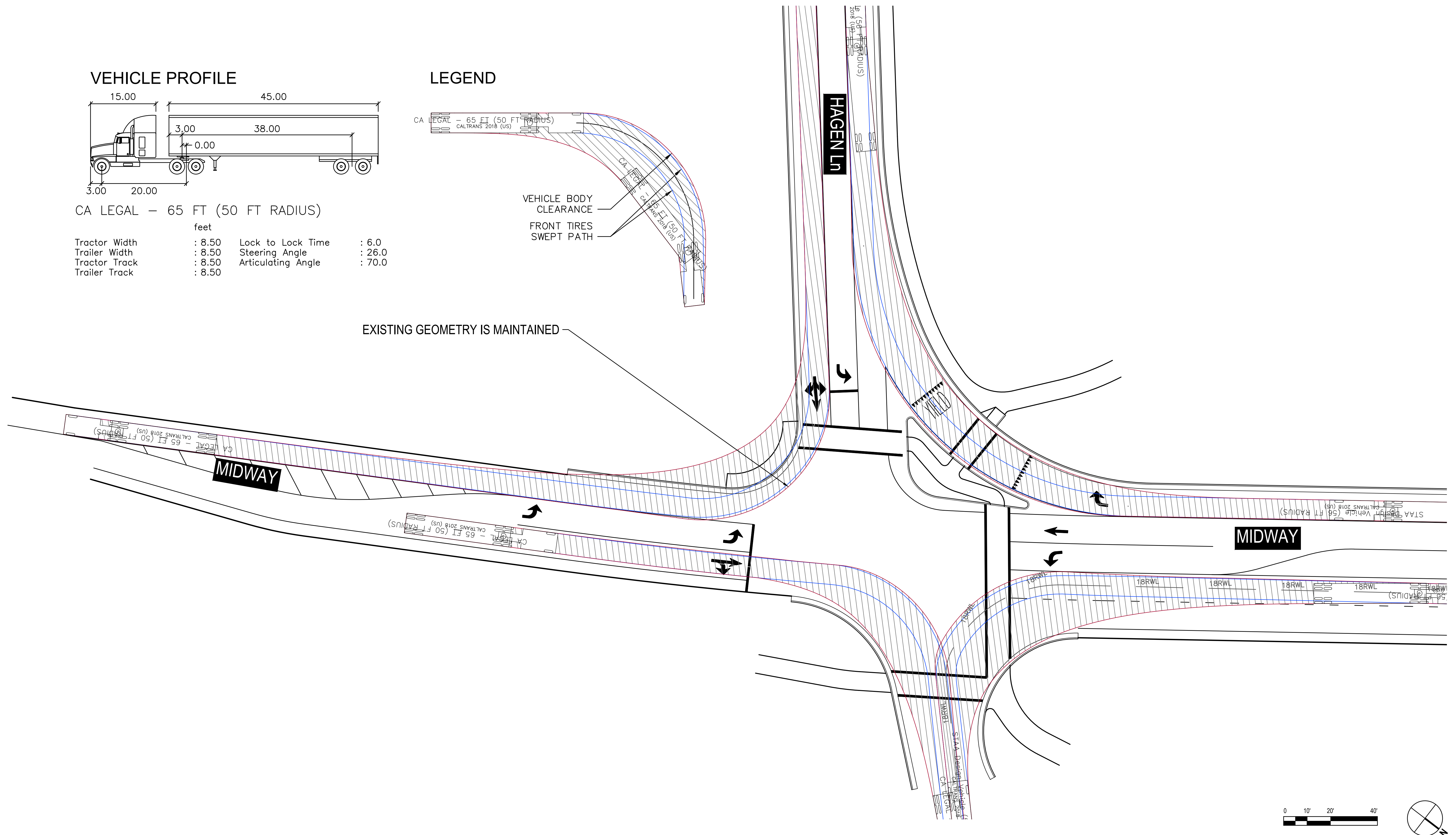
feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.0
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

Diagram illustrating the vehicle body clearance and front tires swept path during a turn. The diagram shows a vehicle's path (swept path) and the resulting clearance area. Key dimensions and labels include:

- CA LEGAL ~ 65 FT (50 FT RADIUS)
- CALTRANS 2018 (US)
- VEHICLE BODY CLEARANCE
- FRONT TIRES SWEEP PATH
- CA LEGAL ~ 65 FT (50 FT RADIUS)
- CALTRANS 2018 (US)

EXISTING GEOMETRY IS MAINTAINED



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT MIDWAY & HEGAN SIGNAL

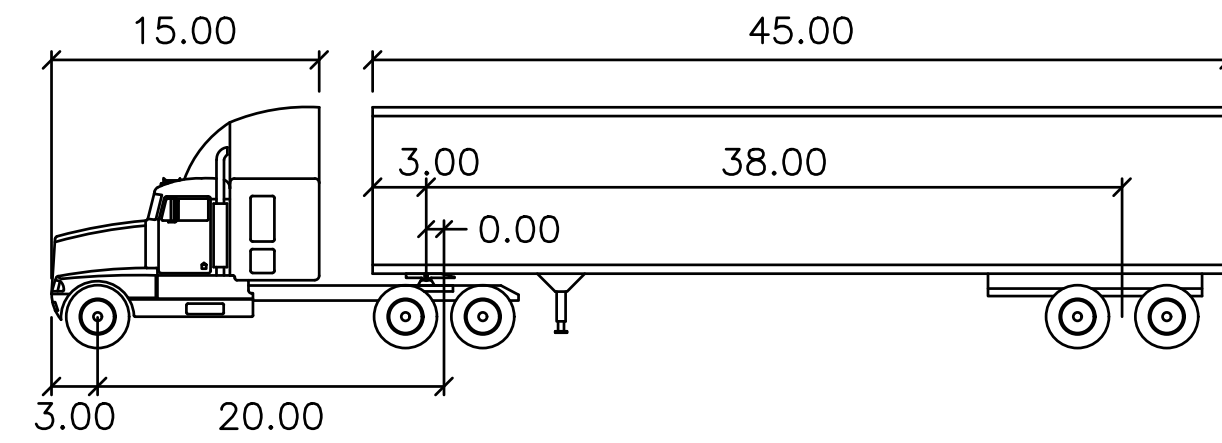


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FIGURE 1

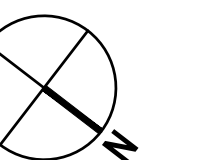
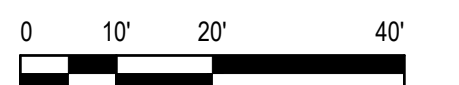
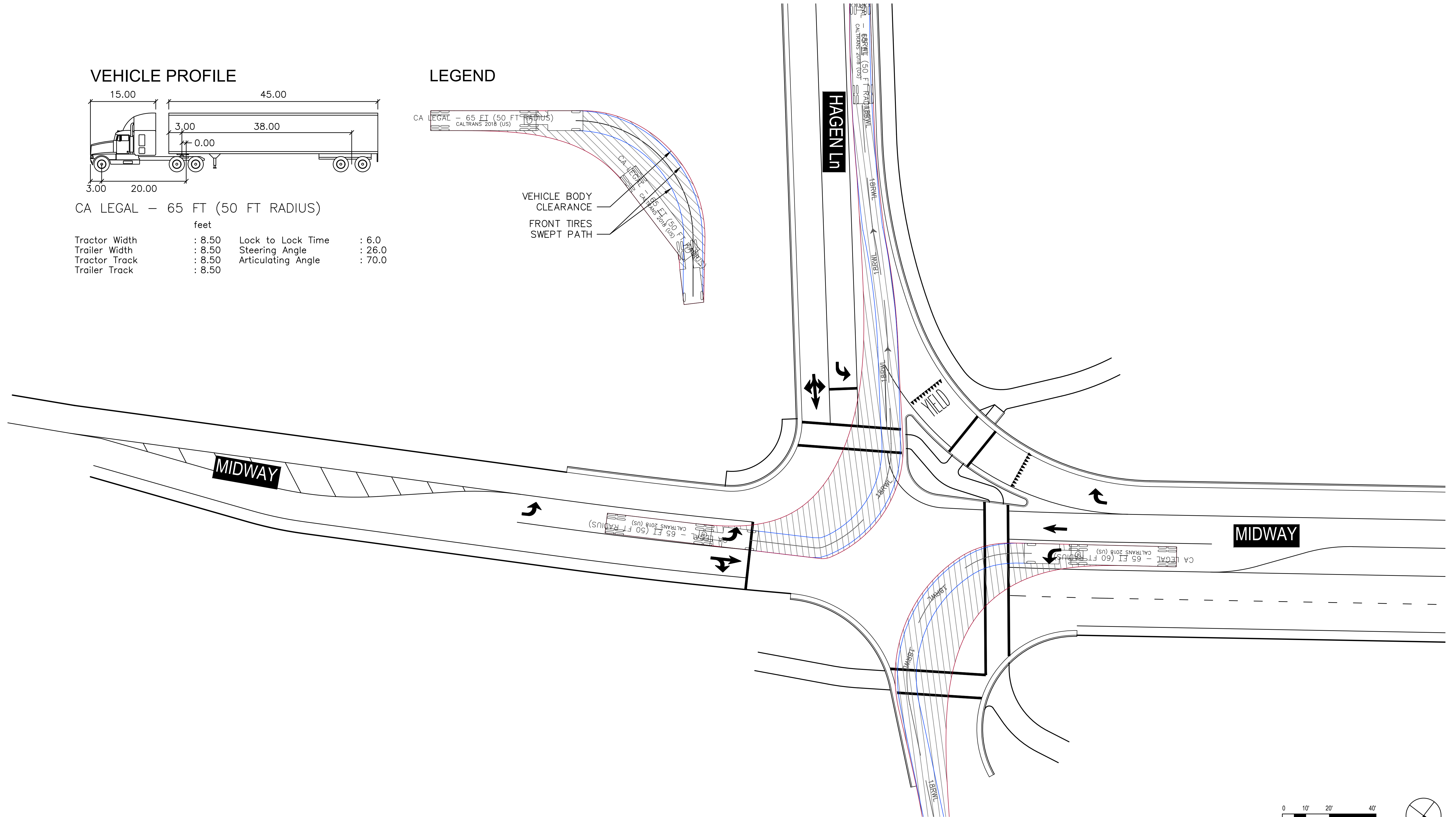
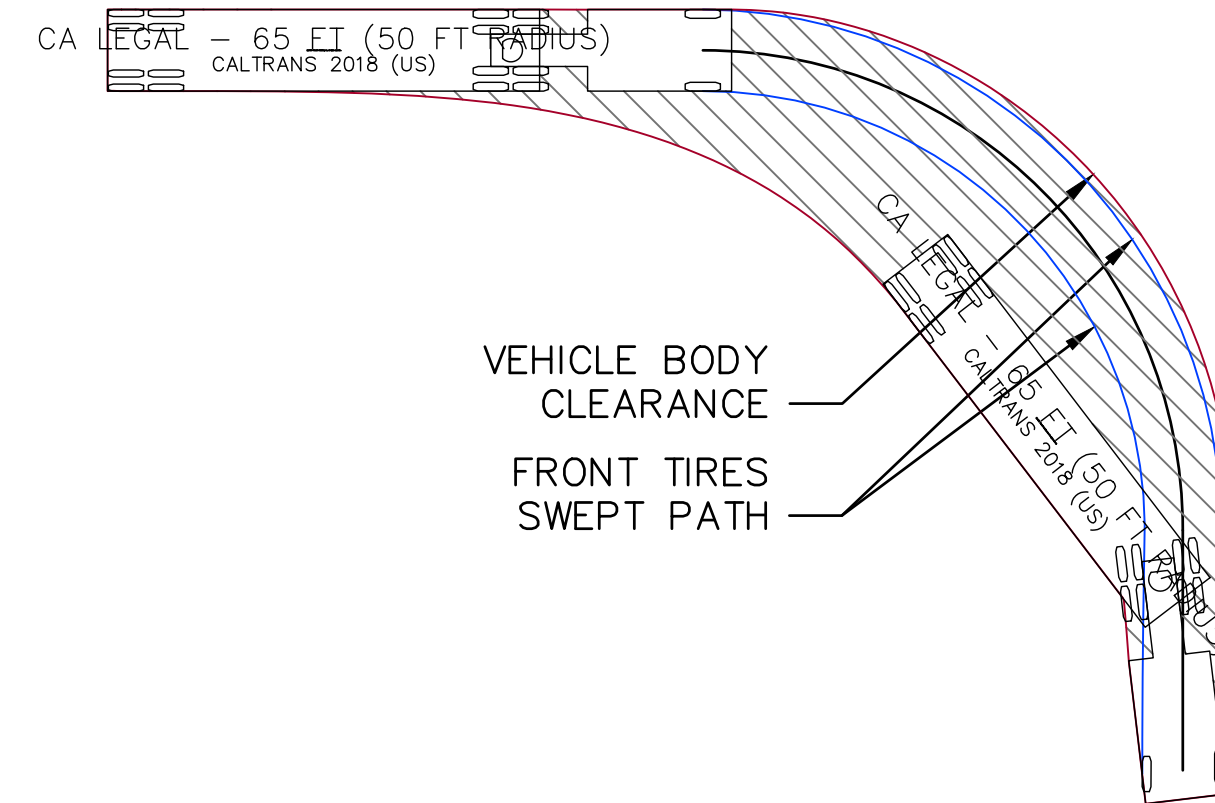
VEHICLE PROFILE



CA LEGAL — 65 FT (50 FT RADIUS)

	feet		
Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.0
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

LEGEND



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT MIDWAY & HEGAN SIGNAL

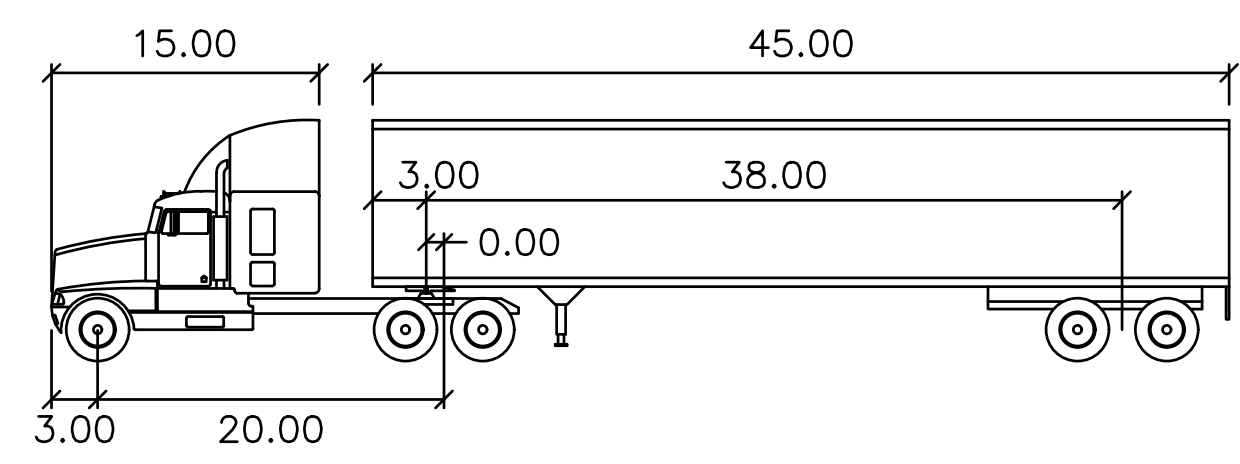


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FIGURE 2

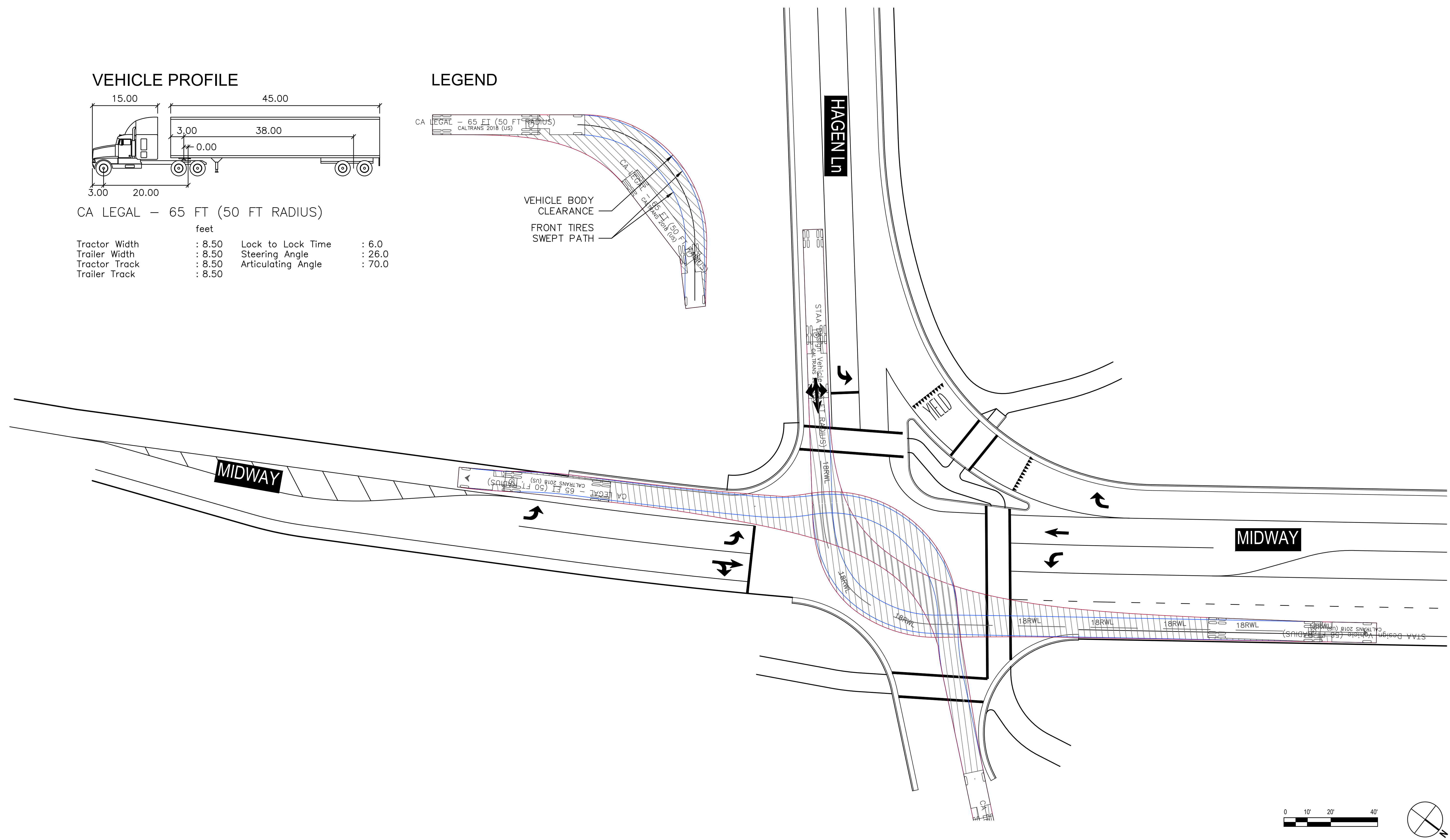
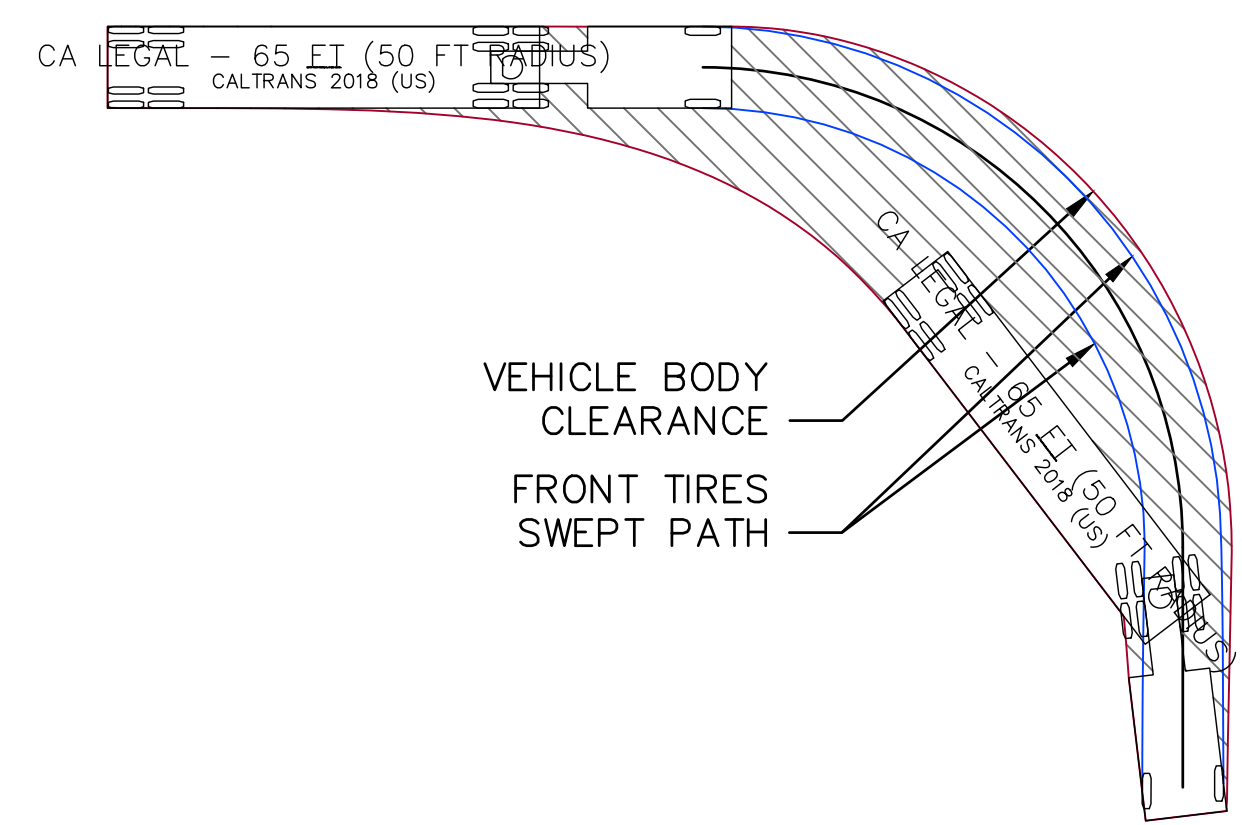
VEHICLE PROFILE



CA LEGAL - 65 FT (50 FT RADIUS)

	feet		
Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.0
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

LEGEND



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT MIDWAY & HEGAN SIGNAL

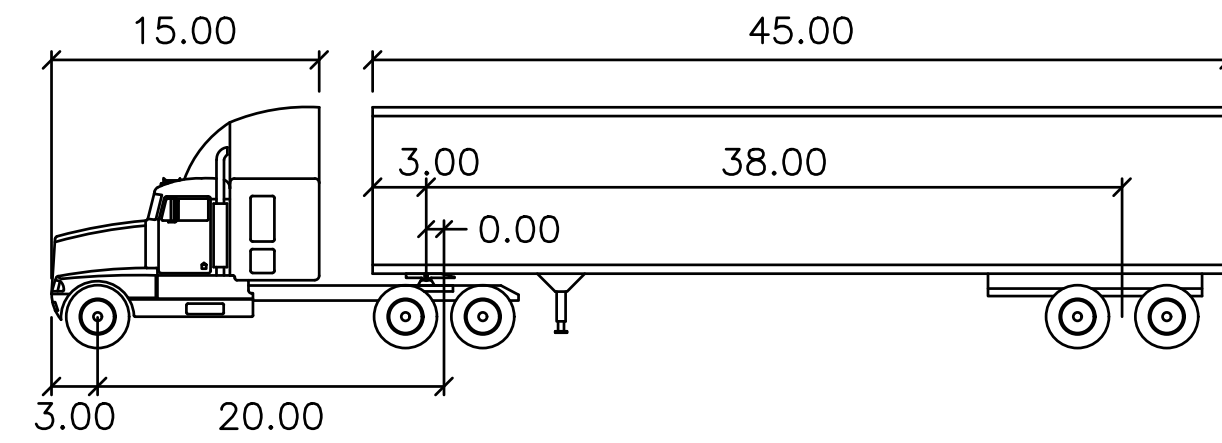


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FIGURE 3

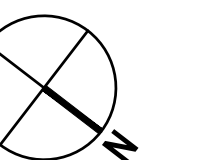
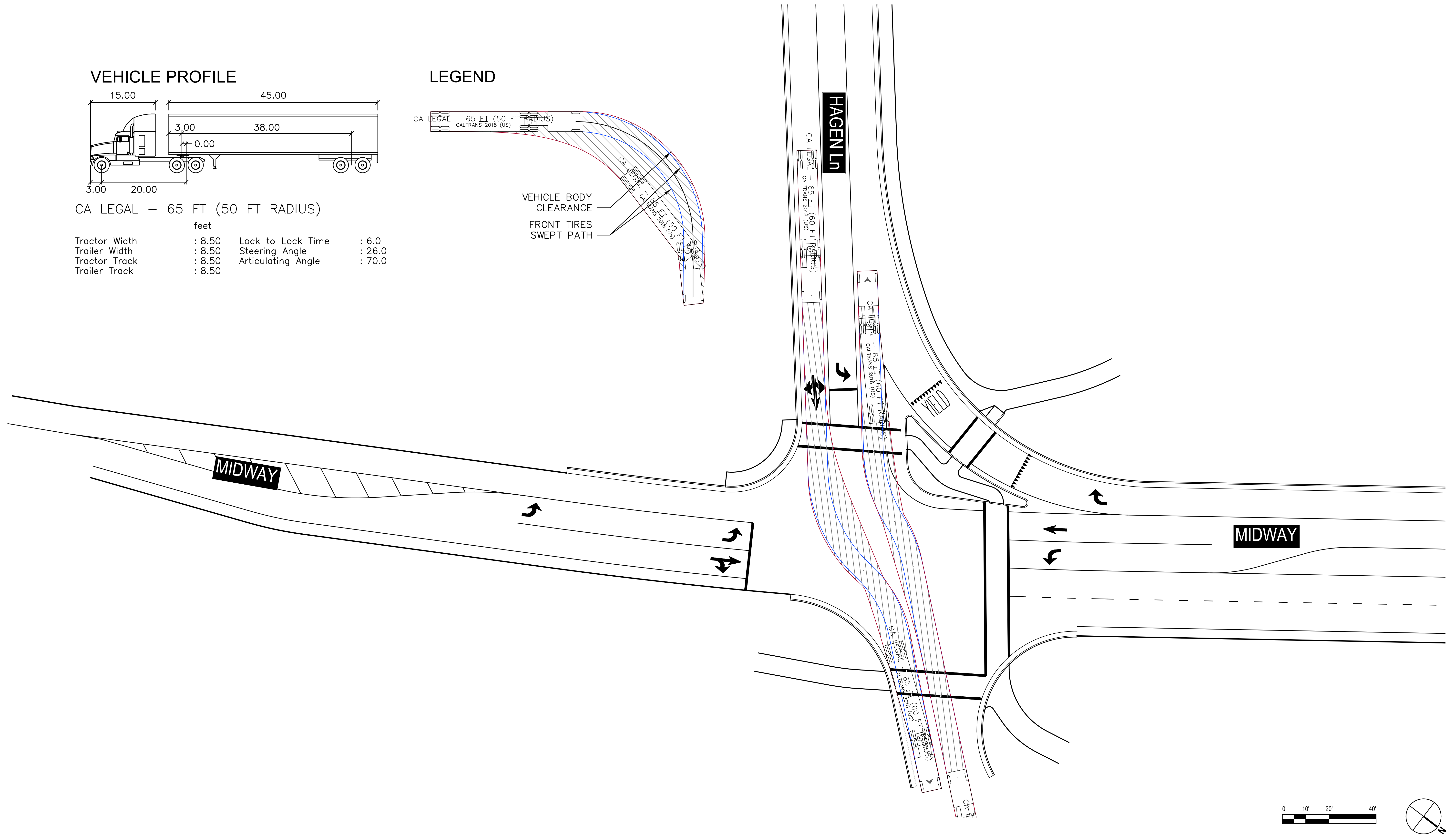
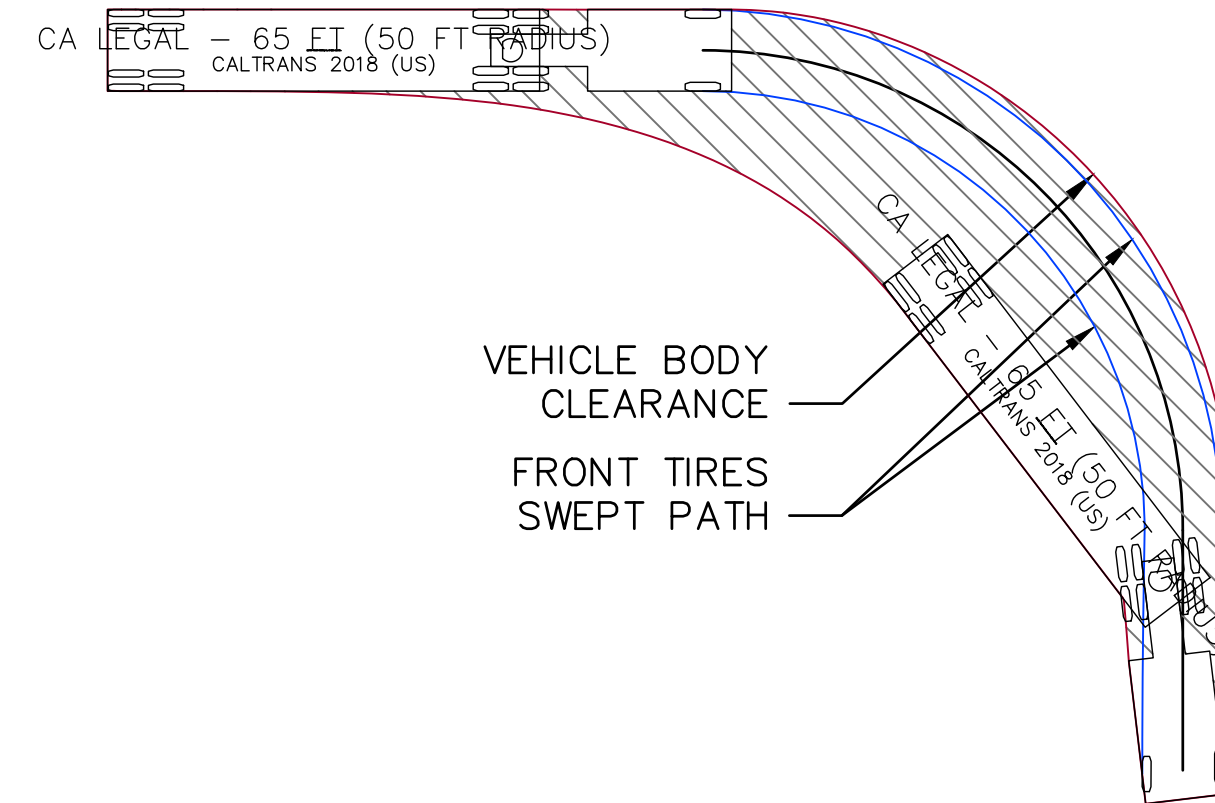
VEHICLE PROFILE



CA LEGAL — 65 FT (50 FT RADIUS)

	feet		
Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.0
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

LEGEND



PRELIMINARY
SUBJECT TO CHANGE

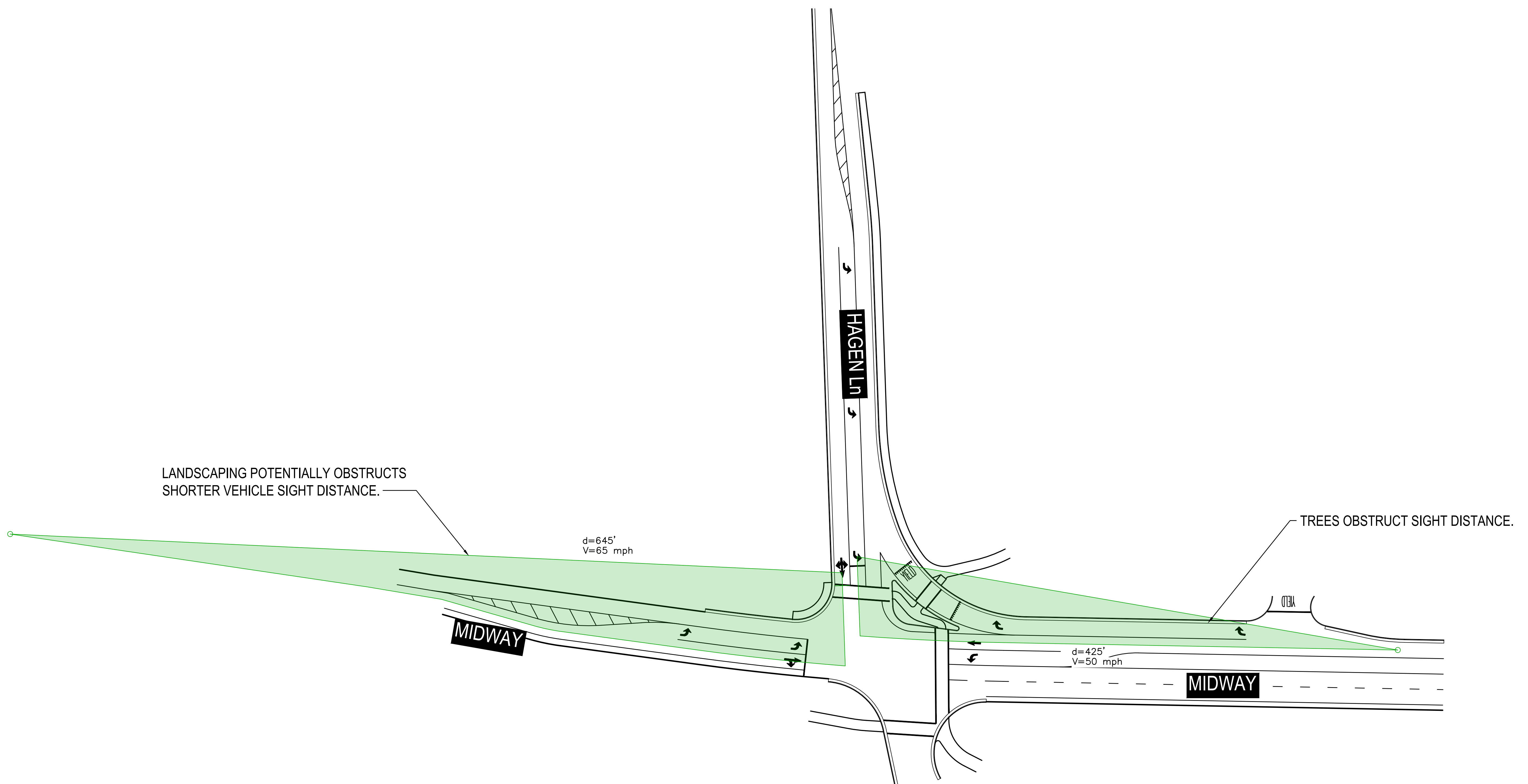
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FIGURE 4



PRELIMINARY
SUBJECT TO CHANGE

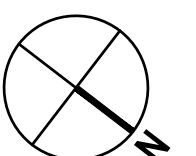
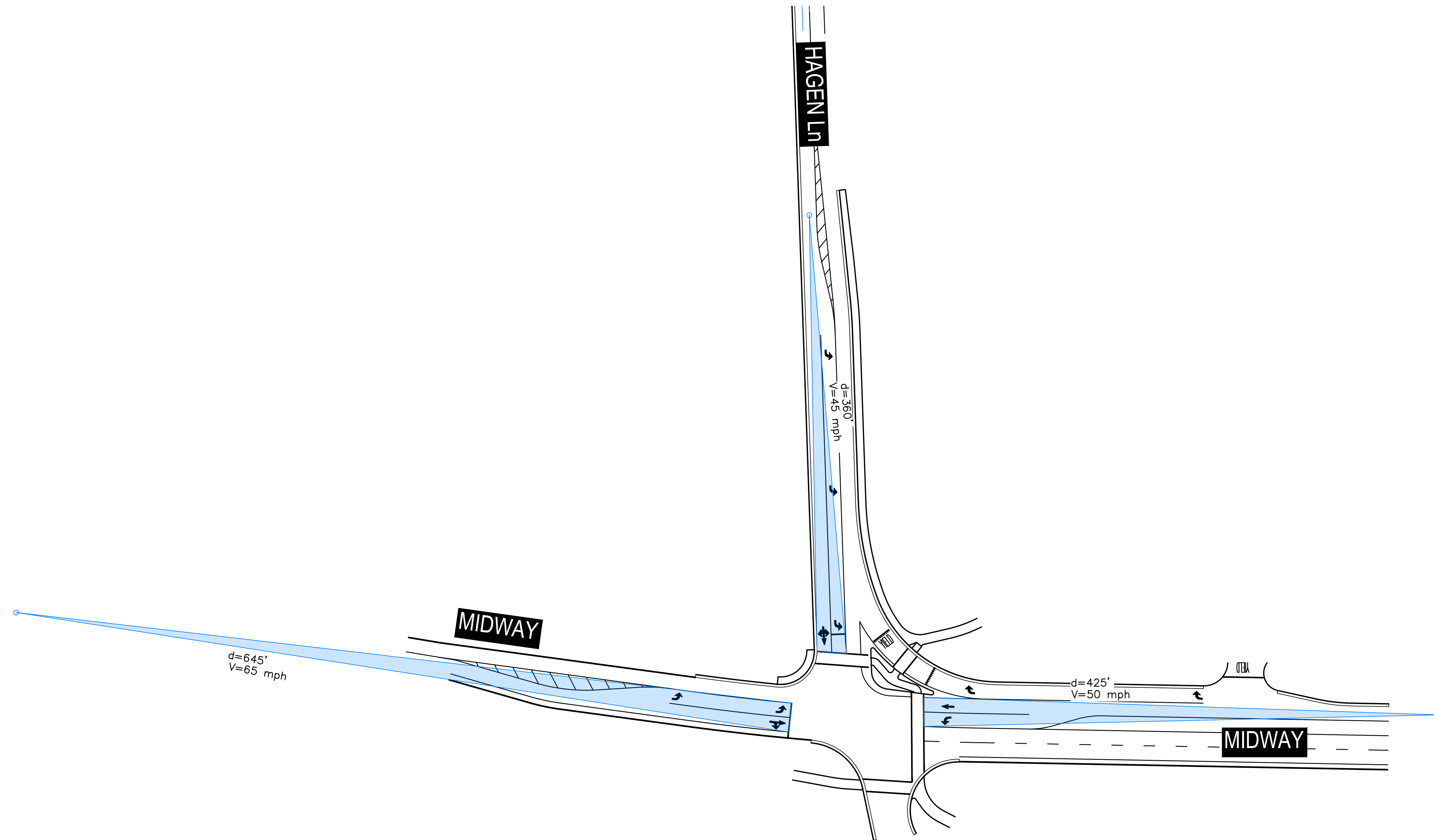
HEGAN Ln CONGESTION RELIEF PROJECT MIDWAY & HEGAN SIGNAL



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FIGURE 5



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT MIDWAY & HEGAN SIGNAL



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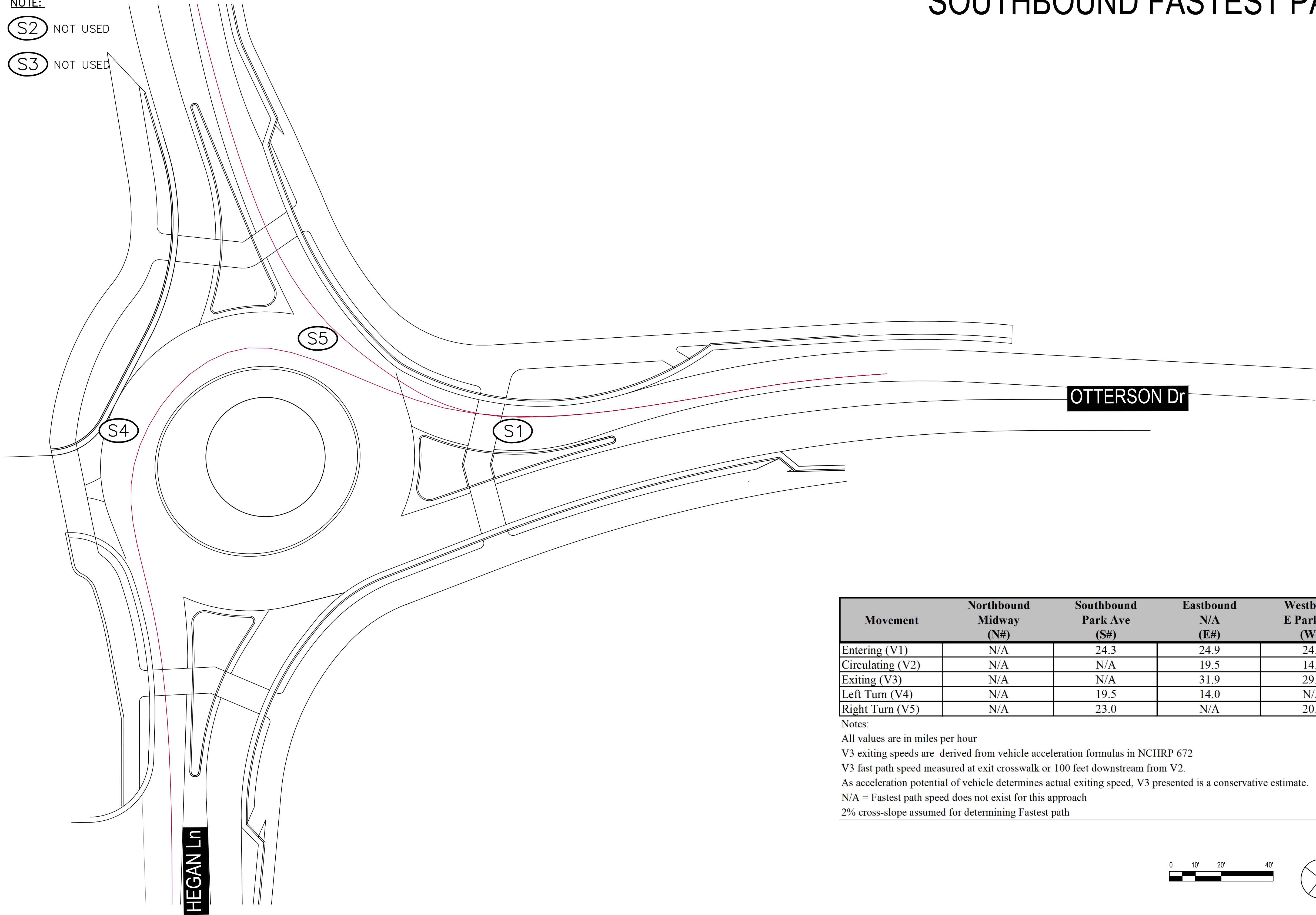
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FIGURE 6

SOUTHBOUND FASTEST PATH

LEGEND:
FAST PATH
FAST PATH SPEED IDENTIFIER

NOTE:
S2 NOT USED
S3 NOT USED



Movement	Northbound Midway (N#)	Southbound Park Ave (S#)	Eastbound N/A (E#)	Westbound E Park Ave (W#)
Entering (V1)	N/A	24.3	24.9	24.2
Circulating (V2)	N/A	N/A	19.5	14.9
Exiting (V3)	N/A	N/A	31.9	29.3
Left Turn (V4)	N/A	19.5	14.0	N/A
Right Turn (V5)	N/A	23.0	N/A	20.8

Notes:
All values are in miles per hour
V3 exiting speeds are derived from vehicle acceleration formulas in NCHRP 672
V3 fast path speed measured at exit crosswalk or 100 feet downstream from V2.
As acceleration potential of vehicle determines actual exiting speed, V3 presented is a conservative estimate.
N/A = Fastest path speed does not exist for this approach
2% cross-slope assumed for determining Fastest path



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
OTTERSON Dr & HEGAN Ln ROUNDABOUT



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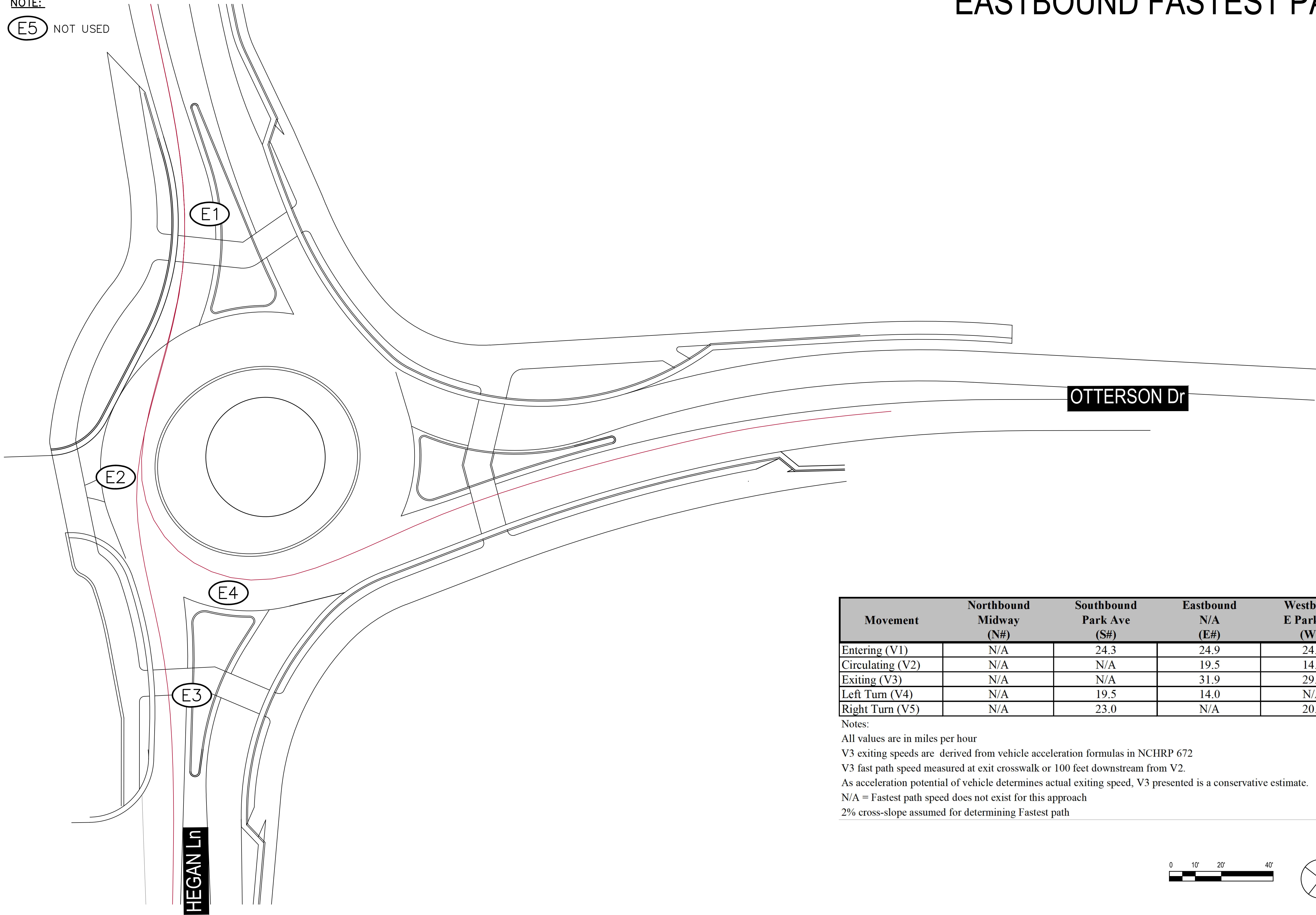
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FIGURE 1

EASTBOUND FASTEST PATH

LEGEND:
FAST PATH
FAST PATH SPEED IDENTIFIER

NOTE:
E5 NOT USED



Movement	Northbound Midway (N#)	Southbound Park Ave (S#)	Eastbound N/A (E#)	Westbound E Park Ave (W#)
Entering (V1)	N/A	24.3	24.9	24.2
Circulating (V2)	N/A	N/A	19.5	14.9
Exiting (V3)	N/A	N/A	31.9	29.3
Left Turn (V4)	N/A	19.5	14.0	N/A
Right Turn (V5)	N/A	23.0	N/A	20.8

Notes:
All values are in miles per hour
V3 exiting speeds are derived from vehicle acceleration formulas in NCHRP 672
V3 fast path speed measured at exit crosswalk or 100 feet downstream from V2.
As acceleration potential of vehicle determines actual exiting speed, V3 presented is a conservative estimate.
N/A = Fastest path speed does not exist for this approach
2% cross-slope assumed for determining Fastest path

PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
OTTERSON Dr & HEGAN Ln ROUNDABOUT



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FIGURE 2

WESTBOUND FASTEST PATH

LEGEND:

FAST PATH

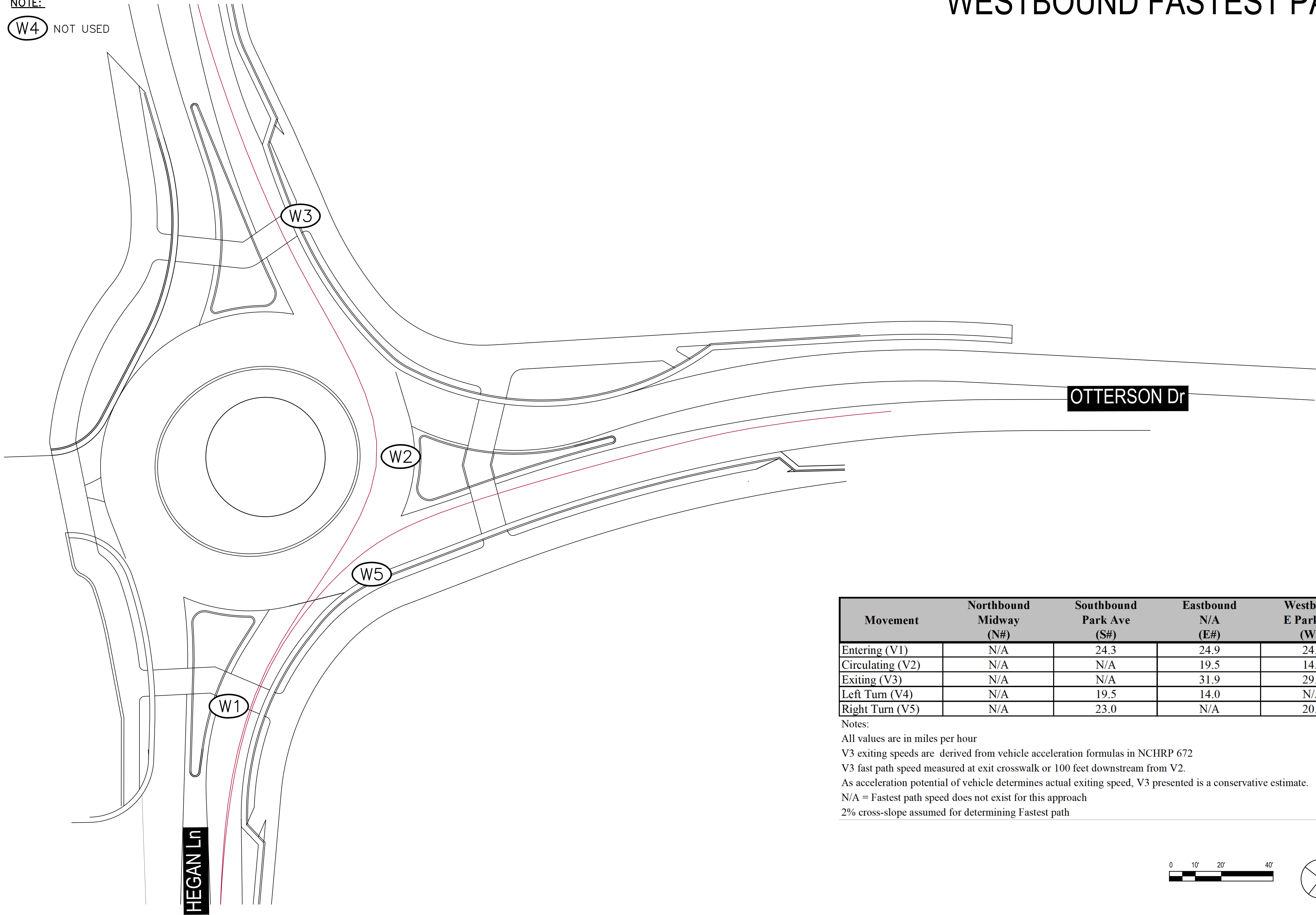
D#

FAST PATH SPEED IDENTIFIER

NOTE:

W4

NOT USED



Movement	Northbound Midway (N#)	Southbound Park Ave (S#)	Eastbound N/A (E#)	Westbound E Park Ave (W#)
Entering (V1)	N/A	24.3	24.9	24.2
Circulating (V2)	N/A	N/A	19.5	14.9
Exiting (V3)	N/A	N/A	31.9	29.3
Left Turn (V4)	N/A	19.5	14.0	N/A
Right Turn (V5)	N/A	23.0	N/A	20.8

Notes:

All values are in miles per hour

V3 exiting speeds are derived from vehicle acceleration formulas in NCHRP 672

V3 fast path speed measured at exit crosswalk or 100 feet downstream from V2.

As acceleration potential of vehicle determines actual exiting speed, V3 presented is a conservative estimate.

N/A = Fastest path speed does not exist for this approach

2% cross-slope assumed for determining Fastest path

PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
OTTERSON Dr & HEGAN Ln ROUNDABOUT



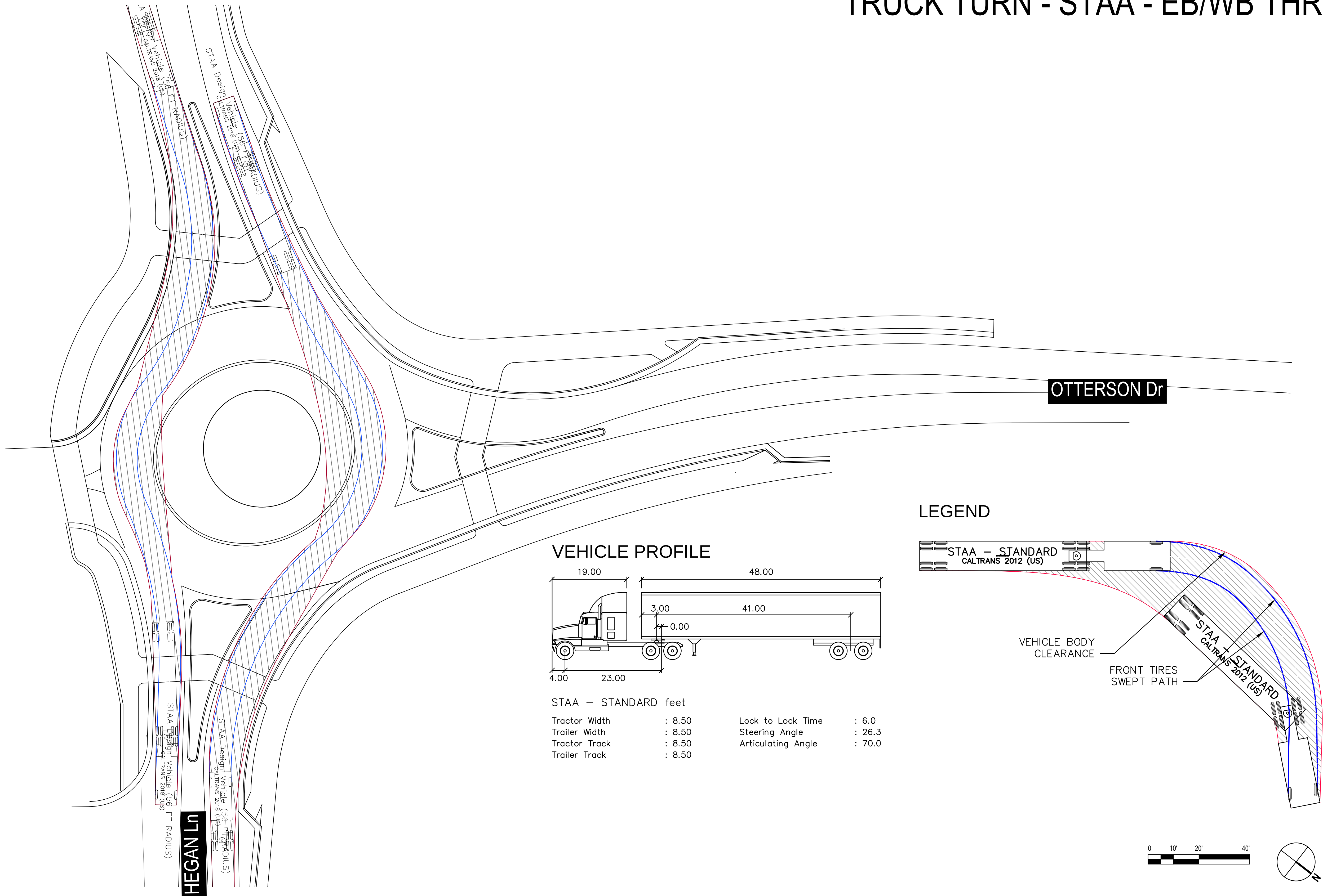
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FIGURE 3

TRUCK TURN - STAA - EB/WB THRU



PRELIMINARY
SUBJECT TO CHANGE

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OTTERSON Dr & HEGAN Ln ROUNDABOUT

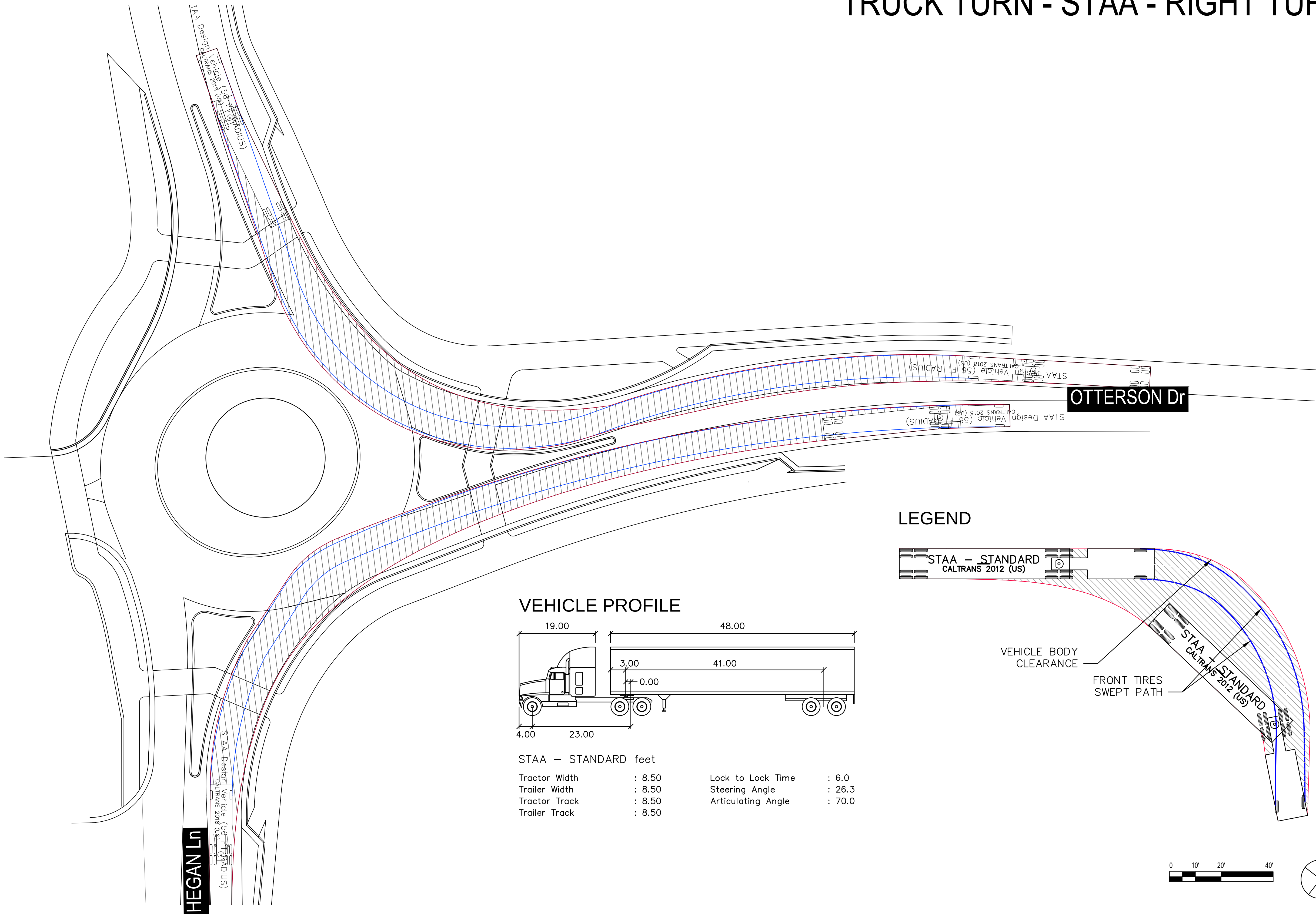


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FIGURE 4

TRUCK TURN - STAA - RIGHT TURNS



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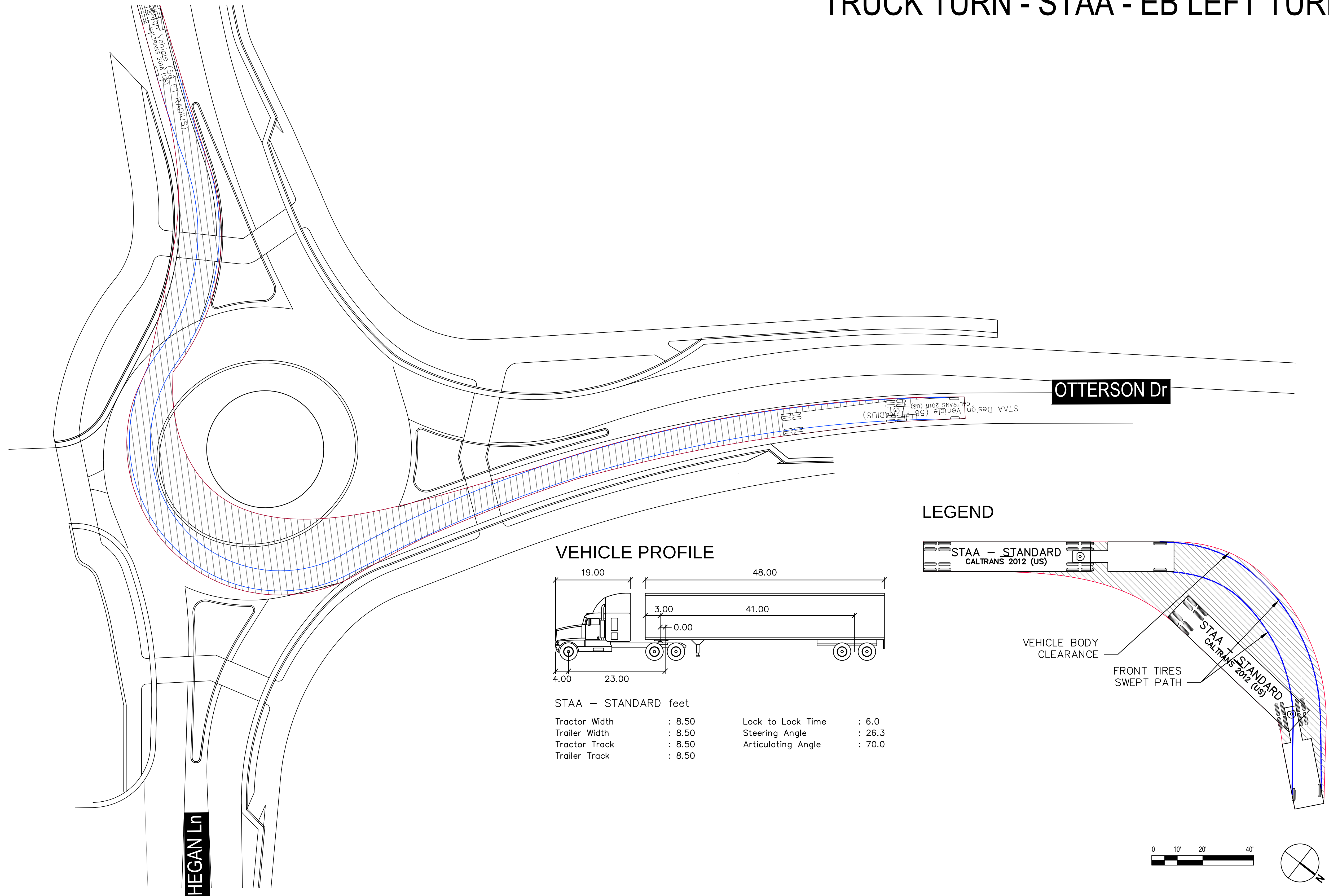


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FIGURE 5

TRUCK TURN - STAA - EB LEFT TURN



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SUBJECT TO CHANGE

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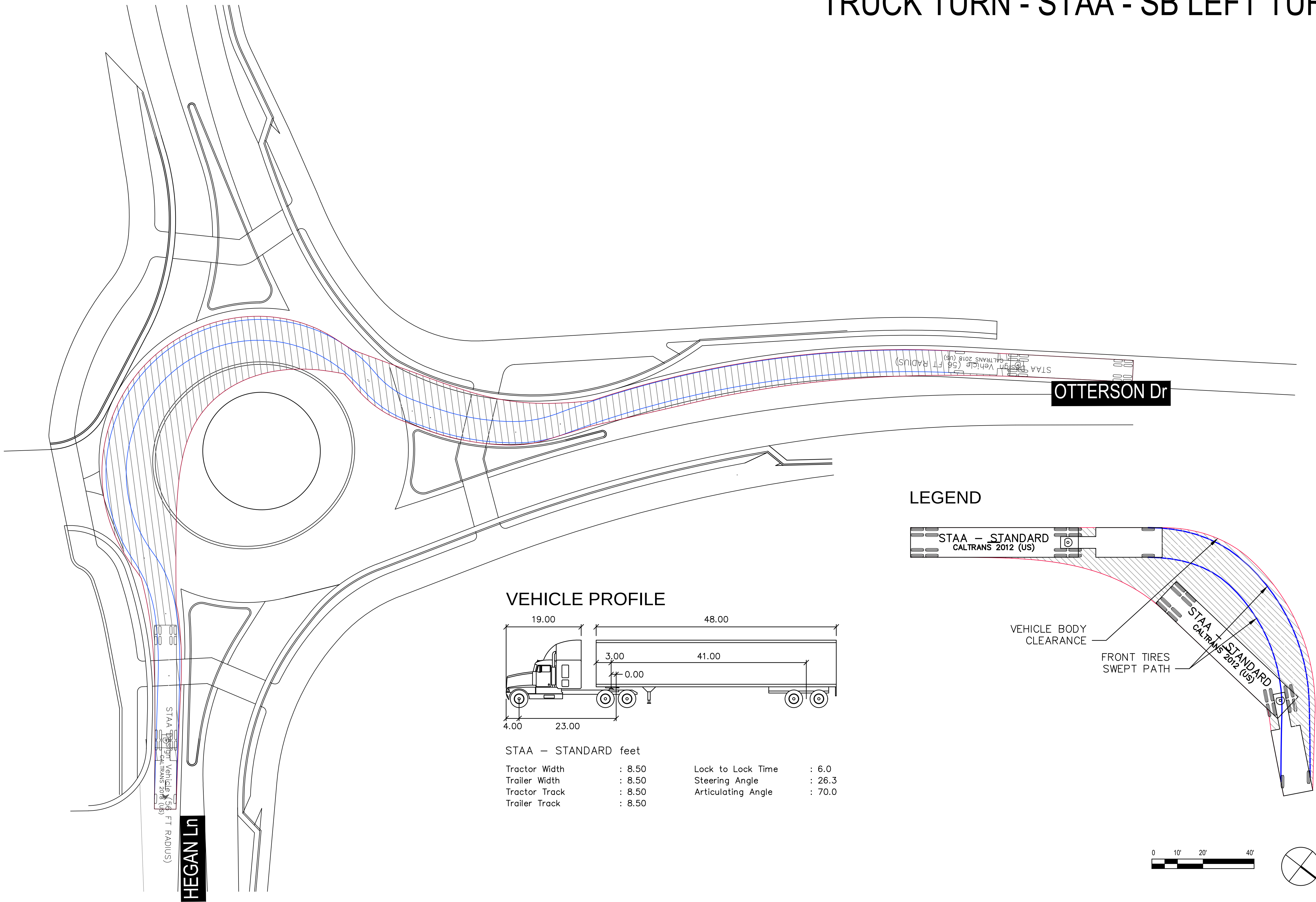


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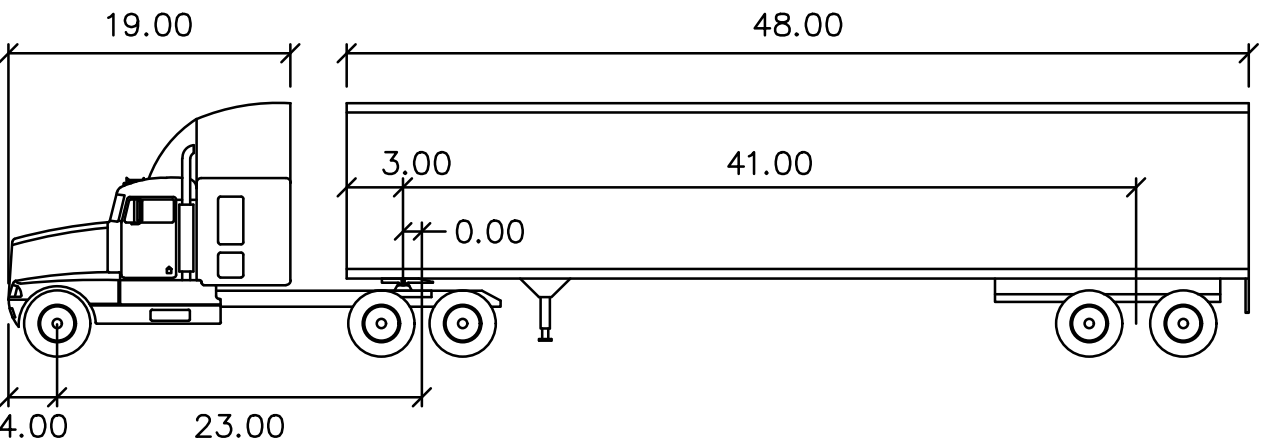
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FIGURE 6

TRUCK TURN - STAA - SB LEFT TURN



VEHICLE PROFILE



STAA - STANDARD feet			
Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
OTTERSON Dr & HEGAN Ln ROUNDABOUT

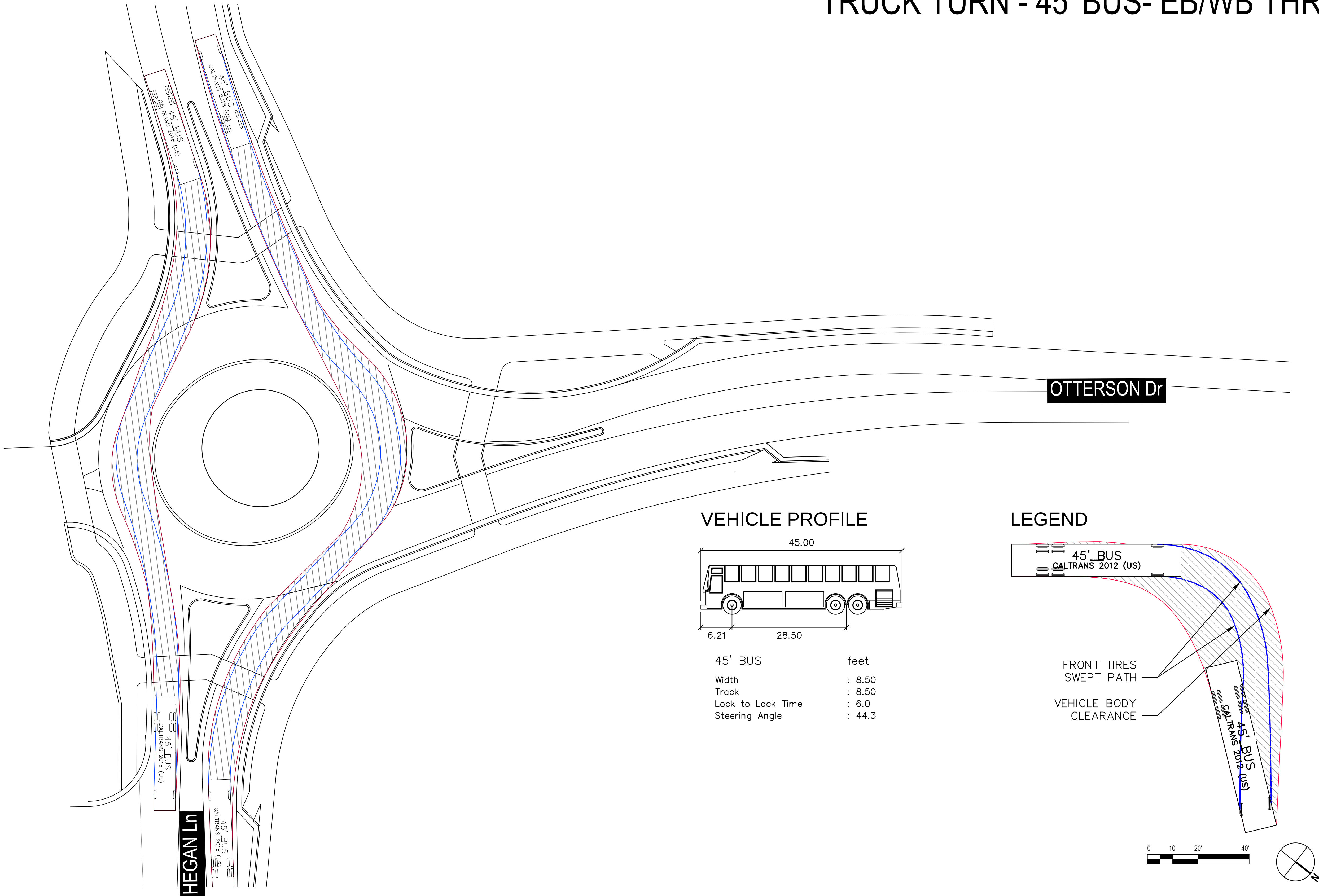


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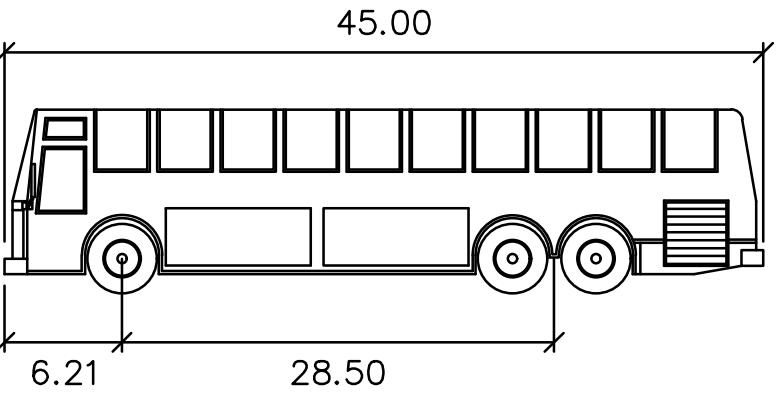
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FIGURE 7

TRUCK TURN - 45' BUS- EB/WB THRU

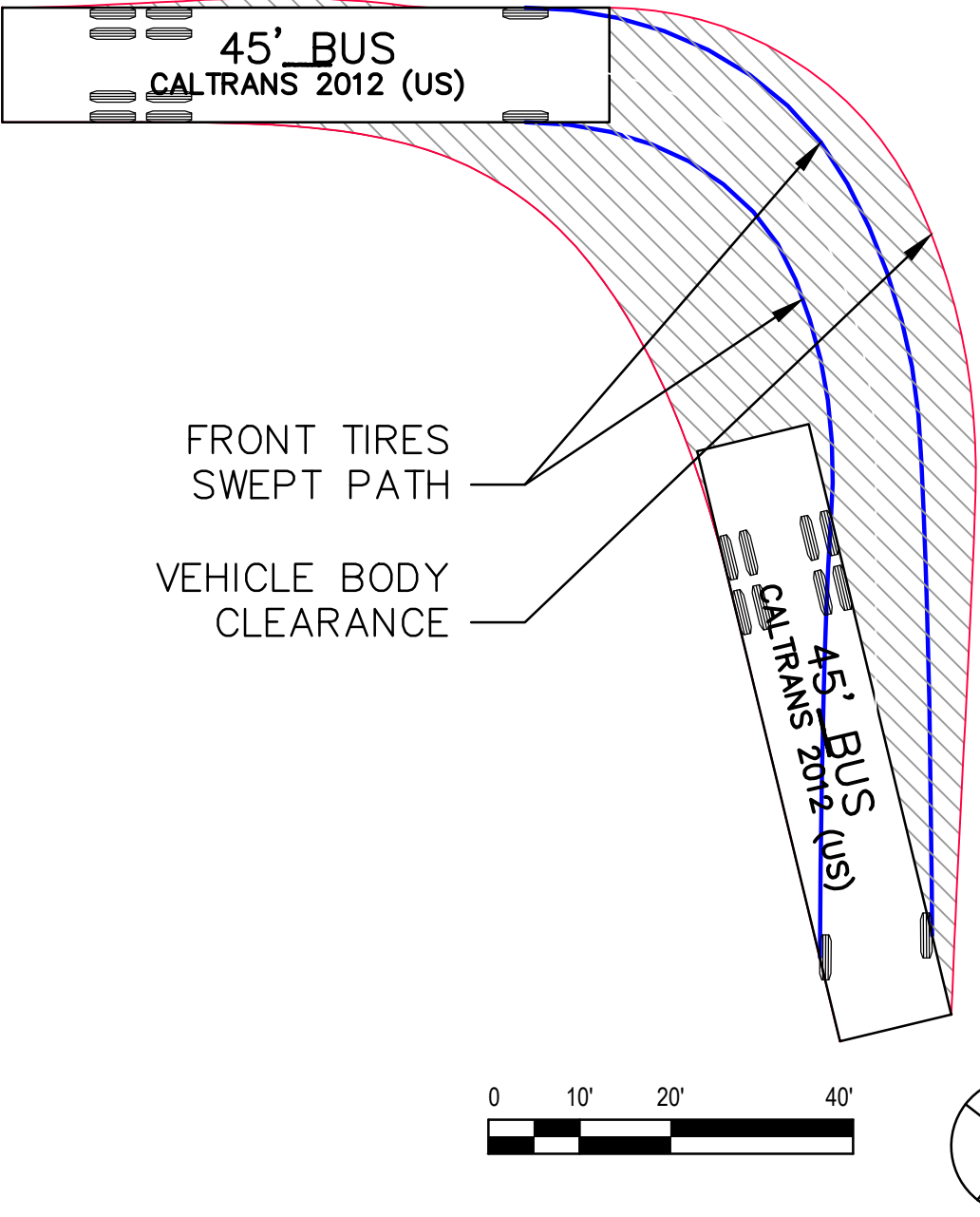


VEHICLE PROFILE



45' BUS	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 44.3

LEGEND



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
OTTERSON Dr & HEGAN Ln ROUNDABOUT

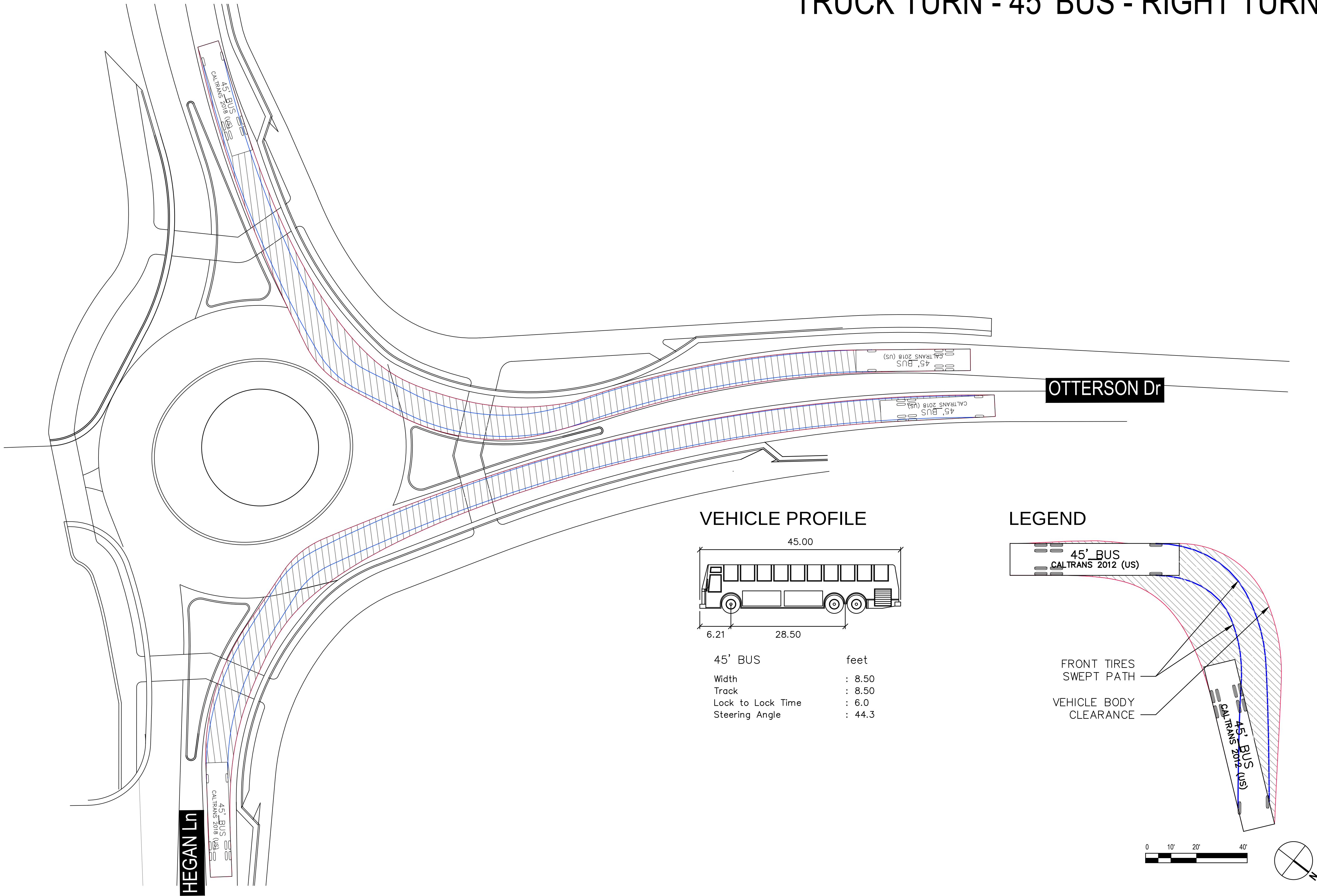


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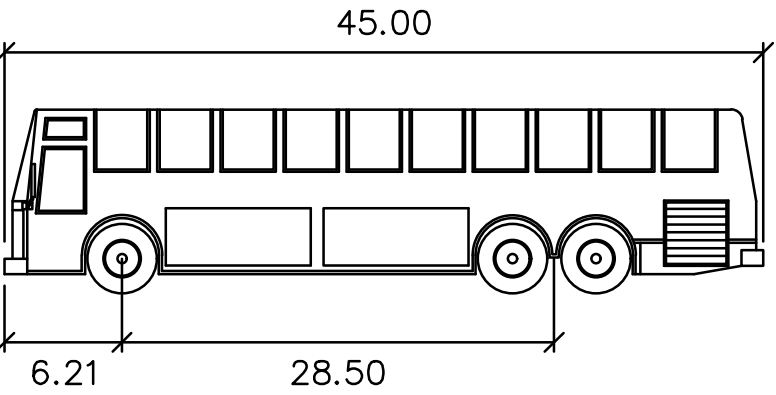
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FIGURE 8

TRUCK TURN - 45' BUS - RIGHT TURNS

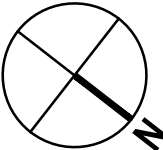
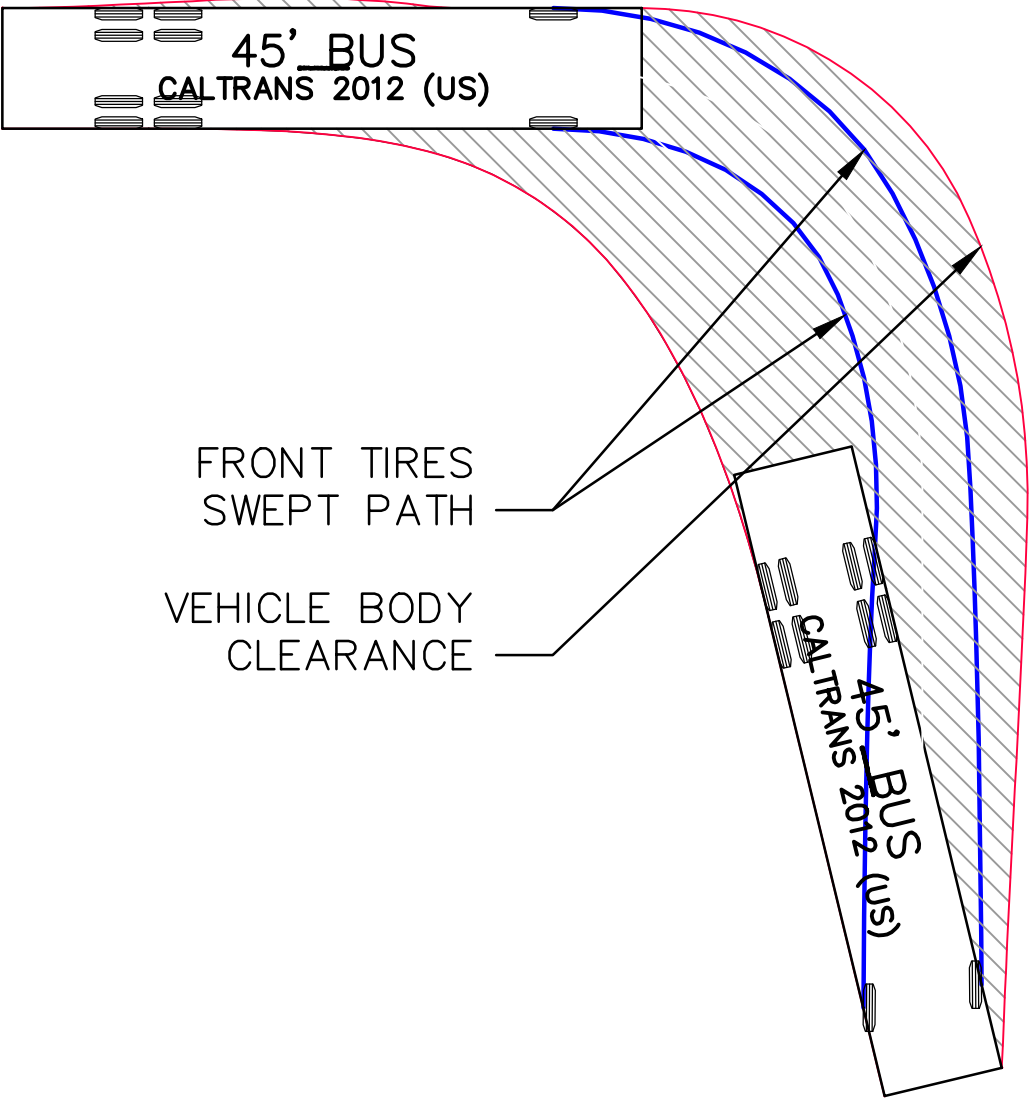


VEHICLE PROFILE



45' BUS	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 44.3

LEGEND



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
OTTERSON Dr & HEGAN Ln ROUNDABOUT

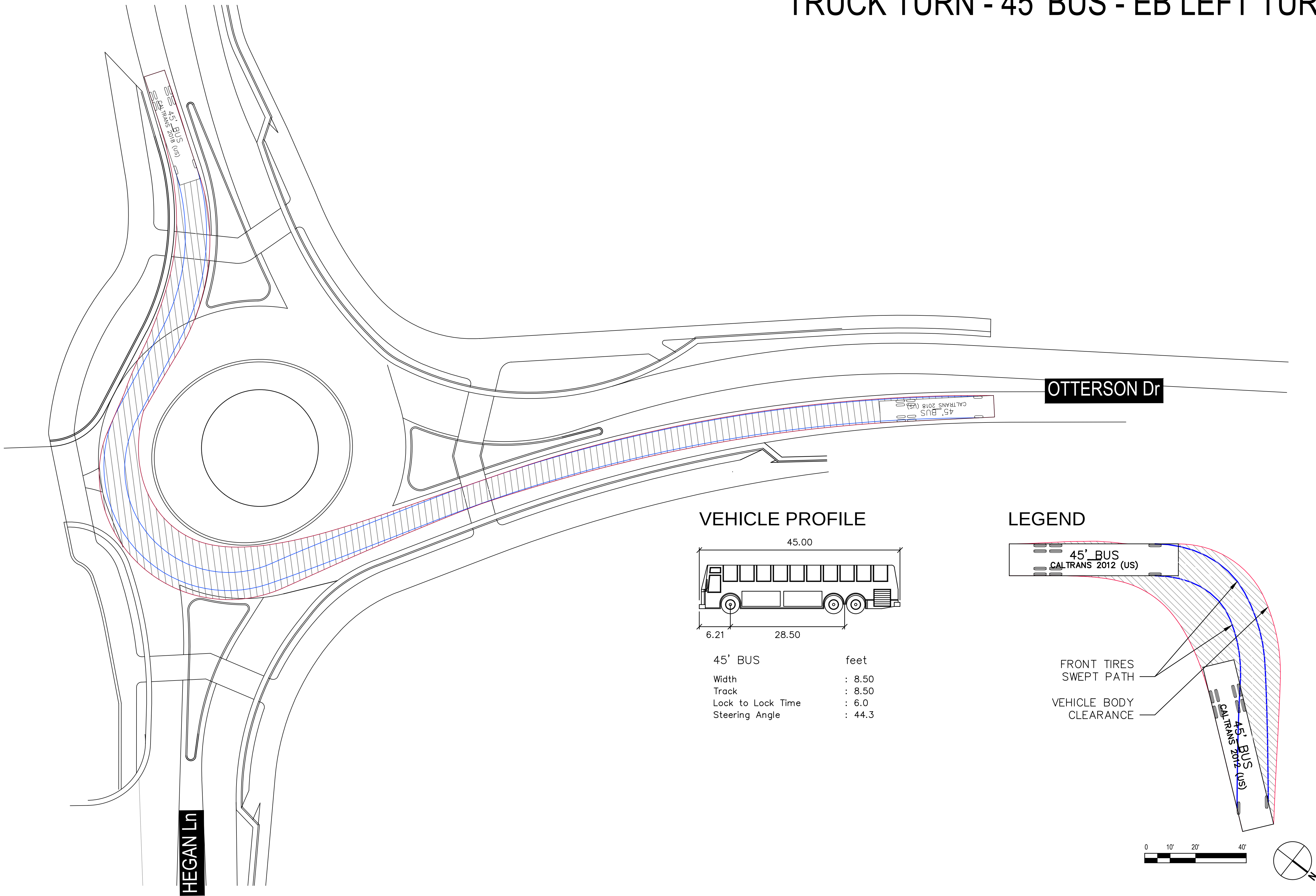


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FIGURE 9

TRUCK TURN - 45' BUS - EB LEFT TURN



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
OTTERSON Dr & HEGAN Ln ROUNDABOUT

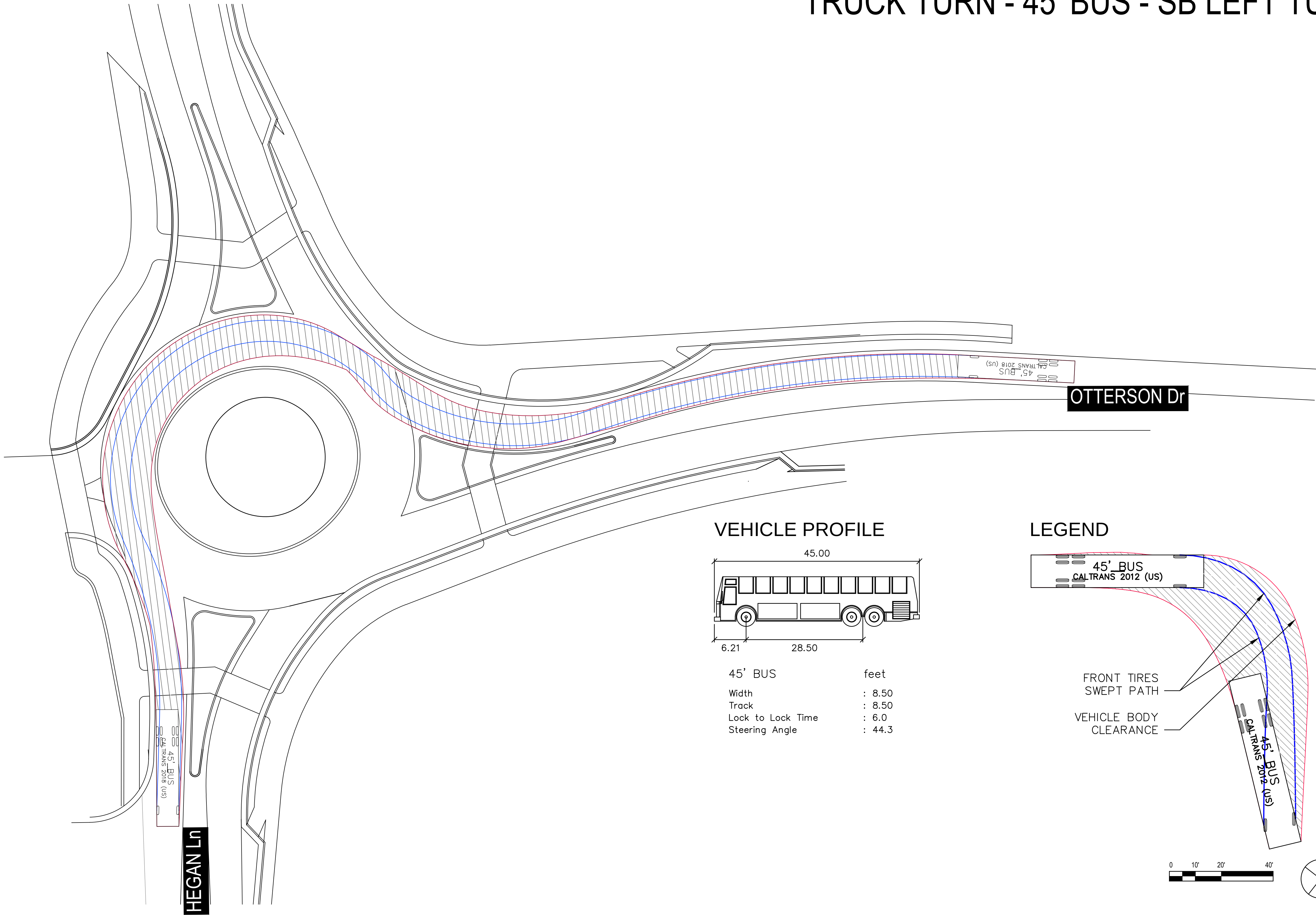


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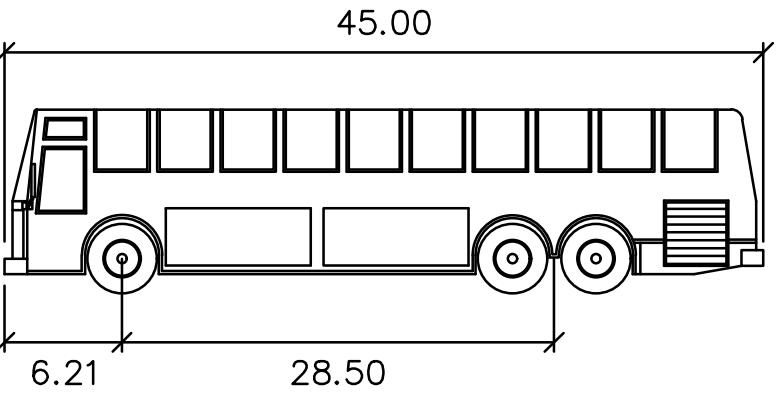
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FIGURE 10

TRUCK TURN - 45' BUS - SB LEFT TURN

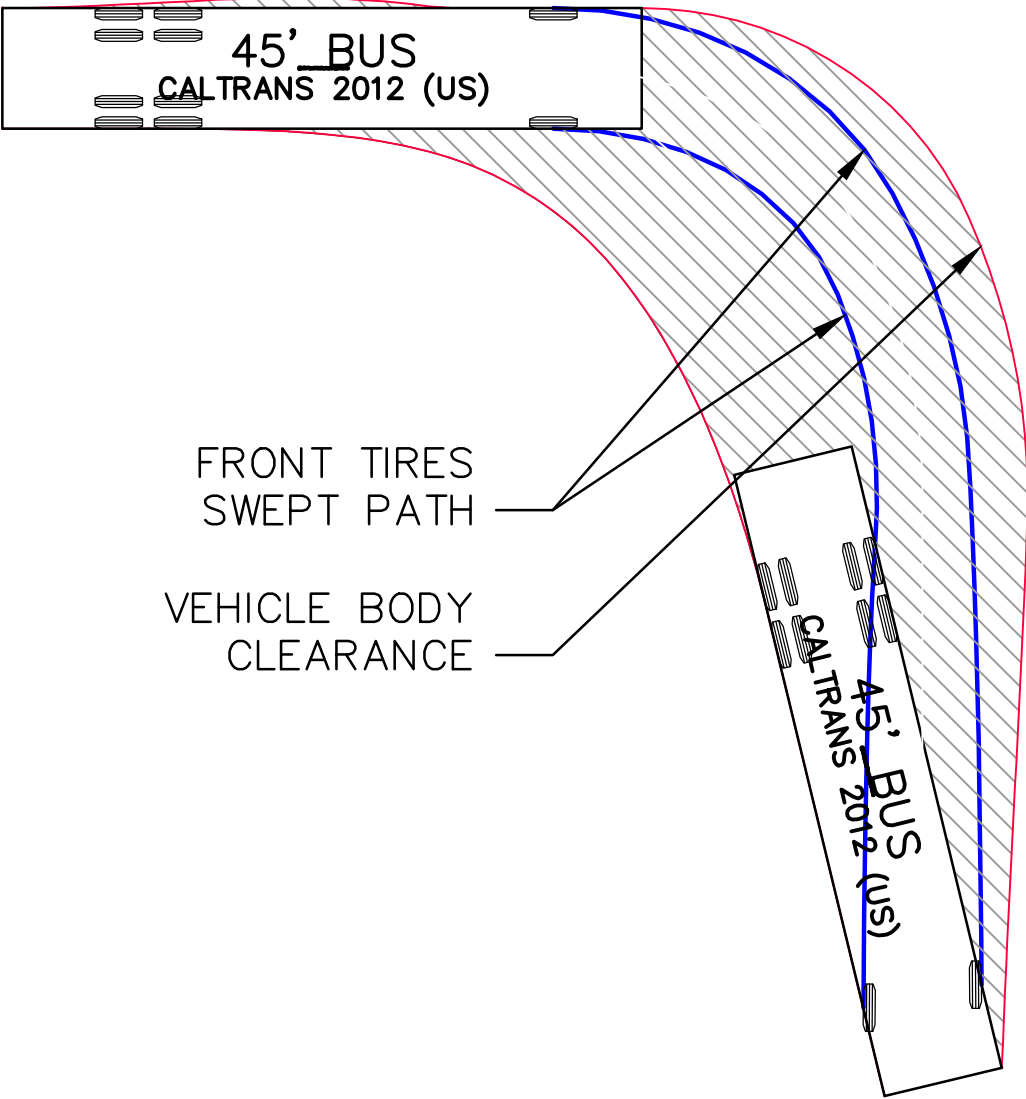


VEHICLE PROFILE



45' BUS	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 44.3

LEGEND



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
OTTERSON Dr & HEGAN Ln ROUNDABOUT

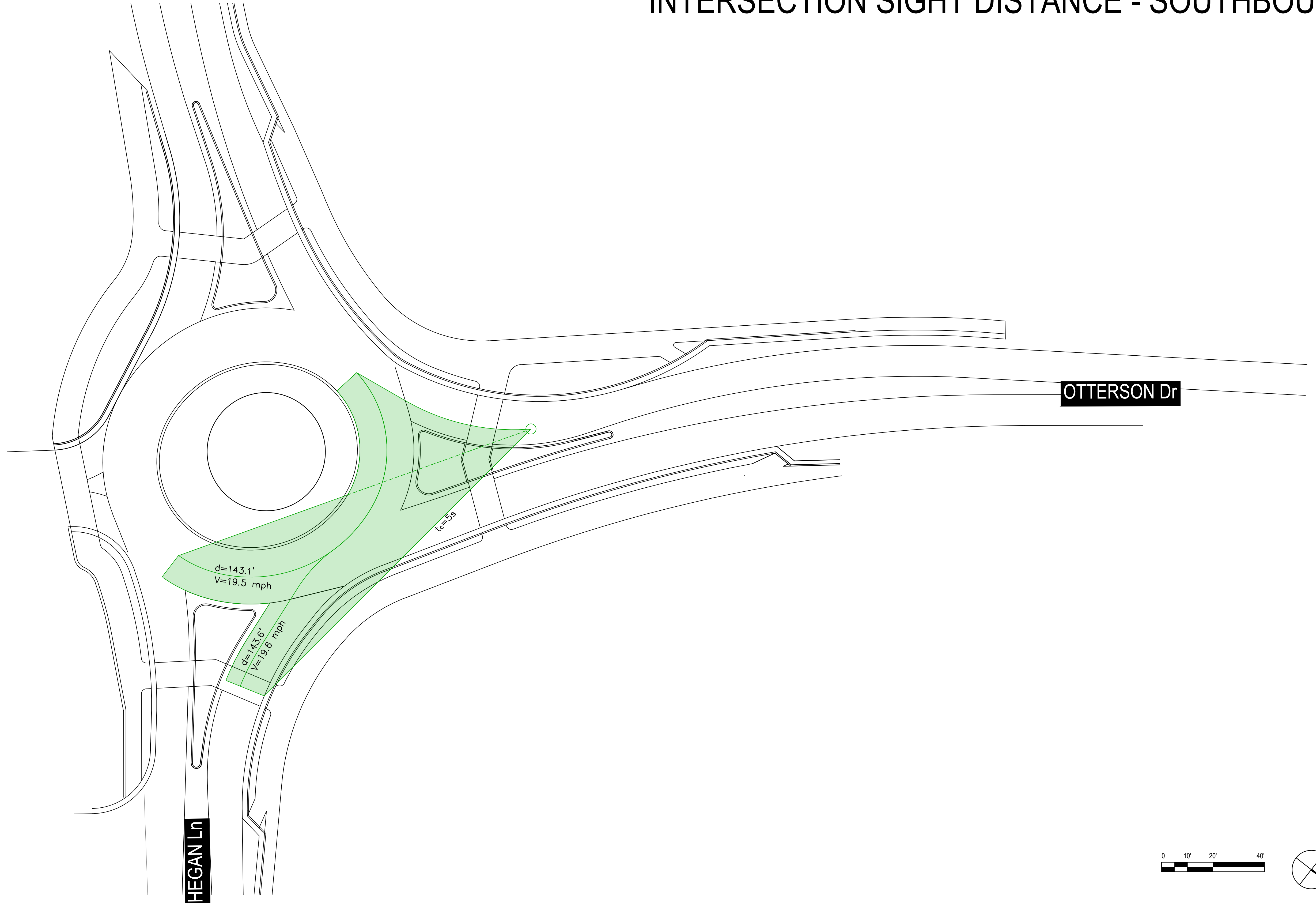


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FIGURE 11

LEGEND:

INTERSECTION SIGHT TRIANGLE

INTERSECTION SIGHT DISTANCE - SOUTHBOUND



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT OTTERSON Dr & HEGAN Ln ROUNDABOUT



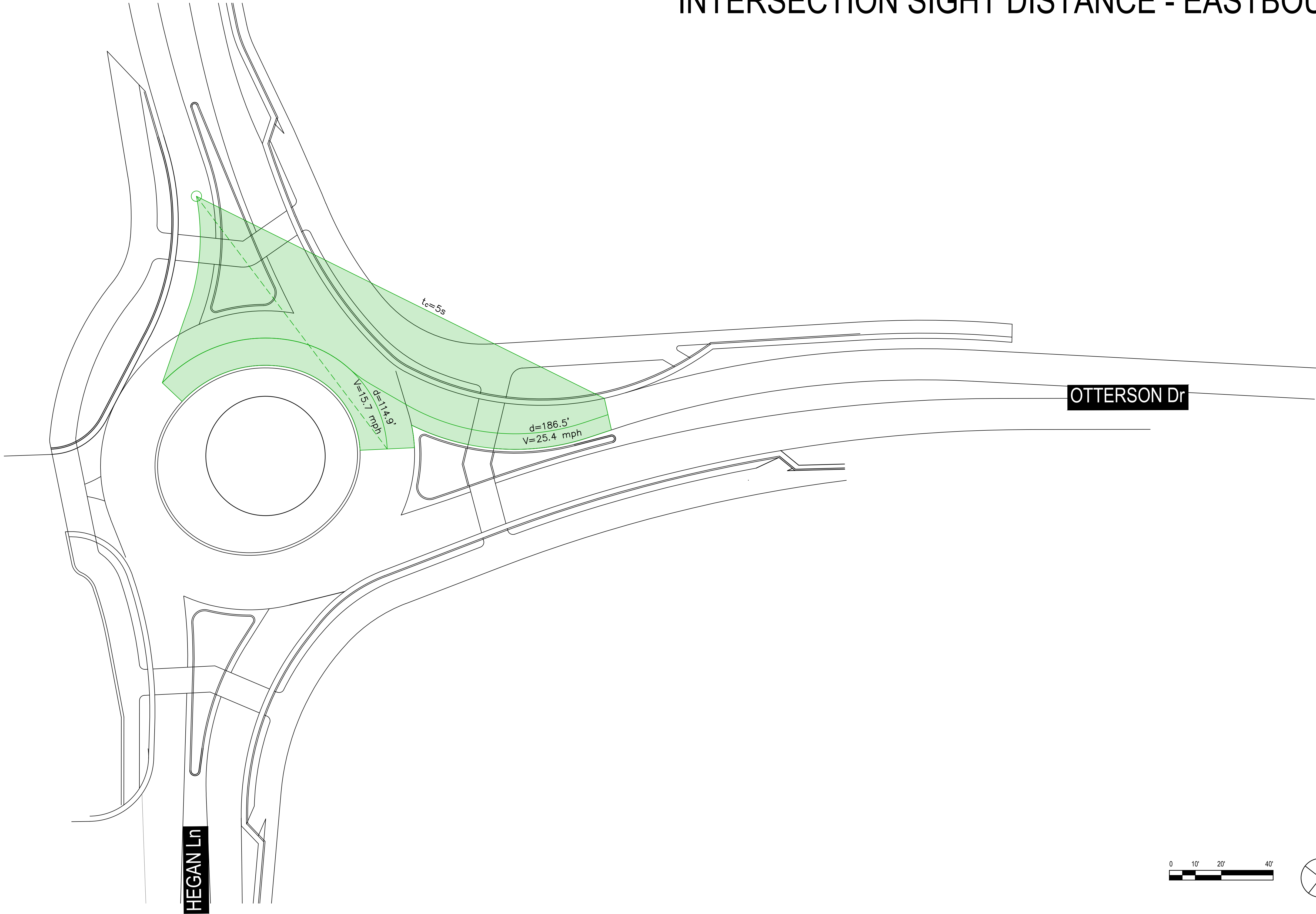
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FIGURE 12

INTERSECTION SIGHT DISTANCE - EASTBOUND

LEGEND:
INTERSECTION SIGHT TRIANGLE



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
OTTERSON Dr & HEGAN Ln ROUNDABOUT



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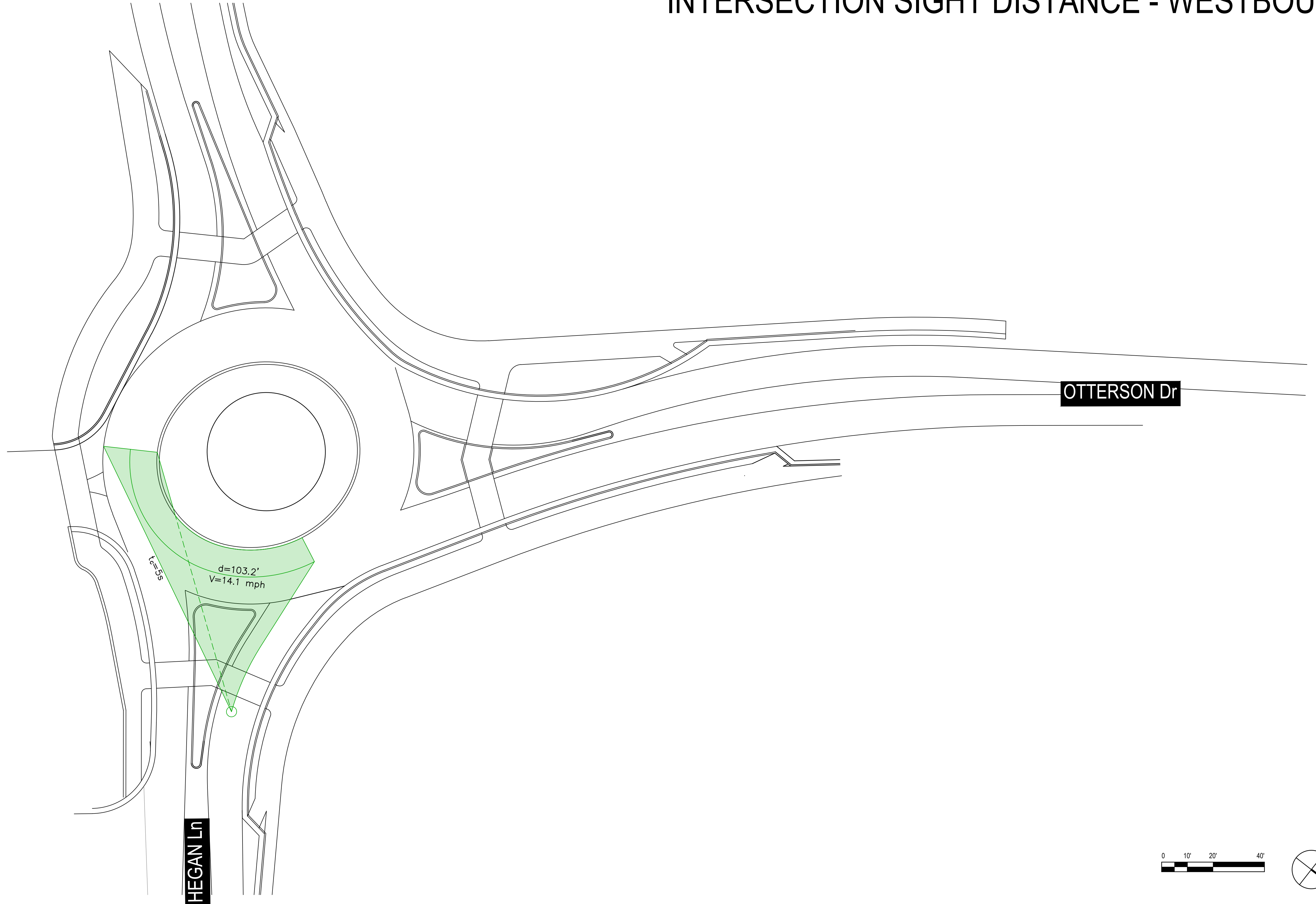
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FIGURE 13

LEGEND:

INTERSECTION SIGHT TRIANGLE

INTERSECTION SIGHT DISTANCE - WESTBOUND



PRELIMINARY
SUBJECT TO CHANGE

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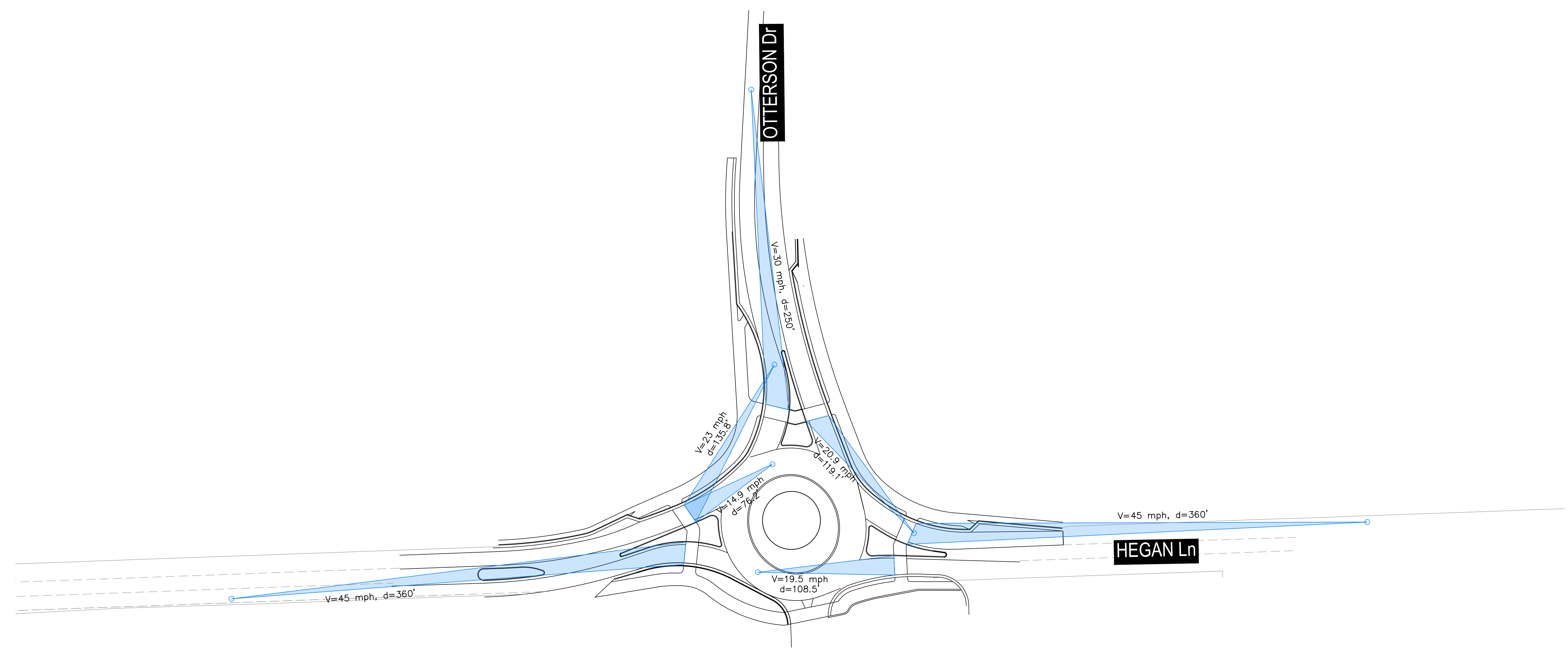
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FIGURE 14

LEGEND:
STOPPING SIGHT DISTANCE

STOPPING SIGHT DISTANCE - PEDESTRIANS



PRELIMINARY
SUBJECT TO CHANGE

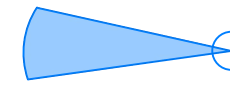
HEGAN Ln CONGESTION RELIEF PROJECT OTTERSON Dr & HEGAN Ln ROUNDABOUT



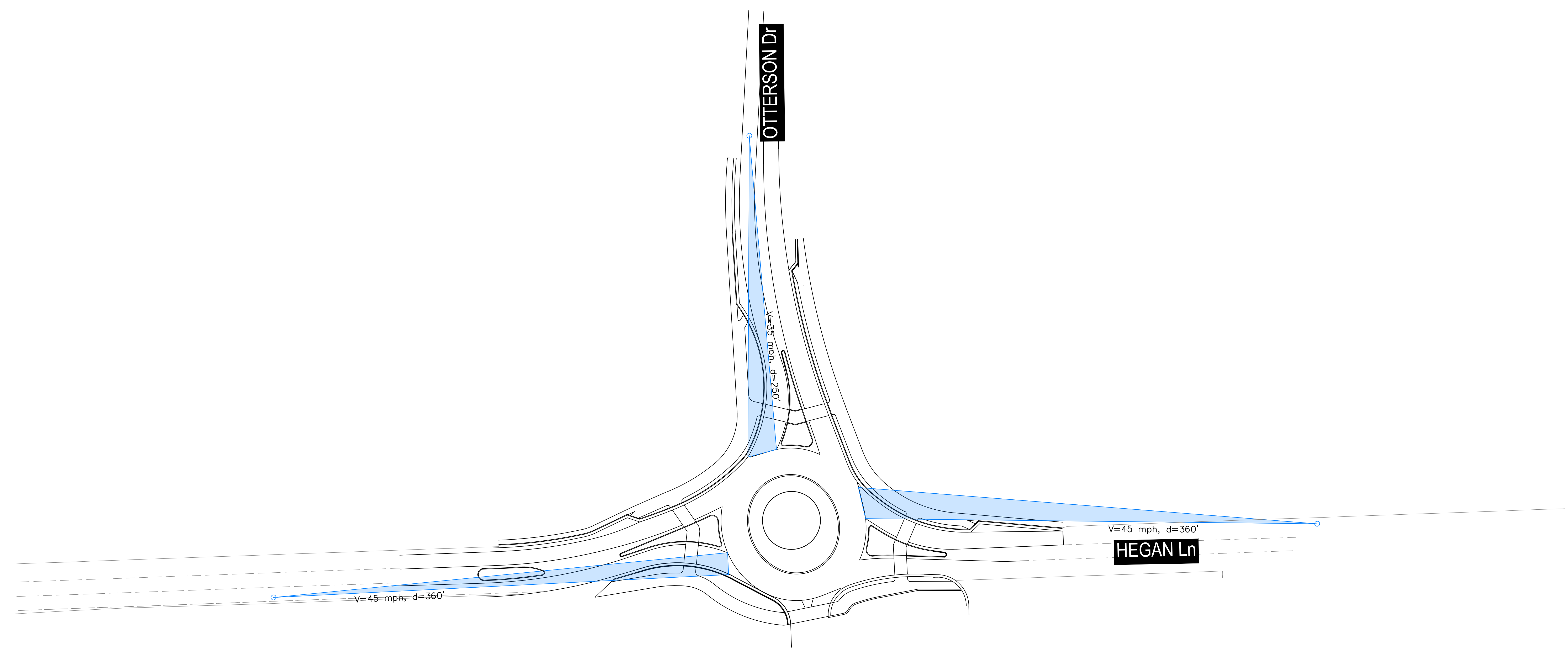
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FIGURE 15

LEGEND:
 STOPPING SIGHT DISTANCE

STOPPING SIGHT DISTANCE - YIELD



PRELIMINARY
SUBJECT TO CHANGE

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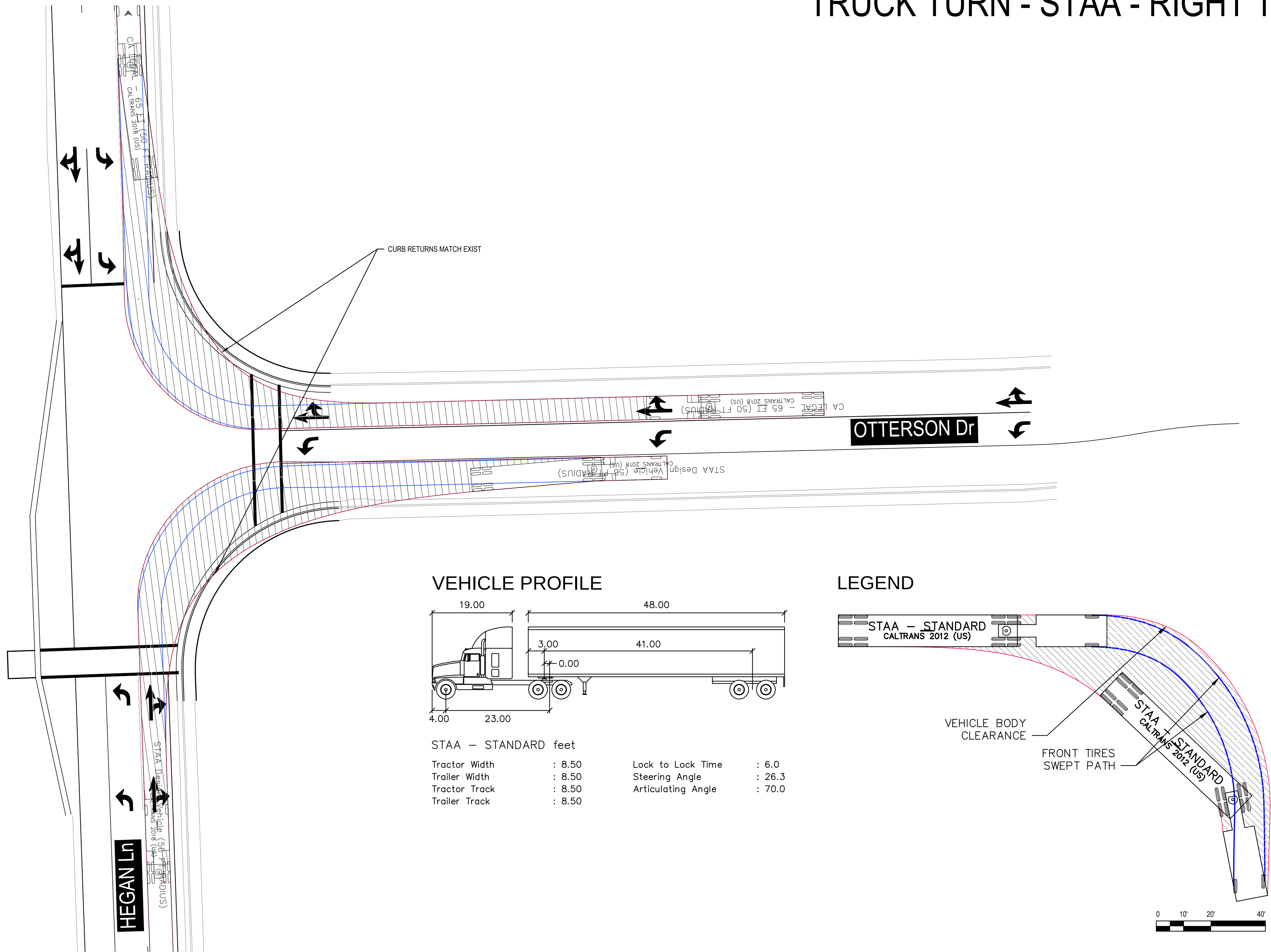


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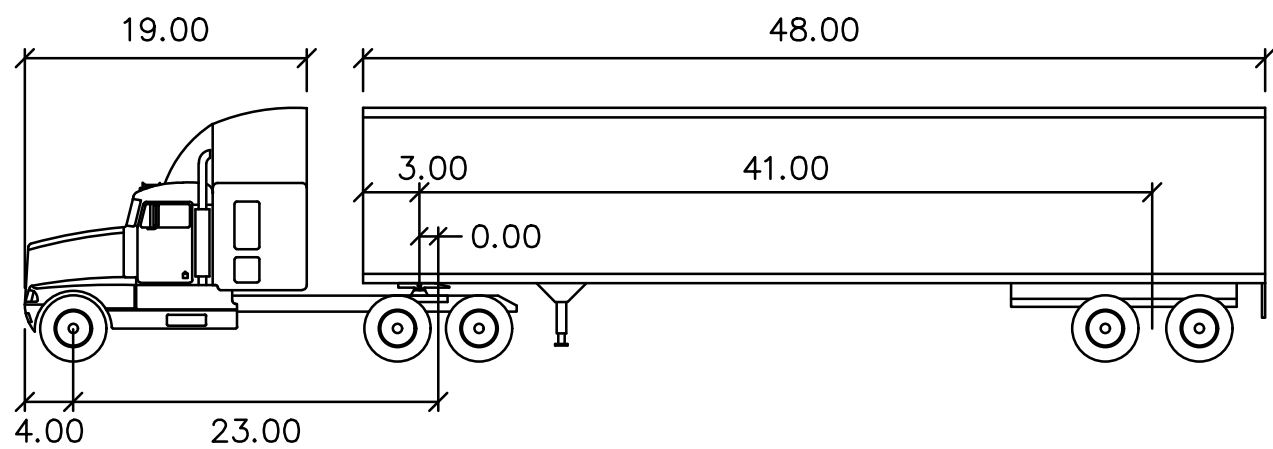
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FIGURE 16

TRUCK TURN - STAA - RIGHT TURNS



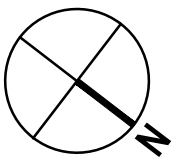
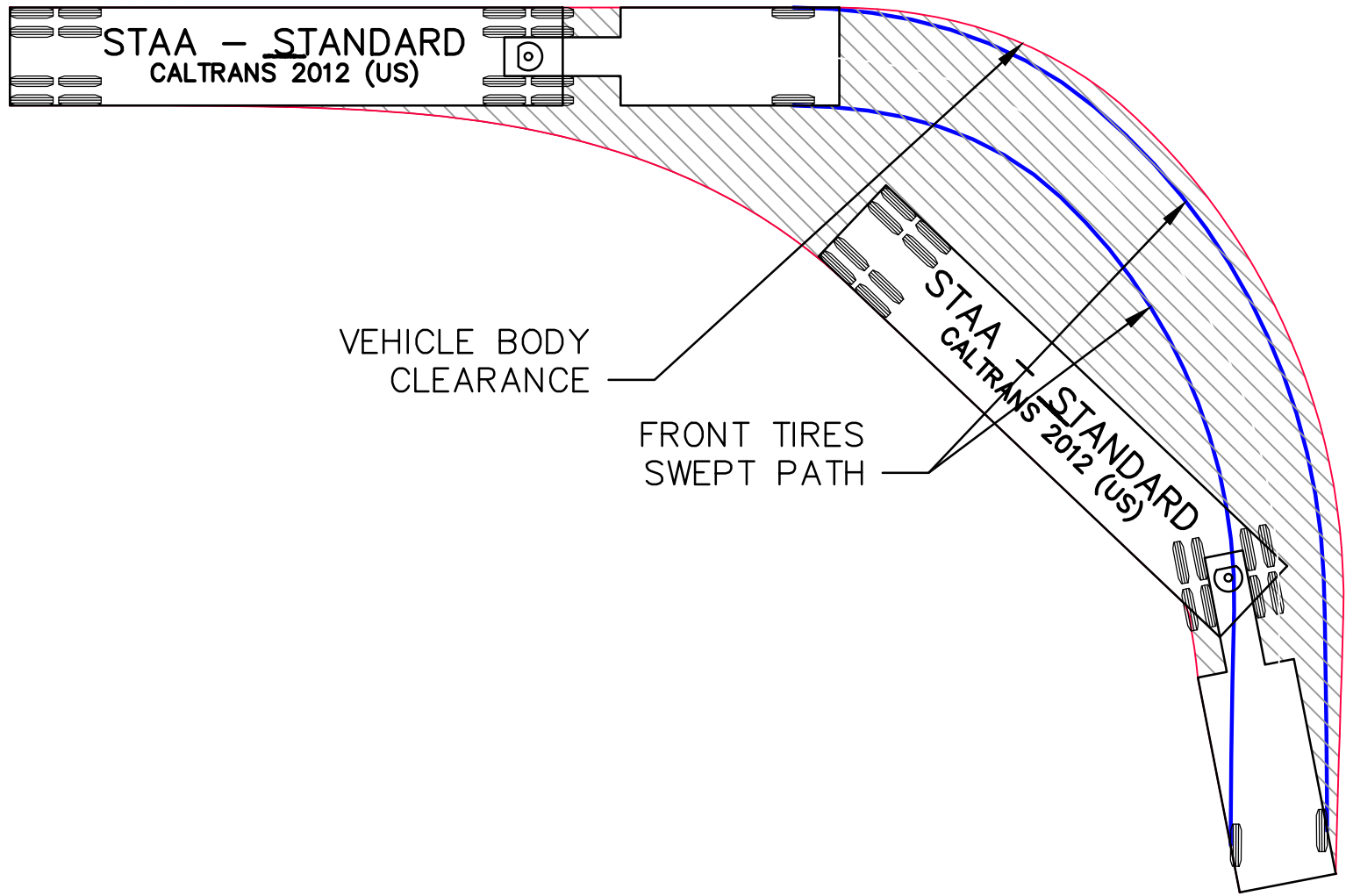
VEHICLE PROFILE



STAA - STANDARD feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

LEGEND



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
OTTERSON Dr & HEGAN Ln SIGNAL

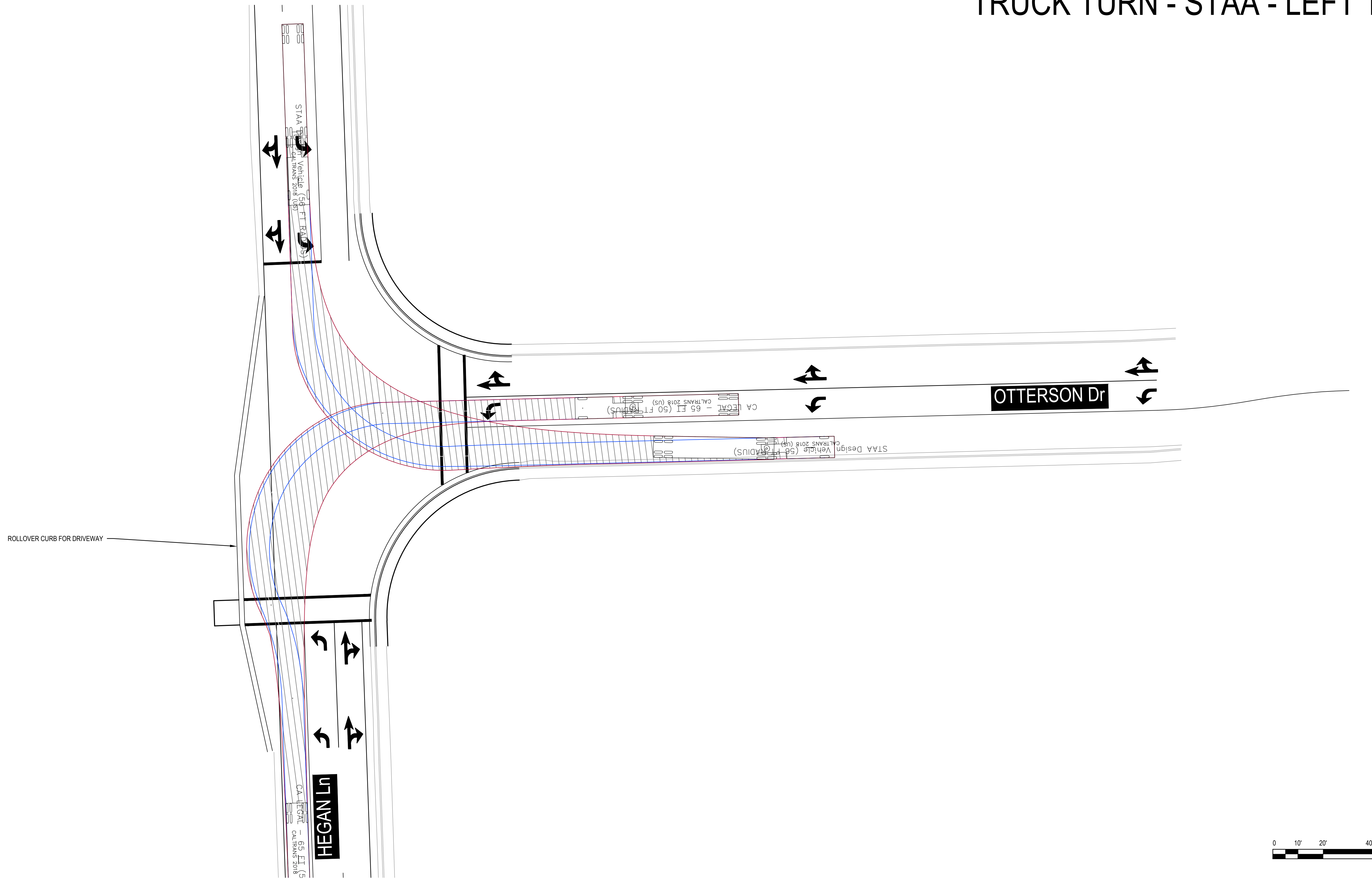


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FIGURE 1

TRUCK TURN - STAA - LEFT TURNS



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
OTTERSON Dr & HEGAN Ln SIGNAL

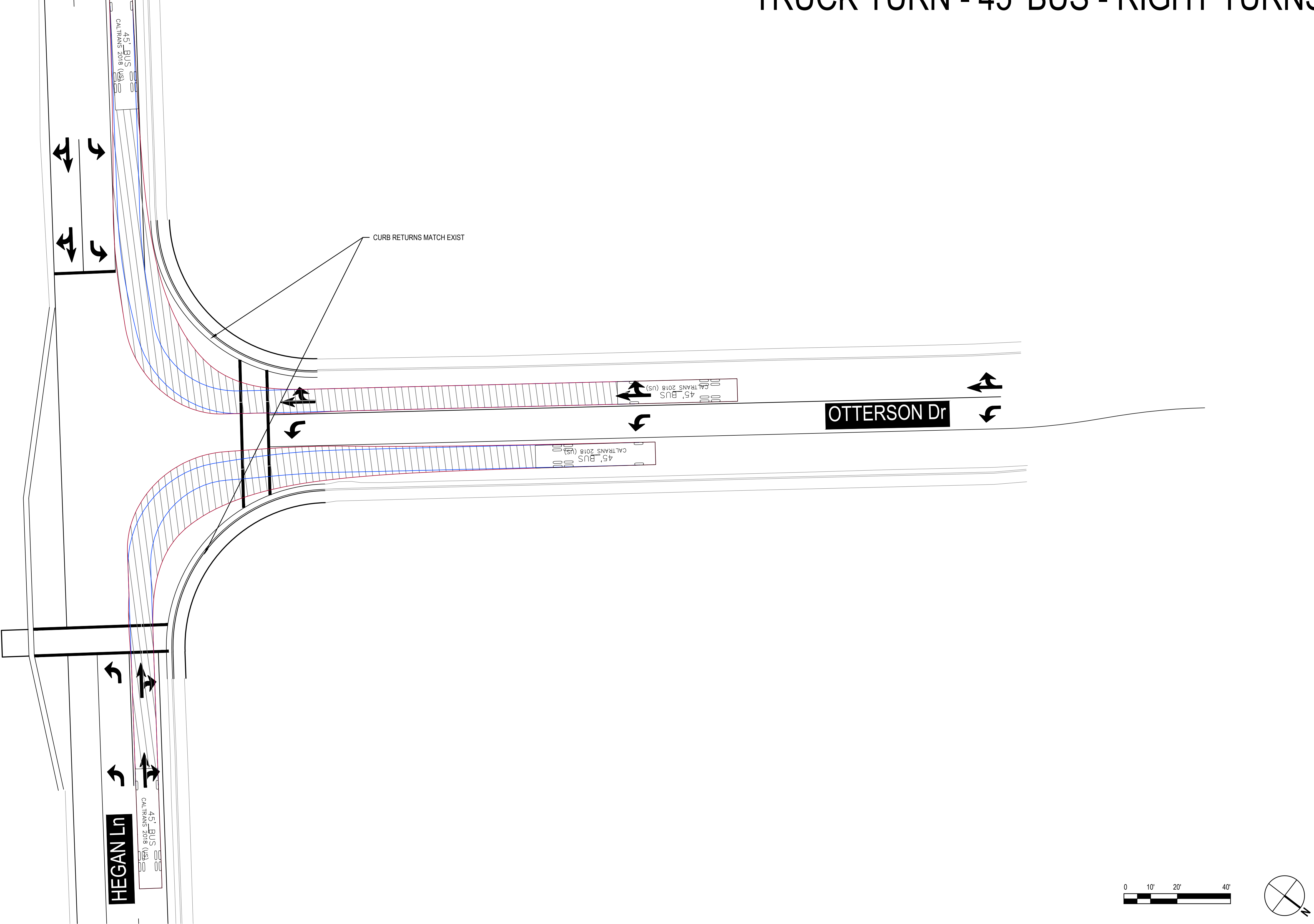


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FIGURE 2

TRUCK TURN - 45' BUS - RIGHT TURNS



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
OTTERSON Dr & HEGAN Ln SIGNAL

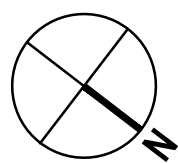
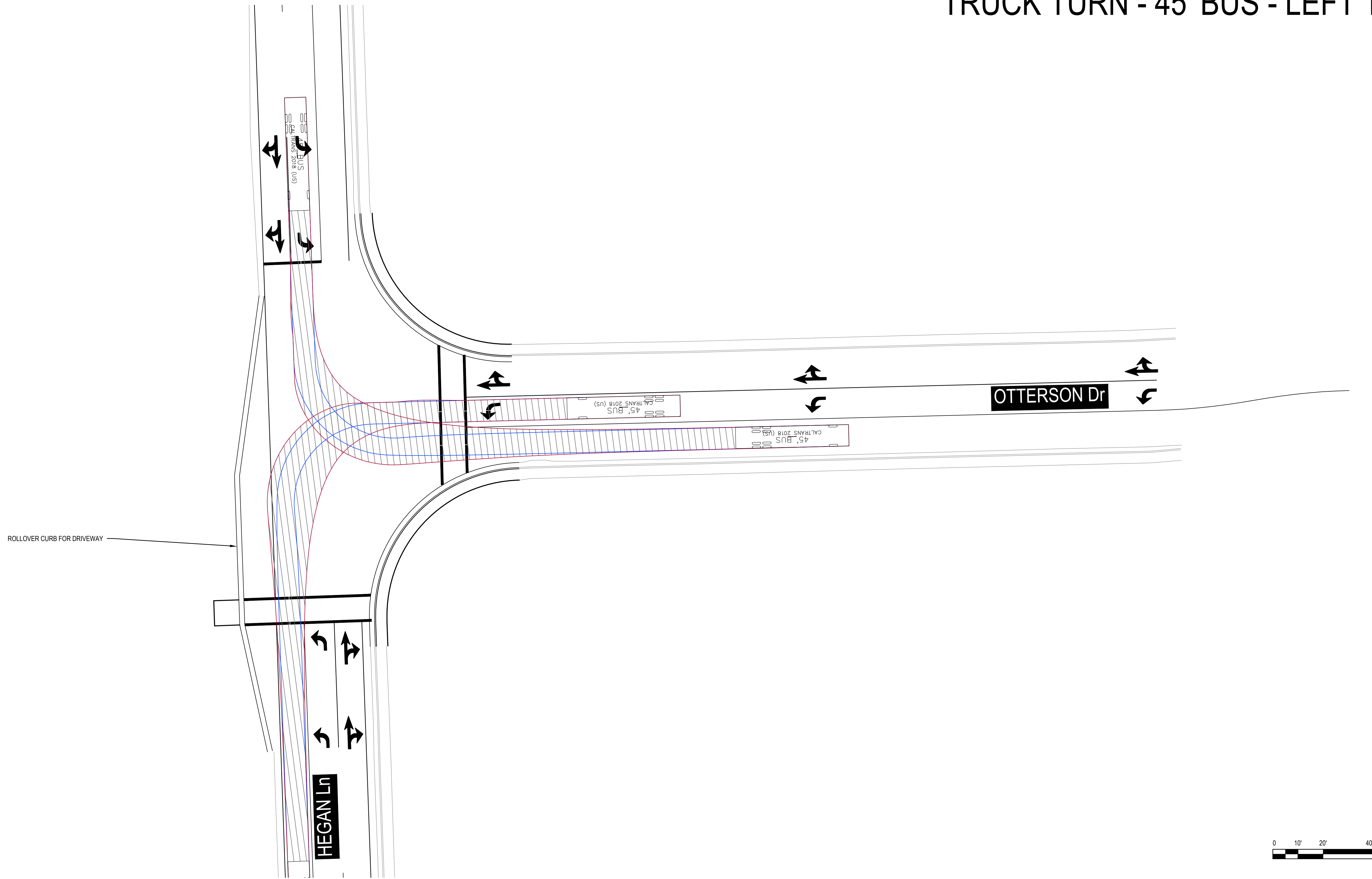


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FIGURE 3

TRUCK TURN - 45' BUS - LEFT TURNS



PRELIMINARY
SUBJECT TO CHANGE

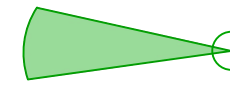
HEGAN Ln CONGESTION RELIEF PROJECT
OTTERSON Dr & HEGAN Ln SIGNAL



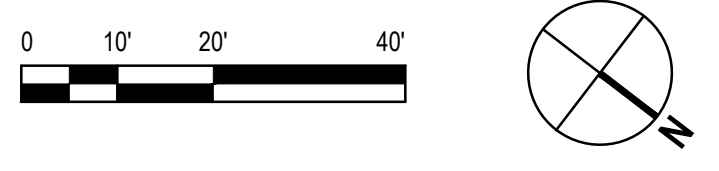
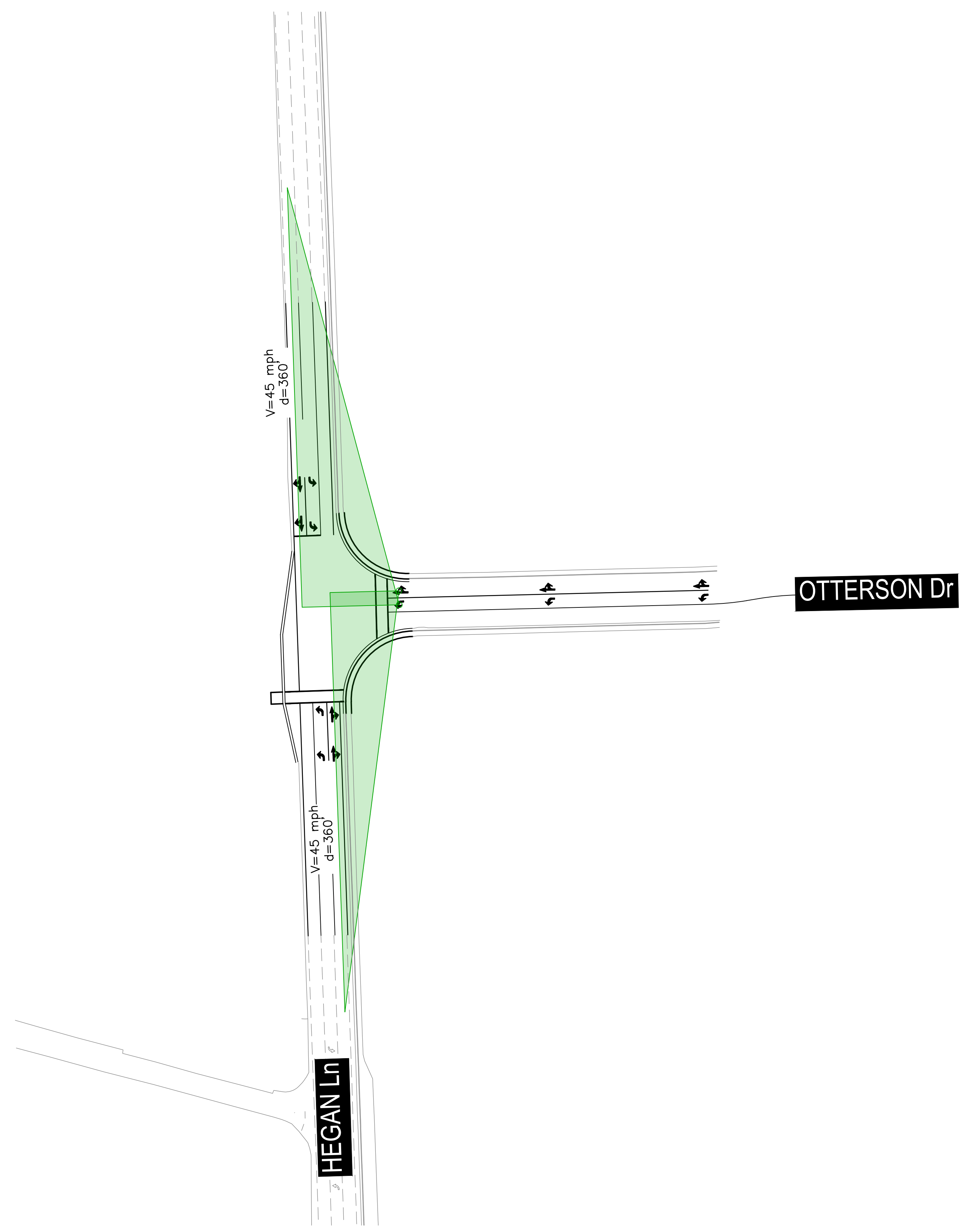
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FIGURE 4

LEGEND:
 INTERSECTION SIGHT TRIANGLE

CORNER SIGHT DISTANCE



PRELIMINARY
SUBJECT TO CHANGE

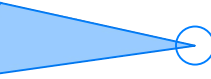
HEGAN Ln CONGESTION RELIEF PROJECT OTTERSON Dr & HEGAN Ln SIGNAL



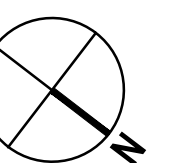
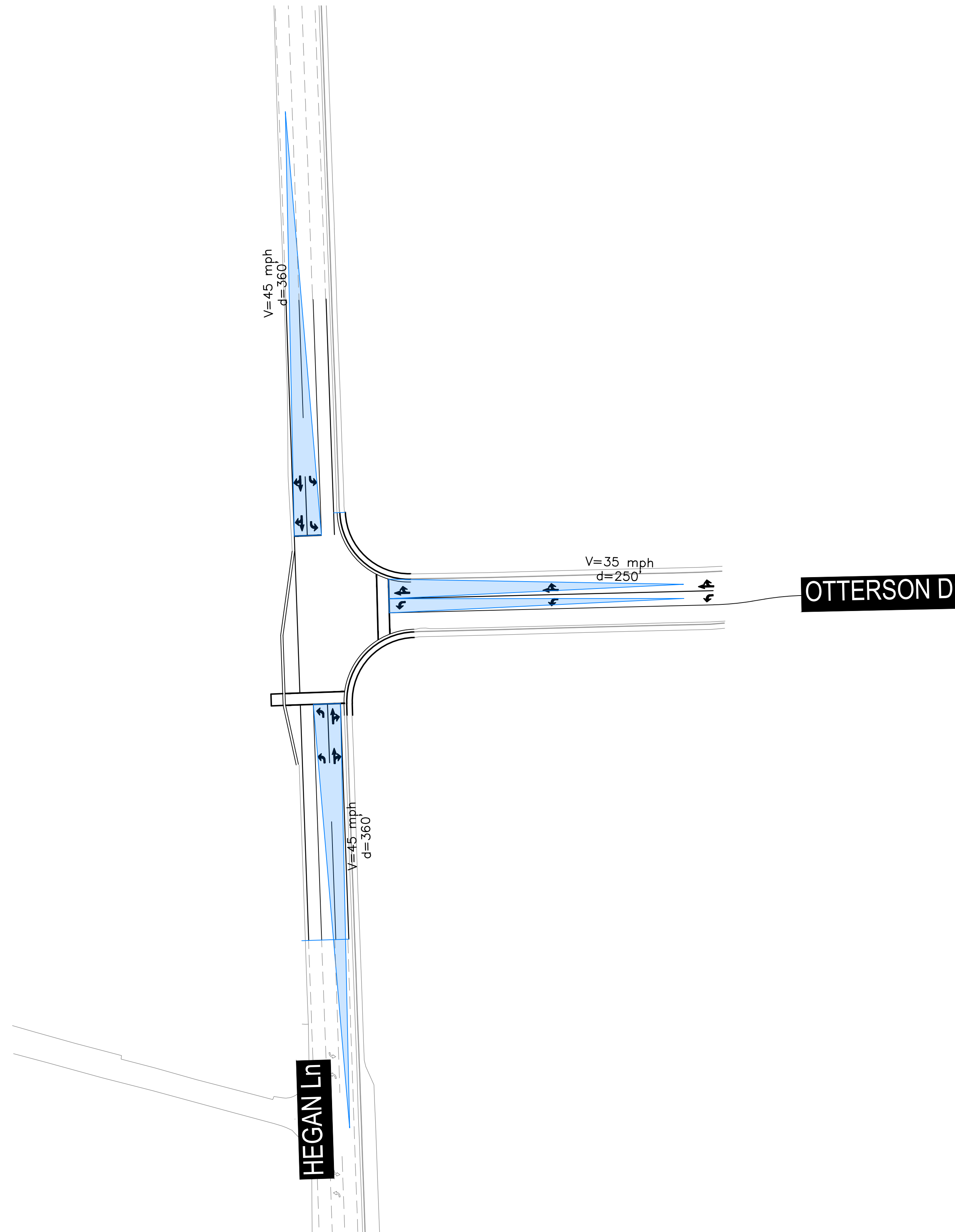
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FIGURE 5

LEGEND:
 STOPPING SIGHT DISTANCE

STOPPING SIGHT DISTANCE



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT OTTERSON Dr & HEGAN Ln SIGNAL AND ALL WAY STOP



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FIGURE 6

NORTHBOUND FASTEST PATH

LEGEND:

FAST PATH

D#

FAST PATH SPEED IDENTIFIER

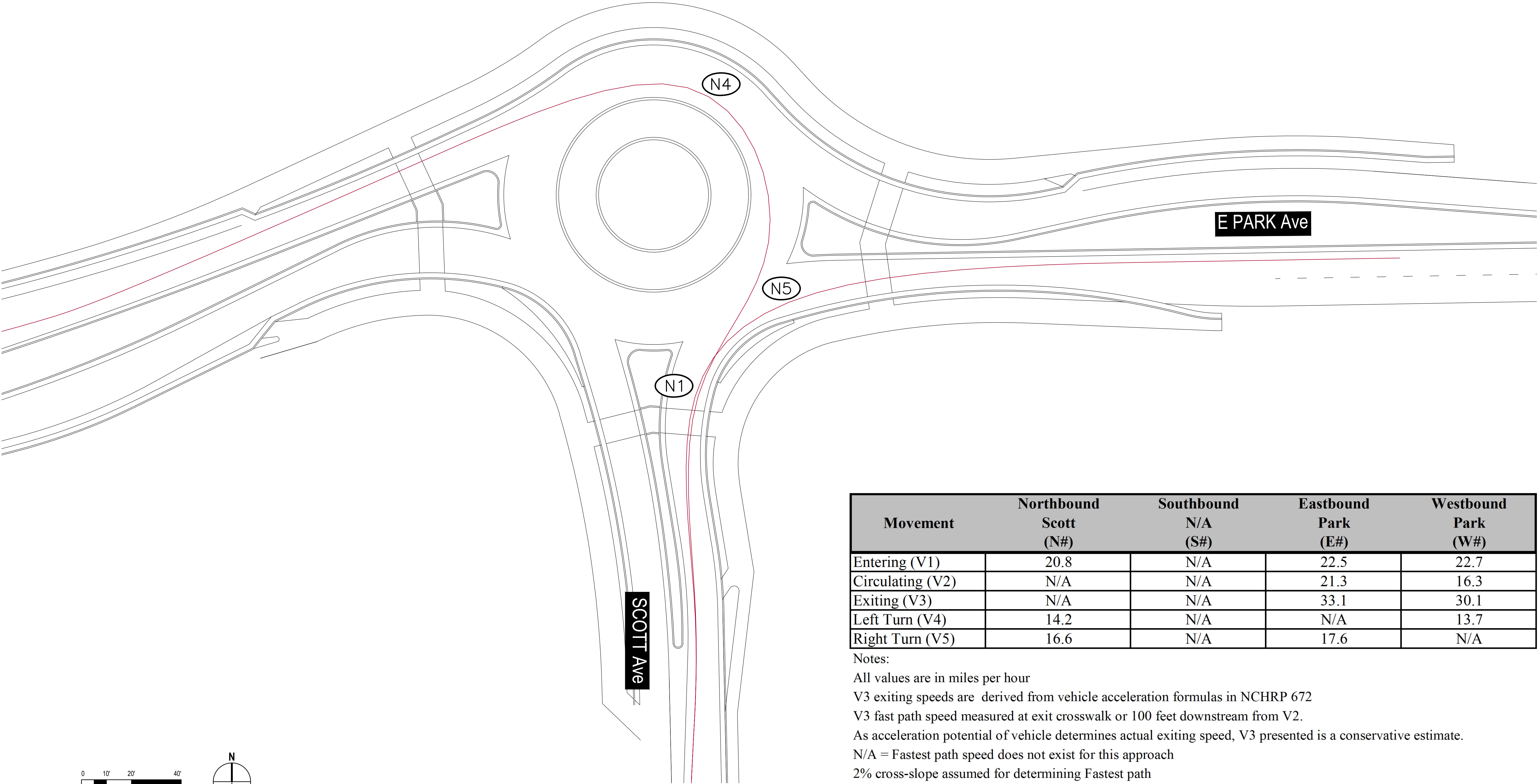
NOTE:

N2

NOT USED

N3

NOT USED



Movement	Northbound Scott (N#)	Southbound N/A (S#)	Eastbound Park (E#)	Westbound Park (W#)
Entering (V1)	20.8	N/A	22.5	22.7
Circulating (V2)	N/A	N/A	21.3	16.3
Exiting (V3)	N/A	N/A	33.1	30.1
Left Turn (V4)	14.2	N/A	N/A	13.7
Right Turn (V5)	16.6	N/A	17.6	N/A

Notes:

All values are in miles per hour

V3 exiting speeds are derived from vehicle acceleration formulas in NCHRP 672

V3 fast path speed measured at exit crosswalk or 100 feet downstream from V2.

As acceleration potential of vehicle determines actual exiting speed, V3 presented is a conservative estimate.

N/A = Fastest path speed does not exist for this approach

2% cross-slope assumed for determining Fastest path

PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
E PARK Ave & Scott ROUNDABOUT ALTERNATIVE



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FIGURE 1

LEGEND:

D#

FAST PATH

D#

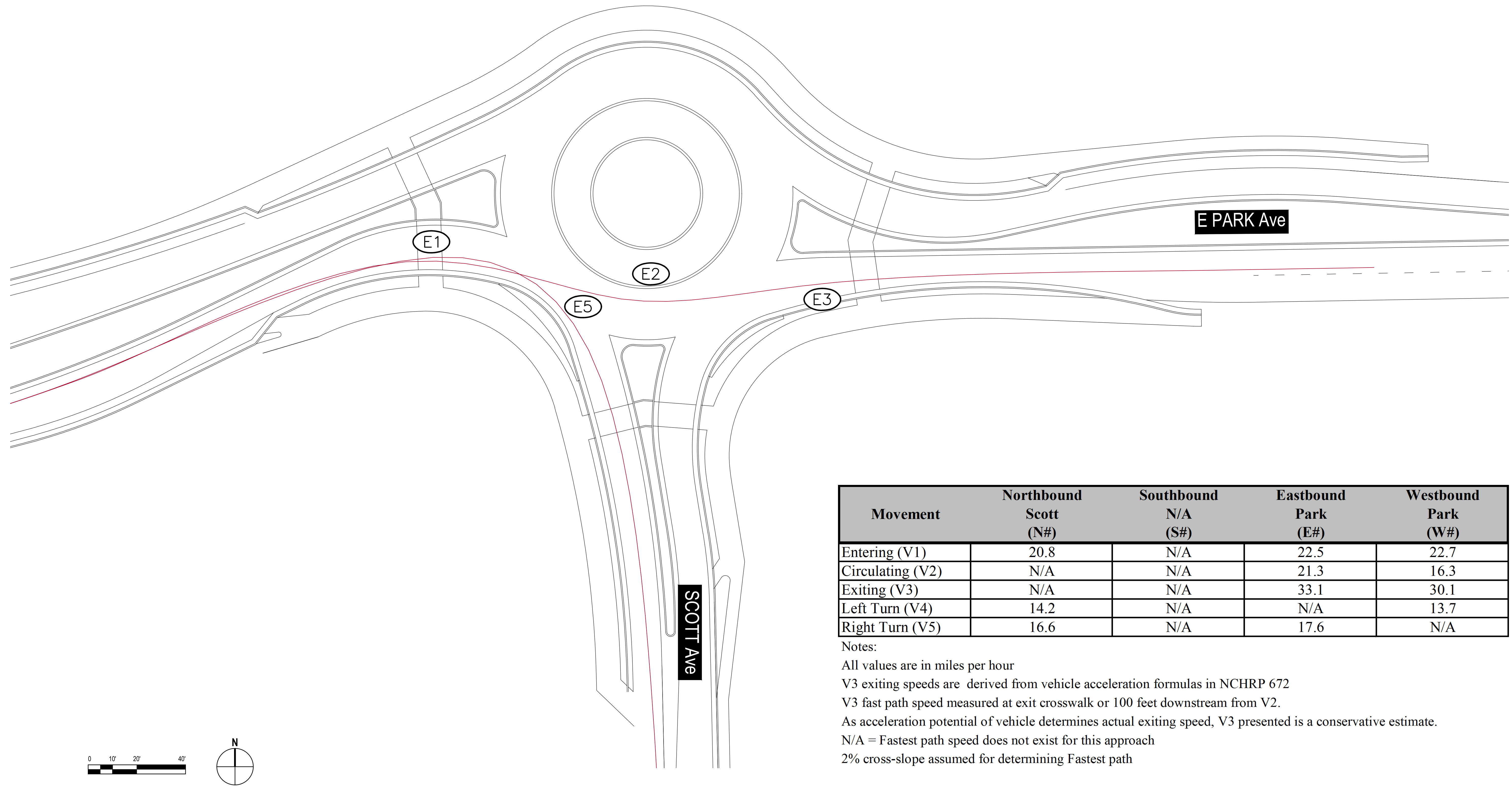
FAST PATH SPEED IDENTIFIER

NOTE:

E4

NOT USED

EASTBOUND FASTEST PATH



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & Scott ROUNDABOUT ALTERNATIVE



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FIGURE 2

LEGEND:

D#

FAST PATH

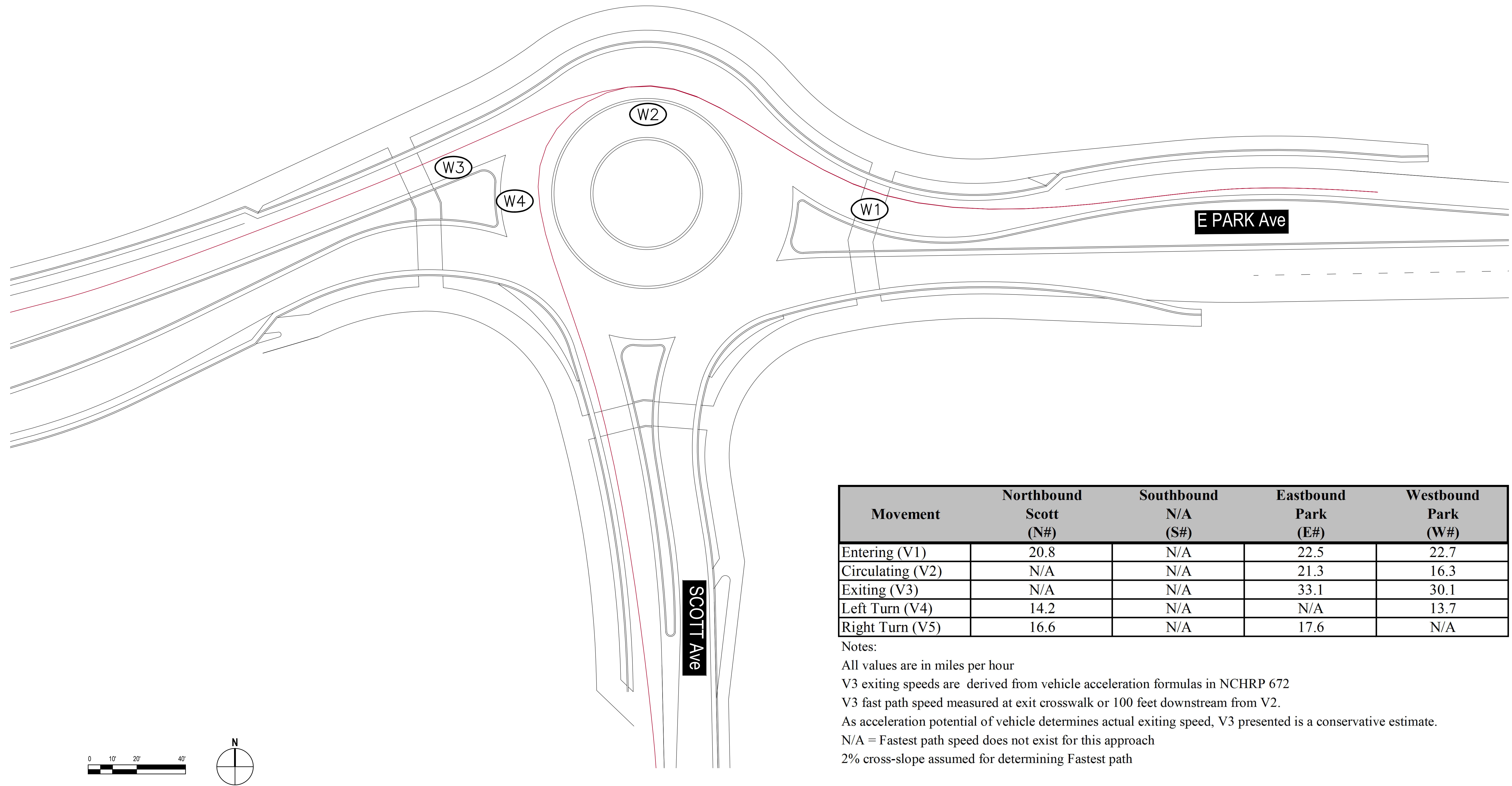
FAST PATH SPEED IDENTIFIER

NOTE:

W5

NOT USED

WESTBOUND FASTEST PATH



Movement	Northbound Scott (N#)	Southbound N/A (S#)	Eastbound Park (E#)	Westbound Park (W#)
Entering (V1)	20.8	N/A	22.5	22.7
Circulating (V2)	N/A	N/A	21.3	16.3
Exiting (V3)	N/A	N/A	33.1	30.1
Left Turn (V4)	14.2	N/A	N/A	13.7
Right Turn (V5)	16.6	N/A	17.6	N/A

Notes:

All values are in miles per hour

V3 exiting speeds are derived from vehicle acceleration formulas in NCHRP 672

V3 fast path speed measured at exit crosswalk or 100 feet downstream from V2.

As acceleration potential of vehicle determines actual exiting speed, V3 presented is a conservative estimate.

N/A = Fastest path speed does not exist for this approach

2% cross-slope assumed for determining Fastest path

PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & Scott ROUNDABOUT ALTERNATIVE

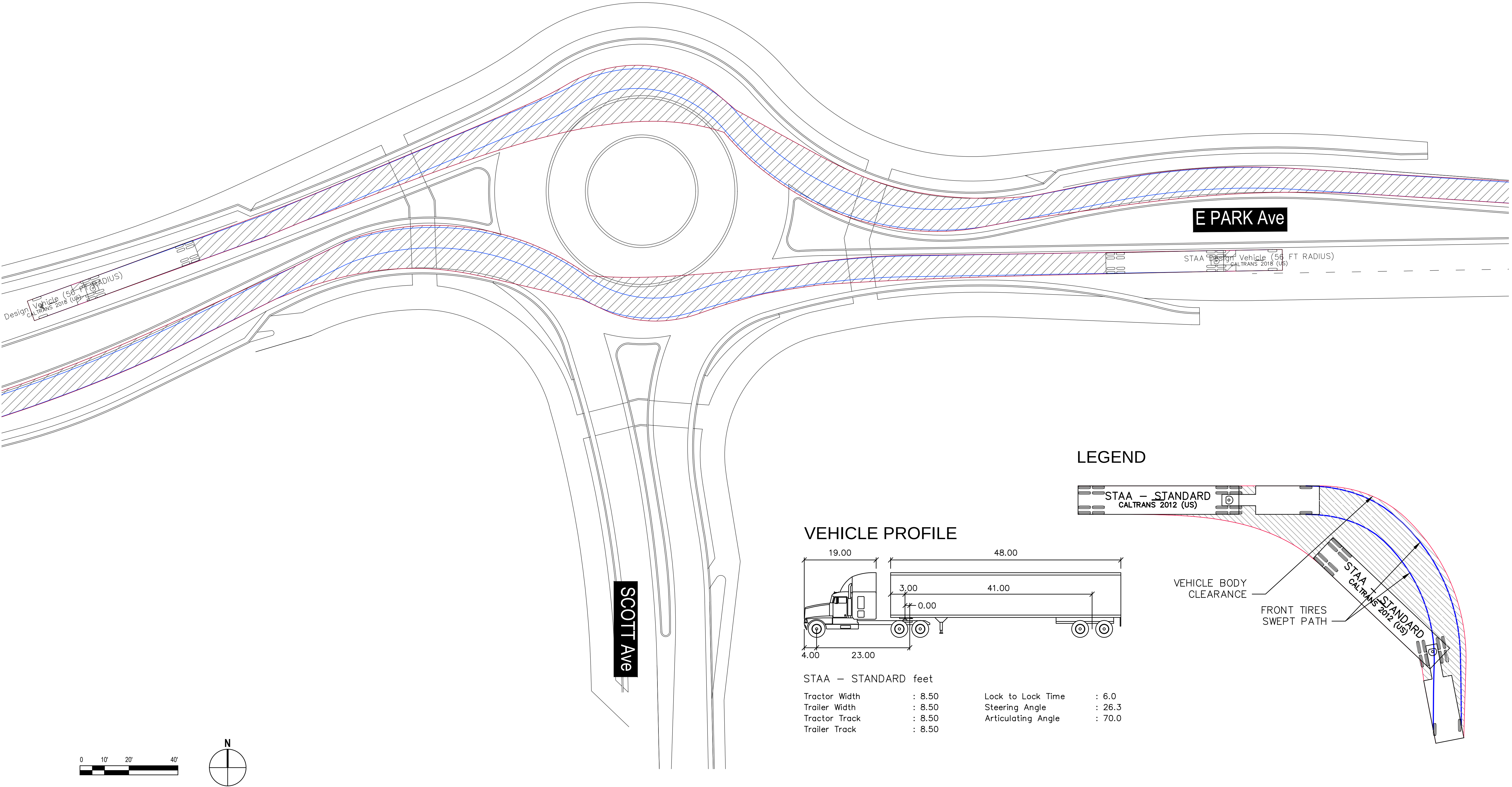


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FIGURE 3

TRUCK TURN - STAA - NB/SB THRU



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
E PARK Ave & Scott ROUNDABOUT ALTERNATIVE

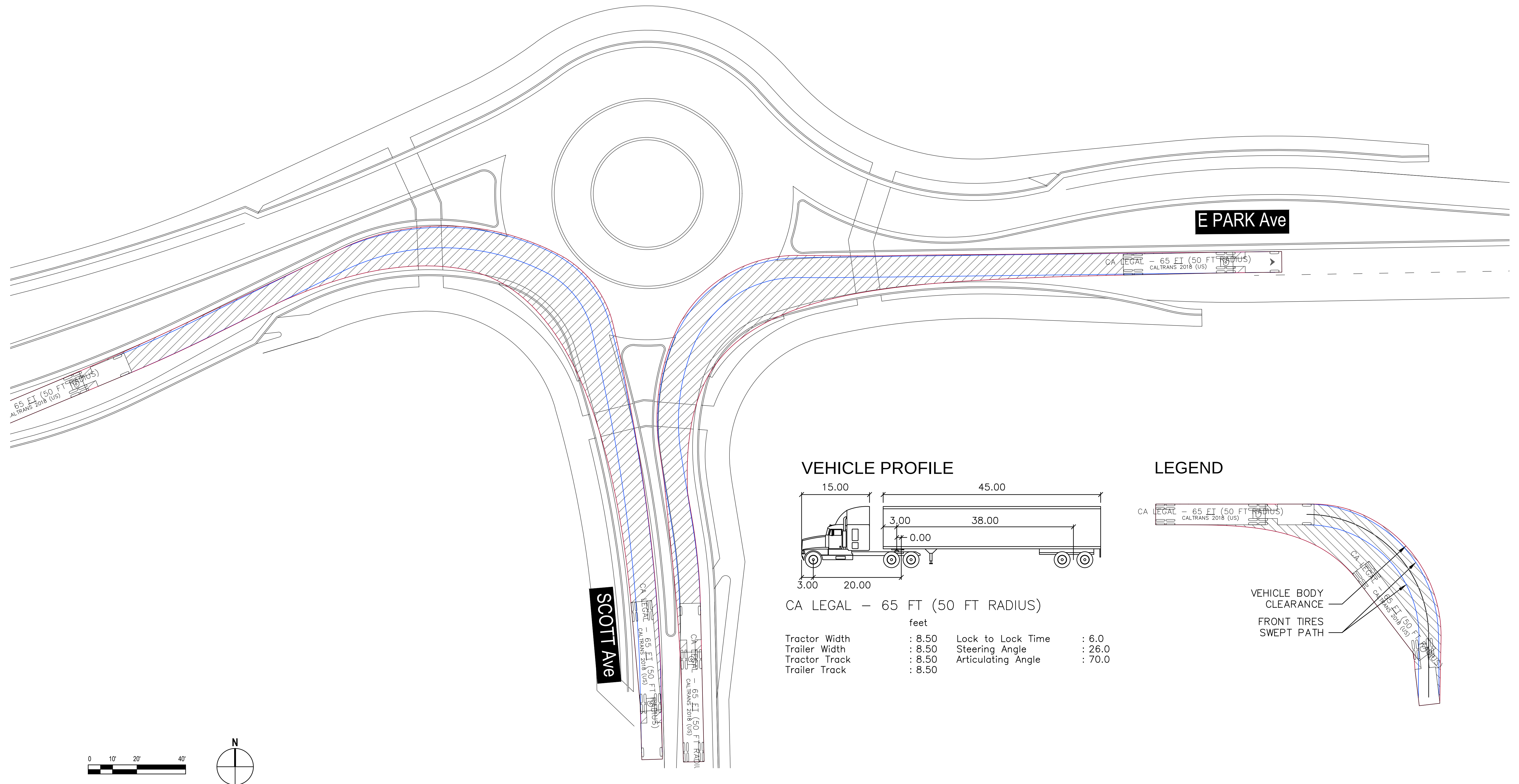


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FIGURE 4

TRUCK TURN - CAL LEGAL - RIGHTS



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & Scott ROUNDABOUT ALTERNATIVE

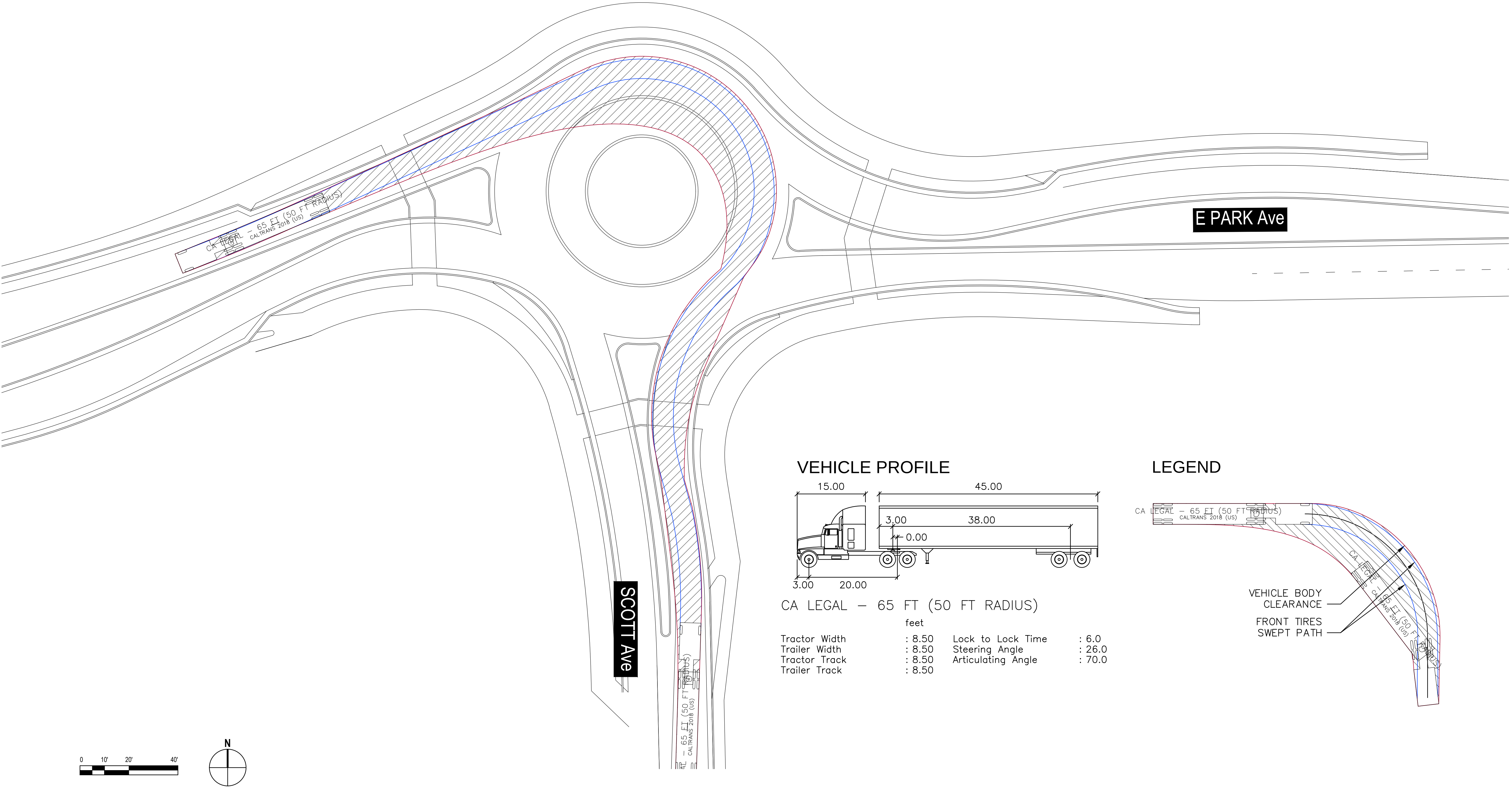


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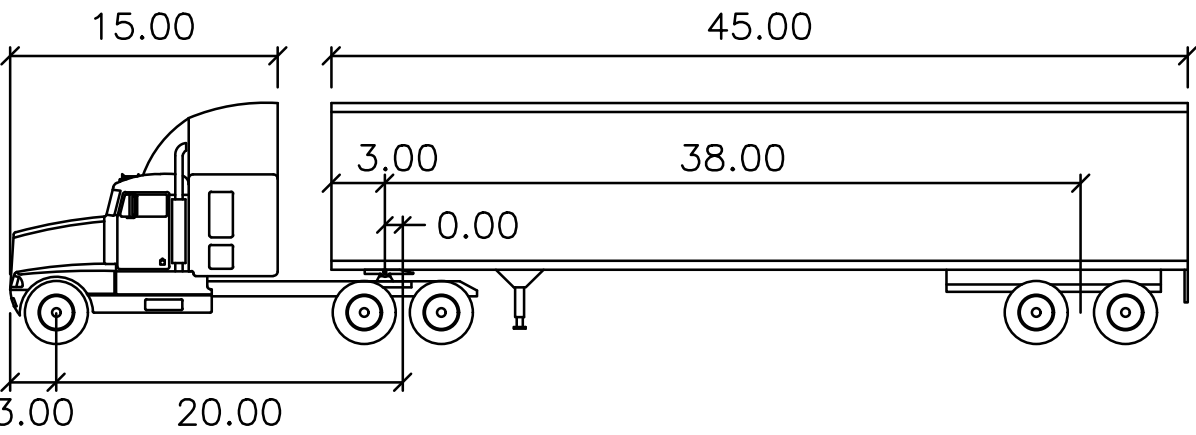
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FIGURE 5

TRUCK TURN - CAL LEGAL - NB LEFT TURN



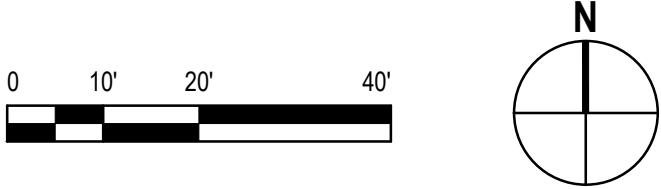
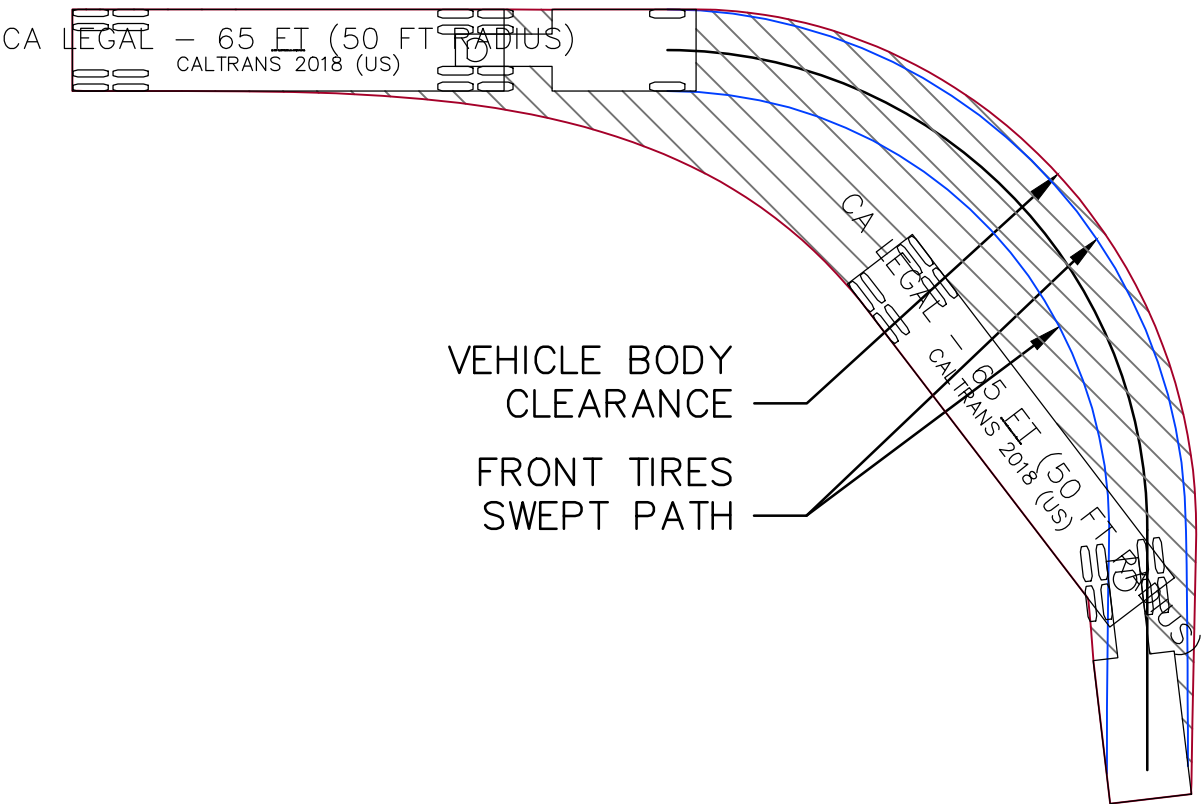
VEHICLE PROFILE



CA LEGAL - 65 FT (50 FT RADIUS)

	feet		
Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.0
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

LEGEND



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
E PARK Ave & Scott ROUNDABOUT ALTERNATIVE

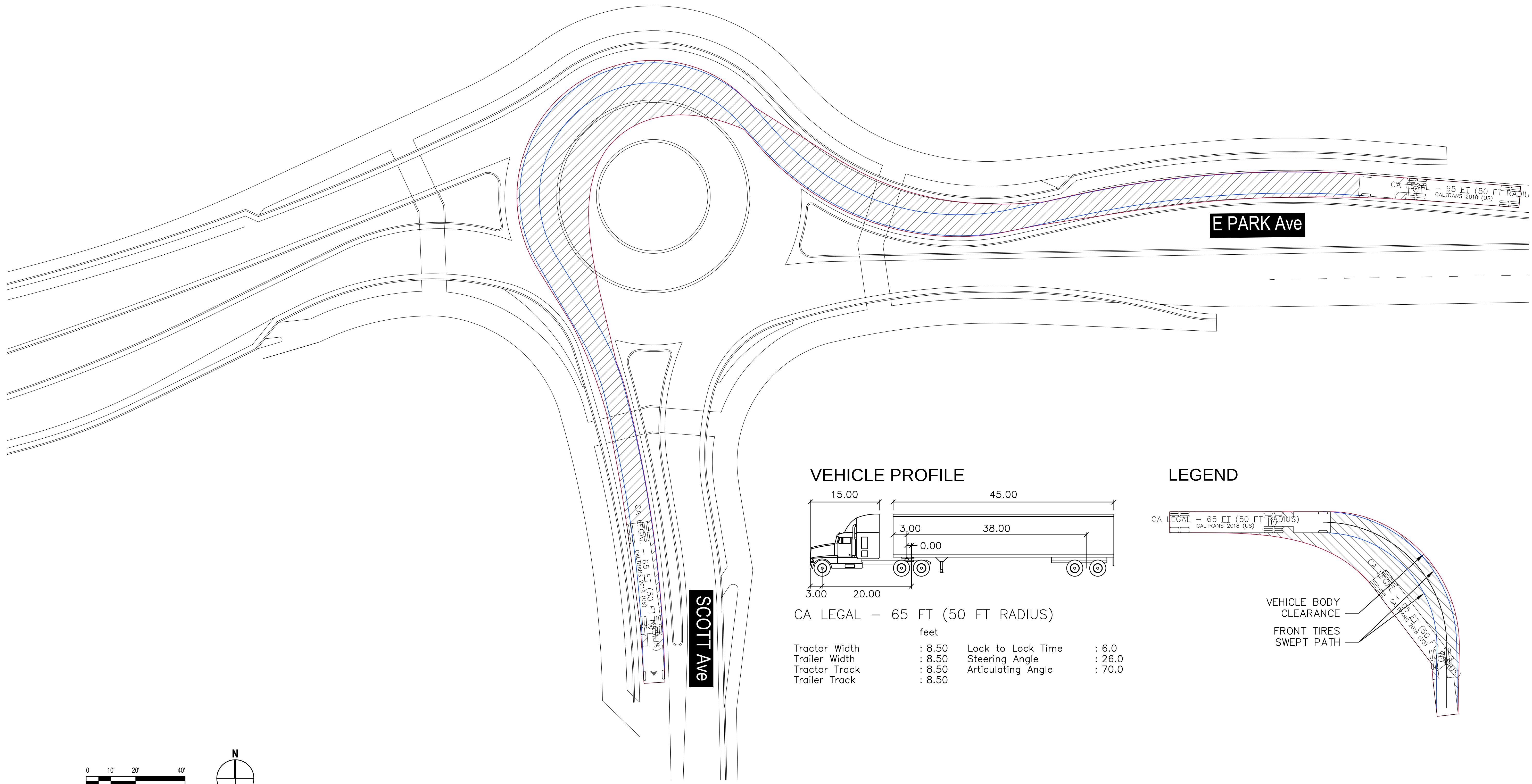


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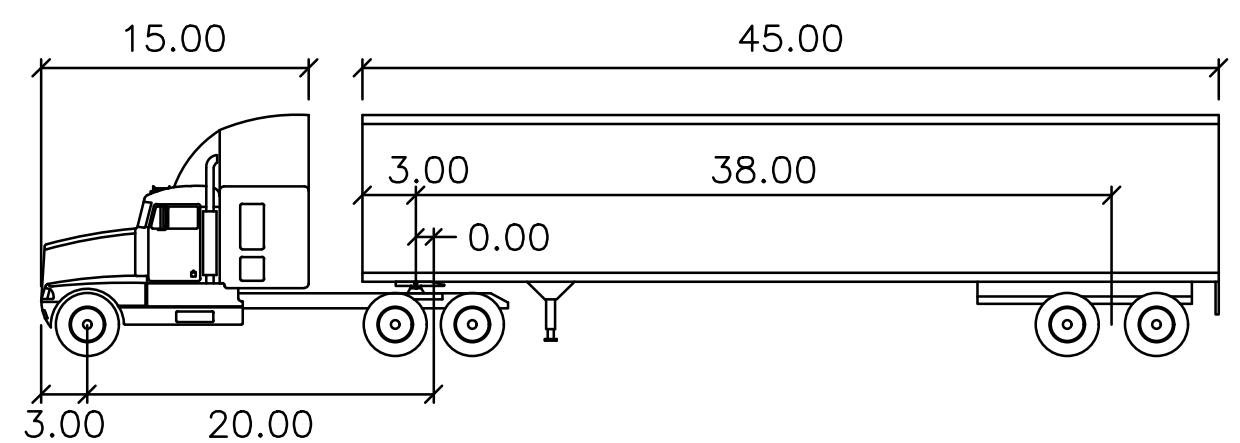
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FIGURE 6

TRUCK TURN - CAL LEGAL - WB LEFT TURN



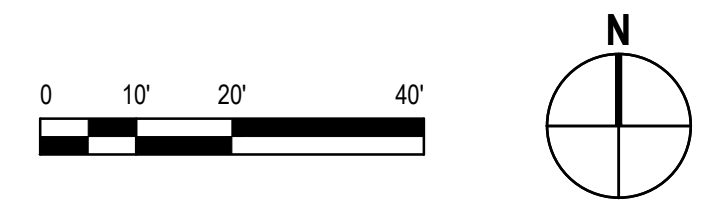
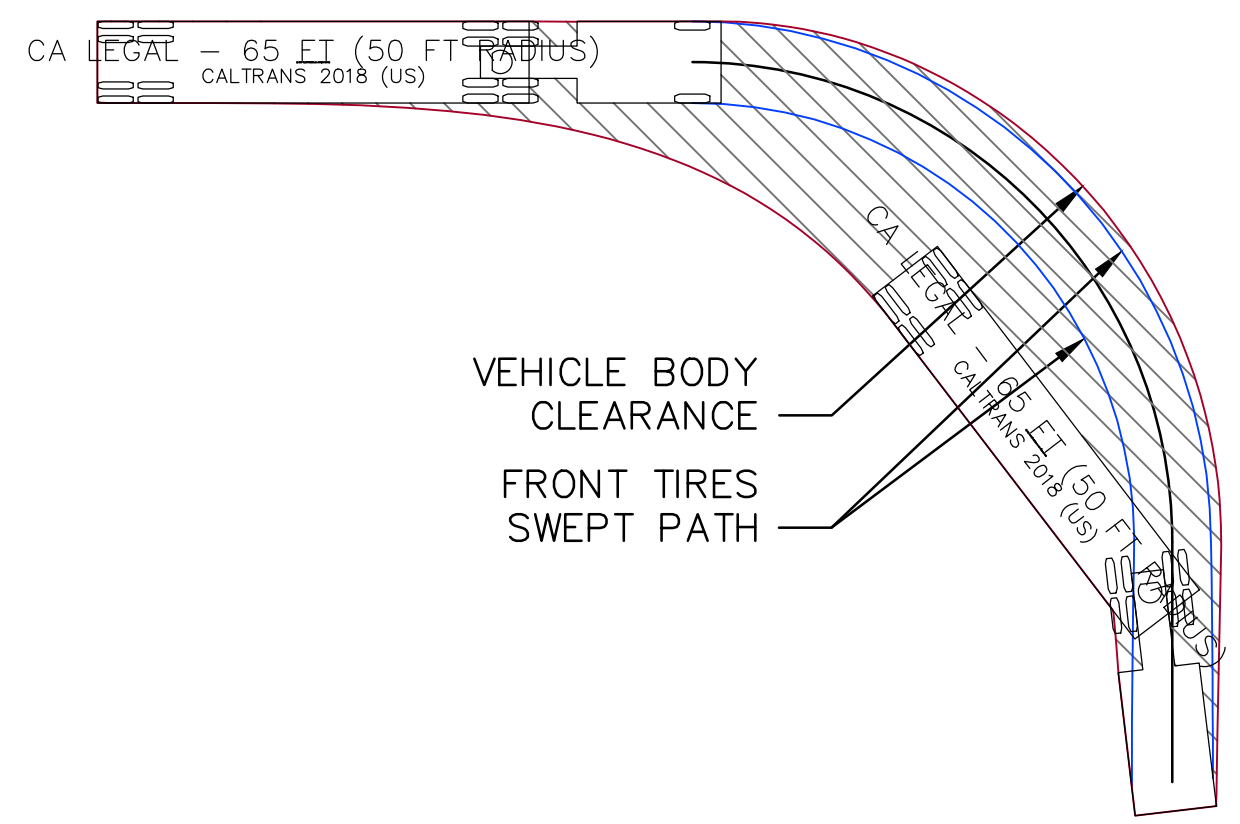
VEHICLE PROFILE



CA LEGAL - 65 FT (50 FT RADIUS)

	feet		
Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.0
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

LEGEND



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & Scott ROUNDABOUT ALTERNATIVE

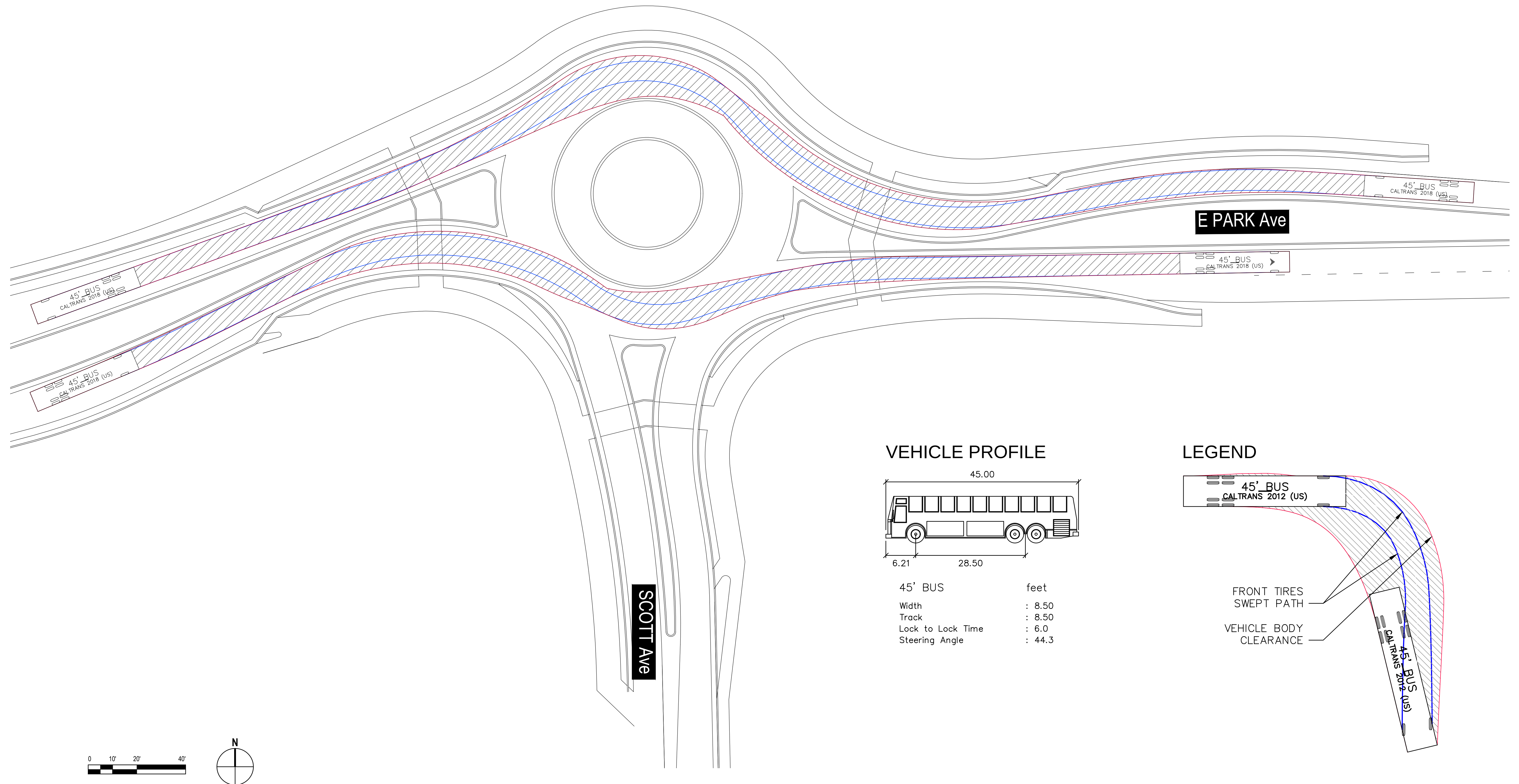


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FIGURE 7

BUS TURN - NB/SB THRU



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & Scott ROUNDABOUT ALTERNATIVE

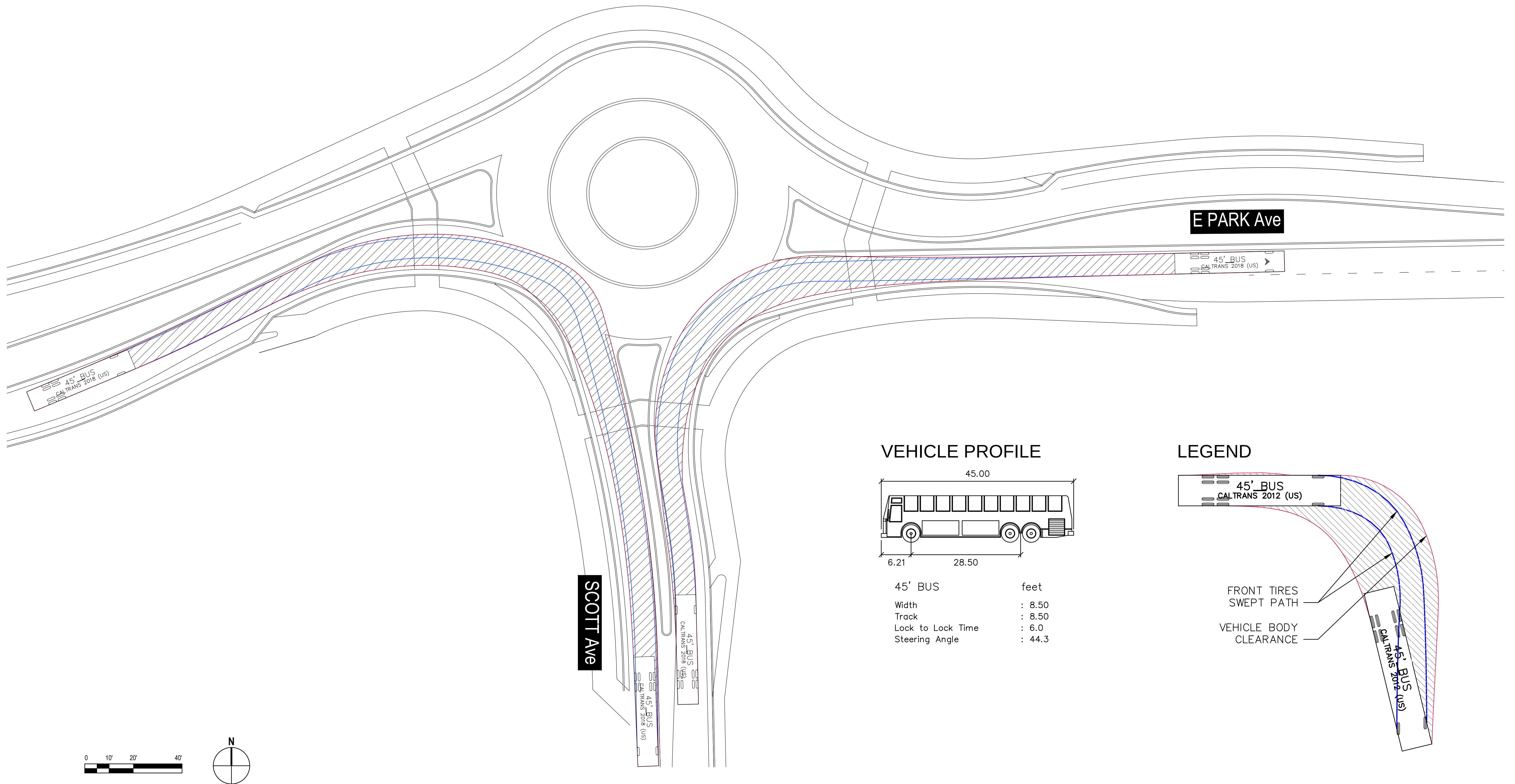


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FIGURE 8

BUS TURN - RIGHT TURNS



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & Scott ROUNDABOUT ALTERNATIVE

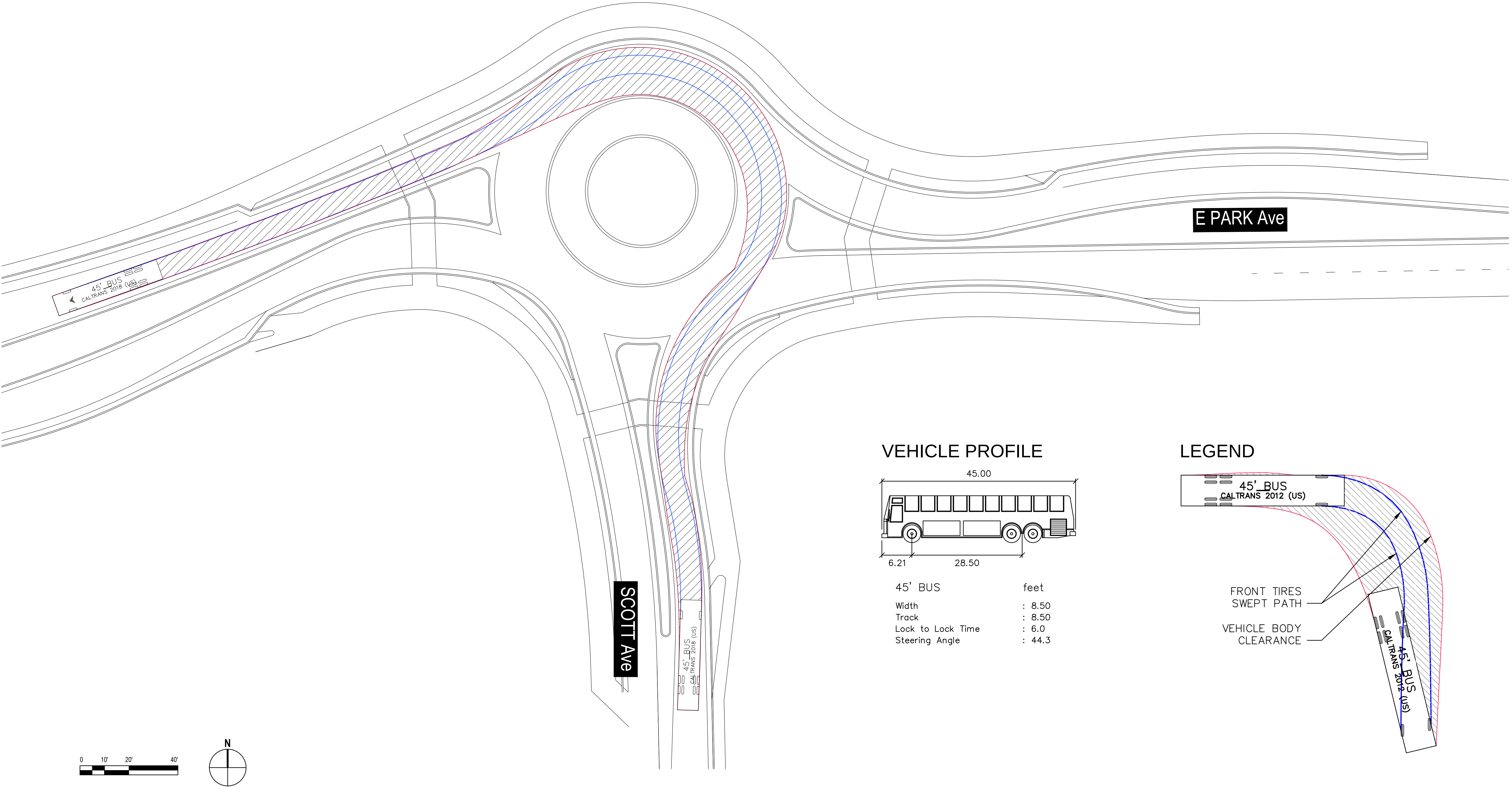


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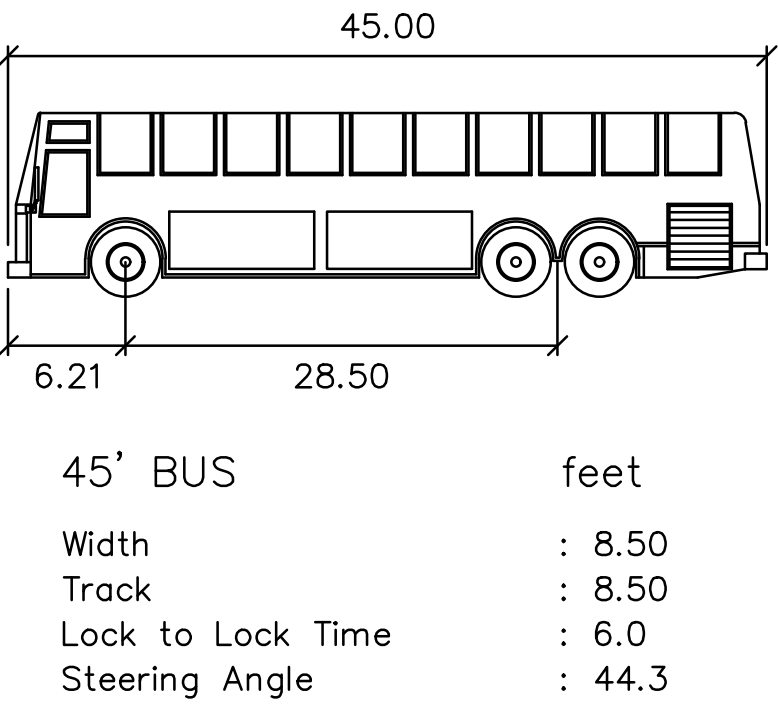
Project No. **11217309**
Date **2/28/22**

FIGURE 9

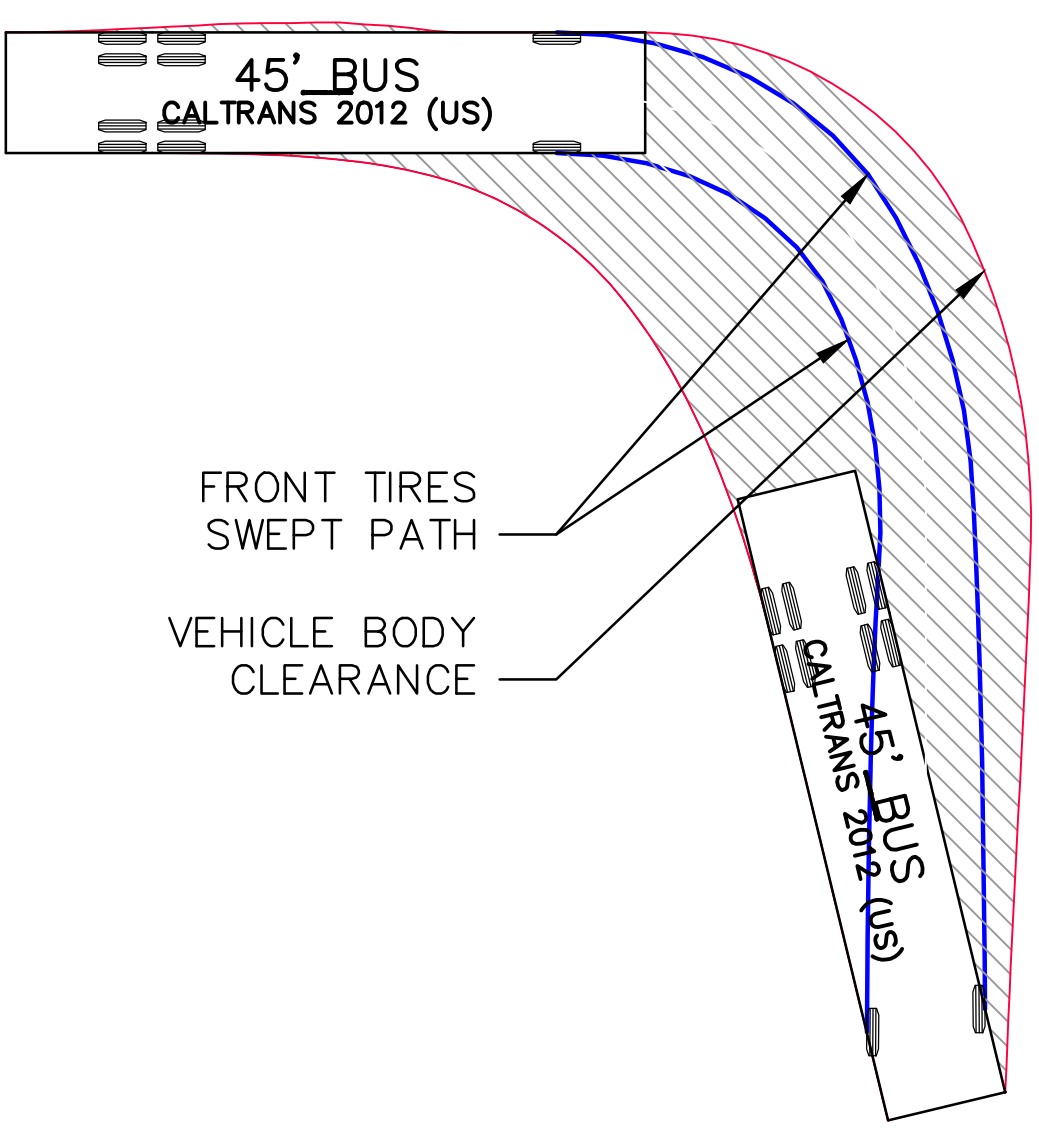
TRUCK TURN - CAL LEGAL - NB LEFT TURN



VEHICLE PROFILE



LEGEND



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT
E PARK Ave & Scott ROUNDABOUT ALTERNATIVE

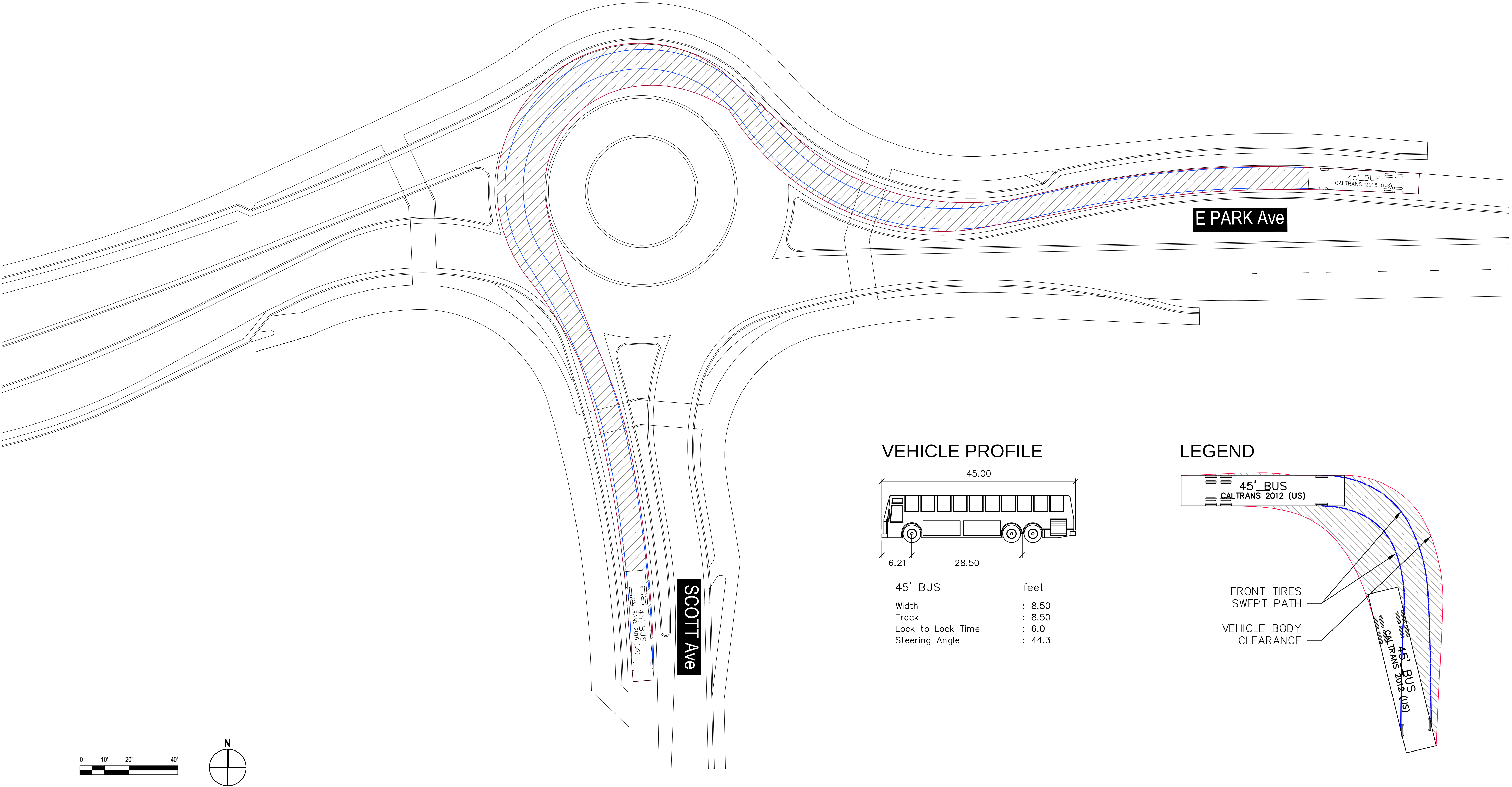


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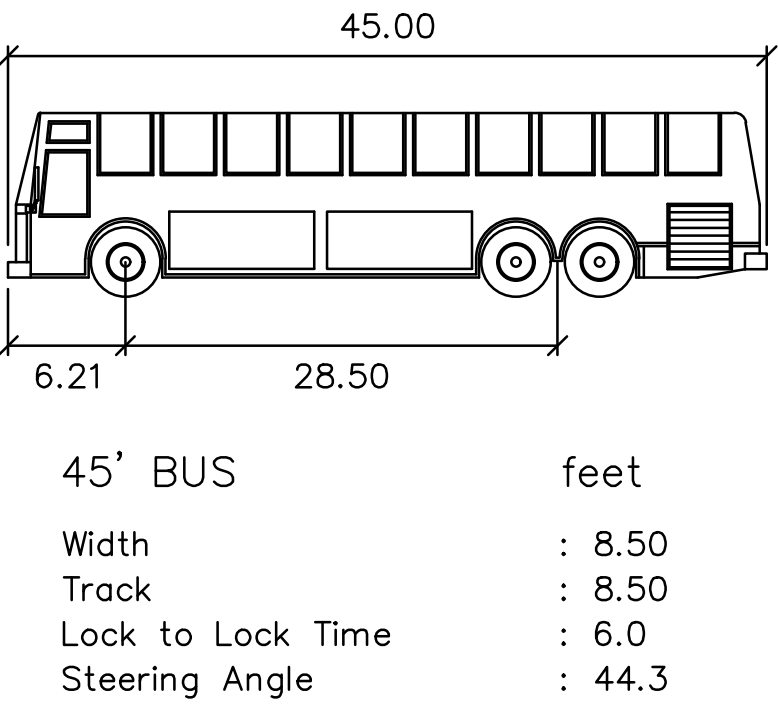
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FIGURE 10

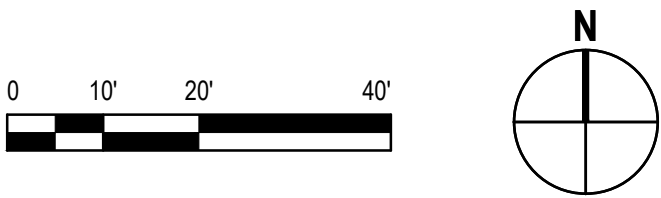
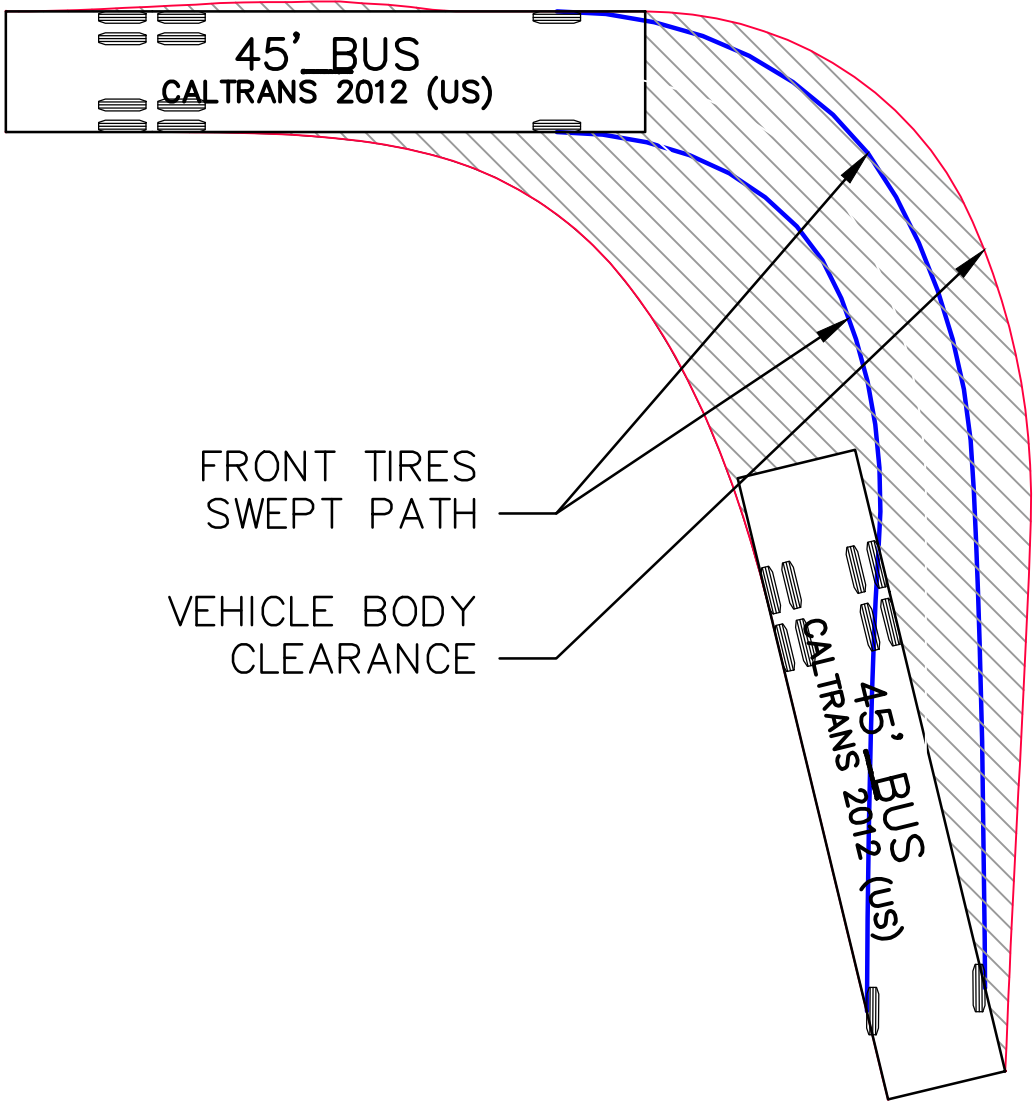
BUS TURN - WB LEFT TURN



VEHICLE PROFILE



LEGEND



PRELIMINARY
SUBJECT TO CHANGE

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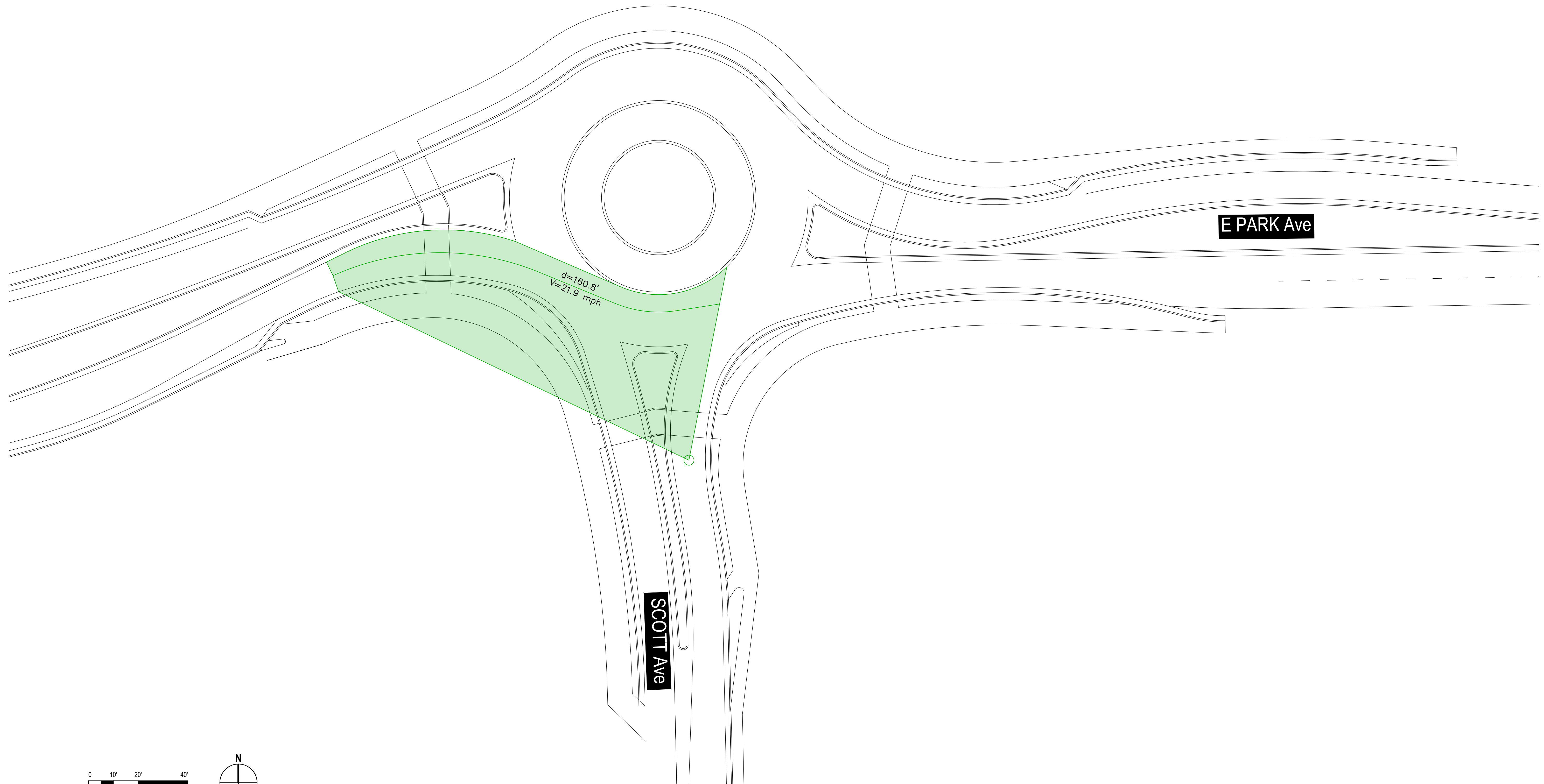


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FIGURE 11

LEGEND:
 INTERSECTION SIGHT TRIANGLE

INTERSECTION SIGHT DISTANCE - NB



PRELIMINARY
SUBJECT TO CHANGE

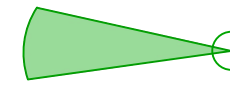
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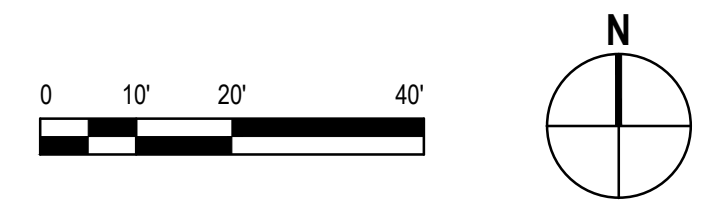
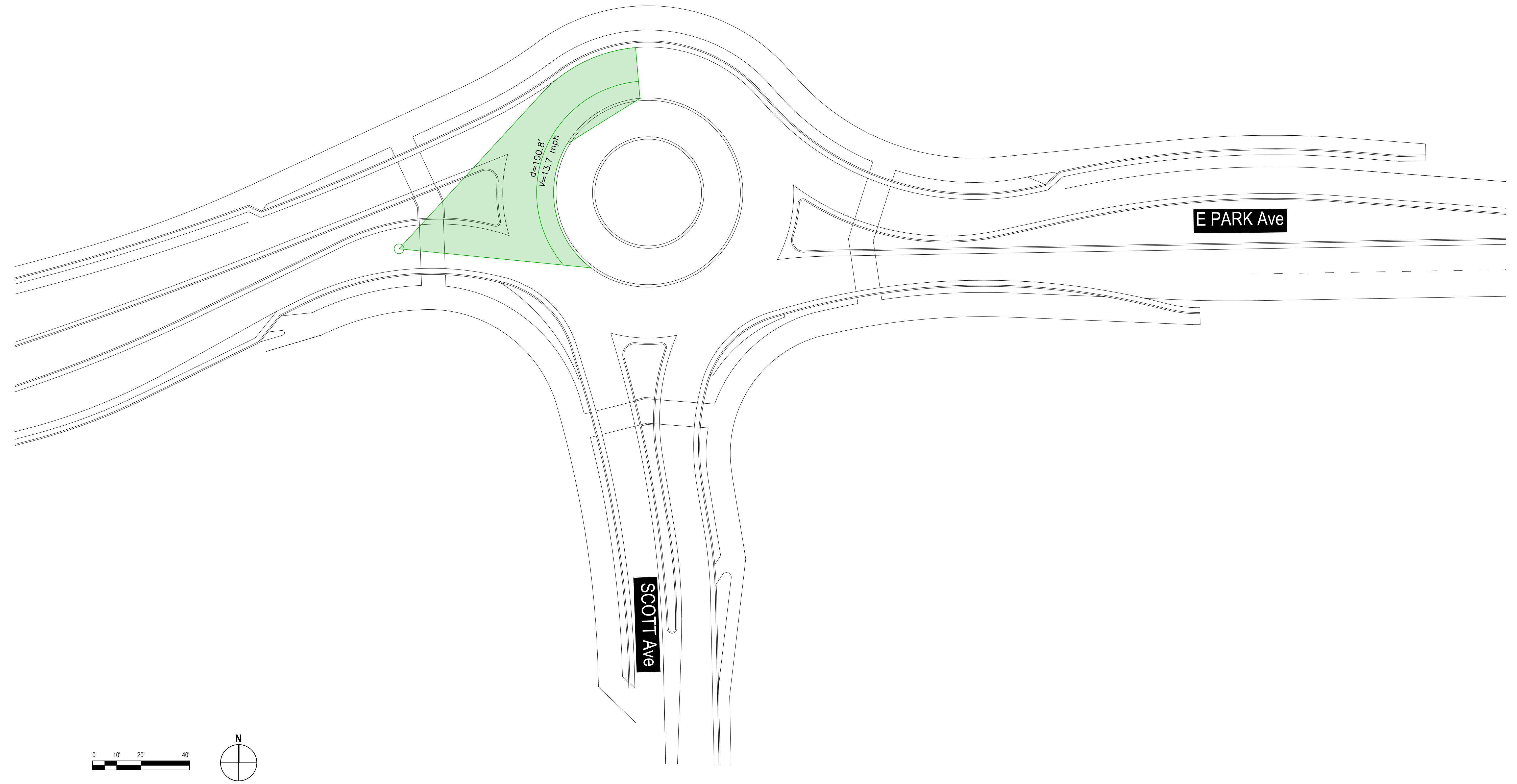
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FIGURE 12

LEGEND:
 INTERSECTION SIGHT TRIANGLE

INTERSECTION SIGHT DISTANCE - NB



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & Scott ROUNDABOUT ALTERNATIVE

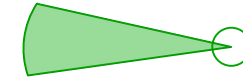


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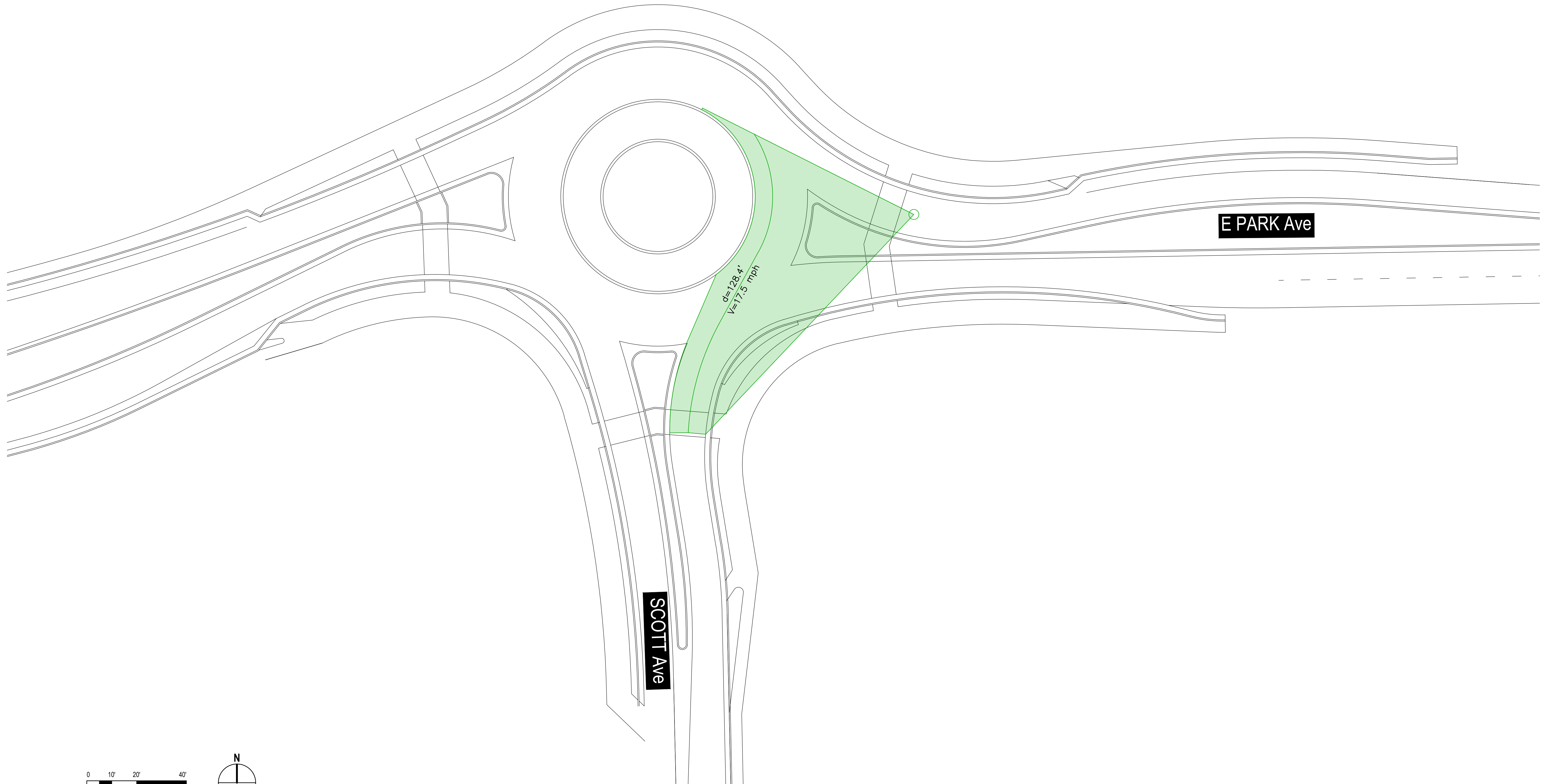
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FIGURE 13

LEGEND:

 INTERSECTION SIGHT TRIANGLE

INTERSECTION SIGHT DISTANCE - WB



PRELIMINARY
SUBJECT TO CHANGE

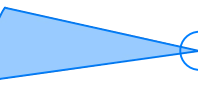
HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & Scott ROUNDABOUT ALTERNATIVE



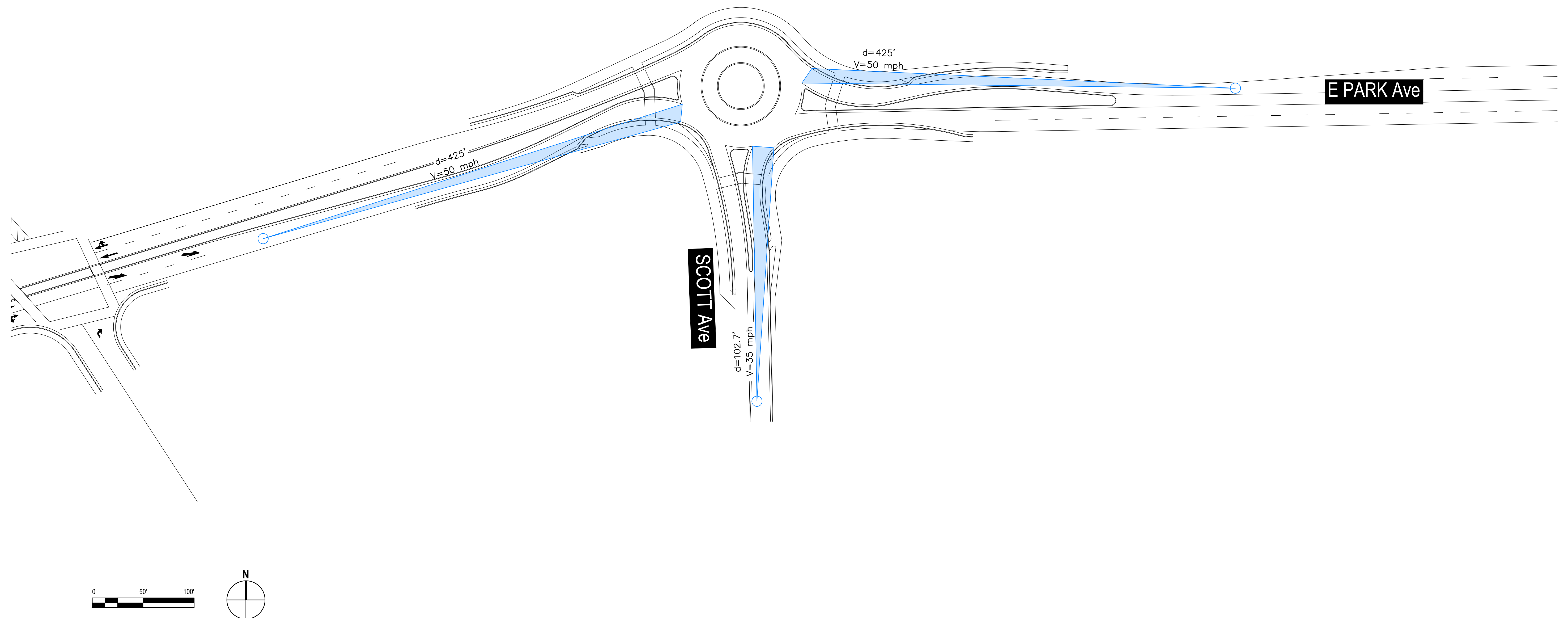
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FIGURE 14

LEGEND:
 STOPPING SIGHT TRIANGLE

STOPPING SIGHT DISTANCE - YIELD



PRELIMINARY
SUBJECT TO CHANGE

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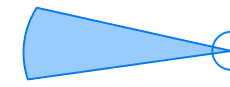


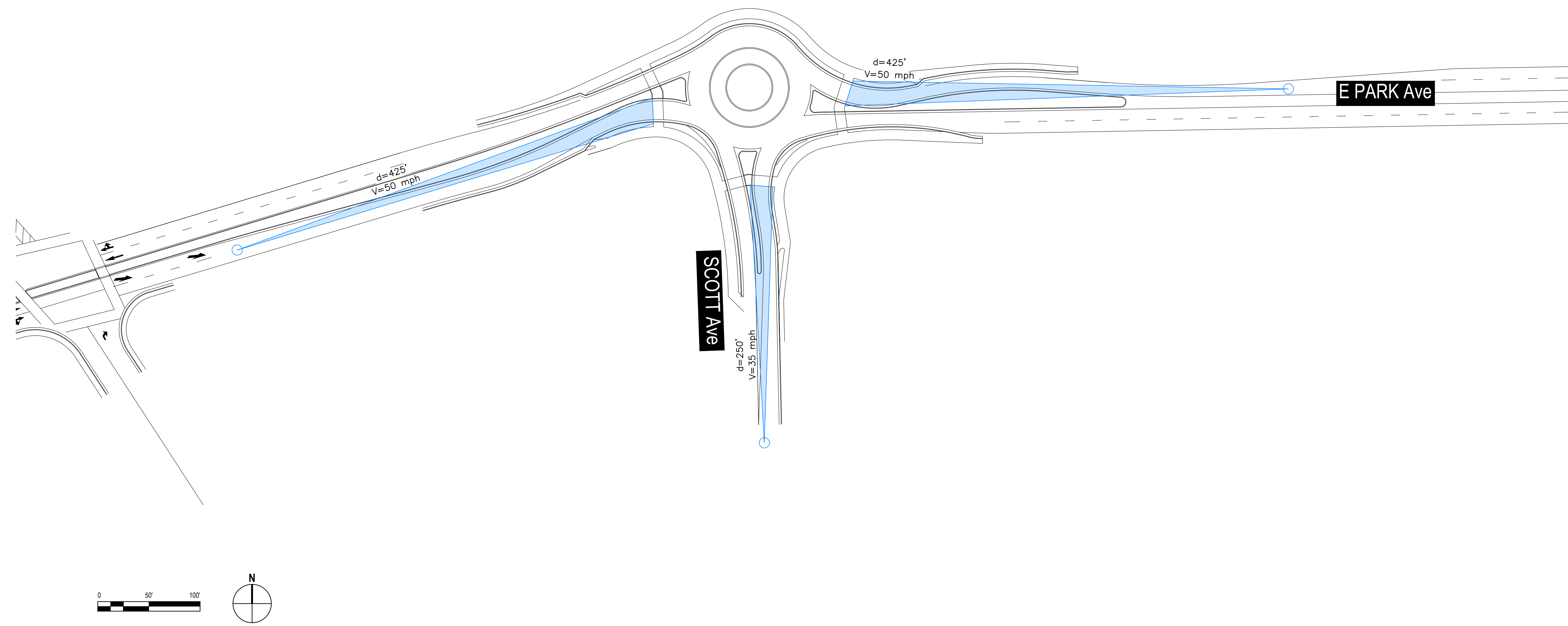
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FIGURE 15

STOPPING SIGHT DISTANCE - PEDESTRIANS

LEGEND:
 STOPPING SIGHT TRIANGLE



PRELIMINARY
SUBJECT TO CHANGE

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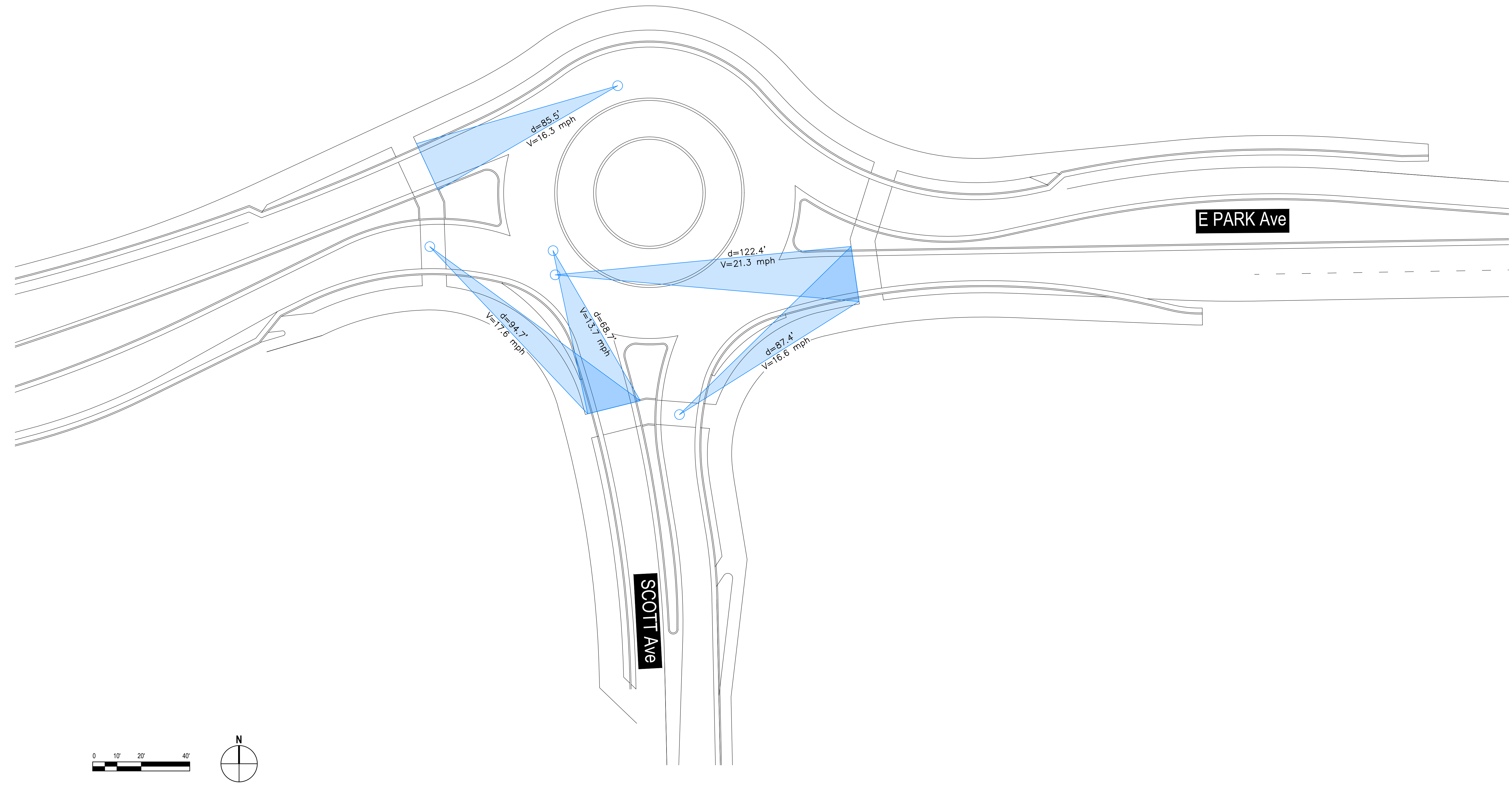
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FIGURE 16

LEGEND:
STOPPING SIGHT TRIANGLE

STOPPING SIGHT DISTANCE - CIRCULATING/RIGHT TURNS



PRELIMINARY
SUBJECT TO CHANGE

HEGAN Ln CONGESTION RELIEF PROJECT E PARK Ave & Scott ROUNDABOUT ALTERNATIVE



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FIGURE 17

Appendix E

Signal and Stop-Control LOS and Queueing Reports

HCM 6th Signalized Intersection Summary

1: Park Ave & Meyers St

Existing Conditions

AM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	47	71	115	311	408	94
Future Volume (veh/h)	47	71	115	311	408	94
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1841	1841	1841	1841
Adj Flow Rate, veh/h	55	83	134	362	474	109
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	0	0	4	4	4	4
Cap, veh/h	97	146	257	2062	965	221
Arrive On Green	0.15	0.15	0.15	0.59	0.34	0.34
Sat Flow, veh/h	646	975	1753	3589	2919	646
Grp Volume(v), veh/h	139	0	134	362	292	291
Grp Sat Flow(s),veh/h/ln	1633	0	1753	1749	1749	1724
Q Serve(g_s), s	2.7	0.0	2.4	1.6	4.6	4.6
Cycle Q Clear(g_c), s	2.7	0.0	2.4	1.6	4.6	4.6
Prop In Lane	0.40	0.60	1.00			0.37
Lane Grp Cap(c), veh/h	244	0	257	2062	597	589
V/C Ratio(X)	0.57	0.00	0.52	0.18	0.49	0.49
Avail Cap(c_a), veh/h	758	0	839	3550	1775	1750
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.6	0.0	13.6	3.2	9.0	9.0
Incr Delay (d2), s/veh	0.8	0.0	0.6	0.1	0.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.8	0.2	1.2	1.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.4	0.0	14.2	3.3	9.9	9.9
LnGrp LOS	B	A	B	A	A	A
Approach Vol, veh/h	139			496	583	
Approach Delay, s/veh	14.4			6.2	9.9	
Approach LOS	B			A	A	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	8.6	16.8		9.2		25.3
Change Period (Y+Rc), s	3.5	5.0		4.0		5.0
Max Green Setting (Gmax), s	16.5	35.0		16.0		35.0
Max Q Clear Time (g_c+I1), s	4.4	6.6		4.7		3.6
Green Ext Time (p_c), s	0.0	5.2		0.1		3.6
Intersection Summary						
HCM 6th Ctrl Delay			8.9			
HCM 6th LOS			A			
Notes						
User approved pedestrian interval to be less than phase max green.						
User approved volume balancing among the lanes for turning movement.						

HCM 6th Signalized Intersection Summary

2: Midway/Park Ave & Greenway/E Park Ave

Existing Conditions
AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔		↔	↔	↔	↔	
Traffic Volume (veh/h)	0	2	0	576	1	205	0	221	447	268	215	1
Future Volume (veh/h)	0	2	0	576	1	205	0	221	447	268	215	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1767	1767	1767	1767	1767	1767	1767	1767	1767	1767	1767	1767
Adj Flow Rate, veh/h	0	2	0	634	0	0	0	243	491	266	277	1
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
Percent Heavy Veh, %	9	9	9	9	9	9	9	9	9	9	9	9
Cap, veh/h	0	7	0	790	0	0	0	603	511	339	354	1
Arrive On Green	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.34	0.34	0.20	0.20	0.20
Sat Flow, veh/h	0	1767	0	3365	0	1497	0	1767	1497	1682	1759	6
Grp Volume(v), veh/h	0	2	0	634	0	0	0	243	491	266	0	278
Grp Sat Flow(s),veh/h/ln	0	1767	0	1682	0	1497	0	1767	1497	1682	0	1765
Q Serve(g_s), s	0.0	0.1	0.0	15.6	0.0	0.0	0.0	9.2	28.2	13.2	0.0	13.1
Cycle Q Clear(g_c), s	0.0	0.1	0.0	15.6	0.0	0.0	0.0	9.2	28.2	13.2	0.0	13.1
Prop In Lane	0.00		0.00	1.00		1.00	0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	0	7	0	790	0	0	0	603	511	339	0	356
V/C Ratio(X)	0.00	0.30	0.00	0.80	0.00	0.00	0.00	0.40	0.96	0.78	0.00	0.78
Avail Cap(c_a), veh/h	0	209	0	1165	0	0	0	603	511	575	0	603
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	43.6	0.0	31.7	0.0	0.0	0.0	22.1	28.3	33.3	0.0	33.2
Incr Delay (d2), s/veh	0.0	8.9	0.0	3.3	0.0	0.0	0.0	0.3	29.8	4.8	0.0	4.5
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.0	6.4	0.0	0.0	0.0	3.8	13.9	5.6	0.0	5.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	52.5	0.0	35.0	0.0	0.0	0.0	22.4	58.1	38.1	0.0	37.8
LnGrp LOS	A	D	A	D	A		A	C	E	D	A	D
Approach Vol, veh/h	2			634			A			734		
Approach Delay, s/veh	52.5			35.0			46.3			37.9		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	35.0			4.9			22.7			25.2		
Change Period (Y+Rc), s	5.0			4.6			5.0			4.6		
Max Green Setting (Gmax), s	30.0			10.4			30.0			30.4		
Max Q Clear Time (g_c+I1), s	30.2			2.1			15.2			17.6		
Green Ext Time (p_c), s	0.0			0.0			2.5			3.0		

Intersection Summary

HCM 6th Ctrl Delay 40.2

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

3: Fair St & E Park Ave

Existing Conditions
AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	73	628	11	6	655	72	12	7	4	118	9	115
Future Volume (veh/h)	73	628	11	6	655	72	12	7	4	118	9	115
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1752	1752	1752	1752	1752	1752	1752	1752	1752	1752	1752	1752
Adj Flow Rate, veh/h	75	647	11	6	675	74	12	7	4	122	9	119
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	10	10	10	10	10	10	10	10	10	10	10	10
Cap, veh/h	111	1325	23	13	1019	112	48	28	16	345	22	289
Arrive On Green	0.07	0.40	0.40	0.01	0.34	0.34	0.06	0.06	0.06	0.21	0.21	0.21
Sat Flow, veh/h	1668	3349	57	1668	3025	331	864	504	288	1668	106	1395
Grp Volume(v), veh/h	75	321	337	6	371	378	23	0	0	122	0	128
Grp Sat Flow(s), veh/h/ln	1668	1664	1742	1668	1664	1692	1657	0	0	1668	0	1501
Q Serve(g_s), s	2.0	6.7	6.7	0.2	8.8	8.8	0.6	0.0	0.0	2.9	0.0	3.4
Cycle Q Clear(g_c), s	2.0	6.7	6.7	0.2	8.8	8.8	0.6	0.0	0.0	2.9	0.0	3.4
Prop In Lane	1.00		0.03	1.00		0.20	0.52		0.17	1.00		0.93
Lane Grp Cap(c), veh/h	111	658	689	13	561	570	92	0	0	345	0	311
V/C Ratio(X)	0.67	0.49	0.49	0.45	0.66	0.66	0.25	0.00	0.00	0.35	0.00	0.41
Avail Cap(c_a), veh/h	719	1435	1502	899	1435	1459	786	0	0	719	0	647
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.2	10.5	10.5	22.9	13.1	13.1	21.0	0.0	0.0	15.7	0.0	15.9
Incr Delay (d2), s/veh	2.6	0.6	0.5	8.5	1.3	1.3	1.4	0.0	0.0	0.6	0.0	0.9
Initial Q Delay(d3), 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
%ile BackOfQ(50%), veh/ln	0.8	2.1	2.2	0.1	2.7	2.8	0.3	0.0	0.0	1.1	0.0	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	23.8	11.1	11.0	31.4	14.5	14.5	22.4	0.0	0.0	16.4	0.0	16.8
LnGrp LOS	C	B	B	C	B	B	C	A	A	B	A	B
Approach Vol, veh/h	733			755			23			250		
Approach Delay, s/veh	12.4			14.6			22.4			16.6		
Approach LOS	B			B			C			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	3.9	22.4		13.6	6.6	19.6		6.6				
Change Period (Y+Rc), s	3.5	4.0		4.0	3.5	4.0		4.0				
Max Green Setting (Gmax), s	25.0	40.0		20.0	20.0	40.0		22.0				
Max Q Clear Time (g_c+I), s	12.2	8.7		5.4	4.0	10.8		2.6				
Green Ext Time (p_c), s	0.0	4.5		1.0	0.0	4.8		0.1				

Intersection Summary

HCM 6th Ctrl Delay 14.1

HCM 6th LOS B

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

4: Midway & Hegan Ln/Driveway

Existing Conditions
AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	↕
Traffic Volume (veh/h)	231	0	21	1	0	0	49	432	0	2	295	479
Future Volume (veh/h)	231	0	21	1	0	0	49	432	0	2	295	479
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1767	1767	1767	1767	1767	1767	1767	1767	1767	1767	1767	1767
Adj Flow Rate, veh/h	275	0	25	1	0	0	58	514	0	2	351	570
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	9	9	9	9	9	9	9	9	9	9	9	9
Cap, veh/h	439	0	28	529	0	0	91	810	0	5	720	610
Arrive On Green	0.25	0.00	0.25	0.25	0.00	0.00	0.05	0.46	0.00	0.00	0.41	0.41
Sat Flow, veh/h	1239	0	113	1573	0	0	1682	1767	0	1682	1767	1497
Grp Volume(v), veh/h	300	0	0	1	0	0	58	514	0	2	351	570
Grp Sat Flow(s), veh/h/ln	1351	0	0	1574	0	0	1682	1767	0	1682	1767	1497
Q Serve(g_s), s	11.5	0.0	0.0	0.0	0.0	0.0	1.8	12.0	0.0	0.1	7.9	19.6
Cycle Q Clear(g_c), s	11.5	0.0	0.0	0.0	0.0	0.0	1.8	12.0	0.0	0.1	7.9	19.6
Prop In Lane	0.92		0.08	1.00		0.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	467	0	0	529	0	0	91	810	0	5	720	610
V/C Ratio(X)	0.64	0.00	0.00	0.00	0.00	0.00	0.64	0.63	0.00	0.43	0.49	0.93
Avail Cap(c_a), veh/h	617	0	0	673	0	0	640	1294	0	484	1294	1097
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.4	0.0	0.0	15.1	0.0	0.0	25.0	11.1	0.0	26.8	11.8	15.3
Incr Delay (d2), s/veh	0.6	0.0	0.0	0.0	0.0	0.0	2.8	0.3	0.0	22.1	0.2	4.3
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	8.2	0.0	0.0	0.0	0.0	0.0	0.7	3.7	0.0	0.1	2.7	6.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.0	0.0	0.0	15.1	0.0	0.0	27.8	11.5	0.0	48.9	12.0	19.5
LnGrp LOS	B	A	A	B	A	A	C	B	A	D	B	B
Approach Vol, veh/h	300			1			572			923		
Approach Delay, s/veh	20.0			15.1			13.1			16.7		
Approach LOS	B			B			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.6	30.2		19.0	7.4	27.5		19.0				
Change Period (Y+Rc), s	4.5	5.5		5.5	4.5	5.5		5.5				
Max Green Setting (Gmax), s	15.5	39.5		19.5	20.5	39.5		19.5				
Max Q Clear Time (g_c+I), s	12.1	14.0		2.0	3.8	21.6		13.5				
Green Ext Time (p_c), s	0.0	0.5		0.0	0.0	0.3		0.2				

Intersection Summary

HCM 6th Ctrl Delay 16.1

HCM 6th LOS B

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th TWSC
5: Driveway/Otterson Dr & Hegan Ln

Existing Conditions
AM Peak Hour

Intersection												
Int Delay, s/veh	1.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	174	0	0	217	301	0	0	0	73	0	8
Future Vol, veh/h	17	174	0	0	217	301	0	0	0	73	0	8
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	-	-	-	100	-	-	-	-	-	100	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	19	196	0	0	244	338	0	0	0	82	0	9
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	582	0	-	196	0	0	652	816	196	647	-	413
Stage 1	-	-	-	-	-	-	234	234	-	413	-	-
Stage 2	-	-	-	-	-	-	418	582	-	234	-	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.14	6.54	6.24	7.14	-	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	-	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.536	4.036	3.336	3.536	-	3.336
Pot Cap-1 Maneuver	982	-	0	1365	-	-	378	309	840	381	0	635
Stage 1	-	-	0	-	-	-	765	707	-	612	0	-
Stage 2	-	-	0	-	-	-	609	496	-	765	0	-
Platoon blocked, %		-			-	-						
Mov Cap-1 Maneuver	982	-	-	1365	-	-	366	302	840	375	-	635
Mov Cap-2 Maneuver	-	-	-	-	-	-	366	302	-	375	-	-
Stage 1	-	-	-	-	-	-	748	691	-	599	-	-
Stage 2	-	-	-	-	-	-	600	496	-	748	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.8			0			0			16.7		
HCM LOS							A			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	WBR	SBLn1	SBLn2				
Capacity (veh/h)	-	982	-	1365	-	-	375	635				
HCM Lane V/C Ratio	-	0.019	-	-	-	-	0.219	0.014				
HCM Control Delay (s)	0	8.7	0	0	-	-	17.3	10.8				
HCM Lane LOS	A	A	A	A	-	-	C	B				
HCM 95th %tile Q(veh)	-	0.1	-	0	-	-	0.8	0				

HCM 6th TWSC
6: Scott Ave & E Park Ave

Existing Conditions
AM Peak Hour

Intersection						
Int Delay, s/veh	1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↖	
Traffic Vol, veh/h	715	30	65	712	6	57
Future Vol, veh/h	715	30	65	712	6	57
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	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	777	33	71	774	7	62
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	810	0	1323	405
Stage 1	-	-	-	-	794	-
Stage 2	-	-	-	-	529	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	812	-	148	595
Stage 1	-	-	-	-	406	-
Stage 2	-	-	-	-	555	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	812	-	135	595
Mov Cap-2 Maneuver	-	-	-	-	135	-
Stage 1	-	-	-	-	406	-
Stage 2	-	-	-	-	507	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.8		14.5	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	449	-	-	812	-	
HCM Lane V/C Ratio	0.153	-	-	0.087	-	
HCM Control Delay (s)	14.5	-	-	9.9	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	0.5	-	-	0.3	-	

HCM 6th Signalized Intersection Summary

1: Park Ave & Meyers St

Existing Conditions

PM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	173	145	108	471	397	88
Future Volume (veh/h)	173	145	108	471	397	88
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1826	1826	1826	1826
Adj Flow Rate, veh/h	182	153	114	496	418	93
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	5	5	5	5
Cap, veh/h	217	182	225	1795	832	184
Arrive On Green	0.24	0.24	0.13	0.52	0.29	0.29
Sat Flow, veh/h	892	750	1739	3561	2916	623
Grp Volume(v), veh/h	336	0	114	496	255	256
Grp Sat Flow(s),veh/h/ln	1646	0	1739	1735	1735	1714
Q Serve(g_s), s	7.3	0.0	2.3	3.0	4.6	4.6
Cycle Q Clear(g_c), s	7.3	0.0	2.3	3.0	4.6	4.6
Prop In Lane	0.54	0.46	1.00			0.36
Lane Grp Cap(c), veh/h	400	0	225	1795	511	505
V/C Ratio(X)	0.84	0.00	0.51	0.28	0.50	0.51
Avail Cap(c_a), veh/h	701	0	764	3231	1616	1596
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.5	0.0	15.2	5.1	11.0	11.0
Incr Delay (d2), s/veh	1.8	0.0	0.7	0.1	1.1	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	0.8	0.7	1.4	1.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	15.4	0.0	15.9	5.2	12.0	12.1
LnGrp LOS	B	A	B	A	B	B
Approach Vol, veh/h	336			610	511	
Approach Delay, s/veh	15.4			7.2	12.1	
Approach LOS	B			A	B	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	8.4	16.1		13.1		24.4
Change Period (Y+Rc), s	3.5	5.0		4.0		5.0
Max Green Setting (Gmax), s	16.5	35.0		16.0		35.0
Max Q Clear Time (g_c+I1), s	4.3	6.6		9.3		5.0
Green Ext Time (p_c), s	0.0	4.4		0.1		5.1
Intersection Summary						
HCM 6th Ctrl Delay			10.8			
HCM 6th LOS			B			
Notes						
User approved pedestrian interval to be less than phase max green.						
User approved volume balancing among the lanes for turning movement.						

HCM 6th Signalized Intersection Summary

2: Midway/Park Ave & Greenway/E Park Ave

Existing Conditions
PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔		↔	↔	↔	↔	
Traffic Volume (veh/h)	2	5	0	506	5	291	0	286	650	333	214	0
Future Volume (veh/h)	2	5	0	506	5	291	0	286	650	333	214	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	2	5	0	531	0	0	0	298	677	285	310	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
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	6	16	0	692	0	0	0	638	540	375	394	0
Arrive On Green	0.01	0.01	0.00	0.20	0.00	0.00	0.00	0.35	0.35	0.22	0.22	0.00
Sat Flow, veh/h	514	1286	0	3478	0	1547	0	1826	1547	1739	1826	0
Grp Volume(v), veh/h	7	0	0	531	0	0	0	298	677	285	310	0
Grp Sat Flow(s), veh/h/ln1800	0	0	0	1739	0	1547	0	1826	1547	1739	1826	0
Q Serve(g_s), s	0.3	0.0	0.0	12.4	0.0	0.0	0.0	10.9	30.0	13.2	13.8	0.0
Cycle Q Clear(g_c), s	0.3	0.0	0.0	12.4	0.0	0.0	0.0	10.9	30.0	13.2	13.8	0.0
Prop In Lane	0.29		0.00	1.00		1.00	0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	23	0	0	692	0	0	0	638	540	375	394	0
V/C Ratio(X)	0.31	0.00	0.00	0.77	0.00	0.00	0.00	0.47	1.25	0.76	0.79	0.00
Avail Cap(c_a), veh/h	218	0	0	1231	0	0	0	638	540	607	638	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	42.0	0.0	0.0	32.5	0.0	0.0	0.0	21.7	27.9	31.6	31.8	0.0
Incr Delay (d2), s/veh	2.8	0.0	0.0	2.6	0.0	0.0	0.0	0.4	128.3	3.8	4.2	0.0
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln0.2	0.0	0.0	0.0	5.2	0.0	0.0	0.0	4.6	29.8	5.6	6.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.9	0.0	0.0	35.1	0.0	0.0	0.0	22.1	156.3	35.4	36.1	0.0
LnGrp LOS	D	A	A	D	A		A	C	F	D	D	A
Approach Vol, veh/h	7			531			A			975		
Approach Delay, s/veh	44.9			35.1			115.3			35.8		
Approach LOS	D			D			F			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	35.0			5.7			23.5			21.7		
Change Period (Y+Rc), s	5.0			4.6			5.0			4.6		
Max Green Setting (Gmax), s	30.0			10.4			30.0			30.4		
Max Q Clear Time (g_c+I1), s	32.0			2.3			15.8			14.4		
Green Ext Time (p_c), s	0.0			0.0			2.7			2.7		

Intersection Summary

HCM 6th Ctrl Delay 72.4

HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

3: Fair St & E Park Ave

Existing Conditions
PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	853	5	6	700	116	26	24	15	117	15	76
Future Volume (veh/h)	125	853	5	6	700	116	26	24	15	117	15	76
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	130	889	5	6	729	121	27	25	16	122	16	79
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
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	165	1526	9	14	1026	170	79	73	47	297	46	226
Arrive On Green	0.09	0.43	0.43	0.01	0.34	0.34	0.12	0.12	0.12	0.17	0.17	0.17
Sat Flow, veh/h	1739	3537	20	1739	2978	494	683	632	404	1739	267	1321
Grp Volume(v), veh/h	130	436	458	6	425	425	68	0	0	122	0	95
Grp Sat Flow(s), veh/h/ln	1739	1735	1822	1739	1735	1737	1719	0	0	1739	0	1588
Q Serve(g_s), s	4.1	10.8	10.8	0.2	12.0	12.0	2.1	0.0	0.0	3.5	0.0	3.0
Cycle Q Clear(g_c), s	4.1	10.8	10.8	0.2	12.0	12.0	2.1	0.0	0.0	3.5	0.0	3.0
Prop In Lane	1.00		0.01	1.00		0.28	0.40		0.24	1.00		0.83
Lane Grp Cap(c), veh/h	165	748	786	14	598	599	199	0	0	297	0	271
V/C Ratio(X)	0.79	0.58	0.58	0.43	0.71	0.71	0.34	0.00	0.00	0.41	0.00	0.35
Avail Cap(c_a), veh/h	614	1226	1288	768	1226	1227	668	0	0	614	0	561
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.1	12.2	12.2	28.0	16.1	16.1	23.0	0.0	0.0	20.9	0.0	20.7
Incr Delay (d2), s/veh	3.2	0.7	0.7	7.7	1.6	1.6	1.0	0.0	0.0	0.9	0.0	0.8
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	1.7	3.7	3.9	0.1	4.2	4.2	0.9	0.0	0.0	1.4	0.0	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.2	12.9	12.9	35.7	17.7	17.7	24.0	0.0	0.0	21.8	0.0	21.5
LnGrp LOS	C	B	B	D	B	B	C	A	A	C	A	C
Approach Vol, veh/h	1024			856			68			217		
Approach Delay, s/veh	14.9			17.8			24.0			21.7		
Approach LOS	B			B			C			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.0	28.4		13.7	8.9	23.5		10.6				
Change Period (Y+Rc), s	3.5	4.0		4.0	3.5	4.0		4.0				
Max Green Setting (Gmax), s	25.0	40.0		20.0	20.0	40.0		22.0				
Max Q Clear Time (g_c+I), s	12.2	12.8		5.5	6.1	14.0		4.1				
Green Ext Time (p_c), s	0.0	6.4		0.8	0.0	5.5		0.3				

Intersection Summary

HCM 6th Ctrl Delay 17.0

HCM 6th LOS B

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary 4: Midway & Hegan Ln/Driveway

Existing Conditions
PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↖		↗	↖	↗
Traffic Volume (veh/h)	571	0	46	3	0	6	43	364	1	7	401	297
Future Volume (veh/h)	571	0	46	3	0	6	43	364	1	7	401	297
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	614	0	49	3	0	6	46	391	1	8	431	319
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
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	629	0	39	275	42	447	82	562	1	18	497	421
Arrive On Green	0.38	0.00	0.38	0.38	0.00	0.38	0.05	0.31	0.31	0.01	0.27	0.27
Sat Flow, veh/h	1299	0	104	477	110	1175	1753	1835	5	1753	1841	1560
Grp Volume(v), veh/h	663	0	0	9	0	0	46	0	392	8	431	319
Grp Sat Flow(s),veh/h/ln	1402	0	0	1763	0	0	1753	0	1840	1753	1841	1560
Q Serve(g_s), s	19.3	0.0	0.0	0.0	0.0	0.0	1.3	0.0	9.6	0.2	11.4	9.6
Cycle Q Clear(g_c), s	19.5	0.0	0.0	0.2	0.0	0.0	1.3	0.0	9.6	0.2	11.4	9.6
Prop In Lane	0.93		0.07	0.33		0.67	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	669	0	0	765	0	0	82	0	564	18	497	421
V/C Ratio(X)	0.99	0.00	0.00	0.01	0.00	0.00	0.56	0.00	0.70	0.43	0.87	0.76
Avail Cap(c_a), veh/h	669	0	0	765	0	0	701	0	1418	530	1419	1202
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.8	0.0	0.0	9.9	0.0	0.0	23.9	0.0	15.7	25.2	17.8	17.2
Incr Delay (d2), s/veh	32.4	0.0	0.0	0.0	0.0	0.0	2.2	0.0	0.6	5.9	1.8	1.1
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	18.2	0.0	0.0	0.1	0.0	0.0	0.5	0.0	3.5	0.1	4.5	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.2	0.0	0.0	9.9	0.0	0.0	26.1	0.0	16.2	31.1	19.7	18.2
LnGrp LOS	D	A	A	A	A	A	C	A	B	C	B	B
Approach Vol, veh/h	663			9			438			758		
Approach Delay, s/veh	50.2			9.9			17.3			19.2		
Approach LOS	D			A			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.0	21.2		25.0	6.9	19.3		25.0				
Change Period (Y+Rc), s	4.5	5.5		5.5	4.5	5.5		5.5				
Max Green Setting (Gmax), s	15.5	39.5		19.5	20.5	39.5		19.5				
Max Q Clear Time (g_c+I), s	12.2	11.6		2.2	3.3	13.4		21.5				
Green Ext Time (p_c), s	0.0	0.3		0.0	0.0	0.4		0.0				

Intersection Summary

HCM 6th Ctrl Delay 29.7
HCM 6th LOS C

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th TWSC
5: Driveway/Otterson Dr & Hegan Ln

Existing Conditions
PM Peak Hour

Intersection												
Int Delay, s/veh	20.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕		↕		↕
Traffic Vol, veh/h	16	302	0	3	229	88	0	0	0	280	0	28
Future Vol, veh/h	16	302	0	3	229	88	0	0	0	280	0	28
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	-	-	-	100	-	-	-	-	-	100	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	18	347	0	3	263	101	0	0	0	322	0	32
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	364	0	-	347	0	0	719	753	347	703	-	314
Stage 1	-	-	-	-	-	-	383	383	-	320	-	-
Stage 2	-	-	-	-	-	-	336	370	-	383	-	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	-	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	-	3.318
Pot Cap-1 Maneuver	1195	-	0	1212	-	-	344	339	696	352	0	726
Stage 1	-	-	0	-	-	-	640	612	-	692	0	-
Stage 2	-	-	0	-	-	-	678	620	-	640	0	-
Platoon blocked, %		-			-	-						
Mov Cap-1 Maneuver	1195	-	-	1212	-	-	323	332	696	346	-	726
Mov Cap-2 Maneuver	-	-	-	-	-	-	323	332	-	346	-	-
Stage 1	-	-	-	-	-	-	628	600	-	679	-	-
Stage 2	-	-	-	-	-	-	646	619	-	628	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.4			0.1			0			62.3		
HCM LOS							A			F		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	WBR	SBLn1	SBLn2				
Capacity (veh/h)	-	1195	-	1212	-	-	346	726				
HCM Lane V/C Ratio	-	0.015	-	0.003	-	-	0.93	0.044				
HCM Control Delay (s)	0	8.1	0	8	-	-	67.5	10.2				
HCM Lane LOS	A	A	A	A	-	-	F	B				
HCM 95th %tile Q(veh)	-	0	-	0	-	-	9.6	0.1				

HCM 6th TWSC
6: Scott Ave & E Park Ave

Existing Conditions
PM Peak Hour

Intersection						
Int Delay, s/veh	0.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↘	↑↑	↘	
Traffic Vol, veh/h	964	16	44	810	7	50
Future Vol, veh/h	964	16	44	810	7	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	6	6	6	6	6	6
Mvmt Flow	1048	17	48	880	8	54
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1065	0	1593	533
Stage 1	-	-	-	-	1057	-
Stage 2	-	-	-	-	536	-
Critical Hdwy	-	-	4.22	-	6.92	7.02
Critical Hdwy Stg 1	-	-	-	-	5.92	-
Critical Hdwy Stg 2	-	-	-	-	5.92	-
Follow-up Hdwy	-	-	2.26	-	3.56	3.36
Pot Cap-1 Maneuver	-	-	627	-	94	481
Stage 1	-	-	-	-	287	-
Stage 2	-	-	-	-	540	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	627	-	87	481
Mov Cap-2 Maneuver	-	-	-	-	87	-
Stage 1	-	-	-	-	287	-
Stage 2	-	-	-	-	498	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.6		19.5	
HCM LOS					C	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	309	-	-	627	-	
HCM Lane V/C Ratio	0.201	-	-	0.076	-	
HCM Control Delay (s)	19.5	-	-	11.2	-	
HCM Lane LOS	C	-	-	B	-	
HCM 95th %tile Q(veh)	0.7	-	-	0.2	-	

HCM 6th Signalized Intersection Summary

1: Park Ave & Meyers St

2025 No Build Conditions

AM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	49	75	121	327	428	99
Future Volume (veh/h)	49	75	121	327	428	99
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1841	1841	1841	1841
Adj Flow Rate, veh/h	57	87	141	380	498	115
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	0	0	4	4	4	4
Cap, veh/h	96	147	260	2087	989	227
Arrive On Green	0.15	0.15	0.15	0.60	0.35	0.35
Sat Flow, veh/h	642	979	1753	3589	2916	649
Grp Volume(v), veh/h	145	0	141	380	307	306
Grp Sat Flow(s),veh/h/ln	1632	0	1753	1749	1749	1724
Q Serve(g_s), s	2.9	0.0	2.6	1.7	4.9	5.0
Cycle Q Clear(g_c), s	2.9	0.0	2.6	1.7	4.9	5.0
Prop In Lane	0.39	0.60	1.00			0.38
Lane Grp Cap(c), veh/h	245	0	260	2087	612	604
V/C Ratio(X)	0.59	0.00	0.54	0.18	0.50	0.51
Avail Cap(c_a), veh/h	735	0	814	3446	1723	1699
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.1	0.0	14.0	3.2	9.1	9.1
Incr Delay (d2), s/veh	0.9	0.0	0.7	0.1	0.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.9	0.2	1.3	1.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.9	0.0	14.7	3.3	10.0	10.1
LnGrp LOS	B	A	B	A	B	B
Approach Vol, veh/h	145			521	613	
Approach Delay, s/veh	14.9			6.4	10.0	
Approach LOS	B			A	B	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	8.8	17.4		9.3		26.2
Change Period (Y+Rc), s	3.5	5.0		4.0		5.0
Max Green Setting (Gmax), s	16.5	35.0		16.0		35.0
Max Q Clear Time (g_c+I1), s	4.6	7.0		4.9		3.7
Green Ext Time (p_c), s	0.0	5.5		0.1		3.8

Intersection Summary

HCM 6th Ctrl Delay	9.1
HCM 6th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

2: Midway/Park Ave & Greenway/E Park Ave

2025 No Build Conditions
AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔		↔	↔	↔	↔	
Traffic Volume (veh/h)	0	2	0	605	1	215	0	232	469	281	226	1
Future Volume (veh/h)	0	2	0	605	1	215	0	232	469	281	226	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1767	1767	1767	1767	1767	1767	1767	1767	1767	1767	1767	1767
Adj Flow Rate, veh/h	0	2	0	666	0	0	0	255	515	279	290	1
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
Percent Heavy Veh, %	9	9	9	9	9	9	9	9	9	9	9	9
Cap, veh/h	0	7	0	816	0	0	0	588	498	350	366	1
Arrive On Green	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.33	0.33	0.21	0.21	0.21
Sat Flow, veh/h	0	1767	0	3365	0	1497	0	1767	1497	1682	1759	6
Grp Volume(v), veh/h	0	2	0	666	0	0	0	255	515	279	0	291
Grp Sat Flow(s),veh/h/ln	0	1767	0	1682	0	1497	0	1767	1497	1682	0	1766
Q Serve(g_s), s	0.0	0.1	0.0	16.9	0.0	0.0	0.0	10.2	30.0	14.2	0.0	14.1
Cycle Q Clear(g_c), s	0.0	0.1	0.0	16.9	0.0	0.0	0.0	10.2	30.0	14.2	0.0	14.1
Prop In Lane	0.00		0.00	1.00		1.00	0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	0	7	0	816	0	0	0	588	498	350	0	368
V/C Ratio(X)	0.00	0.30	0.00	0.82	0.00	0.00	0.00	0.43	1.03	0.80	0.00	0.79
Avail Cap(c_a), veh/h	0	204	0	1134	0	0	0	588	498	560	0	587
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	44.8	0.0	32.3	0.0	0.0	0.0	23.5	30.1	33.9	0.0	33.9
Incr Delay (d2), s/veh	0.0	8.9	0.0	4.0	0.0	0.0	0.0	0.4	49.4	5.0	0.0	4.6
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.0	7.0	0.0	0.0	0.0	4.2	17.2	6.0	0.0	6.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	53.7	0.0	36.3	0.0	0.0	0.0	23.8	79.5	38.9	0.0	38.5
LnGrp LOS	A	D	A	D	A		A	C	F	D	A	D
Approach Vol, veh/h	2			666			A			770		
Approach Delay, s/veh	53.7			36.3			61.1			38.7		
Approach LOS	D			D			E			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	35.0			4.9			23.8			26.5		
Change Period (Y+Rc), s	5.0			4.6			5.0			4.6		
Max Green Setting (Gmax), s	30.0			10.4			30.0			30.4		
Max Q Clear Time (g_c+I1), s	32.0			2.1			16.2			18.9		
Green Ext Time (p_c), s	0.0			0.0			2.6			3.0		

Intersection Summary

HCM 6th Ctrl Delay 46.5
HCM 6th LOS D

Notes

- User approved pedestrian interval to be less than phase max green.
- User approved volume balancing among the lanes for turning movement.
- Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

3: Fair St & E Park Ave

2025 No Build Conditions
AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	77	659	12	6	688	76	13	7	4	124	9	121
Future Volume (veh/h)	77	659	12	6	688	76	13	7	4	124	9	121
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1752	1752	1752	1752	1752	1752	1752	1752	1752	1752	1752	1752
Adj Flow Rate, veh/h	79	679	12	6	709	78	13	7	4	128	9	125
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	10	10	10	10	10	10	10	10	10	10	10	10
Cap, veh/h	113	1364	24	13	1052	116	51	28	16	338	20	284
Arrive On Green	0.07	0.41	0.41	0.01	0.35	0.35	0.06	0.06	0.06	0.20	0.20	0.20
Sat Flow, veh/h	1668	3346	59	1668	3024	332	898	483	276	1668	101	1399
Grp Volume(v), veh/h	79	338	353	6	390	397	24	0	0	128	0	134
Grp Sat Flow(s),veh/h/ln	1668	1664	1741	1668	1664	1692	1657	0	0	1668	0	1500
Q Serve(g_s), s	2.2	7.2	7.2	0.2	9.5	9.6	0.7	0.0	0.0	3.2	0.0	3.7
Cycle Q Clear(g_c), s	2.2	7.2	7.2	0.2	9.5	9.6	0.7	0.0	0.0	3.2	0.0	3.7
Prop In Lane	1.00		0.03	1.00		0.20	0.54		0.17	1.00		0.93
Lane Grp Cap(c), veh/h	113	679	710	13	579	588	95	0	0	338	0	304
V/C Ratio(X)	0.70	0.50	0.50	0.45	0.67	0.67	0.25	0.00	0.00	0.38	0.00	0.44
Avail Cap(c_a), veh/h	698	1393	1457	873	1393	1416	763	0	0	698	0	628
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.8	10.5	10.5	23.6	13.3	13.3	21.6	0.0	0.0	16.4	0.0	16.7
Incr Delay (d2), s/veh	2.9	0.6	0.5	8.5	1.4	1.4	1.4	0.0	0.0	0.7	0.0	1.0
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	0.9	2.2	2.3	0.1	2.9	3.0	0.3	0.0	0.0	1.2	0.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.6	11.1	11.1	32.1	14.7	14.6	22.9	0.0	0.0	17.1	0.0	17.7
LnGrp LOS	C	B	B	C	B	B	C	A	A	B	A	B
Approach Vol, veh/h	770			793			24			262		
Approach Delay, s/veh	12.5			14.8			22.9			17.4		
Approach LOS	B			B			C			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	3.9	23.5		13.7	6.7	20.6		6.7				
Change Period (Y+Rc), s	3.5	4.0		4.0	3.5	4.0		4.0				
Max Green Setting (Gmax), s	25.0	40.0		20.0	20.0	40.0		22.0				
Max Q Clear Time (g_c+I), s	12.2	9.2		5.7	4.2	11.6		2.7				
Green Ext Time (p_c), s	0.0	4.8		1.0	0.0	5.1		0.1				

Intersection Summary

HCM 6th Ctrl Delay 14.3

HCM 6th LOS B

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

4: Midway & Hegan Ln/Driveway

2025 No Build Conditions
AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	↕
Traffic Volume (veh/h)	243	0	22	1	0	0	51	454	0	2	310	503
Future Volume (veh/h)	243	0	22	1	0	0	51	454	0	2	310	503
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1767	1767	1767	1767	1767	1767	1767	1767	1767	1767	1767	1767
Adj Flow Rate, veh/h	289	0	26	1	0	0	61	540	0	2	369	599
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	9	9	9	9	9	9	9	9	9	9	9	9
Cap, veh/h	439	0	29	532	0	0	90	839	0	5	749	635
Arrive On Green	0.26	0.00	0.26	0.26	0.00	0.00	0.05	0.47	0.00	0.00	0.42	0.42
Sat Flow, veh/h	1240	0	112	1579	0	0	1682	1767	0	1682	1767	1497
Grp Volume(v), veh/h	315	0	0	1	0	0	61	540	0	2	369	599
Grp Sat Flow(s),veh/h/ln	1351	0	0	1579	0	0	1682	1767	0	1682	1767	1497
Q Serve(g_s), s	13.3	0.0	0.0	0.0	0.0	0.0	2.1	13.6	0.0	0.1	9.0	22.7
Cycle Q Clear(g_c), s	13.3	0.0	0.0	0.0	0.0	0.0	2.1	13.6	0.0	0.1	9.0	22.7
Prop In Lane	0.92		0.08	1.00		0.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	468	0	0	532	0	0	90	839	0	5	749	635
V/C Ratio(X)	0.67	0.00	0.00	0.00	0.00	0.00	0.68	0.64	0.00	0.43	0.49	0.94
Avail Cap(c_a), veh/h	563	0	0	624	0	0	584	1182	0	442	1182	1002
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.1	0.0	0.0	16.2	0.0	0.0	27.4	11.7	0.0	29.4	12.4	16.3
Incr Delay (d2), s/veh	1.5	0.0	0.0	0.0	0.0	0.0	3.3	0.3	0.0	22.2	0.2	9.1
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	8.9	0.0	0.0	0.0	0.0	0.0	0.9	4.4	0.0	0.1	3.1	8.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.6	0.0	0.0	16.2	0.0	0.0	30.7	12.0	0.0	51.6	12.6	25.4
LnGrp LOS	C	A	A	B	A	A	C	B	A	D	B	C
Approach Vol, veh/h	315			1			601			970		
Approach Delay, s/veh	22.6			16.2			13.9			20.6		
Approach LOS	C			B			B			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.7	33.5		20.8	7.7	30.5		20.8				
Change Period (Y+Rc), s	4.5	5.5		5.5	4.5	5.5		5.5				
Max Green Setting (Gmax), s	15.5	39.5		19.5	20.5	39.5		19.5				
Max Q Clear Time (g_c+I), s	12.1	15.6		2.0	4.1	24.7		15.3				
Green Ext Time (p_c), s	0.0	0.5		0.0	0.0	0.4		0.1				

Intersection Summary

HCM 6th Ctrl Delay 18.8

HCM 6th LOS B

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th TWSC
5: Driveway/Otterson Dr & Hegan Ln

2025 No Build Conditions
AM Peak Hour

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	18	183	0	0	228	316	0	0	0	77	0	8
Future Vol, veh/h	18	183	0	0	228	316	0	0	0	77	0	8
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	-	-	-	100	-	-	-	-	-	100	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	20	206	0	0	256	355	0	0	0	87	0	9
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	611	0	-	206	0	0	684	857	206	680	-	434
Stage 1	-	-	-	-	-	-	246	246	-	434	-	-
Stage 2	-	-	-	-	-	-	438	611	-	246	-	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.14	6.54	6.24	7.14	-	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	-	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.536	4.036	3.336	3.536	-	3.336
Pot Cap-1 Maneuver	958	-	0	1353	-	-	360	293	829	362	0	618
Stage 1	-	-	0	-	-	-	753	699	-	596	0	-
Stage 2	-	-	0	-	-	-	594	481	-	753	0	-
Platoon blocked, %		-			-	-						
Mov Cap-1 Maneuver	958	-	-	1353	-	-	348	286	829	355	-	618
Mov Cap-2 Maneuver	-	-	-	-	-	-	348	286	-	355	-	-
Stage 1	-	-	-	-	-	-	735	682	-	582	-	-
Stage 2	-	-	-	-	-	-	585	481	-	735	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.8			0			0			17.7		
HCM LOS							A			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	WBR	SBLn1	SBLn2				
Capacity (veh/h)	-	958	-	1353	-	-	355	618				
HCM Lane V/C Ratio	-	0.021	-	-	-	-	0.244	0.015				
HCM Control Delay (s)	0	8.8	0	0	-	-	18.4	10.9				
HCM Lane LOS	A	A	A	A	-	-	C	B				
HCM 95th %tile Q(veh)	-	0.1	-	0	-	-	0.9	0				

Intersection						
Int Delay, s/veh	1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↘	
Traffic Vol, veh/h	751	32	68	748	6	60
Future Vol, veh/h	751	32	68	748	6	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	12	12	12	12	12	12
Mvmt Flow	791	34	72	787	6	63
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	825	0	1346	413
Stage 1	-	-	-	-	808	-
Stage 2	-	-	-	-	538	-
Critical Hdwy	-	-	4.34	-	7.04	7.14
Critical Hdwy Stg 1	-	-	-	-	6.04	-
Critical Hdwy Stg 2	-	-	-	-	6.04	-
Follow-up Hdwy	-	-	2.32	-	3.62	3.42
Pot Cap-1 Maneuver	-	-	740	-	131	561
Stage 1	-	-	-	-	374	-
Stage 2	-	-	-	-	522	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	740	-	118	561
Mov Cap-2 Maneuver	-	-	-	-	118	-
Stage 1	-	-	-	-	374	-
Stage 2	-	-	-	-	471	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.9		15.3	
HCM LOS					C	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	418	-	-	740	-	
HCM Lane V/C Ratio	0.166	-	-	0.097	-	
HCM Control Delay (s)	15.3	-	-	10.4	-	
HCM Lane LOS	C	-	-	B	-	
HCM 95th %tile Q(veh)	0.6	-	-	0.3	-	

HCM 6th Signalized Intersection Summary

1: Park Ave & Meyers St

2025 Conditions

PM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	182	152	113	495	417	92
Future Volume (veh/h)	182	152	113	495	417	92
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1826	1826	1826	1826
Adj Flow Rate, veh/h	192	160	119	521	439	97
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	5	5	5	5
Cap, veh/h	226	189	225	1797	847	186
Arrive On Green	0.25	0.25	0.13	0.52	0.30	0.30
Sat Flow, veh/h	896	746	1739	3561	2920	620
Grp Volume(v), veh/h	353	0	119	521	268	268
Grp Sat Flow(s),veh/h/ln	1647	0	1739	1735	1735	1714
Q Serve(g_s), s	8.0	0.0	2.5	3.3	5.0	5.1
Cycle Q Clear(g_c), s	8.0	0.0	2.5	3.3	5.0	5.1
Prop In Lane	0.54	0.45	1.00			0.36
Lane Grp Cap(c), veh/h	416	0	225	1797	519	513
V/C Ratio(X)	0.85	0.00	0.53	0.29	0.52	0.52
Avail Cap(c_a), veh/h	671	0	731	3093	1546	1528
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.0	0.0	16.0	5.4	11.4	11.4
Incr Delay (d2), s/veh	3.0	0.0	0.7	0.1	1.1	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.0	0.9	0.8	1.5	1.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	16.9	0.0	16.7	5.5	12.5	12.6
LnGrp LOS	B	A	B	A	B	B
Approach Vol, veh/h	353			640	536	
Approach Delay, s/veh	16.9			7.6	12.6	
Approach LOS	B			A	B	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	8.6	16.8		13.9		25.3
Change Period (Y+Rc), s	3.5	5.0		4.0		5.0
Max Green Setting (Gmax), s	16.5	35.0		16.0		35.0
Max Q Clear Time (g_c+I1), s	4.5	7.1		10.0		5.3
Green Ext Time (p_c), s	0.0	4.7		0.1		5.4

Intersection Summary

HCM 6th Ctrl Delay	11.5
HCM 6th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

2: Midway/Park Ave & Greenway/E Park Ave

2025 Conditions
PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔		↔	↔	↔	↔	
Traffic Volume (veh/h)	2	5	0	531	5	306	0	300	683	350	225	0
Future Volume (veh/h)	2	5	0	531	5	306	0	300	683	350	225	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	2	5	0	557	0	0	0	312	711	300	326	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
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	6	16	0	715	0	0	0	622	527	388	408	0
Arrive On Green	0.01	0.01	0.00	0.21	0.00	0.00	0.00	0.34	0.34	0.22	0.22	0.00
Sat Flow, veh/h	514	1286	0	3478	0	1547	0	1826	1547	1739	1826	0
Grp Volume(v), veh/h	7	0	0	557	0	0	0	312	711	300	326	0
Grp Sat Flow(s), veh/h/ln1800	0	0	0	1739	0	1547	0	1826	1547	1739	1826	0
Q Serve(g_s), s	0.3	0.0	0.0	13.3	0.0	0.0	0.0	12.0	30.0	14.3	14.9	0.0
Cycle Q Clear(g_c), s	0.3	0.0	0.0	13.3	0.0	0.0	0.0	12.0	30.0	14.3	14.9	0.0
Prop In Lane	0.29		0.00	1.00		1.00	0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	23	0	0	715	0	0	0	622	527	388	408	0
V/C Ratio(X)	0.31	0.00	0.00	0.78	0.00	0.00	0.00	0.50	1.35	0.77	0.80	0.00
Avail Cap(c_a), veh/h	212	0	0	1200	0	0	0	622	527	592	622	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	43.1	0.0	0.0	33.1	0.0	0.0	0.0	23.1	29.1	32.1	32.3	0.0
Incr Delay (d2), s/veh	2.9	0.0	0.0	2.7	0.0	0.0	0.0	0.5	169.5	4.1	4.9	0.0
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.0	5.6	0.0	0.0	0.0	5.1	35.4	6.1	6.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.0	0.0	0.0	35.7	0.0	0.0	0.0	23.6	198.6	36.2	37.3	0.0
LnGrp LOS	D	A	A	D	A		A	C	F	D	D	A
Approach Vol, veh/h	7			557			A			1023		
Approach Delay, s/veh	46.0			35.7			145.2			36.8		
Approach LOS	D			D			F			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	35.0			5.7			24.7			22.7		
Change Period (Y+Rc), s	5.0			4.6			5.0			4.6		
Max Green Setting (Gmax), s	30.0			10.4			30.0			30.4		
Max Q Clear Time (g_c+I1), s	32.0			2.3			16.9			15.3		
Green Ext Time (p_c), s	0.0			0.0			2.8			2.8		

Intersection Summary

HCM 6th Ctrl Delay 86.7

HCM 6th LOS F

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

3: Fair St & E Park Ave

2025 Conditions
PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	131	896	5	6	735	122	27	25	16	123	16	80
Future Volume (veh/h)	131	896	5	6	735	122	27	25	16	123	16	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	136	933	5	6	766	127	28	26	17	128	17	83
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
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	172	1579	8	14	1058	175	79	73	48	288	45	219
Arrive On Green	0.10	0.45	0.45	0.01	0.36	0.36	0.12	0.12	0.12	0.17	0.17	0.17
Sat Flow, veh/h	1739	3538	19	1739	2978	494	678	629	411	1739	270	1319
Grp Volume(v), veh/h	136	457	481	6	446	447	71	0	0	128	0	100
Grp Sat Flow(s), veh/h/ln	1739	1735	1822	1739	1735	1737	1718	0	0	1739	0	1589
Q Serve(g_s), s	4.5	11.7	11.7	0.2	13.1	13.1	2.2	0.0	0.0	3.9	0.0	3.3
Cycle Q Clear(g_c), s	4.5	11.7	11.7	0.2	13.1	13.1	2.2	0.0	0.0	3.9	0.0	3.3
Prop In Lane	1.00		0.01	1.00		0.28	0.39		0.24	1.00		0.83
Lane Grp Cap(c), veh/h	172	774	813	14	616	617	200	0	0	288	0	263
V/C Ratio(X)	0.79	0.59	0.59	0.43	0.72	0.72	0.35	0.00	0.00	0.44	0.00	0.38
Avail Cap(c_a), veh/h	591	1179	1239	739	1179	1181	642	0	0	591	0	540
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.9	12.3	12.3	29.1	16.5	16.5	24.0	0.0	0.0	22.1	0.0	21.9
Incr Delay (d2), s/veh	3.1	0.7	0.7	7.8	1.6	1.6	1.1	0.0	0.0	1.1	0.0	0.9
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	1.9	4.0	4.2	0.1	4.6	4.6	0.9	0.0	0.0	1.6	0.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.0	13.0	12.9	36.8	18.1	18.1	25.0	0.0	0.0	23.2	0.0	22.8
LnGrp LOS	C	B	B	D	B	B	C	A	A	C	A	C
Approach Vol, veh/h	1074			899			71			228		
Approach Delay, s/veh	15.0			18.2			25.0			23.0		
Approach LOS	B			B			C			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.0	30.3		13.8	9.3	24.9		10.9				
Change Period (Y+Rc), s	3.5	4.0		4.0	3.5	4.0		4.0				
Max Green Setting (Gmax), s	25.0	40.0		20.0	20.0	40.0		22.0				
Max Q Clear Time (g_c+I), s	12.2	13.7		5.9	6.5	15.1		4.2				
Green Ext Time (p_c), s	0.0	6.8		0.8	0.0	5.8		0.3				

Intersection Summary

HCM 6th Ctrl Delay 17.4

HCM 6th LOS B

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

4: Midway & Hegan Ln/Driveway

2025 Conditions
PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↖		↗	↖	↗
Traffic Volume (veh/h)	600	0	48	3	0	6	45	382	1	7	427	312
Future Volume (veh/h)	600	0	48	3	0	6	45	382	1	7	427	312
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	645	0	52	3	0	6	48	411	1	8	459	335
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
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	615	0	39	269	41	437	84	590	1	18	523	443
Arrive On Green	0.37	0.00	0.37	0.37	0.00	0.37	0.05	0.32	0.32	0.01	0.28	0.28
Sat Flow, veh/h	1298	0	105	477	110	1175	1753	1835	4	1753	1841	1560
Grp Volume(v), veh/h	697	0	0	9	0	0	48	0	412	8	459	335
Grp Sat Flow(s),veh/h/ln	1402	0	0	1763	0	0	1753	0	1840	1753	1841	1560
Q Serve(g_s), s	19.3	0.0	0.0	0.0	0.0	0.0	1.4	0.0	10.3	0.2	12.5	10.3
Cycle Q Clear(g_c), s	19.5	0.0	0.0	0.2	0.0	0.0	1.4	0.0	10.3	0.2	12.5	10.3
Prop In Lane	0.93		0.07	0.33		0.67	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	654	0	0	747	0	0	84	0	592	18	523	443
V/C Ratio(X)	1.07	0.00	0.00	0.01	0.00	0.00	0.57	0.00	0.70	0.44	0.88	0.76
Avail Cap(c_a), veh/h	654	0	0	747	0	0	686	0	1387	518	1387	1176
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.4	0.0	0.0	10.4	0.0	0.0	24.4	0.0	15.5	25.8	17.9	17.1
Incr Delay (d2), s/veh	54.0	0.0	0.0	0.0	0.0	0.0	2.3	0.0	0.6	5.9	1.9	1.0
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	17.2	0.0	0.0	0.1	0.0	0.0	0.6	0.0	3.7	0.1	4.9	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.4	0.0	0.0	10.4	0.0	0.0	26.7	0.0	16.1	31.7	19.8	18.1
LnGrp LOS	F	A	A	B	A	A	C	A	B	C	B	B
Approach Vol, veh/h	697			9			460			802		
Approach Delay, s/veh	72.4			10.4			17.2			19.2		
Approach LOS	E			B			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.0	22.4		25.0	7.0	20.4		25.0				
Change Period (Y+Rc), s	4.5	5.5		5.5	4.5	5.5		5.5				
Max Green Setting (Gmax), s	15.5	39.5		19.5	20.5	39.5		19.5				
Max Q Clear Time (g_c+I), s	12.3	12.3		2.2	3.4	14.5		21.5				
Green Ext Time (p_c), s	0.0	0.4		0.0	0.0	0.4		0.0				

Intersection Summary

HCM 6th Ctrl Delay 37.5

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th TWSC
5: Driveway/Otterson Dr & Hegan Ln

2025 Conditions
PM Peak Hour

Intersection												
Int Delay, s/veh	31											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰		↰	↰			↰		↰		↰
Traffic Vol, veh/h	17	317	0	3	240	92	0	0	0	300	0	29
Future Vol, veh/h	17	317	0	3	240	92	0	0	0	300	0	29
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	-	-	-	100	-	-	-	-	-	100	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	20	364	0	3	276	106	0	0	0	345	0	33

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	382	0	-	364	0	0	756	792	364	739	-	329
Stage 1	-	-	-	-	-	-	404	404	-	335	-	-
Stage 2	-	-	-	-	-	-	352	388	-	404	-	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	-	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	-	3.318
Pot Cap-1 Maneuver	1176	-	0	1195	-	-	325	322	681	~ 333	0	712
Stage 1	-	-	0	-	-	-	623	599	-	679	0	-
Stage 2	-	-	0	-	-	-	665	609	-	623	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1176	-	-	1195	-	-	304	314	681	~ 327	-	712
Mov Cap-2 Maneuver	-	-	-	-	-	-	304	314	-	~ 327	-	-
Stage 1	-	-	-	-	-	-	610	586	-	665	-	-
Stage 2	-	-	-	-	-	-	632	607	-	610	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.1	0	93.6
HCM LOS			A	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1176	-	1195	-	-	327	712
HCM Lane V/C Ratio	-	0.017	-	0.003	-	-	1.055	0.047
HCM Control Delay (s)	0	8.1	0	8	-	-	101.6	10.3
HCM Lane LOS	A	A	A	A	-	-	F	B
HCM 95th %tile Q(veh)	-	0.1	-	0	-	-	12.5	0.1

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection						
Int Delay, s/veh	0.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↱	↑↑	↱	
Traffic Vol, veh/h	1012	17	46	851	7	53
Future Vol, veh/h	1012	17	46	851	7	53
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	6	6	6	6	6	6
Mvmt Flow	1100	18	50	925	8	58
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	1118	0	1672	559
Stage 1	-	-	-	-	1109	-
Stage 2	-	-	-	-	563	-
Critical Hdwy	-	-	4.22	-	6.92	7.02
Critical Hdwy Stg 1	-	-	-	-	5.92	-
Critical Hdwy Stg 2	-	-	-	-	5.92	-
Follow-up Hdwy	-	-	2.26	-	3.56	3.36
Pot Cap-1 Maneuver	-	-	598	-	83	462
Stage 1	-	-	-	-	269	-
Stage 2	-	-	-	-	522	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	598	-	76	462
Mov Cap-2 Maneuver	-	-	-	-	76	-
Stage 1	-	-	-	-	269	-
Stage 2	-	-	-	-	478	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.6		21	
HCM LOS					C	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	290	-	-	598	-	
HCM Lane V/C Ratio	0.225	-	-	0.084	-	
HCM Control Delay (s)	21	-	-	11.6	-	
HCM Lane LOS	C	-	-	B	-	
HCM 95th %tile Q(veh)	0.8	-	-	0.3	-	

HCM 6th Signalized Intersection Summary

1: Park Ave & Meyers St

2040 Conditions

AM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	55	85	140	375	495	115
Future Volume (veh/h)	55	85	140	375	495	115
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1841	1841	1841	1841
Adj Flow Rate, veh/h	64	99	163	436	576	134
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	0	0	4	4	4	4
Cap, veh/h	95	147	262	2161	1066	247
Arrive On Green	0.15	0.15	0.15	0.62	0.38	0.38
Sat Flow, veh/h	637	985	1753	3589	2910	654
Grp Volume(v), veh/h	164	0	163	436	357	353
Grp Sat Flow(s),veh/h/ln	1632	0	1753	1749	1749	1723
Q Serve(g_s), s	3.7	0.0	3.4	2.1	6.2	6.2
Cycle Q Clear(g_c), s	3.7	0.0	3.4	2.1	6.2	6.2
Prop In Lane	0.39	0.60	1.00			0.38
Lane Grp Cap(c), veh/h	244	0	262	2161	661	652
V/C Ratio(X)	0.67	0.00	0.62	0.20	0.54	0.54
Avail Cap(c_a), veh/h	674	0	747	3159	1580	1557
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.6	0.0	15.5	3.2	9.4	9.4
Incr Delay (d2), s/veh	1.2	0.0	0.9	0.1	1.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	1.2	0.3	1.7	1.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	16.8	0.0	16.4	3.3	10.4	10.4
LnGrp LOS	B	A	B	A	B	B
Approach Vol, veh/h	164			599	710	
Approach Delay, s/veh	16.8			6.8	10.4	
Approach LOS	B			A	B	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	9.3	19.7		9.8		28.9
Change Period (Y+Rc), s	3.5	5.0		4.0		5.0
Max Green Setting (Gmax), s	16.5	35.0		16.0		35.0
Max Q Clear Time (g_c+I1), s	5.4	8.2		5.7		4.1
Green Ext Time (p_c), s	0.1	6.4		0.1		4.4
Intersection Summary						
HCM 6th Ctrl Delay			9.7			
HCM 6th LOS			A			
Notes						
User approved pedestrian interval to be less than phase max green.						
User approved volume balancing among the lanes for turning movement.						

HCM 6th Signalized Intersection Summary

2: Midway/Park Ave & Greenway/E Park Ave

2040 Conditions
AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔		↔	↔	↔	↔	
Traffic Volume (veh/h)	0	5	0	690	5	245	0	270	535	320	260	5
Future Volume (veh/h)	0	5	0	690	5	245	0	270	535	320	260	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	5	0	762	0	0	0	297	588	322	329	5
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	0	17	0	867	0	0	0	675	572	380	391	6
Arrive On Green	0.00	0.01	0.00	0.24	0.00	0.00	0.00	0.36	0.36	0.21	0.21	0.21
Sat Flow, veh/h	0	1870	0	3563	0	1585	0	1870	1585	1781	1837	28
Grp Volume(v), veh/h	0	5	0	762	0	0	0	297	588	322	0	334
Grp Sat Flow(s), veh/h/ln	0	1870	0	1781	0	1585	0	1870	1585	1781	0	1865
Q Serve(g_s), s	0.0	0.3	0.0	22.8	0.0	0.0	0.0	13.4	40.0	19.2	0.0	19.0
Cycle Q Clear(g_c), s	0.0	0.3	0.0	22.8	0.0	0.0	0.0	13.4	40.0	19.2	0.0	19.0
Prop In Lane	0.00		0.00	1.00		1.00	0.00		1.00	1.00		0.01
Lane Grp Cap(c), veh/h	0	17	0	867	0	0	0	675	572	380	0	397
V/C Ratio(X)	0.00	0.30	0.00	0.88	0.00	0.00	0.00	0.44	1.03	0.85	0.00	0.84
Avail Cap(c_a), veh/h	0	176	0	978	0	0	0	675	572	482	0	505
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	54.5	0.0	40.3	0.0	0.0	0.0	26.9	35.4	41.9	0.0	41.8
Incr Delay (d2), s/veh	0.0	3.6	0.0	9.0	0.0	0.0	0.0	0.3	44.7	11.5	0.0	10.4
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	0.0	0.2	0.0	10.7	0.0	0.0	0.0	6.0	22.1	9.4	0.0	9.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	58.1	0.0	49.3	0.0	0.0	0.0	27.2	80.1	53.4	0.0	52.2
LnGrp LOS	A	E	A	D	A		A	C	F	D	A	D
Approach Vol, veh/h	5			762			A			885		
Approach Delay, s/veh	58.1			49.3			62.4			52.8		
Approach LOS	E			D			E			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	45.0			5.6			28.6			31.6		
Change Period (Y+Rc), s	5.0			4.6			5.0			4.6		
Max Green Setting (Gmax), s	40.0			10.4			30.0			30.4		
Max Q Clear Time (g_c+I1), s	42.0			2.3			21.2			24.8		
Green Ext Time (p_c), s	0.0			0.0			2.4			2.2		

Intersection Summary

HCM 6th Ctrl Delay 55.3

HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary 3: Fair St & E Park Ave

2040 Conditions
AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	755	15	5	785	85	15	10	5	140	10	140
Future Volume (veh/h)	90	755	15	5	785	85	15	10	5	140	10	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	93	778	15	5	809	88	15	10	5	144	10	144
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	124	1512	29	12	1167	127	59	39	20	332	19	279
Arrive On Green	0.07	0.43	0.43	0.01	0.37	0.37	0.07	0.07	0.07	0.19	0.19	0.19
Sat Flow, veh/h	1739	3481	67	1739	3156	343	865	577	288	1739	101	1461
Grp Volume(v), veh/h	93	388	405	5	445	452	30	0	0	144	0	154
Grp Sat Flow(s),veh/h/ln	1739	1735	1814	1739	1735	1764	1731	0	0	1739	0	1563
Q Serve(g_s), s	2.7	8.4	8.4	0.1	11.2	11.2	0.8	0.0	0.0	3.8	0.0	4.6
Cycle Q Clear(g_c), s	2.7	8.4	8.4	0.1	11.2	11.2	0.8	0.0	0.0	3.8	0.0	4.6
Prop In Lane	1.00		0.04	1.00		0.19	0.50		0.17	1.00		0.94
Lane Grp Cap(c), veh/h	124	754	788	12	641	652	117	0	0	332	0	298
V/C Ratio(X)	0.75	0.51	0.51	0.43	0.69	0.69	0.26	0.00	0.00	0.43	0.00	0.52
Avail Cap(c_a), veh/h	674	1344	1405	842	1344	1367	737	0	0	674	0	605
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.5	10.6	10.6	25.5	13.8	13.8	22.8	0.0	0.0	18.4	0.0	18.7
Incr Delay (d2), s/veh	3.4	0.5	0.5	9.0	1.4	1.3	1.1	0.0	0.0	0.9	0.0	1.4
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	1.1	2.7	2.9	0.1	3.7	3.7	0.4	0.0	0.0	1.5	0.0	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.9	11.2	11.2	34.5	15.1	15.1	24.0	0.0	0.0	19.3	0.0	20.1
LnGrp LOS	C	B	B	C	B	B	C	A	A	B	A	C
Approach Vol, veh/h	886			902			30			298		
Approach Delay, s/veh	12.8			15.2			24.0			19.7		
Approach LOS	B			B			C			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	3.8	26.4		13.9	7.2	23.1		7.5				
Change Period (Y+Rc), s	3.5	4.0		4.0	3.5	4.0		4.0				
Max Green Setting (Gmax), s	25.0	40.0		20.0	20.0	40.0		22.0				
Max Q Clear Time (g_c+I), s	12.1	10.4		6.6	4.7	13.2		2.8				
Green Ext Time (p_c), s	0.0	5.6		1.1	0.0	5.9		0.1				

Intersection Summary

HCM 6th Ctrl Delay 15.0

HCM 6th LOS B

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

4: Midway & Hegan Ln/Driveway

2040 Conditions
AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↖	↗		↖	↗	↖
Traffic Volume (veh/h)	275	0	25	5	0	0	60	520	0	5	355	575
Future Volume (veh/h)	275	0	25	5	0	0	60	520	0	5	355	575
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	327	0	30	6	0	0	71	619	0	6	423	685
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	455	0	33	558	0	0	94	927	0	14	843	715
Arrive On Green	0.28	0.00	0.28	0.28	0.00	0.00	0.05	0.50	0.00	0.01	0.45	0.45
Sat Flow, veh/h	1303	0	120	1661	0	0	1767	1856	0	1767	1856	1572
Grp Volume(v), veh/h	357	0	0	6	0	0	71	619	0	6	423	685
Grp Sat Flow(s),veh/h/ln	1422	0	0	1661	0	0	1767	1856	0	1767	1856	1572
Q Serve(g_s), s	17.1	0.0	0.0	0.0	0.0	0.0	2.8	17.9	0.0	0.2	11.5	30.0
Cycle Q Clear(g_c), s	17.3	0.0	0.0	0.2	0.0	0.0	2.8	17.9	0.0	0.2	11.5	30.0
Prop In Lane	0.92		0.08	1.00		0.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	488	0	0	558	0	0	94	927	0	14	843	715
V/C Ratio(X)	0.73	0.00	0.00	0.01	0.00	0.00	0.76	0.67	0.00	0.43	0.50	0.96
Avail Cap(c_a), veh/h	824	0	0	882	0	0	235	1897	0	126	1782	1511
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.0	0.0	0.0	18.8	0.0	0.0	33.3	13.4	0.0	35.2	13.7	18.8
Incr Delay (d2), s/veh	0.8	0.0	0.0	0.0	0.0	0.0	4.6	0.3	0.0	7.7	0.2	3.8
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	5.5	0.0	0.0	0.1	0.0	0.0	1.3	6.4	0.0	0.1	4.4	10.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.8	0.0	0.0	18.8	0.0	0.0	38.0	13.7	0.0	42.9	13.9	22.6
LnGrp LOS	C	A	A	B	A	A	D	B	A	D	B	C
Approach Vol, veh/h	357			6			690			1114		
Approach Delay, s/veh	25.8			18.8			16.2			19.4		
Approach LOS	C			B			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.1	41.1		25.1	8.3	37.9		25.1				
Change Period (Y+Rc), s	4.5	5.5		5.5	4.5	5.5		5.5				
Max Green Setting (Gmax), s	5.1	72.9		36.5	9.5	68.5		36.5				
Max Q Clear Time (g_c+I2), s	12.2	19.9		2.2	4.8	32.0		19.3				
Green Ext Time (p_c), s	0.0	0.6		0.0	0.0	0.4		0.3				

Intersection Summary

HCM 6th Ctrl Delay 19.4

HCM 6th LOS B

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th TWSC
5: Driveway/Otterson Dr & Hegan Ln

2040 Conditions
AM Peak Hour

Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕		↕		↕
Traffic Vol, veh/h	20	210	0	0	260	365	0	0	0	90	0	10
Future Vol, veh/h	20	210	0	0	260	365	0	0	0	90	0	10
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	-	-	-	100	-	-	-	-	-	100	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	22	236	0	0	292	410	0	0	0	101	0	11
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	702	0	-	236	0	0	783	982	236	777	-	497
Stage 1	-	-	-	-	-	-	280	280	-	497	-	-
Stage 2	-	-	-	-	-	-	503	702	-	280	-	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.14	6.54	6.24	7.14	-	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	-	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.536	4.036	3.336	3.536	-	3.336
Pot Cap-1 Maneuver	886	-	0	1319	-	-	309	247	798	312	0	569
Stage 1	-	-	0	-	-	-	722	675	-	551	0	-
Stage 2	-	-	0	-	-	-	547	437	-	722	0	-
Platoon blocked, %		-			-	-						
Mov Cap-1 Maneuver	886	-	-	1319	-	-	296	240	798	305	-	569
Mov Cap-2 Maneuver	-	-	-	-	-	-	296	240	-	305	-	-
Stage 1	-	-	-	-	-	-	701	655	-	535	-	-
Stage 2	-	-	-	-	-	-	536	437	-	701	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.8			0			0			21.4		
HCM LOS							A			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	WBR	SBLn1	SBLn2				
Capacity (veh/h)	-	886	-	1319	-	-	305	569				
HCM Lane V/C Ratio	-	0.025	-	-	-	-	0.332	0.02				
HCM Control Delay (s)	0	9.2	0	0	-	-	22.5	11.5				
HCM Lane LOS	A	A	A	A	-	-	C	B				
HCM 95th %tile Q(veh)	-	0.1	-	0	-	-	1.4	0.1				

Intersection						
Int Delay, s/veh	1.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↖	
Traffic Vol, veh/h	860	35	80	855	10	70
Future Vol, veh/h	860	35	80	855	10	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	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	935	38	87	929	11	76
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	973	0	1593	487
Stage 1	-	-	-	-	954	-
Stage 2	-	-	-	-	639	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	704	-	98	526
Stage 1	-	-	-	-	335	-
Stage 2	-	-	-	-	488	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	704	-	86	526
Mov Cap-2 Maneuver	-	-	-	-	86	-
Stage 1	-	-	-	-	335	-
Stage 2	-	-	-	-	427	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.9		20.3	
HCM LOS	C					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	321	-	-	704	-	
HCM Lane V/C Ratio	0.271	-	-	0.124	-	
HCM Control Delay (s)	20.3	-	-	10.8	-	
HCM Lane LOS	C	-	-	B	-	
HCM 95th %tile Q(veh)	1.1	-	-	0.4	-	

HCM 6th Signalized Intersection Summary

1: Park Ave & Meyers St

2040 Conditions

PM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W		W	↑↑	↑↑	
Traffic Volume (veh/h)	210	175	130	570	475	105
Future Volume (veh/h)	210	175	130	570	475	105
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1826	1826	1826	1826
Adj Flow Rate, veh/h	221	184	137	600	500	111
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	5	5	5	5
Cap, veh/h	252	209	222	1799	883	195
Arrive On Green	0.28	0.28	0.13	0.52	0.31	0.31
Sat Flow, veh/h	896	746	1739	3561	2916	624
Grp Volume(v), veh/h	406	0	137	600	306	305
Grp Sat Flow(s),veh/h/ln	1647	0	1739	1735	1735	1714
Q Serve(g_s), s	10.6	0.0	3.3	4.5	6.6	6.7
Cycle Q Clear(g_c), s	10.6	0.0	3.3	4.5	6.6	6.7
Prop In Lane	0.54	0.45	1.00			0.36
Lane Grp Cap(c), veh/h	462	0	222	1799	542	536
V/C Ratio(X)	0.88	0.00	0.62	0.33	0.56	0.57
Avail Cap(c_a), veh/h	588	0	640	2708	1354	1338
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.4	0.0	18.5	6.3	12.9	12.9
Incr Delay (d2), s/veh	10.2	0.0	1.0	0.2	1.3	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	0.0	1.3	1.2	2.1	2.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	25.6	0.0	19.5	6.4	14.2	14.2
LnGrp LOS	C	A	B	A	B	B
Approach Vol, veh/h	406			737	611	
Approach Delay, s/veh	25.6			8.9	14.2	
Approach LOS	C			A	B	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	9.2	19.0		16.6		28.2
Change Period (Y+Rc), s	3.5	5.0		4.0		5.0
Max Green Setting (Gmax), s	16.5	35.0		16.0		35.0
Max Q Clear Time (g_c+I1), s	5.3	8.7		12.6		6.5
Green Ext Time (p_c), s	0.0	5.3		0.1		6.3

Intersection Summary

HCM 6th Ctrl Delay 14.6

HCM 6th LOS B

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

2: Midway/Park Ave & Greenway/E Park Ave

2040 Conditions
PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔		↔	↔	↔	↔	
Traffic Volume (veh/h)	5	5	0	605	5	350	0	345	780	400	255	0
Future Volume (veh/h)	5	5	0	605	5	350	0	345	780	400	255	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	5	5	0	634	0	0	0	359	812	342	372	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
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	15	15	0	723	0	0	0	728	617	390	409	0
Arrive On Green	0.02	0.02	0.00	0.21	0.00	0.00	0.00	0.40	0.40	0.22	0.22	0.00
Sat Flow, veh/h	891	891	0	3478	0	1547	0	1826	1547	1739	1826	0
Grp Volume(v), veh/h	10	0	0	634	0	0	0	359	812	342	372	0
Grp Sat Flow(s), veh/h/ln	1781	0	0	1739	0	1547	0	1826	1547	1739	1826	0
Q Serve(g_s), s	0.7	0.0	0.0	22.2	0.0	0.0	0.0	18.5	50.0	23.8	24.9	0.0
Cycle Q Clear(g_c), s	0.7	0.0	0.0	22.2	0.0	0.0	0.0	18.5	50.0	23.8	24.9	0.0
Prop In Lane	0.50		0.00	1.00		1.00	0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	29	0	0	723	0	0	0	728	617	390	409	0
V/C Ratio(X)	0.34	0.00	0.00	0.88	0.00	0.00	0.00	0.49	1.32	0.88	0.91	0.00
Avail Cap(c_a), veh/h	148	0	0	843	0	0	0	728	617	416	437	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	61.0	0.0	0.0	48.1	0.0	0.0	0.0	28.2	37.7	47.0	47.4	0.0
Incr Delay (d2), s/veh	2.5	0.0	0.0	9.9	0.0	0.0	0.0	0.4	153.7	18.3	22.3	0.0
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	10.4	0.0	0.0	0.0	8.2	44.9	12.1	13.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.6	0.0	0.0	58.0	0.0	0.0	0.0	28.6	191.5	65.4	69.7	0.0
LnGrp LOS	E	A	A	E	A		A	C	F	E	E	A
Approach Vol, veh/h	10			634			A			1171		
Approach Delay, s/veh	63.6			58.0			141.5			67.6		
Approach LOS	E			E			F			E		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	55.0			6.7			33.1			30.7		
Change Period (Y+Rc), s	5.0			4.6			5.0			4.6		
Max Green Setting (Gmax), s	50.0			10.4			30.0			30.4		
Max Q Clear Time (g_c+I1), s	52.0			2.7			26.9			24.2		
Green Ext Time (p_c), s	0.0			0.0			1.2			1.9		

Intersection Summary

HCM 6th Ctrl Delay 99.4

HCM 6th LOS F

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

3: Fair St & E Park Ave

2040 Conditions
PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	1025	5	10	835	140	30	30	20	140	20	95
Future Volume (veh/h)	150	1025	5	10	835	140	30	30	20	140	20	95
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	156	1068	5	10	870	146	31	31	21	146	21	99
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
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	194	1709	8	22	1141	191	76	76	51	262	42	198
Arrive On Green	0.11	0.48	0.48	0.01	0.38	0.38	0.12	0.12	0.12	0.15	0.15	0.15
Sat Flow, veh/h	1739	3541	17	1739	2972	499	641	641	434	1739	278	1312
Grp Volume(v), veh/h	156	523	550	10	508	508	83	0	0	146	0	120
Grp Sat Flow(s), veh/h/ln	1739	1735	1823	1739	1735	1736	1716	0	0	1739	0	1590
Q Serve(g_s), s	5.8	14.7	14.7	0.4	16.8	16.8	3.0	0.0	0.0	5.1	0.0	4.6
Cycle Q Clear(g_c), s	5.8	14.7	14.7	0.4	16.8	16.8	3.0	0.0	0.0	5.1	0.0	4.6
Prop In Lane	1.00		0.01	1.00		0.29	0.37		0.25	1.00		0.82
Lane Grp Cap(c), veh/h	194	837	880	22	666	666	203	0	0	262	0	240
V/C Ratio(X)	0.80	0.62	0.62	0.45	0.76	0.76	0.41	0.00	0.00	0.56	0.00	0.50
Avail Cap(c_a), veh/h	528	1054	1107	660	1054	1055	573	0	0	528	0	483
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.5	12.6	12.6	32.3	17.7	17.7	26.9	0.0	0.0	25.9	0.0	25.7
Incr Delay (d2), s/veh	3.0	0.8	0.7	5.3	1.8	1.8	1.3	0.0	0.0	1.8	0.0	1.6
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	2.5	5.1	5.4	0.2	6.0	6.0	1.2	0.0	0.0	2.2	0.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.5	13.4	13.4	37.6	19.5	19.5	28.2	0.0	0.0	27.8	0.0	27.3
LnGrp LOS	C	B	B	D	B	B	C	A	A	C	A	C
Approach Vol, veh/h	1229			1026			83			266		
Approach Delay, s/veh	15.7			19.7			28.2			27.6		
Approach LOS	B			B			C			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.3	35.8		13.9	10.8	29.3		11.8				
Change Period (Y+Rc), s	3.5	4.0		4.0	3.5	4.0		4.0				
Max Green Setting (Gmax), s	25.0	40.0		20.0	20.0	40.0		22.0				
Max Q Clear Time (g_c+I), s	12.4	16.7		7.1	7.8	18.8		5.0				
Green Ext Time (p_c), s	0.0	7.7		0.9	0.0	6.5		0.3				

Intersection Summary

HCM 6th Ctrl Delay 18.9

HCM 6th LOS B

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

4: Midway & Hegan Ln/Driveway

2040 Conditions
PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	↕
Traffic Volume (veh/h)	685	0	55	5	0	10	50	435	5	10	490	355
Future Volume (veh/h)	685	0	55	5	0	10	50	435	5	10	490	355
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	737	0	59	5	0	11	54	468	5	11	527	382
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
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	802	0	59	341	21	701	69	497	5	23	455	385
Arrive On Green	0.57	0.00	0.57	0.57	0.00	0.57	0.04	0.27	0.27	0.01	0.25	0.25
Sat Flow, veh/h	1292	0	103	521	36	1226	1753	1818	19	1753	1841	1560
Grp Volume(v), veh/h	796	0	0	16	0	0	54	0	473	11	527	382
Grp Sat Flow(s), veh/h/ln	1396	0	0	1783	0	0	1753	0	1837	1753	1841	1560
Q Serve(g_s), s	61.6	0.0	0.0	0.0	0.0	0.0	3.3	0.0	27.5	0.7	27.0	26.7
Cycle Q Clear(g_c), s	62.1	0.0	0.0	0.5	0.0	0.0	3.3	0.0	27.5	0.7	27.0	26.7
Prop In Lane	0.93		0.07	0.31		0.69	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	862	0	0	1063	0	0	69	0	502	23	455	385
V/C Ratio(X)	0.92	0.00	0.00	0.02	0.00	0.00	0.78	0.00	0.94	0.48	1.16	0.99
Avail Cap(c_a), veh/h	862	0	0	1063	0	0	80	0	502	80	455	385
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.3	0.0	0.0	10.1	0.0	0.0	52.0	0.0	38.9	53.6	41.2	41.0
Incr Delay (d2), s/veh	15.1	0.0	0.0	0.0	0.0	0.0	28.9	0.0	26.0	5.8	93.6	43.4
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	22.0	0.0	0.0	0.2	0.0	0.0	2.0	0.0	15.7	0.3	23.9	14.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.4	0.0	0.0	10.1	0.0	0.0	81.0	0.0	64.8	59.3	134.8	84.4
LnGrp LOS	D	A	A	B	A	A	F	A	E	E	F	F
Approach Vol, veh/h	796			16			527			920		
Approach Delay, s/veh	38.4			10.1			66.5			113.0		
Approach LOS	D			B			E			F		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.9	35.4		68.0	8.8	32.5		68.0				
Change Period (Y+Rc), s	4.5	5.5		5.5	4.5	5.5		5.5				
Max Green Setting (Gmax), s	5.0	27.0		62.5	5.0	27.0		62.5				
Max Q Clear Time (g_c+I), s	12.7	29.5		2.5	5.3	29.0		64.1				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay 75.1

HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th TWSC
5: Driveway/Otterson Dr & Hegan Ln

2040 Conditions
PM Peak Hour

Intersection												
Int Delay, s/veh	79.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰		↰	↰			↰		↰		↰
Traffic Vol, veh/h	20	365	0	5	275	105	0	0	0	345	0	35
Future Vol, veh/h	20	365	0	5	275	105	0	0	0	345	0	35
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	-	-	-	100	-	-	-	-	-	100	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	23	420	0	6	316	121	0	0	0	397	0	40

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	437	0	-	420	0	0	875	915	420	855	-	377
Stage 1	-	-	-	-	-	-	466	466	-	389	-	-
Stage 2	-	-	-	-	-	-	409	449	-	466	-	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	-	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	-	3.318
Pot Cap-1 Maneuver	1123	-	0	1139	-	-	270	273	633	~ 278	0	670
Stage 1	-	-	0	-	-	-	577	562	-	635	0	-
Stage 2	-	-	0	-	-	-	619	572	-	577	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1123	-	-	1139	-	-	248	264	633	~ 271	-	670
Mov Cap-2 Maneuver	-	-	-	-	-	-	248	264	-	~ 271	-	-
Stage 1	-	-	-	-	-	-	561	547	-	618	-	-
Stage 2	-	-	-	-	-	-	579	569	-	561	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.4			0.1			0			239.4		
HCM LOS							A			F		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1123	-	1139	-	-	271	670
HCM Lane V/C Ratio	-	0.02	-	0.005	-	-	1.463	0.06
HCM Control Delay (s)	0	8.3	0	8.2	-	-	262.6	10.7
HCM Lane LOS	A	A	A	A	-	-	F	B
HCM 95th %tile Q(veh)	-	0.1	-	0	-	-	22.3	0.2

Notes												
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined							*: All major volume in platoon			

Intersection						
Int Delay, s/veh	1.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↘	↑↑	↘	
Traffic Vol, veh/h	1160	20	55	970	10	60
Future Vol, veh/h	1160	20	55	970	10	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	6	6	6	6	6	6
Mvmt Flow	1261	22	60	1054	11	65
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1283	0	1919	642
Stage 1	-	-	-	-	1272	-
Stage 2	-	-	-	-	647	-
Critical Hdwy	-	-	4.22	-	6.92	7.02
Critical Hdwy Stg 1	-	-	-	-	5.92	-
Critical Hdwy Stg 2	-	-	-	-	5.92	-
Follow-up Hdwy	-	-	2.26	-	3.56	3.36
Pot Cap-1 Maneuver	-	-	516	-	56	407
Stage 1	-	-	-	-	219	-
Stage 2	-	-	-	-	472	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	516	-	50	407
Mov Cap-2 Maneuver	-	-	-	-	50	-
Stage 1	-	-	-	-	219	-
Stage 2	-	-	-	-	417	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.7		33.4	
HCM LOS					D	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	201	-	-	516	-	
HCM Lane V/C Ratio	0.379	-	-	0.116	-	
HCM Control Delay (s)	33.4	-	-	12.9	-	
HCM Lane LOS	D	-	-	B	-	
HCM 95th %tile Q(veh)	1.7	-	-	0.4	-	

HCM 6th Signalized Intersection Summary

2: Midway/Park Ave & Greenway/E Park Ave

2025 Improvement Conditions

AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	0	2	0	605	1	215	0	232	469	281	226	1
Future Volume (veh/h)	0	2	0	605	1	215	0	232	469	281	226	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1767	1767	1767	1767	1767	1767	1767	1767	1767	1767	1767	1767
Adj Flow Rate, veh/h	0	2	0	666	0	0	0	255	0	309	248	1
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
Percent Heavy Veh, %	9	9	9	9	9	9	9	9	9	9	9	9
Cap, veh/h	0	7	0	892	0		3	354		463	780	3
Arrive On Green	0.00	0.00	0.00	0.27	0.00	0.00	0.00	0.20	0.00	0.14	0.44	0.44
Sat Flow, veh/h	0	1767	0	3365	0	1497	1682	1767	1497	3264	1758	7
Grp Volume(v), veh/h	0	2	0	666	0	0	0	255	0	309	0	249
Grp Sat Flow(s),veh/h/ln	0	1767	0	1682	0	1497	1682	1767	1497	1632	0	1765
Q Serve(g_s), s	0.0	0.1	0.0	9.0	0.0	0.0	0.0	6.7	0.0	4.4	0.0	4.5
Cycle Q Clear(g_c), s	0.0	0.1	0.0	9.0	0.0	0.0	0.0	6.7	0.0	4.4	0.0	4.5
Prop In Lane	0.00		0.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	0	7	0	892	0		3	354		463	0	783
V/C Ratio(X)	0.00	0.30	0.00	0.75	0.00		0.00	0.72		0.67	0.00	0.32
Avail Cap(c_a), veh/h	0	250	0	1199	0		170	1295		661	0	1491
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	24.5	0.0	16.6	0.0	0.0	0.0	18.4	0.0	20.1	0.0	8.9
Incr Delay (d2), s/veh	0.0	8.7	0.0	2.2	0.0	0.0	0.0	2.1	0.0	2.0	0.0	0.3
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	3.1	0.0	0.0	0.0	2.6	0.0	1.6	0.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	33.2	0.0	18.9	0.0	0.0	0.0	20.5	0.0	22.1	0.0	9.2
LnGrp LOS	A	C	A	B	A		A	C		C	A	A
Approach Vol, veh/h		2			666	A		255	A		558	
Approach Delay, s/veh		33.2			18.9			20.5			16.3	
Approach LOS		C			B			C			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.0	14.9		4.8	0.0	26.9		17.7				
Change Period (Y+Rc), s	5.0	5.0		4.6	4.5	5.0		4.6				
Max Green Setting (Gmax), s	10.0	36.2		7.0	5.0	41.7		17.6				
Max Q Clear Time (g_c+I), s	10.4	8.7		2.1	0.0	6.5		11.0				
Green Ext Time (p_c), s	0.5	1.2		0.0	0.0	1.7		2.1				

Intersection Summary

HCM 6th Ctrl Delay 18.2

HCM 6th LOS B

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

3: Fair St & E Park Ave

2025 Improvement Conditions
AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	77	659	12	6	688	76	13	7	4	124	9	121
Future Volume (veh/h)	77	659	12	6	688	76	13	7	4	124	9	121
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1752	1752	1752	1752	1752	1752	1752	1752	1752	1752	1752	1752
Adj Flow Rate, veh/h	79	679	12	6	709	78	13	7	4	128	9	125
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	10	10	10	10	10	10	10	10	10	10	10	10
Cap, veh/h	113	1364	24	13	1052	116	51	28	16	338	20	284
Arrive On Green	0.07	0.41	0.41	0.01	0.35	0.35	0.06	0.06	0.06	0.20	0.20	0.20
Sat Flow, veh/h	1668	3346	59	1668	3024	332	898	483	276	1668	101	1399
Grp Volume(v), veh/h	79	338	353	6	390	397	24	0	0	128	0	134
Grp Sat Flow(s),veh/h/ln	1668	1664	1741	1668	1664	1692	1657	0	0	1668	0	1500
Q Serve(g_s), s	2.2	7.2	7.2	0.2	9.5	9.6	0.7	0.0	0.0	3.2	0.0	3.7
Cycle Q Clear(g_c), s	2.2	7.2	7.2	0.2	9.5	9.6	0.7	0.0	0.0	3.2	0.0	3.7
Prop In Lane	1.00		0.03	1.00		0.20	0.54		0.17	1.00		0.93
Lane Grp Cap(c), veh/h	113	679	710	13	579	588	95	0	0	338	0	304
V/C Ratio(X)	0.70	0.50	0.50	0.45	0.67	0.67	0.25	0.00	0.00	0.38	0.00	0.44
Avail Cap(c_a), veh/h	698	1393	1457	873	1393	1416	763	0	0	698	0	628
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.8	10.5	10.5	23.6	13.3	13.3	21.6	0.0	0.0	16.4	0.0	16.7
Incr Delay (d2), s/veh	2.9	0.6	0.5	8.5	1.4	1.4	1.4	0.0	0.0	0.7	0.0	1.0
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	0.9	2.2	2.3	0.1	2.9	3.0	0.3	0.0	0.0	1.2	0.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.6	11.1	11.1	32.1	14.7	14.6	22.9	0.0	0.0	17.1	0.0	17.7
LnGrp LOS	C	B	B	C	B	B	C	A	A	B	A	B
Approach Vol, veh/h	770			793			24			262		
Approach Delay, s/veh	12.5			14.8			22.9			17.4		
Approach LOS	B			B			C			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	3.9	23.5		13.7	6.7	20.6		6.7				
Change Period (Y+Rc), s	3.5	4.0		4.0	3.5	4.0		4.0				
Max Green Setting (Gmax), s	25.0	40.0		20.0	20.0	40.0		22.0				
Max Q Clear Time (g_c+I), s	12.2	9.2		5.7	4.2	11.6		2.7				
Green Ext Time (p_c), s	0.0	4.8		1.0	0.0	5.1		0.1				

Intersection Summary

HCM 6th Ctrl Delay 14.3

HCM 6th LOS B

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

4: Midway & Hegan Ln/Driveway

2025 Improvement Conditions
AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	243	0	22	1	0	0	51	454	0	2	310	503
Future Volume (veh/h)	243	0	22	1	0	0	51	454	0	2	310	503
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1767	1767	1767	1767	1767	1767	1767	1767	1767	1767	1767	1767
Adj Flow Rate, veh/h	313	0	0	1	0	0	61	540	0	2	369	0
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	9	9	9	9	9	9	9	9	9	9	9	9
Cap, veh/h	879	289	0	439	0	0	109	634	0	5	524	
Arrive On Green	0.16	0.00	0.00	0.16	0.00	0.00	0.07	0.36	0.00	0.00	0.30	0.00
Sat Flow, veh/h	2678	1767	0	1339	0	0	1682	1767	0	1682	1767	1497
Grp Volume(v), veh/h	313	0	0	1	0	0	61	540	0	2	369	0
Grp Sat Flow(s), veh/h/ln	1339	1767	0	1339	0	0	1682	1767	0	1682	1767	1497
Q Serve(g_s), s	3.6	0.0	0.0	0.0	0.0	0.0	1.1	9.2	0.0	0.0	6.1	0.0
Cycle Q Clear(g_c), s	3.6	0.0	0.0	0.0	0.0	0.0	1.1	9.2	0.0	0.0	6.1	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	879	289	0	439	0	0	109	634	0	5	524	
V/C Ratio(X)	0.36	0.00	0.00	0.00	0.00	0.00	0.56	0.85	0.00	0.39	0.70	
Avail Cap(c_a), veh/h	1876	947	0	938	0	0	386	2272	0	258	2137	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	12.9	0.0	0.0	11.4	0.0	0.0	14.8	9.7	0.0	16.3	10.2	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.0	0.0	0.0	1.6	1.3	0.0	16.7	0.6	0.0
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	0.0	0.0	0.0	0.4	2.3	0.0	0.0	1.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.0	0.0	0.0	11.4	0.0	0.0	16.5	10.9	0.0	33.0	10.9	0.0
LnGrp LOS	B	A	A	B	A	A	B	B	A	C	B	
Approach Vol, veh/h	313			1			601			371		
Approach Delay, s/veh	13.0			11.4			11.5			11.0		
Approach LOS	B			B			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.6	17.2		10.8	6.6	15.2		10.8				
Change Period (Y+Rc), s	4.5	5.5		5.5	4.5	5.5		5.5				
Max Green Setting (Gmax), s	42.0	42.0		17.5	7.5	39.5		17.5				
Max Q Clear Time (g_c+I), s	11.2	11.2		2.0	3.1	8.1		5.6				
Green Ext Time (p_c), s	0.0	0.5		0.0	0.0	0.4		0.1				

Intersection Summary

HCM 6th Ctrl Delay 11.7

HCM 6th LOS B

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection												
Intersection Delay, s/veh19.4												
Intersection LOS C												

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔			↔		↔		↔
Traffic Vol, veh/h	18	183	0	0	228	316	0	0	0	77	0	8
Future Vol, veh/h	18	183	0	0	228	316	0	0	0	77	0	8
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
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	20	206	0	0	256	355	0	0	0	87	0	9
Number of Lanes	0	1	0	1	1	0	0	1	0	1	0	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	2	1	1	2
Conflicting Approach RightNB		SB	WB	EB
Conflicting Lanes Right	1	2	2	1
HCM Control Delay	11.7	23.5	0	11.1
HCM LOS	B	C	-	B

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	9%	0%	0%	100%	0%
Vol Thru, %	100%	91%	100%	42%	0%	0%
Vol Right, %	0%	0%	0%	58%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	201	0	544	77	8
LT Vol	0	18	0	0	77	0
Through Vol	0	183	0	228	0	0
RT Vol	0	0	0	316	0	8
Lane Flow Rate	0	226	0	611	87	9
Geometry Grp	6	6	7	7	7	7
Degree of Util (X)	0	0.351	0	0.799	0.172	0.015
Departure Headway (Hd)	6.949	5.602	5.112	4.703	7.143	5.922
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	0	637	0	764	505	608
Service Time	4.954	3.685	2.868	2.459	4.843	3.622
HCM Lane V/C Ratio	0	0.355	0	0.8	0.172	0.015
HCM Control Delay	10	11.7	7.9	23.5	11.3	8.7
HCM Lane LOS	N	B	N	C	B	A
HCM 95th-tile Q	0	1.6	0	8.3	0.6	0

HCM 6th Signalized Intersection Summary

5: Driveway/Otterson Dr & Hegan Ln

2025 Improvement Conditions

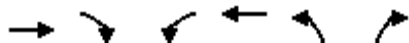
AM Peak Hour

																
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR				
Lane Configurations																
Traffic Volume (veh/h)	18	183	0	0	228	316	0	0	0	77	0	8				
Future Volume (veh/h)	18	183	0	0	228	316	0	0	0	77	0	8				
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0				
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00				
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Work Zone On Approach	No			No			No			No						
Adj Sat Flow, veh/h/ln	1841	1841	0	1841	1841	1841	1841	1841	1841	1841	0	1841				
Adj Flow Rate, veh/h	20	206	0	0	256	355	0	0	0	87	0	9				
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				
Percent Heavy Veh, %	4	4	0	4	4	4	4	4	4	4	0	4				
Cap, veh/h	43	1320	0	4	411	569	0	4	0	131	0	0				
Arrive On Green	0.02	0.72	0.00	0.00	0.59	0.59	0.00	0.00	0.00	0.07	0.00	0.00				
Sat Flow, veh/h	1753	1841	0	1753	698	968	0	-82832	0	1753	87					
Grp Volume(v), veh/h	20	206	0	0	0	611	0	0	0	87	25.1					
Grp Sat Flow(s),veh/h/ln	1753	1841	0	1753	0	1666	0	1841	0	1753	C					
Q Serve(g_s), s	0.5	1.5	0.0	0.0	0.0	10.3	0.0	0.0	0.0	2.1						
Cycle Q Clear(g_c), s	0.5	1.5	0.0	0.0	0.0	10.3	0.0	0.0	0.0	2.1						
Prop In Lane	1.00		0.00	1.00		0.58	0.00		0.00	1.00						
Lane Grp Cap(c), veh/h	43	1320	0	4	0	980	0	4	0	131						
V/C Ratio(X)	0.46	0.16	0.00	0.00	0.00	0.62	0.00	0.00	0.00	0.66						
Avail Cap(c_a), veh/h	203	1320	0	203	0	1195	0	766	0	730						
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00						
Upstream Filter(l)	1.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00						
Uniform Delay (d), s/veh	20.8	2.0	0.0	0.0	0.0	5.8	0.0	0.0	0.0	19.5						
Incr Delay (d2), s/veh	7.5	0.3	0.0	0.0	0.0	0.7	0.0	0.0	0.0	5.6						
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0						
%ile BackOfQ(50%),veh/ln	0.3	0.2	0.0	0.0	0.0	2.0	0.0	0.0	0.0	1.0						
Unsig. Movement Delay, s/veh																
LnGrp Delay(d),s/veh	28.3	2.2	0.0	0.0	0.0	6.5	0.0	0.0	0.0	25.1						
LnGrp LOS	C	A	A	A	A	A	A	A	A	C						
Approach Vol, veh/h	226			611			0									
Approach Delay, s/veh	4.5			6.5			0.0									
Approach LOS	A			A												
Timer - Assigned Phs	1	2			5	6	7	8								
Phs Duration (G+Y+Rc), s	0.0	35.5			5.6	29.9	7.7	0.0								
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5	4.5	4.5								
Max Green Setting (Gmax), s	5.0	31.0			5.0	31.0	18.0	18.0								
Max Q Clear Time (g_c+I1), s	0.0	3.5			2.5	12.3	4.1	0.0								
Green Ext Time (p_c), s	0.0	1.1			0.0	4.1	0.2	0.0								
Intersection Summary																
HCM 6th Ctrl Delay				7.8												
HCM 6th LOS				A												

HCM 6th Signalized Intersection Summary

6: Scott Ave & E Park Ave

2025 Improvement Conditions
AM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	
Traffic Volume (veh/h)	751	32	68	748	6	60
Future Volume (veh/h)	751	32	68	748	6	60
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1722	1722	1722	1722	1900	1900
Adj Flow Rate, veh/h	791	34	72	787	6	63
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	12	12	12	12	0	0
Cap, veh/h	1329	57	117	2003	18	184
Arrive On Green	0.42	0.42	0.07	0.61	0.14	0.14
Sat Flow, veh/h	3278	137	1640	3358	127	1329
Grp Volume(v), veh/h	405	420	72	787	70	0
Grp Sat Flow(s), veh/h/ln	1636	1693	1640	1636	1477	0
Q Serve(g_s), s	6.9	6.9	1.5	4.4	1.5	0.0
Cycle Q Clear(g_c), s	6.9	6.9	1.5	4.4	1.5	0.0
Prop In Lane		0.08	1.00		0.09	0.90
Lane Grp Cap(c), veh/h	681	705	117	2003	204	0
V/C Ratio(X)	0.59	0.60	0.62	0.39	0.34	0.00
Avail Cap(c_a), veh/h	1563	1618	495	4522	863	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.2	8.2	16.3	3.6	14.1	0.0
Incr Delay (d2), s/veh	0.8	0.8	5.2	0.1	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	1.8	0.6	0.3	0.5	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.0	9.0	21.5	3.7	15.1	0.0
LnGrp LOS	A	A	C	A	B	A
Approach Vol, veh/h	825			859	70	
Approach Delay, s/veh	9.0			5.2	15.1	
Approach LOS	A			A	B	
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		9.5	7.1	19.5		26.6
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s		21.1	10.9	34.5		49.9
Max Q Clear Time (g_c+I1), s		3.5	3.5	8.9		6.4
Green Ext Time (p_c), s		0.1	0.1	5.8		6.1
Intersection Summary						
HCM 6th Ctrl Delay			7.4			
HCM 6th LOS			A			

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

2: Midway/Park Ave & Greenway/E Park Ave

2025 Signal Improvement Conditions

PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔	↔	↑	↔	↔	↔	↔
Traffic Volume (veh/h)	2	5	0	531	5	306	0	300	683	350	225	0
Future Volume (veh/h)	2	5	0	531	5	306	0	300	683	350	225	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	2	5	0	557	0	0	0	312	0	365	234	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
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	7	17	0	788	0		3	418		511	875	0
Arrive On Green	0.01	0.01	0.00	0.23	0.00	0.00	0.00	0.23	0.00	0.15	0.48	0.00
Sat Flow, veh/h	514	1286	0	3478	0	1547	1739	1826	1547	3374	1826	0
Grp Volume(v), veh/h	7	0	0	557	0	0	0	312	0	365	234	0
Grp Sat Flow(s), veh/h/ln1800	0	0	0	1739	0	1547	1739	1826	1547	1687	1826	0
Q Serve(g_s), s	0.2	0.0	0.0	7.5	0.0	0.0	0.0	8.0	0.0	5.2	3.9	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.0	7.5	0.0	0.0	0.0	8.0	0.0	5.2	3.9	0.0
Prop In Lane	0.29		0.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	23	0	0	788	0		3	418		511	875	0
V/C Ratio(X)	0.30	0.00	0.00	0.71	0.00		0.00	0.75		0.71	0.27	0.00
Avail Cap(c_a), veh/h	249	0	0	1211	0		172	1308		668	1507	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	24.7	0.0	0.0	18.0	0.0	0.0	0.0	18.1	0.0	20.4	7.9	0.0
Incr Delay (d2), s/veh	2.6	0.0	0.0	1.7	0.0	0.0	0.0	2.0	0.0	2.8	0.2	0.0
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	2.7	0.0	0.0	0.0	3.2	0.0	2.0	1.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.3	0.0	0.0	19.7	0.0	0.0	0.0	20.1	0.0	23.2	8.0	0.0
LnGrp LOS	C	A	A	B	A		A	C		C	A	A
Approach Vol, veh/h	7			557			A			599		
Approach Delay, s/veh	27.3			19.7			20.1			17.3		
Approach LOS	C			B			C			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.7	16.6		5.3	0.0	29.2		16.1				
Change Period (Y+Rc), s	5.0	5.0		4.6	4.5	5.0		4.6				
Max Green Setting (Gmax), s	10.0	36.2		7.0	5.0	41.7		17.6				
Max Q Clear Time (g_c+I), s	10.0	10.0		2.2	0.0	5.9		9.5				
Green Ext Time (p_c), s	0.5	1.5		0.0	0.0	1.6		2.0				

Intersection Summary

HCM 6th Ctrl Delay 18.8

HCM 6th LOS B

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

3: Fair St & E Park Ave

2025 Signal Improvement Conditions
PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	131	896	5	6	735	122	27	25	16	123	16	80
Future Volume (veh/h)	131	896	5	6	735	122	27	25	16	123	16	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	136	933	5	6	766	127	28	26	17	128	17	83
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
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	172	1579	8	14	1058	175	79	73	48	288	45	219
Arrive On Green	0.10	0.45	0.45	0.01	0.36	0.36	0.12	0.12	0.12	0.17	0.17	0.17
Sat Flow, veh/h	1739	3538	19	1739	2978	494	678	629	411	1739	270	1319
Grp Volume(v), veh/h	136	457	481	6	446	447	71	0	0	128	0	100
Grp Sat Flow(s), veh/h/ln	1739	1735	1822	1739	1735	1737	1718	0	0	1739	0	1589
Q Serve(g_s), s	4.5	11.7	11.7	0.2	13.1	13.1	2.2	0.0	0.0	3.9	0.0	3.3
Cycle Q Clear(g_c), s	4.5	11.7	11.7	0.2	13.1	13.1	2.2	0.0	0.0	3.9	0.0	3.3
Prop In Lane	1.00		0.01	1.00		0.28	0.39		0.24	1.00		0.83
Lane Grp Cap(c), veh/h	172	774	813	14	616	617	200	0	0	288	0	263
V/C Ratio(X)	0.79	0.59	0.59	0.43	0.72	0.72	0.35	0.00	0.00	0.44	0.00	0.38
Avail Cap(c_a), veh/h	591	1179	1239	739	1179	1181	642	0	0	591	0	540
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.9	12.3	12.3	29.1	16.5	16.5	24.0	0.0	0.0	22.1	0.0	21.9
Incr Delay (d2), s/veh	3.1	0.7	0.7	7.8	1.6	1.6	1.1	0.0	0.0	1.1	0.0	0.9
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	1.9	4.0	4.2	0.1	4.6	4.6	0.9	0.0	0.0	1.6	0.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.0	13.0	12.9	36.8	18.1	18.1	25.0	0.0	0.0	23.2	0.0	22.8
LnGrp LOS	C	B	B	D	B	B	C	A	A	C	A	C
Approach Vol, veh/h	1074			899			71			228		
Approach Delay, s/veh	15.0			18.2			25.0			23.0		
Approach LOS	B			B			C			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.0	30.3		13.8	9.3	24.9		10.9				
Change Period (Y+Rc), s	3.5	4.0		4.0	3.5	4.0		4.0				
Max Green Setting (Gmax), s	25.0	40.0		20.0	20.0	40.0		22.0				
Max Q Clear Time (g_c+I), s	12.2	13.7		5.9	6.5	15.1		4.2				
Green Ext Time (p_c), s	0.0	6.8		0.8	0.0	5.8		0.3				

Intersection Summary

HCM 6th Ctrl Delay 17.4

HCM 6th LOS B

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

4: Midway & Hegan Ln/Driveway

2025 Signal Improvement Conditions
PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	600	0	48	3	0	6	45	382	1	7	427	312
Future Volume (veh/h)	600	0	48	3	0	6	45	382	1	7	427	312
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	694	0	0	3	0	6	48	411	1	8	459	0
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
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	1141	528	0	214	48	295	89	613	1	19	540	
Arrive On Green	0.29	0.00	0.00	0.29	0.00	0.29	0.05	0.33	0.33	0.01	0.29	0.00
Sat Flow, veh/h	2775	1841	0	349	166	1029	1753	1835	4	1753	1841	1560
Grp Volume(v), veh/h	694	0	0	9	0	0	48	0	412	8	459	0
Grp Sat Flow(s), veh/h/ln	1388	1841	0	1544	0	0	1753	0	1840	1753	1841	1560
Q Serve(g_s), s	9.8	0.0	0.0	0.0	0.0	0.0	1.1	0.0	8.1	0.2	9.9	0.0
Cycle Q Clear(g_c), s	9.9	0.0	0.0	0.2	0.0	0.0	1.1	0.0	8.1	0.2	9.9	0.0
Prop In Lane	1.00		0.00	0.33		0.67	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	1141	528	0	557	0	0	89	0	614	19	540	
V/C Ratio(X)	0.61	0.00	0.00	0.02	0.00	0.00	0.54	0.00	0.67	0.43	0.85	
Avail Cap(c_a), veh/h	2347	1327	0	1209	0	0	213	0	1279	209	1275	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	14.2	0.0	0.0	10.8	0.0	0.0	19.5	0.0	12.0	20.7	14.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.5	5.7	1.5	0.0
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	2.4	0.0	0.0	0.1	0.0	0.0	0.4	0.0	2.6	0.1	3.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.4	0.0	0.0	10.8	0.0	0.0	21.3	0.0	12.5	26.4	15.4	0.0
LnGrp LOS	B	A	A	B	A	A	C	A	B	C	B	
Approach Vol, veh/h	694			9			460			467		
Approach Delay, s/veh	14.4			10.8			13.4			15.6		
Approach LOS	B			B			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.9	19.5		17.5	6.6	17.8		17.5				
Change Period (Y+Rc), s	4.5	5.5		5.5	4.5	5.5		5.5				
Max Green Setting (Gmax), s	5.0	29.2		30.3	5.1	29.1		30.3				
Max Q Clear Time (g_c+I2), s	10.2	10.1		2.2	3.1	11.9		11.9				
Green Ext Time (p_c), s	0.0	0.4		0.0	0.0	0.5		0.1				

Intersection Summary

HCM 6th Ctrl Delay 14.5

HCM 6th LOS B

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection

Intersection Delay, s/veh24.5

Intersection LOS C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔			↔		↔		↔
Traffic Vol, veh/h	17	317	0	3	240	92	0	0	0	300	0	29
Future Vol, veh/h	17	317	0	3	240	92	0	0	0	300	0	29
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	20	364	0	3	276	106	0	0	0	345	0	33
Number of Lanes	0	1	0	1	1	0	0	1	0	1	0	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	2	1	1	2
Conflicting Approach RightNB		SB	WB	EB
Conflicting Lanes Right	1	2	2	1
HCM Control Delay	25.5	22.7	0	25.2
HCM LOS	D	C	-	D

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	5%	100%	0%	100%	0%
Vol Thru, %	100%	95%	0%	72%	0%	0%
Vol Right, %	0%	0%	0%	28%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	334	3	332	300	29
LT Vol	0	17	3	0	300	0
Through Vol	0	317	0	240	0	0
RT Vol	0	0	0	92	0	29
Lane Flow Rate	0	384	3	382	345	33
Geometry Grp	6	6	7	7	7	7
Degree of Util (X)	0	0.722	0.007	0.693	0.714	0.058
Departure Headway (Hd)	8.344	6.775	7.243	6.533	7.458	6.233
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	0	534	495	553	486	577
Service Time	6.414	4.797	4.979	4.27	5.174	3.95
HCM Lane V/C Ratio	0	0.719	0.006	0.691	0.71	0.057
HCM Control Delay	11.4	25.5	10	22.8	26.7	9.3
HCM Lane LOS	N	D	A	C	D	A
HCM 95th-tile Q	0	5.9	0	5.4	5.6	0.2

HCM 6th Signalized Intersection Summary

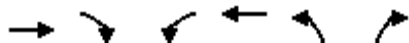
5: Driveway/Otterson Dr & Hegan Ln

2025 Signal Conditions
PM Peak Hour

																
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR				
Lane Configurations																
Traffic Volume (veh/h)	17	317	0	3	240	92	0	0	0	300	0	29				
Future Volume (veh/h)	17	317	0	3	240	92	0	0	0	300	0	29				
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0				
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00				
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Work Zone On Approach	No			No			No			No						
Adj Sat Flow, veh/h/ln	1870	1870	0	1870	1870	1870	1870	1870	1870	1870	0	1870				
Adj Flow Rate, veh/h	20	364	0	3	276	106	0	0	0	345	0	33				
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87				
Percent Heavy Veh, %	2	2	0	2	2	2	2	2	2	2	0	2				
Cap, veh/h	45	613	0	7	394	151	0	6	0	453	0	0				
Arrive On Green	0.03	0.33	0.00	0.00	0.31	0.31	0.00	0.00	0.00	0.25	0.00	0.00				
Sat Flow, veh/h	1781	1870	0	1781	1287	494	0	-84166	0	1781	345					
Grp Volume(v), veh/h	20	364	0	3	0	382	0	0	0	345	13.9					
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1781	0	1781	0	1870	0	1781	B					
Q Serve(g_s), s	0.4	5.3	0.0	0.1	0.0	6.2	0.0	0.0	0.0	5.8						
Cycle Q Clear(g_c), s	0.4	5.3	0.0	0.1	0.0	6.2	0.0	0.0	0.0	5.8						
Prop In Lane	1.00		0.00	1.00		0.28	0.00		0.00	1.00						
Lane Grp Cap(c), veh/h	45	613	0	7	0	546	0	6	0	453						
V/C Ratio(X)	0.44	0.59	0.00	0.41	0.00	0.70	0.00	0.00	0.00	0.76						
Avail Cap(c_a), veh/h	273	1176	0	273	0	1120	0	1033	0	1011						
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00						
Upstream Filter(l)	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00						
Uniform Delay (d), s/veh	15.7	9.1	0.0	16.2	0.0	10.0	0.0	0.0	0.0	11.2						
Incr Delay (d2), s/veh	6.6	0.9	0.0	32.8	0.0	1.6	0.0	0.0	0.0	2.7						
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0						
%ile BackOfQ(50%),veh/ln	0.2	1.5	0.0	0.1	0.0	1.8	0.0	0.0	0.0	2.1						
Unsig. Movement Delay, s/veh																
LnGrp Delay(d),s/veh	22.3	10.1	0.0	49.0	0.0	11.6	0.0	0.0	0.0	13.9						
LnGrp LOS	C	B	A	D	A	B	A	A	A	B						
Approach Vol, veh/h	384			385			0									
Approach Delay, s/veh	10.7			11.9			0.0									
Approach LOS	B			B												
Timer - Assigned Phs	1	2			5	6	7	8								
Phs Duration (G+Y+Rc), s	4.6	15.2			5.3	14.5	12.8	0.0								
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5	4.5	4.5								
Max Green Setting (Gmax), s	5.0	20.5			5.0	20.5	18.5	18.0								
Max Q Clear Time (g_c+I1), s	2.1	7.3			2.4	8.2	7.8	0.0								
Green Ext Time (p_c), s	0.0	1.7			0.0	1.8	0.8	0.0								
Intersection Summary																
HCM 6th Ctrl Delay				12.1												
HCM 6th LOS				B												

HCM 6th Signalized Intersection Summary 6: Scott Ave & E Park Ave

2025 Signal Improvement Conditions
PM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↱		↱	↑↑	↱↱	
Traffic Volume (veh/h)	1012	17	46	851	7	53
Future Volume (veh/h)	1012	17	46	851	7	53
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1900	1900
Adj Flow Rate, veh/h	1100	18	50	925	8	58
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	6	6	6	0	0
Cap, veh/h	2005	33	403	1992	28	203
Arrive On Green	0.58	0.58	0.58	0.58	0.15	0.15
Sat Flow, veh/h	3554	57	487	3532	186	1349
Grp Volume(v), veh/h	546	572	50	925	67	0
Grp Sat Flow(s),veh/h/ln	1721	1800	487	1721	1559	0
Q Serve(g_s), s	6.5	6.5	2.3	5.1	1.3	0.0
Cycle Q Clear(g_c), s	6.5	6.5	8.9	5.1	1.3	0.0
Prop In Lane		0.03	1.00		0.12	0.87
Lane Grp Cap(c), veh/h	996	1042	403	1992	234	0
V/C Ratio(X)	0.55	0.55	0.12	0.46	0.29	0.00
Avail Cap(c_a), veh/h	2613	2733	860	5226	961	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	4.3	4.3	7.1	4.0	12.5	0.0
Incr Delay (d2), s/veh	0.5	0.5	0.1	0.2	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	1.0	0.1	0.4	0.4	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	4.8	4.8	7.2	4.2	13.2	0.0
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h	1118			975	67	
Approach Delay, s/veh	4.8			4.4	13.2	
Approach LOS	A			A	B	
Timer - Assigned Phs		2		4		8
Phs Duration (G+Y+Rc), s		9.5		23.8		23.8
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		20.5		50.5		50.5
Max Q Clear Time (g_c+I1), s		3.3		8.5		10.9
Green Ext Time (p_c), s		0.1		9.7		8.4
Intersection Summary						
HCM 6th Ctrl Delay			4.8			
HCM 6th LOS			A			

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

2: Midway/Park Ave & Greenway/E Park Ave

2040 Improvement Conditions

AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔	↔	↑	↔	↔	↔	↔
Traffic Volume (veh/h)	0	5	0	690	5	245	0	270	535	320	260	5
Future Volume (veh/h)	0	5	0	690	5	245	0	270	535	320	260	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1767	1767	1767	1767	1767	1767	1767	1767	1767	1767	1767	1767
Adj Flow Rate, veh/h	0	5	0	754	0	0	0	293	0	348	283	5
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
Percent Heavy Veh, %	9	9	9	9	9	9	9	9	9	9	9	9
Cap, veh/h	0	17	0	930	0		3	385		475	787	14
Arrive On Green	0.00	0.01	0.00	0.28	0.00	0.00	0.00	0.22	0.00	0.15	0.45	0.45
Sat Flow, veh/h	0	1767	0	3365	0	1497	1682	1767	1497	3264	1731	31
Grp Volume(v), veh/h	0	5	0	754	0	0	0	293	0	348	0	288
Grp Sat Flow(s),veh/h/ln	0	1767	0	1682	0	1497	1682	1767	1497	1632	0	1761
Q Serve(g_s), s	0.0	0.2	0.0	11.4	0.0	0.0	0.0	8.5	0.0	5.6	0.0	5.8
Cycle Q Clear(g_c), s	0.0	0.2	0.0	11.4	0.0	0.0	0.0	8.5	0.0	5.6	0.0	5.8
Prop In Lane	0.00		0.00	1.00		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	0	17	0	930	0		3	385		475	0	801
V/C Ratio(X)	0.00	0.30	0.00	0.81	0.00		0.00	0.76		0.73	0.00	0.36
Avail Cap(c_a), veh/h	0	226	0	1081	0		154	1168		596	0	1341
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	27.0	0.0	18.5	0.0	0.0	0.0	20.1	0.0	22.4	0.0	9.7
Incr Delay (d2), s/veh	0.0	3.7	0.0	4.6	0.0	0.0	0.0	2.3	0.0	3.9	0.0	0.3
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.0	4.3	0.0	0.0	0.0	3.4	0.0	2.1	0.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	30.7	0.0	23.0	0.0	0.0	0.0	22.4	0.0	26.3	0.0	10.1
LnGrp LOS	A	C	A	C	A		A	C		C	A	B
Approach Vol, veh/h	5				754		A		293		A	
Approach Delay, s/veh	30.7				23.0				22.4		18.9	
Approach LOS	C				C				C		B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	3.0	17.0		5.1	0.0	29.9		19.7				
Change Period (Y+Rc), s	5.0	5.0		4.6	4.5	5.0		4.6				
Max Green Setting (Gmax), s	10.0	36.2		7.0	5.0	41.7		17.6				
Max Q Clear Time (g_c+I), s	10.5	10.5		2.2	0.0	7.8		13.4				
Green Ext Time (p_c), s	0.4	1.4		0.0	0.0	2.0		1.7				

Intersection Summary

HCM 6th Ctrl Delay 21.4

HCM 6th LOS C

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

3: Fair St & E Park Ave

2040 Improvement Conditions
AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	755	15	5	785	85	15	10	5	140	10	140
Future Volume (veh/h)	90	755	15	5	785	85	15	10	5	140	10	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1752	1752	1752	1752	1752	1752	1752	1752	1752	1752	1752	1752
Adj Flow Rate, veh/h	93	778	15	5	809	88	15	10	5	144	10	144
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	10	10	10	10	10	10	10	10	10	10	10	10
Cap, veh/h	118	1475	28	11	1143	124	56	37	19	314	18	264
Arrive On Green	0.07	0.44	0.44	0.01	0.38	0.38	0.07	0.07	0.07	0.19	0.19	0.19
Sat Flow, veh/h	1668	3340	64	1668	3027	329	830	553	277	1668	97	1402
Grp Volume(v), veh/h	93	388	405	5	445	452	30	0	0	144	0	154
Grp Sat Flow(s), veh/h/ln	1668	1664	1740	1668	1664	1693	1660	0	0	1668	0	1499
Q Serve(g_s), s	2.9	8.9	8.9	0.2	11.9	11.9	0.9	0.0	0.0	4.0	0.0	4.9
Cycle Q Clear(g_c), s	2.9	8.9	8.9	0.2	11.9	11.9	0.9	0.0	0.0	4.0	0.0	4.9
Prop In Lane	1.00		0.04	1.00		0.19	0.50		0.17	1.00		0.94
Lane Grp Cap(c), veh/h	118	735	768	11	628	639	112	0	0	314	0	282
V/C Ratio(X)	0.79	0.53	0.53	0.45	0.71	0.71	0.27	0.00	0.00	0.46	0.00	0.55
Avail Cap(c_a), veh/h	637	1271	1329	796	1271	1292	697	0	0	637	0	572
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.0	10.7	10.7	25.9	13.9	13.9	23.2	0.0	0.0	18.9	0.0	19.2
Incr Delay (d2), s/veh	4.3	0.6	0.6	10.0	1.5	1.5	1.3	0.0	0.0	1.0	0.0	1.6
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	1.2	2.8	2.9	0.1	3.7	3.8	0.4	0.0	0.0	1.5	0.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.3	11.2	11.2	36.0	15.3	15.3	24.5	0.0	0.0	19.9	0.0	20.9
LnGrp LOS	C	B	B	D	B	B	C	A	A	B	A	C
Approach Vol, veh/h	886			902			30			298		
Approach Delay, s/veh	13.0			15.4			24.5			20.4		
Approach LOS	B			B			C			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	3.9	27.1		13.9	7.2	23.8		7.5				
Change Period (Y+Rc), s	3.5	4.0		4.0	3.5	4.0		4.0				
Max Green Setting (Gmax), s	25.0	40.0		20.0	20.0	40.0		22.0				
Max Q Clear Time (g_c+I), s	12.2	10.9		6.9	4.9	13.9		2.9				
Green Ext Time (p_c), s	0.0	5.6		1.1	0.0	5.9		0.1				

Intersection Summary

HCM 6th Ctrl Delay 15.3

HCM 6th LOS B

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

4: Midway & Hegan Ln/Driveway

2040 Improvement Conditions

AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	275	0	25	5	0	0	60	520	0	5	355	575
Future Volume (veh/h)	275	0	25	5	0	0	60	520	0	5	355	575
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1767	1767	1767	1767	1767	1767	1767	1767	1767	1767	1767	1767
Adj Flow Rate, veh/h	338	0	0	6	0	0	68	591	0	6	403	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
Percent Heavy Veh, %	9	9	9	9	9	9	9	9	9	9	9	9
Cap, veh/h	867	302	0	432	0	0	116	676	0	14	569	
Arrive On Green	0.17	0.00	0.00	0.17	0.00	0.00	0.07	0.38	0.00	0.01	0.32	0.00
Sat Flow, veh/h	2678	1767	0	1339	0	0	1682	1767	0	1682	1767	1497
Grp Volume(v), veh/h	338	0	0	6	0	0	68	591	0	6	403	0
Grp Sat Flow(s), veh/h/ln	1339	1767	0	1339	0	0	1682	1767	0	1682	1767	1497
Q Serve(g_s), s	4.1	0.0	0.0	0.1	0.0	0.0	1.4	11.0	0.0	0.1	7.1	0.0
Cycle Q Clear(g_c), s	4.2	0.0	0.0	0.1	0.0	0.0	1.4	11.0	0.0	0.1	7.1	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	867	302	0	432	0	0	116	676	0	14	569	
V/C Ratio(X)	0.39	0.00	0.00	0.01	0.00	0.00	0.59	0.87	0.00	0.44	0.71	
Avail Cap(c_a), veh/h	1734	874	0	866	0	0	357	2097	0	238	1972	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	13.9	0.0	0.0	12.2	0.0	0.0	16.0	10.1	0.0	17.5	10.5	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.0	0.0	0.0	1.7	1.4	0.0	8.1	0.6	0.0
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.9	0.0	0.1	2.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.0	0.0	0.0	12.2	0.0	0.0	17.7	11.6	0.0	25.5	11.1	0.0
LnGrp LOS	B	A	A	B	A	A	B	B	A	C	B	
Approach Vol, veh/h	338			6			659			409		
Approach Delay, s/veh	14.0			12.2			12.2			11.4		
Approach LOS	B			B			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.8	19.0		11.5	6.9	16.9		11.5				
Change Period (Y+Rc), s	4.5	5.5		5.5	4.5	5.5		5.5				
Max Green Setting (Gmax), s	42.0	42.0		17.5	7.5	39.5		17.5				
Max Q Clear Time (g_c+I), s	13.0	13.0		2.1	3.4	9.1		6.2				
Green Ext Time (p_c), s	0.0	0.6		0.0	0.0	0.4		0.1				

Intersection Summary

HCM 6th Ctrl Delay 12.4

HCM 6th LOS B

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection

Intersection Delay, s/veh 27.4

Intersection LOS D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔			↔		↔		↔
Traffic Vol, veh/h	20	210	0	0	260	365	0	0	0	90	0	10
Future Vol, veh/h	20	210	0	0	260	365	0	0	0	90	0	10
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
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	22	228	0	0	283	397	0	0	0	98	0	11
Number of Lanes	0	1	0	1	1	0	0	1	0	1	0	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	2	1	1	2
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	1	2	2	1
HCM Control Delay	12.8	35.3	0	11.7
HCM LOS	B	E	-	B

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	9%	0%	0%	100%	0%
Vol Thru, %	100%	91%	100%	42%	0%	0%
Vol Right, %	0%	0%	0%	58%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	230	0	625	90	10
LT Vol	0	20	0	0	90	0
Through Vol	0	210	0	260	0	0
RT Vol	0	0	0	365	0	10
Lane Flow Rate	0	250	0	679	98	11
Geometry Grp	6	6	7	7	7	7
Degree of Util (X)	0	0.407	0	0.903	0.201	0.019
Departure Headway (Hd)	7.275	5.856	5.198	4.787	7.388	6.164
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	0	618	0	747	488	583
Service Time	5.296	3.856	2.979	2.567	5.099	3.875
HCM Lane V/C Ratio	0	0.405	0	0.909	0.201	0.019
HCM Control Delay	10.3	12.8	8	35.3	12	9
HCM Lane LOS	N	B	N	E	B	A
HCM 95th-tile Q	0	2	0	12	0.7	0.1

HCM 6th Signalized Intersection Summary

5: Driveway/Otterson Dr & Hegan Ln

2040 Improvement Conditions

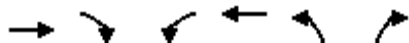
AM Peak Hour

																
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR				
Lane Configurations																
Traffic Volume (veh/h)	20	210	0	0	260	365	0	0	0	90	0	10				
Future Volume (veh/h)	20	210	0	0	260	365	0	0	0	90	0	10				
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0				
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00				
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Work Zone On Approach	No			No			No			No						
Adj Sat Flow, veh/h/ln	1841	1841	0	1841	1841	1841	1841	1841	1841	1841	0	1841				
Adj Flow Rate, veh/h	22	228	0	0	283	397	0	0	0	98	0	11				
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				
Percent Heavy Veh, %	4	4	0	4	4	4	4	4	4	4	0	4				
Cap, veh/h	47	1313	0	4	404	567	0	4	0	140	0	0				
Arrive On Green	0.03	0.71	0.00	0.00	0.58	0.58	0.00	0.00	0.00	0.08	0.00	0.00				
Sat Flow, veh/h	1753	1841	0	1753	693	972	0	-82832	0	1753	98					
Grp Volume(v), veh/h	22	228	0	0	0	680	0	0	0	98	25.7					
Grp Sat Flow(s),veh/h/ln	1753	1841	0	1753	0	1666	0	1841	0	1753	C					
Q Serve(g_s), s	0.5	1.8	0.0	0.0	0.0	12.5	0.0	0.0	0.0	2.4						
Cycle Q Clear(g_c), s	0.5	1.8	0.0	0.0	0.0	12.5	0.0	0.0	0.0	2.4						
Prop In Lane	1.00		0.00	1.00		0.58	0.00		0.00	1.00						
Lane Grp Cap(c), veh/h	47	1313	0	4	0	971	0	4	0	140						
V/C Ratio(X)	0.47	0.17	0.00	0.00	0.00	0.70	0.00	0.00	0.00	0.70						
Avail Cap(c_a), veh/h	202	1313	0	202	0	1188	0	762	0	726						
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00						
Upstream Filter(l)	1.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00						
Uniform Delay (d), s/veh	20.8	2.0	0.0	0.0	0.0	6.4	0.0	0.0	0.0	19.5						
Incr Delay (d2), s/veh	7.1	0.3	0.0	0.0	0.0	1.4	0.0	0.0	0.0	6.2						
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0						
%ile BackOfQ(50%),veh/ln	0.3	0.2	0.0	0.0	0.0	2.6	0.0	0.0	0.0	1.1						
Unsig. Movement Delay, s/veh																
LnGrp Delay(d),s/veh	27.9	2.3	0.0	0.0	0.0	7.8	0.0	0.0	0.0	25.7						
LnGrp LOS	C	A	A	A	A	A	A	A	A	C						
Approach Vol, veh/h	250			680			0									
Approach Delay, s/veh	4.6			7.8			0.0									
Approach LOS	A			A												
Timer - Assigned Phs	1	2			5	6	7	8								
Phs Duration (G+Y+Rc), s	0.0	35.5			5.7	29.8	8.0	0.0								
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5	4.5	4.5								
Max Green Setting (Gmax), s	5.0	31.0			5.0	31.0	18.0	18.0								
Max Q Clear Time (g_c+I1), s	0.0	3.8			2.5	14.5	4.4	0.0								
Green Ext Time (p_c), s	0.0	1.3			0.0	4.5	0.2	0.0								
Intersection Summary																
HCM 6th Ctrl Delay				8.7												
HCM 6th LOS				A												

HCM 6th Signalized Intersection Summary

6: Scott Ave & E Park Ave

2040 Improvement Conditions
AM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	
Traffic Volume (veh/h)	860	35	80	855	10	70
Future Volume (veh/h)	860	35	80	855	10	70
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1722	1722	1722	1722	1900	1900
Adj Flow Rate, veh/h	905	37	84	900	11	74
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	12	12	12	12	0	0
Cap, veh/h	1426	58	126	2090	24	165
Arrive On Green	0.45	0.45	0.08	0.64	0.13	0.13
Sat Flow, veh/h	3286	131	1640	3358	190	1276
Grp Volume(v), veh/h	463	479	84	900	86	0
Grp Sat Flow(s), veh/h/ln	1636	1695	1640	1636	1483	0
Q Serve(g_s), s	8.5	8.5	1.9	5.3	2.1	0.0
Cycle Q Clear(g_c), s	8.5	8.5	1.9	5.3	2.1	0.0
Prop In Lane		0.08	1.00		0.13	0.86
Lane Grp Cap(c), veh/h	729	755	126	2090	191	0
V/C Ratio(X)	0.63	0.63	0.67	0.43	0.45	0.00
Avail Cap(c_a), veh/h	1457	1509	461	4214	808	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.3	8.3	17.4	3.5	15.6	0.0
Incr Delay (d2), s/veh	0.9	0.9	5.9	0.1	1.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	2.2	0.8	0.4	0.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.2	9.2	23.3	3.6	17.2	0.0
LnGrp LOS	A	A	C	A	B	A
Approach Vol, veh/h	942			984	86	
Approach Delay, s/veh	9.2			5.3	17.2	
Approach LOS	A			A	B	
Timer - Assigned Phs	2	3	4		8	
Phs Duration (G+Y+Rc), s	9.5	7.5	21.8		29.2	
Change Period (Y+Rc), s	4.5	4.5	4.5		4.5	
Max Green Setting (Gmax), s	21.1	10.9	34.5		49.9	
Max Q Clear Time (g_c+I1), s	4.1	3.9	10.5		7.3	
Green Ext Time (p_c), s	0.2	0.1	6.7		7.3	
Intersection Summary						
HCM 6th Ctrl Delay			7.6			
HCM 6th LOS			A			

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

2: Midway/Park Ave & Greenway/E Park Ave

2040 Conditions
PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔	↔	↑	↔	↔	↔	↔
Traffic Volume (veh/h)	5	5	0	605	5	350	0	345	780	400	255	0
Future Volume (veh/h)	5	5	0	605	5	350	0	345	780	400	255	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	5	5	0	634	0	0	0	359	0	417	266	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
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	16	16	0	826	0		3	456		534	905	0
Arrive On Green	0.02	0.02	0.00	0.24	0.00	0.00	0.00	0.25	0.00	0.16	0.50	0.00
Sat Flow, veh/h	891	891	0	3478	0	1547	1739	1826	1547	3374	1826	0
Grp Volume(v), veh/h	10	0	0	634	0	0	0	359	0	417	266	0
Grp Sat Flow(s), veh/h/ln	1781	0	0	1739	0	1547	1739	1826	1547	1687	1826	0
Q Serve(g_s), s	0.3	0.0	0.0	9.7	0.0	0.0	0.0	10.5	0.0	6.8	4.9	0.0
Cycle Q Clear(g_c), s	0.3	0.0	0.0	9.7	0.0	0.0	0.0	10.5	0.0	6.8	4.9	0.0
Prop In Lane	0.50		0.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	32	0	0	826	0		3	456		534	905	0
V/C Ratio(X)	0.31	0.00	0.00	0.77	0.00		0.00	0.79		0.78	0.29	0.00
Avail Cap(c_a), veh/h	218	0	0	1072	0		152	1158		591	1334	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	27.7	0.0	0.0	20.3	0.0	0.0	0.0	20.0	0.0	23.1	8.5	0.0
Incr Delay (d2), s/veh	2.0	0.0	0.0	3.0	0.0	0.0	0.0	2.3	0.0	6.4	0.2	0.0
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	3.7	0.0	0.0	0.0	4.3	0.0	2.9	1.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.7	0.0	0.0	23.3	0.0	0.0	0.0	22.3	0.0	29.5	8.7	0.0
LnGrp LOS	C	A	A	C	A		A	C		C	A	A
Approach Vol, veh/h	10			634			359			683		
Approach Delay, s/veh	29.7			23.3			22.3			21.4		
Approach LOS	C			C			C			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.0	19.3		5.6	0.0	33.3		18.2				
Change Period (Y+Rc), s	5.0	5.0		4.6	4.5	5.0		4.6				
Max Green Setting (Gmax), s	10.0	36.2		7.0	5.0	41.7		17.6				
Max Q Clear Time (g_c+I), s	10.8	12.5		2.3	0.0	6.9		11.7				
Green Ext Time (p_c), s	0.3	1.8		0.0	0.0	1.9		1.9				

Intersection Summary

HCM 6th Ctrl Delay	22.4
HCM 6th LOS	C

Notes

- User approved pedestrian interval to be less than phase max green.
- User approved volume balancing among the lanes for turning movement.
- Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

3: Fair St & E Park Ave

2040 Conditions
PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	1025	5	10	835	140	30	30	20	140	20	95
Future Volume (veh/h)	150	1025	5	10	835	140	30	30	20	140	20	95
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	156	1068	5	10	870	146	31	31	21	146	21	99
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
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	194	1709	8	22	1141	191	76	76	51	262	42	198
Arrive On Green	0.11	0.48	0.48	0.01	0.38	0.38	0.12	0.12	0.12	0.15	0.15	0.15
Sat Flow, veh/h	1739	3541	17	1739	2972	499	641	641	434	1739	278	1312
Grp Volume(v), veh/h	156	523	550	10	508	508	83	0	0	146	0	120
Grp Sat Flow(s), veh/h/ln	1739	1735	1823	1739	1735	1736	1716	0	0	1739	0	1590
Q Serve(g_s), s	5.8	14.7	14.7	0.4	16.8	16.8	3.0	0.0	0.0	5.1	0.0	4.6
Cycle Q Clear(g_c), s	5.8	14.7	14.7	0.4	16.8	16.8	3.0	0.0	0.0	5.1	0.0	4.6
Prop In Lane	1.00		0.01	1.00		0.29	0.37		0.25	1.00		0.82
Lane Grp Cap(c), veh/h	194	837	880	22	666	666	203	0	0	262	0	240
V/C Ratio(X)	0.80	0.62	0.62	0.45	0.76	0.76	0.41	0.00	0.00	0.56	0.00	0.50
Avail Cap(c_a), veh/h	528	1054	1107	660	1054	1055	573	0	0	528	0	483
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.5	12.6	12.6	32.3	17.7	17.7	26.9	0.0	0.0	25.9	0.0	25.7
Incr Delay (d2), s/veh	3.0	0.8	0.7	5.3	1.8	1.8	1.3	0.0	0.0	1.8	0.0	1.6
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	2.5	5.1	5.4	0.2	6.0	6.0	1.2	0.0	0.0	2.2	0.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.5	13.4	13.4	37.6	19.5	19.5	28.2	0.0	0.0	27.8	0.0	27.3
LnGrp LOS	C	B	B	D	B	B	C	A	A	C	A	C
Approach Vol, veh/h	1229			1026			83			266		
Approach Delay, s/veh	15.7			19.7			28.2			27.6		
Approach LOS	B			B			C			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.3	35.8		13.9	10.8	29.3		11.8				
Change Period (Y+Rc), s	3.5	4.0		4.0	3.5	4.0		4.0				
Max Green Setting (Gmax), s	25.0	40.0		20.0	20.0	40.0		22.0				
Max Q Clear Time (g_c+I), s	12.4	16.7		7.1	7.8	18.8		5.0				
Green Ext Time (p_c), s	0.0	7.7		0.9	0.0	6.5		0.3				

Intersection Summary

HCM 6th Ctrl Delay 18.9

HCM 6th LOS B

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

4: Midway & Hegan Ln/Driveway

2040 Conditions
PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	685	0	55	5	0	10	50	435	5	10	490	355
Future Volume (veh/h)	685	0	55	5	0	10	50	435	5	10	490	355
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	792	0	0	5	0	11	54	468	5	11	527	0
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
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	1163	580	0	203	43	334	92	656	7	25	593	
Arrive On Green	0.32	0.00	0.00	0.32	0.00	0.32	0.05	0.36	0.36	0.01	0.32	0.00
Sat Flow, veh/h	2763	1841	0	346	135	1059	1753	1818	19	1753	1841	1560
Grp Volume(v), veh/h	792	0	0	16	0	0	54	0	473	11	527	0
Grp Sat Flow(s), veh/h/ln	1841	1841	0	1540	0	0	1753	0	1837	1753	1841	1560
Q Serve(g_s), s	13.3	0.0	0.0	0.0	0.0	0.0	1.5	0.0	11.1	0.3	13.6	0.0
Cycle Q Clear(g_c), s	13.7	0.0	0.0	0.3	0.0	0.0	1.5	0.0	11.1	0.3	13.6	0.0
Prop In Lane	1.00		0.00	0.31		0.69	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	1163	580	0	580	0	0	92	0	663	25	593	
V/C Ratio(X)	0.68	0.00	0.00	0.03	0.00	0.00	0.58	0.00	0.71	0.44	0.89	
Avail Cap(c_a), veh/h	1965	1114	0	1016	0	0	179	0	1072	175	1070	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	16.4	0.0	0.0	11.9	0.0	0.0	23.2	0.0	13.8	24.5	16.1	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.0	0.0	0.0	2.2	0.0	0.5	4.5	1.9	0.0
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	8.6	0.0	0.0	0.1	0.0	0.0	0.6	0.0	3.8	0.2	5.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.6	0.0	0.0	11.9	0.0	0.0	25.3	0.0	14.3	29.0	18.0	0.0
LnGrp LOS	B	A	A	B	A	A	C	A	B	C	B	
Approach Vol, veh/h	792			16			527			538		
Approach Delay, s/veh	16.6			11.9			15.4			18.2		
Approach LOS	B			B			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.2	23.6		21.3	7.1	21.6		21.3				
Change Period (Y+Rc), s	4.5	5.5		5.5	4.5	5.5		5.5				
Max Green Setting (Gmax), s	5.0	29.2		30.3	5.1	29.1		30.3				
Max Q Clear Time (g_c+I), s	12.3	13.1		2.3	3.5	15.6		15.7				
Green Ext Time (p_c), s	0.0	0.4		0.0	0.0	0.5		0.1				

Intersection Summary

HCM 6th Ctrl Delay 16.7

HCM 6th LOS B

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection

Intersection Delay, s/veh32.7

Intersection LOS D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔			↔		↔		↔
Traffic Vol, veh/h	20	365	0	5	275	105	0	0	0	345	0	35
Future Vol, veh/h	20	365	0	5	275	105	0	0	0	345	0	35
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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	397	0	5	299	114	0	0	0	375	0	38
Number of Lanes	0	1	0	1	1	0	0	1	0	1	0	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	2	1	1	2
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	1	2	2	1
HCM Control Delay	35	30.2	0	32.9
HCM LOS	D	D	-	D

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	5%	100%	0%	100%	0%
Vol Thru, %	100%	95%	0%	72%	0%	0%
Vol Right, %	0%	0%	0%	28%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	385	5	380	345	35
LT Vol	0	20	5	0	345	0
Through Vol	0	365	0	275	0	0
RT Vol	0	0	0	105	0	35
Lane Flow Rate	0	418	5	413	375	38
Geometry Grp	6	6	7	7	7	7
Degree of Util (X)	0	0.821	0.011	0.787	0.804	0.069
Departure Headway (Hd)	8.954	7.065	7.568	6.857	7.715	6.487
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	0	511	473	529	469	552
Service Time	7.054	5.111	5.316	4.604	5.46	4.231
HCM Lane V/C Ratio	0	0.818	0.011	0.781	0.8	0.069
HCM Control Delay	12.1	35	10.4	30.5	35.3	9.7
HCM Lane LOS	N	D	B	D	E	A
HCM 95th-tile Q	0	8	0	7.3	7.4	0.2

HCM 6th Signalized Intersection Summary

5: Driveway/Otterson Dr & Hegan Ln

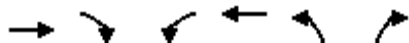
2040 Conditions
PM Peak Hour

																		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR						
Lane Configurations																		
Traffic Volume (veh/h)	20	365	0	5	275	105	0	0	0	345	0	35						
Future Volume (veh/h)	20	365	0	5	275	105	0	0	0	345	0	35						
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0						
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00						
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00						
Work Zone On Approach	No			No			No			No								
Adj Sat Flow, veh/h/ln	1870	1870	0	1870	1870	1870	1870	1870	1870	1870	0	1870						
Adj Flow Rate, veh/h	22	397	0	5	299	114	0	0	0	375	0	38						
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						
Percent Heavy Veh, %	2	2	0	2	2	2	2	2	2	2	0	2						
Cap, veh/h	49	632	0	12	409	156	0	5	0	480	0	0						
Arrive On Green	0.03	0.34	0.00	0.01	0.32	0.32	0.00	0.00	0.00	0.27	0.00	0.00						
Sat Flow, veh/h	1781	1870	0	1781	1290	492	0	-84166	0	1781	375							
Grp Volume(v), veh/h	22	397	0	5	0	413	0	0	0	375	14.6							
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1781	0	1782	0	1870	0	1781	B							
Q Serve(g_s), s	0.4	6.2	0.0	0.1	0.0	7.2	0.0	0.0	0.0	6.8								
Cycle Q Clear(g_c), s	0.4	6.2	0.0	0.1	0.0	7.2	0.0	0.0	0.0	6.8								
Prop In Lane	1.00		0.00	1.00		0.28	0.00		0.00	1.00								
Lane Grp Cap(c), veh/h	49	632	0	12	0	566	0	5	0	480								
V/C Ratio(X)	0.45	0.63	0.00	0.41	0.00	0.73	0.00	0.00	0.00	0.78								
Avail Cap(c_a), veh/h	254	1095	0	254	0	1043	0	961	0	941								
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00								
Upstream Filter(l)	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00								
Uniform Delay (d), s/veh	16.8	9.7	0.0	17.3	0.0	10.6	0.0	0.0	0.0	11.8								
Incr Delay (d2), s/veh	6.3	1.0	0.0	21.1	0.0	1.8	0.0	0.0	0.0	2.8								
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
%ile BackOfQ(50%),veh/ln	0.2	1.9	0.0	0.1	0.0	2.2	0.0	0.0	0.0	2.5								
Unsig. Movement Delay, s/veh																		
LnGrp Delay(d),s/veh	23.1	10.8	0.0	38.4	0.0	12.5	0.0	0.0	0.0	14.6								
LnGrp LOS	C	B	A	D	A	B	A	A	A	B								
Approach Vol, veh/h	419			418			0											
Approach Delay, s/veh	11.4			12.8			0.0											
Approach LOS	B			B														
Timer - Assigned Phs	1	2			5	6	7	8										
Phs Duration (G+Y+Rc), s	4.7	16.3			5.5	15.6	13.9	0.0										
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5	4.5	4.5										
Max Green Setting (Gmax), s	5.0	20.5			5.0	20.5	18.5	18.0										
Max Q Clear Time (g_c+I1), s	2.1	8.2			2.4	9.2	8.8	0.0										
Green Ext Time (p_c), s	0.0	1.8			0.0	1.9	0.9	0.0										
Intersection Summary																		
HCM 6th Ctrl Delay																		
HCM 6th LOS																		

HCM 6th Signalized Intersection Summary

6: Scott Ave & E Park Ave

2040 Conditions
PM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	
Traffic Volume (veh/h)	1160	20	55	970	10	60
Future Volume (veh/h)	1160	20	55	970	10	60
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1900	1900
Adj Flow Rate, veh/h	1261	22	60	1054	11	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	6	6	6	0	0
Cap, veh/h	2184	38	364	2172	29	174
Arrive On Green	0.63	0.63	0.63	0.63	0.13	0.13
Sat Flow, veh/h	3550	60	416	3532	223	1319
Grp Volume(v), veh/h	627	656	60	1054	77	0
Grp Sat Flow(s),veh/h/ln	1721	1799	416	1721	1563	0
Q Serve(g_s), s	8.0	8.0	3.7	6.2	1.7	0.0
Cycle Q Clear(g_c), s	8.0	8.0	11.7	6.2	1.7	0.0
Prop In Lane		0.03	1.00		0.14	0.84
Lane Grp Cap(c), veh/h	1086	1136	364	2172	206	0
V/C Ratio(X)	0.58	0.58	0.16	0.49	0.37	0.00
Avail Cap(c_a), veh/h	2288	2393	655	4576	844	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	4.1	4.1	7.5	3.7	15.1	0.0
Incr Delay (d2), s/veh	0.5	0.5	0.2	0.2	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	1.2	0.2	0.5	0.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	4.5	4.5	7.7	3.9	16.2	0.0
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h	1283			1114	77	
Approach Delay, s/veh	4.5			4.1	16.2	
Approach LOS	A			A	B	
Timer - Assigned Phs	2		4		8	
Phs Duration (G+Y+Rc), s	9.5		28.5		28.5	
Change Period (Y+Rc), s	4.5		4.5		4.5	
Max Green Setting (Gmax), s	20.5		50.5		50.5	
Max Q Clear Time (g_c+I1), s	3.7		10.0		13.7	
Green Ext Time (p_c), s	0.2		12.0		10.2	
Intersection Summary						
HCM 6th Ctrl Delay	4.7					
HCM 6th LOS	A					

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

3: Fair St & E Park Ave

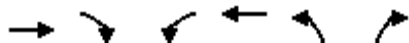
2025 Partial RIRO Conditions
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	77	783	21	0	701	83	0	0	0	0	0	254
Future Volume (veh/h)	77	783	21	0	701	83	0	0	0	0	0	254
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1752	1752	1752	0	1752	1752	1752	1752	1752	1752	1752	1752
Adj Flow Rate, veh/h	79	807	22	0	723	86	0	0	0	0	0	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	10	10	10	0	10	10	10	10	10	10	10	10
Cap, veh/h	149	2634	72	0	1582	188	0	9		0	9	
Arrive On Green	0.09	0.80	0.80	0.00	0.53	0.53	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	1668	3310	90	0	3083	356	0	-70072	0	0	-70072	0
Grp Volume(v), veh/h	79	406	423	0	401	408	0	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	1668	1664	1736	0	1664	1688	0	1752	0	0	1752	0
Q Serve(g_s), s	0.9	1.3	1.3	0.0	2.9	2.9	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.9	1.3	1.3	0.0	2.9	2.9	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		0.05	0.00		0.21	0.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h	149	1325	1381	0	879	891	0	9		0	9	
V/C Ratio(X)	0.53	0.31	0.31	0.00	0.46	0.46	0.00	0.00		0.00	0.00	
Avail Cap(c_a), veh/h	1319	4160	4338	0	3311	3358	0	179		0	179	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	8.5	0.5	0.5	0.0	2.9	2.9	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	1.1	0.1	0.1	0.0	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.6	0.7	0.7	0.0	3.2	3.2	0.0	0.0	0.0	0.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	A	A		A	A	
Approach Vol, veh/h	908			809			0		A		0	
Approach Delay, s/veh	1.4			3.2			0.0				0.0	
Approach LOS	A			A								
Timer - Assigned Phs	2			4		5	6		8			
Phs Duration (G+Y+Rc), s	19.6			0.0		5.2	14.4		0.0			
Change Period (Y+Rc), s	4.0			4.0		3.5	4.0		4.0			
Max Green Setting (Gmax), s	49.0			2.0		15.5	39.0		2.0			
Max Q Clear Time (g_c+I1), s	3.3			0.0		2.9	4.9		0.0			
Green Ext Time (p_c), s	6.4			0.0		0.0	5.4		0.0			
Intersection Summary												
HCM 6th Ctrl Delay				2.3								
HCM 6th LOS				A								
Notes												
User approved pedestrian interval to be less than phase max green.												
Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

HCM 6th Signalized Intersection Summary

6: E Park Ave

2025 Partial RIRO Conditions
AM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	
Traffic Volume (veh/h)	751	32	74	742	29	64
Future Volume (veh/h)	751	32	74	742	29	64
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1722	1722	1722	1722	1900	1900
Adj Flow Rate, veh/h	791	34	78	781	31	67
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	12	12	12	12	0	0
Cap, veh/h	1324	57	123	2007	65	141
Arrive On Green	0.41	0.41	0.08	0.61	0.14	0.14
Sat Flow, veh/h	3282	137	1640	3358	474	1025
Grp Volume(v), veh/h	405	420	78	781	99	0
Grp Sat Flow(s), veh/h/ln	1636	1697	1640	1636	1514	0
Q Serve(g_s), s	7.0	7.0	1.7	4.4	2.2	0.0
Cycle Q Clear(g_c), s	7.0	7.0	1.7	4.4	2.2	0.0
Prop In Lane		0.08	1.00		0.31	0.68
Lane Grp Cap(c), veh/h	678	703	123	2007	209	0
V/C Ratio(X)	0.60	0.60	0.63	0.39	0.47	0.00
Avail Cap(c_a), veh/h	1793	1860	340	4670	807	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.3	8.3	16.3	3.6	14.4	0.0
Incr Delay (d2), s/veh	0.8	0.8	5.3	0.1	1.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	1.8	0.7	0.3	0.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.1	9.1	21.6	3.7	16.1	0.0
LnGrp LOS	A	A	C	A	B	A
Approach Vol, veh/h	825			859	99	
Approach Delay, s/veh	9.1			5.3	16.1	
Approach LOS	A			A	B	
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		9.5	7.2	19.5		26.7
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s		19.3	7.5	39.7		51.7
Max Q Clear Time (g_c+I1), s		4.2	3.7	9.0		6.4
Green Ext Time (p_c), s		0.2	0.0	6.0		6.0
Intersection Summary						
HCM 6th Ctrl Delay			7.7			
HCM 6th LOS			A			

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

3: Fair St & E Park Ave

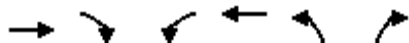
2025 Partial RIRO Conditions
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	131	1019	21	0	762	147	0	0	0	0	0	219
Future Volume (veh/h)	131	1019	21	0	762	147	0	0	0	0	0	219
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1826	1826	1826	0	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	136	1061	22	0	794	153	0	0	0	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
Percent Heavy Veh, %	5	5	5	0	5	5	5	5	5	5	5	5
Cap, veh/h	220	2871	60	0	1588	306	0	8		0	8	
Arrive On Green	0.13	0.83	0.83	0.00	0.55	0.55	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	1739	3475	72	0	2992	559	0	-73036	0	0	-73036	0
Grp Volume(v), veh/h	136	530	553	0	475	472	0	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	1739	1735	1813	0	1735	1725	0	1826	0	0	1826	0
Q Serve(g_s), s	1.7	1.8	1.8	0.0	3.9	3.9	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.7	1.8	1.8	0.0	3.9	3.9	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		0.04	0.00		0.32	0.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h	220	1433	1497	0	950	944	0	8		0	8	
V/C Ratio(X)	0.62	0.37	0.37	0.00	0.50	0.50	0.00	0.00		0.00	0.00	
Avail Cap(c_a), veh/h	1173	3698	3865	0	2943	2928	0	159		0	159	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	9.5	0.5	0.5	0.0	3.2	3.2	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	1.1	0.2	0.2	0.0	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	0.5	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.6	0.7	0.7	0.0	3.6	3.7	0.0	0.0	0.0	0.0	0.0	0.0
LnGrp LOS	B	A	A	A	A	A	A	A		A	A	
Approach Vol, veh/h	1219			947			0			A		
Approach Delay, s/veh	1.8			3.7			0.0			0.0		
Approach LOS	A			A								
Timer - Assigned Phs	2			4		5	6		8			
Phs Duration (G+Y+Rc), s	23.0			0.0		6.4	16.6		0.0			
Change Period (Y+Rc), s	4.0			4.0		3.5	4.0		4.0			
Max Green Setting (Gmax), s	49.0			2.0		15.5	39.0		2.0			
Max Q Clear Time (g_c+I1), s	3.8			0.0		3.7	5.9		0.0			
Green Ext Time (p_c), s	9.3			0.0		0.0	6.7		0.0			
Intersection Summary												
HCM 6th Ctrl Delay				2.6								
HCM 6th LOS				A								
Notes												
User approved pedestrian interval to be less than phase max green.												
Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

HCM 6th Signalized Intersection Summary

6: E Park Ave

2025 Partial RIRO Conditions
PM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	
Traffic Volume (veh/h)	996	17	52	845	59	69
Future Volume (veh/h)	996	17	52	845	59	69
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1900	1900
Adj Flow Rate, veh/h	1083	18	57	918	64	75
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	6	6	6	0	0
Cap, veh/h	1680	28	100	2236	101	118
Arrive On Green	0.49	0.49	0.06	0.65	0.14	0.14
Sat Flow, veh/h	3554	58	1725	3532	740	867
Grp Volume(v), veh/h	538	563	57	918	140	0
Grp Sat Flow(s), veh/h/ln	1721	1801	1725	1721	1618	0
Q Serve(g_s), s	9.9	9.9	1.4	5.4	3.4	0.0
Cycle Q Clear(g_c), s	9.9	9.9	1.4	5.4	3.4	0.0
Prop In Lane		0.03	1.00		0.46	0.54
Lane Grp Cap(c), veh/h	835	874	100	2236	221	0
V/C Ratio(X)	0.64	0.64	0.57	0.41	0.63	0.00
Avail Cap(c_a), veh/h	1622	1697	307	4224	742	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.1	8.1	19.3	3.5	17.2	0.0
Incr Delay (d2), s/veh	0.8	0.8	5.1	0.1	3.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	2.8	0.6	0.5	1.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.0	8.9	24.4	3.6	20.2	0.0
LnGrp LOS	A	A	C	A	C	A
Approach Vol, veh/h	1101			975	140	
Approach Delay, s/veh	8.9			4.9	20.2	
Approach LOS	A			A	C	
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		10.3	6.9	24.9		31.9
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s		19.3	7.5	39.7		51.7
Max Q Clear Time (g_c+I1), s		5.4	3.4	11.9		7.4
Green Ext Time (p_c), s		0.3	0.0	8.6		7.4
Intersection Summary						
HCM 6th Ctrl Delay			7.9			
HCM 6th LOS			A			

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

3: Fair St & E Park Ave

2040 Conditions
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	895	30	0	805	85	0	0	0	0	0	290
Future Volume (veh/h)	90	895	30	0	805	85	0	0	0	0	0	290
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1752	1752	1752	0	1752	1752	1752	1752	1752	1752	1752	1752
Adj Flow Rate, veh/h	93	923	31	0	830	88	0	0	0	0	0	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	10	10	10	0	10	10	10	10	10	10	10	10
Cap, veh/h	165	2679	90	0	1684	179	0	8		0	8	
Arrive On Green	0.10	0.82	0.82	0.00	0.55	0.55	0.00	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	1668	3286	110	0	3124	322	0	-70072	0	0	-70072	0
Grp Volume(v), veh/h	93	467	487	0	455	463	0	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	1668	1664	1732	0	1664	1694	0	1752	0	0	1752	0
Q Serve(g_s), s	1.2	1.6	1.6	0.0	3.6	3.6	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.2	1.6	1.6	0.0	3.6	3.6	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		0.06	0.00		0.19	0.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h	165	1357	1412	0	923	939	0	8		0	8	
V/C Ratio(X)	0.56	0.34	0.34	0.00	0.49	0.49	0.00	0.00		0.00	0.00	
Avail Cap(c_a), veh/h	1195	3767	3920	0	2998	3052	0	162		0	162	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	9.3	0.5	0.5	0.0	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	1.1	0.2	0.1	0.0	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	0.3	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.4	0.7	0.7	0.0	3.4	3.4	0.0	0.0	0.0	0.0	0.0	0.0
LnGrp LOS	B	A	A	A	A	A	A	A		A	A	
Approach Vol, veh/h	1047				918				0	A	0	A
Approach Delay, s/veh	1.5				3.4				0.0		0.0	
Approach LOS	A				A							
Timer - Assigned Phs	2			4	5	6	8					
Phs Duration (G+Y+Rc), s	21.6			0.0	5.6	16.0	0.0					
Change Period (Y+Rc), s	4.0			4.0	3.5	4.0	4.0					
Max Green Setting (Gmax), s	49.0			2.0	15.5	39.0	2.0					
Max Q Clear Time (g_c+I1), s	3.6			0.0	3.2	5.6	0.0					
Green Ext Time (p_c), s	7.8			0.0	0.0	6.4	0.0					
Intersection Summary												
HCM 6th Ctrl Delay	2.4											
HCM 6th LOS	A											
Notes												
User approved pedestrian interval to be less than phase max green.												
Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

HCM 6th Signalized Intersection Summary

6: E Park Ave

2040 Conditions
AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	860	35	80	855	20	35	0	70	20	0	20
Future Volume (veh/h)	20	860	35	80	855	20	35	0	70	20	0	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1722	1722	1722	1722	1722	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	22	905	37	84	900	22	37	0	74	22	0	22
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Percent Heavy Veh, %	2	12	12	12	12	12	2	2	2	2	2	2
Cap, veh/h	47	1216	50	111	1373	34	61	0	122	81	0	81
Arrive On Green	0.03	0.38	0.38	0.07	0.42	0.42	0.11	0.00	0.11	0.10	0.00	0.10
Sat Flow, veh/h	1781	3204	131	1640	3264	80	548	0	1097	839	0	839
Grp Volume(v), veh/h	22	462	480	84	451	471	111	0	0	44	0	0
Grp Sat Flow(s),veh/h/ln	1781	1636	1699	1640	1636	1708	1645	0	0	1677	0	0
Q Serve(g_s), s	0.6	12.7	12.7	2.6	11.5	11.5	3.3	0.0	0.0	1.3	0.0	0.0
Cycle Q Clear(g_c), s	0.6	12.7	12.7	2.6	11.5	11.5	3.3	0.0	0.0	1.3	0.0	0.0
Prop In Lane	1.00		0.08	1.00		0.05	0.33		0.67	0.50		0.50
Lane Grp Cap(c), veh/h	47	621	644	111	688	719	183	0	0	161	0	0
V/C Ratio(X)	0.47	0.74	0.74	0.76	0.66	0.66	0.61	0.00	0.00	0.27	0.00	0.00
Avail Cap(c_a), veh/h	174	864	897	205	908	948	629	0	0	583	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	25.0	14.0	14.0	23.9	12.1	12.1	22.0	0.0	0.0	21.8	0.0	0.0
Incr Delay (d2), s/veh	7.2	2.2	2.2	10.1	1.1	1.0	3.2	0.0	0.0	0.9	0.0	0.0
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	0.3	4.3	4.5	1.2	3.3	3.5	1.3	0.0	0.0	0.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.2	16.2	16.1	33.9	13.1	13.1	25.3	0.0	0.0	22.7	0.0	0.0
LnGrp LOS	C	B	B	C	B	B	C	A	A	C	A	A
Approach Vol, veh/h	964			1006			111			44		
Approach Delay, s/veh	16.5			14.8			25.3			22.7		
Approach LOS	B			B			C			C		
Timer - Assigned Phs	2			3			4			6		
Phs Duration (G+Y+Rc), s	10.3			8.0			24.3			9.5		
Change Period (Y+Rc), s	4.5			4.5			4.5			4.5		
Max Green Setting (Gmax), s	19.9			6.5			27.5			18.1		
Max Q Clear Time (g_c+I1), s	5.3			4.6			14.7			3.3		
Green Ext Time (p_c), s	0.4			0.0			5.0			0.1		

Intersection Summary

HCM 6th Ctrl Delay	16.3
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary

3: Fair St & E Park Ave

2040 Conditions
PM Peak Hour

																			
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR									
Lane Configurations																			
Traffic Volume (veh/h)	150	1165	25	0	865	170	0	255	0	0									
Future Volume (veh/h)	150	1165	25	0	865	170	0	255	0	0									
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0									
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00									
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00									
Work Zone On Approach	No			No			No			No									
Adj Sat Flow, veh/h/ln	1826	1826	1826	0	1826	1826	1826	1826	1826	1826									
Adj Flow Rate, veh/h	156	1214	26	0	901	177	0	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									
Percent Heavy Veh, %	5	5	5	0	5	5	5	5	5	5									
Cap, veh/h	230	2916	62	0	1638	322	0		0										
Arrive On Green	0.13	0.84	0.84	0.00	0.57	0.57	0.00	0.00	0.00	0.00									
Sat Flow, veh/h	1739	3473	74	0	2982	568	0	0	0	0									
Grp Volume(v), veh/h	156	606	634	0	541	537	0	0	0	0									
Grp Sat Flow(s),veh/h/ln	1739	1735	1813	0	1735	1724	0	0	0	0									
Q Serve(g_s), s	2.1	2.1	2.2	0.0	4.9	4.9	0.0	0.0	0.0	0.0									
Cycle Q Clear(g_c), s	2.1	2.1	2.2	0.0	4.9	4.9	0.0	0.0	0.0	0.0									
Prop In Lane	1.00		0.04	0.00		0.33	0.00	0.00	0.00	0.00									
Lane Grp Cap(c), veh/h	230	1456	1522	0	983	977	0		0										
V/C Ratio(X)	0.68	0.42	0.42	0.00	0.55	0.55	0.00		0.00										
Avail Cap(c_a), veh/h	1081	3409	3562	0	2087	2074	0		0										
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00									
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00									
Uniform Delay (d), s/veh	10.3	0.5	0.5	0.0	3.4	3.4	0.0	0.0	0.0	0.0									
Incr Delay (d2), s/veh	1.3	0.2	0.2	0.0	0.5	0.5	0.0	0.0	0.0	0.0									
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0									
%ile BackOfQ(50%),veh/ln	0.6	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0									
Unsig. Movement Delay, s/veh																			
LnGrp Delay(d),s/veh	11.6	0.7	0.7	0.0	3.9	3.9	0.0	0.0	0.0	0.0									
LnGrp LOS	B	A	A	A	A	A	A		A										
Approach Vol, veh/h	1396			1078			0	A	0	A									
Approach Delay, s/veh	1.9			3.9			0.0		0.0										
Approach LOS	A			A															
Timer - Assigned Phs	2			4	5	6	8												
Phs Duration (G+Y+Rc), s	24.9			0.0	6.8	18.1	0.0												
Change Period (Y+Rc), s	4.0			4.0	3.5	4.0	4.0												
Max Green Setting (Gmax), s	49.0			2.0	15.5	30.0	2.0												
Max Q Clear Time (g_c+I1), s	4.2			0.0	4.1	6.9	0.0												
Green Ext Time (p_c), s	11.6			0.0	0.0	7.2	0.0												
Intersection Summary																			
HCM 6th Ctrl Delay				2.8															
HCM 6th LOS				A															
Notes																			
User approved pedestrian interval to be less than phase max green.																			
Unsignalized Delay for [NWR2, SBR] is excluded from calculations of the approach delay and intersection delay.																			

HCM 6th Signalized Intersection Summary

6: E Park Ave

2040 Conditions
PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	1160	20	65	960	20	70	5	80	20	5	20
Future Volume (veh/h)	20	1160	20	65	960	20	70	5	80	20	5	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1811	1811	1811	1811	1811	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	22	1261	22	71	1043	22	76	5	87	22	5	22
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
Percent Heavy Veh, %	2	6	6	6	6	6	2	2	2	2	2	2
Cap, veh/h	46	1575	27	101	1681	35	101	7	116	36	8	36
Arrive On Green	0.03	0.46	0.46	0.06	0.49	0.49	0.13	0.13	0.13	0.05	0.05	0.05
Sat Flow, veh/h	1781	3460	60	1725	3446	73	758	50	868	761	173	761
Grp Volume(v), veh/h	22	627	656	71	521	544	168	0	0	49	0	0
Grp Sat Flow(s),veh/h/ln	1781	1721	1800	1725	1721	1798	1676	0	0	1695	0	0
Q Serve(g_s), s	0.7	18.3	18.4	2.4	13.1	13.1	5.7	0.0	0.0	1.7	0.0	0.0
Cycle Q Clear(g_c), s	0.7	18.3	18.4	2.4	13.1	13.1	5.7	0.0	0.0	1.7	0.0	0.0
Prop In Lane	1.00		0.03	1.00		0.04	0.45		0.52	0.45		0.45
Lane Grp Cap(c), veh/h	46	783	819	101	839	877	223	0	0	79	0	0
V/C Ratio(X)	0.48	0.80	0.80	0.70	0.62	0.62	0.75	0.00	0.00	0.62	0.00	0.00
Avail Cap(c_a), veh/h	155	923	966	162	935	977	568	0	0	147	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	28.2	13.7	13.7	27.1	11.0	11.0	24.5	0.0	0.0	27.5	0.0	0.0
Incr Delay (d2), s/veh	7.6	4.4	4.2	8.7	1.1	1.0	5.1	0.0	0.0	7.5	0.0	0.0
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	0.4	6.9	7.2	1.1	4.0	4.1	2.4	0.0	0.0	0.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.9	18.1	17.9	35.8	12.1	12.1	29.6	0.0	0.0	35.0	0.0	0.0
LnGrp LOS	D	B	B	D	B	B	C	A	A	D	A	A
Approach Vol, veh/h		1305				1136		168				49
Approach Delay, s/veh		18.3				13.6		29.6				35.0
Approach LOS		B				B		C				D
Timer - Assigned Phs		2		3		4		6		7		8
Phs Duration (G+Y+Rc), s		12.3		7.9		31.2		7.3		6.0		33.1
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		19.9		5.5		31.5		5.1		5.1		31.9
Max Q Clear Time (g_c+I1), s		7.7		4.4		20.4		3.7		2.7		15.1
Green Ext Time (p_c), s		0.7		0.0		6.4		0.0		0.0		6.1
Intersection Summary												
HCM 6th Ctrl Delay			17.3									
HCM 6th LOS			B									

HCM 6th TWSC
3: Fair St & E Park Ave

2025 RIRO Conditions
AM Peak Hour

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	0	860	21	0	701	160	0	0	0	0	0	254
Future Vol, veh/h	0	860	21	0	701	160	0	0	0	0	0	254
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	-	-	80	180	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	10	10	10	10	10	10	10	10	10	10	10	10
Mvmt Flow	0	887	22	0	723	165	0	0	0	0	0	262
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	909	0	0	-	-	444	-	-	444
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	4.3	-	-	-	-	7.1	-	-	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	2.3	-	-	-	-	3.4	-	-	3.4
Pot Cap-1 Maneuver	0	-	-	697	-	-	0	0	540	0	0	540
Stage 1	0	-	-	-	-	-	0	0	-	0	0	-
Stage 2	0	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	697	-	-	-	-	540	-	-	540
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			0			17.8		
HCM LOS							A			C		
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	WBR	SBLn1					
Capacity (veh/h)	-	-	-	697	-	-	540					
HCM Lane V/C Ratio	-	-	-	-	-	-	0.485					
HCM Control Delay (s)	0	-	-	0	-	-	17.8					
HCM Lane LOS	A	-	-	A	-	-	C					
HCM 95th %tile Q(veh)	-	-	-	0	-	-	2.6					

HCM 6th TWSC
3: Fair St & E Park Ave

2025 RIRO Conditions
PM Peak Hour

Intersection												
Int Delay, s/veh	1.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗		↕		↗	↘	
Traffic Vol, veh/h	0	1150	21	0	762	278	0	0	0	0	0	219
Future Vol, veh/h	0	1150	21	0	762	278	0	0	0	0	0	219
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	-	-	80	-	-	180	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	0	1198	22	0	794	290	0	0	0	0	0	228
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	1595	2282	599	1393	2014	397
Stage 1	-	-	-	-	-	-	1198	1198	-	794	794	-
Stage 2	-	-	-	-	-	-	397	1084	-	599	1220	-
Critical Hdwy	-	-	-	-	-	-	7.6	6.6	7	7.6	6.6	7
Critical Hdwy Stg 1	-	-	-	-	-	-	6.6	5.6	-	6.6	5.6	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.6	5.6	-	6.6	5.6	-
Follow-up Hdwy	-	-	-	-	-	-	3.55	4.05	3.35	3.55	4.05	3.35
Pot Cap-1 Maneuver	0	-	-	0	-	-	69	38	437	99	56	594
Stage 1	0	-	-	0	-	-	192	251	-	341	391	-
Stage 2	0	-	-	0	-	-	592	285	-	448	245	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	43	38	437	99	56	594
Mov Cap-2 Maneuver	-	-	-	-	-	-	43	38	-	99	56	-
Stage 1	-	-	-	-	-	-	192	251	-	341	391	-
Stage 2	-	-	-	-	-	-	365	285	-	448	245	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			0			14.8		
HCM LOS							A			B		
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1	SBLn2					
Capacity (veh/h)	-	-	-	-	-	-	594					
HCM Lane V/C Ratio	-	-	-	-	-	-	0.384					
HCM Control Delay (s)	0	-	-	-	-	0	14.8					
HCM Lane LOS	A	-	-	-	-	A	B					
HCM 95th %tile Q(veh)	-	-	-	-	-	-	1.8					

HCM 6th TWSC
3: Fair St & E Park Ave

2040 Conditions
AM Peak Hour

Intersection												
Int Delay, s/veh	2.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑				↑			↑
Traffic Vol, veh/h	0	985	30	0	805	175	0	0	0	0	0	290
Future Vol, veh/h	0	985	30	0	805	175	0	0	0	0	0	290
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	-	-	80	180	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	10	10	10	10	10	10	10	10	10	10	10	10
Mvmt Flow	0	1015	31	0	830	180	0	0	0	0	0	299
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	1046	0	0	-	-	508	-	-	505
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	4.3	-	-	-	-	7.1	-	-	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	2.3	-	-	-	-	3.4	-	-	3.4
Pot Cap-1 Maneuver	0	-	-	615	-	-	0	0	489	0	0	492
Stage 1	0	-	-	-	-	-	0	0	-	0	0	-
Stage 2	0	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	615	-	-	-	-	489	-	-	492
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			0			23		
HCM LOS							A			C		
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	WBR	SBLn1					
Capacity (veh/h)	-	-	-	615	-	-	492					
HCM Lane V/C Ratio	-	-	-	-	-	-	0.608					
HCM Control Delay (s)	0	-	-	0	-	-	23					
HCM Lane LOS	A	-	-	A	-	-	C					
HCM 95th %tile Q(veh)	-	-	-	0	-	-	4					

Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗		↕		↗	↖	
Traffic Vol, veh/h	0	1315	25	0	865	320	0	0	0	0	0	255
Future Vol, veh/h	0	1315	25	0	865	320	0	0	0	0	0	255
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	-	-	80	-	-	180	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	0	1370	26	0	901	333	0	0	0	0	0	266
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	1821	2604	685	1586	2297	451
Stage 1	-	-	-	-	-	-	1370	1370	-	901	901	-
Stage 2	-	-	-	-	-	-	451	1234	-	685	1396	-
Critical Hdwy	-	-	-	-	-	-	7.6	6.6	7	7.6	6.6	7
Critical Hdwy Stg 1	-	-	-	-	-	-	6.6	5.6	-	6.6	5.6	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.6	5.6	-	6.6	5.6	-
Follow-up Hdwy	-	-	-	-	-	-	3.55	4.05	3.35	3.55	4.05	3.35
Pot Cap-1 Maneuver	0	-	-	0	-	-	47	23	384	70	37	547
Stage 1	0	-	-	0	-	-	150	207	-	293	348	-
Stage 2	0	-	-	0	-	-	550	241	-	397	201	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	24	23	384	70	37	547
Mov Cap-2 Maneuver	-	-	-	-	-	-	24	23	-	70	37	-
Stage 1	-	-	-	-	-	-	150	207	-	293	348	-
Stage 2	-	-	-	-	-	-	283	241	-	397	201	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			0			17.6		
HCM LOS							A			C		
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1	SBLn2					
Capacity (veh/h)	-	-	-	-	-	-	547					
HCM Lane V/C Ratio	-	-	-	-	-	-	0.486					
HCM Control Delay (s)	0	-	-	-	-	0	17.6					
HCM Lane LOS	A	-	-	-	-	A	C					
HCM 95th %tile Q(veh)	-	-	-	-	-	-	2.6					

HCM 6th Signalized Intersection Summary

2: Midway/Park Ave & Greenway/E Park Ave

2040 Improvement Conditions

AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔	↔	↑	↔	↔	↔	↔
Traffic Volume (veh/h)	0	5	0	790	5	245	0	280	560	320	300	5
Future Volume (veh/h)	0	5	0	790	5	245	0	280	560	320	300	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1767	1767	1767	1767	1767	1767	1767	1767	1767	1767	1767	1767
Adj Flow Rate, veh/h	0	5	0	863	0	0	0	304	0	348	326	5
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
Percent Heavy Veh, %	9	9	9	9	9	9	9	9	9	9	9	9
Cap, veh/h	0	17	0	985	0		3	393		466	784	12
Arrive On Green	0.00	0.01	0.00	0.29	0.00	0.00	0.00	0.22	0.00	0.14	0.45	0.45
Sat Flow, veh/h	0	1767	0	3365	0	1497	1682	1767	1497	3264	1735	27
Grp Volume(v), veh/h	0	5	0	863	0	0	0	304	0	348	0	331
Grp Sat Flow(s),veh/h/ln	0	1767	0	1682	0	1497	1682	1767	1497	1632	0	1762
Q Serve(g_s), s	0.0	0.2	0.0	14.1	0.0	0.0	0.0	9.3	0.0	5.9	0.0	7.3
Cycle Q Clear(g_c), s	0.0	0.2	0.0	14.1	0.0	0.0	0.0	9.3	0.0	5.9	0.0	7.3
Prop In Lane	0.00		0.00	1.00		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	0	17	0	985	0		3	393		466	0	796
V/C Ratio(X)	0.00	0.30	0.00	0.88	0.00		0.00	0.77		0.75	0.00	0.42
Avail Cap(c_a), veh/h	0	214	0	1027	0		146	1109		566	0	1274
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	28.4	0.0	19.4	0.0	0.0	0.0	21.1	0.0	23.7	0.0	10.7
Incr Delay (d2), s/veh	0.0	3.7	0.0	8.7	0.0	0.0	0.0	2.5	0.0	4.7	0.0	0.4
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.0	5.8	0.0	0.0	0.0	3.8	0.0	2.3	0.0	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	32.1	0.0	28.1	0.0	0.0	0.0	23.5	0.0	28.4	0.0	11.1
LnGrp LOS	A	C	A	C	A		A	C		C	A	B
Approach Vol, veh/h	5			863			A			304		
Approach Delay, s/veh	32.1			28.1			23.5			20.0		
Approach LOS	C			C			C			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	3.2	17.8		5.1	0.0	31.0		21.5				
Change Period (Y+Rc), s	5.0	5.0		4.6	4.5	5.0		4.6				
Max Green Setting (Gmax), s	10.0	36.2		7.0	5.0	41.7		17.6				
Max Q Clear Time (g_c+I), s	11.3			2.2	0.0	9.3		16.1				
Green Ext Time (p_c), s	0.3	1.5		0.0	0.0	2.4		0.8				

Intersection Summary

HCM 6th Ctrl Delay 24.4

HCM 6th LOS C

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

3: Fair St & E Park Ave

2040 Improvement Conditions
AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	95	775	15	5	870	85	15	10	5	140	10	155
Future Volume (veh/h)	95	775	15	5	870	85	15	10	5	140	10	155
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1752	1752	1752	1752	1752	1752	1752	1752	1752	1752	1752	1752
Adj Flow Rate, veh/h	98	799	15	5	897	88	15	10	5	144	10	160
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	10	10	10	10	10	10	10	10	10	10	10	10
Cap, veh/h	122	1564	29	11	1229	121	55	37	18	299	16	252
Arrive On Green	0.07	0.47	0.47	0.01	0.40	0.40	0.07	0.07	0.07	0.18	0.18	0.18
Sat Flow, veh/h	1668	3342	63	1668	3062	300	830	553	277	1668	88	1410
Grp Volume(v), veh/h	98	398	416	5	488	497	30	0	0	144	0	170
Grp Sat Flow(s), veh/h/ln	1668	1664	1741	1668	1664	1698	1660	0	0	1668	0	1498
Q Serve(g_s), s	3.2	9.3	9.3	0.2	13.8	13.8	1.0	0.0	0.0	4.3	0.0	5.8
Cycle Q Clear(g_c), s	3.2	9.3	9.3	0.2	13.8	13.8	1.0	0.0	0.0	4.3	0.0	5.8
Prop In Lane	1.00		0.04	1.00		0.18	0.50		0.17	1.00		0.94
Lane Grp Cap(c), veh/h	122	779	815	11	668	681	111	0	0	299	0	268
V/C Ratio(X)	0.80	0.51	0.51	0.45	0.73	0.73	0.27	0.00	0.00	0.48	0.00	0.63
Avail Cap(c_a), veh/h	602	1201	1256	752	1201	1225	659	0	0	602	0	540
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.3	10.3	10.3	27.4	14.0	14.0	24.6	0.0	0.0	20.5	0.0	21.1
Incr Delay (d2), s/veh	4.5	0.5	0.5	10.1	1.6	1.5	1.3	0.0	0.0	1.2	0.0	2.5
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	1.3	2.9	3.0	0.1	4.3	4.4	0.4	0.0	0.0	1.7	0.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.8	10.8	10.8	37.5	15.6	15.6	25.9	0.0	0.0	21.7	0.0	23.6
LnGrp LOS	C	B	B	D	B	B	C	A	A	C	A	C
Approach Vol, veh/h	912			990			30			314		
Approach Delay, s/veh	12.9			15.7			25.9			22.7		
Approach LOS	B			B			C			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	3.9	30.0		13.9	7.6	26.3		7.7				
Change Period (Y+Rc), s	3.5	4.0		4.0	3.5	4.0		4.0				
Max Green Setting (Gmax), s	25.0	40.0		20.0	20.0	40.0		22.0				
Max Q Clear Time (g_c+I), s	12.2	11.3		7.8	5.2	15.8		3.0				
Green Ext Time (p_c), s	0.0	5.8		1.2	0.0	6.5		0.1				

Intersection Summary

HCM 6th Ctrl Delay 15.7

HCM 6th LOS B

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

4: Midway & Hegan Ln/Driveway

2040 Improvement Conditions
AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	310	0	30	5	0	0	75	520	0	5	355	715
Future Volume (veh/h)	310	0	30	5	0	0	75	520	0	5	355	715
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1767	1767	1767	1767	1767	1767	1767	1767	1767	1767	1767	1767
Adj Flow Rate, veh/h	384	0	0	6	0	0	85	591	0	6	403	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
Percent Heavy Veh, %	9	9	9	9	9	9	9	9	9	9	9	9
Cap, veh/h	898	332	0	448	0	0	133	674	0	14	548	
Arrive On Green	0.19	0.00	0.00	0.19	0.00	0.00	0.08	0.38	0.00	0.01	0.31	0.00
Sat Flow, veh/h	2678	1767	0	1339	0	0	1682	1767	0	1682	1767	1497
Grp Volume(v), veh/h	384	0	0	6	0	0	85	591	0	6	403	0
Grp Sat Flow(s), veh/h/ln	1339	1767	0	1339	0	0	1682	1767	0	1682	1767	1497
Q Serve(g_s), s	4.8	0.0	0.0	0.1	0.0	0.0	1.8	11.4	0.0	0.1	7.5	0.0
Cycle Q Clear(g_c), s	4.9	0.0	0.0	0.1	0.0	0.0	1.8	11.4	0.0	0.1	7.5	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	898	332	0	448	0	0	133	674	0	14	548	
V/C Ratio(X)	0.43	0.00	0.00	0.01	0.00	0.00	0.64	0.88	0.00	0.44	0.74	
Avail Cap(c_a), veh/h	1674	843	0	836	0	0	344	2024	0	230	1904	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	14.1	0.0	0.0	12.1	0.0	0.0	16.4	10.5	0.0	18.1	11.3	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.0	0.0	0.0	1.9	1.5	0.0	8.1	0.7	0.0
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	1.2	0.0	0.0	0.0	0.0	0.0	0.6	3.1	0.0	0.1	2.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.2	0.0	0.0	12.1	0.0	0.0	18.3	12.0	0.0	26.2	12.0	0.0
LnGrp LOS	B	A	A	B	A	A	B	B	A	C	B	
Approach Vol, veh/h	384			6			676			409		
Approach Delay, s/veh	14.2			12.1			12.8			12.2		
Approach LOS	B			B			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.8	19.5		12.4	7.4	16.9		12.4				
Change Period (Y+Rc), s	4.5	5.5		5.5	4.5	5.5		5.5				
Max Green Setting (Gmax), s	5.0	42.0		17.5	7.5	39.5		17.5				
Max Q Clear Time (g_c+I), s	12.1	13.4		2.1	3.8	9.5		6.9				
Green Ext Time (p_c), s	0.0	0.6		0.0	0.0	0.4		0.1				

Intersection Summary

HCM 6th Ctrl Delay 13.0

HCM 6th LOS B

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

5: Driveway/Otterson Dr & Hegan Ln

2040 Improvement Conditions

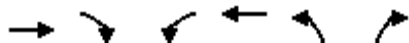
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	210	0	0	260	520	0	0	0	130	0	15
Future Volume (veh/h)	35	210	0	0	260	520	0	0	0	130	0	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1841	1841	0	1841	1841	1841	1841	1841	1841	1841	0	1841
Adj Flow Rate, veh/h	38	228	0	0	283	565	0	0	0	141	0	16
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
Percent Heavy Veh, %	4	4	0	4	4	4	4	4	4	4	0	4
Cap, veh/h	73	1300	0	4	313	626	0	4	0	187	0	0
Arrive On Green	0.04	0.71	0.00	0.00	0.57	0.57	0.00	0.00	0.00	0.11	0.00	0.00
Sat Flow, veh/h	1753	1841	0	1753	549	1095	0	-82832	0	1753	141	
Grp Volume(v), veh/h	38	228	0	0	0	848	0	0	0	141	27.0	
Grp Sat Flow(s),veh/h/ln	1753	1841	0	1753	0	1644	0	1841	0	1753	C	
Q Serve(g_s), s	1.0	2.0	0.0	0.0	0.0	22.0	0.0	0.0	0.0	3.8		
Cycle Q Clear(g_c), s	1.0	2.0	0.0	0.0	0.0	22.0	0.0	0.0	0.0	3.8		
Prop In Lane	1.00		0.00	1.00		0.67	0.00		0.00	1.00		
Lane Grp Cap(c), veh/h	73	1300	0	4	0	939	0	4	0	187		
V/C Ratio(X)	0.52	0.18	0.00	0.00	0.00	0.90	0.00	0.00	0.00	0.76		
Avail Cap(c_a), veh/h	182	1300	0	182	0	1060	0	689	0	656		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(l)	1.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00		
Uniform Delay (d), s/veh	22.6	2.4	0.0	0.0	0.0	9.1	0.0	0.0	0.0	20.9		
Incr Delay (d2), s/veh	5.7	0.3	0.0	0.0	0.0	10.0	0.0	0.0	0.0	6.1		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	0.5	0.3	0.0	0.0	0.0	7.2	0.0	0.0	0.0	1.7		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.3	2.7	0.0	0.0	0.0	19.1	0.0	0.0	0.0	27.0		
LnGrp LOS	C	A	A	A	A	B	A	A	A	C		
Approach Vol, veh/h	266			848			0					
Approach Delay, s/veh	6.3			19.1			0.0					
Approach LOS	A			B								
Timer - Assigned Phs	1	2			5	6	7	8				
Phs Duration (G+Y+Rc), s	0.0	38.5			6.5	32.0	9.6	0.0				
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	31.0			5.0	31.0	18.0	18.0				
Max Q Clear Time (g_c+I1), s	0.0	4.0			3.0	24.0	5.8	0.0				
Green Ext Time (p_c), s	0.0	1.3			0.0	3.5	0.3	0.0				
Intersection Summary												
HCM 6th Ctrl Delay				17.3								
HCM 6th LOS				B								

HCM 6th Signalized Intersection Summary

6: Scott Ave & E Park Ave

2040 Improvement Conditions
AM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	
Traffic Volume (veh/h)	880	35	80	940	10	70
Future Volume (veh/h)	880	35	80	940	10	70
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1722	1722	1722	1722	1722	1722
Adj Flow Rate, veh/h	926	37	84	989	11	74
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	12	12	12	12	12	12
Cap, veh/h	1445	58	125	2102	24	163
Arrive On Green	0.45	0.45	0.08	0.64	0.13	0.13
Sat Flow, veh/h	3290	128	1640	3358	190	1276
Grp Volume(v), veh/h	473	490	84	989	86	0
Grp Sat Flow(s), veh/h/ln	1636	1696	1640	1636	1483	0
Q Serve(g_s), s	8.7	8.7	2.0	6.1	2.1	0.0
Cycle Q Clear(g_c), s	8.7	8.7	2.0	6.1	2.1	0.0
Prop In Lane		0.08	1.00		0.13	0.86
Lane Grp Cap(c), veh/h	738	765	125	2102	189	0
V/C Ratio(X)	0.64	0.64	0.67	0.47	0.45	0.00
Avail Cap(c_a), veh/h	1442	1494	457	4170	799	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.3	8.3	17.6	3.6	15.8	0.0
Incr Delay (d2), s/veh	0.9	0.9	6.0	0.2	1.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	2.3	0.8	0.4	0.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.2	9.2	23.6	3.8	17.5	0.0
LnGrp LOS	A	A	C	A	B	A
Approach Vol, veh/h	963			1073	86	
Approach Delay, s/veh	9.2			5.3	17.5	
Approach LOS	A			A	B	
Timer - Assigned Phs	2	3	4		8	
Phs Duration (G+Y+Rc), s	9.5	7.5	22.2		29.7	
Change Period (Y+Rc), s	4.5	4.5	4.5		4.5	
Max Green Setting (Gmax), s	21.1	10.9	34.5		49.9	
Max Q Clear Time (g_c+I1), s	4.1	4.0	10.7		8.1	
Green Ext Time (p_c), s	0.2	0.1	6.9		8.3	
Intersection Summary						
HCM 6th Ctrl Delay			7.6			
HCM 6th LOS			A			

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

2: Midway/Park Ave & Greenway/E Park Ave

2040 Conditions
PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	5	5	0	640	5	350	0	390	885	400	270	0
Future Volume (veh/h)	5	5	0	640	5	350	0	390	885	400	270	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	5	5	0	671	0	0	0	406	0	417	281	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
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	16	16	0	836	0		3	499		521	931	0
Arrive On Green	0.02	0.02	0.00	0.24	0.00	0.00	0.00	0.27	0.00	0.15	0.51	0.00
Sat Flow, veh/h	891	891	0	3478	0	1547	1739	1826	1547	3374	1826	0
Grp Volume(v), veh/h	10	0	0	671	0	0	0	406	0	417	281	0
Grp Sat Flow(s), veh/h/ln	1781	0	0	1739	0	1547	1739	1826	1547	1687	1826	0
Q Serve(g_s), s	0.3	0.0	0.0	11.1	0.0	0.0	0.0	12.7	0.0	7.3	5.5	0.0
Cycle Q Clear(g_c), s	0.3	0.0	0.0	11.1	0.0	0.0	0.0	12.7	0.0	7.3	5.5	0.0
Prop In Lane	0.50		0.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	32	0	0	836	0		3	499		521	931	0
V/C Ratio(X)	0.31	0.00	0.00	0.80	0.00		0.00	0.81		0.80	0.30	0.00
Avail Cap(c_a), veh/h	204	0	0	1000	0		142	1080		551	1244	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.7	0.0	0.0	21.9	0.0	0.0	0.0	20.8	0.0	25.0	8.7	0.0
Incr Delay (d2), s/veh	2.1	0.0	0.0	4.5	0.0	0.0	0.0	2.4	0.0	8.1	0.2	0.0
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.0	4.5	0.0	0.0	0.0	5.3	0.0	3.2	1.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.7	0.0	0.0	26.4	0.0	0.0	0.0	23.2	0.0	33.1	8.9	0.0
LnGrp LOS	C	A	A	C	A		A	C		C	A	A
Approach Vol, veh/h	10			671			A			698		
Approach Delay, s/veh	31.7			26.4			23.2			23.4		
Approach LOS	C			C			C			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.4	21.7		5.7	0.0	36.2		19.3				
Change Period (Y+Rc), s	5.0	5.0		4.6	4.5	5.0		4.6				
Max Green Setting (Gmax), s	10.0	36.2		7.0	5.0	41.7		17.6				
Max Q Clear Time (g_c+I), s	19.3	14.7		2.3	0.0	7.5		13.1				
Green Ext Time (p_c), s	0.2	2.0		0.0	0.0	2.0		1.6				

Intersection Summary

HCM 6th Ctrl Delay 24.5

HCM 6th LOS C

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

3: Fair St & E Park Ave

2040 Conditions
PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	165	1115	5	10	865	140	30	30	20	140	20	100
Future Volume (veh/h)	165	1115	5	10	865	140	30	30	20	140	20	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	172	1161	5	10	901	146	31	31	21	146	21	104
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
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	211	1764	8	22	1164	189	74	74	50	254	39	193
Arrive On Green	0.12	0.50	0.50	0.01	0.39	0.39	0.12	0.12	0.12	0.15	0.15	0.15
Sat Flow, veh/h	1739	3543	15	1739	2989	484	641	641	434	1739	267	1321
Grp Volume(v), veh/h	172	568	598	10	523	524	83	0	0	146	0	125
Grp Sat Flow(s), veh/h/ln	1739	1735	1823	1739	1735	1739	1716	0	0	1739	0	1588
Q Serve(g_s), s	6.6	16.7	16.7	0.4	18.0	18.0	3.1	0.0	0.0	5.3	0.0	5.0
Cycle Q Clear(g_c), s	6.6	16.7	16.7	0.4	18.0	18.0	3.1	0.0	0.0	5.3	0.0	5.0
Prop In Lane	1.00		0.01	1.00		0.28	0.37		0.25	1.00		0.83
Lane Grp Cap(c), veh/h	211	864	908	22	675	677	199	0	0	254	0	232
V/C Ratio(X)	0.81	0.66	0.66	0.45	0.77	0.77	0.42	0.00	0.00	0.58	0.00	0.54
Avail Cap(c_a), veh/h	510	1017	1069	638	1017	1020	554	0	0	510	0	466
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.2	12.8	12.8	33.4	18.2	18.2	28.0	0.0	0.0	27.2	0.0	27.0
Incr Delay (d2), s/veh	2.9	1.2	1.2	5.3	2.1	2.1	1.4	0.0	0.0	2.1	0.0	2.0
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	2.8	5.9	6.2	0.2	6.6	6.6	1.3	0.0	0.0	2.3	0.0	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.1	14.0	13.9	38.8	20.3	20.3	29.4	0.0	0.0	29.2	0.0	29.0
LnGrp LOS	C	B	B	D	C	C	C	A	A	C	A	C
Approach Vol, veh/h	1338			1057			83			271		
Approach Delay, s/veh	16.3			20.5			29.4			29.1		
Approach LOS	B			C			C			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.4	38.0		13.9	11.8	30.5		11.9				
Change Period (Y+Rc), s	3.5	4.0		4.0	3.5	4.0		4.0				
Max Green Setting (Gmax), s	25.0	40.0		20.0	20.0	40.0		22.0				
Max Q Clear Time (g_c+I), s	12.4	18.7		7.3	8.6	20.0		5.1				
Green Ext Time (p_c), s	0.0	8.3		0.9	0.0	6.6		0.3				

Intersection Summary

HCM 6th Ctrl Delay 19.6

HCM 6th LOS B

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

4: Midway & Hegan Ln/Driveway

2040 Conditions
PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	835	0	65	5	0	10	55	435	5	10	490	405
Future Volume (veh/h)	835	0	65	5	0	10	55	435	5	10	490	405
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	963	0	0	5	0	11	59	468	5	11	527	0
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
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	1271	682	0	219	37	390	92	645	7	24	582	
Arrive On Green	0.37	0.00	0.00	0.37	0.00	0.37	0.05	0.35	0.35	0.01	0.32	0.00
Sat Flow, veh/h	2763	1841	0	378	101	1052	1753	1818	19	1753	1841	1560
Grp Volume(v), veh/h	963	0	0	16	0	0	59	0	473	11	527	0
Grp Sat Flow(s), veh/h/ln	1841	1841	0	1531	0	0	1753	0	1837	1753	1841	1560
Q Serve(g_s), s	19.5	0.0	0.0	0.0	0.0	0.0	2.0	0.0	13.3	0.4	16.3	0.0
Cycle Q Clear(g_c), s	19.9	0.0	0.0	0.4	0.0	0.0	2.0	0.0	13.3	0.4	16.3	0.0
Prop In Lane	1.00		0.00	0.31		0.69	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	1271	682	0	647	0	0	92	0	652	24	582	
V/C Ratio(X)	0.76	0.00	0.00	0.02	0.00	0.00	0.64	0.00	0.73	0.45	0.90	
Avail Cap(c_a), veh/h	1655	938	0	856	0	0	150	0	902	147	901	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	18.0	0.0	0.0	11.9	0.0	0.0	27.6	0.0	16.7	29.1	19.5	0.0
Incr Delay (d2), s/veh	1.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.9	4.7	6.1	0.0
Initial Q Delay(d3),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
%ile BackOfQ(50%),veh/ln	5.6	0.0	0.0	0.1	0.0	0.0	0.8	0.0	5.0	0.2	7.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.0	0.0	0.0	11.9	0.0	0.0	30.4	0.0	17.6	33.8	25.6	0.0
LnGrp LOS	B	A	A	B	A	A	C	A	B	C	C	
Approach Vol, veh/h	963			16			532			538		
Approach Delay, s/veh	19.0			11.9			19.0			25.7		
Approach LOS	B			B			B			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.3	26.6		27.5	7.6	24.3		27.5				
Change Period (Y+Rc), s	4.5	5.5		5.5	4.5	5.5		5.5				
Max Green Setting (Gmax), s	5.3	29.2		30.3	5.1	29.1		30.3				
Max Q Clear Time (g_c+I), s	12.4	15.3		2.4	4.0	18.3		21.9				
Green Ext Time (p_c), s	0.0	0.4		0.0	0.0	0.5		0.2				

Intersection Summary

HCM 6th Ctrl Delay	20.7
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

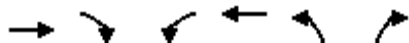
5: Driveway/Otterson Dr & Hegan Ln

2040 Conditions
PM Peak Hour

																
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR				
Lane Configurations																
Traffic Volume (veh/h)	30	365	0	5	275	160	0	0	0	505	0	55				
Future Volume (veh/h)	30	365	0	5	275	160	0	0	0	505	0	55				
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0				
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00				
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Work Zone On Approach	No			No			No			No						
Adj Sat Flow, veh/h/ln	1870	1870	0	1870	1870	1870	1870	1870	1870	1870	0	1870				
Adj Flow Rate, veh/h	33	397	0	5	299	174	0	0	0	549	0	60				
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				
Percent Heavy Veh, %	2	2	0	2	2	2	2	2	2	2	0	2				
Cap, veh/h	66	669	0	12	363	211	0	4	0	618	0	0				
Arrive On Green	0.04	0.36	0.00	0.01	0.33	0.33	0.00	0.00	0.00	0.35	0.00	0.00				
Sat Flow, veh/h	1781	1870	0	1781	1109	645	0	-84166	0	1781	549					
Grp Volume(v), veh/h	33	397	0	5	0	473	0	0	0	549	26.6					
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1781	0	1754	0	1870	0	1781	C					
Q Serve(g_s), s	0.8	8.1	0.0	0.1	0.0	11.6	0.0	0.0	0.0	13.6						
Cycle Q Clear(g_c), s	0.8	8.1	0.0	0.1	0.0	11.6	0.0	0.0	0.0	13.6						
Prop In Lane	1.00		0.00	1.00		0.37	0.00		0.00	1.00						
Lane Grp Cap(c), veh/h	66	669	0	12	0	573	0	4	0	618						
V/C Ratio(X)	0.50	0.59	0.00	0.42	0.00	0.82	0.00	0.00	0.00	0.89						
Avail Cap(c_a), veh/h	191	820	0	191	0	769	0	720	0	705						
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00						
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00						
Uniform Delay (d), s/veh	22.1	12.2	0.0	23.1	0.0	14.5	0.0	0.0	0.0	14.4						
Incr Delay (d2), s/veh	5.6	0.8	0.0	21.5	0.0	5.5	0.0	0.0	0.0	12.2						
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0						
%ile BackOfQ(50%),veh/ln	0.4	2.8	0.0	0.1	0.0	4.5	0.0	0.0	0.0	6.7						
Unsig. Movement Delay, s/veh																
LnGrp Delay(d),s/veh	27.7	13.1	0.0	44.6	0.0	20.0	0.0	0.0	0.0	26.6						
LnGrp LOS	C	B	A	D	A	B	A	A	A	C						
Approach Vol, veh/h	430			478			0									
Approach Delay, s/veh	14.2			20.2			0.0									
Approach LOS	B			C												
Timer - Assigned Phs	1	2			5	6	7	8								
Phs Duration (G+Y+Rc), s	4.8	21.2			6.2	19.8	20.7	0.0								
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5	4.5	4.5								
Max Green Setting (Gmax), s	5.0	20.5			5.0	20.5	18.5	18.0								
Max Q Clear Time (g_c+I1), s	2.1	10.1			2.8	13.6	15.6	0.0								
Green Ext Time (p_c), s	0.0	1.7			0.0	1.7	0.6	0.0								
Intersection Summary																
HCM 6th Ctrl Delay				20.8												
HCM 6th LOS				C												

HCM 6th Signalized Intersection Summary 6: Scott Ave & E Park Ave

2040 Conditions
PM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	
Traffic Volume (veh/h)	1250	20	55	1000	10	60
Future Volume (veh/h)	1250	20	55	1000	10	60
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1811	1811
Adj Flow Rate, veh/h	1359	22	60	1087	11	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	6	6	6	6	6
Cap, veh/h	2254	36	341	2238	28	165
Arrive On Green	0.65	0.65	0.65	0.65	0.12	0.12
Sat Flow, veh/h	3555	56	379	3532	223	1319
Grp Volume(v), veh/h	675	706	60	1087	77	0
Grp Sat Flow(s), veh/h/ln	1721	1800	379	1721	1563	0
Q Serve(g_s), s	9.0	9.0	4.3	6.5	1.8	0.0
Cycle Q Clear(g_c), s	9.0	9.0	13.4	6.5	1.8	0.0
Prop In Lane		0.03	1.00		0.14	0.84
Lane Grp Cap(c), veh/h	1119	1171	341	2238	195	0
V/C Ratio(X)	0.60	0.60	0.18	0.49	0.39	0.00
Avail Cap(c_a), veh/h	2169	2269	572	4338	800	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	4.0	4.0	7.9	3.6	16.1	0.0
Incr Delay (d2), s/veh	0.5	0.5	0.2	0.2	1.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	1.3	0.2	0.5	0.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	4.6	4.5	8.1	3.7	17.4	0.0
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h	1381			1147	77	
Approach Delay, s/veh	4.5			4.0	17.4	
Approach LOS	A			A	B	
Timer - Assigned Phs	2			4		8
Phs Duration (G+Y+Rc), s	9.5			30.6		30.6
Change Period (Y+Rc), s	4.5			4.5		4.5
Max Green Setting (Gmax), s	20.5			50.5		50.5
Max Q Clear Time (g_c+I1), s	3.8			11.0		15.4
Green Ext Time (p_c), s	0.2			13.5		10.7
Intersection Summary						
HCM 6th Ctrl Delay			4.7			
HCM 6th LOS			A			

Notes

User approved volume balancing among the lanes for turning movement.

HCM Signalized Intersection Capacity Analysis

3: Fair St & E Park Ave

Scenario 1
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	77	659	30	0	701	83	0	0	4	124	0	130
Future Volume (vph)	77	659	30	0	701	83	0	0	4	124	0	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0			4.0				4.0	4.0		4.0
Lane Util. Factor	1.00	1.00			0.95				1.00	1.00		1.00
Frt	1.00	0.99			0.98				0.86	1.00		0.85
Flt Protected	0.95	1.00			1.00				1.00	0.95		1.00
Satd. Flow (prot)	1641	1716			3229				1494	1641		1468
Flt Permitted	0.95	1.00			1.00				1.00	0.95		1.00
Satd. Flow (perm)	1641	1716			3229				1494	1641		1468
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	79	679	31	0	723	86	0	0	4	128	0	134
RTOR Reduction (vph)	0	0	0	0	21	0	0	0	3	0	0	112
Lane Group Flow (vph)	79	710	0	0	788	0	0	0	1	128	0	22
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type	Prot	NA			NA				Perm	D.Pm		Perm
Protected Phases	5	2 4!			6							
Permitted Phases									8	4!		4
Actuated Green, G (s)	3.2	37.5			16.6				6.2	6.2		6.2
Effective Green, g (s)	3.2	37.5			16.6				6.2	6.2		6.2
Actuated g/C Ratio	0.09	1.00			0.44				0.17	0.17		0.17
Clearance Time (s)	3.5				4.0				4.0	4.0		4.0
Vehicle Extension (s)	0.5				3.0				3.0	3.0		3.0
Lane Grp Cap (vph)	140	1716			1429				247	271		242
v/s Ratio Prot	0.05	c0.41			c0.24							
v/s Ratio Perm									0.00	0.08		0.02
v/c Ratio	0.56	0.41			0.55				0.00	0.47		0.09
Uniform Delay, d1	16.5	0.0			7.7				13.1	14.2		13.3
Progression Factor	1.00	1.00			1.00				1.00	1.00		1.00
Incremental Delay, d2	3.1	0.2			0.5				0.0	1.3		0.2
Delay (s)	19.6	0.2			8.2				13.1	15.5		13.4
Level of Service	B	A			A				B	B		B
Approach Delay (s)		2.1			8.2			13.1			14.4	
Approach LOS		A			A			B			B	

Intersection Summary

HCM 2000 Control Delay	6.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	37.5	Sum of lost time (s)	11.5
Intersection Capacity Utilization	56.7%	ICU Level of Service	B
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

HCM 6th Signalized Intersection Summary

6: E Park Ave

Scenario 1
AM Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	751	32	74	742	29	64
Future Volume (veh/h)	751	32	74	742	29	64
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1722	1722	1722	1722	1722	1722
Adj Flow Rate, veh/h	791	34	78	781	31	67
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	12	12	12	12	12	12
Cap, veh/h	1324	57	123	2007	65	141
Arrive On Green	0.41	0.41	0.08	0.61	0.14	0.14
Sat Flow, veh/h	3282	137	1640	3358	474	1025
Grp Volume(v), veh/h	405	420	78	781	99	0
Grp Sat Flow(s),veh/h/ln	1636	1697	1640	1636	1514	0
Q Serve(g_s), s	7.0	7.0	1.7	4.4	2.2	0.0
Cycle Q Clear(g_c), s	7.0	7.0	1.7	4.4	2.2	0.0
Prop In Lane		0.08	1.00		0.31	0.68
Lane Grp Cap(c), veh/h	678	703	123	2007	209	0
V/C Ratio(X)	0.60	0.60	0.63	0.39	0.47	0.00
Avail Cap(c_a), veh/h	1793	1860	340	4670	807	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.3	8.3	16.3	3.6	14.4	0.0
Incr Delay (d2), s/veh	0.8	0.8	5.3	0.1	1.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	1.8	0.7	0.3	0.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.1	9.1	21.6	3.7	16.1	0.0
LnGrp LOS	A	A	C	A	B	A
Approach Vol, veh/h	825			859	99	
Approach Delay, s/veh	9.1			5.3	16.1	
Approach LOS	A			A	B	
Timer - Assigned Phs	2		3	4	8	
Phs Duration (G+Y+Rc), s	9.5		7.2	19.5	26.7	
Change Period (Y+Rc), s	4.5		4.5	4.5	4.5	
Max Green Setting (Gmax), s	19.3		7.5	39.7	51.7	
Max Q Clear Time (g_c+I1), s	4.2		3.7	9.0	6.4	
Green Ext Time (p_c), s	0.2		0.0	6.0	6.0	
Intersection Summary						
HCM 6th Ctrl Delay			7.7			
HCM 6th LOS			A			

Notes

User approved volume balancing among the lanes for turning movement.

HCM Signalized Intersection Capacity Analysis

3: Fair St & E Park Ave

Scenario 1
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	131	896	21	0	762	147	0	0	16	123	0	80
Future Volume (vph)	131	896	21	0	762	147	0	0	16	123	0	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0			4.0				4.0	4.0		4.0
Lane Util. Factor	1.00	1.00			0.95				1.00	1.00		1.00
Frt	1.00	1.00			0.98				0.86	1.00		0.85
Flt Protected	0.95	1.00			1.00				1.00	0.95		1.00
Satd. Flow (prot)	1719	1803			3355				1565	1719		1538
Flt Permitted	0.95	1.00			1.00				1.00	0.95		1.00
Satd. Flow (perm)	1719	1803			3355				1565	1719		1538
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	136	933	22	0	794	153	0	0	17	128	0	83
RTOR Reduction (vph)	0	0	0	0	36	0	0	0	15	0	0	72
Lane Group Flow (vph)	136	955	0	0	911	0	0	0	2	128	0	11
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	NA			NA				Perm	D.Pm		Perm
Protected Phases	5	2 4!			6							
Permitted Phases									8	4!		4
Actuated Green, G (s)	3.5	38.3			18.2				5.1	5.1		5.1
Effective Green, g (s)	3.5	38.3			18.2				5.1	5.1		5.1
Actuated g/C Ratio	0.09	1.00			0.48				0.13	0.13		0.13
Clearance Time (s)	3.5				4.0				4.0	4.0		4.0
Vehicle Extension (s)	0.5				3.0				3.0	3.0		3.0
Lane Grp Cap (vph)	157	1803			1594				208	228		204
v/s Ratio Prot	0.08	c0.53			0.27							
v/s Ratio Perm									0.00	0.07		0.01
v/c Ratio	0.87	0.53			0.57				0.01	0.56		0.05
Uniform Delay, d1	17.2	0.0			7.2				14.4	15.6		14.5
Progression Factor	1.00	1.00			1.00				1.00	1.00		1.00
Incremental Delay, d2	35.1	0.3			0.5				0.0	3.1		0.1
Delay (s)	52.3	0.3			7.7				14.4	18.7		14.6
Level of Service	D	A			A				B	B		B
Approach Delay (s)		6.8			7.7			14.4			17.1	
Approach LOS		A			A			B			B	

Intersection Summary

HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	38.3	Sum of lost time (s)	11.5
Intersection Capacity Utilization	68.6%	ICU Level of Service	C
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

HCM 6th Signalized Intersection Summary

6: E Park Ave

Scenario 1
PM Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	996	17	52	845	59	69
Future Volume (veh/h)	996	17	52	845	59	69
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1811	1811
Adj Flow Rate, veh/h	1083	18	57	918	64	75
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	6	6	6	6	6
Cap, veh/h	1680	28	100	2236	101	118
Arrive On Green	0.49	0.49	0.06	0.65	0.14	0.14
Sat Flow, veh/h	3554	58	1725	3532	740	867
Grp Volume(v), veh/h	538	563	57	918	140	0
Grp Sat Flow(s),veh/h/ln	1721	1801	1725	1721	1618	0
Q Serve(g_s), s	9.9	9.9	1.4	5.4	3.4	0.0
Cycle Q Clear(g_c), s	9.9	9.9	1.4	5.4	3.4	0.0
Prop In Lane		0.03	1.00		0.46	0.54
Lane Grp Cap(c), veh/h	835	874	100	2236	221	0
V/C Ratio(X)	0.64	0.64	0.57	0.41	0.63	0.00
Avail Cap(c_a), veh/h	1622	1697	307	4224	742	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.1	8.1	19.3	3.5	17.2	0.0
Incr Delay (d2), s/veh	0.8	0.8	5.1	0.1	3.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	2.8	0.6	0.5	1.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.0	8.9	24.4	3.6	20.2	0.0
LnGrp LOS	A	A	C	A	C	A
Approach Vol, veh/h	1101			975	140	
Approach Delay, s/veh	8.9			4.9	20.2	
Approach LOS	A			A	C	
Timer - Assigned Phs	2		3	4	8	
Phs Duration (G+Y+Rc), s	10.3		6.9	24.9	31.9	
Change Period (Y+Rc), s	4.5		4.5	4.5	4.5	
Max Green Setting (Gmax), s	19.3		7.5	39.7	51.7	
Max Q Clear Time (g_c+I1), s	5.4		3.4	11.9	7.4	
Green Ext Time (p_c), s	0.3		0.0	8.6	7.4	
Intersection Summary						
HCM 6th Ctrl Delay			7.9			
HCM 6th LOS			A			

Notes

User approved volume balancing among the lanes for turning movement.

HCM Signalized Intersection Capacity Analysis

3: Fair St & E Park Ave

Scenario 1
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	755	25	0	800	95	0	0	5	140	0	140
Future Volume (vph)	90	755	25	0	800	95	0	0	5	140	0	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0			4.0				4.0	4.0		4.0
Lane Util. Factor	1.00	1.00			0.95				1.00	1.00		1.00
Frt	1.00	1.00			0.98				0.86	1.00		0.85
Flt Protected	0.95	1.00			1.00				1.00	0.95		1.00
Satd. Flow (prot)	1641	1719			3230				1494	1641		1468
Flt Permitted	0.95	1.00			1.00				1.00	0.95		1.00
Satd. Flow (perm)	1641	1719			3230				1494	1641		1468
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	93	778	26	0	825	98	0	0	5	144	0	144
RTOR Reduction (vph)	0	0	0	0	22	0	0	0	4	0	0	121
Lane Group Flow (vph)	93	804	0	0	901	0	0	0	1	144	0	23
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type	Prot	NA			NA				Perm	D.Pm		Perm
Protected Phases	5	2 4!			6							
Permitted Phases									8	4!		4
Actuated Green, G (s)	3.0	38.4			17.7				6.2	6.2		6.2
Effective Green, g (s)	3.0	38.4			17.7				6.2	6.2		6.2
Actuated g/C Ratio	0.08	1.00			0.46				0.16	0.16		0.16
Clearance Time (s)	3.5				4.0				4.0	4.0		4.0
Vehicle Extension (s)	0.5				3.0				3.0	3.0		3.0
Lane Grp Cap (vph)	128	1719			1488				241	264		237
v/s Ratio Prot	0.06	c0.47			c0.28							
v/s Ratio Perm									0.00	0.09		0.02
v/c Ratio	0.73	0.47			0.61				0.00	0.55		0.10
Uniform Delay, d1	17.3	0.0			7.7				13.5	14.8		13.7
Progression Factor	1.00	1.00			1.00				1.00	1.00		1.00
Incremental Delay, d2	15.9	0.2			0.7				0.0	2.3		0.2
Delay (s)	33.2	0.2			8.4				13.5	17.1		13.9
Level of Service	C	A			A				B	B		B
Approach Delay (s)		3.6			8.4			13.5			15.5	
Approach LOS		A			A			B			B	

Intersection Summary

HCM 2000 Control Delay	7.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	38.4	Sum of lost time (s)	11.5
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

HCM 6th Signalized Intersection Summary

6: E Park Ave

Scenario 1
AM Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	860	35	80	855	35	70
Future Volume (veh/h)	860	35	80	855	35	70
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1722	1722	1722	1722	1722	1722
Adj Flow Rate, veh/h	905	37	84	900	37	74
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	12	12	12	12	12	12
Cap, veh/h	1441	59	126	2099	64	128
Arrive On Green	0.45	0.45	0.08	0.64	0.13	0.13
Sat Flow, veh/h	3290	131	1640	3358	501	1002
Grp Volume(v), veh/h	462	480	84	900	112	0
Grp Sat Flow(s),veh/h/ln	1636	1699	1640	1636	1517	0
Q Serve(g_s), s	8.5	8.5	1.9	5.3	2.7	0.0
Cycle Q Clear(g_c), s	8.5	8.5	1.9	5.3	2.7	0.0
Prop In Lane		0.08	1.00		0.33	0.66
Lane Grp Cap(c), veh/h	736	764	126	2099	194	0
V/C Ratio(X)	0.63	0.63	0.67	0.43	0.58	0.00
Avail Cap(c_a), veh/h	1663	1727	315	4332	750	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.2	8.2	17.5	3.5	16.0	0.0
Incr Delay (d2), s/veh	0.9	0.9	6.0	0.1	2.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	2.2	0.8	0.4	0.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.1	9.1	23.6	3.6	18.7	0.0
LnGrp LOS	A	A	C	A	B	A
Approach Vol, veh/h	942			984	112	
Approach Delay, s/veh	9.1			5.3	18.7	
Approach LOS	A			A	B	
Timer - Assigned Phs	2		3	4	8	
Phs Duration (G+Y+Rc), s	9.5		7.5	22.1	29.6	
Change Period (Y+Rc), s	4.5		4.5	4.5	4.5	
Max Green Setting (Gmax), s	19.3		7.5	39.7	51.7	
Max Q Clear Time (g_c+I1), s	4.7		3.9	10.5	7.3	
Green Ext Time (p_c), s	0.2		0.0	7.1	7.3	
Intersection Summary						
HCM 6th Ctrl Delay			7.8			
HCM 6th LOS			A			
Notes						

HCM Signalized Intersection Capacity Analysis

3: Fair St & E Park Ave

Scenario 1
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					 							
Traffic Volume (vph)	150	1165	25	0	865	170	0	0	20	140	0	95
Future Volume (vph)	150	1165	25	0	865	170	0	0	20	140	0	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0			4.0				4.0	4.0		4.0
Lane Util. Factor	1.00	1.00			0.95				1.00	1.00		1.00
Frt	1.00	1.00			0.98				0.86	1.00		0.85
Flt Protected	0.95	1.00			1.00				1.00	0.95		1.00
Satd. Flow (prot)	1719	1804			3353				1565	1719		1538
Flt Permitted	0.95	1.00			1.00				1.00	0.95		1.00
Satd. Flow (perm)	1719	1804			3353				1565	1719		1538
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	156	1214	26	0	901	177	0	0	21	146	0	99
RTOR Reduction (vph)	0	0	0	0	37	0	0	0	17	0	0	82
Lane Group Flow (vph)	156	1240	0	0	1041	0	0	0	4	146	0	17
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	NA			NA				Perm	D.Pm		Perm
Protected Phases	5	2 4!			6							
Permitted Phases									8	4!		4
Actuated Green, G (s)	5.0	41.4			17.9				7.0	7.0		7.0
Effective Green, g (s)	5.0	41.4			17.9				7.0	7.0		7.0
Actuated g/C Ratio	0.12	1.00			0.43				0.17	0.17		0.17
Clearance Time (s)	3.5				4.0				4.0	4.0		4.0
Vehicle Extension (s)	0.5				3.0				3.0	3.0		3.0
Lane Grp Cap (vph)	207	1804			1449				264	290		260
v/s Ratio Prot	0.09	c0.69			0.31							
v/s Ratio Perm									0.00	0.08		0.01
v/c Ratio	0.75	0.69			0.72				0.01	0.50		0.06
Uniform Delay, d1	17.6	0.0			9.7				14.3	15.6		14.4
Progression Factor	1.00	1.00			1.00				1.00	1.00		1.00
Incremental Delay, d2	12.9	1.1			1.7				0.0	1.4		0.1
Delay (s)	30.5	1.1			11.4				14.3	17.0		14.6
Level of Service	C	A			B				B	B		B
Approach Delay (s)		4.4			11.4			14.3			16.0	
Approach LOS		A			B			B			B	

Intersection Summary

HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	41.4	Sum of lost time (s)	11.5
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

HCM 6th Signalized Intersection Summary

6: E Park Ave

Scenario 1
PM Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1160	20	65	960	70	80
Future Volume (veh/h)	1160	20	65	960	70	80
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1811	1811
Adj Flow Rate, veh/h	1261	22	71	1043	76	87
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	6	6	6	6	6
Cap, veh/h	1797	31	109	2317	108	124
Arrive On Green	0.52	0.52	0.06	0.67	0.14	0.14
Sat Flow, veh/h	3551	60	1725	3532	750	859
Grp Volume(v), veh/h	627	656	71	1043	164	0
Grp Sat Flow(s),veh/h/ln	1721	1800	1725	1721	1619	0
Q Serve(g_s), s	13.6	13.6	2.0	7.0	4.8	0.0
Cycle Q Clear(g_c), s	13.6	13.6	2.0	7.0	4.8	0.0
Prop In Lane		0.03	1.00		0.46	0.53
Lane Grp Cap(c), veh/h	893	935	109	2317	234	0
V/C Ratio(X)	0.70	0.70	0.65	0.45	0.70	0.00
Avail Cap(c_a), veh/h	1384	1448	262	3605	633	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	9.0	9.0	22.6	3.8	20.1	0.0
Incr Delay (d2), s/veh	1.0	1.0	6.5	0.1	3.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	4.1	0.9	0.9	1.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	10.0	10.0	29.1	3.9	23.9	0.0
LnGrp LOS	A	A	C	A	C	A
Approach Vol, veh/h	1283			1114	164	
Approach Delay, s/veh	10.0			5.5	23.9	
Approach LOS	A			A	C	
Timer - Assigned Phs	2		3	4	8	
Phs Duration (G+Y+Rc), s	11.6		7.6	30.1	37.7	
Change Period (Y+Rc), s	4.5		4.5	4.5	4.5	
Max Green Setting (Gmax), s	19.3		7.5	39.7	51.7	
Max Q Clear Time (g_c+I1), s	6.8		4.0	15.6	9.0	
Green Ext Time (p_c), s	0.4		0.0	10.0	8.9	
Intersection Summary						
HCM 6th Ctrl Delay			8.9			
HCM 6th LOS			A			
Notes						

HCM Signalized Intersection Capacity Analysis

3: Fair St & E Park Ave

Scenario 2 - EBL pm+pt
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	77	659	30	0	701	83	0	0	4	124	0	130
Future Volume (vph)	77	659	30	0	701	83	0	0	4	124	0	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0			4.0				4.0	4.0		4.0
Lane Util. Factor	1.00	1.00			0.95				1.00	1.00		1.00
Frt	1.00	0.99			0.98				0.86	1.00		0.85
Flt Protected	0.95	1.00			1.00				1.00	0.95		1.00
Satd. Flow (prot)	1641	1716			3229				1494	1641		1468
Flt Permitted	0.27	1.00			1.00				1.00	0.95		1.00
Satd. Flow (perm)	465	1716			3229				1494	1641		1468
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	79	679	31	0	723	86	0	0	4	128	0	134
RTOR Reduction (vph)	0	0	0	0	21	0	0	0	3	0	0	112
Lane Group Flow (vph)	79	710	0	0	788	0	0	0	1	128	0	22
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type	pm+pt	NA			NA				Perm	D.Pm		Perm
Protected Phases	5	2 4!			6							
Permitted Phases	2 4!								8	4!		4
Actuated Green, G (s)	33.0	37.0			16.5				6.2	6.2		6.2
Effective Green, g (s)	29.0	37.0			16.5				6.2	6.2		6.2
Actuated g/C Ratio	0.78	1.00			0.45				0.17	0.17		0.17
Clearance Time (s)	3.5				4.0				4.0	4.0		4.0
Vehicle Extension (s)	0.5				3.0				3.0	3.0		3.0
Lane Grp Cap (vph)	453	1716			1439				250	274		245
v/s Ratio Prot	0.01	c0.41			c0.24							
v/s Ratio Perm	0.12								0.00	0.08		0.02
v/c Ratio	0.17	0.41			0.55				0.00	0.47		0.09
Uniform Delay, d1	1.4	0.0			7.5				12.8	13.9		13.0
Progression Factor	1.00	1.00			1.00				1.00	1.00		1.00
Incremental Delay, d2	0.1	0.2			0.4				0.0	1.3		0.2
Delay (s)	1.5	0.2			7.9				12.8	15.2		13.2
Level of Service	A	A			A				B	B		B
Approach Delay (s)		0.3			7.9			12.8			14.2	
Approach LOS		A			A			B			B	

Intersection Summary

HCM 2000 Control Delay	5.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	37.0	Sum of lost time (s)	11.5
Intersection Capacity Utilization	56.7%	ICU Level of Service	B
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

HCM 6th Signalized Intersection Summary

6: E Park Ave

Scenario 2 - EBL pm+pt
AM Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↰	↑↑	↰	
Traffic Volume (veh/h)	751	32	74	742	29	64
Future Volume (veh/h)	751	32	74	742	29	64
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1722	1722	1722	1722	1722	1722
Adj Flow Rate, veh/h	791	34	78	781	31	67
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	12	12	12	12	12	12
Cap, veh/h	1324	57	123	2007	65	141
Arrive On Green	0.41	0.41	0.08	0.61	0.14	0.14
Sat Flow, veh/h	3282	137	1640	3358	474	1025
Grp Volume(v), veh/h	405	420	78	781	99	0
Grp Sat Flow(s),veh/h/ln	1636	1697	1640	1636	1514	0
Q Serve(g_s), s	7.0	7.0	1.7	4.4	2.2	0.0
Cycle Q Clear(g_c), s	7.0	7.0	1.7	4.4	2.2	0.0
Prop In Lane		0.08	1.00		0.31	0.68
Lane Grp Cap(c), veh/h	678	703	123	2007	209	0
V/C Ratio(X)	0.60	0.60	0.63	0.39	0.47	0.00
Avail Cap(c_a), veh/h	1793	1860	340	4670	807	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.3	8.3	16.3	3.6	14.4	0.0
Incr Delay (d2), s/veh	0.8	0.8	5.3	0.1	1.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	1.8	0.7	0.3	0.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.1	9.1	21.6	3.7	16.1	0.0
LnGrp LOS	A	A	C	A	B	A
Approach Vol, veh/h	825			859	99	
Approach Delay, s/veh	9.1			5.3	16.1	
Approach LOS	A			A	B	
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		9.5	7.2	19.5		26.7
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s		19.3	7.5	39.7		51.7
Max Q Clear Time (g_c+I1), s		4.2	3.7	9.0		6.4
Green Ext Time (p_c), s		0.2	0.0	6.0		6.0
Intersection Summary						
HCM 6th Ctrl Delay			7.7			
HCM 6th LOS			A			

Notes

User approved volume balancing among the lanes for turning movement.

HCM Signalized Intersection Capacity Analysis

3: Fair St & E Park Ave

Scenario 2 - EBL pm+pt
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	131	896	21	0	762	147	0	0	16	123	0	80
Future Volume (vph)	131	896	21	0	762	147	0	0	16	123	0	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0			4.0				4.0	4.0		4.0
Lane Util. Factor	1.00	1.00			0.95				1.00	1.00		1.00
Frt	1.00	1.00			0.98				0.86	1.00		0.85
Flt Protected	0.95	1.00			1.00				1.00	0.95		1.00
Satd. Flow (prot)	1719	1803			3355				1565	1719		1538
Flt Permitted	0.22	1.00			1.00				1.00	0.95		1.00
Satd. Flow (perm)	394	1803			3355				1565	1719		1538
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	136	933	22	0	794	153	0	0	17	128	0	83
RTOR Reduction (vph)	0	0	0	0	37	0	0	0	14	0	0	70
Lane Group Flow (vph)	136	955	0	0	910	0	0	0	3	128	0	13
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	pm+pt	NA			NA				Perm	D.Pm		Perm
Protected Phases	5	2 4!			6							
Permitted Phases	2 4!								8	4!		4
Actuated Green, G (s)	35.7	39.7			18.2				6.0	6.0		6.0
Effective Green, g (s)	31.7	39.7			18.2				6.0	6.0		6.0
Actuated g/C Ratio	0.80	1.00			0.46				0.15	0.15		0.15
Clearance Time (s)	3.5				4.0				4.0	4.0		4.0
Vehicle Extension (s)	0.5				3.0				3.0	3.0		3.0
Lane Grp Cap (vph)	448	1803			1538				236	259		232
v/s Ratio Prot	0.03	c0.53			0.27							
v/s Ratio Perm	0.21								0.00	0.07		0.01
v/c Ratio	0.30	0.53			0.59				0.01	0.49		0.05
Uniform Delay, d1	1.9	0.0			8.0				14.3	15.5		14.4
Progression Factor	1.00	1.00			1.00				1.00	1.00		1.00
Incremental Delay, d2	0.1	0.3			0.6				0.0	1.5		0.1
Delay (s)	2.0	0.3			8.6				14.3	16.9		14.5
Level of Service	A	A			A				B	B		B
Approach Delay (s)		0.5			8.6			14.3			16.0	
Approach LOS		A			A			B			B	

Intersection Summary

HCM 2000 Control Delay	5.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	39.7	Sum of lost time (s)	11.5
Intersection Capacity Utilization	68.6%	ICU Level of Service	C
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

HCM 6th Signalized Intersection Summary

6: E Park Ave

Scenario 2 - EBL pm+pt
PM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↘	↑↑	↘	
Traffic Volume (veh/h)	996	17	52	845	59	69
Future Volume (veh/h)	996	17	52	845	59	69
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1811	1811
Adj Flow Rate, veh/h	1083	18	57	918	64	75
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	6	6	6	6	6
Cap, veh/h	1680	28	100	2236	101	118
Arrive On Green	0.49	0.49	0.06	0.65	0.14	0.14
Sat Flow, veh/h	3554	58	1725	3532	740	867
Grp Volume(v), veh/h	538	563	57	918	140	0
Grp Sat Flow(s),veh/h/ln	1721	1801	1725	1721	1618	0
Q Serve(g_s), s	9.9	9.9	1.4	5.4	3.4	0.0
Cycle Q Clear(g_c), s	9.9	9.9	1.4	5.4	3.4	0.0
Prop In Lane		0.03	1.00		0.46	0.54
Lane Grp Cap(c), veh/h	835	874	100	2236	221	0
V/C Ratio(X)	0.64	0.64	0.57	0.41	0.63	0.00
Avail Cap(c_a), veh/h	1622	1697	307	4224	742	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.1	8.1	19.3	3.5	17.2	0.0
Incr Delay (d2), s/veh	0.8	0.8	5.1	0.1	3.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	2.8	0.6	0.5	1.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.0	8.9	24.4	3.6	20.2	0.0
LnGrp LOS	A	A	C	A	C	A
Approach Vol, veh/h	1101			975	140	
Approach Delay, s/veh	8.9			4.9	20.2	
Approach LOS	A			A	C	
Timer - Assigned Phs	2		3	4	8	
Phs Duration (G+Y+Rc), s	10.3		6.9	24.9	31.9	
Change Period (Y+Rc), s	4.5		4.5	4.5	4.5	
Max Green Setting (Gmax), s	19.3		7.5	39.7	51.7	
Max Q Clear Time (g_c+I1), s	5.4		3.4	11.9	7.4	
Green Ext Time (p_c), s	0.3		0.0	8.6	7.4	
Intersection Summary						
HCM 6th Ctrl Delay			7.9			
HCM 6th LOS			A			

Notes

User approved volume balancing among the lanes for turning movement.

HCM Signalized Intersection Capacity Analysis

3: Fair St & E Park Ave

Scenario 2 - EBL pm+pt
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	755	25	0	800	95	0	0	5	140	0	140
Future Volume (vph)	90	755	25	0	800	95	0	0	5	140	0	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0			4.0				4.0	4.0		4.0
Lane Util. Factor	1.00	1.00			0.95				1.00	1.00		1.00
Frt	1.00	1.00			0.98				0.86	1.00		0.85
Flt Protected	0.95	1.00			1.00				1.00	0.95		1.00
Satd. Flow (prot)	1641	1719			3230				1494	1641		1468
Flt Permitted	0.23	1.00			1.00				1.00	0.95		1.00
Satd. Flow (perm)	393	1719			3230				1494	1641		1468
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	93	778	26	0	825	98	0	0	5	144	0	144
RTOR Reduction (vph)	0	0	0	0	22	0	0	0	4	0	0	118
Lane Group Flow (vph)	93	804	0	0	901	0	0	0	1	144	0	26
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type	pm+pt	NA			NA				Perm	D.Pm		Perm
Protected Phases	5	2 4!			6							
Permitted Phases	2 4!								8	4!		4
Actuated Green, G (s)	34.8	38.8			17.4				7.1	7.1		7.1
Effective Green, g (s)	30.8	38.8			17.4				7.1	7.1		7.1
Actuated g/C Ratio	0.79	1.00			0.45				0.18	0.18		0.18
Clearance Time (s)	3.5				4.0				4.0	4.0		4.0
Vehicle Extension (s)	0.5				3.0				3.0	3.0		3.0
Lane Grp Cap (vph)	402	1719			1448				273	300		268
v/s Ratio Prot	0.02	c0.47			c0.28							
v/s Ratio Perm	0.17								0.00	0.09		0.02
v/c Ratio	0.23	0.47			0.62				0.00	0.48		0.10
Uniform Delay, d1	1.7	0.0			8.2				13.0	14.2		13.2
Progression Factor	1.00	1.00			1.00				1.00	1.00		1.00
Incremental Delay, d2	0.1	0.2			0.8				0.0	1.2		0.2
Delay (s)	1.8	0.2			9.0				13.0	15.4		13.3
Level of Service	A	A			A				B	B		B
Approach Delay (s)		0.4			9.0			13.0			14.4	
Approach LOS		A			A			B			B	

Intersection Summary

HCM 2000 Control Delay	6.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	38.8	Sum of lost time (s)	11.5
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

HCM 6th Signalized Intersection Summary

6: E Park Ave

Scenario 2 - EBL pm+pt
AM Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↱	↑↑	↱	
Traffic Volume (veh/h)	860	35	80	855	35	70
Future Volume (veh/h)	860	35	80	855	35	70
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1722	1722	1722	1722	1722	1722
Adj Flow Rate, veh/h	905	37	84	900	37	74
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	12	12	12	12	12	12
Cap, veh/h	1441	59	126	2099	64	128
Arrive On Green	0.45	0.45	0.08	0.64	0.13	0.13
Sat Flow, veh/h	3290	131	1640	3358	501	1002
Grp Volume(v), veh/h	462	480	84	900	112	0
Grp Sat Flow(s),veh/h/ln	1636	1699	1640	1636	1517	0
Q Serve(g_s), s	8.5	8.5	1.9	5.3	2.7	0.0
Cycle Q Clear(g_c), s	8.5	8.5	1.9	5.3	2.7	0.0
Prop In Lane		0.08	1.00		0.33	0.66
Lane Grp Cap(c), veh/h	736	764	126	2099	194	0
V/C Ratio(X)	0.63	0.63	0.67	0.43	0.58	0.00
Avail Cap(c_a), veh/h	1663	1727	315	4332	750	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.2	8.2	17.5	3.5	16.0	0.0
Incr Delay (d2), s/veh	0.9	0.9	6.0	0.1	2.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	2.2	0.8	0.4	0.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.1	9.1	23.6	3.6	18.7	0.0
LnGrp LOS	A	A	C	A	B	A
Approach Vol, veh/h	942			984	112	
Approach Delay, s/veh	9.1			5.3	18.7	
Approach LOS	A			A	B	
Timer - Assigned Phs	2		3	4	8	
Phs Duration (G+Y+Rc), s	9.5		7.5	22.1	29.6	
Change Period (Y+Rc), s	4.5		4.5	4.5	4.5	
Max Green Setting (Gmax), s	19.3		7.5	39.7	51.7	
Max Q Clear Time (g_c+I1), s	4.7		3.9	10.5	7.3	
Green Ext Time (p_c), s	0.2		0.0	7.1	7.3	
Intersection Summary						
HCM 6th Ctrl Delay			7.8			
HCM 6th LOS			A			

Notes

User approved volume balancing among the lanes for turning movement.

HCM Signalized Intersection Capacity Analysis

3: Fair St & E Park Ave

Scenario 2 - EBL pm+pt
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	1165	25	0	865	170	0	0	20	140	0	95
Future Volume (vph)	150	1165	25	0	865	170	0	0	20	140	0	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0			4.0				4.0	4.0		4.0
Lane Util. Factor	1.00	1.00			0.95				1.00	1.00		1.00
Frt	1.00	1.00			0.98				0.86	1.00		0.85
Flt Protected	0.95	1.00			1.00				1.00	0.95		1.00
Satd. Flow (prot)	1719	1804			3353				1565	1719		1538
Flt Permitted	0.18	1.00			1.00				1.00	0.95		1.00
Satd. Flow (perm)	323	1804			3353				1565	1719		1538
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	156	1214	26	0	901	177	0	0	21	146	0	99
RTOR Reduction (vph)	0	0	0	0	38	0	0	0	18	0	0	84
Lane Group Flow (vph)	156	1240	0	0	1040	0	0	0	3	146	0	15
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	pm+pt	NA			NA				Perm	D.Pm		Perm
Protected Phases	5	2 4!			6							
Permitted Phases	2 4!								8	4!		4
Actuated Green, G (s)	36.7	40.7			19.2				6.0	6.0		6.0
Effective Green, g (s)	32.7	40.7			19.2				6.0	6.0		6.0
Actuated g/C Ratio	0.80	1.00			0.47				0.15	0.15		0.15
Clearance Time (s)	3.5				4.0				4.0	4.0		4.0
Vehicle Extension (s)	0.5				3.0				3.0	3.0		3.0
Lane Grp Cap (vph)	396	1804			1581				230	253		226
v/s Ratio Prot	0.04	c0.69			0.31							
v/s Ratio Perm	0.28								0.00	0.08		0.01
v/c Ratio	0.39	0.69			0.66				0.01	0.58		0.06
Uniform Delay, d1	2.5	0.0			8.2				14.8	16.2		14.9
Progression Factor	1.00	1.00			1.00				1.00	1.00		1.00
Incremental Delay, d2	0.2	1.1			1.0				0.0	3.2		0.1
Delay (s)	2.7	1.1			9.2				14.8	19.3		15.1
Level of Service	A	A			A				B	B		B
Approach Delay (s)		1.3			9.2			14.8			17.6	
Approach LOS		A			A			B			B	

Intersection Summary

HCM 2000 Control Delay	6.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	40.7	Sum of lost time (s)	11.5
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

HCM 6th Signalized Intersection Summary

6: E Park Ave

Scenario 2 - EBL pm+pt
PM Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↰	↑↑	↰	
Traffic Volume (veh/h)	1160	20	65	960	70	80
Future Volume (veh/h)	1160	20	65	960	70	80
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1811	1811
Adj Flow Rate, veh/h	1261	22	71	1043	76	87
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	6	6	6	6	6
Cap, veh/h	1797	31	109	2317	108	124
Arrive On Green	0.52	0.52	0.06	0.67	0.14	0.14
Sat Flow, veh/h	3551	60	1725	3532	750	859
Grp Volume(v), veh/h	627	656	71	1043	164	0
Grp Sat Flow(s),veh/h/ln	1721	1800	1725	1721	1619	0
Q Serve(g_s), s	13.6	13.6	2.0	7.0	4.8	0.0
Cycle Q Clear(g_c), s	13.6	13.6	2.0	7.0	4.8	0.0
Prop In Lane		0.03	1.00		0.46	0.53
Lane Grp Cap(c), veh/h	893	935	109	2317	234	0
V/C Ratio(X)	0.70	0.70	0.65	0.45	0.70	0.00
Avail Cap(c_a), veh/h	1384	1448	262	3605	633	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	9.0	9.0	22.6	3.8	20.1	0.0
Incr Delay (d2), s/veh	1.0	1.0	6.5	0.1	3.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	4.1	0.9	0.9	1.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	10.0	10.0	29.1	3.9	23.9	0.0
LnGrp LOS	A	A	C	A	C	A
Approach Vol, veh/h	1283			1114	164	
Approach Delay, s/veh	10.0			5.5	23.9	
Approach LOS	A			A	C	
Timer - Assigned Phs	2		3	4	8	
Phs Duration (G+Y+Rc), s	11.6		7.6	30.1	37.7	
Change Period (Y+Rc), s	4.5		4.5	4.5	4.5	
Max Green Setting (Gmax), s	19.3		7.5	39.7	51.7	
Max Q Clear Time (g_c+I1), s	6.8		4.0	15.6	9.0	
Green Ext Time (p_c), s	0.4		0.0	10.0	8.9	
Intersection Summary						
HCM 6th Ctrl Delay			8.9			
HCM 6th LOS			A			
Notes						

Queuing and Blocking Report
Existing Conditions

Existing Conditions
AM Peak Hour

Intersection: 1: Park Ave & Meyers St

Movement	EB	NB	NB	NB	SB	SB
Directions Served	LR	L	T	T	T	TR
Maximum Queue (ft)	114	105	64	98	105	106
Average Queue (ft)	44	51	13	31	38	50
95th Queue (ft)	87	89	46	76	78	95
Link Distance (ft)	844		652	652	740	740
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		100				
Storage Blk Time (%)		1	0			
Queuing Penalty (veh)		1	0			

Intersection: 2: Midway/Park Ave & Greenway/E Park Ave

Movement	EB	WB	WB	WB	NB	NB	B23	SB	SB
Directions Served	LTR	L	LT	R	LT	R	T	L	LTR
Maximum Queue (ft)	26	235	352	122	319	146	240	220	267
Average Queue (ft)	2	219	253	15	145	119	16	115	153
95th Queue (ft)	12	274	432	121	284	174	123	193	233
Link Distance (ft)	283		294	294	236		1880	652	652
Upstream Blk Time (%)			22	1	4				
Queuing Penalty (veh)			87	3	26				
Storage Bay Dist (ft)		160				120			
Storage Blk Time (%)		46	4		7	6			
Queuing Penalty (veh)		135	10		33	14			

Intersection: 3: Fair St & E Park Ave

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	L	TR
Maximum Queue (ft)	114	184	176	98	504	483	74	146	194
Average Queue (ft)	38	59	72	10	249	147	21	57	73
95th Queue (ft)	86	145	151	79	545	461	56	119	151
Link Distance (ft)		294	294		582	582	409	600	600
Upstream Blk Time (%)					3	1			
Queuing Penalty (veh)					12	5			
Storage Bay Dist (ft)	80			180					
Storage Blk Time (%)	2	4			26				
Queuing Penalty (veh)	7	3			2				

Queuing and Blocking Report
Existing Conditions

Existing Conditions
AM Peak Hour

Intersection: 4: Midway & Hegan Ln/Driveway

Movement	EB	WB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	TR	L	T	R
Maximum Queue (ft)	242	6	79	218	24	251	125
Average Queue (ft)	103	0	34	86	2	89	87
95th Queue (ft)	193	4	70	165	15	201	144
Link Distance (ft)	1642	212		1055		1880	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			80		85		50
Storage Blk Time (%)			0	5		12	11
Queuing Penalty (veh)			2	3		59	34

Intersection: 5: Driveway/Otterson Dr & Hegan Ln

Movement	EB	WB	SB	SB
Directions Served	LT	TR	L	R
Maximum Queue (ft)	80	22	75	31
Average Queue (ft)	13	1	35	8
95th Queue (ft)	52	10	66	30
Link Distance (ft)	690	641		
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			100	
Storage Blk Time (%)			0	
Queuing Penalty (veh)			0	

Intersection: 6: Scott Ave & E Park Ave

Movement	EB	EB	WB	WB	WB	NB
Directions Served	T	TR	L	T	T	LR
Maximum Queue (ft)	10	13	67	100	75	84
Average Queue (ft)	0	1	26	11	7	34
95th Queue (ft)	7	8	61	77	59	64
Link Distance (ft)	582	582		1661	1661	602
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			50			
Storage Blk Time (%)			2	2		
Queuing Penalty (veh)			6	2		

Intersection: 7: Hegan Ln & Keller Supply Company Driveway

Movement

Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 9: Aztec Dr & Otterson Dr

Movement

Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 24: Hegan Ln & Huss Ln

Movement

Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 444

Queuing and Blocking Report
Existing Conditions

Existing Conditions
PM Peak Hour

Intersection: 1: Park Ave & Meyers St

Movement	EB	NB	NB	NB	SB	SB
Directions Served	LR	L	T	T	T	TR
Maximum Queue (ft)	252	113	137	133	134	142
Average Queue (ft)	115	57	34	55	54	62
95th Queue (ft)	208	100	101	110	100	113
Link Distance (ft)	844		652	652	740	740
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		100				
Storage Blk Time (%)		2	0			
Queuing Penalty (veh)		5	0			

Intersection: 2: Midway/Park Ave & Greenway/E Park Ave

Movement	EB	WB	WB	WB	NB	NB	B23	SB	SB
Directions Served	LTR	L	LT	R	LT	R	T	L	LTR
Maximum Queue (ft)	35	235	338	126	347	156	628	239	293
Average Queue (ft)	7	221	247	4	264	143	155	136	166
95th Queue (ft)	28	269	428	65	388	163	511	215	251
Link Distance (ft)	283		294	294	236		1880	652	652
Upstream Blk Time (%)			22	0	27				
Queuing Penalty (veh)			88	1	254				
Storage Bay Dist (ft)		160				120			
Storage Blk Time (%)		48	6		15	34			
Queuing Penalty (veh)		124	15		97	98			

Intersection: 3: Fair St & E Park Ave

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	L	TR
Maximum Queue (ft)	129	237	249	102	485	460	162	145	147
Average Queue (ft)	66	94	108	8	250	178	49	56	53
95th Queue (ft)	128	192	199	70	542	487	139	106	106
Link Distance (ft)		294	294		581	581	400	600	600
Upstream Blk Time (%)		0	0		3	2			
Queuing Penalty (veh)		0	0		13	10			
Storage Bay Dist (ft)	80			180					
Storage Blk Time (%)	8	8			28				
Queuing Penalty (veh)	33	10			2				

Queuing and Blocking Report
Existing Conditions

Existing Conditions
PM Peak Hour

Intersection: 4: Midway & Hegan Ln/Driveway

Movement	EB	WB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	TR	L	T	R
Maximum Queue (ft)	1185	31	101	211	76	359	125
Average Queue (ft)	804	5	34	94	9	158	94
95th Queue (ft)	1535	23	77	165	41	301	155
Link Distance (ft)	1642	212		1055		1880	
Upstream Blk Time (%)	1						
Queuing Penalty (veh)	7						
Storage Bay Dist (ft)			80		85		50
Storage Blk Time (%)			1	8		25	6
Queuing Penalty (veh)			3	3		75	25

Intersection: 5: Driveway/Otterson Dr & Hegan Ln

Movement	EB	WB	WB	SB	SB
Directions Served	LT	L	TR	L	R
Maximum Queue (ft)	56	18	14	125	265
Average Queue (ft)	7	1	0	84	56
95th Queue (ft)	34	10	8	133	190
Link Distance (ft)			641		
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		100		100	
Storage Blk Time (%)				17	0
Queuing Penalty (veh)				5	0

Intersection: 6: Scott Ave & E Park Ave

Movement	EB	EB	WB	WB	WB	NB
Directions Served	T	TR	L	T	T	LR
Maximum Queue (ft)	21	15	57	125	124	85
Average Queue (ft)	1	1	18	18	17	34
95th Queue (ft)	18	9	48	124	125	68
Link Distance (ft)	581	581		1765	1765	778
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			50			
Storage Blk Time (%)			1	3		
Queuing Penalty (veh)			3	2		

Queuing and Blocking Report

Existing Conditions

Existing Conditions
PM Peak Hour

Intersection: 7: Hegan Ln & Keller Supply Company Driveway

Movement	EB	SB
Directions Served	LT	L
Maximum Queue (ft)	93	47
Average Queue (ft)	20	12
95th Queue (ft)	150	39
Link Distance (ft)	641	885
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		1
Queuing Penalty (veh)		0

Intersection: 9: Aztec Dr & Otterson Dr

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 24: Hegan Ln & Huss Ln

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 872

Queuing and Blocking Report
2025 No Build Conditions

03/04/2022

Intersection: 1: Park Ave & Meyers St

Movement	EB	NB	NB	NB	SB	SB
Directions Served	LR	L	T	T	T	TR
Maximum Queue (ft)	98	116	85	82	100	134
Average Queue (ft)	45	57	15	29	40	57
95th Queue (ft)	82	98	53	73	84	107
Link Distance (ft)	844		652	652	740	740
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		100				
Storage Blk Time (%)		2				
Queuing Penalty (veh)		3				

Intersection: 2: Midway/Park Ave & Greenway/E Park Ave

Movement	EB	WB	WB	WB	NB	NB	B23	SB	SB
Directions Served	LTR	L	LT	R	LT	R	T	L	LTR
Maximum Queue (ft)	22	235	355	248	329	145	167	251	323
Average Queue (ft)	2	232	313	13	167	128	19	120	168
95th Queue (ft)	13	248	384	113	312	173	116	202	264
Link Distance (ft)	283		294	294	236		1880	652	652
Upstream Blk Time (%)			37	1	5				
Queuing Penalty (veh)			154	3	37				
Storage Bay Dist (ft)		160				120			
Storage Blk Time (%)		59	7		9	10			
Queuing Penalty (veh)		181	21		41	23			

Intersection: 3: Fair St & E Park Ave

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	L	TR
Maximum Queue (ft)	129	212	211	187	616	622	106	161	278
Average Queue (ft)	48	75	87	20	453	360	28	65	108
95th Queue (ft)	103	160	170	119	750	754	78	125	237
Link Distance (ft)		294	294		582	582	409	600	600
Upstream Blk Time (%)		0			26	10			
Queuing Penalty (veh)		0			98	39			
Storage Bay Dist (ft)	80			180					
Storage Blk Time (%)	4	5			59				
Queuing Penalty (veh)	13	4			4				

Queuing and Blocking Report
2025 No Build Conditions

03/04/2022

Intersection: 4: Midway & Hegan Ln/Driveway

Movement	EB	WB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	TR	L	T	R
Maximum Queue (ft)	248	18	120	220	24	310	125
Average Queue (ft)	118	1	40	97	1	107	96
95th Queue (ft)	203	7	87	181	11	230	146
Link Distance (ft)	1642	212		1055		1880	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			80		85		50
Storage Blk Time (%)			1	6		13	13
Queuing Penalty (veh)			7	3		67	41

Intersection: 5: Driveway/Otterson Dr & Hegan Ln

Movement	EB	WB	SB	SB
Directions Served	LT	TR	L	R
Maximum Queue (ft)	108	4	70	31
Average Queue (ft)	14	0	36	8
95th Queue (ft)	56	4	62	30
Link Distance (ft)	690	641		
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			100	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Scott Ave & E Park Ave

Movement	EB	EB	WB	WB	WB	NB
Directions Served	T	TR	L	T	T	LR
Maximum Queue (ft)	13	17	76	502	465	100
Average Queue (ft)	0	1	36	162	136	35
95th Queue (ft)	6	9	83	527	482	77
Link Distance (ft)	582	582		1661	1661	602
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			50			
Storage Blk Time (%)			3	30		
Queuing Penalty (veh)			10	20		

Intersection: 7: Hegan Ln & Keller Supply Company Driveway

Movement

Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 9: Aztec Dr & Otterson Dr

Movement

Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 24: Hegan Ln & Huss Ln

Movement

Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 767

Queuing and Blocking Report

2025 Conditions

03/04/2022

Intersection: 1: Park Ave & Meyers St

Movement	EB	NB	NB	NB	SB	SB
Directions Served	LR	L	T	T	T	TR
Maximum Queue (ft)	253	123	153	136	116	130
Average Queue (ft)	111	64	39	60	54	61
95th Queue (ft)	192	113	105	113	97	104
Link Distance (ft)	844		652	652	740	740
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		100				
Storage Blk Time (%)		3	0			
Queuing Penalty (veh)		8	0			

Intersection: 2: Midway/Park Ave & Greenway/E Park Ave

Movement	EB	WB	WB	WB	NB	NB	B23	SB	SB
Directions Served	LTR	L	LT	R	LT	R	T	L	LTR
Maximum Queue (ft)	48	235	343	310	339	155	880	310	368
Average Queue (ft)	7	228	279	15	296	145	382	147	185
95th Queue (ft)	29	261	415	124	379	151	1065	250	301
Link Distance (ft)	283		294	294	236		1880	652	652
Upstream Blk Time (%)			24	1	42				
Queuing Penalty (veh)			103	3	419				
Storage Bay Dist (ft)		160				120			
Storage Blk Time (%)		52	6		19	43			
Queuing Penalty (veh)		141	15		131	128			

Intersection: 3: Fair St & E Park Ave

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	L	TR
Maximum Queue (ft)	130	253	252	142	470	411	168	178	156
Average Queue (ft)	78	99	112	8	247	165	52	67	58
95th Queue (ft)	135	212	214	70	497	418	120	135	121
Link Distance (ft)		294	294		581	581	400	600	600
Upstream Blk Time (%)		0	0		1	0			
Queuing Penalty (veh)		0	1		3	2			
Storage Bay Dist (ft)	80			180					
Storage Blk Time (%)	14	9			28				
Queuing Penalty (veh)	64	11			2				

Queuing and Blocking Report

2025 Conditions

03/04/2022

Intersection: 4: Midway & Hegan Ln/Driveway

Movement	EB	WB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	TR	L	T	R
Maximum Queue (ft)	1189	35	79	190	56	367	125
Average Queue (ft)	843	5	34	95	8	169	90
95th Queue (ft)	1458	24	69	157	35	306	155
Link Distance (ft)	1642	212		1055		1880	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			80		85		50
Storage Blk Time (%)			1	9		25	6
Queuing Penalty (veh)			2	4		81	27

Intersection: 5: Driveway/Otterson Dr & Hegan Ln

Movement	EB	WB	WB	SB	SB
Directions Served	LT	L	TR	L	R
Maximum Queue (ft)	63	6	4	125	247
Average Queue (ft)	4	0	0	83	40
95th Queue (ft)	37	6	3	130	142
Link Distance (ft)			641		
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		100		100	
Storage Blk Time (%)				12	0
Queuing Penalty (veh)				4	0

Intersection: 6: Scott Ave & E Park Ave

Movement	EB	WB	WB	WB	NB
Directions Served	TR	L	T	T	LR
Maximum Queue (ft)	20	66	52	27	82
Average Queue (ft)	1	22	2	1	34
95th Queue (ft)	9	52	24	14	64
Link Distance (ft)	581		1765	1765	778
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		50			
Storage Blk Time (%)		1	0		
Queuing Penalty (veh)		4	0		

Intersection: 7: Hegan Ln & Keller Supply Company Driveway

Movement	SB
Directions Served	L
Maximum Queue (ft)	39
Average Queue (ft)	13
95th Queue (ft)	38
Link Distance (ft)	885
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 9: Aztec Dr & Otterson Dr

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 24: Hegan Ln & Huss Ln

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 1153

Queuing and Blocking Report
2040 Conditions

2040 Conditions
AM Peak Hour

Intersection: 1: Park Ave & Meyers St

Movement	EB	NB	NB	NB	SB	SB
Directions Served	LR	L	T	T	T	TR
Maximum Queue (ft)	114	118	62	94	108	165
Average Queue (ft)	56	60	15	30	46	65
95th Queue (ft)	101	102	48	79	85	129
Link Distance (ft)			652	652	740	740
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		100				
Storage Blk Time (%)		2				
Queuing Penalty (veh)		4				

Intersection: 2: Midway/Park Ave & Greenway/E Park Ave

Movement	EB	WB	WB	WB	NB	NB	B23	SB	SB
Directions Served	LTR	L	LT	R	LT	R	T	L	LTR
Maximum Queue (ft)	36	235	362	196	352	145	615	299	385
Average Queue (ft)	5	234	320	11	240	136	100	154	214
95th Queue (ft)	24	238	345	105	388	174	385	256	335
Link Distance (ft)	283		294	294	236		1880	652	652
Upstream Blk Time (%)			53	0	17				
Queuing Penalty (veh)			247	2	135				
Storage Bay Dist (ft)		160				120			
Storage Blk Time (%)		68	10		16	18			
Queuing Penalty (veh)		238	34		86	48			

Intersection: 3: Fair St & E Park Ave

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	L	TR
Maximum Queue (ft)	129	260	279	146	584	614	187	284	502
Average Queue (ft)	66	126	134	7	559	517	60	132	240
95th Queue (ft)	126	260	261	69	572	708	184	409	568
Link Distance (ft)		294	294		548	548	403	600	600
Upstream Blk Time (%)		0	0		70	29		6	12
Queuing Penalty (veh)		0	2		304	127		0	0
Storage Bay Dist (ft)	80			180					
Storage Blk Time (%)	9	11			82				
Queuing Penalty (veh)	33	10			4				

Queuing and Blocking Report
2040 Conditions

2040 Conditions
AM Peak Hour

Intersection: 4: Midway & Hegan Ln/Driveway

Movement	EB	WB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	TR	L	T	R
Maximum Queue (ft)	302	43	152	364	40	305	125
Average Queue (ft)	144	5	51	127	4	118	92
95th Queue (ft)	255	25	111	255	22	257	154
Link Distance (ft)	1642	212		1055		1880	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			80		85		50
Storage Blk Time (%)			3	11	0	12	11
Queuing Penalty (veh)			16	7	0	73	38

Intersection: 5: Driveway/Otterson Dr & Hegan Ln

Movement	EB	WB	SB	SB
Directions Served	LT	TR	L	R
Maximum Queue (ft)	84	26	98	61
Average Queue (ft)	13	2	40	11
95th Queue (ft)	49	12	76	41
Link Distance (ft)	690	641		
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			100	
Storage Blk Time (%)			1	
Queuing Penalty (veh)			0	

Intersection: 6: Scott Ave & E Park Ave

Movement	EB	WB	WB	WB	NB
Directions Served	T	L	T	T	LR
Maximum Queue (ft)	11	75	1602	1604	464
Average Queue (ft)	0	48	1374	1360	160
95th Queue (ft)	8	103	1934	1939	446
Link Distance (ft)	548		1544	1544	485
Upstream Blk Time (%)			64	60	14
Queuing Penalty (veh)			0	0	0
Storage Bay Dist (ft)		50			
Storage Blk Time (%)		2	86		
Queuing Penalty (veh)		9	69		

Intersection: 7: Hegan Ln & Keller Supply Company Driveway

Movement

Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 8: Otterson Dr & Ivy St & Meyers St

Movement

Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 9: Aztec Dr & Otterson Dr

Movement

Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 24: Hegan Ln & Huss Ln

Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 1485

Queuing and Blocking Report
2040 Conditions

2040 Conditions
PM Peak Hour

Intersection: 1: Park Ave & Meyers St

Movement	EB	NB	NB	NB	SB	SB
Directions Served	LR	L	T	T	T	TR
Maximum Queue (ft)	334	117	129	150	142	151
Average Queue (ft)	147	60	40	63	60	72
95th Queue (ft)	268	105	93	119	108	123
Link Distance (ft)	844		652	652	740	740
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		100				
Storage Blk Time (%)		3	0			
Queuing Penalty (veh)		8	0			

Intersection: 2: Midway/Park Ave & Greenway/E Park Ave

Movement	EB	WB	WB	NB	NB	B23	SB	SB
Directions Served	LTR	L	LT	LT	R	T	L	LTR
Maximum Queue (ft)	56	235	354	345	159	1883	355	389
Average Queue (ft)	12	233	315	314	145	1470	205	255
95th Queue (ft)	40	238	339	352	153	2454	319	374
Link Distance (ft)	283		294	236		1880	652	652
Upstream Blk Time (%)			53	49		2		
Queuing Penalty (veh)			253	560		19		
Storage Bay Dist (ft)		160			120			
Storage Blk Time (%)		69	10	19	42			
Queuing Penalty (veh)		213	31	147	146			

Intersection: 3: Fair St & E Park Ave

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	L	TR
Maximum Queue (ft)	130	305	302	199	600	621	246	205	244
Average Queue (ft)	90	151	160	17	578	564	80	78	100
95th Queue (ft)	147	277	277	108	592	690	181	157	196
Link Distance (ft)		294	294		568	568	405	600	600
Upstream Blk Time (%)		0	0		73	44			
Queuing Penalty (veh)		1	2		359	216			
Storage Bay Dist (ft)	80			180					
Storage Blk Time (%)	20	15			84				
Queuing Penalty (veh)	100	22			8				

Intersection: 4: Midway & Hegan Ln/Driveway

Movement	EB	WB	NB	NB	SB	SB	SB	B23
Directions Served	LTR	LTR	L	TR	L	T	R	T
Maximum Queue (ft)	888	39	154	955	72	1495	125	108
Average Queue (ft)	531	8	79	590	7	876	113	15
95th Queue (ft)	1259	30	176	1259	38	1919	156	113
Link Distance (ft)	1642	212		1055		1880		236
Upstream Blk Time (%)	1			29		5		0
Queuing Penalty (veh)	11			0		42		2
Storage Bay Dist (ft)			80		85		50	
Storage Blk Time (%)			4	63		63	9	
Queuing Penalty (veh)			16	31		228	44	

Intersection: 5: Driveway/Otterson Dr & Hegan Ln

Movement	EB	WB	WB	SB	SB
Directions Served	LT	L	TR	L	R
Maximum Queue (ft)	97	17	8	125	452
Average Queue (ft)	9	1	0	103	125
95th Queue (ft)	46	10	4	147	377
Link Distance (ft)	690		641		
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		100		100	
Storage Blk Time (%)				35	0
Queuing Penalty (veh)				12	1

Intersection: 6: E Park Ave

Movement	EB	WB	WB	WB	NB
Directions Served	TR	L	T	T	LR
Maximum Queue (ft)	20	75	1432	1437	475
Average Queue (ft)	1	36	1200	1191	272
95th Queue (ft)	8	93	1818	1825	598
Link Distance (ft)	568		1376	1376	509
Upstream Blk Time (%)			69	65	31
Queuing Penalty (veh)			0	0	0
Storage Bay Dist (ft)		50			
Storage Blk Time (%)		1	87		
Queuing Penalty (veh)		5	48		

Intersection: 7: Hegan Ln & Keller Supply Company Driveway

Movement	EB	SB
Directions Served	LT	L
Maximum Queue (ft)	130	35
Average Queue (ft)	37	13
95th Queue (ft)	235	38
Link Distance (ft)	641	885
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		
Storage Blk Time (%)		1
Queuing Penalty (veh)		0

Intersection: 8: Hegan Ln & Huss Ln

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 9: Aztec Dr & Otterson Dr

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 2526

Queuing and Blocking Report

2025 Improvement Conditions

03/07/2022

Intersection: 1: Park Ave & Meyers St

Movement	EB	NB	NB	NB	SB	SB
Directions Served	LR	L	T	T	T	TR
Maximum Queue (ft)	112	104	68	100	98	139
Average Queue (ft)	48	54	14	34	47	51
95th Queue (ft)	87	91	47	84	86	103
Link Distance (ft)			652	652	740	740
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		100				
Storage Blk Time (%)		1	0			
Queuing Penalty (veh)		2	0			

Intersection: 2: Midway/Park Ave & Greenway/E Park Ave

Movement	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	LTR	L	LT	T	R	L	L	TR
Maximum Queue (ft)	22	226	237	178	163	132	153	153
Average Queue (ft)	2	142	107	94	64	54	70	58
95th Queue (ft)	12	220	217	156	141	107	123	119
Link Distance (ft)	283		318	793			652	652
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		160			200	200		
Storage Blk Time (%)		6	2	25	0		0	
Queuing Penalty (veh)		19	5	116	0		0	

Intersection: 3: Fair St & E Park Ave

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	L	TR
Maximum Queue (ft)	114	152	156	31	278	175	74	141	103
Average Queue (ft)	41	48	64	3	112	48	19	53	44
95th Queue (ft)	88	115	126	14	228	129	52	104	83
Link Distance (ft)		318	318		556	556	401	600	600
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	80			180					
Storage Blk Time (%)	2	2			2				
Queuing Penalty (veh)	8	1			0				

Intersection: 4: Midway & Hegan Ln/Driveway

Movement	EB	EB	WB	NB	NB	SB	SB	SB
Directions Served	L	LTR	LTR	L	TR	L	T	R
Maximum Queue (ft)	123	174	12	109	247	31	436	125
Average Queue (ft)	48	75	0	35	87	3	112	60
95th Queue (ft)	104	132	6	75	176	17	255	155
Link Distance (ft)		1653	212		1050		1330	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	100			80		85		50
Storage Blk Time (%)	0	3		1	5		15	0
Queuing Penalty (veh)	1	4		3	3		79	1

Intersection: 5: Driveway/Otterson Dr & Hegan Ln

Movement	EB	WB	SB	SB
Directions Served	LT	TR	L	R
Maximum Queue (ft)	91	144	62	31
Average Queue (ft)	46	83	31	7
95th Queue (ft)	77	128	51	27
Link Distance (ft)	690	641		
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			100	
Storage Blk Time (%)		3		
Queuing Penalty (veh)		0		

Intersection: 6: Scott Ave & E Park Ave

Movement	EB	EB	WB	WB	WB	NB
Directions Served	T	TR	L	T	T	LR
Maximum Queue (ft)	197	178	73	268	185	84
Average Queue (ft)	77	88	40	71	40	34
95th Queue (ft)	142	151	71	155	111	67
Link Distance (ft)	556	556		810	810	483
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			50			
Storage Blk Time (%)			9	5		
Queuing Penalty (veh)			34	3		

Intersection: 7: Hegan Ln & Keller Supply Company Driveway

Movement

Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 8: Otterson Dr & Ivy St & Meyers St

Movement

Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 9: Aztec Dr & Otterson Dr

Movement

Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 24: Hegan Ln & Huss Ln

Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 277

Intersection: 5: Driveway/Otterson Dr & Hegan Ln

Movement	EB	EB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (ft)	48	62	169	108	61
Average Queue (ft)	14	17	69	41	8
95th Queue (ft)	37	49	134	81	39
Link Distance (ft)		1919	1985		2120
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	75			100	
Storage Blk Time (%)		0	1	0	
Queuing Penalty (veh)		0	0	0	

Network Summary

Network wide Queuing Penalty: 0

Queuing and Blocking Report

2025 Signal Improvement Conditions

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Intersection: 1: Park Ave & Meyers St

Movement	EB	NB	NB	NB	SB	SB
Directions Served	LR	L	T	T	T	TR
Maximum Queue (ft)	244	120	145	139	142	138
Average Queue (ft)	116	59	41	61	63	63
95th Queue (ft)	197	103	105	121	116	115
Link Distance (ft)			652	652	740	740
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		100				
Storage Blk Time (%)		3	0			
Queuing Penalty (veh)		7	0			

Intersection: 2: Midway/Park Ave & Greenway/E Park Ave

Movement	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	LTR	L	LT	T	R	L	L	TR
Maximum Queue (ft)	48	231	256	254	222	135	128	140
Average Queue (ft)	8	136	105	118	123	66	66	50
95th Queue (ft)	30	215	213	203	216	116	110	105
Link Distance (ft)	283		318	823			652	652
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		160			200	200		
Storage Blk Time (%)		5	1	30	1			
Queuing Penalty (veh)		12	2	208	2			

Intersection: 3: Fair St & E Park Ave

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	L	TR
Maximum Queue (ft)	129	232	228	12	288	242	103	154	99
Average Queue (ft)	67	87	97	2	120	99	44	61	41
95th Queue (ft)	119	181	180	9	231	202	84	118	77
Link Distance (ft)		318	318		556	556	401	600	600
Upstream Blk Time (%)			0						
Queuing Penalty (veh)			0						
Storage Bay Dist (ft)	80			180					
Storage Blk Time (%)	8	6			2				
Queuing Penalty (veh)	34	7			0				

Queuing and Blocking Report
2025 Signal Improvement Conditions

03/07/2022

Intersection: 4: Midway & Hegan Ln/Driveway

Movement	EB	EB	WB	NB	NB	SB	SB	SB
Directions Served	L	LTR	LTR	L	TR	L	T	R
Maximum Queue (ft)	125	551	31	146	256	72	467	125
Average Queue (ft)	114	242	7	43	124	7	229	83
95th Queue (ft)	148	471	28	99	209	38	409	178
Link Distance (ft)		1653	212		1050		1301	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	100			80		85		50
Storage Blk Time (%)	7	39		1	15		39	0
Queuing Penalty (veh)	24	118		2	7		124	0

Intersection: 5: Driveway/Otterson Dr & Hegan Ln

Movement	EB	WB	WB	SB	SB
Directions Served	LT	L	TR	L	R
Maximum Queue (ft)	162	23	153	115	82
Average Queue (ft)	69	1	72	61	25
95th Queue (ft)	122	11	122	97	64
Link Distance (ft)			641		
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		100		100	
Storage Blk Time (%)			3	1	
Queuing Penalty (veh)			0	0	

Intersection: 6: Scott Ave & E Park Ave

Movement	EB	EB	WB	WB	WB	NB
Directions Served	T	TR	L	T	T	LR
Maximum Queue (ft)	144	152	67	136	106	63
Average Queue (ft)	62	78	27	54	41	29
95th Queue (ft)	118	131	58	110	83	59
Link Distance (ft)	556	556		810	810	483
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			50			
Storage Blk Time (%)			2	4		
Queuing Penalty (veh)			10	2		

Intersection: 7: Hegan Ln & Keller Supply Company Driveway

Movement	SB
Directions Served	L
Maximum Queue (ft)	36
Average Queue (ft)	12
95th Queue (ft)	37
Link Distance (ft)	885
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 8: Otterson Dr & Ivy St & Meyers St

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 9: Aztec Dr & Otterson Dr

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 24: Hegan Ln & Huss Ln

Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 559

Queuing and Blocking Report

2025 Signal Conditions

03/07/2022

Intersection: 5: Driveway/Otterson Dr & Hegan Ln

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	L	TR	L	R
Maximum Queue (ft)	66	146	30	154	124	166
Average Queue (ft)	15	62	3	68	84	25
95th Queue (ft)	43	117	18	123	125	90
Link Distance (ft)		981		1357		1122
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	75		100		100	
Storage Blk Time (%)		3		2	4	
Queuing Penalty (veh)		1		0	1	

Network Summary

Network wide Queuing Penalty: 2

Queuing and Blocking Report
2040 Conditions

2040 Conditions
PM Peak Hour

Intersection: 1: Park Ave & Meyers St

Movement	EB	NB	NB	NB	SB	SB
Directions Served	LR	L	T	T	T	TR
Maximum Queue (ft)	135	115	99	102	112	141
Average Queue (ft)	54	64	19	35	51	58
95th Queue (ft)	99	103	62	86	95	114
Link Distance (ft)			652	652	740	740
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		100				
Storage Blk Time (%)		2	0			
Queuing Penalty (veh)		4	0			

Intersection: 2: Midway/Park Ave & Greenway/E Park Ave

Movement	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	LTR	L	LT	R	T	R	L	L	TR
Maximum Queue (ft)	36	232	286	64	260	217	134	156	166
Average Queue (ft)	6	159	128	2	118	91	58	76	59
95th Queue (ft)	24	226	248	46	208	192	109	127	121
Link Distance (ft)	283		316	316	753			652	652
Upstream Blk Time (%)			0	0					
Queuing Penalty (veh)			1	0					
Storage Bay Dist (ft)		160				200	200		
Storage Blk Time (%)		9	1		33	0			
Queuing Penalty (veh)		31	5		175	1			

Intersection: 3: Fair St & E Park Ave

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	L	TR
Maximum Queue (ft)	121	175	174	59	374	293	88	195	159
Average Queue (ft)	51	63	79	3	151	75	27	73	59
95th Queue (ft)	102	140	152	35	310	198	64	142	115
Link Distance (ft)		316	316		556	556	401	600	600
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	80			180					
Storage Blk Time (%)	5	4			7				
Queuing Penalty (veh)	19	3			0				

Queuing and Blocking Report
2040 Conditions

2040 Conditions
PM Peak Hour

Intersection: 4: Midway & Hegan Ln/Driveway

Movement	EB	EB	WB	NB	NB	SB	SB	SB
Directions Served	L	LTR	LTR	L	TR	L	T	R
Maximum Queue (ft)	125	239	35	129	232	80	502	125
Average Queue (ft)	70	108	3	46	111	7	155	74
95th Queue (ft)	134	196	17	92	194	42	346	166
Link Distance (ft)		1653	212		1050		1369	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	100			80		85		50
Storage Blk Time (%)	1	11		2	10		20	1
Queuing Penalty (veh)	1	16		10	6		119	3

Intersection: 5: Driveway/Otterson Dr & Hegan Ln

Movement	EB	WB	SB	SB
Directions Served	LT	TR	L	R
Maximum Queue (ft)	92	222	66	31
Average Queue (ft)	47	104	34	8
95th Queue (ft)	75	179	57	30
Link Distance (ft)	690	641		
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			100	
Storage Blk Time (%)		8		
Queuing Penalty (veh)		0		

Intersection: 6: Scott Ave & E Park Ave

Movement	EB	EB	WB	WB	WB	NB
Directions Served	T	TR	L	T	T	LR
Maximum Queue (ft)	260	266	74	284	200	97
Average Queue (ft)	129	146	47	140	89	33
95th Queue (ft)	215	231	82	232	166	69
Link Distance (ft)	556	556		810	810	483
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			50			
Storage Blk Time (%)			10	23		
Queuing Penalty (veh)			42	19		

Intersection: 7: Hegan Ln & Keller Supply Company Driveway

Movement

Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 8: Otterson Dr & Ivy St & Meyers St

Movement

Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 9: Aztec Dr & Otterson Dr

Movement

Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 24: Hegan Ln & Huss Ln

Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 454

Queuing and Blocking Report
2040 Improvement Conditions

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Intersection: 5: Driveway/Otterson Dr & Hegan Ln

Movement	EB	EB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (ft)	40	75	170	110	81
Average Queue (ft)	14	20	83	46	11
95th Queue (ft)	38	57	150	85	46
Link Distance (ft)		1919	1985		2120
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	75			100	
Storage Blk Time (%)		0	3	1	
Queuing Penalty (veh)		0	0	0	

Network Summary

Network wide Queuing Penalty: 0

Queuing and Blocking Report
2040 Conditions

2040 Conditions
PM Peak Hour

Intersection: 1: Park Ave & Meyers St

Movement	EB	NB	NB	NB	SB	SB
Directions Served	LR	L	T	T	T	TR
Maximum Queue (ft)	286	120	164	152	171	169
Average Queue (ft)	150	67	52	72	80	78
95th Queue (ft)	256	115	121	132	142	143
Link Distance (ft)			652	652	740	740
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		100				
Storage Blk Time (%)		4	1			
Queuing Penalty (veh)		11	1			

Intersection: 2: Midway/Park Ave & Greenway/E Park Ave

Movement	EB	WB	WB	WB	NB	NB	B23	SB	SB	SB
Directions Served	LTR	L	LT	R	T	R	T	L	L	TR
Maximum Queue (ft)	32	221	241	32	288	225	270	170	159	144
Average Queue (ft)	9	145	118	1	133	138	9	81	79	59
95th Queue (ft)	29	218	225	23	228	231	194	134	130	117
Link Distance (ft)	283		318	318	856		1267		652	652
Upstream Blk Time (%)							0			
Queuing Penalty (veh)							0			
Storage Bay Dist (ft)		160				200		200		
Storage Blk Time (%)		6	1		34	1		0		
Queuing Penalty (veh)		20	4		266	4		0		

Intersection: 3: Fair St & E Park Ave

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	L	TR
Maximum Queue (ft)	130	256	266	24	358	361	121	165	114
Average Queue (ft)	78	116	124	4	156	135	55	65	47
95th Queue (ft)	137	216	217	16	297	273	107	127	91
Link Distance (ft)		318	318		556	556	401	600	600
Upstream Blk Time (%)			0						
Queuing Penalty (veh)			0						
Storage Bay Dist (ft)	80			180					
Storage Blk Time (%)	11	10			6				
Queuing Penalty (veh)	58	15			1				

Queuing and Blocking Report
2040 Conditions

2040 Conditions
PM Peak Hour

Intersection: 4: Midway & Hegan Ln/Driveway

Movement	EB	EB	WB	NB	NB	SB	SB	SB
Directions Served	L	LTR	LTR	L	TR	L	T	R
Maximum Queue (ft)	125	1366	45	154	302	101	787	125
Average Queue (ft)	124	968	12	44	150	12	415	105
95th Queue (ft)	132	1398	38	101	260	59	787	178
Link Distance (ft)		1653	212		1050		1267	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	100			80		85		50
Storage Blk Time (%)	17	71		1	22		51	0
Queuing Penalty (veh)	68	242		6	11		186	0

Intersection: 5: Driveway/Otterson Dr & Hegan Ln

Movement	EB	WB	WB	SB	SB
Directions Served	LT	L	TR	L	R
Maximum Queue (ft)	234	48	206	125	213
Average Queue (ft)	95	4	87	82	47
95th Queue (ft)	171	26	156	129	148
Link Distance (ft)	690		641		
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		100		100	
Storage Blk Time (%)			6	12	
Queuing Penalty (veh)			0	4	

Intersection: 6: Scott Ave & E Park Ave

Movement	EB	EB	WB	WB	WB	NB
Directions Served	T	TR	L	T	T	LR
Maximum Queue (ft)	158	199	71	120	116	88
Average Queue (ft)	72	89	31	55	46	36
95th Queue (ft)	140	158	62	104	92	70
Link Distance (ft)	556	556		810	810	483
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			50			
Storage Blk Time (%)			3	4		
Queuing Penalty (veh)			16	2		

Intersection: 7: Hegan Ln & Keller Supply Company Driveway

Movement

Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 8: Otterson Dr & Ivy St & Meyers St

Movement

Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 9: Aztec Dr & Otterson Dr

Movement

Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 24: Hegan Ln & Huss Ln

Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 915

Queuing and Blocking Report

2040 Conditions

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Intersection: 5: Driveway/Otterson Dr & Hegan Ln

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	L	TR	L	R
Maximum Queue (ft)	73	145	30	167	124	236
Average Queue (ft)	19	71	5	81	97	42
95th Queue (ft)	52	123	23	135	136	149
Link Distance (ft)		981		1357		1122
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	75		100		100	
Storage Blk Time (%)	0	6		3	9	
Queuing Penalty (veh)	1	1		0	3	

Network Summary

Network wide Queuing Penalty: 5

Intersection: 3: Fair St & E Park Ave

Movement	EB	EB	EB	WB	WB	SB
Directions Served	L	T	TR	T	TR	LTR
Maximum Queue (ft)	80	70	70	86	102	165
Average Queue (ft)	31	23	11	26	21	72
95th Queue (ft)	66	55	42	67	65	125
Link Distance (ft)		1203	1203	582	582	603
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	80					
Storage Blk Time (%)	0	0				
Queuing Penalty (veh)	2	0				

Intersection: 6: E Park Ave

Movement	EB	EB	WB	WB	WB	NB
Directions Served	T	TR	L	T	T	LR
Maximum Queue (ft)	183	198	74	170	139	109
Average Queue (ft)	92	96	42	59	40	43
95th Queue (ft)	151	168	73	117	92	87
Link Distance (ft)	582	582		1376	1376	509
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			50			
Storage Blk Time (%)			8	5		
Queuing Penalty (veh)			31	3		

Network Summary

Network wide Queuing Penalty: 37

Intersection: 3: Fair St & E Park Ave

Movement	EB	EB	EB	WB	WB	SB
Directions Served	L	T	TR	T	TR	LTR
Maximum Queue (ft)	109	86	51	85	72	124
Average Queue (ft)	46	16	7	30	19	48
95th Queue (ft)	87	51	29	68	52	102
Link Distance (ft)		1243	1243	582	582	611
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	80					
Storage Blk Time (%)	2	0				
Queuing Penalty (veh)	9	0				

Intersection: 6: E Park Ave

Movement	EB	EB	WB	WB	WB	NB
Directions Served	T	TR	L	T	T	LR
Maximum Queue (ft)	176	174	68	144	120	116
Average Queue (ft)	94	99	35	63	44	53
95th Queue (ft)	149	155	67	117	91	93
Link Distance (ft)	582	582		1376	1376	509
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			50			
Storage Blk Time (%)			7	5		
Queuing Penalty (veh)			31	3		

Network Summary

Network wide Queuing Penalty: 42

Queuing and Blocking Report

2040 Conditions

02/18/2022

Intersection: 3: Fair St & E Park Ave

Movement	EB	EB	EB	WB	WB	SB
Directions Served	L	T	TR	T	TR	LTR
Maximum Queue (ft)	92	100	58	131	122	206
Average Queue (ft)	35	18	7	31	25	71
95th Queue (ft)	71	60	31	86	81	149
Link Distance (ft)		590	590	587	587	611
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	80					
Storage Blk Time (%)	1	0				
Queuing Penalty (veh)	3	0				

Intersection: 6: E Park Ave

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (ft)	107	257	241	75	255	237	135	69
Average Queue (ft)	17	155	142	52	127	105	52	24
95th Queue (ft)	57	236	217	85	215	197	102	54
Link Distance (ft)		587	587		1370	1370	509	276
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	100			50				
Storage Blk Time (%)		18		22	20			
Queuing Penalty (veh)		3		94	16			

Network Summary

Network wide Queuing Penalty: 116

3: Fair St & E Park Ave Performance by movement

Movement	EBL	EBT	EBR	WBT	WBR	SBR	All
Vehicles Entered	145	1173	24	880	168	257	2647
Vehicles Exited	145	1172	24	880	168	259	2648
Hourly Exit Rate	145	1172	24	880	168	259	2648
Input Volume	150	1165	25	888	170	255	2653
% of Volume	97	101	95	99	99	102	100

6: E Park Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	18	1166	20	60	951	20	72	5	79	18	3	22
Vehicles Exited	18	1167	21	60	948	19	72	5	79	19	3	22
Hourly Exit Rate	18	1167	21	60	948	19	72	5	79	19	3	22
Input Volume	20	1160	20	65	960	20	70	5	80	20	5	20
% of Volume	91	101	106	92	99	96	103	100	98	96	60	111

6: E Park Ave Performance by movement

Movement	All
Vehicles Entered	2434
Vehicles Exited	2433
Hourly Exit Rate	2433
Input Volume	2444
% of Volume	100

Total Network Performance

Vehicles Entered	2870
Vehicles Exited	2868
Hourly Exit Rate	2868
Input Volume	7956
% of Volume	36

Queuing and Blocking Report

2040 Conditions

02/18/2022

Intersection: 3: Fair St & E Park Ave

Movement	EB	EB	EB	WB	WB	SB
Directions Served	L	T	TR	T	TR	<LR
Maximum Queue (ft)	125	142	74	160	131	152
Average Queue (ft)	55	32	11	46	40	75
95th Queue (ft)	102	92	40	112	101	130
Link Distance (ft)		633	633	586	586	1460
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	80					
Storage Blk Time (%)	4	0				
Queuing Penalty (veh)	22	0				

Intersection: 6: E Park Ave

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (ft)	113	265	283	72	194	178	148	83
Average Queue (ft)	20	133	131	37	83	75	74	30
95th Queue (ft)	63	230	232	69	154	145	125	65
Link Distance (ft)		586	586		1370	1370	509	196
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	100			50				
Storage Blk Time (%)		12		11	13			
Queuing Penalty (veh)		2		51	8			

Network Summary

Network wide Queuing Penalty: 84

Queuing and Blocking Report

2025 RIRO Conditions

03/08/2022

Intersection: 3: Fair St & E Park Ave

Movement	WB	SB
Directions Served	T	R
Maximum Queue (ft)	4	125
Average Queue (ft)	0	66
95th Queue (ft)	3	106
Link Distance (ft)	1322	602
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0

Intersection: 3: Fair St & E Park Ave

Movement	SB
Directions Served	TR
Maximum Queue (ft)	112
Average Queue (ft)	58
95th Queue (ft)	94
Link Distance (ft)	607
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 0

Queuing and Blocking Report

2040 Conditions

02/11/2022

Intersection: 3: Fair St & E Park Ave

Movement	WB	WB	SB
Directions Served	T	TR	R
Maximum Queue (ft)	11	6	158
Average Queue (ft)	0	0	73
95th Queue (ft)	8	5	124
Link Distance (ft)	556	556	603
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Scott Ave & E Park Ave

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	UL	T	TR	L	T	TR	LTR	LTR
Maximum Queue (ft)	132	196	209	107	180	158	127	60
Average Queue (ft)	50	100	86	50	63	55	56	26
95th Queue (ft)	104	176	172	98	131	120	102	53
Link Distance (ft)		556	556		1538	1538	485	190
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	200			100				
Storage Blk Time (%)		0		1	1			
Queuing Penalty (veh)		0		5	1			

Intersection: 24: Hegan Ln & Huss Ln

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 6

Queuing and Blocking Report

2040 Conditions

02/11/2022

Intersection: 3: Fair St & E Park Ave

Movement	SB
Directions Served	TR
Maximum Queue (ft)	152
Average Queue (ft)	71
95th Queue (ft)	118
Link Distance (ft)	602
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: E Park Ave

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	UL	T	TR	L	T	TR	LTR	LTR
Maximum Queue (ft)	224	331	335	74	240	253	173	73
Average Queue (ft)	84	161	154	46	93	93	86	31
95th Queue (ft)	165	280	278	79	204	207	147	66
Link Distance (ft)		574	574		1370	1370	509	260
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	200			50				
Storage Blk Time (%)	0	3		25	9			
Queuing Penalty (veh)	1	5		119	6			

Network Summary

Network wide Queuing Penalty: 131

3: Fair St & E Park Ave Performance by movement

Movement	EBL	EBT	EBR	WBT	WBR	NBR	SBL	SBR	All
Denied Del/Veh (s)	2.5	0.8	0.7	0.0	0.0	0.1	0.2	0.2	0.4
Total Del/Veh (s)	15.3	2.1	1.5	7.3	4.5	0.8	15.6	1.2	5.7

6: E Park Ave Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.0	2.8	0.2	0.2	0.1	0.2
Total Del/Veh (s)	7.7	7.2	23.6	4.5	15.9	7.3	7.1

Total Network Performance

Denied Del/Veh (s)									0.6
Total Del/Veh (s)									13.7

Intersection: 3: Fair St & E Park Ave

Movement	EB	WB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (ft)	101	131	150	108	93
Average Queue (ft)	40	58	54	56	11
95th Queue (ft)	78	110	110	96	51
Link Distance (ft)		590	590	614	614
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	110				
Storage Blk Time (%)	0				
Queuing Penalty (veh)	1				

Intersection: 6: E Park Ave

Movement	EB	EB	WB	WB	WB	NB
Directions Served	T	TR	L	T	T	LR
Maximum Queue (ft)	184	182	74	199	178	102
Average Queue (ft)	79	97	43	63	47	45
95th Queue (ft)	145	160	72	141	117	87
Link Distance (ft)	590	590		1376	1376	509
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			50			
Storage Blk Time (%)			11	4		
Queuing Penalty (veh)			40	3		

Network Summary

Network wide Queuing Penalty: 45

3: Fair St & E Park Ave Performance by movement

Movement	EBL	EBT	EBR	WBT	WBR	NBR	SBL	SBR	All
Denied Del/Veh (s)	2.5	1.4	1.4	0.0	0.0	0.1	0.2	0.2	0.7
Total Del/Veh (s)	17.8	3.1	2.6	8.4	5.4	2.8	19.6	1.8	6.9

6: E Park Ave Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.0	2.4	0.2	0.2	0.2	0.1
Total Del/Veh (s)	8.3	8.8	26.6	4.2	19.4	11.4	7.5

Total Network Performance

Denied Del/Veh (s)	0.8
Total Del/Veh (s)	15.6

Intersection: 3: Fair St & E Park Ave

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	T	TR	R	L	R
Maximum Queue (ft)	114	24	122	147	27	145	67
Average Queue (ft)	55	1	65	70	3	58	13
95th Queue (ft)	95	17	115	126	25	109	50
Link Distance (ft)		1250	590	590	418	613	613
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	110						
Storage Blk Time (%)	0	0					
Queuing Penalty (veh)	4	0					

Intersection: 6: E Park Ave

Movement	EB	EB	WB	WB	WB	NB
Directions Served	T	TR	L	T	T	LR
Maximum Queue (ft)	197	197	64	137	129	139
Average Queue (ft)	92	110	33	55	47	61
95th Queue (ft)	155	170	61	104	91	114
Link Distance (ft)	590	590		1376	1376	509
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			50			
Storage Blk Time (%)			6	5		
Queuing Penalty (veh)			27	2		

Network Summary

Network wide Queuing Penalty: 33

3: Fair St & E Park Ave Performance by movement

Movement	EBL	EBT	EBR	WBT	WBR	NBR	SBL	SBR	All
Denied Del/Veh (s)	3.1	1.0	0.8	0.0	0.0	0.1	0.2	0.3	0.6
Total Del/Veh (s)	15.1	1.1	0.4	7.0	4.6	0.8	17.0	2.3	5.6

6: E Park Ave Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.1	2.6	0.2	0.1	0.1	0.2
Total Del/Veh (s)	7.6	5.5	21.2	4.0	13.9	11.4	6.8

Total Zone Performance

Denied Del/Veh (s)	0.7
Total Del/Veh (s)	133.8

Intersection: 3: Fair St & E Park Ave

Movement	EB	WB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (ft)	63	112	95	116	68
Average Queue (ft)	45	63	59	73	28
95th Queue (ft)	73	121	113	137	75
Link Distance (ft)		590	590	612	612
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	110				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: E Park Ave

Movement	EB	EB	WB	WB	WB	NB
Directions Served	T	TR	L	T	T	LR
Maximum Queue (ft)	130	186	65	112	95	88
Average Queue (ft)	78	118	42	64	45	57
95th Queue (ft)	154	211	75	120	99	96
Link Distance (ft)	590	590		1376	1376	509
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			50			
Storage Blk Time (%)			14	4		
Queuing Penalty (veh)			58	3		

Zone Summary

Zone wide Queuing Penalty: 62

3: Fair St & E Park Ave Performance by movement

Movement	EBL	EBT	EBR	WBT	WBR	NBR	SBL	SBR	All
Denied Del/Veh (s)	5.1	4.6	4.7	0.0	0.0	0.1	0.2	0.1	2.4
Total Del/Veh (s)	22.2	3.0	1.1	9.8	7.1	9.4	15.0	1.8	7.3

6: E Park Ave Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.0	2.8	0.2	0.2	0.1	0.2
Total Del/Veh (s)	8.9	7.0	25.8	3.9	22.9	14.4	8.1

Total Zone Performance

Denied Del/Veh (s)	2.5
Total Del/Veh (s)	110.4

Intersection: 3: Fair St & E Park Ave

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	T	TR	R	L	R
Maximum Queue (ft)	99	144	110	125	34	90	42
Average Queue (ft)	71	29	78	78	10	60	15
95th Queue (ft)	123	190	129	134	45	93	53
Link Distance (ft)		337	590	590	418	613	613
Upstream Blk Time (%)		2					
Queuing Penalty (veh)		0					
Storage Bay Dist (ft)	110						
Storage Blk Time (%)	3	0					
Queuing Penalty (veh)	37	0					

Intersection: 6: E Park Ave

Movement	EB	EB	WB	WB	WB	NB
Directions Served	T	TR	L	T	T	LR
Maximum Queue (ft)	188	207	59	93	73	108
Average Queue (ft)	124	155	40	54	47	67
95th Queue (ft)	218	231	64	104	90	117
Link Distance (ft)	590	590		1376	1376	509
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			50			
Storage Blk Time (%)			15	5		
Queuing Penalty (veh)			73	3		

Zone Summary

Zone wide Queuing Penalty: 114

3: Fair St & E Park Ave Performance by movement

Movement	EBL	EBT	EBR	WBT	WBR	NBR	SBL	SBR	All
Denied Del/Veh (s)	2.4	0.7	0.8	0.0	0.0	0.1	0.2	0.2	0.4
Total Del/Veh (s)	5.3	2.0	1.5	5.7	3.6	0.8	14.9	1.2	4.5

6: E Park Ave Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.1	2.5	0.2	0.2	0.2	0.2
Total Del/Veh (s)	7.7	5.7	23.7	4.3	15.8	7.1	7.0

Total Network Performance

Denied Del/Veh (s)									0.5
Total Del/Veh (s)									12.4

Intersection: 3: Fair St & E Park Ave

Movement	EB	WB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (ft)	81	131	110	122	83
Average Queue (ft)	23	46	42	57	14
95th Queue (ft)	57	92	87	100	54
Link Distance (ft)		590	590	614	614
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	110				
Storage Blk Time (%)	0				
Queuing Penalty (veh)	0				

Intersection: 6: E Park Ave

Movement	EB	EB	WB	WB	WB	NB
Directions Served	T	TR	L	T	T	LR
Maximum Queue (ft)	184	203	75	177	152	123
Average Queue (ft)	82	94	43	65	44	45
95th Queue (ft)	149	157	78	139	101	87
Link Distance (ft)	590	590		1376	1376	509
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			50			
Storage Blk Time (%)			11	4		
Queuing Penalty (veh)			41	3		

Network Summary

Network wide Queuing Penalty: 44

3: Fair St & E Park Ave Performance by movement

Movement	EBL	EBT	EBR	WBT	WBR	NBR	SBL	SBR	All
Denied Del/Veh (s)	2.3	1.2	1.3	0.0	0.0	0.1	0.2	0.2	0.7
Total Del/Veh (s)	7.5	3.0	2.6	6.3	4.0	1.1	17.8	1.7	5.3

6: E Park Ave Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.0	2.6	0.2	0.2	0.2	0.1
Total Del/Veh (s)	7.9	7.1	27.1	4.2	22.0	10.7	7.3

Total Network Performance

Denied Del/Veh (s)									0.8
Total Del/Veh (s)									13.8

Intersection: 3: Fair St & E Park Ave

Movement	EB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	R	L	R
Maximum Queue (ft)	84	118	126	37	113	64
Average Queue (ft)	35	47	46	2	54	14
95th Queue (ft)	66	90	93	15	96	51
Link Distance (ft)		590	590	418	613	613
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	110					
Storage Blk Time (%)	0					
Queuing Penalty (veh)	0					

Intersection: 6: E Park Ave

Movement	EB	EB	WB	WB	WB	NB
Directions Served	T	TR	L	T	T	LR
Maximum Queue (ft)	169	182	69	137	116	126
Average Queue (ft)	92	107	33	57	43	57
95th Queue (ft)	151	168	64	105	95	103
Link Distance (ft)	590	590		1376	1376	509
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			50			
Storage Blk Time (%)			5	4		
Queuing Penalty (veh)			23	2		

Network Summary

Network wide Queuing Penalty: 25

3: Fair St & E Park Ave Performance by movement

Movement	EBL	EBT	EBR	WBT	WBR	NBR	SBL	SBR	All
Denied Del/Veh (s)	3.0	1.0	0.6	0.0	0.0	0.1	0.2	0.2	0.5
Total Del/Veh (s)	4.9	0.8	0.3	6.1	4.2	0.7	17.1	2.5	4.4

6: E Park Ave Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.2	2.8	0.2	0.2	0.1	0.2
Total Del/Veh (s)	7.9	8.3	23.6	4.1	17.7	9.6	7.1

Total Zone Performance

Denied Del/Veh (s)	0.7
Total Del/Veh (s)	119.1

Intersection: 3: Fair St & E Park Ave

Movement	EB	WB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (ft)	40	75	78	88	64
Average Queue (ft)	24	53	52	59	24
95th Queue (ft)	53	92	95	118	85
Link Distance (ft)		590	590	612	612
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	110				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: E Park Ave

Movement	EB	EB	WB	WB	WB	NB
Directions Served	T	TR	L	T	T	LR
Maximum Queue (ft)	158	167	66	135	110	89
Average Queue (ft)	106	126	46	83	52	56
95th Queue (ft)	188	202	78	191	131	96
Link Distance (ft)	590	590		1376	1376	509
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			50			
Storage Blk Time (%)			17	4		
Queuing Penalty (veh)			73	3		

Zone Summary

Zone wide Queuing Penalty: 76

3: Fair St & E Park Ave Performance by movement

Movement	EBL	EBT	EBR	WBT	WBR	NBR	SBL	SBR	All
Denied Del/Veh (s)	4.2	3.7	4.8	0.0	0.0	0.1	0.2	0.1	1.9
Total Del/Veh (s)	7.6	2.3	1.4	6.7	4.8	9.4	18.0	1.9	5.1

6: E Park Ave Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.0	2.4	0.2	0.2	0.1	0.2
Total Del/Veh (s)	9.7	8.2	32.4	5.1	22.0	16.2	8.9

Total Zone Performance

Denied Del/Veh (s)	1.9
Total Del/Veh (s)	107.9

Intersection: 3: Fair St & E Park Ave

Movement	EB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	R	L	R
Maximum Queue (ft)	50	87	96	26	92	41
Average Queue (ft)	33	54	59	5	64	14
95th Queue (ft)	58	103	106	29	103	54
Link Distance (ft)		590	590	418	613	613
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	110					
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 6: E Park Ave

Movement	EB	EB	WB	WB	WB	NB
Directions Served	T	TR	L	T	T	LR
Maximum Queue (ft)	190	222	68	116	114	108
Average Queue (ft)	138	176	43	76	73	72
95th Queue (ft)	210	237	71	128	141	128
Link Distance (ft)	590	590		1376	1376	509
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			50			
Storage Blk Time (%)			17	7		
Queuing Penalty (veh)			83	5		

Zone Summary

Zone wide Queuing Penalty: 87

Appendix F

Roundabout LOS and Queueing Reports

LANE SUMMARY

 **Site: 2 [Midway Rd/E Park Ave/Park Ave (Site Folder: AM Peak Hour - 2025)]**

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	DEMAND FLOWS [Total HV] veh/h %		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh Dist] ft		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Midway Rd													
Lane 1	256	9.0	884	0.290	100	6.4	LOS A	1.9	50.9	Full	650	0.0	0.0
Lane 2 ^d	515	9.0	1146	0.450	100	6.1	LOS A	3.6	97.4	Short	100	0.0	NA
Approach	771	9.0		0.450		6.2	LOS A	3.6	97.4				
East: E Park Ave													
Lane 1 ^d	666	9.0	1224	0.544	100	11.2	LOS B	4.7	125.2	Full	300	0.0	0.0
Lane 2	236	9.0	891	0.265	100	5.6	LOS A	1.6	43.5	Full	300	0.0	0.0
Approach	902	9.0		0.544		9.8	LOS A	4.7	125.2				
North: Park Ave													
Lane 1 ^d	309	9.0	824	0.375	100	14.3	LOS B	2.9	78.7	Full	650	0.0	0.0
Lane 2	249	9.0	632	0.395	100	9.9	LOS A	2.8	75.9	Full	650	0.0	0.0
Approach	558	9.0		0.395		12.3	LOS B	2.9	78.7				
West: Dwy													
Lane 1 ^d	4	9.0	449	0.010	100	9.3	LOS A	0.0	1.2	Full	100	0.0	0.0
Approach	4	9.0		0.010		9.3	LOS A	0.0	1.2				
Intersection	2236	9.0		0.544		9.2	LOS A	4.7	125.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: Midway Rd											
Mov.	L2	T1	R2	Total	%HV						
From S						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	W	N	E			veh/h	v/c	Util. SL	Ov. %	Lane No.	
Lane 1	1	255	-	256	9.0	884	0.290	100	NA	NA	
Lane 2	-	-	515	515	9.0	1146	0.450	100	4.2	1	
Approach	1	255	515	771	9.0		0.450				
East: E Park Ave											
Mov.	L2	T1	R2	Total	%HV						
From E						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	S	W	N			veh/h	v/c	Util. %	Ov. %	Lane No.	
Lane 1	665	1	-	666	9.0	1224	0.544	100	NA	NA	

Lane 2	-	-	236	236	9.0	891	0.265	100	NA	NA
Approach	665	1	236	902	9.0	0.544				
North: Park Ave										
Mov.	L2	T1	R2	Total	%HV					
From N						Cap.	Deg.	Lane	Prob.	Ov.
To Exit:	E	S	W			veh/h	Satn	Util.	SL	Lane
							v/c	%	%	No.
Lane 1	309	-	-	309	9.0	824	0.375	100	NA	NA
Lane 2	-	248	1	249	9.0	632	0.395	100	NA	NA
Approach	309	248	1	558	9.0	0.395				
West: Dwy										
Mov.	L2	T1	R2	Total	%HV					
From W						Cap.	Deg.	Lane	Prob.	Ov.
To Exit:	N	E	S			veh/h	Satn	Util.	SL	Lane
							v/c	%	%	No.
Lane 1	1	2	1	4	9.0	449	0.010	100	NA	NA
Approach	1	2	1	4	9.0	0.010				
Total %HV Deg.Satn (v/c)										
Intersection	2236	9.0		0.544						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis											
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Midway Rd Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
East Exit: E Park Ave Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
North Exit: Park Ave Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
West Exit: Dwy Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									

LANE SUMMARY

 **Site: 3 [Fair St/E Park Ave (Site Folder: AM Peak Hour - 2025)]**

New Site

Site Category: (None)

Roundabout

Lane Use and Performance													
	DEMAND FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h	HV] %						[Veh Dist]					
South: Fair St													
Lane 1 ^d	25	10.0	600	0.041	100	10.8	LOS B	0.2	4.2	Full	800	0.0	0.0
Approach	25	10.0		0.041		10.8	LOS B	0.2	4.2				
East: E Park Ave													
Lane 1	369	10.0	1215	0.304	100	4.9	LOS A	2.0	52.8	Full	575	0.0	0.0
Lane 2 ^d	425	10.0	1397	0.304	100	4.7	LOS A	2.0	53.8	Full	575	0.0	0.0
Approach	794	10.0		0.304		4.8	LOS A	2.0	53.8				
North: Fair St													
Lane 1 ^d	262	10.0	663	0.395	100	9.7	LOS A	1.9	50.4	Full	200	0.0	0.0
Approach	262	10.0		0.395		9.7	LOS A	1.9	50.4				
West: E Park Ave													
Lane 1	357	10.0	1146	0.311	100	5.9	LOS A	2.1	57.0	Full	300	0.0	0.0
Lane 2 ^d	414	10.0	1332	0.311	100	4.4	LOS A	2.2	58.8	Full	300	0.0	0.0
Approach	771	10.0		0.311		5.1	LOS A	2.2	58.8				
Intersection	1852	10.0		0.395		5.7	LOS A	2.2	58.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if $v/c > 1$ irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)										
South: Fair St										
Mov. From S To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	13	7	4	25	10.0	600	0.041	100	NA	NA
Approach	13	7	4	25	10.0	0.041				
East: E Park Ave										
Mov. From E To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	6	363	-	369	10.0	1215	0.304	100	NA	NA
Lane 2	-	346	78	425	10.0	1397	0.304	100	NA	NA
Approach	6	709	78	794	10.0	0.304				
North: Fair St										

Mov. From N To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	128	9	125	262	10.0	663	0.395	100	NA	NA
Approach	128	9	125	262	10.0		0.395			
West: E Park Ave										
Mov. From W To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	79	277	-	357	10.0	1146	0.311	100	NA	NA
Lane 2	-	402	12	414	10.0	1332	0.311	100	NA	NA
Approach	79	679	12	771	10.0		0.311			
Total %HV Deg.Satn (v/c)										
Intersection	1852	10.0		0.395						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis											
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Fair St Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
East Exit: E Park Ave Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									
North Exit: Fair St Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
West Exit: E Park Ave Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									

LANE SUMMARY

 **Site: 4 [Midway Rd/Hegan Ln (Site Folder: AM Peak Hour - 2025)]**

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	DEMAND FLOWS [Total HV] veh/h %		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh Dist] ft		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Midway Rd													
Lane 1 ^d	522	9.0	837	0.624	100	8.4	LOS A	5.0	134.8	Full	900	0.0	0.0
Lane 2	80	9.0	455	0.176	28 ⁶	10.0	LOS B	0.7	19.4	Short	50	0.0	NA
Approach	602	9.0		0.624		8.6	LOS A	5.0	134.8				
East: Dwy													
Lane 1 ^d	4	9.0	531	0.007	100	9.1	LOS A	0.0	0.8	Full	120	0.0	0.0
Approach	4	9.0		0.007		9.1	LOS A	0.0	0.8				
North: Midway Rd													
Lane 1	371	9.0	1181	0.314	100	4.2	LOS A	2.2	59.8	Full	350	0.0	0.0
Lane 2 ^d	599	9.0	1392	0.430	100	4.4	LOS A	3.6	96.9	Short	100	0.0	NA
Approach	970	9.0		0.430		4.4	LOS A	3.6	96.9				
West: Hegan Ln													
Lane 1 ^d	250	9.0	1094	0.229	100	11.8	LOS B	1.4	37.1	Short	100	0.0	NA
Lane 2	66	9.0	720	0.092	40 ⁶	11.7	LOS B	0.5	12.5	Full	400	0.0	0.0
Approach	317	9.0		0.229		11.8	LOS B	1.4	37.1				
Intersection	1893	9.0		0.624		7.0	LOS A	5.0	134.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

⁶ Lane under-utilisation due to downstream effects

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: Midway Rd											
Mov.	L2	T1	R2	Total	%HV						
From S						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	W	N	E			veh/h	Satn	Util.	SL Ov.	Lane	
							v/c	%	%	No.	
Lane 1	61	462	-	522	9.0	837	0.624	100	NA	NA	
Lane 2	-	79	1	80	9.0	455	0.176	28 ⁶	0.0	1	
Approach	61	540	1	602	9.0		0.624				
East: Dwy											
Mov.	L2	T1	R2	Total	%HV						
From E						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	S	W	N			veh/h	Satn	Util.	SL Ov.	Lane	
							v/c	%	%	No.	

Lane 1	1	1	1	4	9.0	531	0.007	100	NA	NA
Approach	1	1	1	4	9.0		0.007			
North: Midway Rd										
Mov.	L2	T1	R2	Total	%HV					
From N						Cap.	Deg.	Lane	Prob.	Ov.
To Exit:	E	S	W			veh/h	Satn	Util.	SL	Lane
							v/c	%	%	No.
Lane 1	2	369	-	371	9.0	1181	0.314	100	NA	NA
Lane 2	-	-	599	599	9.0	1392	0.430	100	4.1	1
Approach	2	369	599	970	9.0		0.430			
West: Hegan Ln										
Mov.	L2	T1	R2	Total	%HV					
From W						Cap.	Deg.	Lane	Prob.	Ov.
To Exit:	N	E	S			veh/h	Satn	Util.	SL	Lane
							v/c	%	%	No.
Lane 1	250	-	-	250	9.0	1094	0.229	100	0.0	2
Lane 2	39	1	26	66	9.0	720	0.092	40 ⁶	NA	NA
Approach	289	1	26	317	9.0		0.229			
Total %HV Deg.Satn (v/c)										
Intersection	1893	9.0		0.624						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

⁶ Lane under-utilisation due to downstream effects

Merge Analysis													
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: Midway Rd Merge Type: Not Applied													
Full Length Lane	1	Merge Analysis not applied.											
East Exit: Dwy Merge Type: Not Applied													
Full Length Lane	1	Merge Analysis not applied.											
North Exit: Midway Rd Merge Type: Priority													
Exit Short Lane	2	50	0.0	712	776	3.00	2.00	119	994	0.120	1.6	2.0	
Merge Lane	1	-	100.0	Merge Lane is not Opposed				712	1800	0.396	0.0	0.0	
West Exit: Hegan Ln Merge Type: Not Applied													
Full Length Lane	1	Merge Analysis not applied.											

LANE SUMMARY

 **Site: 5 [Hegan Ln/Otterson Dr (Site Folder: AM Peak Hour - 2025)]**

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	DEMAND FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h	HV] %						[Veh ft	Dist] ft				
South: NB - Dwy													
Lane 1 ^d	3	4.0	1009	0.003	100	5.3	LOS A	0.0	0.4	Full	125	0.0	0.0
Approach	3	4.0		0.003		5.3	LOS A	0.0	0.4				
East: Hegan Ln													
Lane 1 ^d	612	4.0	1298	0.472	100	4.1	LOS A	3.9	99.6	Full	600	0.0	0.0
Approach	612	4.0		0.472		4.1	LOS A	3.9	99.6				
North: Otterson Dr													
Lane 1 ^d	97	4.0	1054	0.092	100	10.6	LOS B	0.5	12.0	Full	1200	0.0	0.0
Approach	97	4.0		0.092		10.6	LOS B	0.5	12.0				
West: Hegan Ln													
Lane 1 ^d	227	4.0	1214	0.187	100	4.9	LOS A	1.1	28.2	Full	650	0.0	0.0
Approach	227	4.0		0.187		4.9	LOS A	1.1	28.2				
Intersection	939	4.0		0.472		4.9	LOS A	3.9	99.6				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: NB - Dwy											
Mov.	L2	T1	R2	Total	%HV						
From S To Exit:	W	N	E			Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	1	1	1	3	4.0	1009	0.003	100	NA	NA	
Approach	1	1	1	3	4.0		0.003				
East: Hegan Ln											
Mov.	L2	T1	R2	Total	%HV						
From E To Exit:	S	W	N			Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	1	256	355	612	4.0	1298	0.472	100	NA	NA	
Approach	1	256	355	612	4.0		0.472				
North: Otterson Dr											
Mov.	L2	T1	R2	Total	%HV						
From N						Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane	

To Exit:	E	S	W			veh/h	v/c	%	%	No.
Lane 1	87	1	9	97	4.0	1054	0.092	100	NA	NA
Approach	87	1	9	97	4.0		0.092			
West: Hegan Ln										
Mov.	L2	T1	R2	Total	%HV					
From W						Cap.	Deg.	Lane	Prob.	Ov.
To Exit:	N	E	S			veh/h	satn v/c	Util. SL	Ov. %	Lane No.
Lane 1	20	206	1	227	4.0	1214	0.187	100	NA	NA
Approach	20	206	1	227	4.0		0.187			
Total %HV Deg.Satn (v/c)										
Intersection	939	4.0		0.472						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis											
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: NB - Dwy Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
East Exit: Hegan Ln Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
North Exit: Otterson Dr Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
West Exit: Hegan Ln Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									

LANE SUMMARY

 **Site: 101 [E Park Ave/Scott Ave (Site Folder: AM Peak Hour - 2025)]**

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	DEMAND FLOWS [Total HV]		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE [Veh Dist]		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	v/c	%	sec			ft		ft	%	%
South: Scott Ave NB													
Lane 1 ^d	69	12.0	489	0.142	100	11.6	LOS B	0.9	24.4	Full	1600	0.0	0.0
Approach	69	12.0		0.142		11.6	LOS B	0.9	24.4				
East: E Park Ave WB													
Lane 1 ^d	859	12.0	1222	0.703	100	4.5	LOS A	11.4	313.0	Full	1600	0.0	0.0
Approach	859	12.0		0.703		4.5	LOS A	11.4	313.0				
West: E Park Ave EB													
Lane 1 ^d	824	12.0	1134	0.727	100	5.3	LOS A	8.9	244.5	Full	1600	0.0	0.0
Approach	824	12.0		0.727		5.3	LOS A	8.9	244.5				
Intersection	1753	12.0		0.727		5.1	LOS A	11.4	313.0				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)										
South: Scott Ave NB										
Mov.	L2	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From S To Exit:	W	E			Cap. veh/h	v/c	%	%		
Lane 1	6	63	69	12.0	489	0.142	100	NA	NA	
Approach	6	63	69	12.0		0.142				
East: E Park Ave WB										
Mov.	L2	T1	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From E To Exit:	S	W			Cap. veh/h	v/c	%	%		
Lane 1	72	787	859	12.0	1222	0.703	100	NA	NA	
Approach	72	787	859	12.0		0.703				
West: E Park Ave EB										
Mov.	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From W To Exit:	E	S			Cap. veh/h	v/c	%	%		
Lane 1	791	34	824	12.0	1134	0.727	100	NA	NA	
Approach	791	34	824	12.0		0.727				

	Total	%HV	Deg. Satn (v/c)
Intersection	1753	12.0	0.727

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis											
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Scott Ave NB Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
East Exit: E Park Ave WB Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
West Exit: E Park Ave EB Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									

LANE SUMMARY

 **Site: 2 [Midway Rd/E Park Ave/Park Ave (Site Folder: PM Peak Hour - 2025)]**

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	DEMAND FLOWS [Total HV] veh/h %		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh Dist] ft		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Midway Rd													
Lane 1	314	5.0	875	0.359	100	6.8	LOS A	2.5	63.8	Full	650	0.0	0.0
Lane 2 ^d	711	5.0	1162	0.612	100	7.3	LOS A	6.3	164.2	Short	200	0.0	NA
Approach	1025	5.0		0.612		7.2	LOS A	6.3	164.2				
East: E Park Ave													
Lane 1 ^d	558	5.0	1227	0.455	100	11.1	LOS B	3.6	94.3	Full	300	0.0	0.0
Lane 2	319	5.0	971	0.328	100	5.7	LOS A	2.2	57.1	Full	300	0.0	0.0
Approach	877	5.0		0.455		9.2	LOS A	3.6	94.3				
North: Park Ave													
Lane 1 ^d	365	5.0	997	0.366	100	13.0	LOS B	2.8	72.8	Full	650	0.0	0.0
Lane 2	235	5.0	771	0.305	100	7.9	LOS A	2.0	53.3	Full	650	0.0	0.0
Approach	600	5.0		0.366		11.0	LOS B	2.8	72.8				
West: Dwy													
Lane 1 ^d	8	5.0	531	0.016	100	8.0	LOS A	0.1	1.7	Full	100	0.0	0.0
Approach	8	5.0		0.016		8.0	LOS A	0.1	1.7				
Intersection	2510	5.0		0.612		8.8	LOS A	6.3	164.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: Midway Rd											
Mov.	L2	T1	R2	Total	%HV						
From S						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	W	N	E			veh/h	v/c	Util. SL	Ov. %	Lane No.	
Lane 1	1	313	-	314	5.0	875	0.359	100	NA	NA	
Lane 2	-	-	711	711	5.0	1162	0.612	100	0.0	1	
Approach	1	313	711	1025	5.0		0.612				
East: E Park Ave											
Mov.	L2	T1	R2	Total	%HV						
From E						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	S	W	N			veh/h	v/c	Util. %	Ov. %	Lane No.	
Lane 1	553	5	-	558	5.0	1227	0.455	100	NA	NA	

Lane 2	-	-	319	319	5.0	971	0.328	100	NA	NA
Approach	553	5	319	877	5.0	0.455				
North: Park Ave										
Mov.	L2	T1	R2	Total	%HV					
From N						Cap.	Deg.	Lane	Prob.	Ov.
To Exit:	E	S	W			veh/h	Satn	Util.	SL	Lane
							v/c	%	%	No.
Lane 1	365	-	-	365	5.0	997	0.366	100	NA	NA
Lane 2	-	234	1	235	5.0	771	0.305	100	NA	NA
Approach	365	234	1	600	5.0	0.366				
West: Dwy										
Mov.	L2	T1	R2	Total	%HV					
From W						Cap.	Deg.	Lane	Prob.	Ov.
To Exit:	N	E	S			veh/h	Satn	Util.	SL	Lane
							v/c	%	%	No.
Lane 1	2	5	1	8	5.0	531	0.016	100	NA	NA
Approach	2	5	1	8	5.0	0.016				
Total %HV Deg.Satn (v/c)										
Intersection	2510	5.0		0.612						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: Midway Rd Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: E Park Ave Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Park Ave Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: Dwy Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

 **Site: 3 [Fair St/E Park Ave (Site Folder: PM Peak Hour - 2025)]**

New Site

Site Category: (None)

Roundabout

Lane Use and Performance													
	DEMAND FLOWS [Total HV] veh/h %		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh Dist] ft		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Fair St													
Lane 1 ^d	71	5.0	556	0.127	100	10.6	LOS B	0.5	13.4	Full	800	0.0	0.0
Approach	71	5.0		0.127		10.6	LOS B	0.5	13.4				
East: E Park Ave													
Lane 1	414	5.0	1176	0.352	100	5.4	LOS A	2.3	60.6	Full	575	0.0	0.0
Lane 2 ^d	485	5.0	1378	0.352	100	5.1	LOS A	2.4	62.4	Full	575	0.0	0.0
Approach	899	5.0		0.352		5.2	LOS A	2.4	62.4				
North: Fair St													
Lane 1 ^d	228	5.0	677	0.337	100	9.5	LOS A	1.5	39.7	Full	200	0.0	0.0
Approach	228	5.0		0.337		9.5	LOS A	1.5	39.7				
West: E Park Ave													
Lane 1	497	5.0	1206	0.412	100	6.3	LOS A	3.1	81.6	Full	300	0.0	0.0
Lane 2 ^d	578	5.0	1401	0.412	100	4.5	LOS A	3.2	84.1	Full	300	0.0	0.0
Approach	1075	5.0		0.412		5.3	LOS A	3.2	84.1				
Intersection	2273	5.0		0.412		5.9	LOS A	3.2	84.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if $v/c > 1$ irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)										
South: Fair St										
Mov. From S To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	28	26	17	71	5.0	556	0.127	100	NA	NA
Approach	28	26	17	71	5.0	0.127				
East: E Park Ave										
Mov. From E To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	6	408	-	414	5.0	1176	0.352	100	NA	NA
Lane 2	-	358	127	485	5.0	1378	0.352	100	NA	NA
Approach	6	766	127	899	5.0	0.352				
North: Fair St										

Mov. From N To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	128	17	83	228	5.0	677	0.337	100	NA	NA
Approach	128	17	83	228	5.0		0.337			
West: E Park Ave										
Mov. From W To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	136	361	-	497	5.0	1206	0.412	100	NA	NA
Lane 2	-	573	5	578	5.0	1401	0.412	100	NA	NA
Approach	136	933	5	1075	5.0		0.412			
Total %HV Deg.Satn (v/c)										
Intersection	2273	5.0		0.412						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis											
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Fair St Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
East Exit: E Park Ave Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									
North Exit: Fair St Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
West Exit: E Park Ave Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									

LANE SUMMARY

 **Site: 4 [Midway Rd/Hegan Ln (Site Folder: PM Peak Hour - 2025)]**

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	DEMAND FLOWS [Total HV] veh/h %		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh Dist] ft		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Midway Rd													
Lane 1 ^d	396	4.0	831	0.477	100	8.3	LOS A	3.1	80.2	Full	900	0.0	0.0
Lane 2	64	4.0	474	0.135	28 ⁶	11.5	LOS B	0.6	14.7	Short	50	0.0	NA
Approach	460	4.0		0.477		8.7	LOS A	3.1	80.2				
East: Dwy													
Lane 1 ^d	11	4.0	506	0.021	100	10.9	LOS B	0.1	2.5	Full	120	0.0	0.0
Approach	11	4.0		0.021		10.9	LOS B	0.1	2.5				
North: Midway Rd													
Lane 1 ^d	467	4.0	1482	0.315	100	4.1	LOS A	2.3	60.5	Full	350	0.0	0.0
Lane 2	335	4.0	1291	0.260	100	4.3	LOS A	1.8	45.8	Short	100	0.0	NA
Approach	802	4.0		0.315		4.2	LOS A	2.3	60.5				
West: Hegan Ln													
Lane 1 ^d	552	4.0	1104	0.500	100	12.9	LOS B	3.9	100.0	Short	100	0.0	NA
Lane 2	146	4.0	727	0.201	40 ⁶	13.4	LOS B	1.1	28.4	Full	400	0.0	0.0
Approach	698	4.0		0.500		13.0	LOS B	3.9	100.0				
Intersection	1971	4.0		0.500		8.4	LOS A	3.9	100.0				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

⁶ Lane under-utilisation due to downstream effects

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: Midway Rd											
Mov.	L2	T1	R2	Total	%HV						
From S To Exit:	W	N	E			Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	48	348	-	396	4.0	831	0.477	100	NA	NA	
Lane 2	-	63	1	64	4.0	474	0.135	28 ⁶	0.0	1	
Approach	48	411	1	460	4.0		0.477				
East: Dwy											
Mov.	L2	T1	R2	Total	%HV						
From E To Exit:	S	W	N			Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	

Lane 1	3	1	6	11	4.0	506	0.021	100	NA	NA
Approach	3	1	6	11	4.0		0.021			
North: Midway Rd										
Mov.	L2	T1	R2	Total	%HV					
From N						Cap.	Deg.	Lane	Prob.	Ov.
To Exit:	E	S	W			veh/h	Satn	Util.	SL	Lane
							v/c	%	%	No.
Lane 1	8	459	-	467	4.0	1482	0.315	100	NA	NA
Lane 2	-	-	335	335	4.0	1291	0.260	100	0.0	1
Approach	8	459	335	802	4.0		0.315			
West: Hegan Ln										
Mov.	L2	T1	R2	Total	%HV					
From W						Cap.	Deg.	Lane	Prob.	Ov.
To Exit:	N	E	S			veh/h	Satn	Util.	SL	Lane
							v/c	%	%	No.
Lane 1	552	-	-	552	4.0	1104	0.500	100	5.0	2
Lane 2	93	1	52	146	4.0	727	0.201	40 ⁶	NA	NA
Approach	645	1	52	698	4.0		0.500			
Total %HV Deg.Satn (v/c)										
Intersection	1971	4.0		0.500						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

⁶ Lane under-utilisation due to downstream effects

Merge Analysis												
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Midway Rd Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Dwy Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Midway Rd Merge Type: Priority												
Exit Short Lane	2	50	0.0	900	936	3.00	2.00	163	823	0.197	2.3	3.0
Merge Lane	1	-	100.0	Merge Lane is not Opposed				900	1800	0.500	0.0	0.0
West Exit: Hegan Ln Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

 **Site: 5 [Hegan Ln/Otterson Dr (Site Folder: PM Peak Hour - 2025)]**

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	DEMAND FLOWS [Total HV]		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE [Veh Dist]		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	v/c	%	sec			ft		ft	%	%
South: NB - Dwy													
Lane 1 ^d	3	2.0	711	0.005	100	8.0	LOS A	0.0	0.7	Full	125	0.0	0.0
Approach	3	2.0		0.005		8.0	LOS A	0.0	0.7				
East: Hegan Ln													
Lane 1 ^d	385	2.0	1321	0.291	100	4.0	LOS A	2.1	52.1	Full	600	0.0	0.0
Approach	385	2.0		0.291		4.0	LOS A	2.1	52.1				
North: Otterson Dr													
Lane 1 ^d	379	2.0	1061	0.358	100	11.1	LOS B	2.2	56.9	Full	1200	0.0	0.0
Approach	379	2.0		0.358		11.1	LOS B	2.2	56.9				
West: Hegan Ln													
Lane 1 ^d	385	2.0	974	0.396	100	6.6	LOS A	2.7	69.4	Full	650	0.0	0.0
Approach	385	2.0		0.396		6.6	LOS A	2.7	69.4				
Intersection	1153	2.0		0.396		7.2	LOS A	2.7	69.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: NB - Dwy											
Mov.	L2	T1	R2	Total	%HV						
From S To Exit:	W	N	E			Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	1	1	1	3	2.0	711	0.005	100	NA	NA	
Approach	1	1	1	3	2.0		0.005				
East: Hegan Ln											
Mov.	L2	T1	R2	Total	%HV						
From E To Exit:	S	W	N			Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	3	276	106	385	2.0	1321	0.291	100	NA	NA	
Approach	3	276	106	385	2.0		0.291				
North: Otterson Dr											
Mov.	L2	T1	R2	Total	%HV						
From N						Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane	

To Exit:	E	S	W			veh/h	v/c	%	%	No.
Lane 1	345	1	33	379	2.0	1061	0.358	100	NA	NA
Approach	345	1	33	379	2.0		0.358			
West: Hegan Ln										
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.
From W						Cap.	Satn	Util.	SL	Lane
To Exit:	N	E	S			veh/h	v/c	%	%	No.
Lane 1	20	364	1	385	2.0	974	0.396	100	NA	NA
Approach	20	364	1	385	2.0		0.396			
Total %HV Deg.Satn (v/c)										
Intersection	1153	2.0		0.396						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Lane Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: NB - Dwy Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Hegan Ln Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Otterson Dr Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: Hegan Ln Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

 Site: 101 [E Park Ave/Scott Ave (Site Folder: PM Peak Hour - 2025)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	DEMAND FLOWS [Total HV] veh/h %		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh Dist] ft		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block.
South: Scott Ave NB													
Lane 1 ^d	65	6.0	280	0.233	100	17.7	LOS B	1.7	45.1	Full	1600	0.0	0.0
Approach	65	6.0		0.233		17.7	LOS B	1.7	45.1				
East: E Park Ave WB													
Lane 1 ^d	975	6.0	1290	0.756	100	4.3	LOS A	15.2	397.8	Full	1600	0.0	0.0
Approach	975	6.0		0.756		4.3	LOS A	15.2	397.8				
West: E Park Ave EB													
Lane 1 ^d	1118	6.0	1234	0.906	100	5.7	LOS A	24.0	629.4	Full	1600	0.0	0.0
Approach	1118	6.0		0.906		5.7	LOS A	24.0	629.4				
Intersection	2159	6.0		0.906		5.5	LOS A	24.0	629.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)										
South: Scott Ave NB										
Mov.	L2	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From S To Exit:	W	E			Cap. veh/h	v/c	%	%		
Lane 1	8	58	65	6.0	280	0.233	100	NA	NA	
Approach	8	58	65	6.0		0.233				
East: E Park Ave WB										
Mov.	L2	T1	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From E To Exit:	S	W			Cap. veh/h	v/c	%	%		
Lane 1	50	925	975	6.0	1290	0.756	100	NA	NA	
Approach	50	925	975	6.0		0.756				
West: E Park Ave EB										
Mov.	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From W To Exit:	E	S			Cap. veh/h	v/c	%	%		
Lane 1	1100	18	1118	6.0	1234	0.906	100	NA	NA	
Approach	1100	18	1118	6.0		0.906				

	Total	%HV	Deg. Satn (v/c)
Intersection	2159	6.0	0.906

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis											
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Scott Ave NB Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
East Exit: E Park Ave WB Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
West Exit: E Park Ave EB Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									

LANE SUMMARY

 **Site: 101 [E Park Ave/Scott Ave (Site Folder: AM Peak Hour - Yr 2040)]**

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	DEMAND FLOWS [Total HV] veh/h %		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh Dist] ft		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block.
South: Scott Ave NB													
Lane 1 ^d	84	12.0	457	0.184	100	13.5	LOS B	1.2	34.0	Full	1600	0.0	0.0
Approach	84	12.0		0.184		13.5	LOS B	1.2	34.0				
East: E Park Ave WB													
Lane 1 ^d	984	12.0	1536	0.641	100	4.5	LOS A	9.0	245.3	Full	1600	0.0	0.0
Approach	984	12.0		0.641		4.5	LOS A	9.0	245.3				
West: E Park Ave EB													
Lane 1 ^d	942	12.0	1317	0.715	100	5.1	LOS A	8.4	230.1	Full	1600	0.0	0.0
Approach	942	12.0		0.715		5.1	LOS A	8.4	230.1				
Intersection	2011	12.0		0.715		5.1	LOS A	9.0	245.3				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)										
South: Scott Ave NB										
Mov.	L2	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov. Lane	
From S To Exit:	W	E			Cap. veh/h	v/c	%	%	No.	
Lane 1	11	74	84	12.0	457	0.184	100	NA	NA	
Approach	11	74	84	12.0		0.184				
East: E Park Ave WB										
Mov.	L2	T1	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov. Lane	
From E To Exit:	S	W			Cap. veh/h	v/c	%	%	No.	
Lane 1	84	900	984	12.0	1536	0.641	100	NA	NA	
Approach	84	900	984	12.0		0.641				
West: E Park Ave EB										
Mov.	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov. Lane	
From W To Exit:	E	S			Cap. veh/h	v/c	%	%	No.	
Lane 1	905	37	942	12.0	1317	0.715	100	NA	NA	
Approach	905	37	942	12.0		0.715				

	Total	%HV	Deg. Satn (v/c)
Intersection	2011	12.0	0.715

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis											
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Scott Ave NB Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
East Exit: E Park Ave WB Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
West Exit: E Park Ave EB Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									

LANE SUMMARY

 **Site: 2 [Midway Rd/E Park Ave/Park Ave (Site Folder: AM Peak Hour - Yr 2040)]**

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	DEMAND FLOWS [Total HV] veh/h %		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh Dist] ft		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Midway Rd													
Lane 1	295	9.0	887	0.332	100	6.7	LOS A	2.3	62.0	Full	650	0.0	0.0
Lane 2 ^d	582	9.0	1164	0.499	100	6.3	LOS A	4.3	116.5	Short	200	0.0	NA
Approach	876	9.0		0.499		6.4	LOS A	4.3	116.5				
East: E Park Ave													
Lane 1 ^d	755	9.0	1262	0.599	100	11.5	LOS B	5.7	152.2	Full	300	0.0	0.0
Lane 2	266	9.0	919	0.290	100	5.8	LOS A	1.8	49.6	Full	300	0.0	0.0
Approach	1022	9.0		0.599		10.0	LOS B	5.7	152.2				
North: Park Ave													
Lane 1 ^d	348	9.0	776	0.448	100	15.5	LOS B	4.0	107.6	Full	650	0.0	0.0
Lane 2	288	9.0	565	0.510	100	13.3	LOS B	4.4	119.0	Full	650	0.0	0.0
Approach	636	9.0		0.510		14.5	LOS B	4.4	119.0				
West: Dwy													
Lane 1 ^d	8	9.0	425	0.018	100	9.8	LOS A	0.1	2.3	Full	100	0.0	0.0
Approach	8	9.0		0.018		9.8	LOS A	0.1	2.3				
Intersection	2541	9.0		0.599		9.9	LOS A	5.7	152.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: Midway Rd											
Mov.	L2	T1	R2	Total	%HV						
From S						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	W	N	E			veh/h	v/c	Util. SL	Ov. %	Lane No.	
Lane 1	1	293	-	295	9.0	887	0.332	100	NA	NA	
Lane 2	-	-	582	582	9.0	1164	0.499	100	0.0	1	
Approach	1	293	582	876	9.0		0.499				
East: E Park Ave											
Mov.	L2	T1	R2	Total	%HV						
From E						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	S	W	N			veh/h	v/c	Util. %	Ov. %	Lane No.	
Lane 1	750	5	-	755	9.0	1262	0.599	100	NA	NA	

Lane 2	-	-	266	266	9.0	919	0.290	100	NA	NA
Approach	750	5	266	1022	9.0	0.599				
North: Park Ave										
Mov.	L2	T1	R2	Total	%HV					
From N						Cap.	Deg.	Lane	Prob.	Ov.
To Exit:	E	S	W			veh/h	Satn	Util.	SL	Lane
							v/c	%	%	No.
Lane 1	348	-	-	348	9.0	776	0.448	100	NA	NA
Lane 2	-	283	5	288	9.0	565	0.510	100	NA	NA
Approach	348	283	5	636	9.0	0.510				
West: Dwy										
Mov.	L2	T1	R2	Total	%HV					
From W						Cap.	Deg.	Lane	Prob.	Ov.
To Exit:	N	E	S			veh/h	Satn	Util.	SL	Lane
							v/c	%	%	No.
Lane 1	1	5	1	8	9.0	425	0.018	100	NA	NA
Approach	1	5	1	8	9.0	0.018				
Total %HV Deg.Satn (v/c)										
Intersection	2541	9.0		0.599						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: Midway Rd Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: E Park Ave Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Park Ave Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: Dwy Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

 Site: 3 [Fair St/E Park Ave (Site Folder: AM Peak Hour - Yr 2040)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	DEMAND FLOWS [Total HV] veh/h %		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh Dist] ft		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Fair St													
Lane 1 ^d	31	10.0	608	0.051	100	10.6	LOS B	0.2	5.4	Full	800	0.0	0.0
Approach	31	10.0		0.051		10.6	LOS B	0.2	5.4				
East: E Park Ave													
Lane 1	412	10.0	1221	0.337	100	5.0	LOS A	2.3	60.9	Full	575	0.0	0.0
Lane 2 ^d	490	10.0	1453	0.337	100	4.8	LOS A	2.3	62.4	Full	575	0.0	0.0
Approach	902	10.0		0.337		4.9	LOS A	2.3	62.4				
North: Fair St													
Lane 1 ^d	299	10.0	679	0.440	100	10.0	LOS A	2.2	60.2	Full	200	0.0	0.0
Approach	299	10.0		0.440		10.0	LOS A	2.2	60.2				
West: E Park Ave													
Lane 1	403	10.0	1155	0.349	100	6.1	LOS A	2.5	66.8	Full	300	0.0	0.0
Lane 2 ^d	484	10.0	1388	0.349	100	4.5	LOS A	2.6	69.6	Full	300	0.0	0.0
Approach	887	10.0		0.349		5.2	LOS A	2.6	69.6				
Intersection	2119	10.0		0.440		5.8	LOS A	2.6	69.6				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: Fair St											
Mov.	L2	T1	R2	Total	%HV						
From S To Exit:	W	N	E			Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	15	10	5	31	10.0	608	0.051	100	NA	NA	
Approach	15	10	5	31	10.0		0.051				
East: E Park Ave											
Mov.	L2	T1	R2	Total	%HV						
From E To Exit:	S	W	N			Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	5	407	-	412	10.0	1221	0.337	100	NA	NA	
Lane 2	-	402	88	490	10.0	1453	0.337	100	NA	NA	
Approach	5	809	88	902	10.0		0.337				

North: Fair St											
Mov.	L2	T1	R2	Total	%HV						
From N						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	E	S	W			veh/h	v/c	Util. %	SL Ov. %	Lane No.	
Lane 1	144	10	144	299	10.0	679	0.440	100	NA	NA	
Approach	144	10	144	299	10.0		0.440				
West: E Park Ave											
Mov.	L2	T1	R2	Total	%HV						
From W						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	N	E	S			veh/h	v/c	Util. %	SL Ov. %	Lane No.	
Lane 1	93	310	-	403	10.0	1155	0.349	100	NA	NA	
Lane 2	-	469	15	484	10.0	1388	0.349	100	NA	NA	
Approach	93	778	15	887	10.0		0.349				
Total %HV Deg.Satn (v/c)											
Intersection	2119	10.0		0.440							

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis											
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Fair St Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
East Exit: E Park Ave Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									
North Exit: Fair St Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
West Exit: E Park Ave Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									

LANE SUMMARY

 **Site: 4 [Midway Rd/Hegan Ln (Site Folder: AM Peak Hour - Yr 2040)]**

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	DEMAND FLOWS [Total HV] veh/h %		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh Dist] ft		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Midway Rd													
Lane 1 ^d	571	9.0	942	0.606	100	7.8	LOS A	4.8	127.6	Full	900	0.0	0.0
Lane 2	89	9.0	523	0.171	28 ⁶	9.7	LOS A	0.7	19.1	Short	50	0.0	NA
Approach	660	9.0		0.606		8.0	LOS A	4.8	127.6				
East: Dwy													
Lane 1 ^d	8	9.0	543	0.015	100	11.0	LOS B	0.1	1.8	Full	120	0.0	0.0
Approach	8	9.0		0.015		11.0	LOS B	0.1	1.8				
North: Midway Rd													
Lane 1	409	9.0	1243	0.329	100	4.3	LOS A	2.4	63.1	Full	350	0.0	0.0
Lane 2 ^d	653	9.0	1521	0.430	100	4.4	LOS A	3.6	96.0	Short	100	0.0	NA
Approach	1063	9.0		0.430		4.4	LOS A	3.6	96.0				
West: Hegan Ln													
Lane 1 ^d	268	9.0	1131	0.237	100	11.9	LOS B	1.5	39.9	Short	100	0.0	NA
Lane 2	74	9.0	773	0.095	40 ⁶	11.9	LOS B	0.5	13.3	Full	400	0.0	0.0
Approach	342	9.0		0.237		11.9	LOS B	1.5	39.9				
Intersection	2073	9.0		0.606		6.8	LOS A	4.8	127.6				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

⁶ Lane under-utilisation due to downstream effects

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: Midway Rd											
Mov.	L2	T1	R2	Total	%HV						
From S						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	W	N	E			veh/h	Satn	Util.	SL Ov.	Lane	
							v/c	%	%	No.	
Lane 1	68	503	-	571	9.0	942	0.606	100	NA	NA	
Lane 2	-	88	1	89	9.0	523	0.171	28 ⁶	0.0	1	
Approach	68	591	1	660	9.0		0.606				
East: Dwy											
Mov.	L2	T1	R2	Total	%HV						
From E						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	S	W	N			veh/h	Satn	Util.	SL Ov.	Lane	
							v/c	%	%	No.	

Lane 1	6	1	1	8	9.0	543	0.015	100	NA	NA
Approach	6	1	1	8	9.0		0.015			
North: Midway Rd										
Mov.	L2	T1	R2	Total	%HV					
From N						Cap.	Deg.	Lane	Prob.	Ov.
To Exit:	E	S	W			veh/h	Satn	Util.	SL Ov.	Lane
							v/c	%	%	No.
Lane 1	6	403	-	409	9.0	1243	0.329	100	NA	NA
Lane 2	-	-	653	653	9.0	1521	0.430	100	3.8	1
Approach	6	403	653	1063	9.0		0.430			
West: Hegan Ln										
Mov.	L2	T1	R2	Total	%HV					
From W						Cap.	Deg.	Lane	Prob.	Ov.
To Exit:	N	E	S			veh/h	Satn	Util.	SL Ov.	Lane
							v/c	%	%	No.
Lane 1	268	-	-	268	9.0	1131	0.237	100	0.0	2
Lane 2	44	1	28	74	9.0	773	0.095	40 ⁶	NA	NA
Approach	313	1	28	342	9.0		0.237			
Total %HV Deg.Satn (v/c)										
Intersection	2073	9.0		0.606						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

⁶ Lane under-utilisation due to downstream effects

Merge Analysis												
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Midway Rd Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Dwy Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Midway Rd Merge Type: Priority												
Exit Short Lane	2	50	0.0	771	840	3.00	2.00	134	925	0.144	1.9	2.4
Merge Lane	1	-	100.0	Merge Lane is not Opposed				771	1800	0.428	0.0	0.0
West Exit: Hegan Ln Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

 **Site: 5 [Hegan Ln/Otterson Dr (Site Folder: AM Peak Hour - Yr 2040)]**

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	DEMAND FLOWS [Total HV] veh/h %		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh Dist] ft		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block.
South: NB - Dwy													
Lane 1 ^d	3	4.0	1048	0.003	100	5.4	LOS A	0.0	0.4	Full	125	0.0	0.0
Approach	3	4.0		0.003		5.4	LOS A	0.0	0.4				
East: Hegan Ln													
Lane 1 ^d	680	4.0	1583	0.430	100	4.0	LOS A	3.3	85.4	Full	600	0.0	0.0
Approach	680	4.0		0.430		4.0	LOS A	3.3	85.4				
North: Otterson Dr													
Lane 1 ^d	110	4.0	1101	0.100	100	10.6	LOS B	0.5	13.3	Full	1200	0.0	0.0
Approach	110	4.0		0.100		10.6	LOS B	0.5	13.3				
West: Hegan Ln													
Lane 1 ^d	251	4.0	1317	0.191	100	4.9	LOS A	1.1	29.3	Full	650	0.0	0.0
Approach	251	4.0		0.191		4.9	LOS A	1.1	29.3				
Intersection	1045	4.0		0.430		4.9	LOS A	3.3	85.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: NB - Dwy											
Mov.	L2	T1	R2	Total	%HV						
From S To Exit:	W	N	E			Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	1	1	1	3	4.0	1048	0.003	100	NA	NA	
Approach	1	1	1	3	4.0		0.003				
East: Hegan Ln											
Mov.	L2	T1	R2	Total	%HV						
From E To Exit:	S	W	N			Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	1	283	397	680	4.0	1583	0.430	100	NA	NA	
Approach	1	283	397	680	4.0		0.430				
North: Otterson Dr											
Mov.	L2	T1	R2	Total	%HV						
From N						Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane	

To Exit:	E	S	W			veh/h	v/c	%	%	No.
Lane 1	98	1	11	110	4.0	1101	0.100	100	NA	NA
Approach	98	1	11	110	4.0		0.100			
West: Hegan Ln										
Mov.	L2	T1	R2	Total	%HV					
From W						Cap.	Deg.	Lane	Prob.	Ov.
To Exit:	N	E	S			veh/h	satn	Util.	SL	Lane
Lane 1	22	228	1	251	4.0	1317	0.191	100	NA	NA
Approach	22	228	1	251	4.0		0.191			
Total %HV Deg.Satn (v/c)										
Intersection	1045	4.0		0.430						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Lane Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: NB - Dwy Merge Type: Not Applied												
Full Length Lane	1											Merge Analysis not applied.
East Exit: Hegan Ln Merge Type: Not Applied												
Full Length Lane	1											Merge Analysis not applied.
North Exit: Otterson Dr Merge Type: Not Applied												
Full Length Lane	1											Merge Analysis not applied.
West Exit: Hegan Ln Merge Type: Not Applied												
Full Length Lane	1											Merge Analysis not applied.

LANE SUMMARY

 **Site: 101 [E Park Ave/Scott Ave (Site Folder: PM Peak Hour - Yr 2040)]**

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	DEMAND FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total	HV]						[Veh	Dist]				
	veh/h	%	veh/h	v/c	%	sec			ft		ft	%	%
South: Scott Ave NB													
Lane 1 ^d	76	6.0	266	0.286	100	23.2	LOS C	2.2	57.9	Full	1600	0.0	0.0
Approach	76	6.0		0.286		23.2	LOS C	2.2	57.9				
East: E Park Ave WB													
Lane 1 ^d	1114	6.0	1627	0.685	100	4.3	LOS A	11.0	286.9	Full	1600	0.0	0.0
Approach	1114	6.0		0.685		4.3	LOS A	11.0	286.9				
West: E Park Ave EB													
Lane 1 ^d	1283	6.0	1480	0.866	100	5.1	LOS A	18.5	484.6	Full	1600	0.0	0.0
Approach	1283	6.0		0.866		5.1	LOS A	18.5	484.6				
Intersection	2473	6.0		0.866		5.3	LOS A	18.5	484.6				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)										
South: Scott Ave NB										
Mov.	L2	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov. Lane	
From S To Exit:	W	E			Cap. veh/h	v/c	%	%	No.	
Lane 1	11	65	76	6.0	266	0.286	100	NA	NA	
Approach	11	65	76	6.0		0.286				
East: E Park Ave WB										
Mov.	L2	T1	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov. Lane	
From E To Exit:	S	W			Cap. veh/h	v/c	%	%	No.	
Lane 1	60	1054	1114	6.0	1627	0.685	100	NA	NA	
Approach	60	1054	1114	6.0		0.685				
West: E Park Ave EB										
Mov.	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov. Lane	
From W To Exit:	E	S			Cap. veh/h	v/c	%	%	No.	
Lane 1	1261	22	1283	6.0	1480	0.866	100	NA	NA	
Approach	1261	22	1283	6.0		0.866				

	Total	%HV	Deg. Satn (v/c)
Intersection	2473	6.0	0.866

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis											
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Scott Ave NB Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
East Exit: E Park Ave WB Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
West Exit: E Park Ave EB Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									

LANE SUMMARY

 **Site: 2 [Midway Rd/E Park Ave/Park Ave (Site Folder: PM Peak Hour - Yr 2040)]**

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	DEMAND FLOWS [Total HV] veh/h %		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh Dist] ft		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Midway Rd													
Lane 1	360	5.0	876	0.411	100	7.1	LOS A	3.0	78.7	Full	650	0.0	0.0
Lane 2 ^d	813	5.0	1173	0.693	100	8.8	LOS A	8.9	230.9	Short	100	0.0	NA
Approach	1173	5.0		0.693		8.3	LOS A	8.9	230.9				
East: E Park Ave													
Lane 1 ^d	635	5.0	1250	0.508	100	11.4	LOS B	4.4	113.8	Full	300	0.0	0.0
Lane 2	365	5.0	967	0.377	100	6.0	LOS A	2.7	69.7	Full	300	0.0	0.0
Approach	1000	5.0		0.508		9.4	LOS A	4.4	113.8				
North: Park Ave													
Lane 1 ^d	417	5.0	977	0.426	100	13.5	LOS B	3.6	93.9	Full	650	0.0	0.0
Lane 2	267	5.0	729	0.366	100	8.6	LOS A	2.7	68.9	Full	650	0.0	0.0
Approach	683	5.0		0.426		11.6	LOS B	3.6	93.9				
West: Dwy													
Lane 1 ^d	11	5.0	516	0.022	100	9.5	LOS A	0.1	2.6	Full	100	0.0	0.0
Approach	11	5.0		0.022		9.5	LOS A	0.1	2.6				
Intersection	2868	5.0		0.693		9.5	LOS A	8.9	230.9				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: Midway Rd											
Mov.	L2	T1	R2	Total	%HV						
From S						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	W	N	E			veh/h	v/c	Util. SL	Ov. %	Lane No.	
Lane 1	1	359	-	360	5.0	876	0.411	100	NA	NA	
Lane 2	-	-	813	813	5.0	1173	0.693	100	42.6	1	
Approach	1	359	813	1173	5.0		0.693				
East: E Park Ave											
Mov.	L2	T1	R2	Total	%HV						
From E						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	S	W	N			veh/h	v/c	Util. SL	Ov. %	Lane No.	
Lane 1	630	5	-	635	5.0	1250	0.508	100	NA	NA	

Lane 2	-	-	365	365	5.0	967	0.377	100	NA	NA
Approach	630	5	365	1000	5.0	0.508				
North: Park Ave										
Mov.	L2	T1	R2	Total	%HV					
From N						Cap.	Deg.	Lane	Prob.	Ov.
To Exit:	E	S	W			veh/h	Satn	Util.	SL	Lane
							v/c	%	%	No.
Lane 1	417	-	-	417	5.0	977	0.426	100	NA	NA
Lane 2	-	266	1	267	5.0	729	0.366	100	NA	NA
Approach	417	266	1	683	5.0	0.426				
West: Dwy										
Mov.	L2	T1	R2	Total	%HV					
From W						Cap.	Deg.	Lane	Prob.	Ov.
To Exit:	N	E	S			veh/h	Satn	Util.	SL	Lane
							v/c	%	%	No.
Lane 1	5	5	1	11	5.0	516	0.022	100	NA	NA
Approach	5	5	1	11	5.0	0.022				
Total %HV Deg.Satn (v/c)										
Intersection	2868	5.0		0.693						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: Midway Rd Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: E Park Ave Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Park Ave Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: Dwy Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

 Site: 3 [Fair St/E Park Ave (Site Folder: PM Peak Hour - Yr 2040)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	DEMAND FLOWS [Total HV] veh/h %		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh Dist] ft		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Fair St													
Lane 1 ^d	83	5.0	554	0.150	100	10.6	LOS B	0.6	16.7	Full	800	0.0	0.0
Approach	83	5.0		0.150		10.6	LOS B	0.6	16.7				
East: E Park Ave													
Lane 1	462	5.0	1179	0.391	100	5.6	LOS A	2.7	70.6	Full	575	0.0	0.0
Lane 2 ^d	564	5.0	1442	0.391	100	5.2	LOS A	2.8	73.5	Full	575	0.0	0.0
Approach	1026	5.0		0.391		5.4	LOS A	2.8	73.5				
North: Fair St													
Lane 1 ^d	266	5.0	688	0.386	100	9.8	LOS A	1.9	49.6	Full	200	0.0	0.0
Approach	266	5.0		0.386		9.8	LOS A	1.9	49.6				
West: E Park Ave													
Lane 1	555	5.0	1213	0.457	100	6.5	LOS A	3.7	95.1	Full	300	0.0	0.0
Lane 2 ^d	674	5.0	1474	0.457	100	4.5	LOS A	3.8	99.3	Full	300	0.0	0.0
Approach	1229	5.0		0.457		5.4	LOS A	3.8	99.3				
Intersection	2604	5.0		0.457		6.0	LOS A	3.8	99.3				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: Fair St											
Mov.	L2	T1	R2	Total	%HV						
From S To Exit:	W	N	E			Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	31	31	21	83	5.0	554	0.150	100	NA	NA	
Approach	31	31	21	83	5.0		0.150				
East: E Park Ave											
Mov.	L2	T1	R2	Total	%HV						
From E To Exit:	S	W	N			Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	10	451	-	462	5.0	1179	0.391	100	NA	NA	
Lane 2	-	419	146	564	5.0	1442	0.391	100	NA	NA	
Approach	10	870	146	1026	5.0		0.391				

North: Fair St										
Mov.	L2	T1	R2	Total	%HV					
From N						Cap.	Deg.	Lane	Prob.	Ov.
To Exit:	E	S	W			veh/h	satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	146	21	99	266	5.0	688	0.386	100	NA	NA
Approach	146	21	99	266	5.0		0.386			
West: E Park Ave										
Mov.	L2	T1	R2	Total	%HV					
From W						Cap.	Deg.	Lane	Prob.	Ov.
To Exit:	N	E	S			veh/h	satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	156	399	-	555	5.0	1213	0.457	100	NA	NA
Lane 2	-	669	5	674	5.0	1474	0.457	100	NA	NA
Approach	156	1068	5	1229	5.0		0.457			
Total %HV Deg.Satn (v/c)										
Intersection	2604	5.0		0.457						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: Fair St Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: E Park Ave Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: Fair St Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: E Park Ave Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										

LANE SUMMARY

 Site: 4 [Midway Rd/Hegan Ln (Site Folder: PM Peak Hour - Yr 2040)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	DEMAND FLOWS [Total HV] veh/h %		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh Dist] ft		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Midway Rd													
Lane 1 ^d	466	4.0	668	0.697	100	12.7	LOS B	5.9	152.7	Full	900	0.0	0.0
Lane 2	61	4.0	347	0.176	25 ⁶	15.0	LOS B	0.7	18.4	Short	50	0.0	NA
Approach	527	4.0		0.697		12.9	LOS B	5.9	152.7				
East: Dwy													
Lane 1 ^d	17	4.0	449	0.038	100	13.0	LOS B	0.2	4.7	Full	120	0.0	0.0
Approach	17	4.0		0.038		13.0	LOS B	0.2	4.7				
North: Midway Rd													
Lane 1 ^d	538	4.0	1559	0.345	100	4.4	LOS A	2.8	71.1	Full	350	0.0	0.0
Lane 2	382	4.0	1315	0.290	100	4.7	LOS A	2.1	54.3	Short	100	0.0	NA
Approach	919	4.0		0.345		4.5	LOS A	2.8	71.1				
West: Hegan Ln													
Lane 1 ^d	590	4.0	1035	0.570	100	14.4	LOS B	5.4	138.2	Short	100	0.0	NA
Lane 2	207	4.0	731	0.283	50 ⁵	15.2	LOS B	1.7	43.1	Full	400	0.0	0.0
Approach	797	4.0		0.570		14.6	LOS B	5.4	138.2				
Intersection	2260	4.0		0.697		10.1	LOS B	5.9	152.7				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

⁵ Lane under-utilisation found by the program

⁶ Lane under-utilisation due to downstream effects

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: Midway Rd											
Mov.	L2	T1	R2	Total	%HV						
From S To Exit:	W	N	E			Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	54	412	-	466	4.0	668	0.697	100	NA	NA	
Lane 2	-	56	5	61	4.0	347	0.176	25 ⁶	0.0	1	
Approach	54	468	5	527	4.0		0.697				
East: Dwy											
Mov.	L2	T1	R2	Total	%HV						
From E To Exit:	S	W	N			Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	

Lane 1	5	1	11	17	4.0	449	0.038	100	NA	NA
Approach	5	1	11	17	4.0		0.038			
North: Midway Rd										
Mov.	L2	T1	R2	Total	%HV					
From N						Cap.	Deg.	Lane	Prob.	Ov.
To Exit:	E	S	W			veh/h	Satn	Util.	SL	Lane
							v/c	%	%	No.
Lane 1	11	527	-	538	4.0	1559	0.345	100	NA	NA
Lane 2	-	-	382	382	4.0	1315	0.290	100	0.0	1
Approach	11	527	382	919	4.0		0.345			
West: Hegan Ln										
Mov.	L2	T1	R2	Total	%HV					
From W						Cap.	Deg.	Lane	Prob.	Ov.
To Exit:	N	E	S			veh/h	Satn	Util.	SL	Lane
							v/c	%	%	No.
Lane 1	590	-	-	590	4.0	1035	0.570	100	15.5	2
Lane 2	146	1	59	207	4.0	731	0.283	50 ⁵	NA	NA
Approach	737	1	59	797	4.0		0.570			
Total %HV Deg.Satn (v/c)										
Intersection	2260	4.0		0.697						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

⁵ Lane under-utilisation found by the program

⁶ Lane under-utilisation due to downstream effects

Merge Analysis													
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Lane Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec		
South Exit: Midway Rd Merge Type: Not Applied													
Full Length Lane	1	Merge Analysis not applied.											
East Exit: Dwy Merge Type: Not Applied													
Full Length Lane	1	Merge Analysis not applied.											
North Exit: Midway Rd Merge Type: Priority													
Exit Short Lane	2	50	0.0	1002	1042	3.00	2.00	213	711	0.299	2.9	4.3	
Merge Lane	1	-	100.0	Merge Lane is not Opposed			1002	1800	0.557	0.0	0.0		
West Exit: Hegan Ln Merge Type: Not Applied													
Full Length Lane	1	Merge Analysis not applied.											

LANE SUMMARY

 **Site: 5 [Hegan Ln/Otterson Dr (Site Folder: PM Peak Hour - Yr 2040)]**

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	DEMAND FLOWS [Total HV] veh/h %		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh Dist] ft		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block.
South: NB - Dwy													
Lane 1 ^d	3	2.0	718	0.005	100	8.3	LOS A	0.0	0.7	Full	125	0.0	0.0
Approach	3	2.0		0.005		8.3	LOS A	0.0	0.7				
East: Hegan Ln													
Lane 1 ^d	418	2.0	1576	0.265	100	4.0	LOS A	1.9	47.7	Full	600	0.0	0.0
Approach	418	2.0		0.265		4.0	LOS A	1.9	47.7				
North: Otterson Dr													
Lane 1 ^d	414	2.0	1116	0.371	100	11.1	LOS B	2.4	60.4	Full	1200	0.0	0.0
Approach	414	2.0		0.371		11.1	LOS B	2.4	60.4				
West: Hegan Ln													
Lane 1 ^d	420	2.0	1011	0.415	100	6.6	LOS A	3.0	75.4	Full	650	0.0	0.0
Approach	420	2.0		0.415		6.6	LOS A	3.0	75.4				
Intersection	1255	2.0		0.415		7.2	LOS A	3.0	75.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: NB - Dwy											
Mov.	L2	T1	R2	Total	%HV						
From S To Exit:	W	N	E			Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	1	1	1	3	2.0	718	0.005	100	NA	NA	
Approach	1	1	1	3	2.0		0.005				
East: Hegan Ln											
Mov.	L2	T1	R2	Total	%HV						
From E To Exit:	S	W	N			Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	5	299	114	418	2.0	1576	0.265	100	NA	NA	
Approach	5	299	114	418	2.0		0.265				
North: Otterson Dr											
Mov.	L2	T1	R2	Total	%HV						
From N						Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane	

To Exit:	E	S	W			veh/h	v/c	%	%	No.
Lane 1	375	1	38	414	2.0	1116	0.371	100	NA	NA
Approach	375	1	38	414	2.0		0.371			
West: Hegan Ln										
Mov.	L2	T1	R2	Total	%HV					
From W						Cap.	Deg.	Lane	Prob.	Ov.
To Exit:	N	E	S			veh/h	satn	Util.	SL	Lane
Lane 1	22	397	1	420	2.0	1011	0.415	100	NA	NA
Approach	22	397	1	420	2.0		0.415			
Total %HV Deg.Satn (v/c)										
Intersection	1255	2.0		0.415						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Lane Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: NB - Dwy Merge Type: Not Applied												
Full Length Lane	1											Merge Analysis not applied.
East Exit: Hegan Ln Merge Type: Not Applied												
Full Length Lane	1											Merge Analysis not applied.
North Exit: Otterson Dr Merge Type: Not Applied												
Full Length Lane	1											Merge Analysis not applied.
West Exit: Hegan Ln Merge Type: Not Applied												
Full Length Lane	1											Merge Analysis not applied.

LANE SUMMARY

 **Site: 2 [Midway Rd/E Park Ave/Park Ave (Site Folder: AM Peak Hour - Yr 2025 RI/RO)]**

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	DEMAND FLOWS [Total HV] veh/h %		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh Dist] ft		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Midway Rd													
Lane 1	253	9.0	835	0.303	100	7.3	LOS A	2.0	53.3	Full	650	0.0	0.0
Lane 2 ^d	510	9.0	1113	0.458	100	6.7	LOS A	3.7	98.8	Short	200	0.0	NA
Approach	763	9.0		0.458		6.9	LOS A	3.7	98.8				
East: E Park Ave													
Lane 1 ^d	803	7.4	1331	0.604	100	11.6	LOS B	5.7	152.0	Full	300	0.0	0.0
Lane 2	234	9.0	921	0.254	100	5.5	LOS A	1.6	42.1	Full	300	0.0	0.0
Approach	1037	7.7		0.604		10.2	LOS B	5.7	152.0				
North: Park Ave													
Lane 1 ^d	305	9.0	750	0.407	100	15.3	LOS B	3.5	93.2	Full	650	0.0	0.0
Lane 2	247	9.0	542	0.456	100	12.8	LOS B	3.7	99.1	Full	650	0.0	0.0
Approach	552	9.0		0.456		14.2	LOS B	3.7	99.1				
West: Dwy													
Lane 1 ^d	4	9.0	435	0.010	100	10.1	LOS B	0.0	1.3	Full	100	0.0	0.0
Approach	4	9.0		0.010		10.1	LOS B	0.0	1.3				
Intersection	2357	8.4		0.604		10.1	LOS B	5.7	152.0				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: Midway Rd											
Mov.	L2	T1	R2	Total	%HV						
From S						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	W	N	E			veh/h	v/c	Util.	SL Ov.	Lane	No.
								%	%		
Lane 1	1	252	-	253	9.0	835	0.303	100	NA	NA	
Lane 2	-	-	510	510	9.0	1113	0.458	100	0.0	1	
Approach	1	252	510	763	9.0		0.458				
East: E Park Ave											
Mov.	U	L2	T1	R2	Total	%HV					
From E							Cap.	Deg.	Lane	Prob.	Ov.
To Exit:	E	S	W	N			veh/h	v/c	Util.	SL Ov.	Lane
									%	%	No.
Lane 1	145	658	1	-	803	7.4	1331	0.604	100	NA	NA

Lane 2	-	-	-	234	234	9.0	921	0.254	100	NA	NA
Approach	145	658	1	234	1037	7.7		0.604			
North: Park Ave											
Mov.	L2	T1	R2	Total	%HV			Deg.	Lane	Prob.	Ov.
From N							Cap.	Satn	Util.	SL	Lane
To Exit:	E	S	W				veh/h	v/c	%	%	No.
Lane 1	305	-	-	305	9.0		750	0.407	100	NA	NA
Lane 2	-	246	1	247	9.0		542	0.456	100	NA	NA
Approach	305	246	1	552	9.0			0.456			
West: Dwy											
Mov.	L2	T1	R2	Total	%HV			Deg.	Lane	Prob.	Ov.
From W							Cap.	Satn	Util.	SL	Lane
To Exit:	N	E	S				veh/h	v/c	%	%	No.
Lane 1	1	2	1	4	9.0		435	0.010	100	NA	NA
Approach	1	2	1	4	9.0			0.010			
Total %HV Deg.Satn (v/c)											
Intersection	2357	8.4		0.604							

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis											
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Midway Rd Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
East Exit: E Park Ave Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
North Exit: Park Ave Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
West Exit: Dwy Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									

LANE SUMMARY

 **Site: 101 [E Park Ave/Scott Ave (Site Folder: AM Peak Hour - Yr 2025 RI/RO)]**

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	DEMAND FLOWS [Total HV] veh/h %		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh Dist] ft		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Scott Ave NB													
Lane 1 ^d	98	12.0	559	0.175	100	11.2	LOS B	0.8	22.6	Full	1600	0.0	0.0
Approach	98	12.0		0.175		11.2	LOS B	0.8	22.6				
East: E Park Ave WB													
Lane 1	394	12.0	1209	0.326	100	5.9	LOS A	2.1	56.7	Full	1600	0.0	0.0
Lane 2 ^d	465	12.0	1428	0.326	100	4.5	LOS A	2.1	57.5	Full	1600	0.0	0.0
Approach	859	12.0		0.326		5.1	LOS A	2.1	57.5				
West: E Park Ave EB													
Lane 1	84	0.0	1104	0.076	100	12.7	LOS B	0.4	9.7	Short	100	0.0	NA
Lane 2 ^d	820	12.0	1487	0.552	100	4.5	LOS A	5.0	138.1	Full	1600	0.0	0.0
Approach	904	10.9		0.552		5.3	LOS A	5.0	138.1				
Intersection	1861	11.5		0.552		5.5	LOS A	5.0	138.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)										
South: Scott Ave NB										
Mov.	L2	R2	Total	%HV						
From S					Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	W	E			veh/h	v/c	Util.	SL Ov.	Lane	No.
Lane 1	31	67	98	12.0	559	0.175	100	NA	NA	
Approach	31	67	98	12.0		0.175				
East: E Park Ave WB										
Mov.	L2	T1	Total	%HV						
From E					Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	S	W			veh/h	v/c	Util.	SL Ov.	Lane	No.
Lane 1	78	316	394	12.0	1209	0.326	100	NA	NA	
Lane 2	-	465	465	12.0	1428	0.326	100	NA	NA	
Approach	78	781	859	12.0		0.326				
West: E Park Ave EB										
Mov.	U	T1	R2	Total	%HV					
From W					Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	W	E	S		veh/h	v/c	Util.	SL Ov.	Lane	No.

Lane 1	84	-	-	84	0.0	1104	0.076	100	0.0	2
Lane 2	-	786	34	820	12.0	1487	0.552	100	NA	NA
Approach	84	786	34	904	10.9		0.552			
Total %HV Deg.Satn (v/c)										
Intersection	1861	11.5		0.552						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis											
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Scott Ave NB Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
East Exit: E Park Ave WB Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
West Exit: E Park Ave EB Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									

LANE SUMMARY

 **Site: 2 [Midway Rd/E Park Ave/Park Ave (Site Folder: PM Peak Hour - Yr 2025 RI/RO)]**

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	DEMAND FLOWS [Total HV] veh/h %		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh Dist] ft		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Midway Rd													
Lane 1	314	5.0	827	0.379	100	7.7	LOS A	2.7	68.9	Full	650	0.0	0.0
Lane 2 ^d	711	5.0	1118	0.636	100	9.0	LOS A	7.3	189.2	Short	100	0.0	NA
Approach	1025	5.0		0.636		8.6	LOS A	7.3	189.2				
East: E Park Ave													
Lane 1 ^d	709	3.9	1319	0.538	100	11.7	LOS B	4.8	124.3	Full	300	0.0	0.0
Lane 2	319	5.0	985	0.324	100	5.6	LOS A	2.2	57.2	Full	300	0.0	0.0
Approach	1028	4.3		0.538		9.8	LOS A	4.8	124.3				
North: Park Ave													
Lane 1 ^d	365	5.0	914	0.399	100	13.9	LOS B	3.4	88.0	Full	650	0.0	0.0
Lane 2	235	5.0	674	0.349	100	9.2	LOS A	2.5	65.8	Full	650	0.0	0.0
Approach	600	5.0		0.399		12.1	LOS B	3.4	88.0				
West: Dwy													
Lane 1 ^d	8	5.0	519	0.016	100	8.6	LOS A	0.1	1.9	Full	100	0.0	0.0
Approach	8	5.0		0.016		8.6	LOS A	0.1	1.9				
Intersection	2662	4.7		0.636		9.9	LOS A	7.3	189.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)												
South: Midway Rd												
Mov.	L2	T1	R2	Total	%HV							
From S						Cap.	Deg.	Lane	Prob.	Ov.		
To Exit:	W	N	E			veh/h	v/c	Util.	SL Ov.	Lane		
								%	%	No.		
Lane 1	1	313	-	314	5.0	827	0.379	100	NA	NA		
Lane 2	-	-	711	711	5.0	1118	0.636	100	29.2	1		
Approach	1	313	711	1025	5.0		0.636					
East: E Park Ave												
Mov.	U	L2	T1	R2	Total	%HV						
From E						Cap.	Deg.	Lane	Prob.	Ov.		
To Exit:	E	S	W	N		veh/h	v/c	Util.	SL Ov.	Lane		
								%	%	No.		
Lane 1	151	553	5	-	709	3.9	1319	0.538	100	NA	NA	

Lane 2	-	-	-	319	319	5.0	985	0.324	100	NA	NA
Approach	151	553	5	319	1028	4.3	0.538				
North: Park Ave											
Mov.	L2	T1	R2	Total	%HV			Deg.	Lane	Prob.	Ov.
From N							Cap.	Satn	Util.	SL Ov.	Lane
To Exit:	E	S	W				veh/h	v/c	%	%	No.
Lane 1	365	-	-	365	5.0		914	0.399	100	NA	NA
Lane 2	-	234	1	235	5.0		674	0.349	100	NA	NA
Approach	365	234	1	600	5.0		0.399				
West: Dwy											
Mov.	L2	T1	R2	Total	%HV			Deg.	Lane	Prob.	Ov.
From W							Cap.	Satn	Util.	SL Ov.	Lane
To Exit:	N	E	S				veh/h	v/c	%	%	No.
Lane 1	2	5	1	8	5.0		519	0.016	100	NA	NA
Approach	2	5	1	8	5.0		0.016				
Total %HV Deg.Satn (v/c)											
Intersection	2662	4.7		0.636							

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis											
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Midway Rd Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
East Exit: E Park Ave Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
North Exit: Park Ave Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
West Exit: Dwy Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									

LANE SUMMARY

 **Site: 101 [E Park Ave/Scott Ave (Site Folder: PM Peak Hour - Yr 2025 RI/RO)]**

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	DEMAND FLOWS [Total HV] veh/h %		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh Dist] ft		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Scott Ave NB													
Lane 1 ^d	139	6.0	472	0.295	100	14.8	LOS B	1.6	40.6	Full	1600	0.0	0.0
Approach	139	6.0		0.295		14.8	LOS B	1.6	40.6				
East: E Park Ave WB													
Lane 1	444	6.0	1172	0.379	100	6.0	LOS A	2.5	66.3	Full	1600	0.0	0.0
Lane 2 ^d	531	6.0	1402	0.379	100	4.9	LOS A	2.6	68.3	Full	1600	0.0	0.0
Approach	975	6.0		0.379		5.4	LOS A	2.6	68.3				
West: E Park Ave EB													
Lane 1	142	0.0	1158	0.123	100	12.5	LOS B	0.7	17.1	Short	100	0.0	NA
Lane 2 ^d	1101	6.0	1631	0.675	100	4.3	LOS A	8.2	215.6	Full	1600	0.0	0.0
Approach	1243	5.3		0.675		5.3	LOS A	8.2	215.6				
Intersection	2358	5.6		0.675		5.9	LOS A	8.2	215.6				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)										
South: Scott Ave NB										
Mov.	L2	R2	Total	%HV						
From S					Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	W	E			veh/h	v/c	Util.	SL Ov.	Lane	No.
							%	%		
Lane 1	64	75	139	6.0	472	0.295	100	NA	NA	
Approach	64	75	139	6.0		0.295				
East: E Park Ave WB										
Mov.	L2	T1	Total	%HV						
From E					Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	S	W			veh/h	v/c	Util.	SL Ov.	Lane	No.
							%	%		
Lane 1	57	387	444	6.0	1172	0.379	100	NA	NA	
Lane 2	-	531	531	6.0	1402	0.379	100	NA	NA	
Approach	57	918	975	6.0		0.379				
West: E Park Ave EB										
Mov.	U	T1	R2	Total	%HV					
From W					Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	W	E	S		veh/h	v/c	Util.	SL Ov.	Lane	No.
							%	%		

Lane 1	142	-	-	142	0.0	1158	0.123	100	0.0	2
Lane 2	-	1083	18	1101	6.0	1631	0.675	100	NA	NA
Approach	142	1083	18	1243	5.3	0.675				
Total %HV Deg.Satn (v/c)										
Intersection	2358	5.6	0.675							

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis											
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Scott Ave NB Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
East Exit: E Park Ave WB Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
West Exit: E Park Ave EB Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									

LANE SUMMARY

 **Site: 2 [Midway Rd/E Park Ave/Park Ave (Site Folder: AM Peak Hour - Yr 2040 RI/RO)]**

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	DEMAND FLOWS [Total HV] veh/h %		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh Dist] ft		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Midway Rd													
Lane 1	295	9.0	776	0.380	100	8.0	LOS A	2.6	70.7	Full	650	0.0	0.0
Lane 2 ^d	582	9.0	1041	0.559	100	8.3	LOS A	5.4	146.0	Short	200	0.0	NA
Approach	876	9.0		0.559		8.2	LOS A	5.4	146.0				
East: E Park Ave													
Lane 1 ^d	924	7.4	1276	0.724	100	13.5	LOS B	9.5	251.5	Full	300	0.0	0.0
Lane 2	266	9.0	880	0.303	100	5.9	LOS A	2.0	52.6	Full	300	0.0	0.0
Approach	1190	7.7		0.724		11.8	LOS B	9.5	251.5				
North: Park Ave													
Lane 1 ^d	348	9.0	589	0.591	100	22.4	LOS C	6.8	182.2	Full	650	0.0	0.0
Lane 2	288	9.0	414	0.695	100	25.4	LOS C	7.7	205.0	Full	650	0.0	0.0
Approach	636	9.0		0.695		23.8	LOS C	7.7	205.0				
West: Dwy													
Lane 1 ^d	8	9.0	345	0.022	100	12.3	LOS B	0.1	3.0	Full	100	0.0	0.0
Approach	8	9.0		0.022		12.3	LOS B	0.1	3.0				
Intersection	2710	8.4		0.724		13.4	LOS B	9.5	251.5				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: Midway Rd											
Mov.	L2	T1	R2	Total	%HV						
From S						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	W	N	E			veh/h	v/c	Util.	SL Ov.	Lane	No.
								%	%		
Lane 1	1	293	-	295	9.0	776	0.380	100	NA	NA	
Lane 2	-	-	582	582	9.0	1041	0.559	100	0.0	1	
Approach	1	293	582	876	9.0		0.559				
East: E Park Ave											
Mov.	U	L2	T1	R2	Total	%HV					
From E											
To Exit:	E	S	W	N		Cap.	Deg.	Lane	Prob.	Ov.	
						veh/h	v/c	Util.	SL Ov.	Lane	No.
								%	%		
Lane 1	168	750	5	-	924	7.4	1276	0.724	100	NA	NA

Lane 2	-	-	-	266	266	9.0	880	0.303	100	NA	NA
Approach	168	750	5	266	1190	7.7		0.724			
North: Park Ave											
Mov.	L2	T1	R2	Total	%HV			Deg.	Lane	Prob.	Ov.
From N							Cap.	Satn	Util.	SL Ov.	Lane
To Exit:	E	S	W				veh/h	v/c	%	%	No.
Lane 1	348	-	-	348	9.0		589	0.591	100	NA	NA
Lane 2	-	283	5	288	9.0		414	0.695	100	NA	NA
Approach	348	283	5	636	9.0			0.695			
West: Dwy											
Mov.	L2	T1	R2	Total	%HV			Deg.	Lane	Prob.	Ov.
From W							Cap.	Satn	Util.	SL Ov.	Lane
To Exit:	N	E	S				veh/h	v/c	%	%	No.
Lane 1	1	5	1	8	9.0		345	0.022	100	NA	NA
Approach	1	5	1	8	9.0			0.022			
Total %HV Deg.Satn (v/c)											
Intersection	2710	8.4		0.724							

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis											
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Midway Rd Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
East Exit: E Park Ave Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
North Exit: Park Ave Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
West Exit: Dwy Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									

LANE SUMMARY

Site: 101 [E Park Ave/Scott Ave (Site Folder: AM Peak Hour - Yr 2040 RI/RO)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	DEMAND FLOWS [Total HV] veh/h %		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh Dist] ft		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Scott Ave NB													
Lane 1 ^d	121	11.6	475	0.255	100	12.6	LOS B	1.3	35.8	Full	1600	0.0	0.0
Approach	121	11.6		0.255		12.6	LOS B	1.3	35.8				
East: E Park Ave WB													
Lane 1	458	12.0	1148	0.399	100	6.5	LOS A	2.7	74.5	Full	1600	0.0	0.0
Lane 2 ^d	548	11.6	1373	0.399	100	5.1	LOS A	2.8	76.1	Full	1600	0.0	0.0
Approach	1006	11.8		0.399		5.7	LOS A	2.8	76.1				
North: Fairgrounds													
Lane 1 ^d	49	6.0	417	0.117	100	12.5	LOS B	0.4	11.5	Full	1600	0.0	0.0
Approach	49	6.0		0.117		12.5	LOS B	0.4	11.5				
West: E Park Ave EB													
Lane 1	120	0.5	1057	0.113	100	12.6	LOS B	0.6	14.9	Short	100	0.0	NA
Lane 2 ^d	942	12.0	1427	0.660	100	4.9	LOS A	6.9	190.3	Full	1600	0.0	0.0
Approach	1062	10.7		0.660		5.8	LOS A	6.9	190.3				
Intersection	2238	11.1		0.660		6.3	LOS A	6.9	190.3				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: Scott Ave NB											
Mov.	L2	T1	R2	Total	%HV						
From S To Exit:	W	N	E			Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	37	5	79	121	11.6	475	0.255	100	NA	NA	
Approach	37	5	79	121	11.6		0.255				
East: E Park Ave WB											
Mov.	L2	T1	R2	Total	%HV						
From E To Exit:	S	W	N			Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	89	369	-	458	12.0	1148	0.399	100	NA	NA	
Lane 2	-	526	22	548	11.6	1373	0.399	100	NA	NA	
Approach	89	895	22	1006	11.8		0.399				

North: Fairgrounds											
Mov.	L2	T1	R2	Total	%HV			Deg.	Lane	Prob.	Ov.
From N							Cap.	Satn	Util.	SL Ov.	Lane
To Exit:	E	S	W				veh/h	v/c	%	%	No.
Lane 1	22	5	22	49	6.0		417	0.117	100	NA	NA
Approach	22	5	22	49	6.0			0.117			
West: E Park Ave EB											
Mov.	U	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.
From W							Cap.	Satn	Util.	SL Ov.	Lane
To Exit:	W	N	E	S			veh/h	v/c	%	%	No.
Lane 1	98	22	-	-	120	0.5	1057	0.113	100	0.0	2
Lane 2	-	-	905	37	942	12.0	1427	0.660	100	NA	NA
Approach	98	22	905	37	1062	10.7		0.660			
Total %HV Deg.Satn (v/c)											
Intersection	2238	11.1			0.660						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: Scott Ave NB Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: E Park Ave WB Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Fairgrounds Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: E Park Ave EB Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										

LANE SUMMARY

Site: 2 [Midway Rd/E Park Ave/Park Ave (Site Folder: PM Peak Hour - Yr 2040 RI/RO)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	DEMAND FLOWS [Total HV] veh/h %		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh Dist] ft		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Midway Rd													
Lane 1	360	5.0	752	0.479	100	9.4	LOS A	3.9	101.5	Full	650	0.0	0.0
Lane 2 ^d	813	5.0	1023	0.794	100	14.5	LOS B	13.3	345.2	Short	100	0.0	NA
Approach	1173	5.0		0.794		12.9	LOS B	13.3	345.2				
East: E Park Ave													
Lane 1 ^d	809	3.9	1251	0.647	100	13.0	LOS B	7.3	188.2	Full	300	0.0	0.0
Lane 2	365	5.0	931	0.392	100	6.1	LOS A	2.8	73.8	Full	300	0.0	0.0
Approach	1174	4.3		0.647		10.9	LOS B	7.3	188.2				
North: Park Ave													
Lane 1 ^d	417	5.0	771	0.541	100	17.2	LOS B	5.8	150.2	Full	650	0.0	0.0
Lane 2	267	5.0	560	0.476	100	12.3	LOS B	4.1	106.5	Full	650	0.0	0.0
Approach	683	5.0		0.541		15.3	LOS B	5.8	150.2				
West: Dwy													
Lane 1 ^d	11	5.0	443	0.026	100	11.1	LOS B	0.1	3.2	Full	100	0.0	0.0
Approach	11	5.0		0.026		11.1	LOS B	0.1	3.2				
Intersection	3042	4.7		0.794		12.7	LOS B	13.3	345.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: Midway Rd											
Mov.	L2	T1	R2	Total	%HV						
From S						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	W	N	E			veh/h	v/c	Util.	SL Ov.	Lane	No.
								%	%		
Lane 1	1	359	-	360	5.0	752	0.479	100	NA	NA	
Lane 2	-	-	813	813	5.0	1023	0.794	100	100.0	1	
Approach	1	359	813	1173	5.0		0.794				
East: E Park Ave											
Mov.	U	L2	T1	R2	Total	%HV					
From E											
To Exit:	E	S	W	N		Cap.	Deg.	Lane	Prob.	Ov.	
						veh/h	v/c	Util.	SL Ov.	Lane	No.
								%	%		
Lane 1	174	630	5	-	809	3.9	1251	0.647	100	NA	NA

Lane 2	-	-	-	365	365	5.0	931	0.392	100	NA	NA
Approach	174	630	5	365	1174	4.3		0.647			
North: Park Ave											
Mov.	L2	T1	R2	Total	%HV			Deg.	Lane	Prob.	Ov.
From N							Cap.	Satn	Util.	SL	Lane
To Exit:	E	S	W				veh/h	v/c	%	%	No.
Lane 1	417	-	-	417	5.0		771	0.541	100	NA	NA
Lane 2	-	266	1	267	5.0		560	0.476	100	NA	NA
Approach	417	266	1	683	5.0			0.541			
West: Dwy											
Mov.	L2	T1	R2	Total	%HV			Deg.	Lane	Prob.	Ov.
From W							Cap.	Satn	Util.	SL	Lane
To Exit:	N	E	S				veh/h	v/c	%	%	No.
Lane 1	5	5	1	11	5.0		443	0.026	100	NA	NA
Approach	5	5	1	11	5.0			0.026			
Total %HV Deg.Satn (v/c)											
Intersection	3042	4.7		0.794							

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis											
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Midway Rd Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
East Exit: E Park Ave Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
North Exit: Park Ave Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
West Exit: Dwy Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									

LANE SUMMARY

 Site: 101 [E Park Ave/Scott Ave (Site Folder: PM Peak Hour - Yr 2040 RI/RO)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	DEMAND FLOWS [Total HV] veh/h %		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh Dist] ft		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Scott Ave NB													
Lane 1 ^d	168	5.9	330	0.511	100	24.4	LOS C	3.5	92.3	Full	1600	0.0	0.0
Approach	168	5.9		0.511		24.4	LOS C	3.5	92.3				
East: E Park Ave WB													
Lane 1	514	6.0	1105	0.465	100	6.8	LOS A	3.4	87.9	Full	1600	0.0	0.0
Lane 2 ^d	622	5.9	1339	0.465	100	5.6	LOS A	3.5	91.4	Full	1600	0.0	0.0
Approach	1136	5.9		0.465		6.1	LOS A	3.5	91.4				
North: Fairgrounds													
Lane 1 ^d	49	6.0	356	0.137	100	13.7	LOS B	0.5	14.1	Full	1600	0.0	0.0
Approach	49	6.0		0.137		13.7	LOS B	0.5	14.1				
West: E Park Ave EB													
Lane 1	185	0.4	1096	0.169	100	12.6	LOS B	1.0	23.9	Short	100	0.0	NA
Lane 2 ^d	1283	6.0	1412 ¹	0.908	100	5.0	LOS A	13.9	364.1	Full	1600	0.0	0.0
Approach	1467	5.3		0.908		6.0	LOS A	13.9	364.1				
Intersection	2821	5.6		0.908		7.3	LOS A	13.9	364.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: Scott Ave NB											
Mov.	L2	T1	R2	Total	%HV		Cap.	Deg.	Lane	Prob.	Ov.
From S To Exit:	W	N	E				veh/h	v/c	Util. %	SL Ov. %	Lane No.
Lane 1	76	5	87	168	5.9		330	0.511	100	NA	NA
Approach	76	5	87	168	5.9			0.511			
East: E Park Ave WB											
Mov.	L2	T1	R2	Total	%HV		Cap.	Deg.	Lane	Prob.	Ov.
From E To Exit:	S	W	N				veh/h	v/c	Util. %	SL Ov. %	Lane No.
Lane 1	71	443	-	514	6.0		1105	0.465	100	NA	NA
Lane 2	-	601	22	622	5.9		1339	0.465	100	NA	NA

Approach	71	1043	22	1136	5.9		0.465				
North: Fairgrounds											
Mov.	L2	T1	R2	Total	%HV			Deg.	Lane	Prob.	Ov.
From N							Cap.	Satn	Util.	SL Ov.	Lane
To Exit:	E	S	W				veh/h	v/c	%	%	No.
Lane 1	22	5	22	49	6.0		356	0.137	100	NA	NA
Approach	22	5	22	49	6.0			0.137			
West: E Park Ave EB											
Mov.	U	L2	T1	R2	Total	%HV					
From W							Cap.	Satn	Util.	SL Ov.	Lane
To Exit:	W	N	E	S			veh/h	v/c	%	%	No.
Lane 1	163	22	-	-	185	0.4	1096	0.169	100	0.0	2
Lane 2	-	-	1261	22	1283	6.0	1412 ¹	0.908	100	NA	NA
Approach	163	22	1261	22	1467	5.3		0.908			
Total %HV Deg.Satn (v/c)											
Intersection	2821	5.6		0.908							

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Merge Analysis											
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap pcu/h	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: Scott Ave NB Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
East Exit: E Park Ave WB Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
North Exit: Fairgrounds Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
West Exit: E Park Ave EB Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									

LANE SUMMARY

 **Site: 2 [Midway Rd/E Park Ave/Park Ave (Site Folder: AM Peak Hour - Yr 2040 - Otterson)]**

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	DEMAND FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h	HV] %	veh/h	v/c	%	sec		[Veh	Dist] ft		ft	%	%
South: Midway Rd													
Lane 1	305	9.0	882	0.346	100	6.7	LOS A	2.4	65.6	Full	650	0.0	0.0
Lane 2 ^d	609	9.0	1159	0.525	100	6.3	LOS A	4.7	126.0	Short	200	0.0	NA
Approach	914	9.0		0.525		6.4	LOS A	4.7	126.0				
East: E Park Ave													
Lane 1 ^d	864	9.0	1249	0.692	100	12.8	LOS B	8.3	222.8	Full	300	0.0	0.0
Lane 2	266	9.0	889	0.300	100	5.9	LOS A	1.9	51.4	Full	300	0.0	0.0
Approach	1130	9.0		0.692		11.2	LOS B	8.3	222.8				
North: Park Ave													
Lane 1 ^d	348	9.0	642	0.542	100	19.6	LOS B	5.8	155.1	Full	650	0.0	0.0
Lane 2	332	9.0	456	0.727	100	25.1	LOS C	8.5	228.2	Full	650	0.0	0.0
Approach	679	9.0		0.727		22.2	LOS C	8.5	228.2				
West: Dwy													
Lane 1 ^d	8	9.0	356	0.021	100	12.2	LOS B	0.1	2.9	Full	100	0.0	0.0
Approach	8	9.0		0.021		12.2	LOS B	0.1	2.9				
Intersection	2732	9.0		0.727		12.4	LOS B	8.5	228.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: Midway Rd											
Mov.	L2	T1	R2	Total	%HV						
From S						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	W	N	E			veh/h	satn	Util.	SL Ov.	Lane	
							v/c	%	%	No.	
Lane 1	1	304	-	305	9.0	882	0.346	100	NA	NA	
Lane 2	-	-	609	609	9.0	1159	0.525	100	0.0	1	
Approach	1	304	609	914	9.0		0.525				
East: E Park Ave											
Mov.	L2	T1	R2	Total	%HV						
From E						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	S	W	N			veh/h	satn	Util.	SL Ov.	Lane	
							v/c	%	%	No.	
Lane 1	859	5	-	864	9.0	1249	0.692	100	NA	NA	

Lane 2	-	-	266	266	9.0	889	0.300	100	NA	NA
Approach	859	5	266	1130	9.0	0.692				
North: Park Ave										
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.
From N						Cap.	Satn	Util.	SL	Lane
To Exit:	E	S	W			veh/h	v/c	%	%	No.
Lane 1	348	-	-	348	9.0	642	0.542	100	NA	NA
Lane 2	-	326	5	332	9.0	456	0.727	100	NA	NA
Approach	348	326	5	679	9.0	0.727				
West: Dwy										
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.
From W						Cap.	Satn	Util.	SL	Lane
To Exit:	N	E	S			veh/h	v/c	%	%	No.
Lane 1	1	5	1	8	9.0	356	0.021	100	NA	NA
Approach	1	5	1	8	9.0	0.021				
Total %HV Deg.Satn (v/c)										
Intersection	2732	9.0		0.727						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Lane Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: Midway Rd Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: E Park Ave Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Park Ave Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: Dwy Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

Site: 3 [Fair St/E Park Ave (Site Folder: AM Peak Hour - Yr 2040 - Otterson)]

New Site

Site Category: (None)

Roundabout

Lane Use and Performance													
	DEMAND FLOWS [Total HV] veh/h %		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh Dist] ft		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Fair St													
Lane 1 ^d	31	5.0	665	0.047	100	10.2	LOS B	0.2	4.8	Full	800	0.0	0.0
Approach	31	5.0		0.047		10.2	LOS B	0.2	4.8				
East: E Park Ave													
Lane 1	452	5.0	1288	0.351	100	4.9	LOS A	2.4	62.3	Full	575	0.0	0.0
Lane 2 ^d	537	5.0	1530	0.351	100	4.7	LOS A	2.5	63.7	Full	575	0.0	0.0
Approach	990	5.0		0.351		4.8	LOS A	2.5	63.7				
North: Fair St													
Lane 1 ^d	314	5.0	715	0.440	100	9.6	LOS A	2.3	58.5	Full	200	0.0	0.0
Approach	314	5.0		0.440		9.6	LOS A	2.3	58.5				
West: E Park Ave													
Lane 1	415	5.0	1228	0.338	100	6.0	LOS A	2.4	62.7	Full	300	0.0	0.0
Lane 2 ^d	497	5.0	1472	0.338	100	4.3	LOS A	2.5	65.2	Full	300	0.0	0.0
Approach	912	5.0		0.338		5.1	LOS A	2.5	65.2				
Intersection	2247	5.0		0.440		5.7	LOS A	2.5	65.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: Fair St											
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov. Lane	
From S To Exit:	W	N	E			Cap. veh/h	v/c	%	%	No.	
Lane 1	15	10	5	31	5.0	665	0.047	100	NA	NA	
Approach	15	10	5	31	5.0		0.047				
East: E Park Ave											
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov. Lane	
From E To Exit:	S	W	N			Cap. veh/h	v/c	%	%	No.	
Lane 1	5	447	-	452	5.0	1288	0.351	100	NA	NA	
Lane 2	-	450	88	537	5.0	1530	0.351	100	NA	NA	
Approach	5	897	88	990	5.0		0.351				

North: Fair St											
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.	
From N							Satn	Util.	SL	Lane	
To Exit:	E	S	W			Cap.	v/c	%	%	No.	
Lane 1	144	10	160	314	5.0	715	0.440	100	NA	NA	
Approach	144	10	160	314	5.0		0.440				
West: E Park Ave											
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.	
From W							Satn	Util.	SL	Lane	
To Exit:	N	E	S			Cap.	v/c	%	%	No.	
Lane 1	98	317	-	415	5.0	1228	0.338	100	NA	NA	
Lane 2	-	482	15	497	5.0	1472	0.338	100	NA	NA	
Approach	98	799	15	912	5.0		0.338				
Total %HV Deg. Satn (v/c)											
Intersection	2247	5.0		0.440							

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Fair St												
Merge Type: Not Applied												
Full Length Lane	1											
Merge Analysis not applied.												
East Exit: E Park Ave												
Merge Type: Not Applied												
Full Length Lane	1											
Merge Analysis not applied.												
Full Length Lane	2											
Merge Analysis not applied.												
North Exit: Fair St												
Merge Type: Not Applied												
Full Length Lane	1											
Merge Analysis not applied.												
West Exit: E Park Ave												
Merge Type: Not Applied												
Full Length Lane	1											
Merge Analysis not applied.												
Full Length Lane	2											
Merge Analysis not applied.												

LANE SUMMARY

 **Site: 4 [Midway Rd/Hegan Ln (Site Folder: AM Peak Hour - Yr 2040 - Otterson)]**

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	DEMAND FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h	HV] %	veh/h	v/c	%	sec		[Veh	Dist] ft		ft	%	%
South: Midway Rd													
Lane 1 ^d	586	9.0	908	0.645	100	8.8	LOS A	5.5	147.0	Full	900	0.0	0.0
Lane 2	92	9.0	502	0.182	28 ⁶	10.3	LOS B	0.8	20.4	Short	50	0.0	NA
Approach	677	9.0		0.645		9.0	LOS A	5.5	147.0				
East: Dwy													
Lane 1 ^d	8	9.0	515	0.015	100	11.5	LOS B	0.1	1.9	Full	120	0.0	0.0
Approach	8	9.0		0.015		11.5	LOS B	0.1	1.9				
North: Midway Rd													
Lane 1	409	9.0	1178	0.347	100	4.5	LOS A	2.5	67.6	Full	350	0.0	0.0
Lane 2 ^d	813	9.0	1493	0.544	100	4.6	LOS A	5.3	142.2	Short	100	0.0	NA
Approach	1222	9.0		0.544		4.6	LOS A	5.3	142.2				
West: Hegan Ln													
Lane 1 ^d	304	9.0	1124	0.270	100	12.0	LOS B	1.8	47.1	Short	100	0.0	NA
Lane 2	83	9.0	768	0.109	40 ⁶	11.9	LOS B	0.6	15.5	Full	400	0.0	0.0
Approach	388	9.0		0.270		11.9	LOS B	1.8	47.1				
Intersection	2294	9.0		0.645		7.2	LOS A	5.5	147.0				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

⁶ Lane under-utilisation due to downstream effects

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: Midway Rd											
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From S To Exit:	W	N	E			Cap. veh/h	v/c	%	%		
Lane 1	85	500	-	586	9.0	908	0.645	100	NA	NA	
Lane 2	-	90	1	92	9.0	502	0.182	28 ⁶	0.0	1	
Approach	85	591	1	677	9.0		0.645				
East: Dwy											
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From E To Exit:	S	W	N			Cap. veh/h	v/c	%	%		

Lane 1	6	1	1	8	9.0	515	0.015	100	NA	NA
Approach	6	1	1	8	9.0		0.015			
North: Midway Rd										
Mov.	L2	T1	R2	Total	%HV					
From N						Cap.	Deg.	Lane	Prob.	Ov.
To Exit:	E	S	W			veh/h	satn	Util.	SL	Lane
							v/c	%	%	No.
Lane 1	6	403	-	409	9.0	1178	0.347	100	NA	NA
Lane 2	-	-	813	813	9.0	1493	0.544	100	16.6	1
Approach	6	403	813	1222	9.0		0.544			
West: Hegan Ln										
Mov.	L2	T1	R2	Total	%HV					
From W						Cap.	Deg.	Lane	Prob.	Ov.
To Exit:	N	E	S			veh/h	satn	Util.	SL	Lane
							v/c	%	%	No.
Lane 1	304	-	-	304	9.0	1124	0.270	100	0.0	2
Lane 2	48	1	34	83	9.0	768	0.109	40 ⁶	NA	NA
Approach	352	1	34	388	9.0		0.270			
Total %HV Deg.Satn (v/c)										
Intersection	2294	9.0		0.645						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

⁶ Lane under-utilisation due to downstream effects

Merge Analysis												
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Midway Rd Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Dwy Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Midway Rd Merge Type: Priority												
Exit Short Lane	2	50	0.0	805	877	3.00	2.00	140	886	0.158	2.0	2.6
Merge Lane	1	-	100.0	Merge Lane is not Opposed				805	1800	0.447	0.0	0.0
West Exit: Hegan Ln Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

 **Site: 5 [Hegan Ln/Otterson Dr (Site Folder: AM Peak Hour - Yr 2040 - Otterson)]**

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	DEMAND FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h	HV] %						[Veh	Dist] ft				
South: NB - Dwy													
Lane 1 ^d	3	4.0	983	0.003	100	5.8	LOS A	0.0	0.5	Full	125	0.0	0.0
Approach	3	4.0		0.003		5.8	LOS A	0.0	0.5				
East: Hegan Ln													
Lane 1 ^d	878	4.0	1338	0.656	100	4.4	LOS A	7.7	198.1	Full	600	0.0	0.0
Approach	878	4.0		0.656		4.4	LOS A	7.7	198.1				
North: Otterson Dr													
Lane 1 ^d	164	4.0	1077	0.152	100	10.7	LOS B	0.9	22.1	Full	1200	0.0	0.0
Approach	164	4.0		0.152		10.7	LOS B	0.9	22.1				
West: Hegan Ln													
Lane 1 ^d	276	4.0	1209	0.229	100	5.5	LOS A	1.4	36.2	Full	650	0.0	0.0
Approach	276	4.0		0.229		5.5	LOS A	1.4	36.2				
Intersection	1321	4.0		0.656		5.4	LOS A	7.7	198.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: NB - Dwy											
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From S To Exit:	W	N	E			Cap. veh/h	v/c	%	%		
Lane 1	1	1	1	3	4.0	983	0.003	100	NA	NA	
Approach	1	1	1	3	4.0		0.003				
East: Hegan Ln											
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From E To Exit:	S	W	N			Cap. veh/h	v/c	%	%		
Lane 1	1	292	584	878	4.0	1338	0.656	100	NA	NA	
Approach	1	292	584	878	4.0		0.656				
North: Otterson Dr											
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane	
From N						Cap.					

To Exit:	E	S	W			veh/h	v/c	%	%	No.
Lane 1	146	1	17	164	4.0	1077	0.152	100	NA	NA
Approach	146	1	17	164	4.0		0.152			
West: Hegan Ln										
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From W To Exit:	N	E	S			Cap. veh/h	v/c	%	%	No.
Lane 1	39	236	1	276	4.0	1209	0.229	100	NA	NA
Approach	39	236	1	276	4.0		0.229			
Total %HV Deg. Satn (v/c)										
Intersection	1321	4.0		0.656						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: NB - Dwy												
Merge Type: Not Applied												
Full Length Lane	1											
East Exit: Hegan Ln												
Merge Type: Not Applied												
Full Length Lane	1											
North Exit: Otterson Dr												
Merge Type: Not Applied												
Full Length Lane	1											
West Exit: Hegan Ln												
Merge Type: Not Applied												
Full Length Lane	1											

LANE SUMMARY

 **Site: 101 [E Park Ave/Scott Ave (Site Folder: AM Peak Hour - Yr 2040 - Otterson)]**

New Site

Site Category: (None)

Roundabout

Lane Use and Performance													
	DEMAND FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h	HV %						[Veh Dist]					
			veh/h	v/c	%	sec			ft		ft	%	%
South: Scott Ave NB													
Lane 1 ^d	84	12.0	438	0.192	100	14.0	LOS B	1.3	36.0	Full	1600	0.0	0.0
Approach	84	12.0		0.192		14.0	LOS B	1.3	36.0				
East: E Park Ave WB													
Lane 1 ^d	1074	12.0	1539	0.698	100	4.5	LOS A	11.3	308.8	Full	1600	0.0	0.0
Approach	1074	12.0		0.698		4.5	LOS A	11.3	308.8				
West: E Park Ave EB													
Lane 1 ^d	963	12.0	1318	0.731	100	5.1	LOS A	9.0	245.4	Full	1600	0.0	0.0
Approach	963	12.0		0.731		5.1	LOS A	9.0	245.4				
Intersection	2121	12.0		0.731		5.1	LOS A	11.3	308.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)										
South: Scott Ave NB										
Mov.	L2	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov.	
From S					Cap. veh/h	v/c	%	%	Lane No.	
To Exit:	W	E								
Lane 1	11	74	84	12.0	438	0.192	100	NA	NA	
Approach	11	74	84	12.0		0.192				
East: E Park Ave WB										
Mov.	L2	T1	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov.	
From E					Cap. veh/h	v/c	%	%	Lane No.	
To Exit:	S	W								
Lane 1	84	989	1074	12.0	1539	0.698	100	NA	NA	
Approach	84	989	1074	12.0		0.698				
West: E Park Ave EB										
Mov.	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov.	
From W					Cap. veh/h	v/c	%	%	Lane No.	
To Exit:	E	S								
Lane 1	926	37	963	12.0	1318	0.731	100	NA	NA	
Approach	926	37	963	12.0		0.731				

	Total	%HV	Deg.Satn (v/c)
Intersection	2121	12.0	0.731

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis											
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Scott Ave NB Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
East Exit: E Park Ave WB Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
West Exit: E Park Ave EB Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									

LANE SUMMARY

 **Site: 2 [Midway Rd/E Park Ave/Park Ave (Site Folder: PM Peak Hour - Yr 2040 - Otterson)]**

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	DEMAND FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h	HV] %	veh/h	v/c	%	sec		[Veh	Dist] ft		ft	%	%
South: Midway Rd													
Lane 1	407	5.0	869	0.469	100	7.4	LOS A	3.7	95.0	Full	650	0.0	0.0
Lane 2 ^d	922	5.0	1163	0.792	100	11.1	LOS B	13.0	337.4	Short	100	0.0	NA
Approach	1329	5.0		0.792		9.9	LOS A	13.0	337.4				
East: E Park Ave													
Lane 1 ^d	672	5.0	1196	0.562	100	12.1	LOS B	5.3	138.7	Full	300	0.0	0.0
Lane 2	365	5.0	914	0.399	100	6.4	LOS A	2.9	75.1	Full	300	0.0	0.0
Approach	1036	5.0		0.562		10.1	LOS B	5.3	138.7				
North: Park Ave													
Lane 1 ^d	417	5.0	918	0.454	100	13.9	LOS B	4.0	104.5	Full	650	0.0	0.0
Lane 2	282	5.0	682	0.414	100	9.2	LOS A	3.2	82.4	Full	650	0.0	0.0
Approach	699	5.0		0.454		12.0	LOS B	4.0	104.5				
West: Dwy													
Lane 1 ^d	11	5.0	489	0.023	100	9.9	LOS A	0.1	2.8	Full	100	0.0	0.0
Approach	11	5.0		0.023		9.9	LOS A	0.1	2.8				
Intersection	3076	5.0		0.792		10.5	LOS B	13.0	337.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: Midway Rd											
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From S To Exit:	W	N	E			Cap. veh/h	v/c	%	%		
Lane 1	1	406	-	407	5.0	869	0.469	100	NA	NA	
Lane 2	-	-	922	922	5.0	1163	0.792	100	100.0	1	
Approach	1	406	922	1329	5.0		0.792				
East: E Park Ave											
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From E To Exit:	S	W	N			Cap. veh/h	v/c	%	%		
Lane 1	667	5	-	672	5.0	1196	0.562	100	NA	NA	

Lane 2	-	-	365	365	5.0	914	0.399	100	NA	NA
Approach	667	5	365	1036	5.0	0.562				
North: Park Ave										
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.
From N						Cap.	Satn	Util.	SL	Lane
To Exit:	E	S	W			veh/h	v/c	%	%	No.
Lane 1	417	-	-	417	5.0	918	0.454	100	NA	NA
Lane 2	-	281	1	282	5.0	682	0.414	100	NA	NA
Approach	417	281	1	699	5.0	0.454				
West: Dwy										
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.
From W						Cap.	Satn	Util.	SL	Lane
To Exit:	N	E	S			veh/h	v/c	%	%	No.
Lane 1	5	5	1	11	5.0	489	0.023	100	NA	NA
Approach	5	5	1	11	5.0	0.023				
Total %HV Deg.Satn (v/c)										
Intersection	3076	5.0		0.792						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Lane Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: Midway Rd												
Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: E Park Ave												
Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Park Ave												
Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: Dwy												
Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

 Site: 3 [Fair St/E Park Ave (Site Folder: PM Peak Hour - Yr 2040 - Otterson)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	DEMAND FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h	HV] %	veh/h	v/c	%	sec		[Veh	Dist] ft		ft	%	%
South: Fair St													
Lane 1 ^d	83	2.0	561	0.149	100	10.6	LOS B	0.6	16.4	Full	800	0.0	0.0
Approach	83	2.0		0.149		10.6	LOS B	0.6	16.4				
East: E Park Ave													
Lane 1	477	2.0	1206	0.395	100	5.6	LOS A	2.8	70.5	Full	575	0.0	0.0
Lane 2 ^d	581	2.0	1469	0.395	100	5.1	LOS A	2.9	73.4	Full	575	0.0	0.0
Approach	1057	2.0		0.395		5.4	LOS A	2.9	73.4				
North: Fair St													
Lane 1 ^d	271	2.0	715	0.379	100	9.5	LOS A	1.9	47.6	Full	200	0.0	0.0
Approach	271	2.0		0.379		9.5	LOS A	1.9	47.6				
West: E Park Ave													
Lane 1	608	2.0	1253	0.485	100	6.5	LOS A	4.0	102.6	Full	300	0.0	0.0
Lane 2 ^d	731	2.0	1506	0.485	100	4.5	LOS A	4.2	106.6	Full	300	0.0	0.0
Approach	1339	2.0		0.485		5.4	LOS A	4.2	106.6				
Intersection	2750	2.0		0.485		5.9	LOS A	4.2	106.6				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: Fair St											
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From S To Exit:	W	N	E			Cap. veh/h	v/c	%	%		
Lane 1	31	31	21	83	2.0	561	0.149	100	NA	NA	
Approach	31	31	21	83	2.0		0.149				
East: E Park Ave											
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From E To Exit:	S	W	N			Cap. veh/h	v/c	%	%		
Lane 1	10	466	-	477	2.0	1206	0.395	100	NA	NA	
Lane 2	-	435	146	581	2.0	1469	0.395	100	NA	NA	
Approach	10	901	146	1057	2.0		0.395				

North: Fair St											
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.	
From N						Cap.	Satn	Util.	SL	Ov.	Lane
To Exit:	E	S	W			veh/h	v/c	%	%	%	No.
Lane 1	146	21	104	271	2.0	715	0.379	100	NA	NA	
Approach	146	21	104	271	2.0		0.379				
West: E Park Ave											
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.	
From W						Cap.	Satn	Util.	SL	Ov.	Lane
To Exit:	N	E	S			veh/h	v/c	%	%	%	No.
Lane 1	172	436	-	608	2.0	1253	0.485	100	NA	NA	
Lane 2	-	725	5	731	2.0	1506	0.485	100	NA	NA	
Approach	172	1161	5	1339	2.0		0.485				
Total %HV Deg. Satn (v/c)											
Intersection	2750	2.0		0.485							

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Fair St Merge Type: Not Applied												
Full Length Lane	1											Merge Analysis not applied.
East Exit: E Park Ave Merge Type: Not Applied												
Full Length Lane	1											Merge Analysis not applied.
Full Length Lane	2											Merge Analysis not applied.
North Exit: Fair St Merge Type: Not Applied												
Full Length Lane	1											Merge Analysis not applied.
West Exit: E Park Ave Merge Type: Not Applied												
Full Length Lane	1											Merge Analysis not applied.
Full Length Lane	2											Merge Analysis not applied.

LANE SUMMARY

 Site: 4 [Midway Rd/Hegan Ln (Site Folder: PM Peak Hour - Yr 2040 - Otterson)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	DEMAND FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h	HV] %	veh/h	v/c	%	sec		[Veh	Dist] ft		ft	%	%
South: Midway Rd													
Lane 1 ^d	471	4.0	569	0.827	100	19.0	LOS B	8.6	221.5	Full	900	0.0	0.0
Lane 2	62	4.0	295	0.209	25 ⁶	18.3	LOS B	0.9	22.3	Short	50	0.0	NA
Approach	532	4.0		0.827		18.9	LOS B	8.6	221.5				
East: Dwy													
Lane 1 ^d	17	4.0	367	0.047	100	16.3	LOS B	0.2	6.0	Full	120	0.0	0.0
Approach	17	4.0		0.047		16.3	LOS B	0.2	6.0				
North: Midway Rd													
Lane 1 ^d	538	4.0	1542	0.349	100	4.4	LOS A	2.8	73.5	Full	350	0.0	0.0
Lane 2	435	4.0	1325	0.329	100	4.7	LOS A	2.5	65.5	Short	100	0.0	NA
Approach	973	4.0		0.349		4.5	LOS A	2.8	73.5				
West: Hegan Ln													
Lane 1 ^d	718	4.0	1030	0.698	100	16.8	LOS B	8.7	223.4	Short	100	0.0	NA
Lane 2	250	4.0	724	0.346	50 ⁵	17.1	LOS B	2.1	54.6	Full	400	0.0	0.0
Approach	969	4.0		0.698		16.8	LOS B	8.7	223.4				
Intersection	2491	4.0		0.827		12.5	LOS B	8.7	223.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

⁵ Lane under-utilisation found by the program

⁶ Lane under-utilisation due to downstream effects

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: Midway Rd											
Mov.	L2	T1	R2	Total	%HV						
From S						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	W	N	E			veh/h	satn	Util.	SL Ov.	Lane	
							v/c	%	%	No.	
Lane 1	59	412	-	471	4.0	569	0.827	100	NA	NA	
Lane 2	-	56	5	62	4.0	295	0.209	25 ⁶	0.0	1	
Approach	59	468	5	532	4.0		0.827				
East: Dwy											
Mov.	L2	T1	R2	Total	%HV						
From E						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	S	W	N			veh/h	satn	Util.	SL Ov.	Lane	
							v/c	%	%	No.	

Lane 1	5	1	11	17	4.0	367	0.047	100	NA	NA
Approach	5	1	11	17	4.0		0.047			
North: Midway Rd										
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.
From N						Cap.	Satn	Util.	SL	Lane
To Exit:	E	S	W			veh/h	v/c	%	%	No.
Lane 1	11	527	-	538	4.0	1542	0.349	100	NA	NA
Lane 2	-	-	435	435	4.0	1325	0.329	100	0.0	1
Approach	11	527	435	973	4.0		0.349			
West: Hegan Ln										
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.
From W						Cap.	Satn	Util.	SL	Lane
To Exit:	N	E	S			veh/h	v/c	%	%	No.
Lane 1	718	-	-	718	4.0	1030	0.698	100	39.8	2
Lane 2	179	1	70	250	4.0	724	0.346	50 ⁵	NA	NA
Approach	898	1	70	969	4.0		0.698			
Total %HV Deg.Satn (v/c)										
Intersection	2491	4.0		0.827						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

⁵ Lane under-utilisation found by the program

⁶ Lane under-utilisation due to downstream effects

Merge Analysis												
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Midway Rd Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Dwy Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Midway Rd Merge Type: Priority												
Exit Short Lane	2	50	0.0	1130	1175	3.00	2.00	246	573	0.430	3.9	6.5
Merge Lane	1	-	100.0	Merge Lane is not Opposed				1130	1800	0.628	0.0	0.0
West Exit: Hegan Ln Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

 Site: 5 [Hegan Ln/Otterson Dr (Site Folder: PM Peak Hour - Yr 2040 - Otterson)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	DEMAND FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h	HV] %						[Veh	Dist] ft				
South: NB - Dwy													
Lane 1 ^d	3	2.0	579	0.006	100	10.6	LOS B	0.0	0.9	Full	125	0.0	0.0
Approach	3	2.0		0.006		10.6	LOS B	0.0	0.9				
East: Hegan Ln													
Lane 1 ^d	478	2.0	1367	0.350	100	4.1	LOS A	2.8	70.8	Full	600	0.0	0.0
Approach	478	2.0		0.350		4.1	LOS A	2.8	70.8				
North: Otterson Dr													
Lane 1 ^d	610	2.0	1103	0.553	100	11.7	LOS B	4.4	110.6	Full	1200	0.0	0.0
Approach	610	2.0		0.553		11.7	LOS B	4.4	110.6				
West: Hegan Ln													
Lane 1 ^d	430	2.0	847	0.508	100	9.0	LOS A	4.3	109.7	Full	650	0.0	0.0
Approach	430	2.0		0.508		9.0	LOS A	4.3	109.7				
Intersection	1522	2.0		0.553		8.5	LOS A	4.4	110.6				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: NB - Dwy											
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From S To Exit:	W	N	E			Cap. veh/h	v/c	%	%		
Lane 1	1	1	1	3	2.0	579	0.006	100	NA	NA	
Approach	1	1	1	3	2.0		0.006				
East: Hegan Ln											
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From E To Exit:	S	W	N			Cap. veh/h	v/c	%	%		
Lane 1	5	299	174	478	2.0	1367	0.350	100	NA	NA	
Approach	5	299	174	478	2.0		0.350				
North: Otterson Dr											
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane	
From N						Cap.					

To Exit:	E	S	W			veh/h	v/c	%	%	No.
Lane 1	549	1	60	610	2.0	1103	0.553	100	NA	NA
Approach	549	1	60	610	2.0		0.553			
West: Hegan Ln										
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From W To Exit:	N	E	S			Cap. veh/h	v/c	%	%	No.
Lane 1	33	397	1	430	2.0	847	0.508	100	NA	NA
Approach	33	397	1	430	2.0		0.508			
Total %HV Deg. Satn (v/c)										
Intersection	1522	2.0		0.553						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: NB - Dwy												
Merge Type: Not Applied												
Full Length Lane	1											
East Exit: Hegan Ln												
Merge Type: Not Applied												
Full Length Lane	1											
North Exit: Otterson Dr												
Merge Type: Not Applied												
Full Length Lane	1											
West Exit: Hegan Ln												
Merge Type: Not Applied												
Full Length Lane	1											

LANE SUMMARY

 **Site: 101 [E Park Ave/Scott Ave (Site Folder: PM Peak Hour - Yr 2040 - Otterson)]**

New Site

Site Category: (None)

Roundabout

Lane Use and Performance													
	DEMAND FLOWS [Total HV] veh/h %		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh Dist] ft		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Scott Ave NB													
Lane 1 ^d	76	6.0	165	0.461	100	44.5	LOS D	4.0	105.5	Full	1600	0.0	0.0
Approach	76	6.0		0.461		44.5	LOS D	4.0	105.5				
East: E Park Ave WB													
Lane 1 ^d	1147	6.0	1628	0.704	100	4.3	LOS A	11.9	313.0	Full	1600	0.0	0.0
Approach	1147	6.0		0.704		4.3	LOS A	11.9	313.0				
West: E Park Ave EB													
Lane 1 ^d	1380	6.0	1485	0.930	100	5.7	LOS A	29.3	767.6	Full	1600	0.0	0.0
Approach	1380	6.0		0.930		5.7	LOS A	29.3	767.6				
Intersection	2603	6.0		0.930		6.2	LOS A	29.3	767.6				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)										
South: Scott Ave NB										
Mov.	L2	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov.	Ov.
From S					Cap.	v/c	%	%	Lane	No.
To Exit:	W	E			veh/h					
Lane 1	11	65	76	6.0	165	0.461	100	NA	NA	
Approach	11	65	76	6.0		0.461				
East: E Park Ave WB										
Mov.	L2	T1	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov.	Ov.
From E					Cap.	v/c	%	%	Lane	No.
To Exit:	S	W			veh/h					
Lane 1	60	1087	1147	6.0	1628	0.704	100	NA	NA	
Approach	60	1087	1147	6.0		0.704				
West: E Park Ave EB										
Mov.	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov.	Ov.
From W					Cap.	v/c	%	%	Lane	No.
To Exit:	E	S			veh/h					
Lane 1	1359	22	1380	6.0	1485	0.930	100	NA	NA	
Approach	1359	22	1380	6.0		0.930				

	Total	%HV	Deg.Satn (v/c)
Intersection	2603	6.0	0.930

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Scott Ave NB Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: E Park Ave WB Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: E Park Ave EB Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										

Appendix G

Emissions Calculations

INTERSECTION SUMMARY

 **Site: 101vv [E Park Ave/Scott Ave (Site Folder: AM Peak Hour - No Build)]**

New Site
Site Category: (None)
Stop (Two-Way)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	37.9 mph	37.9 mph
Travel Distance (Total)	1027.4 veh-mi/h	1232.9 pers-mi/h
Travel Time (Total)	27.1 veh-h/h	32.5 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.95	
Travel Time Index	9.42	
Congestion Coefficient	1.06	
Demand Flows (Total)	1668 veh/h	2002 pers/h
Percent Heavy Vehicles (Demand)	12.0 %	
Degree of Saturation	0.534	
Practical Spare Capacity	49.8 %	
Effective Intersection Capacity	3124 veh/h	
Control Delay (Total)	1.30 veh-h/h	1.57 pers-h/h
Control Delay (Average)	2.8 sec	2.8 sec
Control Delay (Worst Lane)	418.7 sec	
Control Delay (Worst Movement)	418.7 sec	418.7 sec
Geometric Delay (Average)	0.7 sec	
Stop-Line Delay (Average)	2.1 sec	
Idling Time (Average)	1.9 sec	
Intersection Level of Service (LOS)	NA	
95% Back of Queue - Vehicles (Worst Lane)	1.4 veh	
95% Back of Queue - Distance (Worst Lane)	39.4 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.01	
Total Effective Stops	142 veh/h	171 pers/h
Effective Stop Rate	0.09	0.09
Proportion Queued	0.05	0.05
Performance Index	29.8	29.8
Cost (Total)	585.11 \$/h	585.11 \$/h
Fuel Consumption (Total)	39.6 gal/h	
Carbon Dioxide (Total)	362.7 kg/h	
Hydrocarbons (Total)	0.027 kg/h	
Carbon Monoxide (Total)	0.421 kg/h	
NOx (Total)	1.095 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA: Intersection LOS for Vehicles is Not Applicable for two-way sign control since the average intersection delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Site Model Variability Index (Iterations 3 to N): 2.7 %

Number of Iterations: 6 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 2.8% 1.4% 0.7%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	800,842 veh/y	961,011 pers/y
Delay	626 veh-h/y	751 pers-h/y
Effective Stops	68,299 veh/y	81,958 pers/y
Travel Distance	493,163 veh-mi/y	591,796 pers-mi/y
Travel Time	13,011 veh-h/y	15,613 pers-h/y
Cost	280,853 \$/y	280,853 \$/y
Fuel Consumption	18,998 gal/y	
Carbon Dioxide	174,116 kg/y	
Hydrocarbons	13 kg/y	
Carbon Monoxide	202 kg/y	

NOx	526 kg/y
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INTERSECTION SUMMARY

 **Site: 1v [Park Ave/Meyers St (Site Folder: AM Peak Hour - No Build)]**

New Site

Site Category: (None)

Signals - EQUISAT (Pretimed) Isolated Cycle Time = 80 seconds (Site User-Given Phase Times)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	20.7 mph	20.7 mph
Travel Distance (Total)	264.8 veh-mi/h	317.8 pers-mi/h
Travel Time (Total)	12.8 veh-h/h	15.3 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.52	
Travel Time Index	4.65	
Congestion Coefficient	1.93	
Demand Flows (Total)	1216 veh/h	1460 pers/h
Percent Heavy Vehicles (Demand)	4.0 %	
Degree of Saturation	0.407	
Practical Spare Capacity	120.9 %	
Effective Intersection Capacity	2986 veh/h	
Control Delay (Total)	5.89 veh-h/h	7.07 pers-h/h
Control Delay (Average)	17.4 sec	17.4 sec
Control Delay (Worst Lane)	37.0 sec	
Control Delay (Worst Movement)	37.0 sec	37.0 sec
Geometric Delay (Average)	1.9 sec	
Stop-Line Delay (Average)	15.6 sec	
Idling Time (Average)	12.7 sec	
Intersection Level of Service (LOS)	LOS B	
95% Back of Queue - Vehicles (Worst Lane)	8.0 veh	
95% Back of Queue - Distance (Worst Lane)	206.0 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.30	
Total Effective Stops	687 veh/h	824 pers/h
Effective Stop Rate	0.56	0.56
Proportion Queued	0.64	0.64
Performance Index	55.8	55.8
Cost (Total)	266.77 \$/h	266.77 \$/h
Fuel Consumption (Total)	17.0 gal/h	
Carbon Dioxide (Total)	152.0 kg/h	
Hydrocarbons (Total)	0.015 kg/h	
Carbon Monoxide (Total)	0.171 kg/h	
NOx (Total)	0.283 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 2 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 4.7% 0.0% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	583,814 veh/y	700,577 pers/y
Delay	2,827 veh-h/y	3,392 pers-h/y
Effective Stops	329,602 veh/y	395,523 pers/y
Travel Distance	127,102 veh-mi/y	152,522 pers-mi/y
Travel Time	6,130 veh-h/y	7,356 pers-h/y
Cost	128,049 \$/y	128,049 \$/y
Fuel Consumption	8,137 gal/y	
Carbon Dioxide	72,982 kg/y	
Hydrocarbons	7 kg/y	
Carbon Monoxide	82 kg/y	
NOx	136 kg/y	

INTERSECTION SUMMARY

 **Site: 2v [Midway Rd/E Park Ave/Park Ave (Site Folder: AM Peak Hour - No Build)]**

New Site

Site Category: (None)

Signals - EQUISAT (Pretimed) Isolated Cycle Time = 120 seconds (Site User-Given Phase Times)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	9.3 mph	9.3 mph
Travel Distance (Total)	444.7 veh-mi/h	533.6 pers-mi/h
Travel Time (Total)	47.9 veh-h/h	57.5 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.23	
Travel Time Index	1.47	
Congestion Coefficient	4.31	
Demand Flows (Total)	2131 veh/h	2557 pers/h
Percent Heavy Vehicles (Demand)	9.0 %	
Degree of Saturation	1.122	
Practical Spare Capacity	-19.8 %	
Effective Intersection Capacity	1900 veh/h	
Control Delay (Total)	34.20 veh-h/h	41.04 pers-h/h
Control Delay (Average)	57.8 sec	57.8 sec
Control Delay (Worst Lane)	129.6 sec	
Control Delay (Worst Movement)	135.6 sec	135.6 sec
Geometric Delay (Average)	4.5 sec	
Stop-Line Delay (Average)	53.3 sec	
Idling Time (Average)	49.5 sec	
Intersection Level of Service (LOS)	LOS E	
95% Back of Queue - Vehicles (Worst Lane)	25.8 veh	
95% Back of Queue - Distance (Worst Lane)	691.4 ft	
Ave. Queue Storage Ratio (Worst Lane)	1.41	
Total Effective Stops	1866 veh/h	2239 pers/h
Effective Stop Rate	0.88	0.88
Proportion Queued	0.72	0.72
Performance Index	239.7	239.7
Cost (Total)	921.33 \$/h	921.33 \$/h
Fuel Consumption (Total)	48.4 gal/h	
Carbon Dioxide (Total)	437.1 kg/h	
Hydrocarbons (Total)	0.048 kg/h	
Carbon Monoxide (Total)	0.458 kg/h	
NOx (Total)	1.260 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 2 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 8.1% 0.0% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,022,769 veh/y	1,227,323 pers/y
Delay	16,418 veh-h/y	19,701 pers-h/y
Effective Stops	895,540 veh/y	1,074,648 pers/y
Travel Distance	213,436 veh-mi/y	256,123 pers-mi/y
Travel Time	23,005 veh-h/y	27,606 pers-h/y
Cost	442,238 \$/y	442,238 \$/y
Fuel Consumption	23,239 gal/y	
Carbon Dioxide	209,827 kg/y	
Hydrocarbons	23 kg/y	
Carbon Monoxide	220 kg/y	
NOx	605 kg/y	

INTERSECTION SUMMARY

 **Site: 3v [Fair St/E Park Ave (Site Folder: AM Peak Hour - No Build)]**

New Site

Site Category: (None)

Signals - EQUISAT (Pretimed) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	15.8 mph	15.8 mph
Travel Distance (Total)	294.7 veh-mi/h	353.6 pers-mi/h
Travel Time (Total)	18.6 veh-h/h	22.3 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.40	
Travel Time Index	3.29	
Congestion Coefficient	2.52	
Demand Flows (Total)	1763 veh/h	2115 pers/h
Percent Heavy Vehicles (Demand)	10.0 %	
Degree of Saturation	0.475	
Practical Spare Capacity	89.7 %	
Effective Intersection Capacity	3715 veh/h	
Control Delay (Total)	10.42 veh-h/h	12.51 pers-h/h
Control Delay (Average)	21.3 sec	21.3 sec
Control Delay (Worst Lane)	44.6 sec	
Control Delay (Worst Movement)	46.2 sec	46.2 sec
Geometric Delay (Average)	1.2 sec	
Stop-Line Delay (Average)	20.1 sec	
Idling Time (Average)	16.7 sec	
Intersection Level of Service (LOS)	LOS C	
95% Back of Queue - Vehicles (Worst Lane)	11.0 veh	
95% Back of Queue - Distance (Worst Lane)	295.9 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.56	
Total Effective Stops	1181 veh/h	1418 pers/h
Effective Stop Rate	0.67	0.67
Proportion Queued	0.78	0.78
Performance Index	98.7	98.7
Cost (Total)	410.90 \$/h	410.90 \$/h
Fuel Consumption (Total)	29.0 gal/h	
Carbon Dioxide (Total)	262.0 kg/h	
Hydrocarbons (Total)	0.025 kg/h	
Carbon Monoxide (Total)	0.270 kg/h	
NOx (Total)	0.886 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 2 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 0.0% 3.7% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	846,186 veh/y	1,015,423 pers/y
Delay	5,004 veh-h/y	6,004 pers-h/y
Effective Stops	567,013 veh/y	680,416 pers/y
Travel Distance	141,441 veh-mi/y	169,730 pers-mi/y
Travel Time	8,928 veh-h/y	10,713 pers-h/y
Cost	197,232 \$/y	197,232 \$/y
Fuel Consumption	13,897 gal/y	
Carbon Dioxide	125,738 kg/y	
Hydrocarbons	12 kg/y	
Carbon Monoxide	129 kg/y	
NOx	425 kg/y	

INTERSECTION SUMMARY

 **Site: 4v [Midway Rd/Hegan Ln (Site Folder: AM Peak Hour - No Build)]**

New Site

Site Category: (None)

Signals - EQUISAT (Pretimed) Isolated Cycle Time = 110 seconds (Site Practical Cycle Time)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	14.3 mph	14.3 mph
Travel Distance (Total)	362.4 veh-mi/h	434.9 pers-mi/h
Travel Time (Total)	25.3 veh-h/h	30.3 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.36	
Travel Time Index	2.87	
Congestion Coefficient	2.79	
Demand Flows (Total)	1802 veh/h	2163 pers/h
Percent Heavy Vehicles (Demand)	9.0 %	
Degree of Saturation	0.897	
Practical Spare Capacity	0.3 %	
Effective Intersection Capacity	2009 veh/h	
Control Delay (Total)	15.32 veh-h/h	18.38 pers-h/h
Control Delay (Average)	30.6 sec	30.6 sec
Control Delay (Worst Lane)	65.9 sec	
Control Delay (Worst Movement)	65.9 sec	65.9 sec
Geometric Delay (Average)	3.1 sec	
Stop-Line Delay (Average)	27.5 sec	
Idling Time (Average)	24.3 sec	
Intersection Level of Service (LOS)	LOS C	
95% Back of Queue - Vehicles (Worst Lane)	25.7 veh	
95% Back of Queue - Distance (Worst Lane)	689.0 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.81	
Total Effective Stops	1273 veh/h	1527 pers/h
Effective Stop Rate	0.71	0.71
Proportion Queued	0.68	0.68
Performance Index	191.8	191.8
Cost (Total)	521.91 \$/h	521.91 \$/h
Fuel Consumption (Total)	32.4 gal/h	
Carbon Dioxide (Total)	293.0 kg/h	
Hydrocarbons (Total)	0.030 kg/h	
Carbon Monoxide (Total)	0.310 kg/h	
NOx (Total)	0.854 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 1.3 %

Number of Iterations: 5 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 2.2% 1.7% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	865,143 veh/y	1,038,172 pers/y
Delay	7,353 veh-h/y	8,824 pers-h/y
Effective Stops	610,992 veh/y	733,191 pers/y
Travel Distance	173,963 veh-mi/y	208,755 pers-mi/y
Travel Time	12,127 veh-h/y	14,553 pers-h/y
Cost	250,518 \$/y	250,518 \$/y
Fuel Consumption	15,563 gal/y	
Carbon Dioxide	140,620 kg/y	
Hydrocarbons	14 kg/y	
Carbon Monoxide	149 kg/y	
NOx	410 kg/y	

INTERSECTION SUMMARY

 **Site: 5vv [Hegan Ln/Otterson Dr (Site Folder: AM Peak Hour - No Build)]**

New Site
Site Category: (None)
Stop (Two-Way)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	32.3 mph	32.3 mph
Travel Distance (Total)	267.0 veh-mi/h	320.4 pers-mi/h
Travel Time (Total)	8.3 veh-h/h	9.9 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.81	
Travel Time Index	7.87	
Congestion Coefficient	1.24	
Demand Flows (Total)	894 veh/h	1073 pers/h
Percent Heavy Vehicles (Demand)	4.0 %	
Degree of Saturation	0.338	
Practical Spare Capacity	170.1 %	
Effective Intersection Capacity	2643 veh/h	
Control Delay (Total)	1.25 veh-h/h	1.51 pers-h/h
Control Delay (Average)	5.1 sec	5.1 sec
Control Delay (Worst Lane)	24.4 sec	
Control Delay (Worst Movement)	24.4 sec	24.4 sec
Geometric Delay (Average)	3.3 sec	
Stop-Line Delay (Average)	1.8 sec	
Idling Time (Average)	1.3 sec	
Intersection Level of Service (LOS)	NA	
95% Back of Queue - Vehicles (Worst Lane)	1.4 veh	
95% Back of Queue - Distance (Worst Lane)	35.5 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.00	
Total Effective Stops	315 veh/h	378 pers/h
Effective Stop Rate	0.35	0.35
Proportion Queued	0.12	0.12
Performance Index	11.6	11.6
Cost (Total)	178.55 \$/h	178.55 \$/h
Fuel Consumption (Total)	12.1 gal/h	
Carbon Dioxide (Total)	109.0 kg/h	
Hydrocarbons (Total)	0.009 kg/h	
Carbon Monoxide (Total)	0.131 kg/h	
NOx (Total)	0.207 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA: Intersection LOS for Vehicles is Not Applicable for two-way sign control since the average intersection delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 3 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 84.7% 28.2% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	429,303 veh/y	515,164 pers/y
Delay	602 veh-h/y	723 pers-h/y
Effective Stops	151,354 veh/y	181,625 pers/y
Travel Distance	128,160 veh-mi/y	153,792 pers-mi/y
Travel Time	3,962 veh-h/y	4,755 pers-h/y
Cost	85,705 \$/y	85,705 \$/y
Fuel Consumption	5,820 gal/y	
Carbon Dioxide	52,296 kg/y	
Hydrocarbons	5 kg/y	
Carbon Monoxide	63 kg/y	

NOx	99 kg/y
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INTERSECTION SUMMARY

 **Site: 2v [Midway Rd/E Park Ave/Park Ave (Site Folder: PM Peak Hour - No Build)]**

New Site

Site Category: (None)

Signals - EQUISAT (Pretimed) Isolated Cycle Time = 120 seconds (Site User-Given Phase Times)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	9.6 mph	9.6 mph
Travel Distance (Total)	497.8 veh-mi/h	597.4 pers-mi/h
Travel Time (Total)	52.1 veh-h/h	62.5 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.24	
Travel Time Index	1.54	
Congestion Coefficient	4.18	
Demand Flows (Total)	2391 veh/h	2869 pers/h
Percent Heavy Vehicles (Demand)	5.0 %	
Degree of Saturation	1.382	
Practical Spare Capacity	-34.9 %	
Effective Intersection Capacity	1730 veh/h	
Control Delay (Total)	36.21 veh-h/h	43.45 pers-h/h
Control Delay (Average)	54.5 sec	54.5 sec
Control Delay (Worst Lane)	232.5 sec	
Control Delay (Worst Movement)	238.4 sec	238.4 sec
Geometric Delay (Average)	4.6 sec	
Stop-Line Delay (Average)	50.0 sec	
Idling Time (Average)	47.3 sec	
Intersection Level of Service (LOS)	LOS D	
95% Back of Queue - Vehicles (Worst Lane)	35.6 veh	
95% Back of Queue - Distance (Worst Lane)	925.1 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.87	
Total Effective Stops	2011 veh/h	2413 pers/h
Effective Stop Rate	0.84	0.84
Proportion Queued	0.67	0.67
Performance Index	263.1	263.1
Cost (Total)	973.82 \$/h	973.82 \$/h
Fuel Consumption (Total)	47.4 gal/h	
Carbon Dioxide (Total)	425.5 kg/h	
Hydrocarbons (Total)	0.046 kg/h	
Carbon Monoxide (Total)	0.442 kg/h	
NOx (Total)	0.816 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 2 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 11.7% 0.0% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,147,500 veh/y	1,377,000 pers/y
Delay	17,382 veh-h/y	20,858 pers-h/y
Effective Stops	965,214 veh/y	1,158,257 pers/y
Travel Distance	238,961 veh-mi/y	286,753 pers-mi/y
Travel Time	24,996 veh-h/y	29,995 pers-h/y
Cost	467,434 \$/y	467,434 \$/y
Fuel Consumption	22,760 gal/y	
Carbon Dioxide	204,222 kg/y	
Hydrocarbons	22 kg/y	
Carbon Monoxide	212 kg/y	
NOx	392 kg/y	

INTERSECTION SUMMARY

 **Site: 3v [Fair St/E Park Ave (Site Folder: PM Peak Hour - No Build)]**

New Site

Site Category: (None)

Signals - EQUISAT (Pretimed) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	16.0 mph	16.0 mph
Travel Distance (Total)	365.4 veh-mi/h	438.5 pers-mi/h
Travel Time (Total)	22.9 veh-h/h	27.5 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.40	
Travel Time Index	3.32	
Congestion Coefficient	2.51	
Demand Flows (Total)	2165 veh/h	2598 pers/h
Percent Heavy Vehicles (Demand)	5.0 %	
Degree of Saturation	0.577	
Practical Spare Capacity	56.1 %	
Effective Intersection Capacity	3754 veh/h	
Control Delay (Total)	13.05 veh-h/h	15.66 pers-h/h
Control Delay (Average)	21.7 sec	21.7 sec
Control Delay (Worst Lane)	45.4 sec	
Control Delay (Worst Movement)	47.6 sec	47.6 sec
Geometric Delay (Average)	1.2 sec	
Stop-Line Delay (Average)	20.5 sec	
Idling Time (Average)	17.0 sec	
Intersection Level of Service (LOS)	LOS C	
95% Back of Queue - Vehicles (Worst Lane)	15.4 veh	
95% Back of Queue - Distance (Worst Lane)	399.7 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.82	
Total Effective Stops	1497 veh/h	1797 pers/h
Effective Stop Rate	0.69	0.69
Proportion Queued	0.80	0.80
Performance Index	127.5	127.5
Cost (Total)	481.00 \$/h	481.00 \$/h
Fuel Consumption (Total)	30.9 gal/h	
Carbon Dioxide (Total)	277.7 kg/h	
Hydrocarbons (Total)	0.028 kg/h	
Carbon Monoxide (Total)	0.296 kg/h	
NOx (Total)	0.600 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 2 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 0.0% 0.0% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,039,000 veh/y	1,246,800 pers/y
Delay	6,265 veh-h/y	7,518 pers-h/y
Effective Stops	718,628 veh/y	862,354 pers/y
Travel Distance	175,404 veh-mi/y	210,484 pers-mi/y
Travel Time	10,986 veh-h/y	13,183 pers-h/y
Cost	230,879 \$/y	230,879 \$/y
Fuel Consumption	14,848 gal/y	
Carbon Dioxide	133,293 kg/y	
Hydrocarbons	13 kg/y	
Carbon Monoxide	142 kg/y	
NOx	288 kg/y	

INTERSECTION SUMMARY

 **Site: 4v [Midway Rd/Hegan Ln (Site Folder: PM Peak Hour - No Build)]**

New Site

Site Category: (None)

Signals - EQUISAT (Pretimed) Isolated Cycle Time = 105 seconds (Site Optimum Cycle Time - Minimum Delay)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	9.5 mph	9.5 mph
Travel Distance (Total)	370.7 veh-mi/h	444.9 pers-mi/h
Travel Time (Total)	39.1 veh-h/h	47.0 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.24	
Travel Time Index	1.52	
Congestion Coefficient	4.22	
Demand Flows (Total)	1872 veh/h	2246 pers/h
Percent Heavy Vehicles (Demand)	4.0 %	
Degree of Saturation	1.008	
Practical Spare Capacity	-10.7 %	
Effective Intersection Capacity	1857 veh/h	
Control Delay (Total)	28.67 veh-h/h	34.40 pers-h/h
Control Delay (Average)	55.1 sec	55.1 sec
Control Delay (Worst Lane)	79.0 sec	
Control Delay (Worst Movement)	79.0 sec	79.0 sec
Geometric Delay (Average)	3.3 sec	
Stop-Line Delay (Average)	51.8 sec	
Idling Time (Average)	47.5 sec	
Intersection Level of Service (LOS)	LOS E	
95% Back of Queue - Vehicles (Worst Lane)	46.7 veh	
95% Back of Queue - Distance (Worst Lane)	1204.2 ft	
Ave. Queue Storage Ratio (Worst Lane)	1.84	
Total Effective Stops	1708 veh/h	2050 pers/h
Effective Stop Rate	0.91	0.91
Proportion Queued	0.90	0.90
Performance Index	311.5	311.5
Cost (Total)	736.53 \$/h	736.53 \$/h
Fuel Consumption (Total)	36.5 gal/h	
Carbon Dioxide (Total)	327.3 kg/h	
Hydrocarbons (Total)	0.036 kg/h	
Carbon Monoxide (Total)	0.332 kg/h	
NOx (Total)	0.537 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 3 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 13.0% 2.4% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	898,581 veh/y	1,078,297 pers/y
Delay	13,760 veh-h/y	16,512 pers-h/y
Effective Stops	819,995 veh/y	983,994 pers/y
Travel Distance	177,956 veh-mi/y	213,547 pers-mi/y
Travel Time	18,784 veh-h/y	22,541 pers-h/y
Cost	353,533 \$/y	353,533 \$/y
Fuel Consumption	17,535 gal/y	
Carbon Dioxide	157,081 kg/y	
Hydrocarbons	17 kg/y	
Carbon Monoxide	159 kg/y	
NOx	258 kg/y	

INTERSECTION SUMMARY

 **Site: 5vv [Hegan Ln/Otterson Dr (Site Folder: PM Peak Hour - No Build)]**

New Site
Site Category: (None)
Stop (Two-Way)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	15.3 mph	15.3 mph
Travel Distance (Total)	318.6 veh-mi/h	382.3 pers-mi/h
Travel Time (Total)	20.8 veh-h/h	25.0 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.38	
Travel Time Index	3.14	
Congestion Coefficient	2.62	
Demand Flows (Total)	1093 veh/h	1312 pers/h
Percent Heavy Vehicles (Demand)	2.0 %	
Degree of Saturation	1.188	
Practical Spare Capacity	-32.7 %	
Effective Intersection Capacity	920 veh/h	
Control Delay (Total)	12.48 veh-h/h	14.98 pers-h/h
Control Delay (Average)	41.1 sec	41.1 sec
Control Delay (Worst Lane)	135.7 sec	
Control Delay (Worst Movement)	135.7 sec	135.7 sec
Geometric Delay (Average)	3.4 sec	
Stop-Line Delay (Average)	37.7 sec	
Idling Time (Average)	30.5 sec	
Intersection Level of Service (LOS)	NA	
95% Back of Queue - Vehicles (Worst Lane)	27.9 veh	
95% Back of Queue - Distance (Worst Lane)	707.5 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.00	
Total Effective Stops	860 veh/h	1032 pers/h
Effective Stop Rate	0.79	0.79
Proportion Queued	0.33	0.33
Performance Index	48.5	48.5
Cost (Total)	378.67 \$/h	378.67 \$/h
Fuel Consumption (Total)	16.9 gal/h	
Carbon Dioxide (Total)	150.7 kg/h	
Hydrocarbons (Total)	0.015 kg/h	
Carbon Monoxide (Total)	0.172 kg/h	
NOx (Total)	0.149 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA: Intersection LOS for Vehicles is Not Applicable for two-way sign control since the average intersection delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 3 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 85.3% 38.6% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	524,690 veh/y	629,628 pers/y
Delay	5,991 veh-h/y	7,190 pers-h/y
Effective Stops	412,653 veh/y	495,183 pers/y
Travel Distance	152,925 veh-mi/y	183,510 pers-mi/y
Travel Time	10,004 veh-h/y	12,005 pers-h/y
Cost	181,762 \$/y	181,762 \$/y
Fuel Consumption	8,097 gal/y	
Carbon Dioxide	72,338 kg/y	
Hydrocarbons	7 kg/y	
Carbon Monoxide	82 kg/y	

NOx	72 kg/y
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INTERSECTION SUMMARY

 **Site: 101vv [E Park Ave/Scott Ave (Site Folder: PM Peak Hour - No Build)]**

New Site
Site Category: (None)
Stop (Two-Way)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	38.8 mph	38.8 mph
Travel Distance (Total)	1265.7 veh-mi/h	1518.8 pers-mi/h
Travel Time (Total)	32.6 veh-h/h	39.1 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.97	
Travel Time Index	9.67	
Congestion Coefficient	1.03	
Demand Flows (Total)	2055 veh/h	2467 pers/h
Percent Heavy Vehicles (Demand)	6.0 %	
Degree of Saturation	0.361	
Practical Spare Capacity	121.8 %	
Effective Intersection Capacity	5698 veh/h	
Control Delay (Total)	0.88 veh-h/h	1.06 pers-h/h
Control Delay (Average)	1.5 sec	1.5 sec
Control Delay (Worst Lane)	203.0 sec	
Control Delay (Worst Movement)	203.0 sec	203.0 sec
Geometric Delay (Average)	0.4 sec	
Stop-Line Delay (Average)	1.1 sec	
Idling Time (Average)	0.9 sec	
Intersection Level of Service (LOS)	NA	
95% Back of Queue - Vehicles (Worst Lane)	0.9 veh	
95% Back of Queue - Distance (Worst Lane)	24.4 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.01	
Total Effective Stops	115 veh/h	138 pers/h
Effective Stop Rate	0.06	0.06
Proportion Queued	0.04	0.04
Performance Index	34.5	34.5
Cost (Total)	661.90 \$/h	661.90 \$/h
Fuel Consumption (Total)	39.6 gal/h	
Carbon Dioxide (Total)	358.3 kg/h	
Hydrocarbons (Total)	0.028 kg/h	
Carbon Monoxide (Total)	0.472 kg/h	
NOx (Total)	0.677 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA: Intersection LOS for Vehicles is Not Applicable for two-way sign control since the average intersection delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Site Model Variability Index (Iterations 3 to N): 2.5 %

Number of Iterations: 6 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 2.6% 1.3% 0.6%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	986,609 veh/y	1,183,931 pers/y
Delay	425 veh-h/y	509 pers-h/y
Effective Stops	55,083 veh/y	66,100 pers/y
Travel Distance	607,523 veh-mi/y	729,028 pers-mi/y
Travel Time	15,658 veh-h/y	18,790 pers-h/y
Cost	317,713 \$/y	317,713 \$/y
Fuel Consumption	19,000 gal/y	
Carbon Dioxide	171,994 kg/y	
Hydrocarbons	13 kg/y	
Carbon Monoxide	227 kg/y	

NOx	325 kg/y
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INTERSECTION SUMMARY

 **Site: 101vv [E Park Ave/Scott Ave (Site Folder: AM Peak Hour - Yr 2040 No Build)]**

New Site
Site Category: (None)
Stop (Two-Way)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	37.7 mph	37.7 mph
Travel Distance (Total)	1238.1 veh-mi/h	1485.7 pers-mi/h
Travel Time (Total)	32.9 veh-h/h	39.5 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.94	
Travel Time Index	9.35	
Congestion Coefficient	1.06	
Demand Flows (Total)	2011 veh/h	2413 pers/h
Percent Heavy Vehicles (Demand)	12.0 %	
Degree of Saturation	0.698	
Practical Spare Capacity	14.6 %	
Effective Intersection Capacity	2880 veh/h	
Control Delay (Total)	1.77 veh-h/h	2.13 pers-h/h
Control Delay (Average)	3.2 sec	3.2 sec
Control Delay (Worst Lane)	358.1 sec	
Control Delay (Worst Movement)	358.1 sec	358.1 sec
Geometric Delay (Average)	0.7 sec	
Stop-Line Delay (Average)	2.4 sec	
Idling Time (Average)	2.2 sec	
Intersection Level of Service (LOS)	NA	
95% Back of Queue - Vehicles (Worst Lane)	1.9 veh	
95% Back of Queue - Distance (Worst Lane)	51.2 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.01	
Total Effective Stops	183 veh/h	220 pers/h
Effective Stop Rate	0.09	0.09
Proportion Queued	0.06	0.06
Performance Index	36.3	36.3
Cost (Total)	708.86 \$/h	708.86 \$/h
Fuel Consumption (Total)	47.8 gal/h	
Carbon Dioxide (Total)	438.5 kg/h	
Hydrocarbons (Total)	0.033 kg/h	
Carbon Monoxide (Total)	0.509 kg/h	
NOx (Total)	1.325 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA: Intersection LOS for Vehicles is Not Applicable for two-way sign control since the average intersection delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Site Model Variability Index (Iterations 3 to N): 3.7 %

Number of Iterations: 6 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 3.8% 1.8% 0.9%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	965,053 veh/y	1,158,063 pers/y
Delay	851 veh-h/y	1,021 pers-h/y
Effective Stops	87,964 veh/y	105,557 pers/y
Travel Distance	594,287 veh-mi/y	713,144 pers-mi/y
Travel Time	15,782 veh-h/y	18,938 pers-h/y
Cost	340,250 \$/y	340,250 \$/y
Fuel Consumption	22,965 gal/y	
Carbon Dioxide	210,466 kg/y	
Hydrocarbons	16 kg/y	
Carbon Monoxide	244 kg/y	

NOx	636 kg/y
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INTERSECTION SUMMARY

 **Site: 1v [Park Ave/Meyers St (Site Folder: AM Peak Hour - Yr 2040 No Build)]**

New Site

Site Category: (None)

Signals - EQUISAT (Pretimed) Isolated Cycle Time = 80 seconds (Site User-Given Phase Times)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	20.6 mph	20.6 mph
Travel Distance (Total)	299.4 veh-mi/h	359.2 pers-mi/h
Travel Time (Total)	14.5 veh-h/h	17.5 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.51	
Travel Time Index	4.60	
Congestion Coefficient	1.94	
Demand Flows (Total)	1375 veh/h	1650 pers/h
Percent Heavy Vehicles (Demand)	4.0 %	
Degree of Saturation	0.452	
Practical Spare Capacity	99.1 %	
Effective Intersection Capacity	3041 veh/h	
Control Delay (Total)	6.77 veh-h/h	8.12 pers-h/h
Control Delay (Average)	17.7 sec	17.7 sec
Control Delay (Worst Lane)	37.4 sec	
Control Delay (Worst Movement)	37.4 sec	37.4 sec
Geometric Delay (Average)	1.9 sec	
Stop-Line Delay (Average)	15.9 sec	
Idling Time (Average)	13.0 sec	
Intersection Level of Service (LOS)	LOS B	
95% Back of Queue - Vehicles (Worst Lane)	9.4 veh	
95% Back of Queue - Distance (Worst Lane)	241.5 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.35	
Total Effective Stops	794 veh/h	953 pers/h
Effective Stop Rate	0.58	0.58
Proportion Queued	0.66	0.66
Performance Index	64.3	64.3
Cost (Total)	303.96 \$/h	303.96 \$/h
Fuel Consumption (Total)	19.3 gal/h	
Carbon Dioxide (Total)	173.3 kg/h	
Hydrocarbons (Total)	0.017 kg/h	
Carbon Monoxide (Total)	0.194 kg/h	
NOx (Total)	0.324 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 2 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 5.3% 0.0% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	660,000 veh/y	792,000 pers/y
Delay	3,248 veh-h/y	3,898 pers-h/y
Effective Stops	381,189 veh/y	457,427 pers/y
Travel Distance	143,690 veh-mi/y	172,428 pers-mi/y
Travel Time	6,983 veh-h/y	8,379 pers-h/y
Cost	145,901 \$/y	145,901 \$/y
Fuel Consumption	9,277 gal/y	
Carbon Dioxide	83,204 kg/y	
Hydrocarbons	8 kg/y	
Carbon Monoxide	93 kg/y	
NOx	155 kg/y	

INTERSECTION SUMMARY

 **Site: 2v [Midway Rd/E Park Ave/Park Ave (Site Folder: AM Peak Hour - Yr 2040 No Build)]**

New Site

Site Category: (None)

Signals - EQUISAT (Pretimed) Isolated Cycle Time = 120 seconds (Site User-Given Phase Times)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	6.5 mph	6.5 mph
Travel Distance (Total)	529.8 veh-mi/h	635.7 pers-mi/h
Travel Time (Total)	81.3 veh-h/h	97.6 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.16	
Travel Time Index	0.70	
Congestion Coefficient	6.14	
Demand Flows (Total)	2541 veh/h	3050 pers/h
Percent Heavy Vehicles (Demand)	9.0 %	
Degree of Saturation	1.345	
Practical Spare Capacity	-33.1 %	
Effective Intersection Capacity	1889 veh/h	
Control Delay (Total)	62.76 veh-h/h	75.31 pers-h/h
Control Delay (Average)	88.9 sec	88.9 sec
Control Delay (Worst Lane)	217.2 sec	
Control Delay (Worst Movement)	223.2 sec	223.2 sec
Geometric Delay (Average)	4.5 sec	
Stop-Line Delay (Average)	84.4 sec	
Idling Time (Average)	82.7 sec	
Intersection Level of Service (LOS)	LOS F	
95% Back of Queue - Vehicles (Worst Lane)	38.2 veh	
95% Back of Queue - Distance (Worst Lane)	1024.6 ft	
Ave. Queue Storage Ratio (Worst Lane)	2.09	
Total Effective Stops	2473 veh/h	2968 pers/h
Effective Stop Rate	0.97	0.97
Proportion Queued	0.75	0.75
Performance Index	353.6	353.6
Cost (Total)	1484.01 \$/h	1484.01 \$/h
Fuel Consumption (Total)	67.1 gal/h	
Carbon Dioxide (Total)	605.5 kg/h	
Hydrocarbons (Total)	0.073 kg/h	
Carbon Monoxide (Total)	0.641 kg/h	
NOx (Total)	1.647 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 2 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 9.6% 0.0% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,219,826 veh/y	1,463,792 pers/y
Delay	30,125 veh-h/y	36,150 pers-h/y
Effective Stops	1,187,238 veh/y	1,424,686 pers/y
Travel Distance	254,283 veh-mi/y	305,140 pers-mi/y
Travel Time	39,026 veh-h/y	46,832 pers-h/y
Cost	712,327 \$/y	712,327 \$/y
Fuel Consumption	32,206 gal/y	
Carbon Dioxide	290,622 kg/y	
Hydrocarbons	35 kg/y	
Carbon Monoxide	308 kg/y	
NOx	791 kg/y	

INTERSECTION SUMMARY

 **Site: 3v [Fair St/E Park Ave (Site Folder: AM Peak Hour - Yr 2040 No Build)]**

New Site

Site Category: (None)

Signals - EQUISAT (Pretimed) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	15.5 mph	15.5 mph
Travel Distance (Total)	353.8 veh-mi/h	424.6 pers-mi/h
Travel Time (Total)	22.9 veh-h/h	27.4 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.39	
Travel Time Index	3.19	
Congestion Coefficient	2.58	
Demand Flows (Total)	2119 veh/h	2542 pers/h
Percent Heavy Vehicles (Demand)	10.0 %	
Degree of Saturation	0.575	
Practical Spare Capacity	56.6 %	
Effective Intersection Capacity	3687 veh/h	
Control Delay (Total)	13.03 veh-h/h	15.64 pers-h/h
Control Delay (Average)	22.1 sec	22.1 sec
Control Delay (Worst Lane)	45.2 sec	
Control Delay (Worst Movement)	46.5 sec	46.5 sec
Geometric Delay (Average)	1.2 sec	
Stop-Line Delay (Average)	20.9 sec	
Idling Time (Average)	17.4 sec	
Intersection Level of Service (LOS)	LOS C	
95% Back of Queue - Vehicles (Worst Lane)	14.0 veh	
95% Back of Queue - Distance (Worst Lane)	378.4 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.73	
Total Effective Stops	1495 veh/h	1794 pers/h
Effective Stop Rate	0.71	0.71
Proportion Queued	0.81	0.81
Performance Index	125.2	125.2
Cost (Total)	505.62 \$/h	505.62 \$/h
Fuel Consumption (Total)	35.7 gal/h	
Carbon Dioxide (Total)	323.0 kg/h	
Hydrocarbons (Total)	0.031 kg/h	
Carbon Monoxide (Total)	0.332 kg/h	
NOx (Total)	1.097 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 2 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 0.0% 4.4% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,016,907 veh/y	1,220,289 pers/y
Delay	6,256 veh-h/y	7,507 pers-h/y
Effective Stops	717,692 veh/y	861,231 pers/y
Travel Distance	169,833 veh-mi/y	203,799 pers-mi/y
Travel Time	10,972 veh-h/y	13,166 pers-h/y
Cost	242,695 \$/y	242,695 \$/y
Fuel Consumption	17,136 gal/y	
Carbon Dioxide	155,032 kg/y	
Hydrocarbons	15 kg/y	
Carbon Monoxide	159 kg/y	
NOx	527 kg/y	

INTERSECTION SUMMARY

 **Site: 4v [Midway Rd/Hegan Ln (Site Folder: AM Peak Hour - Yr 2040 No Build)]**

New Site

Site Category: (None)

Signals - EQUISAT (Pretimed) Isolated Cycle Time = 140 seconds (Site Optimum Cycle Time - Minimum Delay)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	10.6 mph	10.6 mph
Travel Distance (Total)	416.8 veh-mi/h	500.2 pers-mi/h
Travel Time (Total)	39.3 veh-h/h	47.2 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.26	
Travel Time Index	1.83	
Congestion Coefficient	3.77	
Demand Flows (Total)	2073 veh/h	2487 pers/h
Percent Heavy Vehicles (Demand)	9.0 %	
Degree of Saturation	0.998	
Practical Spare Capacity	-9.8 %	
Effective Intersection Capacity	2077 veh/h	
Control Delay (Total)	27.90 veh-h/h	33.47 pers-h/h
Control Delay (Average)	48.4 sec	48.4 sec
Control Delay (Worst Lane)	101.3 sec	
Control Delay (Worst Movement)	101.4 sec	101.4 sec
Geometric Delay (Average)	3.1 sec	
Stop-Line Delay (Average)	45.4 sec	
Idling Time (Average)	42.4 sec	
Intersection Level of Service (LOS)	LOS D	
95% Back of Queue - Vehicles (Worst Lane)	41.7 veh	
95% Back of Queue - Distance (Worst Lane)	1118.1 ft	
Ave. Queue Storage Ratio (Worst Lane)	1.26	
Total Effective Stops	1533 veh/h	1839 pers/h
Effective Stop Rate	0.74	0.74
Proportion Queued	0.69	0.69
Performance Index	295.2	295.2
Cost (Total)	764.54 \$/h	764.54 \$/h
Fuel Consumption (Total)	41.3 gal/h	
Carbon Dioxide (Total)	373.3 kg/h	
Hydrocarbons (Total)	0.041 kg/h	
Carbon Monoxide (Total)	0.395 kg/h	
NOx (Total)	1.036 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 3 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 12.5% 1.1% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	994,909 veh/y	1,193,891 pers/y
Delay	13,390 veh-h/y	16,068 pers-h/y
Effective Stops	735,615 veh/y	882,738 pers/y
Travel Distance	200,083 veh-mi/y	240,100 pers-mi/y
Travel Time	18,880 veh-h/y	22,656 pers-h/y
Cost	366,980 \$/y	366,980 \$/y
Fuel Consumption	19,843 gal/y	
Carbon Dioxide	179,205 kg/y	
Hydrocarbons	20 kg/y	
Carbon Monoxide	190 kg/y	
NOx	497 kg/y	

INTERSECTION SUMMARY

 **Site: 5vv [Hegan Ln/Otterson Dr (Site Folder: AM Peak Hour - Yr 2040 No Build)]**

New Site
Site Category: (None)
Stop (Two-Way)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	31.3 mph	31.3 mph
Travel Distance (Total)	312.3 veh-mi/h	374.7 pers-mi/h
Travel Time (Total)	10.0 veh-h/h	12.0 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.78	
Travel Time Index	7.59	
Congestion Coefficient	1.28	
Demand Flows (Total)	1045 veh/h	1253 pers/h
Percent Heavy Vehicles (Demand)	4.0 %	
Degree of Saturation	0.457	
Practical Spare Capacity	75.0 %	
Effective Intersection Capacity	2284 veh/h	
Control Delay (Total)	1.78 veh-h/h	2.14 pers-h/h
Control Delay (Average)	6.2 sec	6.2 sec
Control Delay (Worst Lane)	34.5 sec	
Control Delay (Worst Movement)	34.5 sec	34.5 sec
Geometric Delay (Average)	3.3 sec	
Stop-Line Delay (Average)	2.8 sec	
Idling Time (Average)	2.3 sec	
Intersection Level of Service (LOS)	NA	
95% Back of Queue - Vehicles (Worst Lane)	2.3 veh	
95% Back of Queue - Distance (Worst Lane)	59.3 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.01	
Total Effective Stops	376 veh/h	452 pers/h
Effective Stop Rate	0.36	0.36
Proportion Queued	0.13	0.13
Performance Index	14.7	14.7
Cost (Total)	214.10 \$/h	214.10 \$/h
Fuel Consumption (Total)	14.3 gal/h	
Carbon Dioxide (Total)	128.9 kg/h	
Hydrocarbons (Total)	0.011 kg/h	
Carbon Monoxide (Total)	0.154 kg/h	
NOx (Total)	0.244 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA: Intersection LOS for Vehicles is Not Applicable for two-way sign control since the average intersection delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 3 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 88.2% 30.7% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	501,391 veh/y	601,670 pers/y
Delay	857 veh-h/y	1,028 pers-h/y
Effective Stops	180,639 veh/y	216,767 pers/y
Travel Distance	149,897 veh-mi/y	179,877 pers-mi/y
Travel Time	4,785 veh-h/y	5,742 pers-h/y
Cost	102,768 \$/y	102,768 \$/y
Fuel Consumption	6,887 gal/y	
Carbon Dioxide	61,887 kg/y	
Hydrocarbons	5 kg/y	
Carbon Monoxide	74 kg/y	

NOx	117 kg/y
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INTERSECTION SUMMARY

 **Site: 1v [Park Ave/Meyers St (Site Folder: PM Peak Hour - Yr 2040 No Build)]**

New Site

Site Category: (None)

Signals - EQUISAT (Pretimed) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	17.9 mph	17.9 mph
Travel Distance (Total)	381.7 veh-mi/h	458.1 pers-mi/h
Travel Time (Total)	21.3 veh-h/h	25.6 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.45	
Travel Time Index	3.87	
Congestion Coefficient	2.23	
Demand Flows (Total)	1753 veh/h	2103 pers/h
Percent Heavy Vehicles (Demand)	5.0 %	
Degree of Saturation	0.579	
Practical Spare Capacity	55.4 %	
Effective Intersection Capacity	3027 veh/h	
Control Delay (Total)	11.31 veh-h/h	13.57 pers-h/h
Control Delay (Average)	23.2 sec	23.2 sec
Control Delay (Worst Lane)	42.5 sec	
Control Delay (Worst Movement)	42.5 sec	42.5 sec
Geometric Delay (Average)	2.2 sec	
Stop-Line Delay (Average)	21.0 sec	
Idling Time (Average)	17.5 sec	
Intersection Level of Service (LOS)	LOS C	
95% Back of Queue - Vehicles (Worst Lane)	13.1 veh	
95% Back of Queue - Distance (Worst Lane)	341.4 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.41	
Total Effective Stops	1247 veh/h	1496 pers/h
Effective Stop Rate	0.71	0.71
Proportion Queued	0.80	0.80
Performance Index	101.6	101.6
Cost (Total)	448.09 \$/h	448.09 \$/h
Fuel Consumption (Total)	28.9 gal/h	
Carbon Dioxide (Total)	259.1 kg/h	
Hydrocarbons (Total)	0.026 kg/h	
Carbon Monoxide (Total)	0.281 kg/h	
NOx (Total)	0.564 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 2 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 0.0% 1.8% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	841,263 veh/y	1,009,516 pers/y
Delay	5,427 veh-h/y	6,513 pers-h/y
Effective Stops	598,487 veh/y	718,184 pers/y
Travel Distance	183,238 veh-mi/y	219,886 pers-mi/y
Travel Time	10,228 veh-h/y	12,274 pers-h/y
Cost	215,084 \$/y	215,084 \$/y
Fuel Consumption	13,849 gal/y	
Carbon Dioxide	124,363 kg/y	
Hydrocarbons	12 kg/y	
Carbon Monoxide	135 kg/y	
NOx	271 kg/y	

INTERSECTION SUMMARY

 **Site: 2v [Midway Rd/E Park Ave/Park Ave (Site Folder: PM Peak Hour - Yr 2040 No Build)]**

New Site

Site Category: (None)

Signals - EQUISAT (Pretimed) Isolated Cycle Time = 120 seconds (Site User-Given Phase Times)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	7.3 mph	7.3 mph
Travel Distance (Total)	597.3 veh-mi/h	716.8 pers-mi/h
Travel Time (Total)	81.9 veh-h/h	98.3 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.18	
Travel Time Index	0.91	
Congestion Coefficient	5.49	
Demand Flows (Total)	2868 veh/h	3441 pers/h
Percent Heavy Vehicles (Demand)	5.0 %	
Degree of Saturation	1.663	
Practical Spare Capacity	-45.9 %	
Effective Intersection Capacity	1724 veh/h	
Control Delay (Total)	62.32 veh-h/h	74.79 pers-h/h
Control Delay (Average)	78.2 sec	78.2 sec
Control Delay (Worst Lane)	353.1 sec	
Control Delay (Worst Movement)	359.1 sec	359.1 sec
Geometric Delay (Average)	4.6 sec	
Stop-Line Delay (Average)	73.7 sec	
Idling Time (Average)	70.6 sec	
Intersection Level of Service (LOS)	LOS E	
95% Back of Queue - Vehicles (Worst Lane)	50.8 veh	
95% Back of Queue - Distance (Worst Lane)	1320.1 ft	
Ave. Queue Storage Ratio (Worst Lane)	1.24	
Total Effective Stops	2691 veh/h	3229 pers/h
Effective Stop Rate	0.94	0.94
Proportion Queued	0.73	0.73
Performance Index	384.4	384.4
Cost (Total)	1478.36 \$/h	1478.36 \$/h
Fuel Consumption (Total)	64.4 gal/h	
Carbon Dioxide (Total)	577.6 kg/h	
Hydrocarbons (Total)	0.066 kg/h	
Carbon Monoxide (Total)	0.589 kg/h	
NOx (Total)	1.055 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 2 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 14.0% 0.0% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,376,500 veh/y	1,651,800 pers/y
Delay	29,916 veh-h/y	35,899 pers-h/y
Effective Stops	1,291,678 veh/y	1,550,013 pers/y
Travel Distance	286,725 veh-mi/y	344,070 pers-mi/y
Travel Time	39,322 veh-h/y	47,186 pers-h/y
Cost	709,615 \$/y	709,615 \$/y
Fuel Consumption	30,907 gal/y	
Carbon Dioxide	277,234 kg/y	
Hydrocarbons	32 kg/y	
Carbon Monoxide	283 kg/y	
NOx	507 kg/y	

INTERSECTION SUMMARY

 **Site: 3v [Fair St/E Park Ave (Site Folder: PM Peak Hour - Yr 2040 No Build)]**

New Site

Site Category: (None)

Signals - EQUISAT (Pretimed) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	14.9 mph	14.9 mph
Travel Distance (Total)	439.9 veh-mi/h	527.8 pers-mi/h
Travel Time (Total)	29.5 veh-h/h	35.4 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.37	
Travel Time Index	3.03	
Congestion Coefficient	2.68	
Demand Flows (Total)	2604 veh/h	3125 pers/h
Percent Heavy Vehicles (Demand)	5.0 %	
Degree of Saturation	0.879	
Practical Spare Capacity	2.4 %	
Effective Intersection Capacity	2964 veh/h	
Control Delay (Total)	17.62 veh-h/h	21.14 pers-h/h
Control Delay (Average)	24.4 sec	24.4 sec
Control Delay (Worst Lane)	50.9 sec	
Control Delay (Worst Movement)	50.9 sec	50.9 sec
Geometric Delay (Average)	1.2 sec	
Stop-Line Delay (Average)	23.1 sec	
Idling Time (Average)	19.0 sec	
Intersection Level of Service (LOS)	LOS C	
95% Back of Queue - Vehicles (Worst Lane)	21.1 veh	
95% Back of Queue - Distance (Worst Lane)	549.2 ft	
Ave. Queue Storage Ratio (Worst Lane)	1.12	
Total Effective Stops	2000 veh/h	2400 pers/h
Effective Stop Rate	0.77	0.77
Proportion Queued	0.86	0.86
Performance Index	171.5	171.5
Cost (Total)	616.90 \$/h	616.90 \$/h
Fuel Consumption (Total)	39.4 gal/h	
Carbon Dioxide (Total)	353.2 kg/h	
Hydrocarbons (Total)	0.036 kg/h	
Carbon Monoxide (Total)	0.372 kg/h	
NOx (Total)	0.767 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 18.6 %

Number of Iterations: 6 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 7.2% 26.8% 2.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,250,000 veh/y	1,500,000 pers/y
Delay	8,457 veh-h/y	10,148 pers-h/y
Effective Stops	959,809 veh/y	1,151,771 pers/y
Travel Distance	211,131 veh-mi/y	253,358 pers-mi/y
Travel Time	14,148 veh-h/y	16,978 pers-h/y
Cost	296,112 \$/y	296,112 \$/y
Fuel Consumption	18,890 gal/y	
Carbon Dioxide	169,548 kg/y	
Hydrocarbons	17 kg/y	
Carbon Monoxide	179 kg/y	
NOx	368 kg/y	

INTERSECTION SUMMARY

 **Site: 4v [Midway Rd/Hegan Ln (Site Folder: PM Peak Hour - Yr 2040 No Build)]**

New Site

Site Category: (None)

Signals - EQUISAT (Pretimed) Isolated Cycle Time = 100 seconds (Site Optimum Cycle Time - Minimum Delay)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	6.0 mph	6.0 mph
Travel Distance (Total)	447.5 veh-mi/h	537.0 pers-mi/h
Travel Time (Total)	74.6 veh-h/h	89.5 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.15	
Travel Time Index	0.55	
Congestion Coefficient	6.67	
Demand Flows (Total)	2260 veh/h	2712 pers/h
Percent Heavy Vehicles (Demand)	4.0 %	
Degree of Saturation	1.223	
Practical Spare Capacity	-26.4 %	
Effective Intersection Capacity	1849 veh/h	
Control Delay (Total)	60.24 veh-h/h	72.29 pers-h/h
Control Delay (Average)	96.0 sec	96.0 sec
Control Delay (Worst Lane)	164.4 sec	
Control Delay (Worst Movement)	164.4 sec	164.4 sec
Geometric Delay (Average)	3.3 sec	
Stop-Line Delay (Average)	92.6 sec	
Idling Time (Average)	90.0 sec	
Intersection Level of Service (LOS)	LOS F	
95% Back of Queue - Vehicles (Worst Lane)	71.0 veh	
95% Back of Queue - Distance (Worst Lane)	1830.5 ft	
Ave. Queue Storage Ratio (Worst Lane)	2.80	
Total Effective Stops	2456 veh/h	2947 pers/h
Effective Stop Rate	1.09	1.09
Proportion Queued	0.96	0.96
Performance Index	479.3	479.3
Cost (Total)	1329.16 \$/h	1329.16 \$/h
Fuel Consumption (Total)	55.3 gal/h	
Carbon Dioxide (Total)	495.5 kg/h	
Hydrocarbons (Total)	0.057 kg/h	
Carbon Monoxide (Total)	0.477 kg/h	
NOx (Total)	0.750 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 2 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 0.0% 12.8% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,084,903 veh/y	1,301,884 pers/y
Delay	28,917 veh-h/y	34,700 pers-h/y
Effective Stops	1,178,847 veh/y	1,414,617 pers/y
Travel Distance	214,811 veh-mi/y	257,773 pers-mi/y
Travel Time	35,816 veh-h/y	42,979 pers-h/y
Cost	637,998 \$/y	637,998 \$/y
Fuel Consumption	26,560 gal/y	
Carbon Dioxide	237,819 kg/y	
Hydrocarbons	28 kg/y	
Carbon Monoxide	229 kg/y	
NOx	360 kg/y	

INTERSECTION SUMMARY

 **Site: 5vv [Hegan Ln/Otterson Dr (Site Folder: PM Peak Hour - Yr 2040 No Build)]**

New Site
Site Category: (None)
Stop (Two-Way)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	12.5 mph	12.5 mph
Travel Distance (Total)	366.4 veh-mi/h	439.6 pers-mi/h
Travel Time (Total)	29.4 veh-h/h	35.3 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.31	
Travel Time Index	2.35	
Congestion Coefficient	3.21	
Demand Flows (Total)	1255 veh/h	1507 pers/h
Percent Heavy Vehicles (Demand)	2.0 %	
Degree of Saturation	1.332	
Practical Spare Capacity	-39.9 %	
Effective Intersection Capacity	942 veh/h	
Control Delay (Total)	19.68 veh-h/h	23.61 pers-h/h
Control Delay (Average)	56.4 sec	56.4 sec
Control Delay (Worst Lane)	185.0 sec	
Control Delay (Worst Movement)	185.0 sec	185.0 sec
Geometric Delay (Average)	3.4 sec	
Stop-Line Delay (Average)	53.0 sec	
Idling Time (Average)	43.1 sec	
Intersection Level of Service (LOS)	NA	
95% Back of Queue - Vehicles (Worst Lane)	38.9 veh	
95% Back of Queue - Distance (Worst Lane)	988.4 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.00	
Total Effective Stops	1188 veh/h	1425 pers/h
Effective Stop Rate	0.95	0.95
Proportion Queued	0.34	0.34
Performance Index	67.8	67.8
Cost (Total)	521.75 \$/h	521.75 \$/h
Fuel Consumption (Total)	21.4 gal/h	
Carbon Dioxide (Total)	191.0 kg/h	
Hydrocarbons (Total)	0.020 kg/h	
Carbon Monoxide (Total)	0.210 kg/h	
NOx (Total)	0.183 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA: Intersection LOS for Vehicles is Not Applicable for two-way sign control since the average intersection delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 3 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 84.7% 42.1% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	602,609 veh/y	723,130 pers/y
Delay	9,446 veh-h/y	11,335 pers-h/y
Effective Stops	570,132 veh/y	684,159 pers/y
Travel Distance	175,851 veh-mi/y	211,021 pers-mi/y
Travel Time	14,120 veh-h/y	16,944 pers-h/y
Cost	250,442 \$/y	250,442 \$/y
Fuel Consumption	10,264 gal/y	
Carbon Dioxide	91,685 kg/y	
Hydrocarbons	10 kg/y	
Carbon Monoxide	101 kg/y	

NOx	88 kg/y
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INTERSECTION SUMMARY

 **Site: 101vv [E Park Ave/Scott Ave (Site Folder: PM Peak Hour - Yr 2040 No Build)]**

New Site
Site Category: (None)
Stop (Two-Way)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	35.9 mph	35.9 mph
Travel Distance (Total)	1522.7 veh-mi/h	1827.2 pers-mi/h
Travel Time (Total)	42.5 veh-h/h	51.0 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.90	
Travel Time Index	8.85	
Congestion Coefficient	1.12	
Demand Flows (Total)	2473 veh/h	2967 pers/h
Percent Heavy Vehicles (Demand)	6.0 %	
Degree of Saturation	1.765	
Practical Spare Capacity	-54.7 %	
Effective Intersection Capacity	1401 veh/h	
Control Delay (Total)	3.63 veh-h/h	4.35 pers-h/h
Control Delay (Average)	5.3 sec	5.3 sec
Control Delay (Worst Lane)	969.4 sec	
Control Delay (Worst Movement)	969.4 sec	969.4 sec
Geometric Delay (Average)	0.5 sec	
Stop-Line Delay (Average)	4.8 sec	
Idling Time (Average)	5.5 sec	
Intersection Level of Service (LOS)	NA	
95% Back of Queue - Vehicles (Worst Lane)	5.7 veh	
95% Back of Queue - Distance (Worst Lane)	148.7 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.04	
Total Effective Stops	148 veh/h	177 pers/h
Effective Stop Rate	0.06	0.06
Proportion Queued	0.04	0.04
Performance Index	48.1	48.1
Cost (Total)	847.05 \$/h	847.05 \$/h
Fuel Consumption (Total)	48.7 gal/h	
Carbon Dioxide (Total)	441.2 kg/h	
Hydrocarbons (Total)	0.035 kg/h	
Carbon Monoxide (Total)	0.578 kg/h	
NOx (Total)	0.826 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA: Intersection LOS for Vehicles is Not Applicable for two-way sign control since the average intersection delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Site Model Variability Index (Iterations 3 to N): 2.9 %

Number of Iterations: 8 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 1.4% 1.0% 0.7%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,186,957 veh/y	1,424,348 pers/y
Delay	1,741 veh-h/y	2,089 pers-h/y
Effective Stops	70,988 veh/y	85,186 pers/y
Travel Distance	730,894 veh-mi/y	877,072 pers-mi/y
Travel Time	20,384 veh-h/y	24,461 pers-h/y
Cost	406,583 \$/y	406,583 \$/y
Fuel Consumption	23,397 gal/y	
Carbon Dioxide	211,755 kg/y	
Hydrocarbons	17 kg/y	
Carbon Monoxide	277 kg/y	

NOx	396 kg/y
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INTERSECTION SUMMARY

 **Site: 2v [Midway Rd/E Park Ave/Park Ave (Site Folder: AM Peak Hour - Improvements)]**

New Site

Site Category: (None)

Signals - EQUISAT (Pretimed) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	17.0 mph	17.0 mph
Travel Distance (Total)	446.0 veh-mi/h	535.2 pers-mi/h
Travel Time (Total)	26.3 veh-h/h	31.6 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.42	
Travel Time Index	3.60	
Congestion Coefficient	2.36	
Demand Flows (Total)	2131 veh/h	2557 pers/h
Percent Heavy Vehicles (Demand)	9.0 %	
Degree of Saturation	0.566	
Practical Spare Capacity	59.1 %	
Effective Intersection Capacity	3767 veh/h	
Control Delay (Total)	13.98 veh-h/h	16.78 pers-h/h
Control Delay (Average)	23.6 sec	23.6 sec
Control Delay (Worst Lane)	40.6 sec	
Control Delay (Worst Movement)	42.1 sec	42.1 sec
Geometric Delay (Average)	4.5 sec	
Stop-Line Delay (Average)	19.1 sec	
Idling Time (Average)	16.0 sec	
Intersection Level of Service (LOS)	LOS C	
95% Back of Queue - Vehicles (Worst Lane)	11.0 veh	
95% Back of Queue - Distance (Worst Lane)	293.5 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.60	
Total Effective Stops	1569 veh/h	1882 pers/h
Effective Stop Rate	0.74	0.74
Proportion Queued	0.67	0.67
Performance Index	106.1	106.1
Cost (Total)	576.39 \$/h	576.39 \$/h
Fuel Consumption (Total)	40.1 gal/h	
Carbon Dioxide (Total)	362.0 kg/h	
Hydrocarbons (Total)	0.035 kg/h	
Carbon Monoxide (Total)	0.375 kg/h	
NOx (Total)	1.121 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 2 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 11.4% 4.4% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,022,769 veh/y	1,227,323 pers/y
Delay	6,712 veh-h/y	8,055 pers-h/y
Effective Stops	752,991 veh/y	903,590 pers/y
Travel Distance	214,070 veh-mi/y	256,884 pers-mi/y
Travel Time	12,625 veh-h/y	15,150 pers-h/y
Cost	276,667 \$/y	276,667 \$/y
Fuel Consumption	19,225 gal/y	
Carbon Dioxide	173,736 kg/y	
Hydrocarbons	17 kg/y	
Carbon Monoxide	180 kg/y	
NOx	538 kg/y	

INTERSECTION SUMMARY

 **Site: 4v [Midway Rd/Hegan Ln (Site Folder: AM Peak Hour - Improvements)]**

New Site

Site Category: (None)

Signals - EQUISAT (Pretimed) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	20.8 mph	20.8 mph
Travel Distance (Total)	367.5 veh-mi/h	441.0 pers-mi/h
Travel Time (Total)	17.6 veh-h/h	21.2 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.52	
Travel Time Index	4.67	
Congestion Coefficient	1.92	
Demand Flows (Total)	1802 veh/h	2163 pers/h
Percent Heavy Vehicles (Demand)	9.0 %	
Degree of Saturation	0.534	
Practical Spare Capacity	68.6 %	
Effective Intersection Capacity	3377 veh/h	
Control Delay (Total)	7.47 veh-h/h	8.96 pers-h/h
Control Delay (Average)	14.9 sec	14.9 sec
Control Delay (Worst Lane)	47.4 sec	
Control Delay (Worst Movement)	47.4 sec	47.4 sec
Geometric Delay (Average)	3.1 sec	
Stop-Line Delay (Average)	11.8 sec	
Idling Time (Average)	9.4 sec	
Intersection Level of Service (LOS)	LOS B	
95% Back of Queue - Vehicles (Worst Lane)	12.7 veh	
95% Back of Queue - Distance (Worst Lane)	339.2 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.35	
Total Effective Stops	1091 veh/h	1309 pers/h
Effective Stop Rate	0.61	0.61
Proportion Queued	0.54	0.54
Performance Index	91.7	91.7
Cost (Total)	403.50 \$/h	403.50 \$/h
Fuel Consumption (Total)	30.1 gal/h	
Carbon Dioxide (Total)	271.9 kg/h	
Hydrocarbons (Total)	0.026 kg/h	
Carbon Monoxide (Total)	0.289 kg/h	
NOx (Total)	0.809 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 2 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 15.7% 3.1% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	865,143 veh/y	1,038,172 pers/y
Delay	3,584 veh-h/y	4,301 pers-h/y
Effective Stops	523,493 veh/y	628,191 pers/y
Travel Distance	176,386 veh-mi/y	211,664 pers-mi/y
Travel Time	8,468 veh-h/y	10,162 pers-h/y
Cost	193,679 \$/y	193,679 \$/y
Fuel Consumption	14,439 gal/y	
Carbon Dioxide	130,513 kg/y	
Hydrocarbons	12 kg/y	
Carbon Monoxide	139 kg/y	
NOx	388 kg/y	

INTERSECTION SUMMARY

 **Site: 5vvv [Hegan Ln/Otterson Dr - AWSC (Site Folder: AM Peak Hour - Improvements)]**

New Site
Site Category: (None)
Stop (All-Way)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	14.4 mph	14.4 mph
Travel Distance (Total)	264.6 veh-mi/h	317.5 pers-mi/h
Travel Time (Total)	18.3 veh-h/h	22.0 pers-h/h
Desired Speed (Program)	25.0 mph	
Speed Efficiency	0.58	
Travel Time Index	5.30	
Congestion Coefficient	1.73	
Demand Flows (Total)	888 veh/h	1065 pers/h
Percent Heavy Vehicles (Demand)	4.0 %	
Degree of Saturation	0.921	
Practical Spare Capacity	-7.7 %	
Effective Intersection Capacity	964 veh/h	
Control Delay (Total)	8.28 veh-h/h	9.94 pers-h/h
Control Delay (Average)	33.6 sec	33.6 sec
Control Delay (Worst Lane)	44.3 sec	
Control Delay (Worst Movement)	44.4 sec	44.4 sec
Geometric Delay (Average)	6.7 sec	
Stop-Line Delay (Average)	26.9 sec	
Idling Time (Average)	5.8 sec	
Intersection Level of Service (LOS)	LOS D	
95% Back of Queue - Vehicles (Worst Lane)	11.6 veh	
95% Back of Queue - Distance (Worst Lane)	298.6 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.30	
Total Effective Stops	2272 veh/h	2727 pers/h
Effective Stop Rate	2.56	2.56
Proportion Queued	0.95	0.95
Performance Index	63.5	63.5
Cost (Total)	332.98 \$/h	332.98 \$/h
Fuel Consumption (Total)	14.8 gal/h	
Carbon Dioxide (Total)	133.1 kg/h	
Hydrocarbons (Total)	0.012 kg/h	
Carbon Monoxide (Total)	0.093 kg/h	
NOx (Total)	0.223 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 2 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 0.0% 97.2% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	426,067 veh/y	511,281 pers/y
Delay	3,975 veh-h/y	4,770 pers-h/y
Effective Stops	1,090,662 veh/y	1,308,795 pers/y
Travel Distance	126,991 veh-mi/y	152,389 pers-mi/y
Travel Time	8,799 veh-h/y	10,559 pers-h/y
Cost	159,830 \$/y	159,830 \$/y
Fuel Consumption	7,114 gal/y	
Carbon Dioxide	63,893 kg/y	
Hydrocarbons	6 kg/y	
Carbon Monoxide	45 kg/y	
NOx	107 kg/y	

INTERSECTION SUMMARY

 **Site: 101vvv [E Park Ave/Scott Ave (Site Folder: AM Peak Hour - Improvements)]**

New Site

Site Category: (None)

Signals - EQUISAT (Pretimed) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	34.6 mph	34.6 mph
Travel Distance (Total)	1027.4 veh-mi/h	1232.9 pers-mi/h
Travel Time (Total)	29.7 veh-h/h	35.6 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.87	
Travel Time Index	8.50	
Congestion Coefficient	1.16	
Demand Flows (Total)	1668 veh/h	2002 pers/h
Percent Heavy Vehicles (Demand)	12.0 %	
Degree of Saturation	0.365	
Practical Spare Capacity	146.3 %	
Effective Intersection Capacity	4566 veh/h	
Control Delay (Total)	3.88 veh-h/h	4.66 pers-h/h
Control Delay (Average)	8.4 sec	8.4 sec
Control Delay (Worst Lane)	43.8 sec	
Control Delay (Worst Movement)	43.8 sec	43.8 sec
Geometric Delay (Average)	0.6 sec	
Stop-Line Delay (Average)	7.8 sec	
Idling Time (Average)	5.7 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	7.4 veh	
95% Back of Queue - Distance (Worst Lane)	202.8 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.08	
Total Effective Stops	657 veh/h	789 pers/h
Effective Stop Rate	0.39	0.39
Proportion Queued	0.45	0.45
Performance Index	62.3	62.3
Cost (Total)	671.97 \$/h	671.97 \$/h
Fuel Consumption (Total)	49.3 gal/h	
Carbon Dioxide (Total)	450.2 kg/h	
Hydrocarbons (Total)	0.035 kg/h	
Carbon Monoxide (Total)	0.496 kg/h	
NOx (Total)	1.543 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 2 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 9.2% 4.6% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	800,842 veh/y	961,011 pers/y
Delay	1,864 veh-h/y	2,236 pers-h/y
Effective Stops	315,535 veh/y	378,642 pers/y
Travel Distance	493,163 veh-mi/y	591,796 pers-mi/y
Travel Time	14,253 veh-h/y	17,103 pers-h/y
Cost	322,544 \$/y	322,544 \$/y
Fuel Consumption	23,648 gal/y	
Carbon Dioxide	216,073 kg/y	
Hydrocarbons	17 kg/y	
Carbon Monoxide	238 kg/y	
NOx	740 kg/y	

INTERSECTION SUMMARY

 **Site: 2v [Midway Rd/E Park Ave/Park Ave (Site Folder: PM Peak Hour - Improvements)]**

New Site

Site Category: (None)

Signals - EQUISAT (Pretimed) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	17.6 mph	17.6 mph
Travel Distance (Total)	499.0 veh-mi/h	598.7 pers-mi/h
Travel Time (Total)	28.3 veh-h/h	33.9 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.44	
Travel Time Index	3.79	
Congestion Coefficient	2.27	
Demand Flows (Total)	2391 veh/h	2869 pers/h
Percent Heavy Vehicles (Demand)	5.0 %	
Degree of Saturation	0.565	
Practical Spare Capacity	59.2 %	
Effective Intersection Capacity	4228 veh/h	
Control Delay (Total)	14.61 veh-h/h	17.53 pers-h/h
Control Delay (Average)	22.0 sec	22.0 sec
Control Delay (Worst Lane)	40.2 sec	
Control Delay (Worst Movement)	42.3 sec	42.3 sec
Geometric Delay (Average)	4.6 sec	
Stop-Line Delay (Average)	17.4 sec	
Idling Time (Average)	14.5 sec	
Intersection Level of Service (LOS)	LOS C	
95% Back of Queue - Vehicles (Worst Lane)	10.5 veh	
95% Back of Queue - Distance (Worst Lane)	272.6 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.51	
Total Effective Stops	1727 veh/h	2072 pers/h
Effective Stop Rate	0.72	0.72
Proportion Queued	0.64	0.64
Performance Index	110.4	110.4
Cost (Total)	597.13 \$/h	597.13 \$/h
Fuel Consumption (Total)	38.7 gal/h	
Carbon Dioxide (Total)	347.7 kg/h	
Hydrocarbons (Total)	0.034 kg/h	
Carbon Monoxide (Total)	0.371 kg/h	
NOx (Total)	0.724 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 2 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 16.3% 0.0% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,147,500 veh/y	1,377,000 pers/y
Delay	7,014 veh-h/y	8,417 pers-h/y
Effective Stops	828,723 veh/y	994,468 pers/y
Travel Distance	239,500 veh-mi/y	287,400 pers-mi/y
Travel Time	13,580 veh-h/y	16,295 pers-h/y
Cost	286,625 \$/y	286,625 \$/y
Fuel Consumption	18,590 gal/y	
Carbon Dioxide	166,904 kg/y	
Hydrocarbons	17 kg/y	
Carbon Monoxide	178 kg/y	
NOx	347 kg/y	

INTERSECTION SUMMARY

 **Site: 4v [Midway Rd/Hegan Ln (Site Folder: PM Peak Hour - Improvements)]**

New Site

Site Category: (None)

Signals - EQUISAT (Pretimed) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	17.0 mph	17.0 mph
Travel Distance (Total)	374.4 veh-mi/h	449.3 pers-mi/h
Travel Time (Total)	22.1 veh-h/h	26.5 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.42	
Travel Time Index	3.60	
Congestion Coefficient	2.36	
Demand Flows (Total)	1872 veh/h	2246 pers/h
Percent Heavy Vehicles (Demand)	4.0 %	
Degree of Saturation	0.685	
Practical Spare Capacity	31.3 %	
Effective Intersection Capacity	2731 veh/h	
Control Delay (Total)	11.49 veh-h/h	13.78 pers-h/h
Control Delay (Average)	22.1 sec	22.1 sec
Control Delay (Worst Lane)	46.7 sec	
Control Delay (Worst Movement)	46.7 sec	46.7 sec
Geometric Delay (Average)	3.4 sec	
Stop-Line Delay (Average)	18.7 sec	
Idling Time (Average)	15.4 sec	
Intersection Level of Service (LOS)	LOS C	
95% Back of Queue - Vehicles (Worst Lane)	15.9 veh	
95% Back of Queue - Distance (Worst Lane)	410.6 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.72	
Total Effective Stops	1422 veh/h	1706 pers/h
Effective Stop Rate	0.76	0.76
Proportion Queued	0.73	0.73
Performance Index	128.1	128.1
Cost (Total)	466.80 \$/h	466.80 \$/h
Fuel Consumption (Total)	30.4 gal/h	
Carbon Dioxide (Total)	272.8 kg/h	
Hydrocarbons (Total)	0.027 kg/h	
Carbon Monoxide (Total)	0.295 kg/h	
NOx (Total)	0.491 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 3 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 28.7% 2.6% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	898,581 veh/y	1,078,297 pers/y
Delay	5,513 veh-h/y	6,615 pers-h/y
Effective Stops	682,393 veh/y	818,871 pers/y
Travel Distance	179,733 veh-mi/y	215,680 pers-mi/y
Travel Time	10,587 veh-h/y	12,704 pers-h/y
Cost	224,065 \$/y	224,065 \$/y
Fuel Consumption	14,609 gal/y	
Carbon Dioxide	130,924 kg/y	
Hydrocarbons	13 kg/y	
Carbon Monoxide	142 kg/y	
NOx	236 kg/y	

INTERSECTION SUMMARY

 **Site: 5vvv [Hegan Ln/Otterson Dr - AWSC (Site Folder: PM Peak Hour - Improvements)]**

New Site
Site Category: (None)
Stop (All-Way)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	12.8 mph	12.8 mph
Travel Distance (Total)	314.9 veh-mi/h	377.9 pers-mi/h
Travel Time (Total)	24.6 veh-h/h	29.6 pers-h/h
Desired Speed (Program)	25.0 mph	
Speed Efficiency	0.51	
Travel Time Index	4.57	
Congestion Coefficient	1.96	
Demand Flows (Total)	1084 veh/h	1301 pers/h
Percent Heavy Vehicles (Demand)	2.0 %	
Degree of Saturation	0.903	
Practical Spare Capacity	-5.8 %	
Effective Intersection Capacity	1201 veh/h	
Control Delay (Total)	12.67 veh-h/h	15.21 pers-h/h
Control Delay (Average)	42.1 sec	42.1 sec
Control Delay (Worst Lane)	55.6 sec	
Control Delay (Worst Movement)	55.9 sec	55.9 sec
Geometric Delay (Average)	6.5 sec	
Stop-Line Delay (Average)	35.6 sec	
Idling Time (Average)	16.3 sec	
Intersection Level of Service (LOS)	LOS E	
95% Back of Queue - Vehicles (Worst Lane)	9.5 veh	
95% Back of Queue - Distance (Worst Lane)	241.8 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.24	
Total Effective Stops	2581 veh/h	3097 pers/h
Effective Stop Rate	2.38	2.38
Proportion Queued	1.00	1.00
Performance Index	85.5	85.5
Cost (Total)	433.86 \$/h	433.86 \$/h
Fuel Consumption (Total)	17.3 gal/h	
Carbon Dioxide (Total)	154.5 kg/h	
Hydrocarbons (Total)	0.014 kg/h	
Carbon Monoxide (Total)	0.100 kg/h	
NOx (Total)	0.154 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 2 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 0.0% 96.5% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	520,276 veh/y	624,331 pers/y
Delay	6,082 veh-h/y	7,299 pers-h/y
Effective Stops	1,238,687 veh/y	1,486,424 pers/y
Travel Distance	151,150 veh-mi/y	181,380 pers-mi/y
Travel Time	11,831 veh-h/y	14,197 pers-h/y
Cost	208,252 \$/y	208,252 \$/y
Fuel Consumption	8,298 gal/y	
Carbon Dioxide	74,146 kg/y	
Hydrocarbons	7 kg/y	
Carbon Monoxide	48 kg/y	
NOx	74 kg/y	

INTERSECTION SUMMARY

 **Site: 101vvv [E Park Ave/Scott Ave (Site Folder: PM Peak Hour - Improvements)]**

New Site

Site Category: (None)

Signals - EQUISAT (Pretimed) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	35.8 mph	35.8 mph
Travel Distance (Total)	1265.7 veh-mi/h	1518.8 pers-mi/h
Travel Time (Total)	35.4 veh-h/h	42.4 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.89	
Travel Time Index	8.83	
Congestion Coefficient	1.12	
Demand Flows (Total)	2055 veh/h	2467 pers/h
Percent Heavy Vehicles (Demand)	6.0 %	
Degree of Saturation	0.417	
Practical Spare Capacity	115.9 %	
Effective Intersection Capacity	4931 veh/h	
Control Delay (Total)	3.65 veh-h/h	4.38 pers-h/h
Control Delay (Average)	6.4 sec	6.4 sec
Control Delay (Worst Lane)	46.9 sec	
Control Delay (Worst Movement)	46.9 sec	46.9 sec
Geometric Delay (Average)	0.4 sec	
Stop-Line Delay (Average)	6.0 sec	
Idling Time (Average)	4.1 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	9.0 veh	
95% Back of Queue - Distance (Worst Lane)	237.0 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.09	
Total Effective Stops	741 veh/h	889 pers/h
Effective Stop Rate	0.36	0.36
Proportion Queued	0.41	0.41
Performance Index	71.9	71.9
Cost (Total)	746.75 \$/h	746.75 \$/h
Fuel Consumption (Total)	48.5 gal/h	
Carbon Dioxide (Total)	437.8 kg/h	
Hydrocarbons (Total)	0.036 kg/h	
Carbon Monoxide (Total)	0.543 kg/h	
NOx (Total)	0.958 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 2 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 14.4% 6.8% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	986,609 veh/y	1,183,931 pers/y
Delay	1,750 veh-h/y	2,100 pers-h/y
Effective Stops	355,516 veh/y	426,619 pers/y
Travel Distance	607,523 veh-mi/y	729,028 pers-mi/y
Travel Time	16,978 veh-h/y	20,374 pers-h/y
Cost	358,442 \$/y	358,442 \$/y
Fuel Consumption	23,259 gal/y	
Carbon Dioxide	210,158 kg/y	
Hydrocarbons	17 kg/y	
Carbon Monoxide	261 kg/y	
NOx	460 kg/y	

INTERSECTION SUMMARY

 **Site: 5vvvv [Hegan Ln/Otterson Dr - Signal (Site Folder: PM Peak Hour - Improvements)]**

New Site

Site Category: (None)

Signals - EQUISAT (Pretimed) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	15.6 mph	15.6 mph
Travel Distance (Total)	320.0 veh-mi/h	384.0 pers-mi/h
Travel Time (Total)	20.5 veh-h/h	24.5 pers-h/h
Desired Speed (Program)	25.1 mph	
Speed Efficiency	0.62	
Travel Time Index	5.82	
Congestion Coefficient	1.60	
Demand Flows (Total)	1090 veh/h	1309 pers/h
Percent Heavy Vehicles (Demand)	2.0 %	
Degree of Saturation	0.586	
Practical Spare Capacity	53.5 %	
Effective Intersection Capacity	1860 veh/h	
Control Delay (Total)	7.74 veh-h/h	9.29 pers-h/h
Control Delay (Average)	25.5 sec	25.5 sec
Control Delay (Worst Lane)	43.9 sec	
Control Delay (Worst Movement)	43.9 sec	43.9 sec
Geometric Delay (Average)	1.5 sec	
Stop-Line Delay (Average)	24.0 sec	
Idling Time (Average)	20.3 sec	
Intersection Level of Service (LOS)	LOS C	
95% Back of Queue - Vehicles (Worst Lane)	11.9 veh	
95% Back of Queue - Distance (Worst Lane)	302.4 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.31	
Total Effective Stops	834 veh/h	1001 pers/h
Effective Stop Rate	0.77	0.77
Proportion Queued	0.87	0.87
Performance Index	97.5	97.5
Cost (Total)	363.27 \$/h	363.27 \$/h
Fuel Consumption (Total)	15.0 gal/h	
Carbon Dioxide (Total)	133.8 kg/h	
Hydrocarbons (Total)	0.011 kg/h	
Carbon Monoxide (Total)	0.082 kg/h	
NOx (Total)	0.129 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 2 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 0.0% 2.5% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	523,406 veh/y	628,088 pers/y
Delay	3,715 veh-h/y	4,457 pers-h/y
Effective Stops	400,530 veh/y	480,636 pers/y
Travel Distance	153,606 veh-mi/y	184,327 pers-mi/y
Travel Time	9,818 veh-h/y	11,781 pers-h/y
Cost	174,370 \$/y	174,370 \$/y
Fuel Consumption	7,182 gal/y	
Carbon Dioxide	64,201 kg/y	
Hydrocarbons	5 kg/y	
Carbon Monoxide	39 kg/y	
NOx	62 kg/y	

INTERSECTION SUMMARY

 **Site: 2v [Midway Rd/E Park Ave/Park Ave (Site Folder: AM Peak Hour - Yr 2040 Improvements)]**

New Site

Site Category: (None)

Signals - EQUISAT (Pretimed) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	16.4 mph	16.4 mph
Travel Distance (Total)	531.3 veh-mi/h	637.6 pers-mi/h
Travel Time (Total)	32.4 veh-h/h	38.8 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.41	
Travel Time Index	3.45	
Congestion Coefficient	2.44	
Demand Flows (Total)	2541 veh/h	3050 pers/h
Percent Heavy Vehicles (Demand)	9.0 %	
Degree of Saturation	0.733	
Practical Spare Capacity	22.9 %	
Effective Intersection Capacity	3469 veh/h	
Control Delay (Total)	17.67 veh-h/h	21.20 pers-h/h
Control Delay (Average)	25.0 sec	25.0 sec
Control Delay (Worst Lane)	45.7 sec	
Control Delay (Worst Movement)	45.7 sec	45.7 sec
Geometric Delay (Average)	4.5 sec	
Stop-Line Delay (Average)	20.5 sec	
Idling Time (Average)	17.0 sec	
Intersection Level of Service (LOS)	LOS C	
95% Back of Queue - Vehicles (Worst Lane)	13.6 veh	
95% Back of Queue - Distance (Worst Lane)	365.7 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.75	
Total Effective Stops	1982 veh/h	2378 pers/h
Effective Stop Rate	0.78	0.78
Proportion Queued	0.70	0.70
Performance Index	136.9	136.9
Cost (Total)	705.98 \$/h	705.98 \$/h
Fuel Consumption (Total)	48.7 gal/h	
Carbon Dioxide (Total)	440.0 kg/h	
Hydrocarbons (Total)	0.043 kg/h	
Carbon Monoxide (Total)	0.454 kg/h	
NOx (Total)	1.367 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 3.8 %

Number of Iterations: 3 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 12.2% 6.1% 3.8%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,219,826 veh/y	1,463,792 pers/y
Delay	8,481 veh-h/y	10,177 pers-h/y
Effective Stops	951,133 veh/y	1,141,359 pers/y
Travel Distance	255,043 veh-mi/y	306,052 pers-mi/y
Travel Time	15,529 veh-h/y	18,635 pers-h/y
Cost	338,870 \$/y	338,870 \$/y
Fuel Consumption	23,373 gal/y	
Carbon Dioxide	211,197 kg/y	
Hydrocarbons	21 kg/y	
Carbon Monoxide	218 kg/y	
NOx	656 kg/y	

INTERSECTION SUMMARY

 **Site: 4v [Midway Rd/Hegan Ln (Site Folder: AM Peak Hour - Yr 2040 Improvements)]**

New Site

Site Category: (None)

Signals - EQUISAT (Pretimed) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	20.6 mph	20.6 mph
Travel Distance (Total)	422.6 veh-mi/h	507.2 pers-mi/h
Travel Time (Total)	20.5 veh-h/h	24.6 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.51	
Travel Time Index	4.61	
Congestion Coefficient	1.94	
Demand Flows (Total)	2073 veh/h	2487 pers/h
Percent Heavy Vehicles (Demand)	9.0 %	
Degree of Saturation	0.614	
Practical Spare Capacity	46.5 %	
Effective Intersection Capacity	3374 veh/h	
Control Delay (Total)	8.82 veh-h/h	10.59 pers-h/h
Control Delay (Average)	15.3 sec	15.3 sec
Control Delay (Worst Lane)	47.9 sec	
Control Delay (Worst Movement)	47.9 sec	47.9 sec
Geometric Delay (Average)	3.1 sec	
Stop-Line Delay (Average)	12.2 sec	
Idling Time (Average)	9.7 sec	
Intersection Level of Service (LOS)	LOS B	
95% Back of Queue - Vehicles (Worst Lane)	15.2 veh	
95% Back of Queue - Distance (Worst Lane)	408.4 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.40	
Total Effective Stops	1290 veh/h	1548 pers/h
Effective Stop Rate	0.62	0.62
Proportion Queued	0.57	0.57
Performance Index	110.9	110.9
Cost (Total)	468.82 \$/h	468.82 \$/h
Fuel Consumption (Total)	34.9 gal/h	
Carbon Dioxide (Total)	315.4 kg/h	
Hydrocarbons (Total)	0.030 kg/h	
Carbon Monoxide (Total)	0.335 kg/h	
NOx (Total)	0.939 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 2 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 12.8% 0.0% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	994,909 veh/y	1,193,891 pers/y
Delay	4,235 veh-h/y	5,082 pers-h/y
Effective Stops	619,018 veh/y	742,822 pers/y
Travel Distance	202,867 veh-mi/y	243,440 pers-mi/y
Travel Time	9,849 veh-h/y	11,819 pers-h/y
Cost	225,032 \$/y	225,032 \$/y
Fuel Consumption	16,748 gal/y	
Carbon Dioxide	151,380 kg/y	
Hydrocarbons	14 kg/y	
Carbon Monoxide	161 kg/y	
NOx	451 kg/y	

INTERSECTION SUMMARY

 **Site: 5vvv [Hegan Ln/Otterson Dr - AWSC (Site Folder: AM Peak Hour - Yr 2040 Improvements)]**

New Site
Site Category: (None)
Stop (All-Way)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	10.8 mph	10.8 mph
Travel Distance (Total)	309.7 veh-mi/h	371.6 pers-mi/h
Travel Time (Total)	28.7 veh-h/h	34.5 pers-h/h
Desired Speed (Program)	25.0 mph	
Speed Efficiency	0.43	
Travel Time Index	3.68	
Congestion Coefficient	2.32	
Demand Flows (Total)	1038 veh/h	1246 pers/h
Percent Heavy Vehicles (Demand)	4.0 %	
Degree of Saturation	1.075	
Practical Spare Capacity	-21.0 %	
Effective Intersection Capacity	965 veh/h	
Control Delay (Total)	16.98 veh-h/h	20.37 pers-h/h
Control Delay (Average)	58.9 sec	58.9 sec
Control Delay (Worst Lane)	82.6 sec	
Control Delay (Worst Movement)	82.7 sec	82.7 sec
Geometric Delay (Average)	6.7 sec	
Stop-Line Delay (Average)	52.2 sec	
Idling Time (Average)	16.5 sec	
Intersection Level of Service (LOS)	LOS F	
95% Back of Queue - Vehicles (Worst Lane)	23.2 veh	
95% Back of Queue - Distance (Worst Lane)	597.3 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.60	
Total Effective Stops	3857 veh/h	4629 pers/h
Effective Stop Rate	3.72	3.72
Proportion Queued	0.95	0.95
Performance Index	111.5	111.5
Cost (Total)	507.80 \$/h	507.80 \$/h
Fuel Consumption (Total)	20.5 gal/h	
Carbon Dioxide (Total)	184.2 kg/h	
Hydrocarbons (Total)	0.019 kg/h	
Carbon Monoxide (Total)	0.136 kg/h	
NOx (Total)	0.300 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 2 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 0.0% 97.2% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	498,261 veh/y	597,913 pers/y
Delay	8,148 veh-h/y	9,778 pers-h/y
Effective Stops	1,851,491 veh/y	2,221,789 pers/y
Travel Distance	148,653 veh-mi/y	178,384 pers-mi/y
Travel Time	13,794 veh-h/y	16,553 pers-h/y
Cost	243,742 \$/y	243,742 \$/y
Fuel Consumption	9,853 gal/y	
Carbon Dioxide	88,434 kg/y	
Hydrocarbons	9 kg/y	
Carbon Monoxide	65 kg/y	
NOx	144 kg/y	

INTERSECTION SUMMARY

 **Site: 101vvv [E Park Ave/Scott Ave (Site Folder: AM Peak Hour - Yr 2040 Improvements)]**

New Site

Site Category: (None)

Signals - EQUISAT (Pretimed) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	34.2 mph	34.2 mph
Travel Distance (Total)	1238.1 veh-mi/h	1485.7 pers-mi/h
Travel Time (Total)	36.2 veh-h/h	43.5 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.85	
Travel Time Index	8.38	
Congestion Coefficient	1.17	
Demand Flows (Total)	2011 veh/h	2413 pers/h
Percent Heavy Vehicles (Demand)	12.0 %	
Degree of Saturation	0.445	
Practical Spare Capacity	102.0 %	
Effective Intersection Capacity	4513 veh/h	
Control Delay (Total)	5.12 veh-h/h	6.15 pers-h/h
Control Delay (Average)	9.2 sec	9.2 sec
Control Delay (Worst Lane)	44.1 sec	
Control Delay (Worst Movement)	44.1 sec	44.1 sec
Geometric Delay (Average)	0.6 sec	
Stop-Line Delay (Average)	8.5 sec	
Idling Time (Average)	6.2 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	9.8 veh	
95% Back of Queue - Distance (Worst Lane)	267.7 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.10	
Total Effective Stops	873 veh/h	1048 pers/h
Effective Stop Rate	0.43	0.43
Proportion Queued	0.49	0.49
Performance Index	79.1	79.1
Cost (Total)	822.97 \$/h	822.97 \$/h
Fuel Consumption (Total)	60.7 gal/h	
Carbon Dioxide (Total)	554.5 kg/h	
Hydrocarbons (Total)	0.044 kg/h	
Carbon Monoxide (Total)	0.608 kg/h	
NOx (Total)	1.920 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 2 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 10.9% 10.5% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	965,053 veh/y	1,158,063 pers/y
Delay	2,458 veh-h/y	2,950 pers-h/y
Effective Stops	419,193 veh/y	503,032 pers/y
Travel Distance	594,287 veh-mi/y	713,144 pers-mi/y
Travel Time	17,389 veh-h/y	20,867 pers-h/y
Cost	395,024 \$/y	395,024 \$/y
Fuel Consumption	29,137 gal/y	
Carbon Dioxide	266,160 kg/y	
Hydrocarbons	21 kg/y	
Carbon Monoxide	292 kg/y	
NOx	921 kg/y	

INTERSECTION SUMMARY

 **Site: 2v [Midway Rd/E Park Ave/Park Ave (Site Folder: PM Peak Hour - Yr 2040 Improvements)]**

New Site

Site Category: (None)

Signals - EQUISAT (Pretimed) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	17.3 mph	17.3 mph
Travel Distance (Total)	598.7 veh-mi/h	718.4 pers-mi/h
Travel Time (Total)	34.7 veh-h/h	41.6 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.43	
Travel Time Index	3.68	
Congestion Coefficient	2.32	
Demand Flows (Total)	2868 veh/h	3441 pers/h
Percent Heavy Vehicles (Demand)	5.0 %	
Degree of Saturation	0.740	
Practical Spare Capacity	21.7 %	
Effective Intersection Capacity	3877 veh/h	
Control Delay (Total)	18.26 veh-h/h	21.92 pers-h/h
Control Delay (Average)	22.9 sec	22.9 sec
Control Delay (Worst Lane)	43.3 sec	
Control Delay (Worst Movement)	43.3 sec	43.3 sec
Geometric Delay (Average)	4.6 sec	
Stop-Line Delay (Average)	18.4 sec	
Idling Time (Average)	15.2 sec	
Intersection Level of Service (LOS)	LOS C	
95% Back of Queue - Vehicles (Worst Lane)	13.9 veh	
95% Back of Queue - Distance (Worst Lane)	360.2 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.64	
Total Effective Stops	2158 veh/h	2589 pers/h
Effective Stop Rate	0.75	0.75
Proportion Queued	0.68	0.68
Performance Index	143.0	143.0
Cost (Total)	730.26 \$/h	730.26 \$/h
Fuel Consumption (Total)	47.1 gal/h	
Carbon Dioxide (Total)	423.1 kg/h	
Hydrocarbons (Total)	0.042 kg/h	
Carbon Monoxide (Total)	0.450 kg/h	
NOx (Total)	0.881 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 4.5 %

Number of Iterations: 3 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 4.5% 2.8% 4.5%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,376,500 veh/y	1,651,800 pers/y
Delay	8,767 veh-h/y	10,521 pers-h/y
Effective Stops	1,035,701 veh/y	1,242,841 pers/y
Travel Distance	287,370 veh-mi/y	344,844 pers-mi/y
Travel Time	16,650 veh-h/y	19,980 pers-h/y
Cost	350,525 \$/y	350,525 \$/y
Fuel Consumption	22,622 gal/y	
Carbon Dioxide	203,089 kg/y	
Hydrocarbons	20 kg/y	
Carbon Monoxide	216 kg/y	
NOx	423 kg/y	

INTERSECTION SUMMARY

 **Site: 4v [Midway Rd/Hegan Ln (Site Folder: PM Peak Hour - Yr 2040 Improvements)]**

New Site

Site Category: (None)

Signals - EQUISAT (Pretimed) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	14.0 mph	14.0 mph
Travel Distance (Total)	452.0 veh-mi/h	542.4 pers-mi/h
Travel Time (Total)	32.3 veh-h/h	38.8 pers-h/h
Desired Speed (Program)	37.1 mph	
Speed Efficiency	0.38	
Travel Time Index	3.08	
Congestion Coefficient	2.65	
Demand Flows (Total)	2260 veh/h	2712 pers/h
Percent Heavy Vehicles (Demand)	4.0 %	
Degree of Saturation	0.856	
Practical Spare Capacity	5.2 %	
Effective Intersection Capacity	2642 veh/h	
Control Delay (Total)	17.62 veh-h/h	21.14 pers-h/h
Control Delay (Average)	28.1 sec	28.1 sec
Control Delay (Worst Lane)	47.0 sec	
Control Delay (Worst Movement)	47.0 sec	47.0 sec
Geometric Delay (Average)	2.8 sec	
Stop-Line Delay (Average)	25.3 sec	
Idling Time (Average)	21.0 sec	
Intersection Level of Service (LOS)	LOS C	
95% Back of Queue - Vehicles (Worst Lane)	22.6 veh	
95% Back of Queue - Distance (Worst Lane)	583.0 ft	
Ave. Queue Storage Ratio (Worst Lane)	1.02	
Total Effective Stops	1967 veh/h	2361 pers/h
Effective Stop Rate	0.87	0.87
Proportion Queued	0.75	0.75
Performance Index	177.6	177.6
Cost (Total)	646.73 \$/h	646.73 \$/h
Fuel Consumption (Total)	37.6 gal/h	
Carbon Dioxide (Total)	336.6 kg/h	
Hydrocarbons (Total)	0.034 kg/h	
Carbon Monoxide (Total)	0.344 kg/h	
NOx (Total)	0.622 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 2 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 11.9% 28.5% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,084,903 veh/y	1,301,884 pers/y
Delay	8,455 veh-h/y	10,146 pers-h/y
Effective Stops	944,258 veh/y	1,133,110 pers/y
Travel Distance	216,949 veh-mi/y	260,339 pers-mi/y
Travel Time	15,502 veh-h/y	18,602 pers-h/y
Cost	310,432 \$/y	310,432 \$/y
Fuel Consumption	18,028 gal/y	
Carbon Dioxide	161,565 kg/y	
Hydrocarbons	16 kg/y	
Carbon Monoxide	165 kg/y	
NOx	299 kg/y	

INTERSECTION SUMMARY

 **Site: 5vvv [Hegan Ln/Otterson Dr - AWSC (Site Folder: PM Peak Hour - Yr 2040 Improvements)]**

New Site
Site Category: (None)
Stop (All-Way)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	10.1 mph	10.1 mph
Travel Distance (Total)	362.1 veh-mi/h	434.5 pers-mi/h
Travel Time (Total)	35.9 veh-h/h	43.0 pers-h/h
Desired Speed (Program)	25.0 mph	
Speed Efficiency	0.40	
Travel Time Index	3.38	
Congestion Coefficient	2.48	
Demand Flows (Total)	1245 veh/h	1493 pers/h
Percent Heavy Vehicles (Demand)	2.0 %	
Degree of Saturation	1.035	
Practical Spare Capacity	-17.9 %	
Effective Intersection Capacity	1202 veh/h	
Control Delay (Total)	22.08 veh-h/h	26.50 pers-h/h
Control Delay (Average)	63.9 sec	63.9 sec
Control Delay (Worst Lane)	86.8 sec	
Control Delay (Worst Movement)	87.1 sec	87.1 sec
Geometric Delay (Average)	6.5 sec	
Stop-Line Delay (Average)	57.4 sec	
Idling Time (Average)	29.8 sec	
Intersection Level of Service (LOS)	LOS F	
95% Back of Queue - Vehicles (Worst Lane)	15.5 veh	
95% Back of Queue - Distance (Worst Lane)	393.2 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.39	
Total Effective Stops	3782 veh/h	4538 pers/h
Effective Stop Rate	3.04	3.04
Proportion Queued	1.00	1.00
Performance Index	131.1	131.1
Cost (Total)	618.67 \$/h	618.67 \$/h
Fuel Consumption (Total)	22.8 gal/h	
Carbon Dioxide (Total)	203.4 kg/h	
Hydrocarbons (Total)	0.020 kg/h	
Carbon Monoxide (Total)	0.136 kg/h	
NOx (Total)	0.195 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 2 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 0.0% 96.4% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	597,391 veh/y	716,870 pers/y
Delay	10,600 veh-h/y	12,720 pers-h/y
Effective Stops	1,815,274 veh/y	2,178,329 pers/y
Travel Distance	173,820 veh-mi/y	208,584 pers-mi/y
Travel Time	17,212 veh-h/y	20,654 pers-h/y
Cost	296,960 \$/y	296,960 \$/y
Fuel Consumption	10,928 gal/y	
Carbon Dioxide	97,624 kg/y	
Hydrocarbons	10 kg/y	
Carbon Monoxide	65 kg/y	
NOx	94 kg/y	

INTERSECTION SUMMARY

 **Site: 101vvv [E Park Ave/Scott Ave (Site Folder: PM Peak Hour - Yr 2040 Improvements)]**

New Site

Site Category: (None)

Signals - EQUISAT (Pretimed) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	35.5 mph	35.5 mph
Travel Distance (Total)	1522.7 veh-mi/h	1827.2 pers-mi/h
Travel Time (Total)	42.8 veh-h/h	51.4 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.89	
Travel Time Index	8.76	
Congestion Coefficient	1.13	
Demand Flows (Total)	2473 veh/h	2967 pers/h
Percent Heavy Vehicles (Demand)	6.0 %	
Degree of Saturation	0.502	
Practical Spare Capacity	79.3 %	
Effective Intersection Capacity	4927 veh/h	
Control Delay (Total)	4.68 veh-h/h	5.61 pers-h/h
Control Delay (Average)	6.8 sec	6.8 sec
Control Delay (Worst Lane)	47.3 sec	
Control Delay (Worst Movement)	47.3 sec	47.3 sec
Geometric Delay (Average)	0.4 sec	
Stop-Line Delay (Average)	6.4 sec	
Idling Time (Average)	4.3 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	11.9 veh	
95% Back of Queue - Distance (Worst Lane)	311.3 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.12	
Total Effective Stops	970 veh/h	1164 pers/h
Effective Stop Rate	0.39	0.39
Proportion Queued	0.44	0.44
Performance Index	90.3	90.3
Cost (Total)	907.40 \$/h	907.40 \$/h
Fuel Consumption (Total)	59.2 gal/h	
Carbon Dioxide (Total)	535.2 kg/h	
Hydrocarbons (Total)	0.044 kg/h	
Carbon Monoxide (Total)	0.661 kg/h	
NOx (Total)	1.183 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 2 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 17.2% 8.3% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,186,957 veh/y	1,424,348 pers/y
Delay	2,244 veh-h/y	2,693 pers-h/y
Effective Stops	465,727 veh/y	558,872 pers/y
Travel Distance	730,894 veh-mi/y	877,072 pers-mi/y
Travel Time	20,566 veh-h/y	24,679 pers-h/y
Cost	435,553 \$/y	435,553 \$/y
Fuel Consumption	28,433 gal/y	
Carbon Dioxide	256,874 kg/y	
Hydrocarbons	21 kg/y	
Carbon Monoxide	317 kg/y	
NOx	568 kg/y	

INTERSECTION SUMMARY

 **Site: 5vvvv [Hegan Ln/Otterson Dr - Signal (Site Folder: PM Peak Hour - Yr 2040 Improvements)]**

New Site

Site Category: (None)

Signals - EQUISAT (Pretimed) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	15.4 mph	15.4 mph
Travel Distance (Total)	367.5 veh-mi/h	441.1 pers-mi/h
Travel Time (Total)	23.8 veh-h/h	28.6 pers-h/h
Desired Speed (Program)	25.1 mph	
Speed Efficiency	0.62	
Travel Time Index	5.73	
Congestion Coefficient	1.63	
Demand Flows (Total)	1251 veh/h	1501 pers/h
Percent Heavy Vehicles (Demand)	2.0 %	
Degree of Saturation	0.686	
Practical Spare Capacity	31.3 %	
Effective Intersection Capacity	1825 veh/h	
Control Delay (Total)	9.21 veh-h/h	11.05 pers-h/h
Control Delay (Average)	26.5 sec	26.5 sec
Control Delay (Worst Lane)	43.9 sec	
Control Delay (Worst Movement)	43.9 sec	43.9 sec
Geometric Delay (Average)	1.5 sec	
Stop-Line Delay (Average)	25.0 sec	
Idling Time (Average)	21.2 sec	
Intersection Level of Service (LOS)	LOS C	
95% Back of Queue - Vehicles (Worst Lane)	14.0 veh	
95% Back of Queue - Distance (Worst Lane)	354.8 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.36	
Total Effective Stops	994 veh/h	1193 pers/h
Effective Stop Rate	0.79	0.79
Proportion Queued	0.90	0.90
Performance Index	115.2	115.2
Cost (Total)	422.82 \$/h	422.82 \$/h
Fuel Consumption (Total)	17.4 gal/h	
Carbon Dioxide (Total)	155.4 kg/h	
Hydrocarbons (Total)	0.013 kg/h	
Carbon Monoxide (Total)	0.096 kg/h	
NOx (Total)	0.150 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 2 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 0.0% 0.0% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	600,522 veh/y	720,626 pers/y
Delay	4,421 veh-h/y	5,305 pers-h/y
Effective Stops	477,083 veh/y	572,499 pers/y
Travel Distance	176,423 veh-mi/y	211,708 pers-mi/y
Travel Time	11,434 veh-h/y	13,720 pers-h/y
Cost	202,955 \$/y	202,955 \$/y
Fuel Consumption	8,343 gal/y	
Carbon Dioxide	74,569 kg/y	
Hydrocarbons	6 kg/y	
Carbon Monoxide	46 kg/y	
NOx	72 kg/y	

INTERSECTION SUMMARY

 **Site: 1 [Park Ave/Meyers St (Site Folder: AM Peak Hour)]**

New Site

Site Category: (None)

Roundabout

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	30.0 mph	30.0 mph
Travel Distance (Total)	283.2 veh-mi/h	339.9 pers-mi/h
Travel Time (Total)	9.4 veh-h/h	11.3 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.75	
Travel Time Index	7.22	
Congestion Coefficient	1.33	
Demand Flows (Total)	1216 veh/h	1460 pers/h
Percent Heavy Vehicles (Demand)	4.0 %	
Degree of Saturation	0.222	
Practical Spare Capacity	283.6 %	
Effective Intersection Capacity	5489 veh/h	
Control Delay (Total)	1.97 veh-h/h	2.37 pers-h/h
Control Delay (Average)	5.8 sec	5.8 sec
Control Delay (Worst Lane)	8.6 sec	
Control Delay (Worst Movement)	11.9 sec	11.9 sec
Geometric Delay (Average)	5.1 sec	
Stop-Line Delay (Average)	0.7 sec	
Idling Time (Average)	0.0 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	1.3 veh	
95% Back of Queue - Distance (Worst Lane)	33.3 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.03	
Total Effective Stops	607 veh/h	729 pers/h
Effective Stop Rate	0.50	0.50
Proportion Queued	0.30	0.30
Performance Index	17.4	17.4
Cost (Total)	222.97 \$/h	222.97 \$/h
Fuel Consumption (Total)	17.4 gal/h	
Carbon Dioxide (Total)	156.3 kg/h	
Hydrocarbons (Total)	0.014 kg/h	
Carbon Monoxide (Total)	0.171 kg/h	
NOx (Total)	0.295 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 1.3 %

Number of Iterations: 4 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 92.1% 1.7% 1.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	583,814 veh/y	700,577 pers/y
Delay	946 veh-h/y	1,135 pers-h/y
Effective Stops	291,581 veh/y	349,897 pers/y
Travel Distance	135,956 veh-mi/y	163,147 pers-mi/y
Travel Time	4,533 veh-h/y	5,440 pers-h/y
Cost	107,028 \$/y	107,028 \$/y
Fuel Consumption	8,366 gal/y	
Carbon Dioxide	75,032 kg/y	
Hydrocarbons	7 kg/y	
Carbon Monoxide	82 kg/y	

NOx	142 kg/y
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INTERSECTION SUMMARY

 **Site: 2 [Midway Rd/E Park Ave/Park Ave (Site Folder: AM Peak Hour)]**

New Site
Site Category: (None)
Roundabout

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	26.5 mph	26.5 mph
Travel Distance (Total)	479.8 veh-mi/h	575.7 pers-mi/h
Travel Time (Total)	18.1 veh-h/h	21.8 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.66	
Travel Time Index	6.24	
Congestion Coefficient	1.51	
Demand Flows (Total)	2131 veh/h	2557 pers/h
Percent Heavy Vehicles (Demand)	9.0 %	
Degree of Saturation	0.512	
Practical Spare Capacity	66.0 %	
Effective Intersection Capacity	4162 veh/h	
Control Delay (Total)	5.29 veh-h/h	6.35 pers-h/h
Control Delay (Average)	8.9 sec	8.9 sec
Control Delay (Worst Lane)	13.9 sec	
Control Delay (Worst Movement)	13.9 sec	13.9 sec
Geometric Delay (Average)	6.4 sec	
Stop-Line Delay (Average)	2.5 sec	
Idling Time (Average)	0.0 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	4.2 veh	
95% Back of Queue - Distance (Worst Lane)	113.8 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.15	
Total Effective Stops	1481 veh/h	1778 pers/h
Effective Stop Rate	0.70	0.70
Proportion Queued	0.67	0.67
Performance Index	45.2	45.2
Cost (Total)	466.76 \$/h	466.76 \$/h
Fuel Consumption (Total)	40.8 gal/h	
Carbon Dioxide (Total)	368.8 kg/h	
Hydrocarbons (Total)	0.033 kg/h	
Carbon Monoxide (Total)	0.368 kg/h	
NOx (Total)	1.166 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 3.2 %

Number of Iterations: 7 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 2.6% 1.4% 0.7%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,022,769 veh/y	1,227,323 pers/y
Delay	2,538 veh-h/y	3,046 pers-h/y
Effective Stops	711,006 veh/y	853,208 pers/y
Travel Distance	230,290 veh-mi/y	276,349 pers-mi/y
Travel Time	8,706 veh-h/y	10,448 pers-h/y
Cost	224,045 \$/y	224,045 \$/y
Fuel Consumption	19,591 gal/y	
Carbon Dioxide	177,024 kg/y	
Hydrocarbons	16 kg/y	

Carbon Monoxide	177 kg/y
NOx	560 kg/y

INTERSECTION SUMMARY

 Site: 3 [Fair St/E Park Ave (Site Folder: AM Peak Hour)]

New Site

Site Category: (None)

Roundabout

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	27.7 mph	27.7 mph
Travel Distance (Total)	327.8 veh-mi/h	393.4 pers-mi/h
Travel Time (Total)	11.8 veh-h/h	14.2 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.69	
Travel Time Index	6.58	
Congestion Coefficient	1.44	
Demand Flows (Total)	1763 veh/h	2115 pers/h
Percent Heavy Vehicles (Demand)	10.0 %	
Degree of Saturation	0.369	
Practical Spare Capacity	130.7 %	
Effective Intersection Capacity	4784 veh/h	
Control Delay (Total)	2.74 veh-h/h	3.29 pers-h/h
Control Delay (Average)	5.6 sec	5.6 sec
Control Delay (Worst Lane)	10.5 sec	
Control Delay (Worst Movement)	13.3 sec	13.3 sec
Geometric Delay (Average)	4.4 sec	
Stop-Line Delay (Average)	1.2 sec	
Idling Time (Average)	0.2 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	2.0 veh	
95% Back of Queue - Distance (Worst Lane)	54.5 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.09	
Total Effective Stops	909 veh/h	1091 pers/h
Effective Stop Rate	0.52	0.52
Proportion Queued	0.40	0.40
Performance Index	29.6	29.6
Cost (Total)	307.33 \$/h	307.33 \$/h
Fuel Consumption (Total)	27.2 gal/h	
Carbon Dioxide (Total)	245.9 kg/h	
Hydrocarbons (Total)	0.022 kg/h	
Carbon Monoxide (Total)	0.245 kg/h	
NOx (Total)	0.800 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 2.0 %

Number of Iterations: 6 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 2.5% 1.3% 0.7%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	846,186 veh/y	1,015,423 pers/y
Delay	1,317 veh-h/y	1,580 pers-h/y
Effective Stops	436,229 veh/y	523,475 pers/y
Travel Distance	157,364 veh-mi/y	188,837 pers-mi/y
Travel Time	5,680 veh-h/y	6,816 pers-h/y
Cost	147,517 \$/y	147,517 \$/y
Fuel Consumption	13,038 gal/y	
Carbon Dioxide	118,012 kg/y	
Hydrocarbons	10 kg/y	
Carbon Monoxide	118 kg/y	

NOx	384 kg/y
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INTERSECTION SUMMARY

 **Site: 4 [Midway Rd/Hegan Ln (Site Folder: AM Peak Hour)]**

New Site

Site Category: (None)

Roundabout

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	26.3 mph	26.3 mph
Travel Distance (Total)	389.2 veh-mi/h	467.1 pers-mi/h
Travel Time (Total)	14.8 veh-h/h	17.8 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.66	
Travel Time Index	6.19	
Congestion Coefficient	1.52	
Demand Flows (Total)	1802 veh/h	2163 pers/h
Percent Heavy Vehicles (Demand)	9.0 %	
Degree of Saturation	0.586	
Practical Spare Capacity	45.1 %	
Effective Intersection Capacity	3076 veh/h	
Control Delay (Total)	3.38 veh-h/h	4.06 pers-h/h
Control Delay (Average)	6.8 sec	6.8 sec
Control Delay (Worst Lane)	11.7 sec	
Control Delay (Worst Movement)	13.1 sec	13.1 sec
Geometric Delay (Average)	5.0 sec	
Stop-Line Delay (Average)	1.8 sec	
Idling Time (Average)	0.1 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	4.4 veh	
95% Back of Queue - Distance (Worst Lane)	116.9 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.06	
Total Effective Stops	1036 veh/h	1243 pers/h
Effective Stop Rate	0.57	0.57
Proportion Queued	0.45	0.45
Performance Index	33.7	33.7
Cost (Total)	368.81 \$/h	368.81 \$/h
Fuel Consumption (Total)	31.0 gal/h	
Carbon Dioxide (Total)	280.1 kg/h	
Hydrocarbons (Total)	0.025 kg/h	
Carbon Monoxide (Total)	0.289 kg/h	
NOx (Total)	0.849 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 2.4 %

Number of Iterations: 7 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 1.9% 1.0% 0.5%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	865,143 veh/y	1,038,172 pers/y
Delay	1,622 veh-h/y	1,947 pers-h/y
Effective Stops	497,265 veh/y	596,718 pers/y
Travel Distance	186,835 veh-mi/y	224,202 pers-mi/y
Travel Time	7,107 veh-h/y	8,528 pers-h/y
Cost	177,027 \$/y	177,027 \$/y
Fuel Consumption	14,877 gal/y	
Carbon Dioxide	134,446 kg/y	
Hydrocarbons	12 kg/y	
Carbon Monoxide	139 kg/y	

NOx	407 kg/y
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INTERSECTION SUMMARY

 **Site: 5 [Hegan Ln/Otterson Dr (Site Folder: AM Peak Hour)]**

New Site

Site Category: (None)

Roundabout

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	33.2 mph	33.2 mph
Travel Distance (Total)	277.6 veh-mi/h	333.1 pers-mi/h
Travel Time (Total)	8.4 veh-h/h	10.0 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.83	
Travel Time Index	8.12	
Congestion Coefficient	1.20	
Demand Flows (Total)	894 veh/h	1073 pers/h
Percent Heavy Vehicles (Demand)	4.0 %	
Degree of Saturation	0.449	
Practical Spare Capacity	89.5 %	
Effective Intersection Capacity	1994 veh/h	
Control Delay (Total)	1.22 veh-h/h	1.46 pers-h/h
Control Delay (Average)	4.9 sec	4.9 sec
Control Delay (Worst Lane)	10.4 sec	
Control Delay (Worst Movement)	11.1 sec	11.1 sec
Geometric Delay (Average)	4.5 sec	
Stop-Line Delay (Average)	0.4 sec	
Idling Time (Average)	0.0 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	3.5 veh	
95% Back of Queue - Distance (Worst Lane)	91.2 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.06	
Total Effective Stops	391 veh/h	469 pers/h
Effective Stop Rate	0.44	0.44
Proportion Queued	0.22	0.22
Performance Index	22.4	22.4
Cost (Total)	192.77 \$/h	192.77 \$/h
Fuel Consumption (Total)	14.6 gal/h	
Carbon Dioxide (Total)	130.8 kg/h	
Hydrocarbons (Total)	0.012 kg/h	
Carbon Monoxide (Total)	0.147 kg/h	
NOx (Total)	0.262 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 0.7 %

Number of Iterations: 3 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 100.0% 89.7% 0.7%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	429,303 veh/y	515,164 pers/y
Delay	585 veh-h/y	702 pers-h/y
Effective Stops	187,506 veh/y	225,008 pers/y
Travel Distance	133,241 veh-mi/y	159,889 pers-mi/y
Travel Time	4,010 veh-h/y	4,811 pers-h/y
Cost	92,530 \$/y	92,530 \$/y
Fuel Consumption	6,994 gal/y	
Carbon Dioxide	62,792 kg/y	
Hydrocarbons	6 kg/y	
Carbon Monoxide	71 kg/y	

NOx	126 kg/y
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INTERSECTION SUMMARY

 **Site: 101 [E Park Ave/Scott Ave (Site Folder: AM Peak Hour)]**

New Site

Site Category: (None)

Roundabout

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	36.4 mph	36.4 mph
Travel Distance (Total)	1053.6 veh-mi/h	1264.3 pers-mi/h
Travel Time (Total)	28.9 veh-h/h	34.7 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.91	
Travel Time Index	9.01	
Congestion Coefficient	1.10	
Demand Flows (Total)	1668 veh/h	2002 pers/h
Percent Heavy Vehicles (Demand)	12.0 %	
Degree of Saturation	0.689	
Practical Spare Capacity	23.4 %	
Effective Intersection Capacity	2422 veh/h	
Control Delay (Total)	2.33 veh-h/h	2.80 pers-h/h
Control Delay (Average)	5.0 sec	5.0 sec
Control Delay (Worst Lane)	11.0 sec	
Control Delay (Worst Movement)	16.4 sec	16.4 sec
Geometric Delay (Average)	4.1 sec	
Stop-Line Delay (Average)	0.9 sec	
Idling Time (Average)	0.1 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	9.8 veh	
95% Back of Queue - Distance (Worst Lane)	268.8 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.07	
Total Effective Stops	717 veh/h	861 pers/h
Effective Stop Rate	0.43	0.43
Proportion Queued	0.36	0.36
Performance Index	62.2	62.2
Cost (Total)	703.72 \$/h	703.72 \$/h
Fuel Consumption (Total)	57.3 gal/h	
Carbon Dioxide (Total)	523.1 kg/h	
Hydrocarbons (Total)	0.040 kg/h	
Carbon Monoxide (Total)	0.543 kg/h	
NOx (Total)	1.968 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 3.2 %

Number of Iterations: 7 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 2.3% 1.2% 0.6%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	800,842 veh/y	961,011 pers/y
Delay	1,121 veh-h/y	1,345 pers-h/y
Effective Stops	344,239 veh/y	413,087 pers/y
Travel Distance	505,710 veh-mi/y	606,852 pers-mi/y
Travel Time	13,885 veh-h/y	16,662 pers-h/y
Cost	337,786 \$/y	337,786 \$/y
Fuel Consumption	27,526 gal/y	
Carbon Dioxide	251,072 kg/y	
Hydrocarbons	19 kg/y	
Carbon Monoxide	261 kg/y	

NOx	944 kg/y
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INTERSECTION SUMMARY

 Site: 101 [E Park Ave/Scott Ave (Site Folder: PM Peak Hour)]

New Site

Site Category: (None)

Roundabout

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	36.0 mph	36.0 mph
Travel Distance (Total)	1297.9 veh-mi/h	1557.5 pers-mi/h
Travel Time (Total)	36.0 veh-h/h	43.2 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.90	
Travel Time Index	8.90	
Congestion Coefficient	1.11	
Demand Flows (Total)	2055 veh/h	2467 pers/h
Percent Heavy Vehicles (Demand)	6.0 %	
Degree of Saturation	0.861	
Practical Spare Capacity	-1.2 %	
Effective Intersection Capacity	2389 veh/h	
Control Delay (Total)	2.93 veh-h/h	3.51 pers-h/h
Control Delay (Average)	5.1 sec	5.1 sec
Control Delay (Worst Lane)	15.4 sec	
Control Delay (Worst Movement)	20.6 sec	20.6 sec
Geometric Delay (Average)	4.0 sec	
Stop-Line Delay (Average)	1.1 sec	
Idling Time (Average)	0.2 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	18.1 veh	
95% Back of Queue - Distance (Worst Lane)	474.5 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.12	
Total Effective Stops	850 veh/h	1020 pers/h
Effective Stop Rate	0.41	0.41
Proportion Queued	0.50	0.50
Performance Index	91.6	91.6
Cost (Total)	805.46 \$/h	805.46 \$/h
Fuel Consumption (Total)	58.0 gal/h	
Carbon Dioxide (Total)	522.9 kg/h	
Hydrocarbons (Total)	0.043 kg/h	
Carbon Monoxide (Total)	0.607 kg/h	
NOx (Total)	1.304 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 5.8 %

Number of Iterations: 8 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 2.9% 1.5% 0.8%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	986,609 veh/y	1,183,931 pers/y
Delay	1,405 veh-h/y	1,686 pers-h/y
Effective Stops	408,012 veh/y	489,615 pers/y
Travel Distance	623,006 veh-mi/y	747,607 pers-mi/y
Travel Time	17,283 veh-h/y	20,740 pers-h/y
Cost	386,619 \$/y	386,619 \$/y
Fuel Consumption	27,816 gal/y	
Carbon Dioxide	250,992 kg/y	
Hydrocarbons	21 kg/y	
Carbon Monoxide	291 kg/y	

NOx	626 kg/y
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INTERSECTION SUMMARY

 **Site: 1 [Park Ave/Meyers St (Site Folder: PM Peak Hour)]**

New Site

Site Category: (None)

Roundabout

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	28.3 mph	28.3 mph
Travel Distance (Total)	339.4 veh-mi/h	407.3 pers-mi/h
Travel Time (Total)	12.0 veh-h/h	14.4 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.71	
Travel Time Index	6.75	
Congestion Coefficient	1.41	
Demand Flows (Total)	1455 veh/h	1746 pers/h
Percent Heavy Vehicles (Demand)	5.0 %	
Degree of Saturation	0.427	
Practical Spare Capacity	99.0 %	
Effective Intersection Capacity	3407 veh/h	
Control Delay (Total)	2.70 veh-h/h	3.24 pers-h/h
Control Delay (Average)	6.7 sec	6.7 sec
Control Delay (Worst Lane)	10.0 sec	
Control Delay (Worst Movement)	12.5 sec	12.5 sec
Geometric Delay (Average)	5.4 sec	
Stop-Line Delay (Average)	1.3 sec	
Idling Time (Average)	0.1 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	2.2 veh	
95% Back of Queue - Distance (Worst Lane)	57.0 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.04	
Total Effective Stops	831 veh/h	997 pers/h
Effective Stop Rate	0.57	0.57
Proportion Queued	0.43	0.43
Performance Index	23.8	23.8
Cost (Total)	286.50 \$/h	286.50 \$/h
Fuel Consumption (Total)	22.8 gal/h	
Carbon Dioxide (Total)	204.6 kg/h	
Hydrocarbons (Total)	0.019 kg/h	
Carbon Monoxide (Total)	0.222 kg/h	
NOx (Total)	0.436 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 1.3 %

Number of Iterations: 4 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 92.0% 1.7% 1.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	698,274 veh/y	837,928 pers/y
Delay	1,297 veh-h/y	1,557 pers-h/y
Effective Stops	398,655 veh/y	478,386 pers/y
Travel Distance	162,923 veh-mi/y	195,508 pers-mi/y
Travel Time	5,755 veh-h/y	6,906 pers-h/y
Cost	137,519 \$/y	137,519 \$/y
Fuel Consumption	10,936 gal/y	
Carbon Dioxide	98,221 kg/y	
Hydrocarbons	9 kg/y	
Carbon Monoxide	106 kg/y	

NOx	209 kg/y
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INTERSECTION SUMMARY

 **Site: 2 [Midway Rd/E Park Ave/Park Ave (Site Folder: PM Peak Hour)]**

New Site
Site Category: (None)
Roundabout

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	26.7 mph	26.7 mph
Travel Distance (Total)	530.6 veh-mi/h	636.7 pers-mi/h
Travel Time (Total)	19.9 veh-h/h	23.9 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.67	
Travel Time Index	6.29	
Congestion Coefficient	1.50	
Demand Flows (Total)	2391 veh/h	2869 pers/h
Percent Heavy Vehicles (Demand)	5.0 %	
Degree of Saturation	0.572	
Practical Spare Capacity	48.6 %	
Effective Intersection Capacity	4179 veh/h	
Control Delay (Total)	5.62 veh-h/h	6.75 pers-h/h
Control Delay (Average)	8.5 sec	8.5 sec
Control Delay (Worst Lane)	12.8 sec	
Control Delay (Worst Movement)	12.8 sec	12.8 sec
Geometric Delay (Average)	6.0 sec	
Stop-Line Delay (Average)	2.4 sec	
Idling Time (Average)	0.0 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	5.3 veh	
95% Back of Queue - Distance (Worst Lane)	138.4 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.12	
Total Effective Stops	1671 veh/h	2005 pers/h
Effective Stop Rate	0.70	0.70
Proportion Queued	0.69	0.69
Performance Index	48.1	48.1
Cost (Total)	483.75 \$/h	483.75 \$/h
Fuel Consumption (Total)	39.4 gal/h	
Carbon Dioxide (Total)	353.3 kg/h	
Hydrocarbons (Total)	0.033 kg/h	
Carbon Monoxide (Total)	0.371 kg/h	
NOx (Total)	0.759 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 2.9 %

Number of Iterations: 7 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 2.3% 1.2% 0.6%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,147,500 veh/y	1,377,000 pers/y
Delay	2,699 veh-h/y	3,239 pers-h/y
Effective Stops	802,131 veh/y	962,557 pers/y
Travel Distance	254,683 veh-mi/y	305,619 pers-mi/y
Travel Time	9,556 veh-h/y	11,467 pers-h/y
Cost	232,198 \$/y	232,198 \$/y
Fuel Consumption	18,891 gal/y	
Carbon Dioxide	169,596 kg/y	
Hydrocarbons	16 kg/y	

Carbon Monoxide	178 kg/y
NOx	365 kg/y

INTERSECTION SUMMARY

 Site: 3 [Fair St/E Park Ave (Site Folder: PM Peak Hour)]

New Site

Site Category: (None)

Roundabout

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	27.6 mph	27.6 mph
Travel Distance (Total)	407.0 veh-mi/h	488.4 pers-mi/h
Travel Time (Total)	14.8 veh-h/h	17.7 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.69	
Travel Time Index	6.55	
Congestion Coefficient	1.45	
Demand Flows (Total)	2165 veh/h	2598 pers/h
Percent Heavy Vehicles (Demand)	5.0 %	
Degree of Saturation	0.390	
Practical Spare Capacity	118.1 %	
Effective Intersection Capacity	5554 veh/h	
Control Delay (Total)	3.46 veh-h/h	4.16 pers-h/h
Control Delay (Average)	5.8 sec	5.8 sec
Control Delay (Worst Lane)	10.4 sec	
Control Delay (Worst Movement)	13.9 sec	13.9 sec
Geometric Delay (Average)	4.5 sec	
Stop-Line Delay (Average)	1.3 sec	
Idling Time (Average)	0.2 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	3.0 veh	
95% Back of Queue - Distance (Worst Lane)	77.4 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.10	
Total Effective Stops	1162 veh/h	1394 pers/h
Effective Stop Rate	0.54	0.54
Proportion Queued	0.47	0.47
Performance Index	36.9	36.9
Cost (Total)	358.44 \$/h	358.44 \$/h
Fuel Consumption (Total)	29.2 gal/h	
Carbon Dioxide (Total)	261.7 kg/h	
Hydrocarbons (Total)	0.024 kg/h	
Carbon Monoxide (Total)	0.276 kg/h	
NOx (Total)	0.552 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 2.6 %

Number of Iterations: 7 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 2.1% 1.1% 0.5%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,039,000 veh/y	1,246,800 pers/y
Delay	1,662 veh-h/y	1,995 pers-h/y
Effective Stops	557,693 veh/y	669,232 pers/y
Travel Distance	195,351 veh-mi/y	234,422 pers-mi/y
Travel Time	7,083 veh-h/y	8,499 pers-h/y
Cost	172,052 \$/y	172,052 \$/y
Fuel Consumption	13,992 gal/y	
Carbon Dioxide	125,633 kg/y	
Hydrocarbons	12 kg/y	
Carbon Monoxide	132 kg/y	

NOx	265 kg/y
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INTERSECTION SUMMARY

 **Site: 4 [Midway Rd/Hegan Ln (Site Folder: PM Peak Hour)]**

New Site

Site Category: (None)

Roundabout

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	24.1 mph	24.1 mph
Travel Distance (Total)	407.0 veh-mi/h	488.4 pers-mi/h
Travel Time (Total)	16.9 veh-h/h	20.3 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.60	
Travel Time Index	5.58	
Congestion Coefficient	1.66	
Demand Flows (Total)	1872 veh/h	2246 pers/h
Percent Heavy Vehicles (Demand)	4.0 %	
Degree of Saturation	0.466	
Practical Spare Capacity	82.5 %	
Effective Intersection Capacity	4020 veh/h	
Control Delay (Total)	4.23 veh-h/h	5.07 pers-h/h
Control Delay (Average)	8.1 sec	8.1 sec
Control Delay (Worst Lane)	12.9 sec	
Control Delay (Worst Movement)	13.0 sec	13.0 sec
Geometric Delay (Average)	5.9 sec	
Stop-Line Delay (Average)	2.2 sec	
Idling Time (Average)	0.1 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	3.4 veh	
95% Back of Queue - Distance (Worst Lane)	87.5 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.06	
Total Effective Stops	1156 veh/h	1387 pers/h
Effective Stop Rate	0.62	0.62
Proportion Queued	0.50	0.50
Performance Index	34.4	34.4
Cost (Total)	389.01 \$/h	389.01 \$/h
Fuel Consumption (Total)	29.3 gal/h	
Carbon Dioxide (Total)	262.5 kg/h	
Hydrocarbons (Total)	0.025 kg/h	
Carbon Monoxide (Total)	0.282 kg/h	
NOx (Total)	0.468 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 2.9 %

Number of Iterations: 7 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 2.2% 1.2% 0.7%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	898,581 veh/y	1,078,297 pers/y
Delay	2,029 veh-h/y	2,435 pers-h/y
Effective Stops	554,644 veh/y	665,573 pers/y
Travel Distance	195,341 veh-mi/y	234,410 pers-mi/y
Travel Time	8,111 veh-h/y	9,734 pers-h/y
Cost	186,726 \$/y	186,726 \$/y
Fuel Consumption	14,060 gal/y	
Carbon Dioxide	126,017 kg/y	
Hydrocarbons	12 kg/y	
Carbon Monoxide	135 kg/y	

NOx	225 kg/y
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INTERSECTION SUMMARY

 **Site: 5 [Hegan Ln/Otterson Dr (Site Folder: PM Peak Hour)]**

New Site

Site Category: (None)

Roundabout

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	31.9 mph	31.9 mph
Travel Distance (Total)	339.8 veh-mi/h	407.8 pers-mi/h
Travel Time (Total)	10.7 veh-h/h	12.8 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.80	
Travel Time Index	7.74	
Congestion Coefficient	1.25	
Demand Flows (Total)	1093 veh/h	1312 pers/h
Percent Heavy Vehicles (Demand)	2.0 %	
Degree of Saturation	0.368	
Practical Spare Capacity	130.7 %	
Effective Intersection Capacity	2967 veh/h	
Control Delay (Total)	2.14 veh-h/h	2.57 pers-h/h
Control Delay (Average)	7.1 sec	7.1 sec
Control Delay (Worst Lane)	11.0 sec	
Control Delay (Worst Movement)	12.0 sec	12.0 sec
Geometric Delay (Average)	5.7 sec	
Stop-Line Delay (Average)	1.4 sec	
Idling Time (Average)	0.0 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	2.5 veh	
95% Back of Queue - Distance (Worst Lane)	63.1 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.04	
Total Effective Stops	612 veh/h	735 pers/h
Effective Stop Rate	0.56	0.56
Proportion Queued	0.42	0.42
Performance Index	29.6	29.6
Cost (Total)	239.68 \$/h	239.68 \$/h
Fuel Consumption (Total)	17.4 gal/h	
Carbon Dioxide (Total)	155.4 kg/h	
Hydrocarbons (Total)	0.014 kg/h	
Carbon Monoxide (Total)	0.179 kg/h	
NOx (Total)	0.189 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 1.8 %

Number of Iterations: 6 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 2.1% 1.1% 0.5%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	524,690 veh/y	629,628 pers/y
Delay	1,029 veh-h/y	1,235 pers-h/y
Effective Stops	293,877 veh/y	352,653 pers/y
Travel Distance	163,113 veh-mi/y	195,736 pers-mi/y
Travel Time	5,116 veh-h/y	6,140 pers-h/y
Cost	115,044 \$/y	115,044 \$/y
Fuel Consumption	8,347 gal/y	
Carbon Dioxide	74,573 kg/y	
Hydrocarbons	7 kg/y	
Carbon Monoxide	86 kg/y	

NOx	91 kg/y
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INTERSECTION SUMMARY

 **Site: 101 [E Park Ave/Scott Ave (Site Folder: AM Peak Hour - Yr 2040)]**

New Site
Site Category: (None)
Roundabout

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	36.3 mph	36.3 mph
Travel Distance (Total)	1269.7 veh-mi/h	1523.6 pers-mi/h
Travel Time (Total)	35.0 veh-h/h	42.0 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.91	
Travel Time Index	8.96	
Congestion Coefficient	1.10	
Demand Flows (Total)	2011 veh/h	2413 pers/h
Percent Heavy Vehicles (Demand)	12.0 %	
Degree of Saturation	0.715	
Practical Spare Capacity	18.8 %	
Effective Intersection Capacity	2811 veh/h	
Control Delay (Total)	2.87 veh-h/h	3.45 pers-h/h
Control Delay (Average)	5.1 sec	5.1 sec
Control Delay (Worst Lane)	13.5 sec	
Control Delay (Worst Movement)	18.7 sec	18.7 sec
Geometric Delay (Average)	4.2 sec	
Stop-Line Delay (Average)	1.0 sec	
Idling Time (Average)	0.2 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	9.0 veh	
95% Back of Queue - Distance (Worst Lane)	245.3 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.06	
Total Effective Stops	884 veh/h	1060 pers/h
Effective Stop Rate	0.44	0.44
Proportion Queued	0.38	0.38
Performance Index	69.4	69.4
Cost (Total)	851.65 \$/h	851.65 \$/h
Fuel Consumption (Total)	69.4 gal/h	
Carbon Dioxide (Total)	633.0 kg/h	
Hydrocarbons (Total)	0.048 kg/h	
Carbon Monoxide (Total)	0.657 kg/h	
NOx (Total)	2.384 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 4.4 %

Number of Iterations: 7 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 3.3% 1.7% 0.9%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	965,053 veh/y	1,158,063 pers/y
Delay	1,379 veh-h/y	1,655 pers-h/y
Effective Stops	424,119 veh/y	508,943 pers/y
Travel Distance	609,443 veh-mi/y	731,331 pers-mi/y
Travel Time	16,804 veh-h/y	20,165 pers-h/y
Cost	408,790 \$/y	408,790 \$/y
Fuel Consumption	33,311 gal/y	
Carbon Dioxide	303,823 kg/y	
Hydrocarbons	23 kg/y	

Carbon Monoxide	315 kg/y
NOx	1,144 kg/y

INTERSECTION SUMMARY

 **Site: 1 [Park Ave/Meyers St (Site Folder: AM Peak Hour - Yr 2040)]**

New Site
Site Category: (None)
Roundabout

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	29.9 mph	29.9 mph
Travel Distance (Total)	320.2 veh-mi/h	384.2 pers-mi/h
Travel Time (Total)	10.7 veh-h/h	12.8 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.75	
Travel Time Index	7.20	
Congestion Coefficient	1.34	
Demand Flows (Total)	1375 veh/h	1650 pers/h
Percent Heavy Vehicles (Demand)	4.0 %	
Degree of Saturation	0.243	
Practical Spare Capacity	249.8 %	
Effective Intersection Capacity	5658 veh/h	
Control Delay (Total)	2.24 veh-h/h	2.68 pers-h/h
Control Delay (Average)	5.9 sec	5.9 sec
Control Delay (Worst Lane)	8.6 sec	
Control Delay (Worst Movement)	11.9 sec	11.9 sec
Geometric Delay (Average)	5.1 sec	
Stop-Line Delay (Average)	0.7 sec	
Idling Time (Average)	0.0 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	1.5 veh	
95% Back of Queue - Distance (Worst Lane)	37.7 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.04	
Total Effective Stops	695 veh/h	834 pers/h
Effective Stop Rate	0.51	0.51
Proportion Queued	0.32	0.32
Performance Index	19.6	19.6
Cost (Total)	252.74 \$/h	252.74 \$/h
Fuel Consumption (Total)	19.8 gal/h	
Carbon Dioxide (Total)	177.2 kg/h	
Hydrocarbons (Total)	0.016 kg/h	
Carbon Monoxide (Total)	0.194 kg/h	
NOx (Total)	0.335 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 1.3 %

Number of Iterations: 5 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 2.0% 1.2% 0.6%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	660,000 veh/y	792,000 pers/y
Delay	1,073 veh-h/y	1,288 pers-h/y
Effective Stops	333,544 veh/y	400,253 pers/y
Travel Distance	153,691 veh-mi/y	184,429 pers-mi/y
Travel Time	5,138 veh-h/y	6,165 pers-h/y
Cost	121,314 \$/y	121,314 \$/y
Fuel Consumption	9,486 gal/y	
Carbon Dioxide	85,072 kg/y	
Hydrocarbons	8 kg/y	

Carbon Monoxide	93 kg/y
NOx	161 kg/y

INTERSECTION SUMMARY

 **Site: 2 [Midway Rd/E Park Ave/Park Ave (Site Folder: AM Peak Hour - Yr 2040)]**

New Site
Site Category: (None)
Roundabout

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	25.6 mph	25.6 mph
Travel Distance (Total)	571.6 veh-mi/h	685.9 pers-mi/h
Travel Time (Total)	22.3 veh-h/h	26.8 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.64	
Travel Time Index	6.01	
Congestion Coefficient	1.56	
Demand Flows (Total)	2541 veh/h	3050 pers/h
Percent Heavy Vehicles (Demand)	9.0 %	
Degree of Saturation	0.599	
Practical Spare Capacity	42.0 %	
Effective Intersection Capacity	4244 veh/h	
Control Delay (Total)	6.98 veh-h/h	8.38 pers-h/h
Control Delay (Average)	9.9 sec	9.9 sec
Control Delay (Worst Lane)	15.5 sec	
Control Delay (Worst Movement)	15.5 sec	15.5 sec
Geometric Delay (Average)	6.4 sec	
Stop-Line Delay (Average)	3.5 sec	
Idling Time (Average)	0.3 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	5.7 veh	
95% Back of Queue - Distance (Worst Lane)	152.2 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.20	
Total Effective Stops	1929 veh/h	2315 pers/h
Effective Stop Rate	0.76	0.76
Proportion Queued	0.77	0.77
Performance Index	60.4	60.4
Cost (Total)	573.27 \$/h	573.27 \$/h
Fuel Consumption (Total)	50.1 gal/h	
Carbon Dioxide (Total)	452.5 kg/h	
Hydrocarbons (Total)	0.041 kg/h	
Carbon Monoxide (Total)	0.451 kg/h	
NOx (Total)	1.434 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 3.8 %

Number of Iterations: 8 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 2.0% 1.0% 0.5%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,219,826 veh/y	1,463,792 pers/y
Delay	3,350 veh-h/y	4,020 pers-h/y
Effective Stops	926,121 veh/y	1,111,345 pers/y
Travel Distance	274,348 veh-mi/y	329,218 pers-mi/y
Travel Time	10,700 veh-h/y	12,840 pers-h/y
Cost	275,168 \$/y	275,168 \$/y
Fuel Consumption	24,042 gal/y	
Carbon Dioxide	217,215 kg/y	
Hydrocarbons	20 kg/y	

Carbon Monoxide	216 kg/y
NOx	688 kg/y

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INTERSECTION SUMMARY

 Site: 3 [Fair St/E Park Ave (Site Folder: AM Peak Hour - Yr 2040)]

New Site
Site Category: (None)
Roundabout

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	27.3 mph	27.3 mph
Travel Distance (Total)	393.6 veh-mi/h	472.3 pers-mi/h
Travel Time (Total)	14.4 veh-h/h	17.3 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.68	
Travel Time Index	6.46	
Congestion Coefficient	1.47	
Demand Flows (Total)	2119 veh/h	2542 pers/h
Percent Heavy Vehicles (Demand)	10.0 %	
Degree of Saturation	0.440	
Practical Spare Capacity	93.2 %	
Effective Intersection Capacity	4815 veh/h	
Control Delay (Total)	3.42 veh-h/h	4.11 pers-h/h
Control Delay (Average)	5.8 sec	5.8 sec
Control Delay (Worst Lane)	10.6 sec	
Control Delay (Worst Movement)	13.5 sec	13.5 sec
Geometric Delay (Average)	4.4 sec	
Stop-Line Delay (Average)	1.4 sec	
Idling Time (Average)	0.3 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	2.6 veh	
95% Back of Queue - Distance (Worst Lane)	69.6 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.12	
Total Effective Stops	1141 veh/h	1370 pers/h
Effective Stop Rate	0.54	0.54
Proportion Queued	0.46	0.46
Performance Index	37.1	37.1
Cost (Total)	374.77 \$/h	374.77 \$/h
Fuel Consumption (Total)	33.1 gal/h	
Carbon Dioxide (Total)	299.7 kg/h	
Hydrocarbons (Total)	0.027 kg/h	
Carbon Monoxide (Total)	0.299 kg/h	
NOx (Total)	0.980 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 2.8 %

Number of Iterations: 6 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 3.5% 1.9% 1.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,016,907 veh/y	1,220,289 pers/y
Delay	1,643 veh-h/y	1,971 pers-h/y
Effective Stops	547,901 veh/y	657,481 pers/y
Travel Distance	188,937 veh-mi/y	226,724 pers-mi/y
Travel Time	6,929 veh-h/y	8,314 pers-h/y
Cost	179,892 \$/y	179,892 \$/y
Fuel Consumption	15,894 gal/y	
Carbon Dioxide	143,851 kg/y	
Hydrocarbons	13 kg/y	

Carbon Monoxide	144 kg/y
NOx	470 kg/y

INTERSECTION SUMMARY

 **Site: 4 [Midway Rd/Hegan Ln (Site Folder: AM Peak Hour - Yr 2040)]**

New Site
Site Category: (None)
Roundabout

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	26.2 mph	26.2 mph
Travel Distance (Total)	447.8 veh-mi/h	537.4 pers-mi/h
Travel Time (Total)	17.1 veh-h/h	20.5 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.65	
Travel Time Index	6.16	
Congestion Coefficient	1.53	
Demand Flows (Total)	2073 veh/h	2487 pers/h
Percent Heavy Vehicles (Demand)	9.0 %	
Degree of Saturation	0.606	
Practical Spare Capacity	40.3 %	
Effective Intersection Capacity	3422 veh/h	
Control Delay (Total)	3.92 veh-h/h	4.70 pers-h/h
Control Delay (Average)	6.8 sec	6.8 sec
Control Delay (Worst Lane)	11.9 sec	
Control Delay (Worst Movement)	13.0 sec	13.0 sec
Geometric Delay (Average)	5.0 sec	
Stop-Line Delay (Average)	1.8 sec	
Idling Time (Average)	0.1 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	4.8 veh	
95% Back of Queue - Distance (Worst Lane)	127.6 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.07	
Total Effective Stops	1210 veh/h	1452 pers/h
Effective Stop Rate	0.58	0.58
Proportion Queued	0.48	0.48
Performance Index	38.3	38.3
Cost (Total)	426.66 \$/h	426.66 \$/h
Fuel Consumption (Total)	35.9 gal/h	
Carbon Dioxide (Total)	324.6 kg/h	
Hydrocarbons (Total)	0.029 kg/h	
Carbon Monoxide (Total)	0.334 kg/h	
NOx (Total)	0.986 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 3.1 %

Number of Iterations: 7 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 2.5% 1.3% 0.7%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	994,909 veh/y	1,193,891 pers/y
Delay	1,882 veh-h/y	2,258 pers-h/y
Effective Stops	580,663 veh/y	696,796 pers/y
Travel Distance	214,956 veh-mi/y	257,947 pers-mi/y
Travel Time	8,211 veh-h/y	9,853 pers-h/y
Cost	204,799 \$/y	204,799 \$/y
Fuel Consumption	17,239 gal/y	
Carbon Dioxide	155,793 kg/y	
Hydrocarbons	14 kg/y	

Carbon Monoxide	161 kg/y
NOx	473 kg/y

INTERSECTION SUMMARY

 Site: 5 [Hegan Ln/Otterson Dr (Site Folder: AM Peak Hour - Yr 2040)]

New Site
Site Category: (None)
Roundabout

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	33.2 mph	33.2 mph
Travel Distance (Total)	324.6 veh-mi/h	389.6 pers-mi/h
Travel Time (Total)	9.8 veh-h/h	11.7 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.83	
Travel Time Index	8.12	
Congestion Coefficient	1.20	
Demand Flows (Total)	1045 veh/h	1253 pers/h
Percent Heavy Vehicles (Demand)	4.0 %	
Degree of Saturation	0.430	
Practical Spare Capacity	97.8 %	
Effective Intersection Capacity	2430 veh/h	
Control Delay (Total)	1.42 veh-h/h	1.70 pers-h/h
Control Delay (Average)	4.9 sec	4.9 sec
Control Delay (Worst Lane)	10.6 sec	
Control Delay (Worst Movement)	11.2 sec	11.2 sec
Geometric Delay (Average)	4.5 sec	
Stop-Line Delay (Average)	0.4 sec	
Idling Time (Average)	0.0 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	3.3 veh	
95% Back of Queue - Distance (Worst Lane)	85.4 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.06	
Total Effective Stops	459 veh/h	551 pers/h
Effective Stop Rate	0.44	0.44
Proportion Queued	0.22	0.22
Performance Index	24.1	24.1
Cost (Total)	225.48 \$/h	225.48 \$/h
Fuel Consumption (Total)	17.0 gal/h	
Carbon Dioxide (Total)	153.0 kg/h	
Hydrocarbons (Total)	0.013 kg/h	
Carbon Monoxide (Total)	0.172 kg/h	
NOx (Total)	0.306 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 0.9 %

Number of Iterations: 3 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 100.0% 89.4% 0.9%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	501,391 veh/y	601,670 pers/y
Delay	682 veh-h/y	818 pers-h/y
Effective Stops	220,382 veh/y	264,458 pers/y
Travel Distance	155,827 veh-mi/y	186,992 pers-mi/y
Travel Time	4,689 veh-h/y	5,627 pers-h/y
Cost	108,233 \$/y	108,233 \$/y
Fuel Consumption	8,182 gal/y	
Carbon Dioxide	73,460 kg/y	
Hydrocarbons	6 kg/y	

Carbon Monoxide	83 kg/y
NOx	147 kg/y

INTERSECTION SUMMARY

 **Site: 101 [E Park Ave/Scott Ave (Site Folder: PM Peak Hour - Yr 2040)]**

New Site
Site Category: (None)
Roundabout

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	36.0 mph	36.0 mph
Travel Distance (Total)	1561.6 veh-mi/h	1873.9 pers-mi/h
Travel Time (Total)	43.4 veh-h/h	52.1 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.90	
Travel Time Index	8.88	
Congestion Coefficient	1.11	
Demand Flows (Total)	2473 veh/h	2967 pers/h
Percent Heavy Vehicles (Demand)	6.0 %	
Degree of Saturation	0.866	
Practical Spare Capacity	-1.9 %	
Effective Intersection Capacity	2854 veh/h	
Control Delay (Total)	3.63 veh-h/h	4.36 pers-h/h
Control Delay (Average)	5.3 sec	5.3 sec
Control Delay (Worst Lane)	23.2 sec	
Control Delay (Worst Movement)	28.3 sec	28.3 sec
Geometric Delay (Average)	4.0 sec	
Stop-Line Delay (Average)	1.3 sec	
Idling Time (Average)	0.4 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	18.5 veh	
95% Back of Queue - Distance (Worst Lane)	484.6 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.12	
Total Effective Stops	1035 veh/h	1243 pers/h
Effective Stop Rate	0.42	0.42
Proportion Queued	0.48	0.48
Performance Index	99.4	99.4
Cost (Total)	969.63 \$/h	969.63 \$/h
Fuel Consumption (Total)	69.6 gal/h	
Carbon Dioxide (Total)	628.1 kg/h	
Hydrocarbons (Total)	0.052 kg/h	
Carbon Monoxide (Total)	0.729 kg/h	
NOx (Total)	1.564 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 6.4 %

Number of Iterations: 8 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 3.3% 1.7% 0.9%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,186,957 veh/y	1,424,348 pers/y
Delay	1,744 veh-h/y	2,093 pers-h/y
Effective Stops	497,014 veh/y	596,417 pers/y
Travel Distance	749,546 veh-mi/y	899,456 pers-mi/y
Travel Time	20,833 veh-h/y	25,000 pers-h/y
Cost	465,420 \$/y	465,420 \$/y
Fuel Consumption	33,414 gal/y	
Carbon Dioxide	301,502 kg/y	
Hydrocarbons	25 kg/y	

Carbon Monoxide	350 kg/y
NOx	751 kg/y

INTERSECTION SUMMARY

 **Site: 1 [Park Ave/Meyers St (Site Folder: PM Peak Hour - Yr 2040)]**

New Site
Site Category: (None)
Roundabout

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	27.9 mph	27.9 mph
Travel Distance (Total)	409.0 veh-mi/h	490.8 pers-mi/h
Travel Time (Total)	14.7 veh-h/h	17.6 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.70	
Travel Time Index	6.64	
Congestion Coefficient	1.43	
Demand Flows (Total)	1753 veh/h	2103 pers/h
Percent Heavy Vehicles (Demand)	5.0 %	
Degree of Saturation	0.511	
Practical Spare Capacity	66.4 %	
Effective Intersection Capacity	3431 veh/h	
Control Delay (Total)	3.41 veh-h/h	4.09 pers-h/h
Control Delay (Average)	7.0 sec	7.0 sec
Control Delay (Worst Lane)	10.9 sec	
Control Delay (Worst Movement)	13.3 sec	13.3 sec
Geometric Delay (Average)	5.4 sec	
Stop-Line Delay (Average)	1.6 sec	
Idling Time (Average)	0.1 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	3.0 veh	
95% Back of Queue - Distance (Worst Lane)	78.6 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.05	
Total Effective Stops	1059 veh/h	1271 pers/h
Effective Stop Rate	0.60	0.60
Proportion Queued	0.49	0.49
Performance Index	30.0	30.0
Cost (Total)	350.25 \$/h	350.25 \$/h
Fuel Consumption (Total)	27.8 gal/h	
Carbon Dioxide (Total)	250.1 kg/h	
Hydrocarbons (Total)	0.023 kg/h	
Carbon Monoxide (Total)	0.271 kg/h	
NOx (Total)	0.534 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 1.3 %

Number of Iterations: 5 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 2.1% 1.2% 0.6%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	841,263 veh/y	1,009,516 pers/y
Delay	1,638 veh-h/y	1,965 pers-h/y
Effective Stops	508,384 veh/y	610,061 pers/y
Travel Distance	196,305 veh-mi/y	235,566 pers-mi/y
Travel Time	7,036 veh-h/y	8,444 pers-h/y
Cost	168,122 \$/y	168,122 \$/y
Fuel Consumption	13,367 gal/y	
Carbon Dioxide	120,047 kg/y	
Hydrocarbons	11 kg/y	

Carbon Monoxide	130 kg/y
NOx	256 kg/y

INTERSECTION SUMMARY

 **Site: 2 [Midway Rd/E Park Ave/Park Ave (Site Folder: PM Peak Hour - Yr 2040)]**

New Site
Site Category: (None)
Roundabout

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	26.0 mph	26.0 mph
Travel Distance (Total)	636.6 veh-mi/h	764.0 pers-mi/h
Travel Time (Total)	24.5 veh-h/h	29.3 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.65	
Travel Time Index	6.12	
Congestion Coefficient	1.54	
Demand Flows (Total)	2868 veh/h	3441 pers/h
Percent Heavy Vehicles (Demand)	5.0 %	
Degree of Saturation	0.693	
Practical Spare Capacity	22.7 %	
Effective Intersection Capacity	4139 veh/h	
Control Delay (Total)	7.54 veh-h/h	9.05 pers-h/h
Control Delay (Average)	9.5 sec	9.5 sec
Control Delay (Worst Lane)	13.5 sec	
Control Delay (Worst Movement)	13.5 sec	13.5 sec
Geometric Delay (Average)	6.0 sec	
Stop-Line Delay (Average)	3.4 sec	
Idling Time (Average)	0.0 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	8.9 veh	
95% Back of Queue - Distance (Worst Lane)	230.9 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.15	
Total Effective Stops	2226 veh/h	2671 pers/h
Effective Stop Rate	0.78	0.78
Proportion Queued	0.80	0.80
Performance Index	64.5	64.5
Cost (Total)	595.97 \$/h	595.97 \$/h
Fuel Consumption (Total)	48.7 gal/h	
Carbon Dioxide (Total)	437.0 kg/h	
Hydrocarbons (Total)	0.041 kg/h	
Carbon Monoxide (Total)	0.457 kg/h	
NOx (Total)	0.944 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 4.0 %

Number of Iterations: 7 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 3.4% 1.8% 0.9%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,376,500 veh/y	1,651,800 pers/y
Delay	3,620 veh-h/y	4,344 pers-h/y
Effective Stops	1,068,423 veh/y	1,282,108 pers/y
Travel Distance	305,583 veh-mi/y	366,700 pers-mi/y
Travel Time	11,738 veh-h/y	14,085 pers-h/y
Cost	286,065 \$/y	286,065 \$/y
Fuel Consumption	23,367 gal/y	
Carbon Dioxide	209,756 kg/y	
Hydrocarbons	20 kg/y	

Carbon Monoxide	219 kg/y
NOx	453 kg/y

INTERSECTION SUMMARY

 **Site: 3 [Fair St/E Park Ave (Site Folder: PM Peak Hour - Yr 2040)]**

New Site
Site Category: (None)
Roundabout

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	27.1 mph	27.1 mph
Travel Distance (Total)	489.8 veh-mi/h	587.7 pers-mi/h
Travel Time (Total)	18.1 veh-h/h	21.7 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.68	
Travel Time Index	6.42	
Congestion Coefficient	1.48	
Demand Flows (Total)	2604 veh/h	3125 pers/h
Percent Heavy Vehicles (Demand)	5.0 %	
Degree of Saturation	0.457	
Practical Spare Capacity	85.8 %	
Effective Intersection Capacity	5693 veh/h	
Control Delay (Total)	4.35 veh-h/h	5.22 pers-h/h
Control Delay (Average)	6.0 sec	6.0 sec
Control Delay (Worst Lane)	10.6 sec	
Control Delay (Worst Movement)	14.3 sec	14.3 sec
Geometric Delay (Average)	4.5 sec	
Stop-Line Delay (Average)	1.5 sec	
Idling Time (Average)	0.2 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	3.8 veh	
95% Back of Queue - Distance (Worst Lane)	99.3 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.13	
Total Effective Stops	1459 veh/h	1751 pers/h
Effective Stop Rate	0.56	0.56
Proportion Queued	0.53	0.53
Performance Index	46.6	46.6
Cost (Total)	438.99 \$/h	438.99 \$/h
Fuel Consumption (Total)	35.7 gal/h	
Carbon Dioxide (Total)	320.8 kg/h	
Hydrocarbons (Total)	0.030 kg/h	
Carbon Monoxide (Total)	0.338 kg/h	
NOx (Total)	0.681 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 3.5 %

Number of Iterations: 7 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 3.0% 1.5% 0.8%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,250,000 veh/y	1,500,000 pers/y
Delay	2,089 veh-h/y	2,507 pers-h/y
Effective Stops	700,299 veh/y	840,359 pers/y
Travel Distance	235,086 veh-mi/y	282,103 pers-mi/y
Travel Time	8,669 veh-h/y	10,403 pers-h/y
Cost	210,714 \$/y	210,714 \$/y
Fuel Consumption	17,150 gal/y	
Carbon Dioxide	153,974 kg/y	
Hydrocarbons	14 kg/y	

Carbon Monoxide	162 kg/y
NOx	327 kg/y

INTERSECTION SUMMARY

 Site: 4 [Midway Rd/Hegan Ln (Site Folder: PM Peak Hour - Yr 2040)]

New Site
Site Category: (None)
Roundabout

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	22.5 mph	22.5 mph
Travel Distance (Total)	478.2 veh-mi/h	573.8 pers-mi/h
Travel Time (Total)	21.2 veh-h/h	25.5 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.56	
Travel Time Index	5.15	
Congestion Coefficient	1.77	
Demand Flows (Total)	2260 veh/h	2712 pers/h
Percent Heavy Vehicles (Demand)	4.0 %	
Degree of Saturation	0.697	
Practical Spare Capacity	21.9 %	
Effective Intersection Capacity	3242 veh/h	
Control Delay (Total)	6.33 veh-h/h	7.60 pers-h/h
Control Delay (Average)	10.1 sec	10.1 sec
Control Delay (Worst Lane)	15.2 sec	
Control Delay (Worst Movement)	17.4 sec	17.4 sec
Geometric Delay (Average)	6.0 sec	
Stop-Line Delay (Average)	4.1 sec	
Idling Time (Average)	0.6 sec	
Intersection Level of Service (LOS)	LOS B	
95% Back of Queue - Vehicles (Worst Lane)	5.9 veh	
95% Back of Queue - Distance (Worst Lane)	152.7 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.08	
Total Effective Stops	1658 veh/h	1990 pers/h
Effective Stop Rate	0.73	0.73
Proportion Queued	0.59	0.59
Performance Index	50.1	50.1
Cost (Total)	483.52 \$/h	483.52 \$/h
Fuel Consumption (Total)	35.8 gal/h	
Carbon Dioxide (Total)	321.3 kg/h	
Hydrocarbons (Total)	0.031 kg/h	
Carbon Monoxide (Total)	0.345 kg/h	
NOx (Total)	0.578 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 4.4 %

Number of Iterations: 7 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 3.4% 1.9% 1.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,084,903 veh/y	1,301,884 pers/y
Delay	3,038 veh-h/y	3,646 pers-h/y
Effective Stops	795,965 veh/y	955,158 pers/y
Travel Distance	229,536 veh-mi/y	275,444 pers-mi/y
Travel Time	10,184 veh-h/y	12,220 pers-h/y
Cost	232,091 \$/y	232,091 \$/y
Fuel Consumption	17,207 gal/y	
Carbon Dioxide	154,217 kg/y	
Hydrocarbons	15 kg/y	

Carbon Monoxide	166 kg/y
NOx	277 kg/y

INTERSECTION SUMMARY

 **Site: 5 [Hegan Ln/Otterson Dr (Site Folder: PM Peak Hour - Yr 2040)]**

New Site
Site Category: (None)
Roundabout

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	31.7 mph	31.7 mph
Travel Distance (Total)	390.9 veh-mi/h	469.1 pers-mi/h
Travel Time (Total)	12.3 veh-h/h	14.8 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.79	
Travel Time Index	7.69	
Congestion Coefficient	1.26	
Demand Flows (Total)	1255 veh/h	1507 pers/h
Percent Heavy Vehicles (Demand)	2.0 %	
Degree of Saturation	0.415	
Practical Spare Capacity	104.8 %	
Effective Intersection Capacity	3025 veh/h	
Control Delay (Total)	2.52 veh-h/h	3.03 pers-h/h
Control Delay (Average)	7.2 sec	7.2 sec
Control Delay (Worst Lane)	11.1 sec	
Control Delay (Worst Movement)	12.3 sec	12.3 sec
Geometric Delay (Average)	5.7 sec	
Stop-Line Delay (Average)	1.5 sec	
Idling Time (Average)	0.0 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	3.0 veh	
95% Back of Queue - Distance (Worst Lane)	75.4 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.05	
Total Effective Stops	722 veh/h	867 pers/h
Effective Stop Rate	0.58	0.58
Proportion Queued	0.46	0.46
Performance Index	33.8	33.8
Cost (Total)	277.57 \$/h	277.57 \$/h
Fuel Consumption (Total)	20.2 gal/h	
Carbon Dioxide (Total)	180.2 kg/h	
Hydrocarbons (Total)	0.017 kg/h	
Carbon Monoxide (Total)	0.207 kg/h	
NOx (Total)	0.219 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 2.4 %

Number of Iterations: 6 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 2.9% 1.5% 0.8%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	602,609 veh/y	723,130 pers/y
Delay	1,211 veh-h/y	1,453 pers-h/y
Effective Stops	346,636 veh/y	415,963 pers/y
Travel Distance	187,625 veh-mi/y	225,150 pers-mi/y
Travel Time	5,920 veh-h/y	7,104 pers-h/y
Cost	133,232 \$/y	133,232 \$/y
Fuel Consumption	9,681 gal/y	
Carbon Dioxide	86,482 kg/y	
Hydrocarbons	8 kg/y	

Carbon Monoxide	100 kg/y
NOx	105 kg/y

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INTERSECTION SUMMARY

 **Site: 3v [Fair St/E Park Ave (Site Folder: PM Peak Hour - Yr 2020 Partial RI/RO)]**

New Site

Site Category: (None)

Signals - EQUISAT (Pretimed) Isolated Cycle Time = 125 seconds (Site Optimum Cycle Time - Minimum Delay)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	31.2 mph	31.2 mph
Travel Distance (Total)	370.4 veh-mi/h	444.5 pers-mi/h
Travel Time (Total)	11.9 veh-h/h	14.2 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.78	
Travel Time Index	7.56	
Congestion Coefficient	1.28	
Demand Flows (Total)	2281 veh/h	2738 pers/h
Percent Heavy Vehicles (Demand)	5.0 %	
Degree of Saturation	0.310	
Practical Spare Capacity	190.6 %	
Effective Intersection Capacity	7367 veh/h	
Control Delay (Total)	2.24 veh-h/h	2.69 pers-h/h
Control Delay (Average)	3.5 sec	3.5 sec
Control Delay (Worst Lane)	9.5 sec	
Control Delay (Worst Movement)	9.5 sec	9.5 sec
Geometric Delay (Average)	1.4 sec	
Stop-Line Delay (Average)	2.1 sec	
Idling Time (Average)	1.2 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	8.4 veh	
95% Back of Queue - Distance (Worst Lane)	217.5 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.32	
Total Effective Stops	760 veh/h	911 pers/h
Effective Stop Rate	0.33	0.33
Proportion Queued	0.22	0.22
Performance Index	55.0	55.0
Cost (Total)	263.51 \$/h	263.51 \$/h
Fuel Consumption (Total)	18.7 gal/h	
Carbon Dioxide (Total)	168.5 kg/h	
Hydrocarbons (Total)	0.015 kg/h	
Carbon Monoxide (Total)	0.197 kg/h	
NOx (Total)	0.337 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 2 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 21.2% 0.6% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,095,000 veh/y	1,314,000 pers/y
Delay	1,076 veh-h/y	1,291 pers-h/y
Effective Stops	364,591 veh/y	437,509 pers/y
Travel Distance	177,816 veh-mi/y	213,379 pers-mi/y
Travel Time	5,695 veh-h/y	6,834 pers-h/y
Cost	126,483 \$/y	126,483 \$/y
Fuel Consumption	8,991 gal/y	
Carbon Dioxide	80,890 kg/y	
Hydrocarbons	7 kg/y	
Carbon Monoxide	95 kg/y	
NOx	162 kg/y	

INTERSECTION SUMMARY

 **Site: 101v [E Park Ave/Scott Ave (Site Folder: PM Peak Hour - Yr 2020 Partial RI/RO)]**

New Site

Site Category: (None)

Signals - EQUISAT (Pretimed) Isolated Cycle Time = 85 seconds (Site Optimum Cycle Time - Minimum Delay)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	31.9 mph	31.9 mph
Travel Distance (Total)	1373.4 veh-mi/h	1648.0 pers-mi/h
Travel Time (Total)	43.1 veh-h/h	51.7 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.80	
Travel Time Index	7.74	
Congestion Coefficient	1.26	
Demand Flows (Total)	2238 veh/h	2686 pers/h
Percent Heavy Vehicles (Demand)	5.9 %	
Degree of Saturation	0.747	
Practical Spare Capacity	20.5 %	
Effective Intersection Capacity	2996 veh/h	
Control Delay (Total)	8.58 veh-h/h	10.29 pers-h/h
Control Delay (Average)	13.8 sec	13.8 sec
Control Delay (Worst Lane)	50.0 sec	
Control Delay (Worst Movement)	50.0 sec	50.0 sec
Geometric Delay (Average)	0.8 sec	
Stop-Line Delay (Average)	13.0 sec	
Idling Time (Average)	9.9 sec	
Intersection Level of Service (LOS)	LOS B	
95% Back of Queue - Vehicles (Worst Lane)	27.5 veh	
95% Back of Queue - Distance (Worst Lane)	721.8 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.28	
Total Effective Stops	1341 veh/h	1609 pers/h
Effective Stop Rate	0.60	0.60
Proportion Queued	0.66	0.66
Performance Index	143.7	143.7
Cost (Total)	916.81 \$/h	916.81 \$/h
Fuel Consumption (Total)	60.3 gal/h	
Carbon Dioxide (Total)	544.2 kg/h	
Hydrocarbons (Total)	0.046 kg/h	
Carbon Monoxide (Total)	0.651 kg/h	
NOx (Total)	1.248 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 2 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 17.3% 7.6% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,074,261 veh/y	1,289,113 pers/y
Delay	4,118 veh-h/y	4,941 pers-h/y
Effective Stops	643,756 veh/y	772,507 pers/y
Travel Distance	659,208 veh-mi/y	791,050 pers-mi/y
Travel Time	20,697 veh-h/y	24,836 pers-h/y
Cost	440,071 \$/y	440,071 \$/y
Fuel Consumption	28,947 gal/y	
Carbon Dioxide	261,202 kg/y	
Hydrocarbons	22 kg/y	
Carbon Monoxide	313 kg/y	
NOx	599 kg/y	

INTERSECTION SUMMARY

 **Site: 3v [Fair St/E Park Ave - Copy (2) (Site Folder: PM Peak Hour - Yr 2040 Partial RI/RO)]**

New Site

Site Category: (None)

Signals - EQUISAT (Pretimed) Isolated Cycle Time = 95 seconds (Site Optimum Cycle Time - Minimum Delay)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	29.7 mph	29.7 mph
Travel Distance (Total)	444.7 veh-mi/h	533.7 pers-mi/h
Travel Time (Total)	15.0 veh-h/h	18.0 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.74	
Travel Time Index	7.13	
Congestion Coefficient	1.35	
Demand Flows (Total)	2741 veh/h	3289 pers/h
Percent Heavy Vehicles (Demand)	5.0 %	
Degree of Saturation	0.400	
Practical Spare Capacity	124.9 %	
Effective Intersection Capacity	6847 veh/h	
Control Delay (Total)	3.45 veh-h/h	4.14 pers-h/h
Control Delay (Average)	4.5 sec	4.5 sec
Control Delay (Worst Lane)	9.7 sec	
Control Delay (Worst Movement)	10.9 sec	10.9 sec
Geometric Delay (Average)	1.5 sec	
Stop-Line Delay (Average)	3.1 sec	
Idling Time (Average)	1.7 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	10.5 veh	
95% Back of Queue - Distance (Worst Lane)	273.8 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.40	
Total Effective Stops	1101 veh/h	1321 pers/h
Effective Stop Rate	0.40	0.40
Proportion Queued	0.32	0.32
Performance Index	71.5	71.5
Cost (Total)	338.25 \$/h	338.25 \$/h
Fuel Consumption (Total)	24.7 gal/h	
Carbon Dioxide (Total)	222.0 kg/h	
Hydrocarbons (Total)	0.020 kg/h	
Carbon Monoxide (Total)	0.255 kg/h	
NOx (Total)	0.457 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 2 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 24.0% 1.5% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,315,500 veh/y	1,578,600 pers/y
Delay	1,657 veh-h/y	1,988 pers-h/y
Effective Stops	528,545 veh/y	634,255 pers/y
Travel Distance	213,462 veh-mi/y	256,155 pers-mi/y
Travel Time	7,194 veh-h/y	8,632 pers-h/y
Cost	162,361 \$/y	162,361 \$/y
Fuel Consumption	11,852 gal/y	
Carbon Dioxide	106,581 kg/y	
Hydrocarbons	10 kg/y	
Carbon Monoxide	122 kg/y	
NOx	219 kg/y	

INTERSECTION SUMMARY

 **Site: 101v [E Park Ave/Scott Ave - Copy (2) (Site Folder: PM Peak Hour - Yr 2040 Partial RI/RO)]**

New Site

Site Category: (None)

Signals - EQUISAT (Pretimed) Isolated Cycle Time = 110 seconds (Site Optimum Cycle Time - Minimum Delay)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	30.9 mph	30.9 mph
Travel Distance (Total)	1625.4 veh-mi/h	1950.5 pers-mi/h
Travel Time (Total)	52.6 veh-h/h	63.2 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.77	
Travel Time Index	7.47	
Congestion Coefficient	1.30	
Demand Flows (Total)	2649 veh/h	3179 pers/h
Percent Heavy Vehicles (Demand)	5.9 %	
Degree of Saturation	0.832	
Practical Spare Capacity	8.2 %	
Effective Intersection Capacity	3185 veh/h	
Control Delay (Total)	11.77 veh-h/h	14.13 pers-h/h
Control Delay (Average)	16.0 sec	16.0 sec
Control Delay (Worst Lane)	67.3 sec	
Control Delay (Worst Movement)	67.3 sec	67.3 sec
Geometric Delay (Average)	0.8 sec	
Stop-Line Delay (Average)	15.2 sec	
Idling Time (Average)	12.1 sec	
Intersection Level of Service (LOS)	LOS B	
95% Back of Queue - Vehicles (Worst Lane)	46.3 veh	
95% Back of Queue - Distance (Worst Lane)	1211.9 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.46	
Total Effective Stops	1625 veh/h	1950 pers/h
Effective Stop Rate	0.61	0.61
Proportion Queued	0.66	0.66
Performance Index	204.8	204.8
Cost (Total)	1110.69 \$/h	1110.69 \$/h
Fuel Consumption (Total)	72.0 gal/h	
Carbon Dioxide (Total)	649.6 kg/h	
Hydrocarbons (Total)	0.056 kg/h	
Carbon Monoxide (Total)	0.776 kg/h	
NOx (Total)	1.487 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 2 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 26.9% 6.6% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,271,478 veh/y	1,525,774 pers/y
Delay	5,651 veh-h/y	6,781 pers-h/y
Effective Stops	780,147 veh/y	936,176 pers/y
Travel Distance	780,197 veh-mi/y	936,237 pers-mi/y
Travel Time	25,266 veh-h/y	30,320 pers-h/y
Cost	533,130 \$/y	533,130 \$/y
Fuel Consumption	34,557 gal/y	
Carbon Dioxide	311,815 kg/y	
Hydrocarbons	27 kg/y	
Carbon Monoxide	372 kg/y	
NOx	714 kg/y	

INTERSECTION SUMMARY

 **Site: 2 [Midway Rd/E Park Ave/Park Ave - Copy (3) (Site Folder: PM Peak Hour - Yr 2020 RI/RO)]**

New Site
Site Category: (None)
Roundabout

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	25.8 mph	25.8 mph
Travel Distance (Total)	556.3 veh-mi/h	667.5 pers-mi/h
Travel Time (Total)	21.5 veh-h/h	25.9 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.65	
Travel Time Index	6.06	
Congestion Coefficient	1.55	
Demand Flows (Total)	2534 veh/h	3041 pers/h
Percent Heavy Vehicles (Demand)	4.7 %	
Degree of Saturation	0.590	
Practical Spare Capacity	44.0 %	
Effective Intersection Capacity	4294 veh/h	
Control Delay (Total)	6.64 veh-h/h	7.96 pers-h/h
Control Delay (Average)	9.4 sec	9.4 sec
Control Delay (Worst Lane)	13.6 sec	
Control Delay (Worst Movement)	13.6 sec	13.6 sec
Geometric Delay (Average)	6.4 sec	
Stop-Line Delay (Average)	3.1 sec	
Idling Time (Average)	0.0 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	6.0 veh	
95% Back of Queue - Distance (Worst Lane)	157.2 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.15	
Total Effective Stops	1902 veh/h	2282 pers/h
Effective Stop Rate	0.75	0.75
Proportion Queued	0.75	0.75
Performance Index	56.4	56.4
Cost (Total)	522.68 \$/h	522.68 \$/h
Fuel Consumption (Total)	42.4 gal/h	
Carbon Dioxide (Total)	380.7 kg/h	
Hydrocarbons (Total)	0.036 kg/h	
Carbon Monoxide (Total)	0.397 kg/h	
NOx (Total)	0.784 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 3.4 %

Number of Iterations: 7 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 2.8% 1.5% 0.8%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,216,370 veh/y	1,459,644 pers/y
Delay	3,185 veh-h/y	3,822 pers-h/y
Effective Stops	912,725 veh/y	1,095,270 pers/y
Travel Distance	267,007 veh-mi/y	320,409 pers-mi/y
Travel Time	10,342 veh-h/y	12,411 pers-h/y
Cost	250,887 \$/y	250,887 \$/y
Fuel Consumption	20,366 gal/y	
Carbon Dioxide	182,735 kg/y	
Hydrocarbons	17 kg/y	

Carbon Monoxide	191 kg/y
NOx	376 kg/y

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INTERSECTION SUMMARY

 **Site: 101 [E Park Ave/Scott Ave - Fixed queue - Copy (2) (Site Folder: PM Peak Hour - Yr 2020 RI/RO)]**

New Site
Site Category: (None)
Roundabout

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	35.8 mph	35.8 mph
Travel Distance (Total)	1478.1 veh-mi/h	1773.7 pers-mi/h
Travel Time (Total)	41.3 veh-h/h	49.5 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.90	
Travel Time Index	8.84	
Congestion Coefficient	1.12	
Demand Flows (Total)	2328 veh/h	2794 pers/h
Percent Heavy Vehicles (Demand)	5.6 %	
Degree of Saturation	0.662	
Practical Spare Capacity	28.5 %	
Effective Intersection Capacity	3519 veh/h	
Control Delay (Total)	3.99 veh-h/h	4.79 pers-h/h
Control Delay (Average)	6.2 sec	6.2 sec
Control Delay (Worst Lane)	14.2 sec	
Control Delay (Worst Movement)	17.2 sec	17.2 sec
Geometric Delay (Average)	4.8 sec	
Stop-Line Delay (Average)	1.4 sec	
Idling Time (Average)	0.3 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	7.3 veh	
95% Back of Queue - Distance (Worst Lane)	190.5 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.05	
Total Effective Stops	1191 veh/h	1429 pers/h
Effective Stop Rate	0.51	0.51
Proportion Queued	0.47	0.47
Performance Index	70.5	70.5
Cost (Total)	918.42 \$/h	918.42 \$/h
Fuel Consumption (Total)	65.5 gal/h	
Carbon Dioxide (Total)	590.7 kg/h	
Hydrocarbons (Total)	0.049 kg/h	
Carbon Monoxide (Total)	0.688 kg/h	
NOx (Total)	1.390 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 2.9 %

Number of Iterations: 7 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 2.3% 1.2% 0.6%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,117,565 veh/y	1,341,079 pers/y
Delay	1,917 veh-h/y	2,301 pers-h/y
Effective Stops	571,777 veh/y	686,133 pers/y
Travel Distance	709,467 veh-mi/y	851,361 pers-mi/y
Travel Time	19,808 veh-h/y	23,769 pers-h/y
Cost	440,841 \$/y	440,841 \$/y
Fuel Consumption	31,451 gal/y	
Carbon Dioxide	283,526 kg/y	
Hydrocarbons	23 kg/y	

Carbon Monoxide	330 kg/y
NOx	667 kg/y

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INTERSECTION SUMMARY

 **Site: 3v [Fair St/E Park Ave - Copy (Site Folder: PM Peak Hour - Yr 2020 RI/RO)]**

New Site
Site Category: (None)
Stop (Two-Way)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	34.9 mph	34.9 mph
Travel Distance (Total)	398.5 veh-mi/h	478.2 pers-mi/h
Travel Time (Total)	11.4 veh-h/h	13.7 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.87	
Travel Time Index	8.58	
Congestion Coefficient	1.15	
Demand Flows (Total)	2410 veh/h	2893 pers/h
Percent Heavy Vehicles (Demand)	5.0 %	
Degree of Saturation	0.310	
Practical Spare Capacity	162.1 %	
Effective Intersection Capacity	7786 veh/h	
Control Delay (Total)	1.11 veh-h/h	1.33 pers-h/h
Control Delay (Average)	1.7 sec	1.7 sec
Control Delay (Worst Lane)	18.2 sec	
Control Delay (Worst Movement)	18.2 sec	18.2 sec
Geometric Delay (Average)	1.3 sec	
Stop-Line Delay (Average)	0.3 sec	
Idling Time (Average)	0.2 sec	
Intersection Level of Service (LOS)	NA	
95% Back of Queue - Vehicles (Worst Lane)	1.7 veh	
95% Back of Queue - Distance (Worst Lane)	43.8 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.09	
Total Effective Stops	373 veh/h	447 pers/h
Effective Stop Rate	0.15	0.15
Proportion Queued	0.05	0.05
Performance Index	14.5	14.5
Cost (Total)	238.97 \$/h	238.97 \$/h
Fuel Consumption (Total)	15.2 gal/h	
Carbon Dioxide (Total)	137.2 kg/h	
Hydrocarbons (Total)	0.012 kg/h	
Carbon Monoxide (Total)	0.172 kg/h	
NOx (Total)	0.244 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA: Intersection LOS for Vehicles is Not Applicable for two-way sign control since the average intersection delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 2 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 0.0% 79.5% 0.2%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,157,000 veh/y	1,388,400 pers/y
Delay	531 veh-h/y	637 pers-h/y
Effective Stops	178,847 veh/y	214,616 pers/y
Travel Distance	191,284 veh-mi/y	229,540 pers-mi/y
Travel Time	5,484 veh-h/y	6,580 pers-h/y
Cost	114,705 \$/y	114,705 \$/y
Fuel Consumption	7,309 gal/y	
Carbon Dioxide	65,869 kg/y	
Hydrocarbons	6 kg/y	
Carbon Monoxide	82 kg/y	

NOx

117 kg/y

INTERSECTION SUMMARY

 **Site: 2 [Midway Rd/E Park Ave/Park Ave (Site Folder: PM Peak Hour - Yr 2040 RI/RO)]**

New Site
Site Category: (None)
Roundabout

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	23.7 mph	23.7 mph
Travel Distance (Total)	667.8 veh-mi/h	801.3 pers-mi/h
Travel Time (Total)	28.2 veh-h/h	33.8 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.59	
Travel Time Index	5.47	
Congestion Coefficient	1.69	
Demand Flows (Total)	3042 veh/h	3650 pers/h
Percent Heavy Vehicles (Demand)	4.7 %	
Degree of Saturation	0.794	
Practical Spare Capacity	7.1 %	
Effective Intersection Capacity	3831 veh/h	
Control Delay (Total)	10.70 veh-h/h	12.84 pers-h/h
Control Delay (Average)	12.7 sec	12.7 sec
Control Delay (Worst Lane)	17.2 sec	
Control Delay (Worst Movement)	17.2 sec	17.2 sec
Geometric Delay (Average)	6.4 sec	
Stop-Line Delay (Average)	6.3 sec	
Idling Time (Average)	0.8 sec	
Intersection Level of Service (LOS)	LOS B	
95% Back of Queue - Vehicles (Worst Lane)	13.3 veh	
95% Back of Queue - Distance (Worst Lane)	345.2 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.25	
Total Effective Stops	2805 veh/h	3367 pers/h
Effective Stop Rate	0.92	0.92
Proportion Queued	0.90	0.90
Performance Index	88.5	88.5
Cost (Total)	676.18 \$/h	676.18 \$/h
Fuel Consumption (Total)	54.0 gal/h	
Carbon Dioxide (Total)	484.8 kg/h	
Hydrocarbons (Total)	0.047 kg/h	
Carbon Monoxide (Total)	0.501 kg/h	
NOx (Total)	1.003 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 4.5 %

Number of Iterations: 8 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 2.5% 1.3% 0.7%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,459,978 veh/y	1,751,974 pers/y
Delay	5,137 veh-h/y	6,165 pers-h/y
Effective Stops	1,346,616 veh/y	1,615,939 pers/y
Travel Distance	320,522 veh-mi/y	384,626 pers-mi/y
Travel Time	13,534 veh-h/y	16,241 pers-h/y
Cost	324,569 \$/y	324,569 \$/y
Fuel Consumption	25,939 gal/y	
Carbon Dioxide	232,695 kg/y	
Hydrocarbons	22 kg/y	

Carbon Monoxide	240 kg/y
NOx	481 kg/y

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INTERSECTION SUMMARY

 **Site: 3v [Fair St/E Park Ave (Site Folder: PM Peak Hour - Yr 2040 RI/RO)]**

New Site
Site Category: (None)
Stop (Two-Way)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	34.5 mph	34.5 mph
Travel Distance (Total)	478.6 veh-mi/h	574.3 pers-mi/h
Travel Time (Total)	13.9 veh-h/h	16.7 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.86	
Travel Time Index	8.46	
Congestion Coefficient	1.16	
Demand Flows (Total)	2897 veh/h	3476 pers/h
Percent Heavy Vehicles (Demand)	5.0 %	
Degree of Saturation	0.403	
Practical Spare Capacity	98.4 %	
Effective Intersection Capacity	7185 veh/h	
Control Delay (Total)	1.50 veh-h/h	1.80 pers-h/h
Control Delay (Average)	1.9 sec	1.9 sec
Control Delay (Worst Lane)	22.9 sec	
Control Delay (Worst Movement)	22.9 sec	22.9 sec
Geometric Delay (Average)	1.4 sec	
Stop-Line Delay (Average)	0.5 sec	
Idling Time (Average)	0.3 sec	
Intersection Level of Service (LOS)	NA	
95% Back of Queue - Vehicles (Worst Lane)	2.9 veh	
95% Back of Queue - Distance (Worst Lane)	74.6 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.15	
Total Effective Stops	475 veh/h	570 pers/h
Effective Stop Rate	0.16	0.16
Proportion Queued	0.06	0.06
Performance Index	18.4	18.4
Cost (Total)	290.00 \$/h	290.00 \$/h
Fuel Consumption (Total)	18.4 gal/h	
Carbon Dioxide (Total)	166.0 kg/h	
Hydrocarbons (Total)	0.014 kg/h	
Carbon Monoxide (Total)	0.207 kg/h	
NOx (Total)	0.296 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA: Intersection LOS for Vehicles is Not Applicable for two-way sign control since the average intersection delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 2 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 0.0% 85.1% 0.3%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,390,500 veh/y	1,668,600 pers/y
Delay	718 veh-h/y	862 pers-h/y
Effective Stops	227,951 veh/y	273,541 pers/y
Travel Distance	229,705 veh-mi/y	275,646 pers-mi/y
Travel Time	6,666 veh-h/y	7,999 pers-h/y
Cost	139,202 \$/y	139,202 \$/y
Fuel Consumption	8,841 gal/y	
Carbon Dioxide	79,672 kg/y	
Hydrocarbons	7 kg/y	
Carbon Monoxide	99 kg/y	

NOx

142 kg/y

INTERSECTION SUMMARY

 **Site: 101 [E Park Ave/Scott Ave (Site Folder: PM Peak Hour - Yr 2040 RI/RO)]**

New Site
Site Category: (None)
Roundabout

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	34.9 mph	34.9 mph
Travel Distance (Total)	1790.3 veh-mi/h	2148.3 pers-mi/h
Travel Time (Total)	51.2 veh-h/h	61.5 pers-h/h
Desired Speed (Program)	40.0 mph	
Speed Efficiency	0.87	
Travel Time Index	8.59	
Congestion Coefficient	1.14	
Demand Flows (Total)	2821 veh/h	3385 pers/h
Percent Heavy Vehicles (Demand)	5.6 %	
Degree of Saturation	0.908	
Practical Spare Capacity	-6.4 %	
Effective Intersection Capacity	3106 veh/h	
Control Delay (Total)	5.71 veh-h/h	6.85 pers-h/h
Control Delay (Average)	7.3 sec	7.3 sec
Control Delay (Worst Lane)	24.4 sec	
Control Delay (Worst Movement)	27.7 sec	27.7 sec
Geometric Delay (Average)	4.8 sec	
Stop-Line Delay (Average)	2.5 sec	
Idling Time (Average)	0.8 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	13.9 veh	
95% Back of Queue - Distance (Worst Lane)	364.1 ft	
Ave. Queue Storage Ratio (Worst Lane)	0.09	
Total Effective Stops	1594 veh/h	1913 pers/h
Effective Stop Rate	0.57	0.57
Proportion Queued	0.63	0.63
Performance Index	100.9	100.9
Cost (Total)	1140.23 \$/h	1140.23 \$/h
Fuel Consumption (Total)	81.3 gal/h	
Carbon Dioxide (Total)	733.0 kg/h	
Hydrocarbons (Total)	0.061 kg/h	
Carbon Monoxide (Total)	0.851 kg/h	
NOx (Total)	1.744 kg/h	

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Site Model Variability Index (Iterations 3 to N): 4.9 %

Number of Iterations: 8 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 2.5% 1.3% 0.7%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,353,913 veh/y	1,624,696 pers/y
Delay	2,739 veh-h/y	3,286 pers-h/y
Effective Stops	765,189 veh/y	918,226 pers/y
Travel Distance	859,339 veh-mi/y	1,031,206 pers-mi/y
Travel Time	24,597 veh-h/y	29,516 pers-h/y
Cost	547,310 \$/y	547,310 \$/y
Fuel Consumption	39,033 gal/y	
Carbon Dioxide	351,834 kg/y	
Hydrocarbons	29 kg/y	

Carbon Monoxide	408 kg/y
NOx	837 kg/y

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Appendix H

Phase I Preliminary Cost Estimates

PROJECT PLANNING COST ESTIMATE ©

EA:

EA: PID:

PID:

District-County-Route:

PM:

Type of Estimate : Traffic Study Estimate

Program Code : None

Project Limits : Intersection of E Park Avenue and Fair Street

Project Description: Construction of Modern Roundabout

Scope : Intersection Construction

Alternative : Full Access Roundabout

SUMMARY OF PROJECT COST ESTIMATE

	Current Year Cost	Escalated Cost
TOTAL ROADWAY COST	\$ 3,978,800	\$ 4,690,542
TOTAL STRUCTURES COST	\$ -	\$ -
SUBTOTAL CONSTRUCTION COST	\$ 3,978,800	\$ 4,690,542
TOTAL RIGHT OF WAY COST	\$ 705,500	\$ 798,000
TOTAL CAPITAL OUTLAY COSTS	\$ 4,685,000	\$ 5,489,000
PA/ED SUPPORT	\$ -	\$ -
PS&E SUPPORT	\$ -	\$ -
RIGHT OF WAY SUPPORT	\$ -	\$ -
CONSTRUCTION SUPPORT	\$ -	\$ -
TOTAL SUPPORT COST	\$ -	\$ -

TOTAL PROJECT COST	\$ 4,690,000	\$ 5,500,000
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Programmed Amount

Month / Year
Date of Estimate (Month/Year) 2 / 2022

Estimated Construction Start (Month/Year) 3 / 2025

Number of Working Days = 180

Estimated Mid-Point of Construction (Month/Year) 7 / 2025

Estimated Construction End (Month/Year) 12 / 2025

Number of Plant Establishment Days

Estimated Project Schedule

PID Approval

PA/ED Approval

PS&E

RTL

Begin Construction

Reviewed by District O.E. or
Cost Estimate Certifier

xx/xx/xxxx

(xxx) xxx-xxxx

Office Engineer / Cost Estimate Certifier

Date

Phone

Approved by Project Manager

xx/xx/xxxx

(xxx) xxx-xxxx

Project Manager

Date

Phone

PROJECT COST ESTIMATE

EA: PID:

I. ROADWAY ITEMS SUMMARY

	Section	Cost
1	Earthwork	\$ 139,500
2	Pavement Structural Section	\$ 1,312,200
3	Drainage	\$ 150,000
4	Specialty Items	\$ 13,000
5	Environmental	\$ 363,700
6	Traffic Items	\$ 420,000
7	Detours	\$ -
8	Minor Items	\$ 239,900
9	Roadway Mobilization	\$ 263,900
10	Supplemental Work	\$ 105,600
11	City Furnished	\$ 52,800
12	Time-Related Overhead	\$ -
13	Roadway Contingency	\$ 918,200
TOTAL ROADWAY ITEMS		\$ 3,978,800

Estimate Prepared By :

Michael C Pitcock, Staff Engineer

Date

Phone

Estimate Reviewed By :

Name and Title

Date

Phone

By signing this estimate you are attesting that you have discussed your project with all functional units and have incorporated all their comments or have discussed with them why they will not be incorporated.

SECTION 1: EARTHWORK

Item code		Unit	Quantity		Unit Price (\$)		Cost
190101	Roadway Excavation	CY	4,650	x	30.00	= \$	139,500
152320	Lead Compliance Plan	LS		x		= \$	-
194001	Ditch Excavation	CY		x		= \$	-
19801X	Imported Borrow	CY/TON		x		= \$	-
192037	Structure Excavation (Retaining Wall)	CY		x		= \$	-
193013	Structure Backfill (Retaining Wall)	CY		x		= \$	-
193031	Pervious Backfill Material (Retaining Wall)	CY		x		= \$	-
16010X	Clearing & Grubbing	LS/ACRE		x		= \$	-
170101	Develop Water Supply	LS		x		= \$	-
19801X	Imported Borrow	CY/TON		x		= \$	-
210130	Duff	ACRE		x		= \$	-
XXXXXX	Some Item	Unit		x		= \$	-

TOTAL EARTHWORK SECTION ITEMS	\$	139,500
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SECTION 2: PAVEMENT STRUCTURAL SECTION

Item code		Unit	Quantity		Unit Price (\$)		Cost
401050	Jointed Plain Concrete Pavement	CY		x		= \$	-
400050	Continuously Reinforced Concrete Pavement	CY	70	x	900.00	= \$	63,000
404092	Seal Pavement Joint	LF		x		= \$	-
404093	Seal Isolation Joint	LF		x		= \$	-
413117	Seal Concrete Pavement Joint (Silicone)	LF		x		= \$	-
413118	Seal Pavement Joint (Asphalt Rubber)	LF		x		= \$	-
280010	Rapid Strength Concrete Base	CY		x		= \$	-
410095	Dowel Bar (Drill and Bond)	EA		x		= \$	-
390132	Hot Mix Asphalt (Type A)	TON	3,365	x	135.00	= \$	454,275
390137	Rubberized Hot Mix Asphalt (Gap Graded)	TON		x		= \$	-
395041	RHMA-O (Open Graded Fiction Course)	TON		x		= \$	-
393006	Geosynthetic Pavement Interlayer (Paving Grid)	SQYD		x		= \$	-
260203	Class 2 Aggregate Base	CY	3,130	x	90.00	= \$	281,700
290201	Asphalt Treated Permeable Base	CY		x		= \$	-
250401	Class 4 Aggregate Subbase	CY		x		= \$	-
374002	Asphaltic Emulsion (Fog Seal Coat)	TON		x		= \$	-
397005	Tack Coat	TON	5	x	1,700.00	= \$	8,500
390100	Prime Coat	TON	6	x	1,500.00	= \$	9,000
377501	Slurry Seal	TON		x		= \$	-
3750XX	Screenings (Type XX)	TON		x		= \$	-
374492	Asphaltic Emulsion (Polymer Modified)	TON		x		= \$	-
370001	Sand Cover (Seal)	TON		x		= \$	-
731530A	Hot Mix Asphalt (Textured Paving)	TONS		x		= \$	-
730020	Minor Concrete (Curb)	CY	60	x	1,700.00	= \$	102,000
731504	Minor Concrete (Curb and Gutter)	CY	100	x	1,200.00	= \$	120,000
731516	Minor Concrete (Driveway)	CY	20	x	1,000.00	= \$	20,000
731521	Minor Concrete (Sidewalk)	CY	160	x	1,000.00	= \$	160,000
39407X	Place Hot Mix Asphalt Dike (Type E)	LF		x		= \$	-
150771	Remove Asphalt Concrete Dike	LF		x		= \$	-
420201	Grind Existing Concrete Pavement	SQYD		x		= \$	-
150860	Remove Base and Surfacing	CY		x		= \$	-
390095	Replace Asphalt Concrete Surfacing	CY		x		= \$	-
15312X	Remove Concrete	LS	1	x	75,000.00	= \$	75,000
394090	Place Hot Mix Asphalt (Miscellaneous Area)	SQYD		x		= \$	-
153103	Cold Plane Asphalt Concrete Pavement	SQYD	1,870	x	10.00	= \$	18,700
39405X	Shoulder Rumble Strip (HMA, X-In Indentations)	STA		x		= \$	-
413113	Repair Spalled Joints, Polyester Grout	SQYD		x		= \$	-
420102	Groove Existing Concrete Pavement	SQYD		x		= \$	-
390136	Minor Hot Mix Asphalt	TON		x		= \$	-
394095	Roadside Paving (Miscellaneous Areas)	SQYD		x		= \$	-
XXXXXX	Some Item	Unit		x		= \$	-

TOTAL PAVEMENT STRUCTURAL SECTION ITEMS	\$	1,312,200
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SECTION 3: DRAINAGE

Item code		Unit	Quantity	Unit Price (\$)	Cost
15080X	Remove Culvert	EA/LF	x	= \$	-
150820	Modify Inlet	EA	x	= \$	-
155232	Sand Backfill	CY	x	= \$	-
15020X	Abandon Culvert	EA/LF	x	= \$	-
152430	Adjust Inlet	LF	x	= \$	-
155003	Cap Inlet	EA	x	= \$	-
510501	Minor Concrete	CY	x	= \$	-
510502	Minor Concrete (Minor Structure)	CY	x	= \$	-
5105XX	Minor Concrete (Type XX)	CY	x	= \$	-
620XXX	XX" Alternative Pipe Culvert (Type X)	LF	x	= \$	-
6411XX	XX" Plastic Pipe	LF	x	= \$	-
65XXXX	XX" Reinforced Concrete Pipe (Type X)	LF	x	= \$	-
6650XX	XX" Corrugated Steel Pipe (0.XXX" Thick)	LF	x	= \$	-
68XXXX	XX" Plastic Pipe (Edge Drain)	LF	x	= \$	-
69011X	XX" Corrugated Steel Pipe Downrain (0.XXX" Th	LF	x	= \$	-
70321X	XX" Corrugated Steel Pipe Inlet (0.XXX" Thick)	LF	x	= \$	-
70XXXX	XX" Corrugated Steel Pipe Riser (0.XXX" Thick)	LF	x	= \$	-
7050XX	XX" Steel Flared End Section	EA	x	= \$	-
703233	Grated Line Drain	LF	x	= \$	-
72XXXX	Rock Slope Protection (Type and Method)	CY/TON	x	= \$	-
72901X	Rock Slope Protection Fabric (Class X)	SQYD	x	= \$	-
721420	Concrete (Ditch Lining)	CY	x	= \$	-
721430	Concrete (Channel Lining)	CY	x	= \$	-
750001	Miscellaneous Iron and Steel	LB	x	= \$	-
XXXXXX	Additional Drainage	LS	1 x	150,000.00 = \$	150,000

TOTAL DRAINAGE ITEMS	\$	150,000
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SECTION 4: SPECIALTY ITEMS

Item code		Unit	Quantity	Unit Price (\$)	Cost
080050	Progress Schedule (Critical Path Method)	LS	x	= \$	-
582001	Sound Wall (Masonry Block)	SQFT	x	= \$	-
510530	Minor Concrete (Wall)	CY	x	= \$	-
15325X	Remove Sound Wall	LF/LS	x	= \$	-
070030	Lead Compliance Plan	LS	x	= \$	-
141120	Treated Wood Waste	LB	x	= \$	-
153221	Remove Concrete Barrier	LF	x	= \$	-
150662	Remove Metal Beam Guard Railing	LF	x	= \$	-
150668	Remove Flared End Section	EA	x	= \$	-
8000XX	Chain Link Fence (Type XX)	LF	x	= \$	-
80XXXX	XX" Chain Link Gate (Type CL-6)	EA	x	= \$	-
832005	Midwest Guardrail System	LF	x	= \$	-
839301	Single Thrie Beam Barrier	LF	x	= \$	-
839310	Double Thrie Beam Barrier	LF	x	= \$	-
839521	Cable Railing	LF	x	= \$	-
8395XX	Terminal System (Type WB-31)	EA	x	= \$	-
839585	Alternative Flared Terminal System	EA	x	= \$	-
839584	Alternative In-line Terminal System	EA	x	= \$	-
498052	60" CIDH Concrete Pile (Sign Foundation)	LF	x	= \$	-
839XXX	Crash Cushion (Insert Type)	EA	x	= \$	-
520103	Bar Reinforced Steel (Retaining Wall)	LB	x	= \$	-
510060	Structural Concrete, Retaining Wall	CY	x	= \$	-
513553	Retaining Wall (Masonry Wall)	SQFT	x	= \$	-
511035	Architectural Treatment	SQFT	x	= \$	-
598001	Anti-Graffiti Coating	SQFT	x	= \$	-
203070	Rock Stain	SQFT	x	= \$	-
5136XX	Reinforced Concrete Crib Wall (Type X)	SQFT	x	= \$	-
839543	Transition Railing (Type WB-31)	EA	x	= \$	-
780440	Prepare and Stain Concrete	SQFT	2,165 x	6.00 = \$	12,990
839561	Rail Tensioning Assembly	EA	x	= \$	-
83958X	End Anchor Assembly (Type X)	EA	x	= \$	-
XXXXXX	Some Item	Unit	x	= \$	-

TOTAL SPECIALTY ITEMS	\$	13,000
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SECTION 5: ENVIRONMENTAL**5A - ENVIRONMENTAL MITIGATION**

Item code	Unit	Quantity	Unit Price (\$)	Cost
Biological Mitigation	LS	1	x 50,000.00 = \$	50,000
130670 Temporary Reinforced Silt Fence	LF	x	= \$	-
141000 Temporary Fence (Type ESA)	LF	x	= \$	-
Subtotal Environmental Mitigation				\$ 50,000

5B - LANDSCAPE AND IRRIGATION

Item code	Unit	Quantity	Unit Price (\$)	Cost
20XXXX Highway Planting	LS	1	x 82,000.00 = \$	82,000
20XXXX Irrigation System	LS	1	x 162,000.00 = \$	162,000
204099 Plant Establishment Work	LS	x	= \$	-
204101 Extend Plant Establishment Work	LS	x	= \$	-
20XXXX Follow-up Landscape Project	LS	x	= \$	-
150685 Remove Irrigation Facility	LS	x	= \$	-
20XXXX Maintain Existing (Irrigation or Planted Areas)	LS	x	= \$	-
206400 Check and Test Existing Irrigation Facilities	LS	x	= \$	-
21011X Imported Topsoil (X)	CY/TON	x	= \$	-
20XXXX Rock Blanket, Rock Mulch, DG, Gravel Mulch	SQFT/SQYD	x	= \$	-
200122 Weed Germination	SQYD	x	= \$	-
208304 Water Meter	EA	x	= \$	-
2087XX XX" Conduit (Use for Irrigation x-overs)	LF	x	= \$	-
20890X Extend X" Conduit (Use for Extension of Irrigation x-overs)	LF	x	= \$	-
Subtotal Landscape and Irrigation				\$ 244,000

5C - EROSION CONTROL

Item code	Unit	Quantity	Unit Price (\$)	Cost
210010 Move In/Move Out (Erosion Control)	EA	1	x 5,000.00 = \$	5,000
210350 Fiber Rolls	LF	2,000	x 5.00 = \$	10,000
210360 Compost Sock	LF	x	= \$	-
2102XX Rolled Erosion Control Product (X)	SQFT	x	= \$	-
21025X Bonded Fiber Matrix	SQFT/ACRE	x	= \$	-
210300 Hydromulch	SQFT	10,000	x 0.25 = \$	2,500
210420 Straw	SQFT	x	= \$	-
210430 Hydroseed	SQFT	10,000	x 0.20 = \$	2,000
210600 Compost	CY	31	x 150.00 = \$	4,650
210630 Incorporate Materials	SQFT	10,000	x 0.50 = \$	5,000
Subtotal Erosion Control				\$ 29,150

5D - NPDES

Item code	Unit	Quantity	Unit Price (\$)	Cost
130300 Prepare SWPPP	LS	1	x 10,000.00 = \$	10,000
130200 Prepare WPCP	LS	x	= \$	-
130100 Job Site Management	LS	x	= \$	-
130330 Storm Water Annual Report	EA	x	= \$	-
130310 Rain Event Action Plan (REAP)	EA	x	= \$	-
130320 Storm Water Sampling and Analysis Day	EA	x	= \$	-
130520 Temporary Hydraulic Mulch	SQYD	120	x 2.50 = \$	300
130550 Temporary Hydroseed	SQYD	120	x 1.70 = \$	204
130505 Move-In/Move-Out (Temporary Erosion Control)	EA	x	= \$	-
130640 Temporary Fiber Roll	LF	x	= \$	-
130900 Temporary Concrete Washout	LS	1	x 5,000.00 = \$	5,000
130710 Temporary Construction Entrance	EA	1	x 10,000.00 = \$	10,000
130610 Temporary Check Dam	LF	x	= \$	-
130620 Temporary Drainage Inlet Protection	EA	x	= \$	-
130730 Street Sweeping	LS	1	x 15,000.00 = \$	15,000
Subtotal NPDES				\$ 40,504

Supplemental Work for NPDES

066595 Water Pollution Control Maintenance Sharing*	LS	x	= \$	-
066596 Additional Water Pollution Control**	LS	x	= \$	-
066597 Storm Water Sampling and Analysis***	LS	x	= \$	-
XXXXXX Some Item	LS	x	= \$	-
Subtotal Supplemental Work for NDPS				\$ -

*Applies to all SWPPPs and those WPCPs with sediment control or soil stabilization BMPs.

**Applies to both SWPPPs and WPCP projects.

*** Applies only to project with SWPPPs.

TOTAL ENVIRONMENTAL	\$ 363,700
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SECTION 6: TRAFFIC ITEMS**6A - Traffic Electrical**

Item code	Unit	Quantity	Unit Price (\$)	Cost
860460 Lighting and Sign Illumination	LS	x	= \$	-
860201 Signal and Lighting	LS	1 x	150,000.00 = \$	150,000
860990 Closed Circuit Television System	LS	x	= \$	-
86110X Ramp Metering System (Location X)	LS	x	= \$	-
86070X Interconnection Conduit and Cable	LF/LS	x	= \$	-
5602XX Furnish Sign Structure (Type X)	LB	x	= \$	-
5602XX Install Sign Structure (Type X)	LB	x	= \$	-
498040 XX" CIDHC Pile (Sign Foundation)	LF	x	= \$	-
86080X Inductive Loop Detectors	EA/LS	x	= \$	-
8609XX Traffic Monitoring Station (Type X)	LS	x	= \$	-
15075X Remove Sign Structure	EA/LS	x	= \$	-
151581 Reconstruct Sign Structure	EA	x	= \$	-
152641 Modify Sign Structure	EA	x	= \$	-
860090 Maintain Existing Traffic Management System Ele	LS	x	= \$	-
86XXXX Fiber Optic Conduit System	LS	x	= \$	-
XXXXX Some Item	Unit	x	= \$	-
Subtotal Traffic Electrical				\$ 150,000

6B - Traffic Signing and Striping

Item code	Unit	Quantity	Unit Price (\$)	Cost
566011 Roadside Sign - One Post	EA	x	= \$	-
566012 Roadside Sign - Two Post	EA	x	= \$	-
5602XX Furnish Sign	SQFT	x	= \$	-
568016 Install Sign Panel on Existing Frame	SQFT	x	= \$	-
150711 Remove Painted Traffic Stripe	LF	x	= \$	-
141101 Remove Yellow Painted Traffic Stripe (Hazardous Waste)	LF	x	= \$	-
150712 Remove Painted Pavement Marking	SQFT	x	= \$	-
150742 Remove Roadside Sign	EA	x	= \$	-
152320 Reset Roadside Sign	EA	x	= \$	-
152390 Relocate Roadside Sign	EA	x	= \$	-
82010X Delineator (Class X)	EA	x	= \$	-
840502 Thermoplastic Traffic Stripe (Enhanced Wet Night	LF	x	= \$	-
846012 Thermoplastic Crosswalk and Pavement Marking (	SQFT	x	= \$	-
120090 Construction Area Signs	LS	x	= \$	-
84XXXX Permanent Pavement Delineation	LS	1 x	20,000.00 = \$	20,000
Subtotal Traffic Signing and Striping				\$ 20,000

6C - Traffic Management Plan

Item code	Unit	Quantity	Unit Price (\$)	Cost
12865X Portable Changeable Message Signs	EA/LS	x	= \$	-
Subtotal Traffic Management Plan				\$ -

6C - Stage Construction and Traffic Handling

Item code	Unit	Quantity	Unit Price (\$)	Cost
120199 Traffic Plastic Drum	EA	x	= \$	-
12016X Channelizer (Type X)	EA	x	= \$	-
120120 Type III Barricade	EA	x	= \$	-
129100 Temporary Crash Cushion Module	EA	x	= \$	-
120100 Traffic Control System	LS	x	= \$	-
129110 Temporary Crash Cushion	EA	x	= \$	-
129000 Temporary Railing (Type K)	LF	x	= \$	-
120149 Temporary Pavement Marking (Paint)	SQFT	x	= \$	-
82010X Delineator (Class X)	EA	x	= \$	-
XXXXXX Stage Construction	LS	1 x	250,000.00 = \$	250,000
Subtotal Stage Construction and Traffic Handling				\$ 250,000

TOTAL TRAFFIC ITEMS	\$ 420,000
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SECTION 7: DETOURS

Includes constructing, maintaining, and removal

Item code	Unit	Quantity	Unit Price (\$)	Cost
190101 Roadway Excavation	CY	x	= \$	-
19801X Imported Borrow	CY/TON	x	= \$	-
390132 Hot Mix Asphalt (Type A)	TON	x	= \$	-
26020X Class 2 Aggregate Base	TON/CY	x	= \$	-
250401 Class 4 Aggregate Subbase	CY	x	= \$	-
130620 Temporary Drainage Inlet Protection	EA	x	= \$	-
129000 Temporary Railing (Type K)	LF	x	= \$	-
128601 Temporary Signal System	LS	x	= \$	-
120149 Temporary Pavement Marking (Paint)	SQFT	x	= \$	-
80010X Temporary Fence (Type X)	LF	x	= \$	-
XXXXXX Some Item	LS	x	= \$	-

* Includes constructing, maintaining, and removal

TOTAL DETOURS	\$	-
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SUBTOTAL SECTIONS 1 through 7	\$	2,398,400
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SECTION 8: MINOR ITEMS**8A - Americans with Disabilities Act Items**

ADA Items	1.0%	\$	23,984
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8B - Bike Path Items

Bike Path Items	1.0%	\$	23,984
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8C - Other Minor Items

Other Minor Items	8.0%	\$	191,872
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Total of Section 1-7	\$	2,398,400	x	10.0%	= \$	239,840
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TOTAL MINOR ITEMS	\$	239,900
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SECTIONS 9: ROADWAY MOBILIZATION

Item code						
999990	Total Section 1-8	\$	2,638,300	x	10%	= \$ 263,830

TOTAL ROADWAY MOBILIZATION	\$	263,900
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SECTION 10: SUPPLEMENTAL WORK

Item code	Unit	Quantity	Unit Price (\$)	Cost
066670 Payment Adjustments For Price Index Fluctuations	LS	x	= \$	-
066094 Value Analysis	LS	x	= \$	-
066070 Maintain Traffic	LS	x	= \$	-
066919 Dispute Resolution Board	LS	x	= \$	-
066921 Dispute Resolution Advisor	LS	x	= \$	-
066015 Federal Trainee Program	LS	x	= \$	-
066610 Partnering	LS	x	= \$	-
066204 Remove Rock and Debris	LS	x	= \$	-
066222 Locate Existing Crossover	LS	x	= \$	-
XXXXXX Some Item	Unit	x	= \$	-

Cost of NPDES Supplemental Work specified in Section 5D	= \$	-
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Total Section 1-8	\$	2,638,300	4%	= \$	105,532
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TOTAL SUPPLEMENTAL WORK	\$	105,600
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SECTION 11: CITY FURNISHED MATERIALS AND EXPENSES

Item code		Unit	Quantity	Unit Price (\$)		Cost
066105	Resident Engineers Office	LS	x	=		\$0
066063	Traffic Management Plan - Public Information	LS	x	=		\$0
066901	Water Expenses	LS	x	=		\$0
8609XX	Traffic Monitoring Station (X)	LS	x	=		\$0
066841	Traffic Controller Assembly	LS	x	=		\$0
066840	Traffic Signal Controller Assembly	LS	x	=		\$0
066062	COZEEP Contract	LS	x	=		\$0
066838	Reflective Numbers and Edge Sealer	LS	x	=		\$0
066065	Tow Truck Service Patrol	LS	x	=		\$0
066916	Annual Construction General Permit Fee	LS	x	=		\$0
XXXXXX	Some Item	Unit	x	=		\$0
Total Section 1-8		\$	2,638,300	2%	= \$	52,766

TOTAL CITY FURNISHED	\$52,800
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SECTION 12: TIME-RELATED OVERHEAD

Total of Roadway and Structures Contract Items excluding Mobilization \$2,638,300 (used to calculate TRO)
Total Construction Cost (excluding TRO and Contingency) \$3,060,600 (used to check if project is greater than \$5 million excluding contingency)

Estimated Time-Related Overhead (TRO) Percentage (0% to 10%) = **6%**

Item code		Unit	Quantity	Unit Price (\$)		Cost
090100	Time-Related Overhead	WD	180	X	\$0 =	\$0

TOTAL TIME-RELATED OVERHEAD	\$0
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SECTION 13: ROADWAY CONTINGENCY

Total Section 1-12 \$ 3,060,600 x 30% = \$918,180

TOTAL CONTINGENCY	\$918,200
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II. STRUCTURE ITEMS

	Bridge 1		Bridge 2		
DATE OF ESTIMATE	00/00/00		00/00/00		00/00/00
Bridge Name	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Bridge Number	57-XXX		57-XXX		57-XXX
Structure Type	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Width (Feet) [out to out]	0 LF		0 LF		0 LF
Total Bridge Length (Feet)	0 LF		0 LF		0 LF
Total Area (Square Feet)	0 SQFT		0 SQFT		0 SQFT
Structure Depth (Feet)	0 LF		0 LF		0 LF
Footing Type (pile or spread)	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Cost Per Square Foot	\$0		\$0		\$0
COST OF EACH	\$0		\$0		\$0

	Building 1				
DATE OF ESTIMATE	00/00/00		00/00/00		00/00/00
Building Name	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Bridge Number	57-XXX		57-XXX		57-XXX
Structure Type	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Width (Feet) [out to out]	0 LF		0 LF		0 LF
Total Building Length (Feet)	0 LF		0 LF		0 LF
Total Area (Square Feet)	0 SQFT		0 SQFT		0 SQFT
Structure Depth (Feet)	0 LF		0 LF		0 LF
Footing Type (pile or spread)	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Cost Per Square Foot	\$0		\$0		\$0
COST OF EACH	\$0		\$0		\$0

TOTAL COST OF BRIDGES	\$0
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TOTAL COST OF BUILDINGS	\$0
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STRUCTURES MOBILIZATION	10%	\$0
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Recommended Contingency: (Pre-PSR 30%-50%, PSR 25%, Draft PR 20%, PR 15%, after PR approval 10%, Final PS&E 5%)

Total recommended percentages includes any quantified risk based contingency from the risk register.

STRUCTURES CONTINGENCY	10%	\$0
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TOTAL COST OF STRUCTURES	\$0
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Estimate Prepared By: _____
 XXXXXXXXXXXXXXXXXXXX ----- Division of Structures

 Date

III. RIGHT OF WAY

Fill in all of the available information from the Right of Way Data Sheet.

A)	A1)	Acquisition, including Excess Land Purchases, Damages & Goodwill, Fees	\$	680,500
	A2)	SB-1210	\$	0
B)		Acquisition of Offsite Mitigation	\$	0
C)	C1)	Utility Relocation (City Share)	\$	0
	C2)	Potholing (Design Phase)	\$	25,000
D)		Railroad Acquisition	\$	0
E)		Clearance / Demolition	\$	0
F)		Relocation Assistance (RAP and/or Last Resort Housing Costs)	\$	0
G)		Title and Escrow	\$	0
H)		Environmental Review	\$	0
I)		Condemnation Settlements <u>0%</u>	\$	0
J)		Design Appreciation Factor <u>0%</u>	\$	0
K)		Utility Relocation (Construction Cost)	\$	0

L)	TOTAL RIGHT OF WAY ESTIMATE	\$705,500
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M)	TOTAL R/W ESTIMATE: Escalated	\$798,000
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N)	RIGHT OF WAY SUPPORT	\$0
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Support Cost Estimate Prepared By	Project Coordinator ¹	Phone
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Utility Estimate Prepared By	Utility Coordinator ²	Phone
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R/W Acquisition Estimate Prepared By	Right of Way Estimator ³	Phone
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Note: Items G & H applied to items A + B

¹ When estimate has Support Costs only² When estimate has Utility Relocation³ When R/W Acquisition is required

PROJECT PLANNING COST ESTIMATE ©

EA:

EA: PID:

PID:

District-County-Route:

PM:

Type of Estimate : Traffic Study Estimate

Program Code : None

Project Limits : Intersection of E Park Avenue and Fair Street

Project Description: Construction of Traffic Signal

Scope : Intersection Construction

Alternative : Right In Right Out

SUMMARY OF PROJECT COST ESTIMATE

	Current Year Cost	Escalated Cost
TOTAL ROADWAY COST	\$ 2,315,600	\$ 2,729,823
TOTAL STRUCTURES COST	\$ -	\$ -
SUBTOTAL CONSTRUCTION COST	\$ 2,315,600	\$ 2,729,823
TOTAL RIGHT OF WAY COST	\$ 5,000	\$ 6,000
TOTAL CAPITAL OUTLAY COSTS	\$ 2,321,000	\$ 2,736,000
PA/ED SUPPORT	\$ -	\$ -
PS&E SUPPORT	\$ -	\$ -
RIGHT OF WAY SUPPORT	\$ -	\$ -
CONSTRUCTION SUPPORT	\$ -	\$ -
TOTAL SUPPORT COST	\$ -	\$ -

TOTAL PROJECT COST	\$ 2,330,000	\$ 2,740,000
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Programmed Amount

Month / Year
Date of Estimate (Month/Year) 2 / 2022

Estimated Construction Start (Month/Year) 4 / 2025

Number of Working Days = 100

Estimated Mid-Point of Construction (Month/Year) 5 / 2025

Estimated Construction End (Month/Year) 7 / 2025

Number of Plant Establishment Days

Estimated Project Schedule

PID Approval

PA/ED Approval

PS&E

RTL

Begin Construction

Reviewed by District O.E. or
Cost Estimate Certifier

xx/xx/xxxx

(xxx) xxx-xxxx

Office Engineer / Cost Estimate Certifier

Date

Phone

Approved by Project Manager

xx/xx/xxxx

(xxx) xxx-xxxx

Project Manager

Date

Phone

PROJECT COST ESTIMATE

EA: PID:

I. ROADWAY ITEMS SUMMARY

Section		Cost
1	Earthwork	\$ 11,500
2	Pavement Structural Section	\$ 363,700
3	Drainage	\$ 62,000
4	Specialty Items	\$ -
5	Environmental	\$ 118,500
6	Traffic Items	\$ 840,000
7	Detours	\$ -
8	Minor Items	\$ 139,600
9	Roadway Mobilization	\$ 153,600
10	Supplemental Work	\$ 61,500
11	City Furnished	\$ 30,800
12	Time-Related Overhead	\$ -
13	Roadway Contingency	\$ 534,400
TOTAL ROADWAY ITEMS		\$ 2,315,600

Estimate Prepared By :

Michael C Pitcock PE, Staff Engineer

Date

Phone

Estimate Reviewed By :

Name and Title

Date

Phone

By signing this estimate you are attesting that you have discussed your project with all functional units and have incorporated all their comments or have discussed with them why they will not be incorporated.

SECTION 1: EARTHWORK

Item code		Unit	Quantity		Unit Price (\$)		Cost
190101	Roadway Excavation	CY	230	x	50.00	= \$	11,500
152320	Lead Compliance Plan	LS		x		= \$	-
194001	Ditch Excavation	CY		x		= \$	-
19801X	Imported Borrow	CY/TON		x		= \$	-
192037	Structure Excavation (Retaining Wall)	CY		x		= \$	-
193013	Structure Backfill (Retaining Wall)	CY		x		= \$	-
193031	Pervious Backfill Material (Retaining Wall)	CY		x		= \$	-
16010X	Clearing & Grubbing	LS/ACRE		x		= \$	-
170101	Develop Water Supply	LS		x		= \$	-
19801X	Imported Borrow	CY/TON		x		= \$	-
210130	Duff	ACRE		x		= \$	-
XXXXXX	Some Item	Unit		x		= \$	-

TOTAL EARTHWORK SECTION ITEMS	\$ 11,500
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SECTION 2: PAVEMENT STRUCTURAL SECTION

Item code		Unit	Quantity		Unit Price (\$)		Cost
401050	Jointed Plain Concrete Pavement	CY		x		= \$	-
400050	Continuously Reinforced Concrete Pavement	CY		x		= \$	-
404092	Seal Pavement Joint	LF		x		= \$	-
404093	Seal Isolation Joint	LF		x		= \$	-
413117	Seal Concrete Pavement Joint (Silicone)	LF		x		= \$	-
413118	Seal Pavement Joint (Asphalt Rubber)	LF		x		= \$	-
280010	Rapid Strength Concrete Base	CY		x		= \$	-
410095	Dowel Bar (Drill and Bond)	EA		x		= \$	-
390132	Hot Mix Asphalt (Type A)	TON	710	x	135.00	= \$	95,850
390137	Rubberized Hot Mix Asphalt (Gap Graded)	TON		x		= \$	-
395041	RHMA-O (Open Graded Fiction Course)	TON		x		= \$	-
393006	Geosynthetic Pavement Interlayer (Paving Grid)	SQYD		x		= \$	-
260203	Class 2 Aggregate Base	CY	200	x	90.00	= \$	18,000
290201	Asphalt Treated Permeable Base	CY		x		= \$	-
250401	Class 4 Aggregate Subbase	CY		x		= \$	-
374002	Asphaltic Emulsion (Fog Seal Coat)	TON		x		= \$	-
397005	Tack Coat	TON	3	x	1,700.00	= \$	5,100
390100	Prime Coat	TON	1	x	1,500.00	= \$	1,500
377501	Slurry Seal	TON		x		= \$	-
3750XX	Screenings (Type XX)	TON		x		= \$	-
374492	Asphaltic Emulsion (Polymer Modified)	TON		x		= \$	-
370001	Sand Cover (Seal)	TON		x		= \$	-
731530A	Hot Mix Asphalt (Textured Paving)	TONS		x		= \$	-
730020	Minor Concrete (Curb)	CY	30	x	1,700.00	= \$	51,000
731504	Minor Concrete (Curb and Gutter)	CY	30	x	1,200.00	= \$	36,000
731516	Minor Concrete (Driveway)	CY		x		= \$	-
731521	Minor Concrete (Sidewalk)	CY	40	x	1,000.00	= \$	40,000
39407X	Place Hot Mix Asphalt Dike (Type E)	LF		x		= \$	-
150771	Remove Asphalt Concrete Dike	LF		x		= \$	-
420201	Grind Existing Concrete Pavement	SQYD		x		= \$	-
150860	Remove Base and Surfacing	CY		x		= \$	-
390095	Replace Asphalt Concrete Surfacing	CY		x		= \$	-
15312X	Remove Concrete	LF/CY/LS	1	x	75,000.00	= \$	75,000
394090	Place Hot Mix Asphalt (Miscellaneous Area)	SQYD		x		= \$	-
153103	Cold Plane Asphalt Concrete Pavement	SQYD	4,123	x	10.00	= \$	41,230
39405X	Shoulder Rumble Strip (HMA, X-In Indentations)	STA		x		= \$	-
413113	Repair Spalled Joints, Polyester Grout	SQYD		x		= \$	-
420102	Groove Existing Concrete Pavement	SQYD		x		= \$	-
390136	Minor Hot Mix Asphalt	TON		x		= \$	-
394095	Roadside Paving (Miscellaneous Areas)	SQYD		x		= \$	-
XXXXXX	Some Item	Unit		x		= \$	-

TOTAL PAVEMENT STRUCTURAL SECTION ITEMS	\$ 363,700
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SECTION 3: DRAINAGE

Item code		Unit	Quantity	Unit Price (\$)	Cost
15080X	Remove Culvert	EA/LF	x	= \$	-
150820	Modify Inlet	EA	x	= \$	-
155232	Sand Backfill	CY	x	= \$	-
15020X	Abandon Culvert	EA/LF	x	= \$	-
152430	Adjust Inlet	LF	x	= \$	-
155003	Cap Inlet	EA	x	= \$	-
510501	Minor Concrete	CY	x	= \$	-
510502	Minor Concrete (Minor Structure)	CY	x	= \$	-
5105XX	Minor Concrete (Type XX)	CY	x	= \$	-
620XXX	XX" Alternative Pipe Culvert (Type X)	LF	x	= \$	-
6411XX	XX" Plastic Pipe	LF	x	= \$	-
65XXXX	XX" Reinforced Concrete Pipe (Type X)	LF	x	= \$	-
6650XX	XX" Corrugated Steel Pipe (0.XXX" Thick)	LF	x	= \$	-
68XXXX	XX" Plastic Pipe (Edge Drain)	LF	x	= \$	-
69011X	XX" Corrugated Steel Pipe Downrain (0.XXX" Th	LF	x	= \$	-
70321X	XX" Corrugated Steel Pipe Inlet (0.XXX" Thick)	LF	x	= \$	-
70XXXX	XX" Corrugated Steel Pipe Riser (0.XXX" Thick)	LF	x	= \$	-
7050XX	XX" Steel Flared End Section	EA	x	= \$	-
703233	Grated Line Drain	LF	x	= \$	-
72XXXX	Rock Slope Protection (Type and Method)	CY/TON	x	= \$	-
72901X	Rock Slope Protection Fabric (Class X)	SQYD	x	= \$	-
721420	Concrete (Ditch Lining)	CY	x	= \$	-
721430	Concrete (Channel Lining)	CY	x	= \$	-
750001	Miscellaneous Iron and Steel	LB	x	= \$	-
XXXXXX	Additional Drainage	LS	1 x	62,000.00 = \$	62,000

TOTAL DRAINAGE ITEMS	\$ 62,000
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SECTION 4: SPECIALTY ITEMS

Item code		Unit	Quantity	Unit Price (\$)	Cost
080050	Progress Schedule (Critical Path Method)	LS	x	= \$	-
582001	Sound Wall (Masonry Block)	SQFT	x	= \$	-
510530	Minor Concrete (Wall)	CY	x	= \$	-
15325X	Remove Sound Wall	LF/LS	x	= \$	-
070030	Lead Compliance Plan	LS	x	= \$	-
141120	Treated Wood Waste	LB	x	= \$	-
153221	Remove Concrete Barrier	LF	x	= \$	-
150662	Remove Metal Beam Guard Railing	LF	x	= \$	-
150668	Remove Flared End Section	EA	x	= \$	-
8000XX	Chain Link Fence (Type XX)	LF	x	= \$	-
80XXXX	XX" Chain Link Gate (Type CL-6)	EA	x	= \$	-
832005	Midwest Guardrail System	LF	x	= \$	-
839301	Single Thrie Beam Barrier	LF	x	= \$	-
839310	Double Thrie Beam Barrier	LF	x	= \$	-
839521	Cable Railing	LF	x	= \$	-
8395XX	Terminal System (Type WB-31)	EA	x	= \$	-
839585	Alternative Flared Terminal System	EA	x	= \$	-
839584	Alternative In-line Terminal System	EA	x	= \$	-
498052	60" CIDH Concrete Pile (Sign Foundation)	LF	x	= \$	-
839XXX	Crash Cushion (Insert Type)	EA	x	= \$	-
520103	Bar Reinforced Steel (Retaining Wall)	LB	x	= \$	-
510060	Structural Concrete, Retaining Wall	CY	x	= \$	-
513553	Retaining Wall (Masonry Wall)	SQFT	x	= \$	-
511035	Architectural Treatment	SQFT	x	= \$	-
598001	Anti-Graffiti Coating	SQFT	x	= \$	-
203070	Rock Stain	SQFT	x	= \$	-
5136XX	Reinforced Concrete Crib Wall (Type X)	SQFT	x	= \$	-
839543	Transition Railing (Type WB-31)	EA	x	= \$	-
780440	Prepare and Stain Concrete	SQFT	x	= \$	-
839561	Rail Tensioning Assembly	EA	x	= \$	-
83958X	End Anchor Assembly (Type X)	EA	x	= \$	-
XXXXXX	Some Item	Unit	x	= \$	-

TOTAL SPECIALTY ITEMS	\$ -
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SECTION 5: ENVIRONMENTAL**5A - ENVIRONMENTAL MITIGATION**

Item code	Unit	Quantity	Unit Price (\$)	Cost
Biological Mitigation	LS	x	= \$	-
130670 Temporary Reinforced Silt Fence	LF	x	= \$	-
141000 Temporary Fence (Type ESA)	LF	x	= \$	-
<i>Subtotal Environmental Mitigation</i>				\$ -

5B - LANDSCAPE AND IRRIGATION

Item code	Unit	Quantity	Unit Price (\$)	Cost
20XXXX Highway Planting	LS	1 x	26,000.00 = \$	26,000
20XXXX Irrigation System	LS	1 x	52,000.00 = \$	52,000
204099 Plant Establishment Work	LS	x	= \$	-
204101 Extend Plant Establishment Work	LS	x	= \$	-
20XXXX Follow-up Landscape Project	LS	x	= \$	-
150685 Remove Irrigation Facility	LS	x	= \$	-
20XXXX Maintain Existing (Irrigation or Planted Areas)	LS	x	= \$	-
206400 Check and Test Existing Irrigation Facilities	LS	x	= \$	-
21011X Imported Topsoil (X)	CY/TON	x	= \$	-
20XXXX Rock Blanket, Rock Mulch, DG, Gravel Mulch	SQFT/SQYD	x	= \$	-
200122 Weed Germination	SQYD	x	= \$	-
208304 Water Meter	EA	x	= \$	-
2087XX XX" Conduit (Use for Irrigation x-overs)	LF	x	= \$	-
20890X Extend X" Conduit (Use for Extension of Irrigation x-overs)	LF	x	= \$	-
<i>Subtotal Landscape and Irrigation</i>				\$ 78,000

5C - EROSION CONTROL

Item code	Unit	Quantity	Unit Price (\$)	Cost
210010 Move In/Move Out (Erosion Control)	EA	x	= \$	-
210350 Fiber Rolls	LF	x	= \$	-
210360 Compost Sock	LF	x	= \$	-
2102XX Rolled Erosion Control Product (X)	SQFT	x	= \$	-
21025X Bonded Fiber Matrix	SQFT/ACRE	x	= \$	-
210300 Hydromulch	SQFT	x	= \$	-
210420 Straw	SQFT	x	= \$	-
210430 Hydroseed	SQFT	x	= \$	-
210600 Compost	CY	x	= \$	-
210630 Incorporate Materials	SQFT	x	= \$	-
<i>Subtotal Erosion Control</i>				\$ -

5D - NPDES

Item code	Unit	Quantity	Unit Price (\$)	Cost
130300 Prepare SWPPP	LS	1 x	10,000.00 = \$	10,000
130200 Prepare WPCP	LS	x	= \$	-
130100 Job Site Management	LS	x	= \$	-
130330 Storm Water Annual Report	EA	x	= \$	-
130310 Rain Event Action Plan (REAP)	EA	x	= \$	-
130320 Storm Water Sampling and Analysis Day	EA	x	= \$	-
130520 Temporary Hydraulic Mulch	SQYD	100 x	2.50 = \$	250
130550 Temporary Hydroseed	SQYD	100 x	1.70 = \$	170
130505 Move-In/Move-Out (Temporary Erosion Control)	EA	x	= \$	-
130640 Temporary Fiber Roll	LF	x	= \$	-
130900 Temporary Concrete Washout	LS	1 x	5,000.00 = \$	5,000
130710 Temporary Construction Entrance	EA	1 x	10,000.00 = \$	10,000
130610 Temporary Check Dam	LF	x	= \$	-
130620 Temporary Drainage Inlet Protection	EA	x	= \$	-
130730 Street Sweeping	LS	1 x	15,000.00 = \$	15,000
<i>Subtotal NPDES</i>				\$ 40,420

Supplemental Work for NPDES

066595 Water Pollution Control Maintenance Sharing*	LS	x	= \$	-
066596 Additional Water Pollution Control**	LS	x	= \$	-
066597 Storm Water Sampling and Analysis***	LS	x	= \$	-
XXXXXX Some Item	LS	x	= \$	-
<i>Subtotal Supplemental Work for NDPS</i>				\$ -

*Applies to all SWPPPs and those WPCPs with sediment control or soil stabilization BMPs.

**Applies to both SWPPPs and WPCP projects.

*** Applies only to project with SWPPPs.

TOTAL ENVIRONMENTAL	\$	118,500
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SECTION 6: TRAFFIC ITEMS**6A - Traffic Electrical**

Item code	Unit	Quantity	Unit Price (\$)	Cost
860460 Lighting and Sign Illumination	LS	x	= \$	-
860201 Signal and Lighting	LS	1 x	700,000.00 = \$	700,000
860990 Closed Circuit Television System	LS	x	= \$	-
86110X Ramp Metering System (Location X)	LS	x	= \$	-
86070X Interconnection Conduit and Cable	LF/LS	x	= \$	-
5602XX Furnish Sign Structure (Type X)	LB	x	= \$	-
5602XX Install Sign Structure (Type X)	LB	x	= \$	-
498040 XX" CIDHC Pile (Sign Foundation)	LF	x	= \$	-
86080X Inductive Loop Detectors	EA/LS	x	= \$	-
8609XX Traffic Monitoring Station (Type X)	LS	x	= \$	-
15075X Remove Sign Structure	EA/LS	x	= \$	-
151581 Reconstruct Sign Structure	EA	x	= \$	-
152641 Modify Sign Structure	EA	x	= \$	-
860090 Maintain Existing Traffic Management System Ele	LS	x	= \$	-
86XXXX Fiber Optic Conduit System	LS	x	= \$	-
XXXXX Some Item	Unit	x	= \$	-
Subtotal Traffic Electrical				\$ 700,000

6B - Traffic Signing and Striping

Item code	Unit	Quantity	Unit Price (\$)	Cost
566011 Roadside Sign - One Post	EA	x	= \$	-
566012 Roadside Sign - Two Post	EA	x	= \$	-
5602XX Furnish Sign	SQFT	x	= \$	-
568016 Install Sign Panel on Existing Frame	SQFT	x	= \$	-
150711 Remove Painted Traffic Stripe	LF	x	= \$	-
141101 Remove Yellow Painted Traffic Stripe (Hazardous Waste)	LF	x	= \$	-
150712 Remove Painted Pavement Marking	SQFT	x	= \$	-
150742 Remove Roadside Sign	EA	x	= \$	-
152320 Reset Roadside Sign	EA	x	= \$	-
152390 Relocate Roadside Sign	EA	x	= \$	-
82010X Delineator (Class X)	EA	x	= \$	-
840502 Thermoplastic Traffic Stripe (Enhanced Wet Night	LF	x	= \$	-
846012 Thermoplastic Crosswalk and Pavement Marking (	SQFT	x	= \$	-
120090 Construction Area Signs	LS	x	= \$	-
84XXXX Permanent Pavement Delineation	LS	1 x	15,000.00 = \$	15,000
Subtotal Traffic Signing and Striping				\$ 15,000

6C - Traffic Management Plan

Item code	Unit	Quantity	Unit Price (\$)	Cost
12865X Portable Changeable Message Signs	EA/LS	x	= \$	-
Subtotal Traffic Management Plan				\$ -

6C - Stage Construction and Traffic Handling

Item code	Unit	Quantity	Unit Price (\$)	Cost
120199 Traffic Plastic Drum	EA	x	= \$	-
12016X Channelizer (Type X)	EA	x	= \$	-
120120 Type III Barricade	EA	x	= \$	-
129100 Temporary Crash Cushion Module	EA	x	= \$	-
120100 Traffic Control System	LS	x	= \$	-
129110 Temporary Crash Cushion	EA	x	= \$	-
129000 Temporary Railing (Type K)	LF	x	= \$	-
120149 Temporary Pavement Marking (Paint)	SQFT	x	= \$	-
82010X Delineator (Class X)	EA	x	= \$	-
XXXXXX Stage Construction	LS	1 x	125,000.00 = \$	125,000
Subtotal Stage Construction and Traffic Handling				\$ 125,000

TOTAL TRAFFIC ITEMS	\$ 840,000
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SECTION 7: DETOURS

Includes constructing, maintaining, and removal

Item code	Unit	Quantity	Unit Price (\$)	Cost
190101 Roadway Excavation	CY	x	= \$	-
19801X Imported Borrow	CY/TON	x	= \$	-
390132 Hot Mix Asphalt (Type A)	TON	x	= \$	-
26020X Class 2 Aggregate Base	TON/CY	x	= \$	-
250401 Class 4 Aggregate Subbase	CY	x	= \$	-
130620 Temporary Drainage Inlet Protection	EA	x	= \$	-
129000 Temporary Railing (Type K)	LF	x	= \$	-
128601 Temporary Signal System	LS	x	= \$	-
120149 Temporary Pavement Marking (Paint)	SQFT	x	= \$	-
80010X Temporary Fence (Type X)	LF	x	= \$	-
XXXXXX Some Item	LS	x	= \$	-

* Includes constructing, maintaining, and removal

TOTAL DETOURS	\$	-
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SUBTOTAL SECTIONS 1 through 7	\$	1,395,700
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SECTION 8: MINOR ITEMS**8A - Americans with Disabilities Act Items**

ADA Items	1.0%	\$	13,957
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8B - Bike Path Items

Bike Path Items	1.0%	\$	13,957
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8C - Other Minor Items

Other Minor Items	8.0%	\$	111,656
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Total of Section 1-7	\$	1,395,700	x	10.0%	= \$	139,570
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TOTAL MINOR ITEMS	\$	139,600
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SECTIONS 9: ROADWAY MOBILIZATION

Item code						
999990	Total Section 1-8	\$	1,535,300	x	10%	= \$ 153,530

TOTAL ROADWAY MOBILIZATION	\$	153,600
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SECTION 10: SUPPLEMENTAL WORK

Item code	Unit	Quantity	Unit Price (\$)	Cost
066670 Payment Adjustments For Price Index Fluctuations	LS	x	= \$	-
066094 Value Analysis	LS	x	= \$	-
066070 Maintain Traffic	LS	x	= \$	-
066919 Dispute Resolution Board	LS	x	= \$	-
066921 Dispute Resolution Advisor	LS	x	= \$	-
066015 Federal Trainee Program	LS	x	= \$	-
066610 Partnering	LS	x	= \$	-
066204 Remove Rock and Debris	LS	x	= \$	-
066222 Locate Existing Crossover	LS	x	= \$	-
XXXXXX Some Item	Unit	x	= \$	-

Cost of NPDES Supplemental Work specified in Section 5D	= \$	-
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Total Section 1-8	\$	1,535,300	4%	= \$	61,412
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TOTAL SUPPLEMENTAL WORK	\$	61,500
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SECTION 11: CITY FURNISHED MATERIALS AND EXPENSES

Item code		Unit	Quantity	Unit Price (\$)		Cost
066105	Resident Engineers Office	LS	x	=		\$0
066063	Traffic Management Plan - Public Information	LS	x	=		\$0
066901	Water Expenses	LS	x	=		\$0
8609XX	Traffic Monitoring Station (X)	LS	x	=		\$0
066841	Traffic Controller Assembly	LS	x	=		\$0
066840	Traffic Signal Controller Assembly	LS	x	=		\$0
066062	COZEEP Contract	LS	x	=		\$0
066838	Reflective Numbers and Edge Sealer	LS	x	=		\$0
066065	Tow Truck Service Patrol	LS	x	=		\$0
066916	Annual Construction General Permit Fee	LS	x	=		\$0
XXXXXX	Some Item	Unit	x	=		\$0
Total Section 1-8		\$	1,535,300	2%	= \$	30,706

TOTAL CITY FURNISHED	\$30,800
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SECTION 12: TIME-RELATED OVERHEAD

Total of Roadway and Structures Contract Items excluding Mobilization	\$1,535,300 (used to calculate TRO)
Total Construction Cost (excluding TRO and Contingency)	\$1,781,200 (used to check if project is greater than \$5 million excluding contingency)

Estimated Time-Related Overhead (TRO) Percentage (0% to 10%) = 6%

Item code		Unit	Quantity	Unit Price (\$)		Cost
090100	Time-Related Overhead	WD	100	X	\$0 =	\$0

TOTAL TIME-RELATED OVERHEAD	\$0
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SECTION 13: ROADWAY CONTINGENCY

Total Section 1-12	\$	1,781,200	x	30%	=	\$534,360
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TOTAL CONTINGENCY	\$534,400
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II. STRUCTURE ITEMS

	<u>Bridge 1</u>		<u>Bridge 2</u>		
DATE OF ESTIMATE	00/00/00		00/00/00		00/00/00
Bridge Name	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Bridge Number	57-XXX		57-XXX		57-XXX
Structure Type	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Width (Feet) [out to out]	0 LF		0 LF		0 LF
Total Bridge Length (Feet)	0 LF		0 LF		0 LF
Total Area (Square Feet)	0 SQFT		0 SQFT		0 SQFT
Structure Depth (Feet)	0 LF		0 LF		0 LF
Footing Type (pile or spread)	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Cost Per Square Foot	\$0		\$0		\$0
COST OF EACH	\$0		\$0		\$0

	<u>Building 1</u>				
DATE OF ESTIMATE	00/00/00		00/00/00		00/00/00
Building Name	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Bridge Number	57-XXX		57-XXX		57-XXX
Structure Type	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Width (Feet) [out to out]	0 LF		0 LF		0 LF
Total Building Length (Feet)	0 LF		0 LF		0 LF
Total Area (Square Feet)	0 SQFT		0 SQFT		0 SQFT
Structure Depth (Feet)	0 LF		0 LF		0 LF
Footing Type (pile or spread)	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Cost Per Square Foot	\$0		\$0		\$0
COST OF EACH	\$0		\$0		\$0

TOTAL COST OF BRIDGES	\$0
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TOTAL COST OF BUILDINGS	\$0
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STRUCTURES MOBILIZATION	10%	\$0
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Recommended Contingency: (Pre-PSR 30%-50%, PSR 25%, Draft PR 20%, PR 15%, after PR approval 10%, Final PS&E 5%)

Total recommended percentages includes any quantified risk based contingency from the risk register.

STRUCTURES CONTINGENCY	10%	\$0
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TOTAL COST OF STRUCTURES	\$0
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Estimate Prepared By: _____

XXXXXXXXXXXXXXXXXXXX ----- Division of Structures

Date

III. RIGHT OF WAY

Fill in all of the available information from the Right of Way Data Sheet.

A)	A1)	Acquisition, including Excess Land Purchases, Damages & Goodwill, Fees	\$	0
	A2)	SB-1210	\$	0
B)		Acquisition of Offsite Mitigation	\$	0
C)	C1)	Utility Relocation (City Share)	\$	0
	C2)	Potholing (Design Phase)	\$	5,000
D)		Railroad Acquisition	\$	0
E)		Clearance / Demolition	\$	0
F)		Relocation Assistance (RAP and/or Last Resort Housing Costs)	\$	0
G)		Title and Escrow	\$	0
H)		Environmental Review	\$	0
I)		Condemnation Settlements	_____ 0%	\$ 0
J)		Design Appreciation Factor	_____ 0%	\$ 0
K)		Utility Relocation (Construction Cost)	\$	0

L)	TOTAL RIGHT OF WAY ESTIMATE	\$5,000
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M)	TOTAL R/W ESTIMATE: Escalated	\$6,000
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N)	RIGHT OF WAY SUPPORT	\$0
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Support Cost Estimate Prepared By	_____	_____
	Project Coordinator ¹	Phone

Utility Estimate Prepared By	_____	_____
	Utility Coordinator ²	Phone

R/W Acquisition Estimate Prepared By	_____	_____
	Right of Way Estimator ³	Phone

Note: Items G & H applied to items A + B

¹ When estimate has Support Costs only² When estimate has Utility Relocation³ When R/W Acquisition is required

PROJECT PLANNING COST ESTIMATE ©

EA:

EA: PID:

PID:

District-County-Route:

PM:

Type of Estimate : Traffic Study Estimate

Program Code : None

Project Limits : Intersection of E Park Avenue and Fair Street

Project Description: Construction of Traffic Signal

Scope : Intersection Construction

Alternative : Partial Right In Right Out

SUMMARY OF PROJECT COST ESTIMATE

	Current Year Cost	Escalated Cost
TOTAL ROADWAY COST	\$ 2,230,500	\$ 2,629,500
TOTAL STRUCTURES COST	\$ -	\$ -
SUBTOTAL CONSTRUCTION COST	\$ 2,230,500	\$ 2,629,500
TOTAL RIGHT OF WAY COST	\$ 5,000	\$ 6,000
TOTAL CAPITAL OUTLAY COSTS	\$ 2,236,000	\$ 2,636,000
PA/ED SUPPORT	\$ -	\$ -
PS&E SUPPORT	\$ -	\$ -
RIGHT OF WAY SUPPORT	\$ -	\$ -
CONSTRUCTION SUPPORT	\$ -	\$ -
TOTAL SUPPORT COST	\$ -	\$ -

TOTAL PROJECT COST	\$ 2,240,000	\$ 2,640,000
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Programmed Amount

Month / Year
Date of Estimate (Month/Year) 2 / 2022

Estimated Construction Start (Month/Year) 4 / 2025

Number of Working Days = 100

Estimated Mid-Point of Construction (Month/Year) 6 / 2025

Estimated Construction End (Month/Year) 7 / 2025

Number of Plant Establishment Days

Estimated Project Schedule

PID Approval

PA/ED Approval

PS&E

RTL

Begin Construction

Reviewed by District O.E. or
Cost Estimate Certifier

xx/xx/xxxx

(xxx) xxx-xxxx

Office Engineer / Cost Estimate Certifier

Date

Phone

Approved by Project Manager

xx/xx/xxxx

(xxx) xxx-xxxx

Project Manager

Date

Phone

PROJECT COST ESTIMATE

EA: PID:

I. ROADWAY ITEMS SUMMARY

Section		Cost
1	Earthwork	\$ 7,500
2	Pavement Structural Section	\$ 348,500
3	Drainage	\$ 62,000
4	Specialty Items	\$ -
5	Environmental	\$ 91,500
6	Traffic Items	\$ 835,000
7	Detours	\$ -
8	Minor Items	\$ 134,500
9	Roadway Mobilization	\$ 147,900
10	Supplemental Work	\$ 59,200
11	City Furnished	\$ 29,600
12	Time-Related Overhead	\$ -
13	Roadway Contingency	\$ 514,800
TOTAL ROADWAY ITEMS		\$ 2,230,500

Estimate Prepared By :

Michael C Pitcock PE, Staff Engineer

Date

Phone

Estimate Reviewed By :

Name and Title

Date

Phone

By signing this estimate you are attesting that you have discussed your project with all functional units and have incorporated all their comments or have discussed with them why they will not be incorporated.

SECTION 1: EARTHWORK

Item code		Unit	Quantity		Unit Price (\$)		Cost
190101	Roadway Excavation	CY	150	x	50.00	= \$	7,500
152320	Lead Compliance Plan	LS		x		= \$	-
194001	Ditch Excavation	CY		x		= \$	-
19801X	Imported Borrow	CY/TON		x		= \$	-
192037	Structure Excavation (Retaining Wall)	CY		x		= \$	-
193013	Structure Backfill (Retaining Wall)	CY		x		= \$	-
193031	Pervious Backfill Material (Retaining Wall)	CY		x		= \$	-
16010X	Clearing & Grubbing	LS/ACRE		x		= \$	-
170101	Develop Water Supply	LS		x		= \$	-
19801X	Imported Borrow	CY/TON		x		= \$	-
210130	Duff	ACRE		x		= \$	-
XXXXXX	Some Item	Unit		x		= \$	-

TOTAL EARTHWORK SECTION ITEMS	\$	7,500
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SECTION 2: PAVEMENT STRUCTURAL SECTION

Item code		Unit	Quantity		Unit Price (\$)		Cost
401050	Jointed Plain Concrete Pavement	CY		x		= \$	-
400050	Continuously Reinforced Concrete Pavement	CY		x		= \$	-
404092	Seal Pavement Joint	LF		x		= \$	-
404093	Seal Isolation Joint	LF		x		= \$	-
413117	Seal Concrete Pavement Joint (Silicone)	LF		x		= \$	-
413118	Seal Pavement Joint (Asphalt Rubber)	LF		x		= \$	-
280010	Rapid Strength Concrete Base	CY		x		= \$	-
410095	Dowel Bar (Drill and Bond)	EA		x		= \$	-
390132	Hot Mix Asphalt (Type A)	TON	680	x	135.00	= \$	91,800
390137	Rubberized Hot Mix Asphalt (Gap Graded)	TON		x		= \$	-
395041	RHMA-O (Open Graded Fiction Course)	TON		x		= \$	-
393006	Geosynthetic Pavement Interlayer (Paving Grid)	SQYD		x		= \$	-
260203	Class 2 Aggregate Base	CY	120	x	90.00	= \$	10,800
290201	Asphalt Treated Permeable Base	CY		x		= \$	-
250401	Class 4 Aggregate Subbase	CY		x		= \$	-
374002	Asphaltic Emulsion (Fog Seal Coat)	TON		x		= \$	-
397005	Tack Coat	TON	4	x	1,700.00	= \$	6,800
390100	Prime Coat	TON	1	x	1,500.00	= \$	1,500
377501	Slurry Seal	TON		x		= \$	-
3750XX	Screenings (Type XX)	TON		x		= \$	-
374492	Asphaltic Emulsion (Polymer Modified)	TON		x		= \$	-
370001	Sand Cover (Seal)	TON		x		= \$	-
731530A	Hot Mix Asphalt (Textured Paving)	TONS		x		= \$	-
730020	Minor Concrete (Curb)	CY	25	x	1,700.00	= \$	42,500
731504	Minor Concrete (Curb and Gutter)	CY	30	x	1,200.00	= \$	36,000
731516	Minor Concrete (Driveway)	CY		x		= \$	-
731521	Minor Concrete (Sidewalk)	CY	40	x	1,000.00	= \$	40,000
39407X	Place Hot Mix Asphalt Dike (Type E)	LF		x		= \$	-
150771	Remove Asphalt Concrete Dike	LF		x		= \$	-
420201	Grind Existing Concrete Pavement	SQYD		x		= \$	-
150860	Remove Base and Surfacing	CY		x		= \$	-
390095	Replace Asphalt Concrete Surfacing	CY		x		= \$	-
15312X	Remove Concrete	LS	1	x	75,000.00	= \$	75,000
394090	Place Hot Mix Asphalt (Miscellaneous Area)	SQYD		x		= \$	-
153103	Cold Plane Asphalt Concrete Pavement	SQYD	4,410	x	10.00	= \$	44,100
39405X	Shoulder Rumble Strip (HMA, X-In Indentations)	STA		x		= \$	-
413113	Repair Spalled Joints, Polyester Grout	SQYD		x		= \$	-
420102	Groove Existing Concrete Pavement	SQYD		x		= \$	-
390136	Minor Hot Mix Asphalt	TON		x		= \$	-
394095	Roadside Paving (Miscellaneous Areas)	SQYD		x		= \$	-
XXXXXX	Some Item	Unit		x		= \$	-

TOTAL PAVEMENT STRUCTURAL SECTION ITEMS	\$	348,500
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SECTION 3: DRAINAGE

Item code		Unit	Quantity	Unit Price (\$)	Cost
15080X	Remove Culvert	EA/LF	x	= \$	-
150820	Modify Inlet	EA	x	= \$	-
155232	Sand Backfill	CY	x	= \$	-
15020X	Abandon Culvert	EA/LF	x	= \$	-
152430	Adjust Inlet	LF	x	= \$	-
155003	Cap Inlet	EA	x	= \$	-
510501	Minor Concrete	CY	x	= \$	-
510502	Minor Concrete (Minor Structure)	CY	x	= \$	-
5105XX	Minor Concrete (Type XX)	CY	x	= \$	-
620XXX	XX" Alternative Pipe Culvert (Type X)	LF	x	= \$	-
6411XX	XX" Plastic Pipe	LF	x	= \$	-
65XXXX	XX" Reinforced Concrete Pipe (Type X)	LF	x	= \$	-
6650XX	XX" Corrugated Steel Pipe (0.XXX" Thick)	LF	x	= \$	-
68XXXX	XX" Plastic Pipe (Edge Drain)	LF	x	= \$	-
69011X	XX" Corrugated Steel Pipe Downrain (0.XXX" Th	LF	x	= \$	-
70321X	XX" Corrugated Steel Pipe Inlet (0.XXX" Thick)	LF	x	= \$	-
70XXXX	XX" Corrugated Steel Pipe Riser (0.XXX" Thick)	LF	x	= \$	-
7050XX	XX" Steel Flared End Section	EA	x	= \$	-
703233	Grated Line Drain	LF	x	= \$	-
72XXXX	Rock Slope Protection (Type and Method)	CY/TON	x	= \$	-
72901X	Rock Slope Protection Fabric (Class X)	SQYD	x	= \$	-
721420	Concrete (Ditch Lining)	CY	x	= \$	-
721430	Concrete (Channel Lining)	CY	x	= \$	-
750001	Miscellaneous Iron and Steel	LB	x	= \$	-
XXXXXX	Additional Drainage	LS	1 x	62,000.00 = \$	62,000

TOTAL DRAINAGE ITEMS	\$ 62,000
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SECTION 4: SPECIALTY ITEMS

Item code		Unit	Quantity	Unit Price (\$)	Cost
080050	Progress Schedule (Critical Path Method)	LS	x	= \$	-
582001	Sound Wall (Masonry Block)	SQFT	x	= \$	-
510530	Minor Concrete (Wall)	CY	x	= \$	-
15325X	Remove Sound Wall	LF/LS	x	= \$	-
070030	Lead Compliance Plan	LS	x	= \$	-
141120	Treated Wood Waste	LB	x	= \$	-
153221	Remove Concrete Barrier	LF	x	= \$	-
150662	Remove Metal Beam Guard Railing	LF	x	= \$	-
150668	Remove Flared End Section	EA	x	= \$	-
8000XX	Chain Link Fence (Type XX)	LF	x	= \$	-
80XXXX	XX" Chain Link Gate (Type CL-6)	EA	x	= \$	-
832005	Midwest Guardrail System	LF	x	= \$	-
839301	Single Thrie Beam Barrier	LF	x	= \$	-
839310	Double Thrie Beam Barrier	LF	x	= \$	-
839521	Cable Railing	LF	x	= \$	-
8395XX	Terminal System (Type WB-31)	EA	x	= \$	-
839585	Alternative Flared Terminal System	EA	x	= \$	-
839584	Alternative In-line Terminal System	EA	x	= \$	-
498052	60" CIDH Concrete Pile (Sign Foundation)	LF	x	= \$	-
839XXX	Crash Cushion (Insert Type)	EA	x	= \$	-
520103	Bar Reinforced Steel (Retaining Wall)	LB	x	= \$	-
510060	Structural Concrete, Retaining Wall	CY	x	= \$	-
513553	Retaining Wall (Masonry Wall)	SQFT	x	= \$	-
511035	Architectural Treatment	SQFT	x	= \$	-
598001	Anti-Graffiti Coating	SQFT	x	= \$	-
203070	Rock Stain	SQFT	x	= \$	-
5136XX	Reinforced Concrete Crib Wall (Type X)	SQFT	x	= \$	-
839543	Transition Railing (Type WB-31)	EA	x	= \$	-
780440	Prepare and Stain Concrete	SQFT	x	= \$	-
839561	Rail Tensioning Assembly	EA	x	= \$	-
83958X	End Anchor Assembly (Type X)	EA	x	= \$	-
XXXXXX	Some Item	Unit	x	= \$	-

TOTAL SPECIALTY ITEMS	\$ -
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SECTION 5: ENVIRONMENTAL**5A - ENVIRONMENTAL MITIGATION**

Item code	Unit	Quantity	Unit Price (\$)	Cost
Biological Mitigation	LS	x	= \$	-
130670 Temporary Reinforced Silt Fence	LF	x	= \$	-
141000 Temporary Fence (Type ESA)	LF	x	= \$	-
<i>Subtotal Environmental Mitigation</i>				\$ -

5B - LANDSCAPE AND IRRIGATION

Item code	Unit	Quantity	Unit Price (\$)	Cost
20XXXX Highway Planting	LS	1 x	17,000.00 = \$	17,000
20XXXX Irrigation System	LS	1 x	34,000.00 = \$	34,000
204099 Plant Establishment Work	LS	x	= \$	-
204101 Extend Plant Establishment Work	LS	x	= \$	-
20XXXX Follow-up Landscape Project	LS	x	= \$	-
150685 Remove Irrigation Facility	LS	x	= \$	-
20XXXX Maintain Existing (Irrigation or Planted Areas)	LS	x	= \$	-
206400 Check and Test Existing Irrigation Facilities	LS	x	= \$	-
21011X Imported Topsoil (X)	CY/TON	x	= \$	-
20XXXX Rock Blanket, Rock Mulch, DG, Gravel Mulch	SQFT/SQYD	x	= \$	-
200122 Weed Germination	SQYD	x	= \$	-
208304 Water Meter	EA	x	= \$	-
2087XX XX" Conduit (Use for Irrigation x-overs)	LF	x	= \$	-
20890X Extend X" Conduit (Use for Extension of Irrigation x-overs)	LF	x	= \$	-
<i>Subtotal Landscape and Irrigation</i>				\$ 51,000

5C - EROSION CONTROL

Item code	Unit	Quantity	Unit Price (\$)	Cost
210010 Move In/Move Out (Erosion Control)	EA	x	= \$	-
210350 Fiber Rolls	LF	x	= \$	-
210360 Compost Sock	LF	x	= \$	-
2102XX Rolled Erosion Control Product (X)	SQFT	x	= \$	-
21025X Bonded Fiber Matrix	SQFT/ACRE	x	= \$	-
210300 Hydromulch	SQFT	x	= \$	-
210420 Straw	SQFT	x	= \$	-
210430 Hydroseed	SQFT	x	= \$	-
210600 Compost	CY	x	= \$	-
210630 Incorporate Materials	SQFT	x	= \$	-
<i>Subtotal Erosion Control</i>				\$ -

5D - NPDES

Item code	Unit	Quantity	Unit Price (\$)	Cost
130300 Prepare SWPPP	LS	1 x	10,000.00 = \$	10,000
130200 Prepare WPCP	LS	x	= \$	-
130100 Job Site Management	LS	x	= \$	-
130330 Storm Water Annual Report	EA	x	= \$	-
130310 Rain Event Action Plan (REAP)	EA	x	= \$	-
130320 Storm Water Sampling and Analysis Day	EA	x	= \$	-
130520 Temporary Hydraulic Mulch	SQYD	100 x	2.50 = \$	250
130550 Temporary Hydroseed	SQYD	100 x	1.70 = \$	170
130505 Move-In/Move-Out (Temporary Erosion Control)	EA	x	= \$	-
130640 Temporary Fiber Roll	LF	x	= \$	-
130900 Temporary Concrete Washout	LS	1 x	5,000.00 = \$	5,000
130710 Temporary Construction Entrance	EA	1 x	10,000.00 = \$	10,000
130610 Temporary Check Dam	LF	x	= \$	-
130620 Temporary Drainage Inlet Protection	EA	x	= \$	-
130730 Street Sweeping	LS	1 x	15,000.00 = \$	15,000
<i>Subtotal NPDES</i>				\$ 40,420

Supplemental Work for NPDES

066595 Water Pollution Control Maintenance Sharing*	LS	x	= \$	-
066596 Additional Water Pollution Control**	LS	x	= \$	-
066597 Storm Water Sampling and Analysis***	LS	x	= \$	-
XXXXXX Some Item	LS	x	= \$	-
<i>Subtotal Supplemental Work for NDPS</i>				\$ -

*Applies to all SWPPPs and those WPCPs with sediment control or soil stabilization BMPs.

**Applies to both SWPPPs and WPCP projects.

*** Applies only to project with SWPPPs.

TOTAL ENVIRONMENTAL	\$	91,500
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SECTION 6: TRAFFIC ITEMS**6A - Traffic Electrical**

Item code	Unit	Quantity	Unit Price (\$)	Cost
860460 Lighting and Sign Illumination	LS	x	= \$	-
860201 Signal and Lighting	LS	1 x	700,000.00 = \$	700,000
860990 Closed Circuit Television System	LS	x	= \$	-
86110X Ramp Metering System (Location X)	LS	x	= \$	-
86070X Interconnection Conduit and Cable	LF/LS	x	= \$	-
5602XX Furnish Sign Structure (Type X)	LB	x	= \$	-
5602XX Install Sign Structure (Type X)	LB	x	= \$	-
498040 XX" CIDHC Pile (Sign Foundation)	LF	x	= \$	-
86080X Inductive Loop Detectors	EA/LS	x	= \$	-
8609XX Traffic Monitoring Station (Type X)	LS	x	= \$	-
15075X Remove Sign Structure	EA/LS	x	= \$	-
151581 Reconstruct Sign Structure	EA	x	= \$	-
152641 Modify Sign Structure	EA	x	= \$	-
860090 Maintain Existing Traffic Management System Ele	LS	x	= \$	-
86XXXX Fiber Optic Conduit System	LS	x	= \$	-
XXXXX Some Item	Unit	x	= \$	-
Subtotal Traffic Electrical				\$ 700,000

6B - Traffic Signing and Striping

Item code	Unit	Quantity	Unit Price (\$)	Cost
566011 Roadside Sign - One Post	EA	x	= \$	-
566012 Roadside Sign - Two Post	EA	x	= \$	-
5602XX Furnish Sign	SQFT	x	= \$	-
568016 Install Sign Panel on Existing Frame	SQFT	x	= \$	-
150711 Remove Painted Traffic Stripe	LF	x	= \$	-
141101 Remove Yellow Painted Traffic Stripe (Hazardous Waste)	LF	x	= \$	-
150712 Remove Painted Pavement Marking	SQFT	x	= \$	-
150742 Remove Roadside Sign	EA	x	= \$	-
152320 Reset Roadside Sign	EA	x	= \$	-
152390 Relocate Roadside Sign	EA	x	= \$	-
82010X Delineator (Class X)	EA	x	= \$	-
840502 Thermoplastic Traffic Stripe (Enhanced Wet Night	LF	x	= \$	-
846012 Thermoplastic Crosswalk and Pavement Marking (	SQFT	x	= \$	-
120090 Construction Area Signs	LS	x	= \$	-
84XXXX Permanent Pavement Delineation	LS	1 x	10,000.00 = \$	10,000
Subtotal Traffic Signing and Striping				\$ 10,000

6C - Traffic Management Plan

Item code	Unit	Quantity	Unit Price (\$)	Cost
12865X Portable Changeable Message Signs	EA/LS	x	= \$	-
Subtotal Traffic Management Plan				\$ -

6C - Stage Construction and Traffic Handling

Item code	Unit	Quantity	Unit Price (\$)	Cost
120199 Traffic Plastic Drum	EA	x	= \$	-
12016X Channelizer (Type X)	EA	x	= \$	-
120120 Type III Barricade	EA	x	= \$	-
129100 Temporary Crash Cushion Module	EA	x	= \$	-
120100 Traffic Control System	LS	x	= \$	-
129110 Temporary Crash Cushion	EA	x	= \$	-
129000 Temporary Railing (Type K)	LF	x	= \$	-
120149 Temporary Pavement Marking (Paint)	SQFT	x	= \$	-
82010X Delineator (Class X)	EA	x	= \$	-
XXXXXX Stage Construction	LS	1 x	125,000.00 = \$	125,000
Subtotal Stage Construction and Traffic Handling				\$ 125,000

TOTAL TRAFFIC ITEMS	\$ 835,000
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SECTION 7: DETOURS

Includes constructing, maintaining, and removal

Item code	Unit	Quantity	Unit Price (\$)	Cost
190101 Roadway Excavation	CY	x	= \$	-
19801X Imported Borrow	CY/TON	x	= \$	-
390132 Hot Mix Asphalt (Type A)	TON	x	= \$	-
26020X Class 2 Aggregate Base	TON/CY	x	= \$	-
250401 Class 4 Aggregate Subbase	CY	x	= \$	-
130620 Temporary Drainage Inlet Protection	EA	x	= \$	-
129000 Temporary Railing (Type K)	LF	x	= \$	-
128601 Temporary Signal System	LS	x	= \$	-
120149 Temporary Pavement Marking (Paint)	SQFT	x	= \$	-
80010X Temporary Fence (Type X)	LF	x	= \$	-
XXXXXX Some Item	LS	x	= \$	-

* Includes constructing, maintaining, and removal

TOTAL DETOURS	\$	-
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SUBTOTAL SECTIONS 1 through 7	\$	1,344,500
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SECTION 8: MINOR ITEMS**8A - Americans with Disabilities Act Items**

ADA Items	1.0%	\$	13,445
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8B - Bike Path Items

Bike Path Items	1.0%	\$	13,445
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8C - Other Minor Items

Other Minor Items	8.0%	\$	107,560
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Total of Section 1-7	\$	1,344,500	x	10.0%	= \$	134,450
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TOTAL MINOR ITEMS	\$	134,500
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SECTIONS 9: ROADWAY MOBILIZATION

Item code						
999990	Total Section 1-8	\$	1,479,000	x	10%	= \$ 147,900

TOTAL ROADWAY MOBILIZATION	\$	147,900
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SECTION 10: SUPPLEMENTAL WORK

Item code	Unit	Quantity	Unit Price (\$)	Cost
066670 Payment Adjustments For Price Index Fluctuations	LS	x	= \$	-
066094 Value Analysis	LS	x	= \$	-
066070 Maintain Traffic	LS	x	= \$	-
066919 Dispute Resolution Board	LS	x	= \$	-
066921 Dispute Resolution Advisor	LS	x	= \$	-
066015 Federal Trainee Program	LS	x	= \$	-
066610 Partnering	LS	x	= \$	-
066204 Remove Rock and Debris	LS	x	= \$	-
066222 Locate Existing Crossover	LS	x	= \$	-
XXXXXX Some Item	Unit	x	= \$	-

Cost of NPDES Supplemental Work specified in Section 5D	= \$	-
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Total Section 1-8	\$	1,479,000	4%	= \$	59,160
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TOTAL SUPPLEMENTAL WORK	\$	59,200
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SECTION 11: CITY FURNISHED MATERIALS AND EXPENSES

Item code		Unit	Quantity	Unit Price (\$)		Cost
066105	Resident Engineers Office	LS	x	=		\$0
066063	Traffic Management Plan - Public Information	LS	x	=		\$0
066901	Water Expenses	LS	x	=		\$0
8609XX	Traffic Monitoring Station (X)	LS	x	=		\$0
066841	Traffic Controller Assembly	LS	x	=		\$0
066840	Traffic Signal Controller Assembly	LS	x	=		\$0
066062	COZEEP Contract	LS	x	=		\$0
066838	Reflective Numbers and Edge Sealer	LS	x	=		\$0
066065	Tow Truck Service Patrol	LS	x	=		\$0
066916	Annual Construction General Permit Fee	LS	x	=		\$0
XXXXXX	Some Item	Unit	x	=		\$0
Total Section 1-8		\$	1,479,000	2%	= \$	29,580

TOTAL CITY FURNISHED	\$29,600
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SECTION 12: TIME-RELATED OVERHEAD

Total of Roadway and Structures Contract Items excluding Mobilization \$1,479,000 (used to calculate TRO)
Total Construction Cost (excluding TRO and Contingency) \$1,715,700 (used to check if project is greater than \$5 million excluding contingency)

Estimated Time-Related Overhead (TRO) Percentage (0% to 10%) = **6%**

Item code		Unit	Quantity	Unit Price (\$)		Cost
090100	Time-Related Overhead	WD	100	X	\$0 =	\$0

TOTAL TIME-RELATED OVERHEAD	\$0
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SECTION 13: ROADWAY CONTINGENCY

Total Section 1-12 \$ 1,715,700 x 30% = \$514,710

TOTAL CONTINGENCY	\$514,800
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II. STRUCTURE ITEMS

	<u>Bridge 1</u>		<u>Bridge 2</u>		
DATE OF ESTIMATE	00/00/00		00/00/00		00/00/00
Bridge Name	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Bridge Number	57-XXX		57-XXX		57-XXX
Structure Type	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Width (Feet) [out to out]	0 LF		0 LF		0 LF
Total Bridge Length (Feet)	0 LF		0 LF		0 LF
Total Area (Square Feet)	0 SQFT		0 SQFT		0 SQFT
Structure Depth (Feet)	0 LF		0 LF		0 LF
Footing Type (pile or spread)	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Cost Per Square Foot	\$0		\$0		\$0
COST OF EACH	\$0		\$0		\$0

	<u>Building 1</u>				
DATE OF ESTIMATE	00/00/00		00/00/00		00/00/00
Building Name	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Bridge Number	57-XXX		57-XXX		57-XXX
Structure Type	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Width (Feet) [out to out]	0 LF		0 LF		0 LF
Total Building Length (Feet)	0 LF		0 LF		0 LF
Total Area (Square Feet)	0 SQFT		0 SQFT		0 SQFT
Structure Depth (Feet)	0 LF		0 LF		0 LF
Footing Type (pile or spread)	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Cost Per Square Foot	\$0		\$0		\$0
COST OF EACH	\$0		\$0		\$0

TOTAL COST OF BRIDGES	\$0
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TOTAL COST OF BUILDINGS	\$0
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STRUCTURES MOBILIZATION	10%	\$0
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Recommended Contingency: (Pre-PSR 30%-50%, PSR 25%, Draft PR 20%, PR 15%, after PR approval 10%, Final PS&E 5%)

Total recommended percentages includes any quantified risk based contingency from the risk register.

STRUCTURES CONTINGENCY	10%	\$0
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TOTAL COST OF STRUCTURES	\$0
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Estimate Prepared By: _____
 XXXXXXXXXXXXXXXXXXXX ----- Division of Structures

 Date

III. RIGHT OF WAY

Fill in all of the available information from the Right of Way Data Sheet.

A)	A1)	Acquisition, including Excess Land Purchases, Damages & Goodwill, Fees	\$	0
	A2)	SB-1210	\$	0
B)		Acquisition of Offsite Mitigation	\$	0
C)	C1)	Utility Relocation (City Share)	\$	0
	C2)	Potholing (Design Phase)	\$	5,000
D)		Railroad Acquisition	\$	0
E)		Clearance / Demolition	\$	0
F)		Relocation Assistance (RAP and/or Last Resort Housing Costs)	\$	0
G)		Title and Escrow	\$	0
H)		Environmental Review	\$	0
I)		Condemnation Settlements <u>0%</u>	\$	0
J)		Design Appreciation Factor <u>0%</u>	\$	0
K)		Utility Relocation (Construction Cost)	\$	0

L)	TOTAL RIGHT OF WAY ESTIMATE	\$5,000
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M)	TOTAL R/W ESTIMATE: Escalated	\$6,000
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N)	RIGHT OF WAY SUPPORT	\$0
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Support Cost Estimate Prepared By	Project Coordinator ¹	Phone
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Utility Estimate Prepared By	Utility Coordinator ²	Phone
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R/W Acquisition Estimate Prepared By	Right of Way Estimator ³	Phone
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Note: Items G & H applied to items A + B

¹ When estimate has Support Costs only² When estimate has Utility Relocation³ When R/W Acquisition is required

PROJECT PLANNING COST ESTIMATE ©

EA:

EA: PID:

PID:

District-County-Route:

PM:

Type of Estimate : Traffic Study Estimate

Program Code : None

Project Limits : Intersection of E Park Avenue and Midway

Project Description: Construction of Modern Roundabout

Scope : Intersection Construction

Alternative : 3 Leg Roundabout w/ 4th Leg Driveway

SUMMARY OF PROJECT COST ESTIMATE

	Current Year Cost	Escalated Cost
TOTAL ROADWAY COST	\$ 3,584,100	\$ 4,225,236
TOTAL STRUCTURES COST	\$ -	\$ -
SUBTOTAL CONSTRUCTION COST	\$ 3,584,100	\$ 4,225,236
TOTAL RIGHT OF WAY COST	\$ 31,000	\$ 35,000
TOTAL CAPITAL OUTLAY COSTS	\$ 3,616,000	\$ 4,261,000
PA/ED SUPPORT	\$ -	\$ -
PS&E SUPPORT	\$ -	\$ -
RIGHT OF WAY SUPPORT	\$ -	\$ -
CONSTRUCTION SUPPORT	\$ -	\$ -
TOTAL SUPPORT COST	\$ -	\$ -

TOTAL PROJECT COST	\$ 3,620,000	\$ 4,270,000
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Programmed Amount

Month / Year

Date of Estimate (Month/Year) 2 / 2022

Estimated Construction Start (Month/Year) 3 / 2025

Number of Working Days = 180

Estimated Mid-Point of Construction (Month/Year) 7 / 2025

Estimated Construction End (Month/Year) 12 / 2025

Number of Plant Establishment Days

Estimated Project Schedule

PID Approval

PA/ED Approval

PS&E

RTL

Begin Construction

Reviewed by District O.E. or
Cost Estimate Certifier

xx/xx/xxxx

(xxx) xxx-xxxx

Office Engineer / Cost Estimate Certifier

Date

Phone

Approved by Project Manager

xx/xx/xxxx

(xxx) xxx-xxxx

Project Manager

Date

Phone

PROJECT COST ESTIMATE

EA: PID:

I. ROADWAY ITEMS SUMMARY

	Section	Cost
1	Earthwork	\$ 75,000
2	Pavement Structural Section	\$ 943,600
3	Drainage	\$ 100,000
4	Specialty Items	\$ 14,400
5	Environmental	\$ 612,500
6	Traffic Items	\$ 415,000
7	Detours	\$ -
8	Minor Items	\$ 216,100
9	Roadway Mobilization	\$ 237,700
10	Supplemental Work	\$ 95,100
11	City Furnished	\$ 47,600
12	Time-Related Overhead	\$ -
13	Roadway Contingency	\$ 827,100
TOTAL ROADWAY ITEMS		\$ 3,584,100

Estimate Prepared By :

Michael C Pitcock PE, Staff Engineer

Date

Phone

Estimate Reviewed By :

Name and Title

Date

Phone

By signing this estimate you are attesting that you have discussed your project with all functional units and have incorporated all their comments or have discussed with them why they will not be incorporated.

SECTION 1: EARTHWORK

Item code		Unit	Quantity		Unit Price (\$)		Cost
190101	Roadway Excavation	CY	2,500	x	30.00	= \$	75,000
152320	Lead Compliance Plan	LS		x		= \$	-
194001	Ditch Excavation	CY		x		= \$	-
19801X	Imported Borrow	CY/TON		x		= \$	-
192037	Structure Excavation (Retaining Wall)	CY		x		= \$	-
193013	Structure Backfill (Retaining Wall)	CY		x		= \$	-
193031	Pervious Backfill Material (Retaining Wall)	CY		x		= \$	-
16010X	Clearing & Grubbing	LS/ACRE		x		= \$	-
170101	Develop Water Supply	LS		x		= \$	-
19801X	Imported Borrow	CY/TON		x		= \$	-
210130	Duff	ACRE		x		= \$	-
XXXXXX	Some Item	Unit		x		= \$	-

TOTAL EARTHWORK SECTION ITEMS	\$	75,000
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SECTION 2: PAVEMENT STRUCTURAL SECTION

Item code		Unit	Quantity		Unit Price (\$)		Cost
401050	Jointed Plain Concrete Pavement	CY		x		= \$	-
400050	Continuously Reinforced Concrete Pavement	CY	80	x	900.00	= \$	72,000
404092	Seal Pavement Joint	LF		x		= \$	-
404093	Seal Isolation Joint	LF		x		= \$	-
413117	Seal Concrete Pavement Joint (Silicone)	LF		x		= \$	-
413118	Seal Pavement Joint (Asphalt Rubber)	LF		x		= \$	-
280010	Rapid Strength Concrete Base	CY		x		= \$	-
410095	Dowel Bar (Drill and Bond)	EA		x		= \$	-
390132	Hot Mix Asphalt (Type A)	TON	2,050	x	135.00	= \$	276,750
390137	Rubberized Hot Mix Asphalt (Gap Graded)	TON		x		= \$	-
395041	RHMA-O (Open Graded Fiction Course)	TON		x		= \$	-
393006	Geosynthetic Pavement Interlayer (Paving Grid)	SQYD		x		= \$	-
260203	Class 2 Aggregate Base	CY	1,950	x	90.00	= \$	175,500
290201	Asphalt Treated Permeable Base	CY		x		= \$	-
250401	Class 4 Aggregate Subbase	CY		x		= \$	-
374002	Asphaltic Emulsion (Fog Seal Coat)	TON		x		= \$	-
397005	Tack Coat	TON	4	x	1,700.00	= \$	6,800
390100	Prime Coat	TON	4	x	1,500.00	= \$	6,000
377501	Slurry Seal	TON		x		= \$	-
3750XX	Screenings (Type XX)	TON		x		= \$	-
374492	Asphaltic Emulsion (Polymer Modified)	TON		x		= \$	-
370001	Sand Cover (Seal)	TON		x		= \$	-
731530A	Hot Mix Asphalt (Textured Paving)	TONS		x		= \$	-
730020	Minor Concrete (Curb)	CY	60	x	1,700.00	= \$	102,000
731504	Minor Concrete (Curb and Gutter)	CY	80	x	1,200.00	= \$	96,000
731516	Minor Concrete (Driveway)	CY		x		= \$	-
731521	Minor Concrete (Sidewalk)	CY	120	x	1,000.00	= \$	120,000
39407X	Place Hot Mix Asphalt Dike (Type E)	LF		x		= \$	-
150771	Remove Asphalt Concrete Dike	LF		x		= \$	-
420201	Grind Existing Concrete Pavement	SQYD		x		= \$	-
150860	Remove Base and Surfacing	CY		x		= \$	-
390095	Replace Asphalt Concrete Surfacing	CY		x		= \$	-
15312X	Remove Concrete	LS	1	x	75,000.00	= \$	75,000
394090	Place Hot Mix Asphalt (Miscellaneous Area)	SQYD		x		= \$	-
153103	Cold Plane Asphalt Concrete Pavement	SQYD	1,350	x	10.00	= \$	13,500
39405X	Shoulder Rumble Strip (HMA, X-In Indentations)	STA		x		= \$	-
413113	Repair Spalled Joints, Polyester Grout	SQYD		x		= \$	-
420102	Groove Existing Concrete Pavement	SQYD		x		= \$	-
390136	Minor Hot Mix Asphalt	TON		x		= \$	-
394095	Roadside Paving (Miscellaneous Areas)	SQYD		x		= \$	-
XXXXXX	Some Item	Unit		x		= \$	-

TOTAL PAVEMENT STRUCTURAL SECTION ITEMS	\$	943,600
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SECTION 3: DRAINAGE

Item code		Unit	Quantity	Unit Price (\$)	Cost
15080X	Remove Culvert	EA/LF	x	= \$	-
150820	Modify Inlet	EA	x	= \$	-
155232	Sand Backfill	CY	x	= \$	-
15020X	Abandon Culvert	EA/LF	x	= \$	-
152430	Adjust Inlet	LF	x	= \$	-
155003	Cap Inlet	EA	x	= \$	-
510501	Minor Concrete	CY	x	= \$	-
510502	Minor Concrete (Minor Structure)	CY	x	= \$	-
5105XX	Minor Concrete (Type XX)	CY	x	= \$	-
620XXX	XX" Alternative Pipe Culvert (Type X)	LF	x	= \$	-
6411XX	XX" Plastic Pipe	LF	x	= \$	-
65XXXX	XX" Reinforced Concrete Pipe (Type X)	LF	x	= \$	-
6650XX	XX" Corrugated Steel Pipe (0.XXX" Thick)	LF	x	= \$	-
68XXXX	XX" Plastic Pipe (Edge Drain)	LF	x	= \$	-
69011X	XX" Corrugated Steel Pipe Downrain (0.XXX" Th	LF	x	= \$	-
70321X	XX" Corrugated Steel Pipe Inlet (0.XXX" Thick)	LF	x	= \$	-
70XXXX	XX" Corrugated Steel Pipe Riser (0.XXX" Thick)	LF	x	= \$	-
7050XX	XX" Steel Flared End Section	EA	x	= \$	-
703233	Grated Line Drain	LF	x	= \$	-
72XXXX	Rock Slope Protection (Type and Method)	CY/TON	x	= \$	-
72901X	Rock Slope Protection Fabric (Class X)	SQYD	x	= \$	-
721420	Concrete (Ditch Lining)	CY	x	= \$	-
721430	Concrete (Channel Lining)	CY	x	= \$	-
750001	Miscellaneous Iron and Steel	LB	x	= \$	-
XXXXXX	Additional Drainage	LS	1 x	100,000.00 = \$	100,000

TOTAL DRAINAGE ITEMS	\$ 100,000
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SECTION 4: SPECIALTY ITEMS

Item code		Unit	Quantity	Unit Price (\$)	Cost
080050	Progress Schedule (Critical Path Method)	LS	x	= \$	-
582001	Sound Wall (Masonry Block)	SQFT	x	= \$	-
510530	Minor Concrete (Wall)	CY	x	= \$	-
15325X	Remove Sound Wall	LF/LS	x	= \$	-
070030	Lead Compliance Plan	LS	x	= \$	-
141120	Treated Wood Waste	LB	x	= \$	-
153221	Remove Concrete Barrier	LF	x	= \$	-
150662	Remove Metal Beam Guard Railing	LF	x	= \$	-
150668	Remove Flared End Section	EA	x	= \$	-
8000XX	Chain Link Fence (Type XX)	LF	x	= \$	-
80XXXX	XX" Chain Link Gate (Type CL-6)	EA	x	= \$	-
832005	Midwest Guardrail System	LF	x	= \$	-
839301	Single Thrie Beam Barrier	LF	x	= \$	-
839310	Double Thrie Beam Barrier	LF	x	= \$	-
839521	Cable Railing	LF	x	= \$	-
8395XX	Terminal System (Type WB-31)	EA	x	= \$	-
839585	Alternative Flared Terminal System	EA	x	= \$	-
839584	Alternative In-line Terminal System	EA	x	= \$	-
498052	60" CIDH Concrete Pile (Sign Foundation)	LF	x	= \$	-
839XXX	Crash Cushion (Insert Type)	EA	x	= \$	-
520103	Bar Reinforced Steel (Retaining Wall)	LB	x	= \$	-
510060	Structural Concrete, Retaining Wall	CY	x	= \$	-
513553	Retaining Wall (Masonry Wall)	SQFT	x	= \$	-
511035	Architectural Treatment	SQFT	x	= \$	-
598001	Anti-Graffiti Coating	SQFT	x	= \$	-
203070	Rock Stain	SQFT	x	= \$	-
5136XX	Reinforced Concrete Crib Wall (Type X)	SQFT	x	= \$	-
839543	Transition Railing (Type WB-31)	EA	x	= \$	-
597601	Prepare and Stain Concrete	SQFT	2,400 x	6.00 = \$	14,400
839561	Rail Tensioning Assembly	EA	x	= \$	-
83958X	End Anchor Assembly (Type X)	EA	x	= \$	-
XXXXXX	Some Item	Unit	x	= \$	-

TOTAL SPECIALTY ITEMS	\$ 14,400
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SECTION 5: ENVIRONMENTAL**5A - ENVIRONMENTAL MITIGATION**

Item code	Unit	Quantity	Unit Price (\$)	Cost
Biological Mitigation	LS	1	x 50,000.00 = \$	50,000
130670 Temporary Reinforced Silt Fence	LF	x	= \$	-
141000 Temporary Fence (Type ESA)	LF	x	= \$	-
<i>Subtotal Environmental Mitigation</i>				<i>\$ 50,000</i>

5B - LANDSCAPE AND IRRIGATION

Item code	Unit	Quantity	Unit Price (\$)	Cost
20XXXX Highway Planting	LS	1	x 87,000.00 = \$	87,000
20XXXX Irrigation System	LS	1	x 174,000.00 = \$	174,000
204099 Plant Establishment Work	LS	x	= \$	-
204101 Extend Plant Establishment Work	LS	x	= \$	-
20XXXX Follow-up Landscape Project	LS	x	= \$	-
150685 Remove Irrigation Facility	LS	x	= \$	-
20XXXX Maintain Existing (Irrigation or Planted Areas)	LS	x	= \$	-
206400 Check and Test Existing Irrigation Facilities	LS	x	= \$	-
21011X Imported Topsoil (X)	CY/TON	x	= \$	-
20XXXX Rock Blanket, Rock Mulch, DG, Gravel Mulch	SQFT/SQYD	x	= \$	-
200122 Weed Germination	SQYD	x	= \$	-
208304 Water Meter	EA	x	= \$	-
2087XX XX" Conduit (Use for Irrigation x-overs)	LF	x	= \$	-
20890X Extend X" Conduit (Use for Extension of Irrigation x-overs)	LF	x	= \$	-
<i>Subtotal Landscape and Irrigation</i>				<i>\$ 261,000</i>

5C - EROSION CONTROL

Item code	Unit	Quantity	Unit Price (\$)	Cost
210010 Move In/Move Out (Erosion Control)	EA	1	x 5,000.00 = \$	5,000
210350 Fiber Rolls	LF	3,000	x 5.00 = \$	15,000
210360 Compost Sock	LF	x	= \$	-
2102XX Rolled Erosion Control Product (X)	SQFT	x	= \$	-
21025X Bonded Fiber Matrix	SQFT/ACRE	x	= \$	-
210300 Hydromulch	SQFT	15,000	x 0.25 = \$	3,750
210420 Straw	SQFT	x	= \$	-
210430 Hydroseed	SQFT	15,000	x 0.20 = \$	3,000
210600 Compost	CY	47	x 150.00 = \$	7,050
210630 Incorporate Materials	SQFT	15,000	x 0.50 = \$	7,500
<i>Subtotal Erosion Control</i>				<i>\$ 41,300</i>

5D - NPDES

Item code	Unit	Quantity	Unit Price (\$)	Cost
130300 Prepare SWPPP	LS	1	x 10,000.00 = \$	10,000
130200 Prepare WPCP	LS	x	= \$	-
130100 Job Site Management	LS	x	= \$	-
130330 Storm Water Annual Report	EA	x	= \$	-
130310 Rain Event Action Plan (REAP)	EA	x	= \$	-
130320 Storm Water Sampling and Analysis Day	EA	x	= \$	-
130520 Temporary Hydraulic Mulch	SQYD	16,700	x 2.50 = \$	41,750
130550 Temporary Hydroseed	SQYD	16,700	x 1.70 = \$	28,390
130505 Move-In/Move-Out (Temporary Erosion Control)	EA	x	= \$	-
130640 Temporary Fiber Roll	LF	30,000	x 5.00 = \$	150,000
130900 Temporary Concrete Washout	LS	1	x 5,000.00 = \$	5,000
130710 Temporary Construction Entrance	EA	1	x 10,000.00 = \$	10,000
130610 Temporary Check Dam	LF	x	= \$	-
130620 Temporary Drainage Inlet Protection	EA	x	= \$	-
130730 Street Sweeping	LS	1	x 15,000.00 = \$	15,000
<i>Subtotal NPDES</i>				<i>\$ 260,140</i>

Supplemental Work for NPDES

066595 Water Pollution Control Maintenance Sharing*	LS	x	= \$	-
066596 Additional Water Pollution Control**	LS	x	= \$	-
066597 Storm Water Sampling and Analysis***	LS	x	= \$	-
XXXXXX Some Item	LS	x	= \$	-
<i>Subtotal Supplemental Work for NDPS</i>				<i>\$ -</i>

*Applies to all SWPPPs and those WPCPs with sediment control or soil stabilization BMPs.

**Applies to both SWPPPs and WPCP projects.

*** Applies only to project with SWPPPs.

TOTAL ENVIRONMENTAL	\$ 612,500
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SECTION 6: TRAFFIC ITEMS**6A - Traffic Electrical**

Item code	Unit	Quantity	Unit Price (\$)	Cost
860460 Lighting and Sign Illumination	LS	1 x	150,000.00 = \$	150,000
860201 Signal and Lighting	LS	x	= \$	-
860990 Closed Circuit Television System	LS	x	= \$	-
86110X Ramp Metering System (Location X)	LS	x	= \$	-
86070X Interconnection Conduit and Cable	LF/LS	x	= \$	-
5602XX Furnish Sign Structure (Type X)	LB	x	= \$	-
5602XX Install Sign Structure (Type X)	LB	x	= \$	-
498040 XX" CIDHC Pile (Sign Foundation)	LF	x	= \$	-
86080X Inductive Loop Detectors	EA/LS	x	= \$	-
8609XX Traffic Monitoring Station (Type X)	LS	x	= \$	-
15075X Remove Sign Structure	EA/LS	x	= \$	-
151581 Reconstruct Sign Structure	EA	x	= \$	-
152641 Modify Sign Structure	EA	x	= \$	-
860090 Maintain Existing Traffic Management System Ele	LS	x	= \$	-
86XXXX Fiber Optic Conduit System	LS	x	= \$	-
XXXXX Some Item	Unit	x	= \$	-
Subtotal Traffic Electrical				\$ 150,000

6B - Traffic Signing and Striping

Item code	Unit	Quantity	Unit Price (\$)	Cost
566011 Roadside Sign - One Post	EA	x	= \$	-
566012 Roadside Sign - Two Post	EA	x	= \$	-
5602XX Furnish Sign	SQFT	x	= \$	-
568016 Install Sign Panel on Existing Frame	SQFT	x	= \$	-
150711 Remove Painted Traffic Stripe	LF	x	= \$	-
141101 Remove Yellow Painted Traffic Stripe (Hazardous Waste)	LF	x	= \$	-
150712 Remove Painted Pavement Marking	SQFT	x	= \$	-
150742 Remove Roadside Sign	EA	x	= \$	-
152320 Reset Roadside Sign	EA	x	= \$	-
152390 Relocate Roadside Sign	EA	x	= \$	-
82010X Delineator (Class X)	EA	x	= \$	-
840502 Thermoplastic Traffic Stripe (Enhanced Wet Night	LF	x	= \$	-
846012 Thermoplastic Crosswalk and Pavement Marking (	SQFT	x	= \$	-
120090 Construction Area Signs	LS	x	= \$	-
84XXXX Permanent Pavement Delineation	LS	1 x	15,000.00 = \$	15,000
Subtotal Traffic Signing and Striping				\$ 15,000

6C - Traffic Management Plan

Item code	Unit	Quantity	Unit Price (\$)	Cost
12865X Portable Changeable Message Signs	EA/LS	x	= \$	-
Subtotal Traffic Management Plan				\$ -

6C - Stage Construction and Traffic Handling

Item code	Unit	Quantity	Unit Price (\$)	Cost
120199 Traffic Plastic Drum	EA	x	= \$	-
12016X Channelizer (Type X)	EA	x	= \$	-
120120 Type III Barricade	EA	x	= \$	-
129100 Temporary Crash Cushion Module	EA	x	= \$	-
120100 Traffic Control System	LS	x	= \$	-
129110 Temporary Crash Cushion	EA	x	= \$	-
129000 Temporary Railing (Type K)	LF	x	= \$	-
120149 Temporary Pavement Marking (Paint)	SQFT	x	= \$	-
82010X Delineator (Class X)	EA	x	= \$	-
XXXXXX Stage Construction	LS	1 x	250,000.00 = \$	250,000
Subtotal Stage Construction and Traffic Handling				\$ 250,000

TOTAL TRAFFIC ITEMS	\$ 415,000
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SECTION 7: DETOURS

Includes constructing, maintaining, and removal

Item code	Unit	Quantity	Unit Price (\$)	Cost
190101 Roadway Excavation	CY	x	= \$	-
19801X Imported Borrow	CY/TON	x	= \$	-
390132 Hot Mix Asphalt (Type A)	TON	x	= \$	-
26020X Class 2 Aggregate Base	TON/CY	x	= \$	-
250401 Class 4 Aggregate Subbase	CY	x	= \$	-
130620 Temporary Drainage Inlet Protection	EA	x	= \$	-
129000 Temporary Railing (Type K)	LF	x	= \$	-
128601 Temporary Signal System	LS	x	= \$	-
120149 Temporary Pavement Marking (Paint)	SQFT	x	= \$	-
80010X Temporary Fence (Type X)	LF	x	= \$	-
XXXXXX Some Item	LS	x	= \$	-

* Includes constructing, maintaining, and removal

TOTAL DETOURS	\$	-
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SUBTOTAL SECTIONS 1 through 7	\$	2,160,500
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SECTION 8: MINOR ITEMS**8A - Americans with Disabilities Act Items**

ADA Items	1.0%	\$	21,605
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8B - Bike Path Items

Bike Path Items	1.0%	\$	21,605
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8C - Other Minor Items

Other Minor Items	8.0%	\$	172,840
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Total of Section 1-7	\$	2,160,500	x	10.0%	= \$	216,050
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TOTAL MINOR ITEMS	\$	216,100
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SECTIONS 9: ROADWAY MOBILIZATION

Item code						
999990	Total Section 1-8	\$	2,376,600	x	10%	= \$ 237,660

TOTAL ROADWAY MOBILIZATION	\$	237,700
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SECTION 10: SUPPLEMENTAL WORK

Item code	Unit	Quantity	Unit Price (\$)	Cost
066670 Payment Adjustments For Price Index Fluctuations	LS	x	= \$	-
066094 Value Analysis	LS	x	= \$	-
066070 Maintain Traffic	LS	x	= \$	-
066919 Dispute Resolution Board	LS	x	= \$	-
066921 Dispute Resolution Advisor	LS	x	= \$	-
066015 Federal Trainee Program	LS	x	= \$	-
066610 Partnering	LS	x	= \$	-
066204 Remove Rock and Debris	LS	x	= \$	-
066222 Locate Existing Crossover	LS	x	= \$	-
XXXXXX Some Item	Unit	x	= \$	-

Cost of NPDES Supplemental Work specified in Section 5D	= \$	-
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Total Section 1-8	\$	2,376,600	4%	= \$	95,064
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TOTAL SUPPLEMENTAL WORK	\$	95,100
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SECTION 11: CITY FURNISHED MATERIALS AND EXPENSES

Item code		Unit	Quantity	Unit Price (\$)		Cost
066105	Resident Engineers Office	LS		x	=	\$0
066063	Traffic Management Plan - Public Information	LS		x	=	\$0
066901	Water Expenses	LS		x	=	\$0
8609XX	Traffic Monitoring Station (X)	LS		x	=	\$0
066841	Traffic Controller Assembly	LS		x	=	\$0
066840	Traffic Signal Controller Assembly	LS		x	=	\$0
066062	COZEEP Contract	LS		x	=	\$0
066838	Reflective Numbers and Edge Sealer	LS		x	=	\$0
066065	Tow Truck Service Patrol	LS		x	=	\$0
066916	Annual Construction General Permit Fee	LS		x	=	\$0
XXXXXX	Some Item	Unit		x	=	\$0
Total Section 1-8		\$	2,376,600	2%	= \$	47,532

TOTAL CITY FURNISHED	\$47,600
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SECTION 12: TIME-RELATED OVERHEAD

Total of Roadway and Structures Contract Items excluding Mobilization \$2,376,600 (used to calculate TRO)

Total Construction Cost (excluding TRO and Contingency) \$2,757,000 (used to check if project is greater than \$5 million excluding contingency)

Estimated Time-Related Overhead (TRO) Percentage (0% to 10%) = **6%**

Item code		Unit	Quantity	Unit Price (\$)		Cost
090100	Time-Related Overhead	WD	180	X	\$0 =	\$0

TOTAL TIME-RELATED OVERHEAD	\$0
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SECTION 13: ROADWAY CONTINGENCY

Total Section 1-12 \$ 2,757,000 x 30% = \$827,100

TOTAL CONTINGENCY	\$827,100
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II. STRUCTURE ITEMS

	<u>Bridge 1</u>		<u>Bridge 2</u>		
DATE OF ESTIMATE	00/00/00		00/00/00		00/00/00
Bridge Name	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Bridge Number	57-XXX		57-XXX		57-XXX
Structure Type	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Width (Feet) [out to out]	0 LF		0 LF		0 LF
Total Bridge Length (Feet)	0 LF		0 LF		0 LF
Total Area (Square Feet)	0 SQFT		0 SQFT		0 SQFT
Structure Depth (Feet)	0 LF		0 LF		0 LF
Footing Type (pile or spread)	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Cost Per Square Foot	\$0		\$0		\$0
COST OF EACH	\$0		\$0		\$0

	<u>Building 1</u>				
DATE OF ESTIMATE	00/00/00		00/00/00		00/00/00
Building Name	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Bridge Number	57-XXX		57-XXX		57-XXX
Structure Type	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Width (Feet) [out to out]	0 LF		0 LF		0 LF
Total Building Length (Feet)	0 LF		0 LF		0 LF
Total Area (Square Feet)	0 SQFT		0 SQFT		0 SQFT
Structure Depth (Feet)	0 LF		0 LF		0 LF
Footing Type (pile or spread)	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Cost Per Square Foot	\$0		\$0		\$0
COST OF EACH	\$0		\$0		\$0

TOTAL COST OF BRIDGES	\$0
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TOTAL COST OF BUILDINGS	\$0
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STRUCTURES MOBILIZATION	10%	\$0
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Recommended Contingency: (Pre-PSR 30%-50%, PSR 25%, Draft PR 20%, PR 15%, after PR approval 10%, Final PS&E 5%)

Total recommended percentages includes any quantified risk based contingency from the risk register.

STRUCTURES CONTINGENCY	10%	\$0
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TOTAL COST OF STRUCTURES	\$0
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Estimate Prepared By: _____
 XXXXXXXXXXXXXXXXXXXX ----- Division of Structures

 Date

III. RIGHT OF WAY

Fill in all of the available information from the Right of Way Data Sheet.

A)	A1)	Acquisition, including Excess Land Purchases, Damages & Goodwill, Fees	\$	2,000
	A2)	SB-1210	\$	0
B)	Acquisition of Offsite Mitigation		\$	0
C)	C1)	Utility Relocation (City Share)	\$	4,000
	C2)	Potholing (Design Phase)	\$	25,000
D)	Railroad Acquisition		\$	0
E)	Clearance / Demolition		\$	0
F)	Relocation Assistance (RAP and/or Last Resort Housing Costs)		\$	0
G)	Title and Escrow		\$	0
H)	Environmental Review		\$	0
I)	Condemnation Settlements	<u>0%</u>	\$	0
J)	Design Appreciation Factor	<u>0%</u>	\$	0
K)	Utility Relocation (Construction Cost)		\$	0

L)	TOTAL RIGHT OF WAY ESTIMATE	\$31,000
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M)	TOTAL R/W ESTIMATE: Escalated	\$35,000
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N)	RIGHT OF WAY SUPPORT	\$0
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Support Cost Estimate Prepared By	Project Coordinator ¹	Phone
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Utility Estimate Prepared By	Utility Coordinator ²	Phone
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R/W Acquisition Estimate Prepared By	Right of Way Estimator ³	Phone
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Note: Items G & H applied to items A + B

¹ When estimate has Support Costs only² When estimate has Utility Relocation³ When R/W Acquisition is required

PROJECT PLANNING COST ESTIMATE ©

EA:

EA: PID:

PID:

District-County-Route:

PM:

Type of Estimate : Traffic Study Estimate

Program Code : None

Project Limits : Intersection of E Park Avenue and Midway

Project Description: Construction of Traffic Signal

Scope : Intersection Construction

Alternative : 3 leg intersection with 4th leg driveway

SUMMARY OF PROJECT COST ESTIMATE

	Current Year Cost	Escalated Cost
TOTAL ROADWAY COST	\$ 3,760,600	\$ 4,433,309
TOTAL STRUCTURES COST	\$ 1,209,600	\$ 1,425,977
SUBTOTAL CONSTRUCTION COST	\$ 4,970,200	\$ 5,859,287
TOTAL RIGHT OF WAY COST	\$ 25,000	\$ 28,000
TOTAL CAPITAL OUTLAY COSTS	\$ 4,996,000	\$ 5,888,000
PA/ED SUPPORT	\$ -	\$ -
PS&E SUPPORT	\$ -	\$ -
RIGHT OF WAY SUPPORT	\$ -	\$ -
CONSTRUCTION SUPPORT	\$ -	\$ -
TOTAL SUPPORT COST	\$ -	\$ -

TOTAL PROJECT COST	\$ 5,000,000	\$ 5,900,000
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Programmed Amount

Month / Year

Date of Estimate (Month/Year) 2 / 2022

Estimated Construction Start (Month/Year) 4 / 2025

Number of Working Days = 100

Estimated Mid-Point of Construction (Month/Year) 6 / 2025

Estimated Construction End (Month/Year) 7 / 2025

Number of Plant Establishment Days

Estimated Project Schedule

PID Approval

PA/ED Approval

PS&E

RTL

Begin Construction

Reviewed by District O.E. or
Cost Estimate Certifier

xx/xx/xxxx

(xxx) xxx-xxxx

Office Engineer / Cost Estimate Certifier

Date

Phone

Approved by Project Manager

xx/xx/xxxx

(xxx) xxx-xxxx

Project Manager

Date

Phone

PROJECT COST ESTIMATE

EA: PID:

I. ROADWAY ITEMS SUMMARY

Section		Cost
1	Earthwork	\$ 22,500
2	Pavement Structural Section	\$ 630,900
3	Drainage	\$ 120,000
4	Specialty Items	\$ -
5	Environmental	\$ 523,500
6	Traffic Items	\$ 970,000
7	Detours	\$ -
8	Minor Items	\$ 226,700
9	Roadway Mobilization	\$ 249,400
10	Supplemental Work	\$ 99,800
11	City Furnished	\$ 49,900
12	Time-Related Overhead	\$ -
13	Roadway Contingency	\$ 867,900
TOTAL ROADWAY ITEMS		\$ 3,760,600

Estimate Prepared By :

Michael C Pitcock, Staff Engineer

Date

Phone

Estimate Reviewed By :

Name and Title

Date

Phone

By signing this estimate you are attesting that you have discussed your project with all functional units and have incorporated all their comments or have discussed with them why they will not be incorporated.

SECTION 1: EARTHWORK

Item code		Unit	Quantity		Unit Price (\$)		Cost
190101	Roadway Excavation	CY	750	x	30.00	= \$	22,500
152320	Lead Compliance Plan	LS		x		= \$	-
194001	Ditch Excavation	CY		x		= \$	-
19801X	Imported Borrow	CY/TON		x		= \$	-
192037	Structure Excavation (Retaining Wall)	CY		x		= \$	-
193013	Structure Backfill (Retaining Wall)	CY		x		= \$	-
193031	Pervious Backfill Material (Retaining Wall)	CY		x		= \$	-
16010X	Clearing & Grubbing	LS/ACRE		x		= \$	-
170101	Develop Water Supply	LS		x		= \$	-
19801X	Imported Borrow	CY/TON		x		= \$	-
210130	Duff	ACRE		x		= \$	-
XXXXXX	Some Item	Unit		x		= \$	-

TOTAL EARTHWORK SECTION ITEMS	\$	22,500
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SECTION 2: PAVEMENT STRUCTURAL SECTION

Item code		Unit	Quantity		Unit Price (\$)		Cost
401050	Jointed Plain Concrete Pavement	CY		x		= \$	-
400050	Continuously Reinforced Concrete Pavement	CY		x		= \$	-
404092	Seal Pavement Joint	LF		x		= \$	-
404093	Seal Isolation Joint	LF		x		= \$	-
413117	Seal Concrete Pavement Joint (Silicone)	LF		x		= \$	-
413118	Seal Pavement Joint (Asphalt Rubber)	LF		x		= \$	-
280010	Rapid Strength Concrete Base	CY		x		= \$	-
410095	Dowel Bar (Drill and Bond)	EA		x		= \$	-
390132	Hot Mix Asphalt (Type A)	TON	1,560	x	135.00	= \$	210,600
390137	Rubberized Hot Mix Asphalt (Gap Graded)	TON		x		= \$	-
395041	RHMA-O (Open Graded Fiction Course)	TON		x		= \$	-
393006	Geosynthetic Pavement Interlayer (Paving Grid)	SQYD		x		= \$	-
260203	Class 2 Aggregate Base	CY	580	x	90.00	= \$	52,200
290201	Asphalt Treated Permeable Base	CY		x		= \$	-
250401	Class 4 Aggregate Subbase	CY		x		= \$	-
374002	Asphaltic Emulsion (Fog Seal Coat)	TON		x		= \$	-
397005	Tack Coat	TON	3	x	1,700.00	= \$	5,100
390100	Prime Coat	TON	2	x	1,500.00	= \$	3,000
377501	Slurry Seal	TON		x		= \$	-
3750XX	Screenings (Type XX)	TON		x		= \$	-
374492	Asphaltic Emulsion (Polymer Modified)	TON		x		= \$	-
370001	Sand Cover (Seal)	TON		x		= \$	-
731530A	Hot Mix Asphalt (Textured Paving)	TONS		x		= \$	-
730020	Minor Concrete (Curb)	CY	10	x	1,700.00	= \$	17,000
731521	Minor Concrete (Sidewalk)	CY	100	x	1,000.00	= \$	100,000
731504	Minor Concrete (Curb and Gutter)	CY	80	x	1,200.00	= \$	96,000
39407X	Place Hot Mix Asphalt Dike (Type E)	LF		x		= \$	-
150771	Remove Asphalt Concrete Dike	LF		x		= \$	-
420201	Grind Existing Concrete Pavement	SQYD		x		= \$	-
150860	Remove Base and Surfacing	CY		x		= \$	-
390095	Replace Asphalt Concrete Surfacing	CY		x		= \$	-
15312X	Remove Concrete	LS	1	x	75,000.00	= \$	75,000
394090	Place Hot Mix Asphalt (Miscellaneous Area)	SQYD		x		= \$	-
153103	Cold Plane Asphalt Concrete Pavement	SQYD	7,200	x	10.00	= \$	72,000
39405X	Shoulder Rumble Strip (HMA, X-In Indentations)	STA		x		= \$	-
413113	Repair Spalled Joints, Polyester Grout	SQYD		x		= \$	-
420102	Groove Existing Concrete Pavement	SQYD		x		= \$	-
390136	Minor Hot Mix Asphalt	TON		x		= \$	-
394095	Roadside Paving (Miscellaneous Areas)	SQYD		x		= \$	-
XXXXXX	Some Item	Unit		x		= \$	-

TOTAL PAVEMENT STRUCTURAL SECTION ITEMS	\$	630,900
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SECTION 3: DRAINAGE

Item code		Unit	Quantity	Unit Price (\$)	Cost
15080X	Remove Culvert	EA/LF	x	= \$	-
150820	Modify Inlet	EA	x	= \$	-
155232	Sand Backfill	CY	x	= \$	-
15020X	Abandon Culvert	EA/LF	x	= \$	-
152430	Adjust Inlet	LF	x	= \$	-
155003	Cap Inlet	EA	x	= \$	-
510501	Minor Concrete	CY	x	= \$	-
510502	Minor Concrete (Minor Structure)	CY	x	= \$	-
5105XX	Minor Concrete (Type XX)	CY	x	= \$	-
620XXX	XX" Alternative Pipe Culvert (Type X)	LF	x	= \$	-
6411XX	XX" Plastic Pipe	LF	x	= \$	-
65XXXX	XX" Reinforced Concrete Pipe (Type X)	LF	x	= \$	-
6650XX	XX" Corrugated Steel Pipe (0.XXX" Thick)	LF	x	= \$	-
68XXXX	XX" Plastic Pipe (Edge Drain)	LF	x	= \$	-
69011X	XX" Corrugated Steel Pipe Downrain (0.XXX" Th	LF	x	= \$	-
70321X	XX" Corrugated Steel Pipe Inlet (0.XXX" Thick)	LF	x	= \$	-
70XXXX	XX" Corrugated Steel Pipe Riser (0.XXX" Thick)	LF	x	= \$	-
7050XX	XX" Steel Flared End Section	EA	x	= \$	-
703233	Grated Line Drain	LF	x	= \$	-
72XXXX	Rock Slope Protection (Type and Method)	CY/TON	x	= \$	-
72901X	Rock Slope Protection Fabric (Class X)	SQYD	x	= \$	-
721420	Concrete (Ditch Lining)	CY	x	= \$	-
721430	Concrete (Channel Lining)	CY	x	= \$	-
750001	Miscellaneous Iron and Steel	LB	x	= \$	-
XXXXXX	Additional Drainage	LS	1 x	120,000.00 = \$	120,000

TOTAL DRAINAGE ITEMS	\$	120,000
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SECTION 4: SPECIALTY ITEMS

Item code		Unit	Quantity	Unit Price (\$)	Cost
080050	Progress Schedule (Critical Path Method)	LS	x	= \$	-
582001	Sound Wall (Masonry Block)	SQFT	x	= \$	-
510530	Minor Concrete (Wall)	CY	x	= \$	-
15325X	Remove Sound Wall	LF/LS	x	= \$	-
070030	Lead Compliance Plan	LS	x	= \$	-
141120	Treated Wood Waste	LB	x	= \$	-
153221	Remove Concrete Barrier	LF	x	= \$	-
150662	Remove Metal Beam Guard Railing	LF	x	= \$	-
150668	Remove Flared End Section	EA	x	= \$	-
8000XX	Chain Link Fence (Type XX)	LF	x	= \$	-
80XXXX	XX" Chain Link Gate (Type CL-6)	EA	x	= \$	-
832005	Midwest Guardrail System	LF	x	= \$	-
839301	Single Thrie Beam Barrier	LF	x	= \$	-
839310	Double Thrie Beam Barrier	LF	x	= \$	-
839521	Cable Railing	LF	x	= \$	-
8395XX	Terminal System (Type WB-31)	EA	x	= \$	-
839585	Alternative Flared Terminal System	EA	x	= \$	-
839584	Alternative In-line Terminal System	EA	x	= \$	-
498052	60" CIDH Concrete Pile (Sign Foundation)	LF	x	= \$	-
839XXX	Crash Cushion (Insert Type)	EA	x	= \$	-
520103	Bar Reinforced Steel (Retaining Wall)	LB	x	= \$	-
510060	Structural Concrete, Retaining Wall	CY	x	= \$	-
513553	Retaining Wall (Masonry Wall)	SQFT	x	= \$	-
511035	Architectural Treatment	SQFT	x	= \$	-
598001	Anti-Graffiti Coating	SQFT	x	= \$	-
203070	Rock Stain	SQFT	x	= \$	-
5136XX	Reinforced Concrete Crib Wall (Type X)	SQFT	x	= \$	-
839543	Transition Railing (Type WB-31)	EA	x	= \$	-
597601	Prepare and Stain Concrete	SQFT	x	= \$	-
839561	Rail Tensioning Assembly	EA	x	= \$	-
83958X	End Anchor Assembly (Type X)	EA	x	= \$	-
XXXXXX	Some Item	Unit	x	= \$	-

TOTAL SPECIALTY ITEMS	\$	-
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SECTION 5: ENVIRONMENTAL**5A - ENVIRONMENTAL MITIGATION**

Item code	Unit	Quantity	Unit Price (\$)	Cost
Biological Mitigation	LS	1	x 350,000.00	= \$ 350,000
130670 Temporary Reinforced Silt Fence	LF	x	= \$	-
141000 Temporary Fence (Type ESA)	LF	x	= \$	-
<i>Subtotal Environmental Mitigation</i>				<i>\$ 350,000</i>

5B - LANDSCAPE AND IRRIGATION

Item code	Unit	Quantity	Unit Price (\$)	Cost
20XXXX Highway Planting	LS	1	x 25,000.00	= \$ 25,000
20XXXX Irrigation System	LS	1	x 45,000.00	= \$ 45,000
204099 Plant Establishment Work	LS	x	= \$	-
204101 Extend Plant Establishment Work	LS	x	= \$	-
20XXXX Follow-up Landscape Project	LS	x	= \$	-
150685 Remove Irrigation Facility	LS	x	= \$	-
20XXXX Maintain Existing (Irrigation or Planted Areas)	LS	x	= \$	-
206400 Check and Test Existing Irrigation Facilities	LS	x	= \$	-
21011X Imported Topsoil (X)	CY/TON	x	= \$	-
20XXXX Rock Blanket, Rock Mulch, DG, Gravel Mulch	SQFT/SQYD	x	= \$	-
200122 Weed Germination	SQYD	x	= \$	-
208304 Water Meter	EA	x	= \$	-
2087XX XX" Conduit (Use for Irrigation x-overs)	LF	x	= \$	-
20890X Extend X" Conduit (Use for Extension of Irrigation x-overs)	LF	x	= \$	-
<i>Subtotal Landscape and Irrigation</i>				<i>\$ 70,000</i>

5C - EROSION CONTROL

Item code	Unit	Quantity	Unit Price (\$)	Cost
210010 Move In/Move Out (Erosion Control)	EA	1	x 5,000.00	= \$ 5,000
210350 Fiber Rolls	LF	3,000	x 5.00	= \$ 15,000
210360 Compost Sock	LF	x	= \$	-
2102XX Rolled Erosion Control Product (X)	SQFT	x	= \$	-
21025X Bonded Fiber Matrix	SQFT/ACRE	x	= \$	-
210300 Hydromulch	SQFT	15,000	x 0.25	= \$ 3,750
210420 Straw	SQFT	x	= \$	-
210430 Hydroseed	SQFT	15,000	x 0.20	= \$ 3,000
210600 Compost	CY	47	x 150.00	= \$ 7,050
210630 Incorporate Materials	SQFT	15,000	x 0.50	= \$ 7,500
<i>Subtotal Erosion Control</i>				<i>\$ 41,300</i>

5D - NPDES

Item code	Unit	Quantity	Unit Price (\$)	Cost
130300 Prepare SWPPP	LS	1	x 10,000.00	= \$ 10,000
130200 Prepare WPCP	LS	x	= \$	-
130100 Job Site Management	LS	x	= \$	-
130330 Storm Water Annual Report	EA	x	= \$	-
130310 Rain Event Action Plan (REAP)	EA	x	= \$	-
130320 Storm Water Sampling and Analysis Day	EA	x	= \$	-
130520 Temporary Hydraulic Mulch	SQYD	1,700	x 2.50	= \$ 4,250
130550 Temporary Hydroseed	SQYD	1,700	x 1.70	= \$ 2,890
130505 Move-In/Move-Out (Temporary Erosion Control)	EA	x	= \$	-
130640 Temporary Fiber Roll	LF	3,000	x 5.00	= \$ 15,000
130900 Temporary Concrete Washout	LS	1	x 5,000.00	= \$ 5,000
130710 Temporary Construction Entrance	EA	1	x 10,000.00	= \$ 10,000
130610 Temporary Check Dam	LF	x	= \$	-
130620 Temporary Drainage Inlet Protection	EA	x	= \$	-
130730 Street Sweeping	LS	1	x 15,000.00	= \$ 15,000
<i>Subtotal NPDES</i>				<i>\$ 62,140</i>

Supplemental Work for NPDES

066595 Water Pollution Control Maintenance Sharing*	LS	x	= \$	-
066596 Additional Water Pollution Control**	LS	x	= \$	-
066597 Storm Water Sampling and Analysis***	LS	x	= \$	-
XXXXXX Some Item	LS	x	= \$	-
<i>Subtotal Supplemental Work for NDPS</i>				<i>\$ -</i>

*Applies to all SWPPPs and those WPCPs with sediment control or soil stabilization BMPs.

**Applies to both SWPPPs and WPCP projects.

*** Applies only to project with SWPPPs.

TOTAL ENVIRONMENTAL	\$ 523,500
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SECTION 6: TRAFFIC ITEMS**6A - Traffic Electrical**

Item code	Unit	Quantity	Unit Price (\$)	Cost
860460 Lighting and Sign Illumination	LS	x	= \$	-
860201 Signal and Lighting	LS	1 x	700,000.00 = \$	700,000
860990 Closed Circuit Television System	LS	x	= \$	-
86110X Ramp Metering System (Location X)	LS	x	= \$	-
86070X Interconnection Conduit and Cable	LF/LS	x	= \$	-
5602XX Furnish Sign Structure (Type X)	LB	x	= \$	-
5602XX Install Sign Structure (Type X)	LB	x	= \$	-
498040 XX" CIDHC Pile (Sign Foundation)	LF	x	= \$	-
86080X Inductive Loop Detectors	EA/LS	x	= \$	-
8609XX Traffic Monitoring Station (Type X)	LS	x	= \$	-
15075X Remove Sign Structure	EA/LS	x	= \$	-
151581 Reconstruct Sign Structure	EA	x	= \$	-
152641 Modify Sign Structure	EA	x	= \$	-
860090 Maintain Existing Traffic Management System Ele	LS	x	= \$	-
86XXXX Fiber Optic Conduit System	LS	x	= \$	-
XXXXX Some Item	Unit	x	= \$	-
Subtotal Traffic Electrical				\$ 700,000

6B - Traffic Signing and Striping

Item code	Unit	Quantity	Unit Price (\$)	Cost
566011 Roadside Sign - One Post	EA	x	= \$	-
566012 Roadside Sign - Two Post	EA	x	= \$	-
5602XX Furnish Sign	SQFT	x	= \$	-
568016 Install Sign Panel on Existing Frame	SQFT	x	= \$	-
150711 Remove Painted Traffic Stripe	LF	x	= \$	-
141101 Remove Yellow Painted Traffic Stripe (Hazardous Waste)	LF	x	= \$	-
150712 Remove Painted Pavement Marking	SQFT	x	= \$	-
150742 Remove Roadside Sign	EA	x	= \$	-
152320 Reset Roadside Sign	EA	x	= \$	-
152390 Relocate Roadside Sign	EA	x	= \$	-
82010X Delineator (Class X)	EA	x	= \$	-
840502 Thermoplastic Traffic Stripe (Enhanced Wet Night	LF	x	= \$	-
846012 Thermoplastic Crosswalk and Pavement Marking (	SQFT	x	= \$	-
120090 Construction Area Signs	LS	x	= \$	-
84XXXX Permanent Pavement Delineation	LS	1 x	20,000.00 = \$	20,000
Subtotal Traffic Signing and Striping				\$ 20,000

6C - Traffic Management Plan

Item code	Unit	Quantity	Unit Price (\$)	Cost
12865X Portable Changeable Message Signs	EA/LS	x	= \$	-
Subtotal Traffic Management Plan				\$ -

6C - Stage Construction and Traffic Handling

Item code	Unit	Quantity	Unit Price (\$)	Cost
120199 Traffic Plastic Drum	EA	x	= \$	-
12016X Channelizer (Type X)	EA	x	= \$	-
120120 Type III Barricade	EA	x	= \$	-
129100 Temporary Crash Cushion Module	EA	x	= \$	-
120100 Traffic Control System	LS	x	= \$	-
129110 Temporary Crash Cushion	EA	x	= \$	-
129000 Temporary Railing (Type K)	LF	x	= \$	-
120149 Temporary Pavement Marking (Paint)	SQFT	x	= \$	-
82010X Delineator (Class X)	EA	x	= \$	-
XXXXXX Stage Construction	LS	1 x	250,000.00 = \$	250,000
Subtotal Stage Construction and Traffic Handling				\$ 250,000

TOTAL TRAFFIC ITEMS	\$ 970,000
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SECTION 7: DETOURS

Includes constructing, maintaining, and removal

Item code	Unit	Quantity	Unit Price (\$)	Cost
190101 Roadway Excavation	CY	x	= \$	-
19801X Imported Borrow	CY/TON	x	= \$	-
390132 Hot Mix Asphalt (Type A)	TON	x	= \$	-
26020X Class 2 Aggregate Base	TON/CY	x	= \$	-
250401 Class 4 Aggregate Subbase	CY	x	= \$	-
130620 Temporary Drainage Inlet Protection	EA	x	= \$	-
129000 Temporary Railing (Type K)	LF	x	= \$	-
128601 Temporary Signal System	LS	x	= \$	-
120149 Temporary Pavement Marking (Paint)	SQFT	x	= \$	-
80010X Temporary Fence (Type X)	LF	x	= \$	-
XXXXXX Some Item	LS	x	= \$	-

* Includes constructing, maintaining, and removal

TOTAL DETOURS	\$	-
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SUBTOTAL SECTIONS 1 through 7	\$	2,266,900
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SECTION 8: MINOR ITEMS**8A - Americans with Disabilities Act Items**

ADA Items	1.0%	\$	22,669
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8B - Bike Path Items

Bike Path Items	1.0%	\$	22,669
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8C - Other Minor Items

Other Minor Items	8.0%	\$	181,352
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Total of Section 1-7	\$	2,266,900	x	10.0%	= \$	226,690
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TOTAL MINOR ITEMS	\$	226,700
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SECTIONS 9: ROADWAY MOBILIZATION

Item code						
999990	Total Section 1-8	\$	2,493,600	x	10%	= \$ 249,360

TOTAL ROADWAY MOBILIZATION	\$	249,400
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SECTION 10: SUPPLEMENTAL WORK

Item code	Unit	Quantity	Unit Price (\$)	Cost
066670 Payment Adjustments For Price Index Fluctuations	LS	x	= \$	-
066094 Value Analysis	LS	x	= \$	-
066070 Maintain Traffic	LS	x	= \$	-
066919 Dispute Resolution Board	LS	x	= \$	-
066921 Dispute Resolution Advisor	LS	x	= \$	-
066015 Federal Trainee Program	LS	x	= \$	-
066610 Partnering	LS	x	= \$	-
066204 Remove Rock and Debris	LS	x	= \$	-
066222 Locate Existing Crossover	LS	x	= \$	-
XXXXXX Some Item	Unit	x	= \$	-

Cost of NPDES Supplemental Work specified in Section 5D	= \$	-
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Total Section 1-8	\$	2,493,600	4%	= \$	99,744
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TOTAL SUPPLEMENTAL WORK	\$	99,800
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SECTION 11: CITY FURNISHED MATERIALS AND EXPENSES

Item code		Unit	Quantity	Unit Price (\$)		Cost
066105	Resident Engineers Office	LS	x	=		\$0
066063	Traffic Management Plan - Public Information	LS	x	=		\$0
066901	Water Expenses	LS	x	=		\$0
8609XX	Traffic Monitoring Station (X)	LS	x	=		\$0
066841	Traffic Controller Assembly	LS	x	=		\$0
066840	Traffic Signal Controller Assembly	LS	x	=		\$0
066062	COZEEP Contract	LS	x	=		\$0
066838	Reflective Numbers and Edge Sealer	LS	x	=		\$0
066065	Tow Truck Service Patrol	LS	x	=		\$0
066916	Annual Construction General Permit Fee	LS	x	=		\$0
XXXXXX	Some Item	Unit	x	=		\$0
Total Section 1-8		\$	2,493,600	2%	= \$	49,872

TOTAL CITY FURNISHED	\$49,900
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SECTION 12: TIME-RELATED OVERHEAD

Total of Roadway and Structures Contract Items excluding Mobilization \$3,602,400 (used to calculate TRO)
 Total Construction Cost (excluding TRO and Contingency) \$4,102,300 (used to check if project is greater than \$5 million excluding contingency)

Estimated Time-Related Overhead (TRO) Percentage (0% to 10%) = **6%**

Item code		Unit	Quantity	Unit Price (\$)		Cost
090100	Time-Related Overhead	WD	100	X	\$0 =	\$0

TOTAL TIME-RELATED OVERHEAD	\$0
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SECTION 13: ROADWAY CONTINGENCY

Total Section 1-12 \$ 2,892,700 x 30% = \$867,810

TOTAL CONTINGENCY	\$867,900
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II. STRUCTURE ITEMS

	<u>Bridge 1</u>		<u>Bridge 2</u>		
DATE OF ESTIMATE	00/00/00		00/00/00		00/00/00
Bridge Name	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Bridge Number	57-XXX		57-XXX		57-XXX
Structure Type	PC/PS I		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Width (Feet) [out to out]	22 LF		0 LF		0 LF
Total Bridge Length (Feet)	110 LF		0 LF		0 LF
Total Area (Square Feet)	2400 SQFT		0 SQFT		0 SQFT
Structure Depth (Feet)	6 LF		0 LF		0 LF
Footing Type (pile or spread)	Pile		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Cost Per Square Foot	\$420		\$0		\$0
COST OF EACH	\$1,008,000		\$0		\$0

	<u>Building 1</u>				
DATE OF ESTIMATE	00/00/00		00/00/00		00/00/00
Building Name	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Bridge Number	57-XXX		57-XXX		57-XXX
Structure Type	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Width (Feet) [out to out]	0 LF		0 LF		0 LF
Total Building Length (Feet)	0 LF		0 LF		0 LF
Total Area (Square Feet)	0 SQFT		0 SQFT		0 SQFT
Structure Depth (Feet)	0 LF		0 LF		0 LF
Footing Type (pile or spread)	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Cost Per Square Foot	\$0		\$0		\$0
COST OF EACH	\$0		\$0		\$0

TOTAL COST OF BRIDGES	\$1,008,000
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TOTAL COST OF BUILDINGS	\$0
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STRUCTURES MOBILIZATION	10%	\$100,800
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Recommended Contingency: (Pre-PSR 30%-50%, PSR 25%, Draft PR 20%, PR 15%, after PR approval 10%, Final PS&E 5%)

Total recommended percentages includes any quantified risk based contingency from the risk register.

STRUCTURES CONTINGENCY	10%	\$100,800
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TOTAL COST OF STRUCTURES	\$1,209,600
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Estimate Prepared By: _____
 XXXXXXXXXXXXXXXXXXXX ----- Division of Structures

 Date

III. RIGHT OF WAY

Fill in all of the available information from the Right of Way Data Sheet.

A)	A1)	Acquisition, including Excess Land Purchases, Damages & Goodwill, Fees	\$	0
	A2)	SB-1210	\$	0
B)		Acquisition of Offsite Mitigation	\$	0
C)	C1)	Utility Relocation (City Share)	\$	0
	C2)	Potholing (Design Phase)	\$	25,000
D)		Railroad Acquisition	\$	0
E)		Clearance / Demolition	\$	0
F)		Relocation Assistance (RAP and/or Last Resort Housing Costs)	\$	0
G)		Title and Escrow	\$	0
H)		Environmental Review	\$	0
I)		Condemnation Settlements	_____ 0%	\$ 0
J)		Design Appreciation Factor	_____ 0%	\$ 0
K)		Utility Relocation (Construction Cost)	\$	0

L)	TOTAL RIGHT OF WAY ESTIMATE	\$25,000
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M)	TOTAL R/W ESTIMATE: Escalated	\$28,000
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N)	RIGHT OF WAY SUPPORT	\$0
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Support Cost Estimate Prepared By	_____	_____
	Project Coordinator ¹	Phone

Utility Estimate Prepared By	_____	_____
	Utility Coordinator ²	Phone

R/W Acquisition Estimate Prepared By	_____	_____
	Right of Way Estimator ³	Phone

Note: Items G & H applied to items A + B

¹ When estimate has Support Costs only² When estimate has Utility Relocation³ When R/W Acquisition is required

PROJECT PLANNING COST ESTIMATE ©

EA:

EA: PID:

PID:

District-County-Route:

PM:

Type of Estimate : Traffic Study Estimate

Program Code : None

Project Limits : Intersection of Midway and Hegan Lane

Project Description: Construction of Modern Roundabout

Scope : Intersection Construction

Alternative : 3 Leg roundabout with 4th leg driveway

SUMMARY OF PROJECT COST ESTIMATE

	Current Year Cost	Escalated Cost
TOTAL ROADWAY COST	\$ 2,737,100	\$ 3,226,722
TOTAL STRUCTURES COST	\$ -	\$ -
SUBTOTAL CONSTRUCTION COST	\$ 2,737,100	\$ 3,226,722
TOTAL RIGHT OF WAY COST	\$ 243,000	\$ 275,000
TOTAL CAPITAL OUTLAY COSTS	\$ 2,981,000	\$ 3,502,000
PA/ED SUPPORT	\$ -	\$ -
PS&E SUPPORT	\$ -	\$ -
RIGHT OF WAY SUPPORT	\$ -	\$ -
CONSTRUCTION SUPPORT	\$ -	\$ -
TOTAL SUPPORT COST	\$ -	\$ -

TOTAL PROJECT COST	\$ 2,990,000	\$ 3,510,000
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Programmed Amount

Month / Year
Date of Estimate (Month/Year) 2 / 2022

Estimated Construction Start (Month/Year) 3 / 2025

Number of Working Days = 180

Estimated Mid-Point of Construction (Month/Year) 7 / 2025

Estimated Construction End (Month/Year) 12 / 2025

Number of Plant Establishment Days

Estimated Project Schedule

PID Approval

PA/ED Approval

PS&E

RTL

Begin Construction

Reviewed by District O.E. or
Cost Estimate Certifier

xx/xx/xxxx

(xxx) xxx-xxxx

Office Engineer / Cost Estimate Certifier

Date

Phone

Approved by Project Manager

xx/xx/xxxx

(xxx) xxx-xxxx

Project Manager

Date

Phone

PROJECT COST ESTIMATE

EA: PID:

I. ROADWAY ITEMS SUMMARY

	Section	Cost
1	Earthwork	\$ 60,000
2	Pavement Structural Section	\$ 816,100
3	Drainage	\$ 100,000
4	Specialty Items	\$ 14,400
5	Environmental	\$ 229,500
6	Traffic Items	\$ 430,000
7	Detours	\$ -
8	Minor Items	\$ 165,000
9	Roadway Mobilization	\$ 181,500
10	Supplemental Work	\$ 72,600
11	City Furnished	\$ 36,300
12	Time-Related Overhead	\$ -
13	Roadway Contingency	\$ 631,700
TOTAL ROADWAY ITEMS		\$ 2,737,100

Estimate Prepared By :

Erin Gibbs EIT, Staff Engineer

Date

Phone

Estimate Reviewed By :

Michael Pitcock PE, Staff Engineer

Date

Phone

By signing this estimate you are attesting that you have discussed your project with all functional units and have incorporated all their comments or have discussed with them why they will not be incorporated.

SECTION 1: EARTHWORK

Item code		Unit	Quantity		Unit Price (\$)		Cost
190101	Roadway Excavation	CY	2,000	x	30.00	= \$	60,000
152320	Lead Compliance Plan	LS		x		= \$	-
194001	Ditch Excavation	CY		x		= \$	-
19801X	Imported Borrow	CY/TON		x		= \$	-
192037	Structure Excavation (Retaining Wall)	CY		x		= \$	-
193013	Structure Backfill (Retaining Wall)	CY		x		= \$	-
193031	Pervious Backfill Material (Retaining Wall)	CY		x		= \$	-
16010X	Clearing & Grubbing	LS/ACRE		x		= \$	-
170101	Develop Water Supply	LS		x		= \$	-
19801X	Imported Borrow	CY/TON		x		= \$	-
210130	Duff	ACRE		x		= \$	-
XXXXXX	Some Item	Unit		x		= \$	-

TOTAL EARTHWORK SECTION ITEMS	\$	60,000
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SECTION 2: PAVEMENT STRUCTURAL SECTION

Item code		Unit	Quantity		Unit Price (\$)		Cost
401050	Jointed Plain Concrete Pavement	CY		x		= \$	-
400050	Continuously Reinforced Concrete Pavement	CY	75	x	900.00	= \$	67,500
404092	Seal Pavement Joint	LF		x		= \$	-
404093	Seal Isolation Joint	LF		x		= \$	-
413117	Seal Concrete Pavement Joint (Silicone)	LF		x		= \$	-
413118	Seal Pavement Joint (Asphalt Rubber)	LF		x		= \$	-
280010	Rapid Strength Concrete Base	CY		x		= \$	-
410095	Dowel Bar (Drill and Bond)	EA		x		= \$	-
390132	Hot Mix Asphalt (Type A)	TON	1,865	x	135.00	= \$	251,775
390137	Rubberized Hot Mix Asphalt (Gap Graded)	TON		x		= \$	-
395041	RHMA-O (Open Graded Fiction Course)	TON		x		= \$	-
393006	Geosynthetic Pavement Interlayer (Paving Grid)	SQYD		x		= \$	-
260203	Class 2 Aggregate Base	CY	1,679	x	90.00	= \$	151,110
290201	Asphalt Treated Permeable Base	CY		x		= \$	-
250401	Class 4 Aggregate Subbase	CY		x		= \$	-
374002	Asphaltic Emulsion (Fog Seal Coat)	TON		x		= \$	-
397005	Tack Coat	TON	4	x	1,700.00	= \$	6,800
390100	Prime Coat	TON	3	x	1,500.00	= \$	4,500
377501	Slurry Seal	TON		x		= \$	-
3750XX	Screenings (Type XX)	TON		x		= \$	-
374492	Asphaltic Emulsion (Polymer Modified)	TON		x		= \$	-
370001	Sand Cover (Seal)	TON		x		= \$	-
731530A	Hot Mix Asphalt (Textured Paving)	TONS		x		= \$	-
730020	Minor Concrete (Curb)	CY	40	x	1,700.00	= \$	68,000
731504	Minor Concrete (Curb and Gutter)	CY	70	x	1,200.00	= \$	84,000
731516	Minor Concrete (Driveway)	CY		x		= \$	-
731521	Minor Concrete (Sidewalk)	CY	140	x	1,000.00	= \$	140,000
39407X	Place Hot Mix Asphalt Dike (Type E)	LF		x		= \$	-
150771	Remove Asphalt Concrete Dike	LF		x		= \$	-
420201	Grind Existing Concrete Pavement	SQYD		x		= \$	-
150860	Remove Base and Surfacing	CY		x		= \$	-
390095	Replace Asphalt Concrete Surfacing	CY		x		= \$	-
15312X	Remove Concrete	LS	1	x	15,000.00	= \$	15,000
394090	Place Hot Mix Asphalt (Miscellaneous Area)	SQYD		x		= \$	-
153103	Cold Plane Asphalt Concrete Pavement	SQYD	2,736	x	10.00	= \$	27,360
39405X	Shoulder Rumble Strip (HMA, X-In Indentations)	STA		x		= \$	-
413113	Repair Spalled Joints, Polyester Grout	SQYD		x		= \$	-
420102	Groove Existing Concrete Pavement	SQYD		x		= \$	-
390136	Minor Hot Mix Asphalt	TON		x		= \$	-
394095	Roadside Paving (Miscellaneous Areas)	SQYD		x		= \$	-
XXXXXX	Some Item	Unit		x		= \$	-

TOTAL PAVEMENT STRUCTURAL SECTION ITEMS	\$	816,100
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SECTION 3: DRAINAGE

Item code		Unit	Quantity	Unit Price (\$)	Cost
15080X	Remove Culvert	EA/LF	x	= \$	-
150820	Modify Inlet	EA	x	= \$	-
155232	Sand Backfill	CY	x	= \$	-
15020X	Abandon Culvert	EA/LF	x	= \$	-
152430	Adjust Inlet	LF	x	= \$	-
155003	Cap Inlet	EA	x	= \$	-
510501	Minor Concrete	CY	x	= \$	-
510502	Minor Concrete (Minor Structure)	CY	x	= \$	-
5105XX	Minor Concrete (Type XX)	CY	x	= \$	-
620XXX	XX" Alternative Pipe Culvert (Type X)	LF	x	= \$	-
6411XX	XX" Plastic Pipe	LF	x	= \$	-
65XXXX	XX" Reinforced Concrete Pipe (Type X)	LF	x	= \$	-
6650XX	XX" Corrugated Steel Pipe (0.XXX" Thick)	LF	x	= \$	-
68XXXX	XX" Plastic Pipe (Edge Drain)	LF	x	= \$	-
69011X	XX" Corrugated Steel Pipe Downrain (0.XXX" Th	LF	x	= \$	-
70321X	XX" Corrugated Steel Pipe Inlet (0.XXX" Thick)	LF	x	= \$	-
70XXXX	XX" Corrugated Steel Pipe Riser (0.XXX" Thick)	LF	x	= \$	-
7050XX	XX" Steel Flared End Section	EA	x	= \$	-
703233	Grated Line Drain	LF	x	= \$	-
72XXXX	Rock Slope Protection (Type and Method)	CY/TON	x	= \$	-
72901X	Rock Slope Protection Fabric (Class X)	SQYD	x	= \$	-
721420	Concrete (Ditch Lining)	CY	x	= \$	-
721430	Concrete (Channel Lining)	CY	x	= \$	-
750001	Miscellaneous Iron and Steel	LB	x	= \$	-
XXXXXX	Additional Drainage	LS	1 x	100,000.00 = \$	100,000

TOTAL DRAINAGE ITEMS	\$	100,000
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SECTION 4: SPECIALTY ITEMS

Item code		Unit	Quantity	Unit Price (\$)	Cost
080050	Progress Schedule (Critical Path Method)	LS	x	= \$	-
582001	Sound Wall (Masonry Block)	SQFT	x	= \$	-
510530	Minor Concrete (Wall)	CY	x	= \$	-
15325X	Remove Sound Wall	LF/LS	x	= \$	-
070030	Lead Compliance Plan	LS	x	= \$	-
141120	Treated Wood Waste	LB	x	= \$	-
153221	Remove Concrete Barrier	LF	x	= \$	-
150662	Remove Metal Beam Guard Railing	LF	x	= \$	-
150668	Remove Flared End Section	EA	x	= \$	-
8000XX	Chain Link Fence (Type XX)	LF	x	= \$	-
80XXXX	XX" Chain Link Gate (Type CL-6)	EA	x	= \$	-
832005	Midwest Guardrail System	LF	x	= \$	-
839301	Single Thrie Beam Barrier	LF	x	= \$	-
839310	Double Thrie Beam Barrier	LF	x	= \$	-
839521	Cable Railing	LF	x	= \$	-
8395XX	Terminal System (Type WB-31)	EA	x	= \$	-
839585	Alternative Flared Terminal System	EA	x	= \$	-
839584	Alternative In-line Terminal System	EA	x	= \$	-
498052	60" CIDH Concrete Pile (Sign Foundation)	LF	x	= \$	-
839XXX	Crash Cushion (Insert Type)	EA	x	= \$	-
520103	Bar Reinforced Steel (Retaining Wall)	LB	x	= \$	-
510060	Structural Concrete, Retaining Wall	CY	x	= \$	-
513553	Retaining Wall (Masonry Wall)	SQFT	x	= \$	-
511035	Architectural Treatment	SQFT	x	= \$	-
598001	Anti-Graffiti Coating	SQFT	x	= \$	-
203070	Rock Stain	SQFT	x	= \$	-
5136XX	Reinforced Concrete Crib Wall (Type X)	SQFT	x	= \$	-
839543	Transition Railing (Type WB-31)	EA	x	= \$	-
597601	Prepare and Stain Concrete	SQFT	2,400 x	6.00 = \$	14,400
839561	Rail Tensioning Assembly	EA	x	= \$	-
83958X	End Anchor Assembly (Type X)	EA	x	= \$	-
XXXXXX	Some Item	Unit	x	= \$	-

TOTAL SPECIALTY ITEMS	\$	14,400
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SECTION 5: ENVIRONMENTAL**5A - ENVIRONMENTAL MITIGATION**

Item code	Unit	Quantity	Unit Price (\$)	Cost
Biological Mitigation	LS	50,000	x	= \$ -
130670 Temporary Reinforced Silt Fence	LF	x	= \$ -	
141000 Temporary Fence (Type ESA)	LF	x	= \$ -	
<i>Subtotal Environmental Mitigation</i>				\$ -

5B - LANDSCAPE AND IRRIGATION

Item code	Unit	Quantity	Unit Price (\$)	Cost
20XXXX Highway Planting	LS	1	x 42,230.00	= \$ 42,230
20XXXX Irrigation System	LS	1	x 84,460.00	= \$ 84,460
204099 Plant Establishment Work	LS	x	= \$ -	
204101 Extend Plant Establishment Work	LS	x	= \$ -	
20XXXX Follow-up Landscape Project	LS	x	= \$ -	
150685 Remove Irrigation Facility	LS	x	= \$ -	
20XXXX Maintain Existing (Irrigation or Planted Areas)	LS	x	= \$ -	
206400 Check and Test Existing Irrigation Facilities	LS	x	= \$ -	
21011X Imported Topsoil (X)	CY/TON	x	= \$ -	
20XXXX Rock Blanket, Rock Mulch, DG, Gravel Mulch	SQFT/SQYD	x	= \$ -	
200122 Weed Germination	SQYD	x	= \$ -	
208304 Water Meter	EA	x	= \$ -	
2087XX XX" Conduit (Use for Irrigation x-overs)	LF	x	= \$ -	
20890X XX" Conduit (Use for Extension of Irrigation x-overs)	LF	x	= \$ -	
<i>Subtotal Landscape and Irrigation</i>				\$ 126,690

5C - EROSION CONTROL

Item code	Unit	Quantity	Unit Price (\$)	Cost
210010 Move In/Move Out (Erosion Control)	EA	1	x 5,000.00	= \$ 5,000
210350 Fiber Rolls	LF	4,000	x 5.00	= \$ 20,000
210360 Compost Sock	LF	x	= \$ -	
2102XX Rolled Erosion Control Product (X)	SQFT	x	= \$ -	
21025X Bonded Fiber Matrix	SQFT/ACRE	x	= \$ -	
210300 Hydromulch	SQFT	20,000	x 0.25	= \$ 5,000
210420 Straw	SQFT	x	= \$ -	
210430 Hydroseed	SQFT	20,000	x 0.20	= \$ 4,000
210600 Compost	CY	62	x 150.00	= \$ 9,300
210630 Incorporate Materials	SQFT	20,000	x 0.50	= \$ 10,000
<i>Subtotal Erosion Control</i>				\$ 53,300

5D - NPDES

Item code	Unit	Quantity	Unit Price (\$)	Cost
130300 Prepare SWPPP	LS	1	x 10,000.00	= \$ 10,000
130200 Prepare WPCP	LS	x	= \$ -	
130100 Job Site Management	LS	x	= \$ -	
130330 Storm Water Annual Report	EA	x	= \$ -	
130310 Rain Event Action Plan (REAP)	EA	x	= \$ -	
130320 Storm Water Sampling and Analysis Day	EA	x	= \$ -	
130520 Temporary Hydraulic Mulch	SQYD	2,250	x 2.50	= \$ 5,625
130550 Temporary Hydroseed	SQYD	2,250	x 1.70	= \$ 3,825
130505 Move-In/Move-Out (Temporary Erosion Control)	EA	x	= \$ -	
130640 Temporary Fiber Roll	LF	x	= \$ -	
130900 Temporary Concrete Washout	LS	1	x 5,000.00	= \$ 5,000
130710 Temporary Construction Entrance	EA	1	x 10,000.00	= \$ 10,000
130610 Temporary Check Dam	LF	x	= \$ -	
130620 Temporary Drainage Inlet Protection	EA	x	= \$ -	
130730 Street Sweeping	LS	1	x 15,000.00	= \$ 15,000
<i>Subtotal NPDES</i>				\$ 49,450

Supplemental Work for NPDES

066595 Water Pollution Control Maintenance Sharing*	LS	x	= \$ -	
066596 Additional Water Pollution Control**	LS	x	= \$ -	
066597 Storm Water Sampling and Analysis***	LS	x	= \$ -	
XXXXXX Some Item	LS	x	= \$ -	
<i>Subtotal Supplemental Work for NDPS</i>				\$ -

*Applies to all SWPPPs and those WPCPs with sediment control or soil stabilization BMPs.

**Applies to both SWPPPs and WPCP projects.

*** Applies only to project with SWPPPs.

TOTAL ENVIRONMENTAL	\$	229,500
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SECTION 6: TRAFFIC ITEMS**6A - Traffic Electrical**

Item code	Unit	Quantity	Unit Price (\$)	Cost
860460 Lighting and Sign Illumination	LS	x	= \$	-
860201 Signal and Lighting	LS	1 x	150,000.00 = \$	150,000
860990 Closed Circuit Television System	LS	x	= \$	-
86110X Ramp Metering System (Location X)	LS	x	= \$	-
86070X Interconnection Conduit and Cable	LF/LS	x	= \$	-
5602XX Furnish Sign Structure (Type X)	LB	x	= \$	-
5602XX Install Sign Structure (Type X)	LB	x	= \$	-
498040 XX" CIDHC Pile (Sign Foundation)	LF	x	= \$	-
86080X Inductive Loop Detectors	EA/LS	x	= \$	-
8609XX Traffic Monitoring Station (Type X)	LS	x	= \$	-
15075X Remove Sign Structure	EA/LS	x	= \$	-
151581 Reconstruct Sign Structure	EA	x	= \$	-
152641 Modify Sign Structure	EA	x	= \$	-
860090 Maintain Existing Traffic Management System Ele	LS	x	= \$	-
86XXXX Fiber Optic Conduit System	LS	x	= \$	-
XXXXX Some Item	Unit	x	= \$	-
Subtotal Traffic Electrical				\$ 150,000

6B - Traffic Signing and Striping

Item code	Unit	Quantity	Unit Price (\$)	Cost
566011 Roadside Sign - One Post	EA	x	= \$	-
566012 Roadside Sign - Two Post	EA	x	= \$	-
5602XX Furnish Sign	SQFT	x	= \$	-
568016 Install Sign Panel on Existing Frame	SQFT	x	= \$	-
150711 Remove Painted Traffic Stripe	LF	x	= \$	-
141101 Remove Yellow Painted Traffic Stripe (Hazardous Waste)	LF	x	= \$	-
150712 Remove Painted Pavement Marking	SQFT	x	= \$	-
150742 Remove Roadside Sign	EA	x	= \$	-
152320 Reset Roadside Sign	EA	x	= \$	-
152390 Relocate Roadside Sign	EA	x	= \$	-
82010X Delineator (Class X)	EA	x	= \$	-
840502 Thermoplastic Traffic Stripe (Enhanced Wet Night	LF	x	= \$	-
846012 Thermoplastic Crosswalk and Pavement Marking (	SQFT	x	= \$	-
120090 Construction Area Signs	LS	x	= \$	-
84XXXX Permanent Pavement Delineation	LS	1 x	30,000.00 = \$	30,000
Subtotal Traffic Signing and Striping				\$ 30,000

6C - Traffic Management Plan

Item code	Unit	Quantity	Unit Price (\$)	Cost
12865X Portable Changeable Message Signs	EA/LS	x	= \$	-
Subtotal Traffic Management Plan				\$ -

6C - Stage Construction and Traffic Handling

Item code	Unit	Quantity	Unit Price (\$)	Cost
120199 Traffic Plastic Drum	EA	x	= \$	-
12016X Channelizer (Type X)	EA	x	= \$	-
120120 Type III Barricade	EA	x	= \$	-
129100 Temporary Crash Cushion Module	EA	x	= \$	-
120100 Traffic Control System	LS	x	= \$	-
129110 Temporary Crash Cushion	EA	x	= \$	-
129000 Temporary Railing (Type K)	LF	x	= \$	-
120149 Temporary Pavement Marking (Paint)	SQFT	x	= \$	-
82010X Delineator (Class X)	EA	x	= \$	-
XXXXXX Stage Construction	LS	1 x	250,000.00 = \$	250,000
Subtotal Stage Construction and Traffic Handling				\$ 250,000

TOTAL TRAFFIC ITEMS	\$ 430,000
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SECTION 7: DETOURS

Includes constructing, maintaining, and removal

Item code	Unit	Quantity	Unit Price (\$)	Cost
190101 Roadway Excavation	CY	x	= \$	-
19801X Imported Borrow	CY/TON	x	= \$	-
390132 Hot Mix Asphalt (Type A)	TON	x	= \$	-
26020X Class 2 Aggregate Base	TON/CY	x	= \$	-
250401 Class 4 Aggregate Subbase	CY	x	= \$	-
130620 Temporary Drainage Inlet Protection	EA	x	= \$	-
129000 Temporary Railing (Type K)	LF	x	= \$	-
128601 Temporary Signal System	LS	x	= \$	-
120149 Temporary Pavement Marking (Paint)	SQFT	x	= \$	-
80010X Temporary Fence (Type X)	LF	x	= \$	-
XXXXXX Some Item	LS	x	= \$	-

* Includes constructing, maintaining, and removal

TOTAL DETOURS	\$	-
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SUBTOTAL SECTIONS 1 through 7	\$	1,650,000
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SECTION 8: MINOR ITEMS**8A - Americans with Disabilities Act Items**

ADA Items	1.0%	\$	16,500
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8B - Bike Path Items

Bike Path Items	1.0%	\$	16,500
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8C - Other Minor Items

Other Minor Items	8.0%	\$	132,000
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Total of Section 1-7	\$	1,650,000	x	10.0%	= \$	165,000
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TOTAL MINOR ITEMS	\$	165,000
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SECTIONS 9: ROADWAY MOBILIZATION

Item code						
999990	Total Section 1-8	\$	1,815,000	x	10%	= \$ 181,500

TOTAL ROADWAY MOBILIZATION	\$	181,500
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SECTION 10: SUPPLEMENTAL WORK

Item code	Unit	Quantity	Unit Price (\$)	Cost
066670 Payment Adjustments For Price Index Fluctuations	LS	x	= \$	-
066094 Value Analysis	LS	x	= \$	-
066070 Maintain Traffic	LS	x	= \$	-
066919 Dispute Resolution Board	LS	x	= \$	-
066921 Dispute Resolution Advisor	LS	x	= \$	-
066015 Federal Trainee Program	LS	x	= \$	-
066610 Partnering	LS	x	= \$	-
066204 Remove Rock and Debris	LS	x	= \$	-
066222 Locate Existing Crossover	LS	x	= \$	-
XXXXXX Some Item	Unit	x	= \$	-

Cost of NPDES Supplemental Work specified in Section 5D	= \$	-
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Total Section 1-8	\$	1,815,000	4%	= \$	72,600
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TOTAL SUPPLEMENTAL WORK	\$	72,600
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SECTION 11: CITY FURNISHED MATERIALS AND EXPENSES

Item code		Unit	Quantity	Unit Price (\$)		Cost
066105	Resident Engineers Office	LS	x	=		\$0
066063	Traffic Management Plan - Public Information	LS	x	=		\$0
066901	Water Expenses	LS	x	=		\$0
8609XX	Traffic Monitoring Station (X)	LS	x	=		\$0
066841	Traffic Controller Assembly	LS	x	=		\$0
066840	Traffic Signal Controller Assembly	LS	x	=		\$0
066062	COZEEP Contract	LS	x	=		\$0
066838	Reflective Numbers and Edge Sealer	LS	x	=		\$0
066065	Tow Truck Service Patrol	LS	x	=		\$0
066916	Annual Construction General Permit Fee	LS	x	=		\$0
XXXXXX	Some Item	Unit	x	=		\$0
Total Section 1-8		\$	1,815,000	2%	= \$	36,300

TOTAL CITY FURNISHED	\$36,300
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SECTION 12: TIME-RELATED OVERHEAD

Total of Roadway and Structures Contract Items excluding Mobilization	\$1,815,000 (used to calculate TRO)
Total Construction Cost (excluding TRO and Contingency)	\$2,105,400 (used to check if project is greater than \$5 million excluding contingency)

Estimated Time-Related Overhead (TRO) Percentage (0% to 10%) = 6%

Item code		Unit	Quantity	Unit Price (\$)		Cost
090100	Time-Related Overhead	WD	180	X	\$0 =	\$0

TOTAL TIME-RELATED OVERHEAD	\$0
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SECTION 13: ROADWAY CONTINGENCY

Total Section 1-12	\$	2,105,400	x	30%	=	\$631,620
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TOTAL CONTINGENCY	\$631,700
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II. STRUCTURE ITEMS

	<u>Bridge 1</u>		<u>Bridge 2</u>		
DATE OF ESTIMATE	00/00/00		00/00/00		00/00/00
Bridge Name	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Bridge Number	57-XXX		57-XXX		57-XXX
Structure Type	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Width (Feet) [out to out]	0 LF		0 LF		0 LF
Total Bridge Length (Feet)	0 LF		0 LF		0 LF
Total Area (Square Feet)	0 SQFT		0 SQFT		0 SQFT
Structure Depth (Feet)	0 LF		0 LF		0 LF
Footing Type (pile or spread)	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Cost Per Square Foot	\$0		\$0		\$0
COST OF EACH	\$0		\$0		\$0

	<u>Building 1</u>				
DATE OF ESTIMATE	00/00/00		00/00/00		00/00/00
Building Name	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Bridge Number	57-XXX		57-XXX		57-XXX
Structure Type	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Width (Feet) [out to out]	0 LF		0 LF		0 LF
Total Building Length (Feet)	0 LF		0 LF		0 LF
Total Area (Square Feet)	0 SQFT		0 SQFT		0 SQFT
Structure Depth (Feet)	0 LF		0 LF		0 LF
Footing Type (pile or spread)	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Cost Per Square Foot	\$0		\$0		\$0
COST OF EACH	\$0		\$0		\$0

TOTAL COST OF BRIDGES	\$0
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TOTAL COST OF BUILDINGS	\$0
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STRUCTURES MOBILIZATION	10%	\$0
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Recommended Contingency: (Pre-PSR 30%-50%, PSR 25%, Draft PR 20%, PR 15%, after PR approval 10%, Final PS&E 5%)

Total recommended percentages includes any quantified risk based contingency from the risk register.

STRUCTURES CONTINGENCY	10%	\$0
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TOTAL COST OF STRUCTURES	\$0
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Estimate Prepared By: _____
 XXXXXXXXXXXXXXXXXXXX ----- Division of Structures

 Date

III. RIGHT OF WAY

Fill in all of the available information from the Right of Way Data Sheet.

A)	A1)	Acquisition, including Excess Land Purchases, Damages & Goodwill, Fees	\$	118,000	
	A2)	SB-1210	\$	0	
B)		Acquisition of Offsite Mitigation	\$	0	
C)	C1)	Utility Relocation (City Share)	\$	100,000	
	C2)	Potholing (Design Phase)	\$	25,000	
D)		Railroad Acquisition	\$	0	
E)		Clearance / Demolition	\$	0	
F)		Relocation Assistance (RAP and/or Last Resort Housing Costs)	\$	0	
G)		Title and Escrow	\$	0	
H)		Environmental Review	\$	0	
I)		Condemnation Settlements	<u>0%</u>	\$	0
J)		Design Appreciation Factor	<u>0%</u>	\$	0
K)		Utility Relocation (Construction Cost)	\$	0	

L)	TOTAL RIGHT OF WAY ESTIMATE	\$243,000
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M)	TOTAL R/W ESTIMATE: Escalated	\$275,000
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N)	RIGHT OF WAY SUPPORT	\$0
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Support Cost Estimate Prepared By	Project Coordinator ¹	Phone
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Utility Estimate Prepared By	Utility Coordinator ²	Phone
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R/W Acquisition Estimate Prepared By	Right of Way Estimator ³	Phone
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Note: Items G & H applied to items A + B

¹ When estimate has Support Costs only² When estimate has Utility Relocation³ When R/W Acquisition is required

PROJECT PLANNING COST ESTIMATE ©

EA:

EA: PID:

PID:

District-County-Route:

PM:

Type of Estimate : Traffic Study Estimate

Program Code : None

Project Limits : Intersection of Midway and Hegan Lane

Project Description: Construction of Traffic Signal

Scope : Intersection Construction

Alternative : 3-leg signal with 4th leg driveway

SUMMARY OF PROJECT COST ESTIMATE

	Current Year Cost	Escalated Cost
TOTAL ROADWAY COST	\$ 3,381,300	\$ 3,986,159
TOTAL STRUCTURES COST	\$ -	\$ -
SUBTOTAL CONSTRUCTION COST	\$ 3,381,300	\$ 3,986,159
TOTAL RIGHT OF WAY COST	\$ 164,000	\$ 186,000
TOTAL CAPITAL OUTLAY COSTS	\$ 3,546,000	\$ 4,173,000
PA/ED SUPPORT	\$ -	\$ -
PS&E SUPPORT	\$ -	\$ -
RIGHT OF WAY SUPPORT	\$ -	\$ -
CONSTRUCTION SUPPORT	\$ -	\$ -
TOTAL SUPPORT COST	\$ -	\$ -

TOTAL PROJECT COST	\$ 3,550,000	\$ 4,180,000
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Programmed Amount

Month / Year
Date of Estimate (Month/Year) 2 / 2022

Estimated Construction Start (Month/Year) 4 / 2025

Number of Working Days = 100

Estimated Mid-Point of Construction (Month/Year) 6 / 2025

Estimated Construction End (Month/Year) 7 / 2025

Number of Plant Establishment Days

Estimated Project Schedule

PID Approval

PA/ED Approval

PS&E

RTL

Begin Construction

Reviewed by District O.E. or
Cost Estimate Certifier

xx/xx/xxxx

(xxx) xxx-xxxx

Office Engineer / Cost Estimate Certifier

Date

Phone

Approved by Project Manager

xx/xx/xxxx

(xxx) xxx-xxxx

Project Manager

Date

Phone

PROJECT COST ESTIMATE

EA: PID:

I. ROADWAY ITEMS SUMMARY

Section		Cost
1	Earthwork	\$ 63,000
2	Pavement Structural Section	\$ 790,200
3	Drainage	\$ 230,000
4	Specialty Items	\$ -
5	Environmental	\$ 105,000
6	Traffic Items	\$ 850,000
7	Detours	\$ -
8	Minor Items	\$ 203,900
9	Roadway Mobilization	\$ 224,300
10	Supplemental Work	\$ 89,700
11	City Furnished	\$ 44,900
12	Time-Related Overhead	\$ -
13	Roadway Contingency	\$ 780,300
TOTAL ROADWAY ITEMS		\$ 3,381,300

Estimate Prepared By :

Erin Gibbs EIT, Staff Engineer

Date

Phone

Estimate Reviewed By :

Michael C Pitcock PE, Staff Engineer

Date

Phone

By signing this estimate you are attesting that you have discussed your project with all functional units and have incorporated all their comments or have discussed with them why they will not be incorporated.

SECTION 1: EARTHWORK

Item code		Unit	Quantity		Unit Price (\$)		Cost
190101	Roadway Excavation	CY	2,100	x	30.00	= \$	63,000
152320	Lead Compliance Plan	LS		x		= \$	-
194001	Ditch Excavation	CY		x		= \$	-
19801X	Imported Borrow	CY/TON		x		= \$	-
192037	Structure Excavation (Retaining Wall)	CY		x		= \$	-
193013	Structure Backfill (Retaining Wall)	CY		x		= \$	-
193031	Pervious Backfill Material (Retaining Wall)	CY		x		= \$	-
16010X	Clearing & Grubbing	LS/ACRE		x		= \$	-
170101	Develop Water Supply	LS		x		= \$	-
19801X	Imported Borrow	CY/TON		x		= \$	-
210130	Duff	ACRE		x		= \$	-
XXXXXX	Some Item	Unit		x		= \$	-

TOTAL EARTHWORK SECTION ITEMS	\$	63,000
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SECTION 2: PAVEMENT STRUCTURAL SECTION

Item code		Unit	Quantity		Unit Price (\$)		Cost
401050	Jointed Plain Concrete Pavement	CY		x		= \$	-
400050	Continuously Reinforced Concrete Pavement	CY		x		= \$	-
404092	Seal Pavement Joint	LF		x		= \$	-
404093	Seal Isolation Joint	LF		x		= \$	-
413117	Seal Concrete Pavement Joint (Silicone)	LF		x		= \$	-
413118	Seal Pavement Joint (Asphalt Rubber)	LF		x		= \$	-
280010	Rapid Strength Concrete Base	CY		x		= \$	-
410095	Dowel Bar (Drill and Bond)	EA		x		= \$	-
390132	Hot Mix Asphalt (Type A)	TON	2,700	x	135.00	= \$	364,500
390137	Rubberized Hot Mix Asphalt (Gap Graded)	TON		x		= \$	-
395041	RHMA-O (Open Graded Fiction Course)	TON		x		= \$	-
393006	Geosynthetic Pavement Interlayer (Paving Grid)	SQYD		x		= \$	-
260203	Class 2 Aggregate Base	CY	1,600	x	90.00	= \$	144,000
290201	Asphalt Treated Permeable Base	CY		x		= \$	-
250401	Class 4 Aggregate Subbase	CY		x		= \$	-
374002	Asphaltic Emulsion (Fog Seal Coat)	TON		x		= \$	-
397005	Tack Coat	TON	6	x	1,700.00	= \$	10,200
390100	Prime Coat	TON	4	x	1,500.00	= \$	6,000
377501	Slurry Seal	TON		x		= \$	-
3750XX	Screenings (Type XX)	TON		x		= \$	-
374492	Asphaltic Emulsion (Polymer Modified)	TON		x		= \$	-
370001	Sand Cover (Seal)	TON		x		= \$	-
731530A	Hot Mix Asphalt (Textured Paving)	TONS		x		= \$	-
730020	Minor Concrete (Curb)	CY	10	x	1,700.00	= \$	17,000
731521	Minor Concrete (Sidewalk)	CY	50	x	1,000.00	= \$	50,000
731504	Minor Concrete (Curb and Gutter)	CY	80	x	1,200.00	= \$	96,000
39407X	Place Hot Mix Asphalt Dike (Type E)	LF		x		= \$	-
150771	Remove Asphalt Concrete Dike	LF		x		= \$	-
420201	Grind Existing Concrete Pavement	SQYD		x		= \$	-
150860	Remove Base and Surfacing	CY		x		= \$	-
390095	Replace Asphalt Concrete Surfacing	CY		x		= \$	-
15312X	Remove Concrete	LS	1	x	25,000.00	= \$	25,000
394090	Place Hot Mix Asphalt (Miscellaneous Area)	SQYD		x		= \$	-
153103	Cold Plane Asphalt Concrete Pavement	SQYD	7,750	x	10.00	= \$	77,500
39405X	Shoulder Rumble Strip (HMA, X-In Indentations)	STA		x		= \$	-
413113	Repair Spalled Joints, Polyester Grout	SQYD		x		= \$	-
420102	Groove Existing Concrete Pavement	SQYD		x		= \$	-
390136	Minor Hot Mix Asphalt	TON		x		= \$	-
394095	Roadside Paving (Miscellaneous Areas)	SQYD		x		= \$	-
XXXXXX	Some Item	Unit		x		= \$	-

TOTAL PAVEMENT STRUCTURAL SECTION ITEMS	\$	790,200
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SECTION 3: DRAINAGE

Item code		Unit	Quantity	Unit Price (\$)	Cost
15080X	Remove Culvert	EA/LF	x	= \$	-
150820	Modify Inlet	EA	x	= \$	-
155232	Sand Backfill	CY	x	= \$	-
15020X	Abandon Culvert	EA/LF	x	= \$	-
152430	Adjust Inlet	LF	x	= \$	-
155003	Cap Inlet	EA	x	= \$	-
510501	Minor Concrete	CY	x	= \$	-
510502	Minor Concrete (Minor Structure)	CY	x	= \$	-
5105XX	Minor Concrete (Type XX)	CY	x	= \$	-
620XXX	XX" Alternative Pipe Culvert (Type X)	LF	x	= \$	-
6411XX	XX" Plastic Pipe	LF	x	= \$	-
65XXXX	XX" Reinforced Concrete Pipe (Type X)	LF	x	= \$	-
6650XX	XX" Corrugated Steel Pipe (0.XXX" Thick)	LF	x	= \$	-
68XXXX	XX" Plastic Pipe (Edge Drain)	LF	x	= \$	-
69011X	XX" Corrugated Steel Pipe Downrain (0.XXX" Th	LF	x	= \$	-
70321X	XX" Corrugated Steel Pipe Inlet (0.XXX" Thick)	LF	x	= \$	-
70XXXX	XX" Corrugated Steel Pipe Riser (0.XXX" Thick)	LF	x	= \$	-
7050XX	XX" Steel Flared End Section	EA	x	= \$	-
703233	Grated Line Drain	LF	x	= \$	-
72XXXX	Rock Slope Protection (Type and Method)	CY/TON	x	= \$	-
72901X	Rock Slope Protection Fabric (Class X)	SQYD	x	= \$	-
721420	Concrete (Ditch Lining)	CY	x	= \$	-
721430	Concrete (Channel Lining)	CY	x	= \$	-
750001	Miscellaneous Iron and Steel	LB	x	= \$	-
XXXXXX	Additional Drainage	LS	1 x	230,000.00 = \$	230,000

TOTAL DRAINAGE ITEMS	\$	230,000
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SECTION 4: SPECIALTY ITEMS

Item code		Unit	Quantity	Unit Price (\$)	Cost
080050	Progress Schedule (Critical Path Method)	LS	x	= \$	-
582001	Sound Wall (Masonry Block)	SQFT	x	= \$	-
510530	Minor Concrete (Wall)	CY	x	= \$	-
15325X	Remove Sound Wall	LF/LS	x	= \$	-
070030	Lead Compliance Plan	LS	x	= \$	-
141120	Treated Wood Waste	LB	x	= \$	-
153221	Remove Concrete Barrier	LF	x	= \$	-
150662	Remove Metal Beam Guard Railing	LF	x	= \$	-
150668	Remove Flared End Section	EA	x	= \$	-
8000XX	Chain Link Fence (Type XX)	LF	x	= \$	-
80XXXX	XX" Chain Link Gate (Type CL-6)	EA	x	= \$	-
832005	Midwest Guardrail System	LF	x	= \$	-
839301	Single Thrie Beam Barrier	LF	x	= \$	-
839310	Double Thrie Beam Barrier	LF	x	= \$	-
839521	Cable Railing	LF	x	= \$	-
8395XX	Terminal System (Type WB-31)	EA	x	= \$	-
839585	Alternative Flared Terminal System	EA	x	= \$	-
839584	Alternative In-line Terminal System	EA	x	= \$	-
498052	60" CIDH Concrete Pile (Sign Foundation)	LF	x	= \$	-
839XXX	Crash Cushion (Insert Type)	EA	x	= \$	-
520103	Bar Reinforced Steel (Retaining Wall)	LB	x	= \$	-
510060	Structural Concrete, Retaining Wall	CY	x	= \$	-
513553	Retaining Wall (Masonry Wall)	SQFT	x	= \$	-
511035	Architectural Treatment	SQFT	x	= \$	-
598001	Anti-Graffiti Coating	SQFT	x	= \$	-
203070	Rock Stain	SQFT	x	= \$	-
5136XX	Reinforced Concrete Crib Wall (Type X)	SQFT	x	= \$	-
839543	Transition Railing (Type WB-31)	EA	x	= \$	-
597601	Prepare and Stain Concrete	SQFT	x	= \$	-
839561	Rail Tensioning Assembly	EA	x	= \$	-
83958X	End Anchor Assembly (Type X)	EA	x	= \$	-
XXXXXX	Some Item	Unit	x	= \$	-

TOTAL SPECIALTY ITEMS	\$	-
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SECTION 5: ENVIRONMENTAL**5A - ENVIRONMENTAL MITIGATION**

Item code	Unit	Quantity	Unit Price (\$)	Cost
Biological Mitigation	LS	x	= \$	-
130670 Temporary Reinforced Silt Fence	LF	x	= \$	-
141000 Temporary Fence (Type ESA)	LF	x	= \$	-
<i>Subtotal Environmental Mitigation</i>				\$ -

5B - LANDSCAPE AND IRRIGATION

Item code	Unit	Quantity	Unit Price (\$)	Cost
20XXXX Highway Planting	LS	1 x	2,400.00 = \$	2,400
20XXXX Irrigation System	LS	1 x	4,800.00 = \$	4,800
204099 Plant Establishment Work	LS	x	= \$	-
204101 Extend Plant Establishment Work	LS	x	= \$	-
20XXXX Follow-up Landscape Project	LS	x	= \$	-
150685 Remove Irrigation Facility	LS	x	= \$	-
20XXXX Maintain Existing (Irrigation or Planted Areas)	LS	x	= \$	-
206400 Check and Test Existing Irrigation Facilities	LS	x	= \$	-
21011X Imported Topsoil (X)	CY/TON	x	= \$	-
20XXXX Rock Blanket, Rock Mulch, DG, Gravel Mulch	SQFT/SQYD	x	= \$	-
200122 Weed Germination	SQYD	x	= \$	-
208304 Water Meter	EA	x	= \$	-
2087XX XX" Conduit (Use for Irrigation x-overs)	LF	x	= \$	-
20890X Extend X" Conduit (Use for Extension of Irrigation x-overs)	LF	x	= \$	-
<i>Subtotal Landscape and Irrigation</i>				\$ 7,200

5C - EROSION CONTROL

Item code	Unit	Quantity	Unit Price (\$)	Cost
210010 Move In/Move Out (Erosion Control)	EA	x	= \$	-
210350 Fiber Rolls	LF	4,000 x	5.00 = \$	20,000
210360 Compost Sock	LF	x	= \$	-
2102XX Rolled Erosion Control Product (X)	SQFT	x	= \$	-
21025X Bonded Fiber Matrix	SQFT/ACRE	x	= \$	-
210300 Hydromulch	SQFT	20,000 x	0.25 = \$	5,000
210420 Straw	SQFT	x	= \$	-
210430 Hydroseed	SQFT	20,000 x	0.20 = \$	4,000
210600 Compost	CY	62 x	150.00 = \$	9,300
210630 Incorporate Materials	SQFT	20,000 x	0.50 = \$	10,000
<i>Subtotal Erosion Control</i>				\$ 48,300

5D - NPDES

Item code	Unit	Quantity	Unit Price (\$)	Cost
130300 Prepare SWPPP	LS	1 x	10,000.00 = \$	10,000
130200 Prepare WPCP	LS	x	= \$	-
130100 Job Site Management	LS	x	= \$	-
130330 Storm Water Annual Report	EA	x	= \$	-
130310 Rain Event Action Plan (REAP)	EA	x	= \$	-
130320 Storm Water Sampling and Analysis Day	EA	x	= \$	-
130520 Temporary Hydraulic Mulch	SQYD	2,250 x	2.50 = \$	5,625
130550 Temporary Hydroseed	SQYD	2,250 x	1.70 = \$	3,825
130505 Move-In/Move-Out (Temporary Erosion Control)	EA	x	= \$	-
130640 Temporary Fiber Roll	LF	x	= \$	-
130900 Temporary Concrete Washout	LS	1 x	5,000.00 = \$	5,000
130710 Temporary Construction Entrance	EA	1 x	10,000.00 = \$	10,000
130610 Temporary Check Dam	LF	x	= \$	-
130620 Temporary Drainage Inlet Protection	EA	x	= \$	-
130730 Street Sweeping	LS	1 x	15,000.00 = \$	15,000
<i>Subtotal NPDES</i>				\$ 49,450

Supplemental Work for NPDES

066595 Water Pollution Control Maintenance Sharing*	LS	x	= \$	-
066596 Additional Water Pollution Control**	LS	x	= \$	-
066597 Storm Water Sampling and Analysis***	LS	x	= \$	-
XXXXXX Some Item	LS	x	= \$	-
<i>Subtotal Supplemental Work for NDPS</i>				\$ -

*Applies to all SWPPPs and those WPCPs with sediment control or soil stabilization BMPs.

**Applies to both SWPPPs and WPCP projects.

*** Applies only to project with SWPPPs.

TOTAL ENVIRONMENTAL	\$	105,000
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SECTION 6: TRAFFIC ITEMS**6A - Traffic Electrical**

Item code	Unit	Quantity	Unit Price (\$)	Cost
860460 Lighting and Sign Illumination	LS	x	= \$	-
860201 Signal and Lighting	LS	1 x	700,000.00 = \$	700,000
860990 Closed Circuit Television System	LS	x	= \$	-
86110X Ramp Metering System (Location X)	LS	x	= \$	-
86070X Interconnection Conduit and Cable	LF/LS	x	= \$	-
5602XX Furnish Sign Structure (Type X)	LB	x	= \$	-
5602XX Install Sign Structure (Type X)	LB	x	= \$	-
498040 XX" CIDHC Pile (Sign Foundation)	LF	x	= \$	-
86080X Inductive Loop Detectors	EA/LS	x	= \$	-
8609XX Traffic Monitoring Station (Type X)	LS	x	= \$	-
15075X Remove Sign Structure	EA/LS	x	= \$	-
151581 Reconstruct Sign Structure	EA	x	= \$	-
152641 Modify Sign Structure	EA	x	= \$	-
860090 Maintain Existing Traffic Management System Ele	LS	x	= \$	-
86XXXX Fiber Optic Conduit System	LS	x	= \$	-
XXXXX Some Item	Unit	x	= \$	-
Subtotal Traffic Electrical				\$ 700,000

6B - Traffic Signing and Striping

Item code	Unit	Quantity	Unit Price (\$)	Cost
566011 Roadside Sign - One Post	EA	x	= \$	-
566012 Roadside Sign - Two Post	EA	x	= \$	-
5602XX Furnish Sign	SQFT	x	= \$	-
568016 Install Sign Panel on Existing Frame	SQFT	x	= \$	-
150711 Remove Painted Traffic Stripe	LF	x	= \$	-
141101 Remove Yellow Painted Traffic Stripe (Hazardous Waste)	LF	x	= \$	-
150712 Remove Painted Pavement Marking	SQFT	x	= \$	-
150742 Remove Roadside Sign	EA	x	= \$	-
152320 Reset Roadside Sign	EA	x	= \$	-
152390 Relocate Roadside Sign	EA	x	= \$	-
82010X Delineator (Class X)	EA	x	= \$	-
840502 Thermoplastic Traffic Stripe (Enhanced Wet Night	LF	x	= \$	-
846012 Thermoplastic Crosswalk and Pavement Marking (	SQFT	x	= \$	-
120090 Construction Area Signs	LS	x	= \$	-
84XXXX Permanent Pavement Delineation	LS	1 x	25,000.00 = \$	25,000
Subtotal Traffic Signing and Striping				\$ 25,000

6C - Traffic Management Plan

Item code	Unit	Quantity	Unit Price (\$)	Cost
12865X Portable Changeable Message Signs	EA/LS	x	= \$	-
Subtotal Traffic Management Plan				\$ -

6C - Stage Construction and Traffic Handling

Item code	Unit	Quantity	Unit Price (\$)	Cost
120199 Traffic Plastic Drum	EA	x	= \$	-
12016X Channelizer (Type X)	EA	x	= \$	-
120120 Type III Barricade	EA	x	= \$	-
129100 Temporary Crash Cushion Module	EA	x	= \$	-
120100 Traffic Control System	LS	x	= \$	-
129110 Temporary Crash Cushion	EA	x	= \$	-
129000 Temporary Railing (Type K)	LF	x	= \$	-
120149 Temporary Pavement Marking (Paint)	SQFT	x	= \$	-
82010X Delineator (Class X)	EA	x	= \$	-
XXXXXX Stage Construction	LS	1 x	125,000.00 = \$	125,000
Subtotal Stage Construction and Traffic Handling				\$ 125,000

TOTAL TRAFFIC ITEMS	\$ 850,000
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SECTION 7: DETOURS

Includes constructing, maintaining, and removal

Item code	Unit	Quantity	Unit Price (\$)	Cost
190101 Roadway Excavation	CY	x	= \$	-
19801X Imported Borrow	CY/TON	x	= \$	-
390132 Hot Mix Asphalt (Type A)	TON	x	= \$	-
26020X Class 2 Aggregate Base	TON/CY	x	= \$	-
250401 Class 4 Aggregate Subbase	CY	x	= \$	-
130620 Temporary Drainage Inlet Protection	EA	x	= \$	-
129000 Temporary Railing (Type K)	LF	x	= \$	-
128601 Temporary Signal System	LS	x	= \$	-
120149 Temporary Pavement Marking (Paint)	SQFT	x	= \$	-
80010X Temporary Fence (Type X)	LF	x	= \$	-
XXXXXX Some Item	LS	x	= \$	-

* Includes constructing, maintaining, and removal

TOTAL DETOURS	\$	-
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SUBTOTAL SECTIONS 1 through 7	\$	2,038,200
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SECTION 8: MINOR ITEMS**8A - Americans with Disabilities Act Items**

ADA Items	1.0%	\$	20,382
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8B - Bike Path Items

Bike Path Items	1.0%	\$	20,382
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8C - Other Minor Items

Other Minor Items	8.0%	\$	163,056
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Total of Section 1-7	\$	2,038,200	x	10.0%	= \$	203,820
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TOTAL MINOR ITEMS	\$	203,900
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SECTIONS 9: ROADWAY MOBILIZATION

Item code						
999990	Total Section 1-8	\$	2,242,100	x	10%	= \$ 224,210

TOTAL ROADWAY MOBILIZATION	\$	224,300
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SECTION 10: SUPPLEMENTAL WORK

Item code	Unit	Quantity	Unit Price (\$)	Cost
066670 Payment Adjustments For Price Index Fluctuations	LS	x	= \$	-
066094 Value Analysis	LS	x	= \$	-
066070 Maintain Traffic	LS	x	= \$	-
066919 Dispute Resolution Board	LS	x	= \$	-
066921 Dispute Resolution Advisor	LS	x	= \$	-
066015 Federal Trainee Program	LS	x	= \$	-
066610 Partnering	LS	x	= \$	-
066204 Remove Rock and Debris	LS	x	= \$	-
066222 Locate Existing Crossover	LS	x	= \$	-
XXXXXX Some Item	Unit	x	= \$	-

Cost of NPDES Supplemental Work specified in Section 5D	= \$	-
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Total Section 1-8	\$	2,242,100	4%	= \$	89,684
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TOTAL SUPPLEMENTAL WORK	\$	89,700
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SECTION 11: CITY FURNISHED MATERIALS AND EXPENSES

Item code		Unit	Quantity	Unit Price (\$)		Cost
066105	Resident Engineers Office	LS	x	=		\$0
066063	Traffic Management Plan - Public Information	LS	x	=		\$0
066901	Water Expenses	LS	x	=		\$0
8609XX	Traffic Monitoring Station (X)	LS	x	=		\$0
066841	Traffic Controller Assembly	LS	x	=		\$0
066840	Traffic Signal Controller Assembly	LS	x	=		\$0
066062	COZEEP Contract	LS	x	=		\$0
066838	Reflective Numbers and Edge Sealer	LS	x	=		\$0
066065	Tow Truck Service Patrol	LS	x	=		\$0
066916	Annual Construction General Permit Fee	LS	x	=		\$0
XXXXXX	Some Item	Unit	x	=		\$0
Total Section 1-8		\$	2,242,100	2%	= \$	44,842

TOTAL CITY FURNISHED	\$44,900
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SECTION 12: TIME-RELATED OVERHEAD

Total of Roadway and Structures Contract Items excluding Mobilization \$2,242,100 (used to calculate TRO)
Total Construction Cost (excluding TRO and Contingency) \$2,601,000 (used to check if project is greater than \$5 million excluding contingency)

Estimated Time-Related Overhead (TRO) Percentage (0% to 10%) = 6%

Item code		Unit	Quantity	Unit Price (\$)		Cost
090100	Time-Related Overhead	WD	100	X	\$0 =	\$0

TOTAL TIME-RELATED OVERHEAD	\$0
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SECTION 13: ROADWAY CONTINGENCY

Total Section 1-12 \$ 2,601,000 x 30% = \$780,300

TOTAL CONTINGENCY	\$780,300
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II. STRUCTURE ITEMS

	Bridge 1		Bridge 2		
DATE OF ESTIMATE	00/00/00		00/00/00		00/00/00
Bridge Name	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Bridge Number	57-XXX		57-XXX		57-XXX
Structure Type	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Width (Feet) [out to out]	0 LF		0 LF		0 LF
Total Bridge Length (Feet)	0 LF		0 LF		0 LF
Total Area (Square Feet)	0 SQFT		0 SQFT		0 SQFT
Structure Depth (Feet)	0 LF		0 LF		0 LF
Footing Type (pile or spread)	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Cost Per Square Foot	\$0		\$0		\$0
COST OF EACH	\$0		\$0		\$0

	Building 1				
DATE OF ESTIMATE	00/00/00		00/00/00		00/00/00
Building Name	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Bridge Number	57-XXX		57-XXX		57-XXX
Structure Type	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Width (Feet) [out to out]	0 LF		0 LF		0 LF
Total Building Length (Feet)	0 LF		0 LF		0 LF
Total Area (Square Feet)	0 SQFT		0 SQFT		0 SQFT
Structure Depth (Feet)	0 LF		0 LF		0 LF
Footing Type (pile or spread)	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Cost Per Square Foot	\$0		\$0		\$0
COST OF EACH	\$0		\$0		\$0

TOTAL COST OF BRIDGES	\$0
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TOTAL COST OF BUILDINGS	\$0
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STRUCTURES MOBILIZATION	10%	\$0
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Recommended Contingency: (Pre-PSR 30%-50%, PSR 25%, Draft PR 20%, PR 15%, after PR approval 10%, Final PS&E 5%)

Total recommended percentages includes any quantified risk based contingency from the risk register.

STRUCTURES CONTINGENCY	10%	\$0
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TOTAL COST OF STRUCTURES	\$0
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Estimate Prepared By: _____
 XXXXXXXXXXXXXXXXXXXX ----- Division of Structures

 Date

III. RIGHT OF WAY

Fill in all of the available information from the Right of Way Data Sheet.

A)	A1)	Acquisition, including Excess Land Purchases, Damages & Goodwill, Fees	\$	39,000
	A2)	SB-1210	\$	0
B)		Acquisition of Offsite Mitigation	\$	0
C)	C1)	Utility Relocation (City Share)	\$	100,000
	C2)	Potholing (Design Phase)	\$	25,000
D)		Railroad Acquisition	\$	0
E)		Clearance / Demolition	\$	0
F)		Relocation Assistance (RAP and/or Last Resort Housing Costs)	\$	0
G)		Title and Escrow	\$	0
H)		Environmental Review	\$	0
I)		Condemnation Settlements <u>0%</u>	\$	0
J)		Design Appreciation Factor <u>0%</u>	\$	0
K)		Utility Relocation (Construction Cost)	\$	0

L)	TOTAL RIGHT OF WAY ESTIMATE	\$164,000
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M)	TOTAL R/W ESTIMATE: Escalated	\$186,000
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N)	RIGHT OF WAY SUPPORT	\$0
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Support Cost Estimate Prepared By	Project Coordinator ¹	Phone
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Utility Estimate Prepared By	Utility Coordinator ²	Phone
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R/W Acquisition Estimate Prepared By	Right of Way Estimator ³	Phone
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Note: Items G & H applied to items A + B

¹ When estimate has Support Costs only² When estimate has Utility Relocation³ When R/W Acquisition is required

PROJECT PLANNING COST ESTIMATE ©

EA:

EA: PID:

PID:

District-County-Route:

PM:

Type of Estimate : Traffic Study Estimate

Program Code : None

Project Limits : Intersection of Hegan Lane and Otterson Way

Project Description: Construction of Modern Roundabout

Scope : Intersection Construction

Alternative : 3-Leg Roundabout with 4th leg Driveway

SUMMARY OF PROJECT COST ESTIMATE

	Current Year Cost	Escalated Cost
TOTAL ROADWAY COST	\$ 2,706,500	\$ 3,190,648
TOTAL STRUCTURES COST	\$ -	\$ -
SUBTOTAL CONSTRUCTION COST	\$ 2,706,500	\$ 3,190,648
TOTAL RIGHT OF WAY COST	\$ 149,000	\$ 169,000
TOTAL CAPITAL OUTLAY COSTS	\$ 2,856,000	\$ 3,360,000
PA/ED SUPPORT	\$ -	\$ -
PS&E SUPPORT	\$ -	\$ -
RIGHT OF WAY SUPPORT	\$ -	\$ -
CONSTRUCTION SUPPORT	\$ -	\$ -
TOTAL SUPPORT COST	\$ -	\$ -

TOTAL PROJECT COST	\$ 2,860,000	\$ 3,360,000
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Programmed Amount

Month / Year
Date of Estimate (Month/Year) 2 / 2022

Estimated Construction Start (Month/Year) 3 / 2025

Number of Working Days = 180

Estimated Mid-Point of Construction (Month/Year) 7 / 2025

Estimated Construction End (Month/Year) 12 / 2025

Number of Plant Establishment Days

Estimated Project Schedule

PID Approval

PA/ED Approval

PS&E

RTL

Begin Construction

Reviewed by District O.E. or
Cost Estimate Certifier

xx/xx/xxxx

(xxx) xxx-xxxx

Office Engineer / Cost Estimate Certifier

Date

Phone

Approved by Project Manager

xx/xx/xxxx

(xxx) xxx-xxxx

Project Manager

Date

Phone

PROJECT COST ESTIMATE

EA: PID:

I. ROADWAY ITEMS SUMMARY

Section		Cost
1	Earthwork	\$ 99,000
2	Pavement Structural Section	\$ 891,900
3	Drainage	\$ 150,000
4	Specialty Items	\$ 12,600
5	Environmental	\$ 270,700
6	Traffic Items	\$ 420,000
7	Detours	\$ -
8	Minor Items	\$ 184,500
9	Roadway Mobilization	\$ 202,900
10	Supplemental Work	\$ 81,200
11	City Furnished	\$ 40,600
12	Time-Related Overhead	\$ -
13	Roadway Contingency	\$ 353,100
TOTAL ROADWAY ITEMS		\$ 2,706,500

Estimate Prepared By :

Erin Gibbs EIT, Staff Engineer

Date

Phone

Estimate Reviewed By :

Michael C Pitcock PE, Staff Engineer

Date

Phone

By signing this estimate you are attesting that you have discussed your project with all functional units and have incorporated all their comments or have discussed with them why they will not be incorporated.

SECTION 1: EARTHWORK

Item code		Unit	Quantity		Unit Price (\$)		Cost
190101	Roadway Excavation	CY	3,300	x	30.00	= \$	99,000
152320	Lead Compliance Plan	LS		x		= \$	-
194001	Ditch Excavation	CY		x		= \$	-
19801X	Imported Borrow	CY/TON		x		= \$	-
192037	Structure Excavation (Retaining Wall)	CY		x		= \$	-
193013	Structure Backfill (Retaining Wall)	CY		x		= \$	-
193031	Pervious Backfill Material (Retaining Wall)	CY		x		= \$	-
16010X	Clearing & Grubbing	LS/ACRE		x		= \$	-
170101	Develop Water Supply	LS		x		= \$	-
19801X	Imported Borrow	CY/TON		x		= \$	-
210130	Duff	ACRE		x		= \$	-
XXXXXX	Some Item	Unit		x		= \$	-

TOTAL EARTHWORK SECTION ITEMS	\$	99,000
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SECTION 2: PAVEMENT STRUCTURAL SECTION

Item code		Unit	Quantity		Unit Price (\$)		Cost
401050	Jointed Plain Concrete Pavement	CY		x		= \$	-
400050	Continuously Reinforced Concrete Pavement	CY		x		= \$	-
404092	Seal Pavement Joint	LF		x		= \$	-
404093	Seal Isolation Joint	LF		x		= \$	-
413117	Seal Concrete Pavement Joint (Silicone)	LF		x		= \$	-
413118	Seal Pavement Joint (Asphalt Rubber)	LF		x		= \$	-
280010	Rapid Strength Concrete Base	CY		x		= \$	-
410095	Dowel Bar (Drill and Bond)	EA		x		= \$	-
390132	Hot Mix Asphalt (Type A)	TON	2,100	x	135.00	= \$	283,500
390137	Rubberized Hot Mix Asphalt (Gap Graded)	TON		x		= \$	-
395041	RHMA-O (Open Graded Fiction Course)	TON		x		= \$	-
393006	Geosynthetic Pavement Interlayer (Paving Grid)	SQYD		x		= \$	-
260203	Class 2 Aggregate Base	CY	2,305	x	90.00	= \$	207,450
290201	Asphalt Treated Permeable Base	CY		x		= \$	-
250401	Class 4 Aggregate Subbase	CY		x		= \$	-
374002	Asphaltic Emulsion (Fog Seal Coat)	TON		x		= \$	-
397005	Tack Coat	TON	2	x	1,700.00	= \$	3,400
390100	Prime Coat	TON	5	x	1,500.00	= \$	7,500
377501	Slurry Seal	TON		x		= \$	-
3750XX	Screenings (Type XX)	TON		x		= \$	-
374492	Asphaltic Emulsion (Polymer Modified)	TON		x		= \$	-
370001	Sand Cover (Seal)	TON		x		= \$	-
731530A	Hot Mix Asphalt (Textured Paving)	TONS		x		= \$	-
730020	Minor Concrete (Curb)	CY	80	x	1,700.00	= \$	136,000
731521	Minor Concrete (Sidewalk)	CY	120	x	1,000.00	= \$	120,000
731504	Minor Concrete (Curb and Gutter)	CY	70	x	1,200.00	= \$	84,000
39407X	Place Hot Mix Asphalt Dike (Type E)	LF		x		= \$	-
150771	Remove Asphalt Concrete Dike	LF		x		= \$	-
420201	Grind Existing Concrete Pavement	SQYD		x		= \$	-
150860	Remove Base and Surfacing	CY		x		= \$	-
390095	Replace Asphalt Concrete Surfacing	CY		x		= \$	-
15312X	Remove Concrete	LS	1	x	50,000.00	= \$	50,000
394090	Place Hot Mix Asphalt (Miscellaneous Area)	SQYD		x		= \$	-
153103	Cold Plane Asphalt Concrete Pavement	SQYD		x		= \$	-
39405X	Shoulder Rumble Strip (HMA, X-In Indentations)	STA		x		= \$	-
413113	Repair Spalled Joints, Polyester Grout	SQYD		x		= \$	-
420102	Groove Existing Concrete Pavement	SQYD		x		= \$	-
390136	Minor Hot Mix Asphalt	TON		x		= \$	-
394095	Roadside Paving (Miscellaneous Areas)	SQYD		x		= \$	-
XXXXXX	Some Item	Unit		x		= \$	-

TOTAL PAVEMENT STRUCTURAL SECTION ITEMS	\$	891,900
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SECTION 3: DRAINAGE

Item code		Unit	Quantity	Unit Price (\$)	Cost
15080X	Remove Culvert	EA/LF	x	= \$	-
150820	Modify Inlet	EA	x	= \$	-
155232	Sand Backfill	CY	x	= \$	-
15020X	Abandon Culvert	EA/LF	x	= \$	-
152430	Adjust Inlet	LF	x	= \$	-
155003	Cap Inlet	EA	x	= \$	-
510501	Minor Concrete	CY	x	= \$	-
510502	Minor Concrete (Minor Structure)	CY	x	= \$	-
5105XX	Minor Concrete (Type XX)	CY	x	= \$	-
620XXX	XX" Alternative Pipe Culvert (Type X)	LF	x	= \$	-
6411XX	XX" Plastic Pipe	LF	x	= \$	-
65XXXX	XX" Reinforced Concrete Pipe (Type X)	LF	x	= \$	-
6650XX	XX" Corrugated Steel Pipe (0.XXX" Thick)	LF	x	= \$	-
68XXXX	XX" Plastic Pipe (Edge Drain)	LF	x	= \$	-
69011X	XX" Corrugated Steel Pipe Downrain (0.XXX" Th	LF	x	= \$	-
70321X	XX" Corrugated Steel Pipe Inlet (0.XXX" Thick)	LF	x	= \$	-
70XXXX	XX" Corrugated Steel Pipe Riser (0.XXX" Thick)	LF	x	= \$	-
7050XX	XX" Steel Flared End Section	EA	x	= \$	-
703233	Grated Line Drain	LF	x	= \$	-
72XXXX	Rock Slope Protection (Type and Method)	CY/TON	x	= \$	-
72901X	Rock Slope Protection Fabric (Class X)	SQYD	x	= \$	-
721420	Concrete (Ditch Lining)	CY	x	= \$	-
721430	Concrete (Channel Lining)	CY	x	= \$	-
750001	Miscellaneous Iron and Steel	LB	x	= \$	-
XXXXXX	Additional Drainage	LS	1 x	150,000.00 = \$	150,000

TOTAL DRAINAGE ITEMS	\$	150,000
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SECTION 4: SPECIALTY ITEMS

Item code		Unit	Quantity	Unit Price (\$)	Cost
080050	Progress Schedule (Critical Path Method)	LS	x	= \$	-
582001	Sound Wall (Masonry Block)	SQFT	x	= \$	-
510530	Minor Concrete (Wall)	CY	x	= \$	-
15325X	Remove Sound Wall	LF/LS	x	= \$	-
070030	Lead Compliance Plan	LS	x	= \$	-
141120	Treated Wood Waste	LB	x	= \$	-
153221	Remove Concrete Barrier	LF	x	= \$	-
150662	Remove Metal Beam Guard Railing	LF	x	= \$	-
150668	Remove Flared End Section	EA	x	= \$	-
8000XX	Chain Link Fence (Type XX)	LF	x	= \$	-
80XXXX	XX" Chain Link Gate (Type CL-6)	EA	x	= \$	-
832005	Midwest Guardrail System	LF	x	= \$	-
839301	Single Thrie Beam Barrier	LF	x	= \$	-
839310	Double Thrie Beam Barrier	LF	x	= \$	-
839521	Cable Railing	LF	x	= \$	-
8395XX	Terminal System (Type WB-31)	EA	x	= \$	-
839585	Alternative Flared Terminal System	EA	x	= \$	-
839584	Alternative In-line Terminal System	EA	x	= \$	-
498052	60" CIDH Concrete Pile (Sign Foundation)	LF	x	= \$	-
839XXX	Crash Cushion (Insert Type)	EA	x	= \$	-
520103	Bar Reinforced Steel (Retaining Wall)	LB	x	= \$	-
510060	Structural Concrete, Retaining Wall	CY	x	= \$	-
513553	Retaining Wall (Masonry Wall)	SQFT	x	= \$	-
511035	Architectural Treatment	SQFT	x	= \$	-
598001	Anti-Graffiti Coating	SQFT	x	= \$	-
203070	Rock Stain	SQFT	x	= \$	-
5136XX	Reinforced Concrete Crib Wall (Type X)	SQFT	x	= \$	-
839543	Transition Railing (Type WB-31)	EA	x	= \$	-
597601	Prepare and Stain Concrete	SQFT	2,100 x	6.00 = \$	12,600
839561	Rail Tensioning Assembly	EA	x	= \$	-
83958X	End Anchor Assembly (Type X)	EA	x	= \$	-
XXXXXX	Some Item	Unit	x	= \$	-

TOTAL SPECIALTY ITEMS	\$	12,600
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SECTION 5: ENVIRONMENTAL**5A - ENVIRONMENTAL MITIGATION**

Item code	Unit	Quantity	Unit Price (\$)	Cost
Biological Mitigation	LS	1	x 50,000.00 = \$	50,000
130670 Temporary Reinforced Silt Fence	LF	x	= \$	-
141000 Temporary Fence (Type ESA)	LF	x	= \$	-
<i>Subtotal Environmental Mitigation</i>				<i>\$ 50,000</i>

5B - LANDSCAPE AND IRRIGATION

Item code	Unit	Quantity	Unit Price (\$)	Cost
20XXXX Highway Planting	LS	1	x 50,500.00 = \$	50,500
20XXXX Irrigation System	LS	1	x 101,000.00 = \$	101,000
204099 Plant Establishment Work	LS	x	= \$	-
204101 Extend Plant Establishment Work	LS	x	= \$	-
20XXXX Follow-up Landscape Project	LS	x	= \$	-
150685 Remove Irrigation Facility	LS	x	= \$	-
20XXXX Maintain Existing (Irrigation or Planted Areas)	LS	x	= \$	-
206400 Check and Test Existing Irrigation Facilities	LS	x	= \$	-
21011X Imported Topsoil (X)	CY/TON	x	= \$	-
20XXXX Rock Blanket, Rock Mulch, DG, Gravel Mulch	SQFT/SQYD	x	= \$	-
200122 Weed Germination	SQYD	x	= \$	-
208304 Water Meter	EA	x	= \$	-
2087XX XX" Conduit (Use for Irrigation x-overs)	LF	x	= \$	-
20890X Extend X" Conduit (Use for Extension of Irrigation x-overs)	LF	x	= \$	-
<i>Subtotal Landscape and Irrigation</i>				<i>\$ 151,500</i>

5C - EROSION CONTROL

Item code	Unit	Quantity	Unit Price (\$)	Cost
210010 Move In/Move Out (Erosion Control)	EA	1	x 5,000.00 = \$	5,000
210350 Fiber Rolls	LF	2,000	x 5.00 = \$	10,000
210360 Compost Sock	LF	x	= \$	-
2102XX Rolled Erosion Control Product (X)	SQFT	x	= \$	-
21025X Bonded Fiber Matrix	SQFT/ACRE	x	= \$	-
210300 Hydromulch	SQFT	10,000	x 0.25 = \$	2,500
210420 Straw	SQFT	x	= \$	-
210430 Hydroseed	SQFT	10,000	x 0.20 = \$	2,000
210600 Compost	CY	31	x 150.00 = \$	4,650
210630 Incorporate Materials	SQFT	10,000	x 0.50 = \$	5,000
<i>Subtotal Erosion Control</i>				<i>\$ 29,150</i>

5D - NPDES

Item code	Unit	Quantity	Unit Price (\$)	Cost
130300 Prepare SWPPP	LS	1	x 10,000.00 = \$	10,000
130200 Prepare WPCP	LS	x	= \$	-
130100 Job Site Management	LS	x	= \$	-
130330 Storm Water Annual Report	EA	x	= \$	-
130310 Rain Event Action Plan (REAP)	EA	x	= \$	-
130320 Storm Water Sampling and Analysis Day	EA	x	= \$	-
130520 Temporary Hydraulic Mulch	SQYD	x	= \$	-
130550 Temporary Hydroseed	SQYD	x	= \$	-
130505 Move-In/Move-Out (Temporary Erosion Control)	EA	x	= \$	-
130640 Temporary Fiber Roll	LF	x	= \$	-
130900 Temporary Concrete Washout	LS	1	x 5,000.00 = \$	5,000
130710 Temporary Construction Entrance	EA	1	x 10,000.00 = \$	10,000
130610 Temporary Check Dam	LF	x	= \$	-
130620 Temporary Drainage Inlet Protection	EA	x	= \$	-
130730 Street Sweeping	LS	1	x 15,000.00 = \$	15,000
<i>Subtotal NPDES</i>				<i>\$ 40,000</i>

Supplemental Work for NPDES

066595 Water Pollution Control Maintenance Sharing*	LS	x	= \$	-
066596 Additional Water Pollution Control**	LS	x	= \$	-
066597 Storm Water Sampling and Analysis***	LS	x	= \$	-
XXXXXX Some Item	LS	x	= \$	-
<i>Subtotal Supplemental Work for NDPS</i>				<i>\$ -</i>

*Applies to all SWPPPs and those WPCPs with sediment control or soil stabilization BMPs.

**Applies to both SWPPPs and WPCP projects.

*** Applies only to project with SWPPPs.

TOTAL ENVIRONMENTAL	\$ 270,700
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SECTION 6: TRAFFIC ITEMS**6A - Traffic Electrical**

Item code	Unit	Quantity	Unit Price (\$)	Cost
860460 Lighting and Sign Illumination	LS	1 x	150,000.00 = \$	150,000
860201 Signal and Lighting	LS	x	= \$	-
860990 Closed Circuit Television System	LS	x	= \$	-
86110X Ramp Metering System (Location X)	LS	x	= \$	-
86070X Interconnection Conduit and Cable	LF/LS	x	= \$	-
5602XX Furnish Sign Structure (Type X)	LB	x	= \$	-
5602XX Install Sign Structure (Type X)	LB	x	= \$	-
498040 XX" CIDHC Pile (Sign Foundation)	LF	x	= \$	-
86080X Inductive Loop Detectors	EA/LS	x	= \$	-
8609XX Traffic Monitoring Station (Type X)	LS	x	= \$	-
15075X Remove Sign Structure	EA/LS	x	= \$	-
151581 Reconstruct Sign Structure	EA	x	= \$	-
152641 Modify Sign Structure	EA	x	= \$	-
860090 Maintain Existing Traffic Management System Ele	LS	x	= \$	-
86XXXX Fiber Optic Conduit System	LS	x	= \$	-
XXXXX Some Item	Unit	x	= \$	-
Subtotal Traffic Electrical				\$ 150,000

6B - Traffic Signing and Striping

Item code	Unit	Quantity	Unit Price (\$)	Cost
566011 Roadside Sign - One Post	EA	x	= \$	-
566012 Roadside Sign - Two Post	EA	x	= \$	-
5602XX Furnish Sign	SQFT	x	= \$	-
568016 Install Sign Panel on Existing Frame	SQFT	x	= \$	-
150711 Remove Painted Traffic Stripe	LF	x	= \$	-
141101 Remove Yellow Painted Traffic Stripe (Hazardous Waste)	LF	x	= \$	-
150712 Remove Painted Pavement Marking	SQFT	x	= \$	-
150742 Remove Roadside Sign	EA	x	= \$	-
152320 Reset Roadside Sign	EA	x	= \$	-
152390 Relocate Roadside Sign	EA	x	= \$	-
82010X Delineator (Class X)	EA	x	= \$	-
840502 Thermoplastic Traffic Stripe (Enhanced Wet Night	LF	x	= \$	-
846012 Thermoplastic Crosswalk and Pavement Marking (	SQFT	x	= \$	-
120090 Construction Area Signs	LS	x	= \$	-
84XXXX Permanent Pavement Delineation	LS	1 x	20,000.00 = \$	20,000
Subtotal Traffic Signing and Striping				\$ 20,000

6C - Traffic Management Plan

Item code	Unit	Quantity	Unit Price (\$)	Cost
12865X Portable Changeable Message Signs	EA/LS	x	= \$	-
Subtotal Traffic Management Plan				\$ -

6C - Stage Construction and Traffic Handling

Item code	Unit	Quantity	Unit Price (\$)	Cost
120199 Traffic Plastic Drum	EA	x	= \$	-
12016X Channelizer (Type X)	EA	x	= \$	-
120120 Type III Barricade	EA	x	= \$	-
129100 Temporary Crash Cushion Module	EA	x	= \$	-
120100 Traffic Control System	LS	x	= \$	-
129110 Temporary Crash Cushion	EA	x	= \$	-
129000 Temporary Railing (Type K)	LF	x	= \$	-
120149 Temporary Pavement Marking (Paint)	SQFT	x	= \$	-
82010X Delineator (Class X)	EA	x	= \$	-
XXXXXX Stage Construction	LS	1 x	250,000.00 = \$	250,000
Subtotal Stage Construction and Traffic Handling				\$ 250,000

TOTAL TRAFFIC ITEMS	\$ 420,000
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SECTION 7: DETOURS

Includes constructing, maintaining, and removal

Item code	Unit	Quantity	Unit Price (\$)	Cost
190101 Roadway Excavation	CY	x	= \$	-
19801X Imported Borrow	CY/TON	x	= \$	-
390132 Hot Mix Asphalt (Type A)	TON	x	= \$	-
26020X Class 2 Aggregate Base	TON/CY	x	= \$	-
250401 Class 4 Aggregate Subbase	CY	x	= \$	-
130620 Temporary Drainage Inlet Protection	EA	x	= \$	-
129000 Temporary Railing (Type K)	LF	x	= \$	-
128601 Temporary Signal System	LS	x	= \$	-
120149 Temporary Pavement Marking (Paint)	SQFT	x	= \$	-
80010X Temporary Fence (Type X)	LF	x	= \$	-
XXXXXX Some Item	LS	x	= \$	-

* Includes constructing, maintaining, and removal

TOTAL DETOURS	\$	-
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SUBTOTAL SECTIONS 1 through 7	\$	1,844,200
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SECTION 8: MINOR ITEMS**8A - Americans with Disabilities Act Items**

ADA Items	1.0%	\$	18,442
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8B - Bike Path Items

Bike Path Items	1.0%	\$	18,442
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8C - Other Minor Items

Other Minor Items	8.0%	\$	147,536
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Total of Section 1-7	\$	1,844,200	x	10.0%	= \$	184,420
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TOTAL MINOR ITEMS	\$	184,500
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SECTIONS 9: ROADWAY MOBILIZATION

Item code						
999990	Total Section 1-8	\$	2,028,700	x	10%	= \$ 202,870

TOTAL ROADWAY MOBILIZATION	\$	202,900
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SECTION 10: SUPPLEMENTAL WORK

Item code	Unit	Quantity	Unit Price (\$)	Cost
066670 Payment Adjustments For Price Index Fluctuations	LS	x	= \$	-
066094 Value Analysis	LS	x	= \$	-
066070 Maintain Traffic	LS	x	= \$	-
066919 Dispute Resolution Board	LS	x	= \$	-
066921 Dispute Resolution Advisor	LS	x	= \$	-
066015 Federal Trainee Program	LS	x	= \$	-
066610 Partnering	LS	x	= \$	-
066204 Remove Rock and Debris	LS	x	= \$	-
066222 Locate Existing Crossover	LS	x	= \$	-
XXXXXX Some Item	Unit	x	= \$	-

Cost of NPDES Supplemental Work specified in Section 5D	= \$	-
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Total Section 1-8	\$	2,028,700	4%	= \$	81,148
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TOTAL SUPPLEMENTAL WORK	\$	81,200
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SECTION 11: CITY FURNISHED MATERIALS AND EXPENSES

Item code		Unit	Quantity	Unit Price (\$)		Cost
066105	Resident Engineers Office	LS	x	=		\$0
066063	Traffic Management Plan - Public Information	LS	x	=		\$0
066901	Water Expenses	LS	x	=		\$0
8609XX	Traffic Monitoring Station (X)	LS	x	=		\$0
066841	Traffic Controller Assembly	LS	x	=		\$0
066840	Traffic Signal Controller Assembly	LS	x	=		\$0
066062	COZEEP Contract	LS	x	=		\$0
066838	Reflective Numbers and Edge Sealer	LS	x	=		\$0
066065	Tow Truck Service Patrol	LS	x	=		\$0
066916	Annual Construction General Permit Fee	LS	x	=		\$0
XXXXXX	Some Item	Unit	x	=		\$0
Total Section 1-8		\$	2,028,700	2%	= \$	40,574

TOTAL CITY FURNISHED	\$40,600
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SECTION 12: TIME-RELATED OVERHEAD

Total of Roadway and Structures Contract Items excluding Mobilization \$2,028,700 (used to calculate TRO)
 Total Construction Cost (excluding TRO and Contingency) \$2,353,400 (used to check if project is greater than \$5 million excluding contingency)

Estimated Time-Related Overhead (TRO) Percentage (0% to 10%) = **6%**

Item code		Unit	Quantity	Unit Price (\$)		Cost
090100	Time-Related Overhead	WD	180	X	\$0	= \$0

TOTAL TIME-RELATED OVERHEAD	\$0
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SECTION 13: ROADWAY CONTINGENCY

Total Section 1-12 \$ 2,353,400 x 15% = \$353,010

TOTAL CONTINGENCY	\$353,100
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II. STRUCTURE ITEMS

	<u>Bridge 1</u>		<u>Bridge 2</u>		
DATE OF ESTIMATE	00/00/00		00/00/00		00/00/00
Bridge Name	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Bridge Number	57-XXX		57-XXX		57-XXX
Structure Type	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Width (Feet) [out to out]	0 LF		0 LF		0 LF
Total Bridge Length (Feet)	0 LF		0 LF		0 LF
Total Area (Square Feet)	0 SQFT		0 SQFT		0 SQFT
Structure Depth (Feet)	0 LF		0 LF		0 LF
Footing Type (pile or spread)	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Cost Per Square Foot	\$0		\$0		\$0
COST OF EACH	\$0		\$0		\$0

	<u>Building 1</u>				
DATE OF ESTIMATE	00/00/00		00/00/00		00/00/00
Building Name	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Bridge Number	57-XXX		57-XXX		57-XXX
Structure Type	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Width (Feet) [out to out]	0 LF		0 LF		0 LF
Total Building Length (Feet)	0 LF		0 LF		0 LF
Total Area (Square Feet)	0 SQFT		0 SQFT		0 SQFT
Structure Depth (Feet)	0 LF		0 LF		0 LF
Footing Type (pile or spread)	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Cost Per Square Foot	\$0		\$0		\$0
COST OF EACH	\$0		\$0		\$0

TOTAL COST OF BRIDGES	\$0
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TOTAL COST OF BUILDINGS	\$0
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STRUCTURES MOBILIZATION	10%	\$0
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Recommended Contingency: (Pre-PSR 30%-50%, PSR 25%, Draft PR 20%, PR 15%, after PR approval 10%, Final PS&E 5%)

Total recommended percentages includes any quantified risk based contingency from the risk register.

STRUCTURES CONTINGENCY	10%	\$0
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TOTAL COST OF STRUCTURES	\$0
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Estimate Prepared By: _____
 XXXXXXXXXXXXXXXXXXXX ----- Division of Structures

 Date

III. RIGHT OF WAY

Fill in all of the available information from the Right of Way Data Sheet.

A)	A1)	Acquisition, including Excess Land Purchases, Damages & Goodwill, Fees	\$	114,000
	A2)	SB-1210	\$	0
B)		Acquisition of Offsite Mitigation	\$	0
C)	C1)	Utility Relocation (City Share)	\$	10,000
	C2)	Potholing (Design Phase)	\$	25,000
D)		Railroad Acquisition	\$	0
E)		Clearance / Demolition	\$	0
F)		Relocation Assistance (RAP and/or Last Resort Housing Costs)	\$	0
G)		Title and Escrow	\$	0
H)		Environmental Review	\$	0
I)		Condemnation Settlements <u>0%</u>	\$	0
J)		Design Appreciation Factor <u>0%</u>	\$	0
K)		Utility Relocation (Construction Cost)	\$	0

L)	TOTAL RIGHT OF WAY ESTIMATE	\$149,000
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M)	TOTAL R/W ESTIMATE: Escalated	\$169,000
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N)	RIGHT OF WAY SUPPORT	\$0
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Support Cost Estimate Prepared By	Project Coordinator ¹	Phone
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Utility Estimate Prepared By	Utility Coordinator ²	Phone
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R/W Acquisition Estimate Prepared By	Right of Way Estimator ³	Phone
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Note: Items G & H applied to items A + B

¹ When estimate has Support Costs only² When estimate has Utility Relocation³ When R/W Acquisition is required

PROJECT PLANNING COST ESTIMATE ©

EA:

EA: PID:

PID:

District-County-Route:

PM:

Type of Estimate : Traffic Study Estimate

Program Code : None

Project Limits : Intersection of Hegan Lane and Otterson Drive

Project Description: Construction of Traffic Signal

Scope : Intersection Construction

Alternative : 3-Leg Signal with 4th leg driveway

SUMMARY OF PROJECT COST ESTIMATE

	Current Year Cost	Escalated Cost
TOTAL ROADWAY COST	\$ 1,694,000	\$ 1,997,029
TOTAL STRUCTURES COST	\$ -	\$ -
SUBTOTAL CONSTRUCTION COST	\$ 1,694,000	\$ 1,997,029
TOTAL RIGHT OF WAY COST	\$ 27,000	\$ 31,000
TOTAL CAPITAL OUTLAY COSTS	\$ 1,721,000	\$ 2,029,000
PAVED SUPPORT	\$ -	\$ -
PS&E SUPPORT	\$ -	\$ -
RIGHT OF WAY SUPPORT	\$ -	\$ -
CONSTRUCTION SUPPORT	\$ -	\$ -
TOTAL SUPPORT COST	\$ -	\$ -

TOTAL PROJECT COST	\$ 1,730,000	\$ 2,030,000
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Programmed Amount

Month / Year

Date of Estimate (Month/Year) 2 / 2022

Estimated Construction Start (Month/Year) 4 / 2025

Number of Working Days = 100

Estimated Mid-Point of Construction (Month/Year) 6 / 2025

Estimated Construction End (Month/Year) 7 / 2025

Number of Plant Establishment Days

Estimated Project Schedule

PID Approval
PAVED Approval
PS&E
RTL
Begin Construction

Reviewed by District O.E. or
Cost Estimate Certifier

xx/xx/xxxx

(xxx) xxx-xxxx

Office Engineer / Cost Estimate Certifier

Date

Phone

Approved by Project Manager

xx/xx/xxxx

(xxx) xxx-xxxx

Project Manager

Date

Phone

PROJECT COST ESTIMATE

EA: PID:

I. ROADWAY ITEMS SUMMARY

Section		Cost
1	Earthwork	\$ 8,000
2	Pavement Structural Section	\$ 223,800
3	Drainage	\$ 62,000
4	Specialty Items	\$ -
5	Environmental	\$ 40,500
6	Traffic Items	\$ 820,000
7	Detours	\$ -
8	Minor Items	\$ 115,500
9	Roadway Mobilization	\$ 127,000
10	Supplemental Work	\$ 50,800
11	City Furnished	\$ 25,400
12	Time-Related Overhead	\$ -
13	Roadway Contingency	\$ 221,000
TOTAL ROADWAY ITEMS		\$ 1,694,000

Estimate Prepared By :

Name and Title	Date	Phone
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Estimate Reviewed By :

Name and Title	Date	Phone
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By signing this estimate you are attesting that you have discussed your project with all functional units and have incorporated all their comments or have discussed with them why they will not be incorporated.

SECTION 1: EARTHWORK

Item code		Unit	Quantity		Unit Price (\$)		Cost
190101	Roadway Excavation	CY	160	x	50.00	= \$	8,000
152320	Lead Compliance Plan	LS		x		= \$	-
194001	Ditch Excavation	CY		x		= \$	-
19801X	Imported Borrow	CY/TON		x		= \$	-
192037	Structure Excavation (Retaining Wall)	CY		x		= \$	-
193013	Structure Backfill (Retaining Wall)	CY		x		= \$	-
193031	Pervious Backfill Material (Retaining Wall)	CY		x		= \$	-
16010X	Clearing & Grubbing	LS/ACRE		x		= \$	-
170101	Develop Water Supply	LS		x		= \$	-
19801X	Imported Borrow	CY/TON		x		= \$	-
210130	Duff	ACRE		x		= \$	-
XXXXXX	Some Item	Unit		x		= \$	-

TOTAL EARTHWORK SECTION ITEMS	\$	8,000
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SECTION 2: PAVEMENT STRUCTURAL SECTION

Item code		Unit	Quantity		Unit Price (\$)		Cost
401050	Jointed Plain Concrete Pavement	CY		x		= \$	-
400050	Continuously Reinforced Concrete Pavement	CY		x		= \$	-
404092	Seal Pavement Joint	LF		x		= \$	-
404093	Seal Isolation Joint	LF		x		= \$	-
413117	Seal Concrete Pavement Joint (Silicone)	LF		x		= \$	-
413118	Seal Pavement Joint (Asphalt Rubber)	LF		x		= \$	-
280010	Rapid Strength Concrete Base	CY		x		= \$	-
410095	Dowel Bar (Drill and Bond)	EA		x		= \$	-
390132	Hot Mix Asphalt (Type A)	TON	660	x	135.00	= \$	89,100
390137	Rubberized Hot Mix Asphalt (Gap Graded)	TON		x		= \$	-
395041	RHMA-O (Open Graded Fiction Course)	TON		x		= \$	-
393006	Geosynthetic Pavement Interlayer (Paving Grid)	SQYD		x		= \$	-
260203	Class 2 Aggregate Base	TON/CY	120	x	90.00	= \$	10,800
290201	Asphalt Treated Permeable Base	CY		x		= \$	-
250401	Class 4 Aggregate Subbase	CY		x		= \$	-
374002	Asphaltic Emulsion (Fog Seal Coat)	TON		x		= \$	-
397005	Tack Coat	TON	2	x	1,700.00	= \$	3,400
390100	Prime Coat	TON	1	x	1,500.00	= \$	1,500
377501	Slurry Seal	TON		x		= \$	-
3750XX	Screenings (Type XX)	TON		x		= \$	-
374492	Asphaltic Emulsion (Polymer Modified)	TON		x		= \$	-
370001	Sand Cover (Seal)	TON		x		= \$	-
731530A	Hot Mix Asphalt (Textured Paving)	TONS		x		= \$	-
730020	Minor Concrete (Curb)	CY		x		= \$	-
731521	Minor Concrete (Sidewalk)	CY	20	x	1,000.00	= \$	20,000
731504	Minor Concrete (Curb and Gutter)	CY	30	x	1,200.00	= \$	36,000
39407X	Place Hot Mix Asphalt Dike (Type E)	LF		x		= \$	-
150771	Remove Asphalt Concrete Dike	LF		x		= \$	-
420201	Grind Existing Concrete Pavement	SQYD		x		= \$	-
150860	Remove Base and Surfacing	CY		x		= \$	-
390095	Replace Asphalt Concrete Surfacing	CY		x		= \$	-
15312X	Remove Concrete	LS	1	x	20,000.00	= \$	20,000
394090	Place Hot Mix Asphalt (Miscellaneous Area)	SQYD		x		= \$	-
153103	Cold Plane Asphalt Concrete Pavement	SQYD	4,300	x	10.00	= \$	43,000
39405X	Shoulder Rumble Strip (HMA, X-In Indentations)	STA		x		= \$	-
413113	Repair Spalled Joints, Polyester Grout	SQYD		x		= \$	-
420102	Groove Existing Concrete Pavement	SQYD		x		= \$	-
390136	Minor Hot Mix Asphalt	TON		x		= \$	-
394095	Roadside Paving (Miscellaneous Areas)	SQYD		x		= \$	-
XXXXXX	Some Item	Unit		x		= \$	-

TOTAL PAVEMENT STRUCTURAL SECTION ITEMS	\$	223,800
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SECTION 3: DRAINAGE

Item code		Unit	Quantity	Unit Price (\$)	Cost
15080X	Remove Culvert	EA/LF	x	= \$	-
150820	Modify Inlet	EA	x	= \$	-
155232	Sand Backfill	CY	x	= \$	-
15020X	Abandon Culvert	EA/LF	x	= \$	-
152430	Adjust Inlet	LF	x	= \$	-
155003	Cap Inlet	EA	x	= \$	-
510501	Minor Concrete	CY	x	= \$	-
510502	Minor Concrete (Minor Structure)	CY	x	= \$	-
5105XX	Minor Concrete (Type XX)	CY	x	= \$	-
620XXX	XX" Alternative Pipe Culvert (Type X)	LF	x	= \$	-
6411XX	XX" Plastic Pipe	LF	x	= \$	-
65XXXX	XX" Reinforced Concrete Pipe (Type X)	LF	x	= \$	-
6650XX	XX" Corrugated Steel Pipe (0.XXX" Thick)	LF	x	= \$	-
68XXXX	XX" Plastic Pipe (Edge Drain)	LF	x	= \$	-
69011X	XX" Corrugated Steel Pipe Downrain (0.XXX" Thi	LF	x	= \$	-
70321X	XX" Corrugated Steel Pipe Inlet (0.XXX" Thick)	LF	x	= \$	-
70XXXX	XX" Corrugated Steel Pipe Riser (0.XXX" Thick)	LF	x	= \$	-
7050XX	XX" Steel Flared End Section	EA	x	= \$	-
703233	Grated Line Drain	LF	x	= \$	-
72XXXX	Rock Slope Protection (Type and Method)	CY/TON	x	= \$	-
72901X	Rock Slope Protection Fabric (Class X)	SQYD	x	= \$	-
721420	Concrete (Ditch Lining)	CY	x	= \$	-
721430	Concrete (Channel Lining)	CY	x	= \$	-
750001	Miscellaneous Iron and Steel	LB	x	= \$	-
XXXXXX	Additional Drainage	LS	1 x	62,000.00 = \$	62,000

TOTAL DRAINAGE ITEMS	\$	62,000
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SECTION 4: SPECIALTY ITEMS

Item code		Unit	Quantity	Unit Price (\$)	Cost
080050	Progress Schedule (Critical Path Method)	LS	x	= \$	-
582001	Sound Wall (Masonry Block)	SQFT	x	= \$	-
510530	Minor Concrete (Wall)	CY	x	= \$	-
15325X	Remove Sound Wall	LF/LS	x	= \$	-
070030	Lead Compliance Plan	LS	x	= \$	-
141120	Treated Wood Waste	LB	x	= \$	-
153221	Remove Concrete Barrier	LF	x	= \$	-
150662	Remove Metal Beam Guard Railing	LF	x	= \$	-
150668	Remove Flared End Section	EA	x	= \$	-
8000XX	Chain Link Fence (Type XX)	LF	x	= \$	-
80XXXX	XX" Chain Link Gate (Type CL-6)	EA	x	= \$	-
832005	Midwest Guardrail System	LF	x	= \$	-
839301	Single Thrie Beam Barrier	LF	x	= \$	-
839310	Double Thrie Beam Barrier	LF	x	= \$	-
839521	Cable Railing	LF	x	= \$	-
8395XX	Terminal System (Type WB-31)	EA	x	= \$	-
839585	Alternative Flared Terminal System	EA	x	= \$	-
839584	Alternative In-line Terminal System	EA	x	= \$	-
498052	60" CIDH Concrete Pile (Sign Foundation)	LF	x	= \$	-
839XXX	Crash Cushion (Insert Type)	EA	x	= \$	-
520103	Bar Reinforced Steel (Retaining Wall)	LB	x	= \$	-
510060	Structural Concrete, Retaining Wall	CY	x	= \$	-
513553	Retaining Wall (Masonry Wall)	SQFT	x	= \$	-
511035	Architectural Treatment	SQFT	x	= \$	-
598001	Anti-Graffiti Coating	SQFT	x	= \$	-
203070	Rock Stain	SQFT	x	= \$	-
5136XX	Reinforced Concrete Crib Wall (Type X)	SQFT	x	= \$	-
839543	Transition Railing (Type WB-31)	EA	x	= \$	-
597601	Prepare and Stain Concrete	SQFT	x	= \$	-
839561	Rail Tensioning Assembly	EA	x	= \$	-
83958X	End Anchor Assembly (Type X)	EA	x	= \$	-
XXXXXX	Some Item	Unit	x	= \$	-

TOTAL SPECIALTY ITEMS	\$	-
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SECTION 5: ENVIRONMENTAL**5A - ENVIRONMENTAL MITIGATION**

Item code	Unit	Quantity	Unit Price (\$)	Cost
	LS	x	= \$	-
130670 Biological Mitigation	LF	x	= \$	-
141000 Temporary Reinforced Silt Fence	LF	x	= \$	-
141000 Temporary Fence (Type ESA)	LF	x	= \$	-
Subtotal Environmental Mitigation				\$ -

5B - LANDSCAPE AND IRRIGATION

Item code	Unit	Quantity	Unit Price (\$)	Cost
20XXXX Highway Planting	LS	x	= \$	-
20XXXX Irrigation System	LS	x	= \$	-
204099 Plant Establishment Work	LS	x	= \$	-
204101 Extend Plant Establishment Work	LS	x	= \$	-
20XXXX Follow-up Landscape Project	LS	x	= \$	-
150685 Remove Irrigation Facility	LS	x	= \$	-
20XXXX Maintain Existing (Irrigation or Planted Areas)	LS	x	= \$	-
206400 Check and Test Existing Irrigation Facilities	LS	x	= \$	-
21011X Imported Topsoil (X)	CY/TON	x	= \$	-
20XXXX Rock Blanket, Rock Mulch, DG, Gravel Mulch	SQFT/SQYD	x	= \$	-
200122 Weed Germination	SQYD	x	= \$	-
208304 Water Meter	EA	x	= \$	-
2087XX XX" Conduit (Use for Irrigation x-overs)	LF	x	= \$	-
20890X Extend X" Conduit (Use for Extension of Irrigation x-overs)	LF	x	= \$	-
Subtotal Landscape and Irrigation				\$ -

5C - EROSION CONTROL

Item code	Unit	Quantity	Unit Price (\$)	Cost
210010 Move In/Move Out (Erosion Control)	EA	x	= \$	-
210350 Fiber Rolls	LF	x	= \$	-
210360 Compost Sock	LF	x	= \$	-
2102XX Rolled Erosion Control Product (X)	SQFT	x	= \$	-
21025X Bonded Fiber Matrix	SQFT/ACRE	x	= \$	-
210300 Hydromulch	SQFT	x	= \$	-
210420 Straw	SQFT	x	= \$	-
210430 Hydroseed	SQFT	x	= \$	-
210600 Compost	CY	x	= \$	-
210630 Incorporate Materials	SQFT	x	= \$	-
Subtotal Erosion Control				\$ -

5D - NPDES

Item code	Unit	Quantity	Unit Price (\$)	Cost
130300 Prepare SWPPP	LS	1	10,000.00	10,000
130200 Prepare WPCP	LS	x	= \$	-
130100 Job Site Management	LS	x	= \$	-
130330 Storm Water Annual Report	EA	x	= \$	-
130310 Rain Event Action Plan (REAP)	EA	x	= \$	-
130320 Storm Water Sampling and Analysis Day	EA	x	= \$	-
130520 Temporary Hydraulic Mulch	SQYD	100	2.50	250
130550 Temporary Hydroseed	SQYD	100	1.70	170
130505 Move-In/Move-Out (Temporary Erosion Control)	EA	x	= \$	-
130640 Temporary Fiber Roll	LF	x	= \$	-
130900 Temporary Concrete Washout	LS	1	5,000.00	5,000
130710 Temporary Construction Entrance	EA	1	10,000.00	10,000
130610 Temporary Check Dam	LF	x	= \$	-
130620 Temporary Drainage Inlet Protection	EA	x	= \$	-
130730 Street Sweeping	LS	1	15,000.00	15,000
Subtotal NPDES				\$ 40,420

Supplemental Work for NPDES

066595 Water Pollution Control Maintenance Sharing*	LS	x	= \$	-
066596 Additional Water Pollution Control**	LS	x	= \$	-
066597 Storm Water Sampling and Analysis***	LS	x	= \$	-
XXXXXX Some Item	LS	x	= \$	-
Subtotal Supplemental Work for NDPS				\$ -

*Applies to all SWPPPs and those WPCPs with sediment control or soil stabilization BMPs.

**Applies to both SWPPPs and WPCP projects.

*** Applies only to project with SWPPPs.

TOTAL ENVIRONMENTAL	\$	40,500
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SECTION 6: TRAFFIC ITEMS**6A - Traffic Electrical**

Item code	Unit	Quantity	Unit Price (\$)	Cost
860460 Lighting and Sign Illumination	LS	x	= \$	-
860201 Signal and Lighting	LS	1 x	700,000.00 = \$	700,000
860990 Closed Circuit Television System	LS	x	= \$	-
86110X Ramp Metering System (Location X)	LS	x	= \$	-
86070X Interconnection Conduit and Cable	LF/LS	x	= \$	-
5602XX Furnish Sign Structure (Type X)	LB	x	= \$	-
5602XX Install Sign Structure (Type X)	LB	x	= \$	-
498040 XX" CIDHC Pile (Sign Foundation)	LF	x	= \$	-
86080X Inductive Loop Detectors	EA/LS	x	= \$	-
8609XX Traffic Monitoring Station (Type X)	LS	x	= \$	-
15075X Remove Sign Structure	EA/LS	x	= \$	-
151581 Reconstruct Sign Structure	EA	x	= \$	-
152641 Modify Sign Structure	EA	x	= \$	-
860090 Maintain Existing Traffic Management System Elern	LS	x	= \$	-
86XXXX Fiber Optic Conduit System	LS	x	= \$	-
XXXXX Some Item	Unit	x	= \$	-
Subtotal Traffic Electrical				\$ 700,000

6B - Traffic Signing and Striping

Item code	Unit	Quantity	Unit Price (\$)	Cost
566011 Roadside Sign - One Post	EA	x	= \$	-
566012 Roadside Sign - Two Post	EA	x	= \$	-
5602XX Furnish Sign	SQFT	x	= \$	-
568016 Install Sign Panel on Existing Frame	SQFT	x	= \$	-
150711 Remove Painted Traffic Stripe	LF	x	= \$	-
141101 Remove Yellow Painted Traffic Stripe (Hazardous Waste)	LF	x	= \$	-
150712 Remove Painted Pavement Marking	SQFT	x	= \$	-
150742 Remove Roadside Sign	EA	x	= \$	-
152320 Reset Roadside Sign	EA	x	= \$	-
152390 Relocate Roadside Sign	EA	x	= \$	-
82010X Delineator (Class X)	EA	x	= \$	-
840502 Thermoplastic Traffic Stripe (Enhanced Wet Night)	LF	x	= \$	-
846012 Thermoplastic Crosswalk and Pavement Marking (E	SQFT	x	= \$	-
120090 Construction Area Signs	LS	x	= \$	-
84XXXX Permanent Pavement Delineation	LS	1 x	20,000.00 = \$	20,000
Subtotal Traffic Signing and Striping				\$ 20,000

6C - Traffic Management Plan

Item code	Unit	Quantity	Unit Price (\$)	Cost
12865X Portable Changeable Message Signs	EA/LS	x	= \$	-
Subtotal Traffic Management Plan				\$ -

6C - Stage Construction and Traffic Handling

Item code	Unit	Quantity	Unit Price (\$)	Cost
120199 Traffic Plastic Drum	EA	x	= \$	-
12016X Channelizer (Type X)	EA	x	= \$	-
120120 Type III Barricade	EA	x	= \$	-
129100 Temporary Crash Cushion Module	EA	x	= \$	-
120100 Traffic Control System	LS	x	= \$	-
129110 Temporary Crash Cushion	EA	x	= \$	-
129000 Temporary Railing (Type K)	LF	x	= \$	-
120149 Temporary Pavement Marking (Paint)	SQFT	x	= \$	-
82010X Delineator (Class X)	EA	x	= \$	-
XXXXXX Stage Construction	LS	1 x	100,000.00 = \$	100,000
Subtotal Stage Construction and Traffic Handling				\$ 100,000

TOTAL TRAFFIC ITEMS	\$ 820,000
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SECTION 7: DETOURS

Includes constructing, maintaining, and removal

Item code	Unit	Quantity	Unit Price (\$)	Cost
190101 Roadway Excavation	CY	x	= \$	-
19801X Imported Borrow	CY/TON	x	= \$	-
390132 Hot Mix Asphalt (Type A)	TON	x	= \$	-
26020X Class 2 Aggregate Base	TON/CY	x	= \$	-
250401 Class 4 Aggregate Subbase	CY	x	= \$	-
130620 Temporary Drainage Inlet Protection	EA	x	= \$	-
129000 Temporary Railing (Type K)	LF	x	= \$	-
128601 Temporary Signal System	LS	x	= \$	-
120149 Temporary Pavement Marking (Paint)	SQFT	x	= \$	-
80010X Temporary Fence (Type X)	LF	x	= \$	-
XXXXXX Some Item	LS	x	= \$	-

* Includes constructing, maintaining, and removal

TOTAL DETOURS	\$	-
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SUBTOTAL SECTIONS 1 through 7	\$	1,154,300
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SECTION 8: MINOR ITEMS**8A - Americans with Disabilities Act Items**

ADA Items

1.0% \$ 11,543

8B - Bike Path Items

Bike Path Items

1.0% \$ 11,543

8C - Other Minor Items

Other Minor Items

8.0% \$ 92,344

Total of Section 1-7	\$	1,154,300	x	10.0%	= \$	115,430
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TOTAL MINOR ITEMS	\$	115,500
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SECTIONS 9: ROADWAY MOBILIZATION

Item code	Total Section 1-8	\$	1,269,800	x	10%	= \$	126,980
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TOTAL ROADWAY MOBILIZATION	\$	127,000
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SECTION 10: SUPPLEMENTAL WORK

Item code	Unit	Quantity	Unit Price (\$)	Cost
066670 Payment Adjustments For Price Index Fluctuations	LS	x	= \$	-
066094 Value Analysis	LS	x	= \$	-
066070 Maintain Traffic	LS	x	= \$	-
066919 Dispute Resolution Board	LS	x	= \$	-
066921 Dispute Resolution Advisor	LS	x	= \$	-
066015 Federal Trainee Program	LS	x	= \$	-
066610 Partnering	LS	x	= \$	-
066204 Remove Rock and Debris	LS	x	= \$	-
066222 Locate Existing Crossover	LS	x	= \$	-
XXXXXX Some Item	Unit	x	= \$	-

Cost of NPDES Supplemental Work specified in Section 5D	= \$	-
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Total Section 1-8	\$	1,269,800	4%	= \$	50,792
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TOTAL SUPPLEMENTAL WORK	\$	50,800
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SECTION 11: CITY FURNISHED MATERIALS AND EXPENSES

Item code		Unit	Quantity	Unit Price (\$)		Cost
066105	Resident Engineers Office	LS	x	=		\$0
066063	Traffic Management Plan - Public Information	LS	x	=		\$0
066901	Water Expenses	LS	x	=		\$0
8609XX	Traffic Monitoring Station (X)	LS	x	=		\$0
066841	Traffic Controller Assembly	LS	x	=		\$0
066840	Traffic Signal Controller Assembly	LS	x	=		\$0
066062	COZEEP Contract	LS	x	=		\$0
066838	Reflective Numbers and Edge Sealer	LS	x	=		\$0
066065	Tow Truck Service Patrol	LS	x	=		\$0
066916	Annual Construction General Permit Fee	LS	x	=		\$0
XXXXXX	Some Item	Unit	x	=		\$0
Total Section 1-8		\$	1,269,800	2%	= \$	25,396

TOTAL CITY FURNISHED	\$25,400
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SECTION 12: TIME-RELATED OVERHEAD

Total of Roadway and Structures Contract Items excluding Mobilization \$1,269,800 (used to calculate TRO)
Total Construction Cost (excluding TRO and Contingency) \$1,473,000 (used to check if project is greater than \$5 million excluding contingency)

Estimated Time-Related Overhead (TRO) Percentage (0% to 10%) =

Item code		Unit	Quantity	Unit Price (\$)		Cost
090100	Time-Related Overhead	WD	100	X	\$0 =	\$0

TOTAL TIME-RELATED OVERHEAD	\$0
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SECTION 13: ROADWAY CONTINGENCY

Total Section 1-12 \$ 1,473,000 x 15% = \$220,950

TOTAL CONTINGENCY	\$221,000
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II. STRUCTURE ITEMS

	<u>Bridge 1</u>		<u>Bridge 2</u>		
DATE OF ESTIMATE	00/00/00		00/00/00		00/00/00
Bridge Name	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Bridge Number	57-XXX		57-XXX		57-XXX
Structure Type	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Width (Feet) [out to out]	0 LF		0 LF		0 LF
Total Bridge Length (Feet)	0 LF		0 LF		0 LF
Total Area (Square Feet)	0 SQFT		0 SQFT		0 SQFT
Structure Depth (Feet)	0 LF		0 LF		0 LF
Footing Type (pile or spread)	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Cost Per Square Foot	\$0		\$0		\$0
COST OF EACH	\$0		\$0		\$0

	<u>Building 1</u>				
DATE OF ESTIMATE	00/00/00		00/00/00		00/00/00
Building Name	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Bridge Number	57-XXX		57-XXX		57-XXX
Structure Type	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Width (Feet) [out to out]	0 LF		0 LF		0 LF
Total Building Length (Feet)	0 LF		0 LF		0 LF
Total Area (Square Feet)	0 SQFT		0 SQFT		0 SQFT
Structure Depth (Feet)	0 LF		0 LF		0 LF
Footing Type (pile or spread)	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Cost Per Square Foot	\$0		\$0		\$0
COST OF EACH	\$0		\$0		\$0

TOTAL COST OF BRIDGES	\$0
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TOTAL COST OF BUILDINGS	\$0
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STRUCTURES MOBILIZATION	10%	\$0
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Recommended Contingency: (Pre-PSR 30%-50%, PSR 25%, Draft PR 20%, PR 15%, after PR approval 10%, Final PS&E 5%)

Total recommended percentages includes any quantified risk based contingency from the risk register.

STRUCTURES CONTINGENCY	10%	\$0
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TOTAL COST OF STRUCTURES	\$0
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Estimate Prepared By: _____
 XXXXXXXXXXXXXXXXXXXX ----- Division of Structures

 Date

III. RIGHT OF WAY

Fill in all of the available information from the Right of Way Data Sheet.

A)	A1)	Acquisition, including Excess Land Purchases, Damages & Goodwill, Fees	\$	2,000
	A2)	SB-1210	\$	0
B)		Acquisition of Offsite Mitigation	\$	0
C)	C1)	Utility Relocation (City Share)	\$	0
	C2)	Potholing (Design Phase)	\$	25,000
D)		Railroad Acquisition	\$	0
E)		Clearance / Demolition	\$	0
F)		Relocation Assistance (RAP and/or Last Resort Housing Costs)	\$	0
G)		Title and Escrow	\$	0
H)		Environmental Review	\$	0
I)		Condemnation Settlements <u>0%</u>	\$	0
J)		Design Appreciation Factor <u>0%</u>	\$	0
K)		Utility Relocation (Construction Cost)	\$	0

L)	TOTAL RIGHT OF WAY ESTIMATE	\$27,000
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M)	TOTAL R/W ESTIMATE: Escalated	\$31,000
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N)	RIGHT OF WAY SUPPORT	\$0
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Support Cost Estimate Prepared By	Project Coordinator ¹	Phone
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Utility Estimate Prepared By	Utility Coordinator ²	Phone
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R/W Acquisition Estimate Prepared By	Right of Way Estimator ³	Phone
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Note: Items G & H applied to items A + B

¹ When estimate has Support Costs only² When estimate has Utility Relocation³ When R/W Acquisition is required

PROJECT PLANNING COST ESTIMATE ©

EA:

EA: PID:

PID:

District-County-Route:

PM:

Type of Estimate : Traffic Study Estimate

Program Code : None

Project Limits : Intersection of Hegan Lane and Otterson Drive

Project Description: Construction of All Way Stop Control and Modifications for Truck Access

Scope : Intersection Construction

Alternative : All Way Stop Control

SUMMARY OF PROJECT COST ESTIMATE

	Current Year Cost	Escalated Cost
TOTAL ROADWAY COST	\$ 889,300	\$ 1,048,381
TOTAL STRUCTURES COST	\$ -	\$ -
SUBTOTAL CONSTRUCTION COST	\$ 889,300	\$ 1,048,381
TOTAL RIGHT OF WAY COST	\$ 27,000	\$ 31,000
TOTAL CAPITAL OUTLAY COSTS	\$ 917,000	\$ 1,080,000
PA/ED SUPPORT	\$ -	\$ -
PS&E SUPPORT	\$ -	\$ -
RIGHT OF WAY SUPPORT	\$ -	\$ -
CONSTRUCTION SUPPORT	\$ -	\$ -
TOTAL SUPPORT COST	\$ -	\$ -

TOTAL PROJECT COST	\$ 920,000	\$ 1,080,000
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Programmed Amount

Month / Year
Date of Estimate (Month/Year) 2 / 2022

Estimated Construction Start (Month/Year) 4 / 2025

Number of Working Days = 100

Estimated Mid-Point of Construction (Month/Year) 6 / 2025

Estimated Construction End (Month/Year) 7 / 2025

Number of Plant Establishment Days

Estimated Project Schedule

PID Approval

PA/ED Approval

PS&E

RTL

Begin Construction

Reviewed by District O.E. or
Cost Estimate Certifier

xx/xx/xxxx

(xxx) xxx-xxxx

Office Engineer / Cost Estimate Certifier

Date

Phone

Approved by Project Manager

xx/xx/xxxx

(xxx) xxx-xxxx

Project Manager

Date

Phone

PROJECT COST ESTIMATE

EA: PID:

I. ROADWAY ITEMS SUMMARY

Section		Cost
1	Earthwork	\$ 8,000
2	Pavement Structural Section	\$ 223,800
3	Drainage	\$ 62,000
4	Specialty Items	\$ -
5	Environmental	\$ 42,100
6	Traffic Items	\$ 270,000
7	Detours	\$ -
8	Minor Items	\$ 60,600
9	Roadway Mobilization	\$ 66,700
10	Supplemental Work	\$ 26,700
11	City Furnished	\$ 13,400
12	Time-Related Overhead	\$ -
13	Roadway Contingency	\$ 116,000
TOTAL ROADWAY ITEMS		\$ 889,300

Estimate Prepared By :

Michael C. Pitcock, PE

Date

Phone

Estimate Reviewed By :

Name and Title

Date

Phone

By signing this estimate you are attesting that you have discussed your project with all functional units and have incorporated all their comments or have discussed with them why they will not be incorporated.

SECTION 1: EARTHWORK

Item code		Unit	Quantity		Unit Price (\$)		Cost
190101	Roadway Excavation	CY	160	x	50.00	= \$	8,000
152320	Lead Compliance Plan	LS		x		= \$	-
194001	Ditch Excavation	CY		x		= \$	-
19801X	Imported Borrow	CY/TON		x		= \$	-
192037	Structure Excavation (Retaining Wall)	CY		x		= \$	-
193013	Structure Backfill (Retaining Wall)	CY		x		= \$	-
193031	Pervious Backfill Material (Retaining Wall)	CY		x		= \$	-
16010X	Clearing & Grubbing	LS/ACRE		x		= \$	-
170101	Develop Water Supply	LS		x		= \$	-
19801X	Imported Borrow	CY/TON		x		= \$	-
210130	Duff	ACRE		x		= \$	-
XXXXXX	Some Item	Unit		x		= \$	-

TOTAL EARTHWORK SECTION ITEMS	\$	8,000
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SECTION 2: PAVEMENT STRUCTURAL SECTION

Item code		Unit	Quantity		Unit Price (\$)		Cost
401050	Jointed Plain Concrete Pavement	CY		x		= \$	-
400050	Continuously Reinforced Concrete Pavement	CY		x		= \$	-
404092	Seal Pavement Joint	LF		x		= \$	-
404093	Seal Isolation Joint	LF		x		= \$	-
413117	Seal Concrete Pavement Joint (Silicone)	LF		x		= \$	-
413118	Seal Pavement Joint (Asphalt Rubber)	LF		x		= \$	-
280010	Rapid Strength Concrete Base	CY		x		= \$	-
410095	Dowel Bar (Drill and Bond)	EA		x		= \$	-
390132	Hot Mix Asphalt (Type A)	TON	660	x	135.00	= \$	89,100
390137	Rubberized Hot Mix Asphalt (Gap Graded)	TON		x		= \$	-
395041	RHMA-O (Open Graded Fiction Course)	TON		x		= \$	-
393006	Geosynthetic Pavement Interlayer (Paving Grid)	SQYD		x		= \$	-
260203	Class 2 Aggregate Base	TON/CY	120	x	90.00	= \$	10,800
290201	Asphalt Treated Permeable Base	CY		x		= \$	-
250401	Class 4 Aggregate Subbase	CY		x		= \$	-
374002	Asphaltic Emulsion (Fog Seal Coat)	TON		x		= \$	-
397005	Tack Coat	TON	2	x	1,700.00	= \$	3,400
390100	Prime Coat	TON	1	x	1,500.00	= \$	1,500
377501	Slurry Seal	TON		x		= \$	-
3750XX	Screenings (Type XX)	TON		x		= \$	-
374492	Asphaltic Emulsion (Polymer Modified)	TON		x		= \$	-
370001	Sand Cover (Seal)	TON		x		= \$	-
731530A	Hot Mix Asphalt (Textured Paving)	TONS		x		= \$	-
730020	Minor Concrete (Curb)	CY		x		= \$	-
731521	Minor Concrete (Sidewalk)	CY	20	x	1,000.00	= \$	20,000
731504	Minor Concrete (Curb and Gutter)	CY	30	x	1,200.00	= \$	36,000
39407X	Place Hot Mix Asphalt Dike (Type E)	LF		x		= \$	-
150771	Remove Asphalt Concrete Dike	LF		x		= \$	-
420201	Grind Existing Concrete Pavement	SQYD		x		= \$	-
150860	Remove Base and Surfacing	CY		x		= \$	-
390095	Replace Asphalt Concrete Surfacing	CY		x		= \$	-
15312X	Remove Concrete	LS	1	x	20,000.00	= \$	20,000
394090	Place Hot Mix Asphalt (Miscellaneous Area)	SQYD		x		= \$	-
153103	Cold Plane Asphalt Concrete Pavement	SQYD	4,300	x	10.00	= \$	43,000
39405X	Shoulder Rumble Strip (HMA, X-In Indentations)	STA		x		= \$	-
413113	Repair Spalled Joints, Polyester Grout	SQYD		x		= \$	-
420102	Groove Existing Concrete Pavement	SQYD		x		= \$	-
390136	Minor Hot Mix Asphalt	TON		x		= \$	-
394095	Roadside Paving (Miscellaneous Areas)	SQYD		x		= \$	-
XXXXXX	Some Item	Unit		x		= \$	-

TOTAL PAVEMENT STRUCTURAL SECTION ITEMS	\$	223,800
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SECTION 3: DRAINAGE

Item code		Unit	Quantity	Unit Price (\$)	Cost
15080X	Remove Culvert	EA/LF	x	= \$	-
150820	Modify Inlet	EA	x	= \$	-
155232	Sand Backfill	CY	x	= \$	-
15020X	Abandon Culvert	EA/LF	x	= \$	-
152430	Adjust Inlet	LF	x	= \$	-
155003	Cap Inlet	EA	x	= \$	-
510501	Minor Concrete	CY	x	= \$	-
510502	Minor Concrete (Minor Structure)	CY	x	= \$	-
5105XX	Minor Concrete (Type XX)	CY	x	= \$	-
620XXX	XX" Alternative Pipe Culvert (Type X)	LF	x	= \$	-
6411XX	XX" Plastic Pipe	LF	x	= \$	-
65XXXX	XX" Reinforced Concrete Pipe (Type X)	LF	x	= \$	-
6650XX	XX" Corrugated Steel Pipe (0.XXX" Thick)	LF	x	= \$	-
68XXXX	XX" Plastic Pipe (Edge Drain)	LF	x	= \$	-
69011X	XX" Corrugated Steel Pipe Downrain (0.XXX" Th	LF	x	= \$	-
70321X	XX" Corrugated Steel Pipe Inlet (0.XXX" Thick)	LF	x	= \$	-
70XXXX	XX" Corrugated Steel Pipe Riser (0.XXX" Thick)	LF	x	= \$	-
7050XX	XX" Steel Flared End Section	EA	x	= \$	-
703233	Grated Line Drain	LF	x	= \$	-
72XXXX	Rock Slope Protection (Type and Method)	CY/TON	x	= \$	-
72901X	Rock Slope Protection Fabric (Class X)	SQYD	x	= \$	-
721420	Concrete (Ditch Lining)	CY	x	= \$	-
721430	Concrete (Channel Lining)	CY	x	= \$	-
750001	Miscellaneous Iron and Steel	LB	x	= \$	-
XXXXXX	Additional Drainage	LS	1 x	62,000.00 = \$	62,000

TOTAL DRAINAGE ITEMS	\$ 62,000
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SECTION 4: SPECIALTY ITEMS

Item code		Unit	Quantity	Unit Price (\$)	Cost
080050	Progress Schedule (Critical Path Method)	LS	x	= \$	-
582001	Sound Wall (Masonry Block)	SQFT	x	= \$	-
510530	Minor Concrete (Wall)	CY	x	= \$	-
15325X	Remove Sound Wall	LF/LS	x	= \$	-
070030	Lead Compliance Plan	LS	x	= \$	-
141120	Treated Wood Waste	LB	x	= \$	-
153221	Remove Concrete Barrier	LF	x	= \$	-
150662	Remove Metal Beam Guard Railing	LF	x	= \$	-
150668	Remove Flared End Section	EA	x	= \$	-
8000XX	Chain Link Fence (Type XX)	LF	x	= \$	-
80XXXX	XX" Chain Link Gate (Type CL-6)	EA	x	= \$	-
832005	Midwest Guardrail System	LF	x	= \$	-
839301	Single Thrie Beam Barrier	LF	x	= \$	-
839310	Double Thrie Beam Barrier	LF	x	= \$	-
839521	Cable Railing	LF	x	= \$	-
8395XX	Terminal System (Type WB-31)	EA	x	= \$	-
839585	Alternative Flared Terminal System	EA	x	= \$	-
839584	Alternative In-line Terminal System	EA	x	= \$	-
498052	60" CIDH Concrete Pile (Sign Foundation)	LF	x	= \$	-
839XXX	Crash Cushion (Insert Type)	EA	x	= \$	-
520103	Bar Reinforced Steel (Retaining Wall)	LB	x	= \$	-
510060	Structural Concrete, Retaining Wall	CY	x	= \$	-
513553	Retaining Wall (Masonry Wall)	SQFT	x	= \$	-
511035	Architectural Treatment	SQFT	x	= \$	-
598001	Anti-Graffiti Coating	SQFT	x	= \$	-
203070	Rock Stain	SQFT	x	= \$	-
5136XX	Reinforced Concrete Crib Wall (Type X)	SQFT	x	= \$	-
839543	Transition Railing (Type WB-31)	EA	x	= \$	-
597601	Prepare and Stain Concrete	SQFT	x	= \$	-
839561	Rail Tensioning Assembly	EA	x	= \$	-
83958X	End Anchor Assembly (Type X)	EA	x	= \$	-
XXXXXX	Some Item	Unit	x	= \$	-

TOTAL SPECIALTY ITEMS	\$ -
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SECTION 5: ENVIRONMENTAL**5A - ENVIRONMENTAL MITIGATION**

Item code	Unit	Quantity	Unit Price (\$)	Cost
Biological Mitigation	LS	x	= \$	-
130670 Temporary Reinforced Silt Fence	LF	x	= \$	-
141000 Temporary Fence (Type ESA)	LF	x	= \$	-
<i>Subtotal Environmental Mitigation</i>				\$ -

5B - LANDSCAPE AND IRRIGATION

Item code	Unit	Quantity	Unit Price (\$)	Cost
20XXXX Highway Planting	LS	x	= \$	-
20XXXX Irrigation System	LS	x	= \$	-
204099 Plant Establishment Work	LS	x	= \$	-
204101 Extend Plant Establishment Work	LS	x	= \$	-
20XXXX Follow-up Landscape Project	LS	x	= \$	-
150685 Remove Irrigation Facility	LS	x	= \$	-
20XXXX Maintain Existing (Irrigation or Planted Areas)	LS	x	= \$	-
206400 Check and Test Existing Irrigation Facilities	LS	x	= \$	-
21011X Imported Topsoil (X)	CY/TON	x	= \$	-
20XXXX Rock Blanket, Rock Mulch, DG, Gravel Mulch	SQFT/SQYD	x	= \$	-
200122 Weed Germination	SQYD	x	= \$	-
208304 Water Meter	EA	x	= \$	-
2087XX XX" Conduit (Use for Irrigation x-overs)	LF	x	= \$	-
20890X XX" Conduit (Use for Extension of Irrigation x-overs)	LF	x	= \$	-
<i>Subtotal Landscape and Irrigation</i>				\$ -

5C - EROSION CONTROL

Item code	Unit	Quantity	Unit Price (\$)	Cost
210010 Move In/Move Out (Erosion Control)	EA	x	= \$	-
210350 Fiber Rolls	LF	x	= \$	-
210360 Compost Sock	LF	x	= \$	-
2102XX Rolled Erosion Control Product (X)	SQFT	x	= \$	-
21025X Bonded Fiber Matrix	SQFT/ACRE	x	= \$	-
210300 Hydromulch	SQFT	x	= \$	-
210420 Straw	SQFT	x	= \$	-
210430 Hydroseed	SQFT	x	= \$	-
210600 Compost	CY	x	= \$	-
210630 Incorporate Materials	SQFT	x	= \$	-
<i>Subtotal Erosion Control</i>				\$ -

5D - NPDES

Item code	Unit	Quantity	Unit Price (\$)	Cost
130300 Prepare SWPPP	LS	1	x 10,000.00	= \$ 10,000
130200 Prepare WPCP	LS	x	= \$	-
130100 Job Site Management	LS	x	= \$	-
130330 Storm Water Annual Report	EA	x	= \$	-
130310 Rain Event Action Plan (REAP)	EA	x	= \$	-
130320 Storm Water Sampling and Analysis Day	EA	x	= \$	-
130520 Temporary Hydraulic Mulch	SQYD	500	x 2.50	= \$ 1,250
130550 Temporary Hydroseed	SQYD	500	x 1.70	= \$ 850
130505 Move-In/Move-Out (Temporary Erosion Control)	EA	x	= \$	-
130640 Temporary Fiber Roll	LF	x	= \$	-
130900 Temporary Concrete Washout	LS	1	x 5,000.00	= \$ 5,000
130710 Temporary Construction Entrance	EA	1	x 10,000.00	= \$ 10,000
130610 Temporary Check Dam	LF	x	= \$	-
130620 Temporary Drainage Inlet Protection	EA	x	= \$	-
130730 Street Sweeping	LS	1	x 15,000.00	= \$ 15,000
<i>Subtotal NPDES</i>				\$ 42,100

Supplemental Work for NPDES

066595 Water Pollution Control Maintenance Sharing*	LS	x	= \$	-
066596 Additional Water Pollution Control**	LS	x	= \$	-
066597 Storm Water Sampling and Analysis***	LS	x	= \$	-
XXXXXX Some Item	LS	x	= \$	-
<i>Subtotal Supplemental Work for NDPS</i>				\$ -

*Applies to all SWPPPs and those WPCPs with sediment control or soil stabilization BMPs.

**Applies to both SWPPPs and WPCP projects.

*** Applies only to project with SWPPPs.

TOTAL ENVIRONMENTAL \$ 42,100

SECTION 6: TRAFFIC ITEMS**6A - Traffic Electrical**

Item code		Unit	Quantity	Unit Price (\$)	Cost	
860460	Lighting and Sign Illumination	LS	x	= \$	-	
860201	Signal and Lighting	LS	1	x 150,000.00	= \$ 150,000	Assumed Lighting Improvements
860990	Closed Circuit Television System	LS	x	= \$	-	
86110X	Ramp Metering System (Location X)	LS	x	= \$	-	
86070X	Interconnection Conduit and Cable	LF/LS	x	= \$	-	
5602XX	Furnish Sign Structure (Type X)	LB	x	= \$	-	
5602XX	Install Sign Structure (Type X)	LB	x	= \$	-	
498040	XX" CIDHC Pile (Sign Foundation)	LF	x	= \$	-	
86080X	Inductive Loop Detectors	EA/LS	x	= \$	-	
8609XX	Traffic Monitoring Station (Type X)	LS	x	= \$	-	
15075X	Remove Sign Structure	EA/LS	x	= \$	-	
151581	Reconstruct Sign Structure	EA	x	= \$	-	
152641	Modify Sign Structure	EA	x	= \$	-	
860090	Maintain Existing Traffic Management System Eler	LS	x	= \$	-	
86XXXX	Fiber Optic Conduit System	LS	x	= \$	-	
XXXXXX	Some Item	Unit	x	= \$	-	
Subtotal Traffic Electrical					\$ 150,000	

6B - Traffic Signing and Striping

Item code		Unit	Quantity	Unit Price (\$)	Cost	
566011	Roadside Sign - One Post	EA	x	= \$	-	
566012	Roadside Sign - Two Post	EA	x	= \$	-	
5602XX	Furnish Sign	SQFT	x	= \$	-	
568016	Install Sign Panel on Existing Frame	SQFT	x	= \$	-	
150711	Remove Painted Traffic Stripe	LF	x	= \$	-	
141101	Remove Yellow Painted Traffic Stripe (Hazardous	LF	x	= \$	-	
150712	Remove Painted Pavement Marking	SQFT	x	= \$	-	
150742	Remove Roadside Sign	EA	x	= \$	-	
152320	Reset Roadside Sign	EA	x	= \$	-	
152390	Relocate Roadside Sign	EA	x	= \$	-	
82010X	Delineator (Class X)	EA	x	= \$	-	
840502	Thermoplastic Traffic Stripe (Enhanced Wet Night '	LF	x	= \$	-	
846012	Thermoplastic Crosswalk and Pavement Marking (	SQFT	x	= \$	-	
120090	Construction Area Signs	LS	x	= \$	-	
84XXXX	Permanent Pavement Delineation	LS	1	x 20,000.00	= \$ 20,000	
Subtotal Traffic Signing and Striping					\$ 20,000	

6C - Traffic Management Plan

Item code		Unit	Quantity	Unit Price (\$)	Cost	
12865X	Portable Changeable Message Signs	EA/LS	x	= \$	-	
Subtotal Traffic Management Plan					\$ -	

6C - Stage Construction and Traffic Handling

Item code		Unit	Quantity	Unit Price (\$)	Cost	
120199	Traffic Plastic Drum	EA	x	= \$	-	
12016X	Channelizer (Type X)	EA	x	= \$	-	
120120	Type III Barricade	EA	x	= \$	-	
129100	Temporary Crash Cushion Module	EA	x	= \$	-	
120100	Traffic Control System	LS	x	= \$	-	
129110	Temporary Crash Cushion	EA	x	= \$	-	
129000	Temporary Railing (Type K)	LF	x	= \$	-	
120149	Temporary Pavement Marking (Paint)	SQFT	x	= \$	-	
82010X	Delineator (Class X)	EA	x	= \$	-	
XXXXXX	Stage Construction	LS	1	x 100,000.00	= \$ 100,000	
Subtotal Stage Construction and Traffic Handling					\$ 100,000	

TOTAL TRAFFIC ITEMS	\$ 270,000
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SECTION 7: DETOURS

Includes constructing, maintaining, and removal

Item code		Unit	Quantity	Unit Price (\$)	Cost
190101	Roadway Excavation	CY	x	= \$	-
19801X	Imported Borrow	CY/TON	x	= \$	-
390132	Hot Mix Asphalt (Type A)	TON	x	= \$	-
26020X	Class 2 Aggregate Base	TON/CY	x	= \$	-
250401	Class 4 Aggregate Subbase	CY	x	= \$	-
130620	Temporary Drainage Inlet Protection	EA	x	= \$	-
129000	Temporary Railing (Type K)	LF	x	= \$	-
128601	Temporary Signal System	LS	x	= \$	-
120149	Temporary Pavement Marking (Paint)	SQFT	x	= \$	-
80010X	Temporary Fence (Type X)	LF	x	= \$	-
XXXXXX	Some Item	LS	x	= \$	-

* Includes constructing, maintaining, and removal

TOTAL DETOURS	\$	-
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SUBTOTAL SECTIONS 1 through 7	\$	605,900
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SECTION 8: MINOR ITEMS**8A - Americans with Disabilities Act Items**

ADA Items	1.0%	\$	6,059
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8B - Bike Path Items

Bike Path Items	1.0%	\$	6,059
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8C - Other Minor Items

Other Minor Items	8.0%	\$	48,472
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Total of Section 1-7	\$	605,900	x	10.0%	= \$	60,590
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TOTAL MINOR ITEMS	\$	60,600
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SECTIONS 9: ROADWAY MOBILIZATION

Item code					
999990	Total Section 1-8	\$	666,500	x	10% = \$ 66,650

TOTAL ROADWAY MOBILIZATION	\$	66,700
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SECTION 10: SUPPLEMENTAL WORK

Item code		Unit	Quantity	Unit Price (\$)	Cost
066670	Payment Adjustments For Price Index Fluctuations	LS	x	= \$	-
066094	Value Analysis	LS	x	= \$	-
066070	Maintain Traffic	LS	x	= \$	-
066919	Dispute Resolution Board	LS	x	= \$	-
066921	Dispute Resolution Advisor	LS	x	= \$	-
066015	Federal Trainee Program	LS	x	= \$	-
066610	Partnering	LS	x	= \$	-
066204	Remove Rock and Debris	LS	x	= \$	-
066222	Locate Existing Crossover	LS	x	= \$	-
XXXXXX	Some Item	Unit	x	= \$	-

Cost of NPDES Supplemental Work specified in Section 5D	= \$	-
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Total Section 1-8	\$	666,500	4%	= \$	26,660
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TOTAL SUPPLEMENTAL WORK	\$	26,700
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SECTION 11: CITY FURNISHED MATERIALS AND EXPENSES

Item code		Unit	Quantity	Unit Price (\$)		Cost
066105	Resident Engineers Office	LS	x	=		\$0
066063	Traffic Management Plan - Public Information	LS	x	=		\$0
066901	Water Expenses	LS	x	=		\$0
8609XX	Traffic Monitoring Station (X)	LS	x	=		\$0
066841	Traffic Controller Assembly	LS	x	=		\$0
066840	Traffic Signal Controller Assembly	LS	x	=		\$0
066062	COZEEP Contract	LS	x	=		\$0
066838	Reflective Numbers and Edge Sealer	LS	x	=		\$0
066065	Tow Truck Service Patrol	LS	x	=		\$0
066916	Annual Construction General Permit Fee	LS	x	=		\$0
XXXXXX	Some Item	Unit	x	=		\$0
Total Section 1-8		\$	666,500	2%	= \$	13,330

TOTAL CITY FURNISHED	\$13,400
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SECTION 12: TIME-RELATED OVERHEAD

Total of Roadway and Structures Contract Items excluding Mobilization \$666,500 (used to calculate TRO)
Total Construction Cost (excluding TRO and Contingency) \$773,300 (used to check if project is greater than \$5 million excluding contingency)

Estimated Time-Related Overhead (TRO) Percentage (0% to 10%) = **6%**

Item code		Unit	Quantity	Unit Price (\$)		Cost
090100	Time-Related Overhead	WD	100	X	\$0 =	\$0

TOTAL TIME-RELATED OVERHEAD	\$0
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SECTION 13: ROADWAY CONTINGENCY

Total Section 1-12 \$ 773,300 x 15% = \$115,995

TOTAL CONTINGENCY	\$116,000
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II. STRUCTURE ITEMS

	Bridge 1		Bridge 2		
DATE OF ESTIMATE	00/00/00		00/00/00		00/00/00
Bridge Name	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Bridge Number	57-XXX		57-XXX		57-XXX
Structure Type	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Width (Feet) [out to out]	0 LF		0 LF		0 LF
Total Bridge Length (Feet)	0 LF		0 LF		0 LF
Total Area (Square Feet)	0 SQFT		0 SQFT		0 SQFT
Structure Depth (Feet)	0 LF		0 LF		0 LF
Footing Type (pile or spread)	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Cost Per Square Foot	\$0		\$0		\$0
COST OF EACH	\$0		\$0		\$0

	Building 1				
DATE OF ESTIMATE	00/00/00		00/00/00		00/00/00
Building Name	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Bridge Number	57-XXX		57-XXX		57-XXX
Structure Type	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Width (Feet) [out to out]	0 LF		0 LF		0 LF
Total Building Length (Feet)	0 LF		0 LF		0 LF
Total Area (Square Feet)	0 SQFT		0 SQFT		0 SQFT
Structure Depth (Feet)	0 LF		0 LF		0 LF
Footing Type (pile or spread)	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Cost Per Square Foot	\$0		\$0		\$0
COST OF EACH	\$0		\$0		\$0

TOTAL COST OF BRIDGES	\$0
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TOTAL COST OF BUILDINGS	\$0
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STRUCTURES MOBILIZATION	10%	\$0
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Recommended Contingency: (Pre-PSR 30%-50%, PSR 25%, Draft PR 20%, PR 15%, after PR approval 10%, Final PS&E 5%)

Total recommended percentages includes any quantified risk based contingency from the risk register.

STRUCTURES CONTINGENCY	10%	\$0
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TOTAL COST OF STRUCTURES	\$0
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Estimate Prepared By: _____
 XXXXXXXXXXXXXXXXXXXX ----- Division of Structures

 Date

III. RIGHT OF WAY

Fill in all of the available information from the Right of Way Data Sheet.

A)	A1)	Acquisition, including Excess Land Purchases, Damages & Goodwill, Fees	\$	2,000
	A2)	SB-1210	\$	0
B)		Acquisition of Offsite Mitigation	\$	0
C)	C1)	Utility Relocation (City Share)	\$	0
	C2)	Potholing (Design Phase)	\$	25,000
D)		Railroad Acquisition	\$	0
E)		Clearance / Demolition	\$	0
F)		Relocation Assistance (RAP and/or Last Resort Housing Costs)	\$	0
G)		Title and Escrow	\$	0
H)		Environmental Review	\$	0
I)		Condemnation Settlements	\$	0
		_____ 0%		
J)		Design Appreciation Factor	\$	0
		_____ 0%		
K)		Utility Relocation (Construction Cost)	\$	0

L)	TOTAL RIGHT OF WAY ESTIMATE	\$27,000
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M)	TOTAL R/W ESTIMATE: Escalated	\$31,000
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N)	RIGHT OF WAY SUPPORT	\$0
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Support Cost Estimate Prepared By	_____	_____
	Project Coordinator ¹	Phone

Utility Estimate Prepared By	_____	_____
	Utility Coordinator ²	Phone

R/W Acquisition Estimate Prepared By	_____	_____
	Right of Way Estimator ³	Phone

Note: Items G & H applied to items A + B

¹ When estimate has Support Costs only² When estimate has Utility Relocation³ When R/W Acquisition is required

PROJECT PLANNING COST ESTIMATE ©

EA:

EA: PID:

PID:

District-County-Route:

PM:

Type of Estimate : Traffic Study Estimate

Program Code : None

Project Limits : Intersection of E Park Avenue and Scott Avenue

Project Description: Construction of Modern Roundabout

Scope : Intersection Construction

Alternative : 3-Leg Roundabout

SUMMARY OF PROJECT COST ESTIMATE

	Current Year Cost	Escalated Cost
TOTAL ROADWAY COST	\$ 3,371,100	\$ 3,974,134
TOTAL STRUCTURES COST	\$ -	\$ -
SUBTOTAL CONSTRUCTION COST	\$ 3,371,100	\$ 3,974,134
TOTAL RIGHT OF WAY COST	\$ 172,900	\$ 196,000
TOTAL CAPITAL OUTLAY COSTS	\$ 3,544,000	\$ 4,171,000
PA/ED SUPPORT	\$ -	\$ -
PS&E SUPPORT	\$ -	\$ -
RIGHT OF WAY SUPPORT	\$ -	\$ -
CONSTRUCTION SUPPORT	\$ -	\$ -
TOTAL SUPPORT COST	\$ -	\$ -

TOTAL PROJECT COST	\$ 3,550,000	\$ 4,180,000
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Programmed Amount

Month / Year
Date of Estimate (Month/Year) 2 / 2022

Estimated Construction Start (Month/Year) 3 / 2025

Number of Working Days = 180

Estimated Mid-Point of Construction (Month/Year) 7 / 2025

Estimated Construction End (Month/Year) 12 / 2025

Number of Plant Establishment Days

Estimated Project Schedule

PID Approval

PA/ED Approval

PS&E

RTL

Begin Construction

Reviewed by District O.E. or
Cost Estimate Certifier

xx/xx/xxxx

(xxx) xxx-xxxx

Office Engineer / Cost Estimate Certifier

Date

Phone

Approved by Project Manager

xx/xx/xxxx

(xxx) xxx-xxxx

Project Manager

Date

Phone

PROJECT COST ESTIMATE

EA: PID:

I. ROADWAY ITEMS SUMMARY

Section		Cost
1	Earthwork	\$ 61,800
2	Pavement Structural Section	\$ 1,050,600
3	Drainage	\$ 100,000
4	Specialty Items	\$ 18,700
5	Environmental	\$ 380,900
6	Traffic Items	\$ 420,000
7	Detours	\$ -
8	Minor Items	\$ 203,200
9	Roadway Mobilization	\$ 223,600
10	Supplemental Work	\$ 89,500
11	City Furnished	\$ 44,800
12	Time-Related Overhead	\$ -
13	Roadway Contingency	\$ 778,000
TOTAL ROADWAY ITEMS		\$ 3,371,100

Estimate Prepared By :

Michael C Pitcock PE, Staff Engineer

Date

Phone

Estimate Reviewed By :

Name and Title

Date

Phone

By signing this estimate you are attesting that you have discussed your project with all functional units and have incorporated all their comments or have discussed with them why they will not be incorporated.

SECTION 1: EARTHWORK

Item code		Unit	Quantity		Unit Price (\$)		Cost
190101	Roadway Excavation	CY	2,060	x	30.00	= \$	61,800
152320	Lead Compliance Plan	LS		x		= \$	-
194001	Ditch Excavation	CY		x		= \$	-
19801X	Imported Borrow	CY/TON		x		= \$	-
192037	Structure Excavation (Retaining Wall)	CY		x		= \$	-
193013	Structure Backfill (Retaining Wall)	CY		x		= \$	-
193031	Pervious Backfill Material (Retaining Wall)	CY		x		= \$	-
16010X	Clearing & Grubbing	LS/ACRE		x		= \$	-
170101	Develop Water Supply	LS		x		= \$	-
19801X	Imported Borrow	CY/TON		x		= \$	-
210130	Duff	ACRE		x		= \$	-
XXXXXX	Some Item	Unit		x		= \$	-

TOTAL EARTHWORK SECTION ITEMS	\$	61,800
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SECTION 2: PAVEMENT STRUCTURAL SECTION

Item code		Unit	Quantity		Unit Price (\$)		Cost
401050	Jointed Plain Concrete Pavement	CY		x		= \$	-
400050	Continuously Reinforced Concrete Pavement	CY	98	x	900.00	= \$	88,200
404092	Seal Pavement Joint	LF		x		= \$	-
404093	Seal Isolation Joint	LF		x		= \$	-
413117	Seal Concrete Pavement Joint (Silicone)	LF		x		= \$	-
413118	Seal Pavement Joint (Asphalt Rubber)	LF		x		= \$	-
280010	Rapid Strength Concrete Base	CY		x		= \$	-
410095	Dowel Bar (Drill and Bond)	EA		x		= \$	-
390132	Hot Mix Asphalt (Type A)	TON	2,050	x	135.00	= \$	276,750
390137	Rubberized Hot Mix Asphalt (Gap Graded)	TON		x		= \$	-
395041	RHMA-O (Open Graded Fiction Course)	TON		x		= \$	-
393006	Geosynthetic Pavement Interlayer (Paving Grid)	SQYD		x		= \$	-
260203	Class 2 Aggregate Base	CY	1,650	x	90.00	= \$	148,500
290201	Asphalt Treated Permeable Base	CY		x		= \$	-
250401	Class 4 Aggregate Subbase	CY		x		= \$	-
374002	Asphaltic Emulsion (Fog Seal Coat)	TON		x		= \$	-
397005	Tack Coat	TON	5	x	1,700.00	= \$	8,500
390100	Prime Coat	TON	3	x	1,500.00	= \$	4,500
377501	Slurry Seal	TON		x		= \$	-
3750XX	Screenings (Type XX)	TON		x		= \$	-
374492	Asphaltic Emulsion (Polymer Modified)	TON		x		= \$	-
370001	Sand Cover (Seal)	TON		x		= \$	-
731530A	Hot Mix Asphalt (Textured Paving)	TONS		x		= \$	-
730020	Minor Concrete (Curb)	CY	60	x	1,700.00	= \$	102,000
731504	Minor Concrete (Curb and Gutter)	CY	100	x	1,200.00	= \$	120,000
731516	Minor Concrete (Driveway)	CY		x		= \$	-
731521	Minor Concrete (Sidewalk)	CY	180	x	1,000.00	= \$	180,000
39407X	Place Hot Mix Asphalt Dike (Type E)	LF		x		= \$	-
150771	Remove Asphalt Concrete Dike	LF		x		= \$	-
420201	Grind Existing Concrete Pavement	SQYD		x		= \$	-
150860	Remove Base and Surfacing	CY		x		= \$	-
390095	Replace Asphalt Concrete Surfacing	CY		x		= \$	-
15312X	Remove Concrete	LF/CY/LS	1	x	75,000.00	= \$	75,000
394090	Place Hot Mix Asphalt (Miscellaneous Area)	SQYD		x		= \$	-
153103	Cold Plane Asphalt Concrete Pavement	SQYD	4,710	x	10.00	= \$	47,100
39405X	Shoulder Rumble Strip (HMA, X-In Indentations)	STA		x		= \$	-
413113	Repair Spalled Joints, Polyester Grout	SQYD		x		= \$	-
420102	Groove Existing Concrete Pavement	SQYD		x		= \$	-
390136	Minor Hot Mix Asphalt	TON		x		= \$	-
394095	Roadside Paving (Miscellaneous Areas)	SQYD		x		= \$	-
XXXXXX	Some Item	Unit		x		= \$	-

TOTAL PAVEMENT STRUCTURAL SECTION ITEMS	\$	1,050,600
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SECTION 3: DRAINAGE

Item code		Unit	Quantity	Unit Price (\$)	Cost
15080X	Remove Culvert	EA/LF	x	= \$	-
150820	Modify Inlet	EA	x	= \$	-
155232	Sand Backfill	CY	x	= \$	-
15020X	Abandon Culvert	EA/LF	x	= \$	-
152430	Adjust Inlet	LF	x	= \$	-
155003	Cap Inlet	EA	x	= \$	-
510501	Minor Concrete	CY	x	= \$	-
510502	Minor Concrete (Minor Structure)	CY	x	= \$	-
5105XX	Minor Concrete (Type XX)	CY	x	= \$	-
620XXX	XX" Alternative Pipe Culvert (Type X)	LF	x	= \$	-
6411XX	XX" Plastic Pipe	LF	x	= \$	-
65XXXX	XX" Reinforced Concrete Pipe (Type X)	LF	x	= \$	-
6650XX	XX" Corrugated Steel Pipe (0.XXX" Thick)	LF	x	= \$	-
68XXXX	XX" Plastic Pipe (Edge Drain)	LF	x	= \$	-
69011X	XX" Corrugated Steel Pipe Downrain (0.XXX" Th	LF	x	= \$	-
70321X	XX" Corrugated Steel Pipe Inlet (0.XXX" Thick)	LF	x	= \$	-
70XXXX	XX" Corrugated Steel Pipe Riser (0.XXX" Thick)	LF	x	= \$	-
7050XX	XX" Steel Flared End Section	EA	x	= \$	-
703233	Grated Line Drain	LF	x	= \$	-
72XXXX	Rock Slope Protection (Type and Method)	CY/TON	x	= \$	-
72901X	Rock Slope Protection Fabric (Class X)	SQYD	x	= \$	-
721420	Concrete (Ditch Lining)	CY	x	= \$	-
721430	Concrete (Channel Lining)	CY	x	= \$	-
750001	Miscellaneous Iron and Steel	LB	x	= \$	-
XXXXXX	Additional Drainage	LS	1 x	100,000.00 = \$	100,000

TOTAL DRAINAGE ITEMS	\$ 100,000
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SECTION 4: SPECIALTY ITEMS

Item code		Unit	Quantity	Unit Price (\$)	Cost
080050	Progress Schedule (Critical Path Method)	LS	x	= \$	-
582001	Sound Wall (Masonry Block)	SQFT	x	= \$	-
510530	Minor Concrete (Wall)	CY	x	= \$	-
15325X	Remove Sound Wall	LF/LS	x	= \$	-
070030	Lead Compliance Plan	LS	x	= \$	-
141120	Treated Wood Waste	LB	x	= \$	-
153221	Remove Concrete Barrier	LF	x	= \$	-
150662	Remove Metal Beam Guard Railing	LF	x	= \$	-
150668	Remove Flared End Section	EA	x	= \$	-
8000XX	Chain Link Fence (Type XX)	LF	x	= \$	-
80XXXX	XX" Chain Link Gate (Type CL-6)	EA	x	= \$	-
832005	Midwest Guardrail System	LF	x	= \$	-
839301	Single Thrie Beam Barrier	LF	x	= \$	-
839310	Double Thrie Beam Barrier	LF	x	= \$	-
839521	Cable Railing	LF	x	= \$	-
8395XX	Terminal System (Type WB-31)	EA	x	= \$	-
839585	Alternative Flared Terminal System	EA	x	= \$	-
839584	Alternative In-line Terminal System	EA	x	= \$	-
498052	60" CIDH Concrete Pile (Sign Foundation)	LF	x	= \$	-
839XXX	Crash Cushion (Insert Type)	EA	x	= \$	-
520103	Bar Reinforced Steel (Retaining Wall)	LB	x	= \$	-
510060	Structural Concrete, Retaining Wall	CY	x	= \$	-
513553	Retaining Wall (Masonry Wall)	SQFT	x	= \$	-
511035	Architectural Treatment	SQFT	x	= \$	-
598001	Anti-Graffiti Coating	SQFT	x	= \$	-
203070	Rock Stain	SQFT	x	= \$	-
5136XX	Reinforced Concrete Crib Wall (Type X)	SQFT	x	= \$	-
839543	Transition Railing (Type WB-31)	EA	x	= \$	-
780440	Prepare and Stain Concrete	SQFT	3,110 x	6.00 = \$	18,660
839561	Rail Tensioning Assembly	EA	x	= \$	-
83958X	End Anchor Assembly (Type X)	EA	x	= \$	-
XXXXXX	Some Item	Unit	x	= \$	-

TOTAL SPECIALTY ITEMS	\$ 18,700
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SECTION 5: ENVIRONMENTAL**5A - ENVIRONMENTAL MITIGATION**

Item code	Unit	Quantity	Unit Price (\$)	Cost
Biological Mitigation	LS	1	x 50,000.00 = \$	50,000
130670 Temporary Reinforced Silt Fence	LF	x	= \$	-
141000 Temporary Fence (Type ESA)	LF	x	= \$	-
Subtotal Environmental Mitigation				\$ 50,000

5B - LANDSCAPE AND IRRIGATION

Item code	Unit	Quantity	Unit Price (\$)	Cost
20XXXX Highway Planting	LS	1	x 86,000.00 = \$	86,000
20XXXX Irrigation System	LS	1	x 171,000.00 = \$	171,000
204099 Plant Establishment Work	LS	x	= \$	-
204101 Extend Plant Establishment Work	LS	x	= \$	-
20XXXX Follow-up Landscape Project	LS	x	= \$	-
150685 Remove Irrigation Facility	LS	x	= \$	-
20XXXX Maintain Existing (Irrigation or Planted Areas)	LS	x	= \$	-
206400 Check and Test Existing Irrigation Facilities	LS	x	= \$	-
21011X Imported Topsoil (X)	CY/TON	x	= \$	-
20XXXX Rock Blanket, Rock Mulch, DG, Gravel Mulch	SQFT/SQYD	x	= \$	-
200122 Weed Germination	SQYD	x	= \$	-
208304 Water Meter	EA	x	= \$	-
2087XX XX" Conduit (Use for Irrigation x-overs)	LF	x	= \$	-
20890X Extend X" Conduit (Use for Extension of Irrigation x-overs)	LF	x	= \$	-
Subtotal Landscape and Irrigation				\$ 257,000

5C - EROSION CONTROL

Item code	Unit	Quantity	Unit Price (\$)	Cost
210010 Move In/Move Out (Erosion Control)	EA	1	x 5,000.00 = \$	5,000
210350 Fiber Rolls	LF	2,000	x 5.00 = \$	10,000
210360 Compost Sock	LF	x	= \$	-
2102XX Rolled Erosion Control Product (X)	SQFT	x	= \$	-
21025X Bonded Fiber Matrix	SQFT/ACRE	x	= \$	-
210300 Hydromulch	SQFT	10,000	x 0.25 = \$	2,500
210420 Straw	SQFT	x	= \$	-
210430 Hydroseed	SQFT	10,000	x 0.20 = \$	2,000
210600 Compost	CY	31	x 150.00 = \$	4,650
210630 Incorporate Materials	SQFT	10,000	x 0.50 = \$	5,000
Subtotal Erosion Control				\$ 29,150

5D - NPDES

Item code	Unit	Quantity	Unit Price (\$)	Cost
130300 Prepare SWPPP	LS	1	x 10,000.00 = \$	10,000
130200 Prepare WPCP	LS	x	= \$	-
130100 Job Site Management	LS	x	= \$	-
130330 Storm Water Annual Report	EA	x	= \$	-
130310 Rain Event Action Plan (REAP)	EA	x	= \$	-
130320 Storm Water Sampling and Analysis Day	EA	x	= \$	-
130520 Temporary Hydraulic Mulch	SQYD	1,120	x 2.50 = \$	2,800
130550 Temporary Hydroseed	SQYD	1,120	x 1.70 = \$	1,904
130505 Move-In/Move-Out (Temporary Erosion Control)	EA	x	= \$	-
130640 Temporary Fiber Roll	LF	x	= \$	-
130900 Temporary Concrete Washout	LS	1	x 5,000.00 = \$	5,000
130710 Temporary Construction Entrance	EA	1	x 10,000.00 = \$	10,000
130610 Temporary Check Dam	LF	x	= \$	-
130620 Temporary Drainage Inlet Protection	EA	x	= \$	-
130730 Street Sweeping	LS	1	x 15,000.00 = \$	15,000
Subtotal NPDES				\$ 44,704

Supplemental Work for NPDES

066595 Water Pollution Control Maintenance Sharing*	LS	x	= \$	-
066596 Additional Water Pollution Control**	LS	x	= \$	-
066597 Storm Water Sampling and Analysis***	LS	x	= \$	-
XXXXXX Some Item	LS	x	= \$	-
Subtotal Supplemental Work for NDPS				\$ -

*Applies to all SWPPPs and those WPCPs with sediment control or soil stabilization BMPs.

**Applies to both SWPPPs and WPCP projects.

*** Applies only to project with SWPPPs.

TOTAL ENVIRONMENTAL	\$ 380,900
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SECTION 6: TRAFFIC ITEMS**6A - Traffic Electrical**

Item code	Unit	Quantity	Unit Price (\$)	Cost
860460 Lighting and Sign Illumination	LS	1 x	150,000.00 = \$	150,000
860201 Signal and Lighting	LS	x	= \$	-
860990 Closed Circuit Television System	LS	x	= \$	-
86110X Ramp Metering System (Location X)	LS	x	= \$	-
86070X Interconnection Conduit and Cable	LF/LS	x	= \$	-
5602XX Furnish Sign Structure (Type X)	LB	x	= \$	-
5602XX Install Sign Structure (Type X)	LB	x	= \$	-
498040 XX" CIDHC Pile (Sign Foundation)	LF	x	= \$	-
86080X Inductive Loop Detectors	EA/LS	x	= \$	-
8609XX Traffic Monitoring Station (Type X)	LS	x	= \$	-
15075X Remove Sign Structure	EA/LS	x	= \$	-
151581 Reconstruct Sign Structure	EA	x	= \$	-
152641 Modify Sign Structure	EA	x	= \$	-
860090 Maintain Existing Traffic Management System Ele	LS	x	= \$	-
86XXXX Fiber Optic Conduit System	LS	x	= \$	-
XXXXX Some Item	Unit	x	= \$	-
Subtotal Traffic Electrical				\$ 150,000

6B - Traffic Signing and Striping

Item code	Unit	Quantity	Unit Price (\$)	Cost
566011 Roadside Sign - One Post	EA	x	= \$	-
566012 Roadside Sign - Two Post	EA	x	= \$	-
5602XX Furnish Sign	SQFT	x	= \$	-
568016 Install Sign Panel on Existing Frame	SQFT	x	= \$	-
150711 Remove Painted Traffic Stripe	LF	x	= \$	-
141101 Remove Yellow Painted Traffic Stripe (Hazardous Waste)	LF	x	= \$	-
150712 Remove Painted Pavement Marking	SQFT	x	= \$	-
150742 Remove Roadside Sign	EA	x	= \$	-
152320 Reset Roadside Sign	EA	x	= \$	-
152390 Relocate Roadside Sign	EA	x	= \$	-
82010X Delineator (Class X)	EA	x	= \$	-
840502 Thermoplastic Traffic Stripe (Enhanced Wet Night	LF	x	= \$	-
846012 Thermoplastic Crosswalk and Pavement Marking (	SQFT	x	= \$	-
120090 Construction Area Signs	LS	x	= \$	-
84XXXX Permanent Pavement Delineation	LS	1 x	20,000.00 = \$	20,000
Subtotal Traffic Signing and Striping				\$ 20,000

6C - Traffic Management Plan

Item code	Unit	Quantity	Unit Price (\$)	Cost
12865X Portable Changeable Message Signs	EA/LS	x	= \$	-
Subtotal Traffic Management Plan				\$ -

6C - Stage Construction and Traffic Handling

Item code	Unit	Quantity	Unit Price (\$)	Cost
120199 Traffic Plastic Drum	EA	x	= \$	-
12016X Channelizer (Type X)	EA	x	= \$	-
120120 Type III Barricade	EA	x	= \$	-
129100 Temporary Crash Cushion Module	EA	x	= \$	-
120100 Traffic Control System	LS	x	= \$	-
129110 Temporary Crash Cushion	EA	x	= \$	-
129000 Temporary Railing (Type K)	LF	x	= \$	-
120149 Temporary Pavement Marking (Paint)	SQFT	x	= \$	-
82010X Delineator (Class X)	EA	x	= \$	-
XXXXXX Stage Construction	Unit	1 x	250,000.00 = \$	250,000
Subtotal Stage Construction and Traffic Handling				\$ 250,000

TOTAL TRAFFIC ITEMS	\$ 420,000
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SECTION 7: DETOURS

Includes constructing, maintaining, and removal

Item code	Unit	Quantity	Unit Price (\$)	Cost
190101 Roadway Excavation	CY	x	= \$	-
19801X Imported Borrow	CY/TON	x	= \$	-
390132 Hot Mix Asphalt (Type A)	TON	x	= \$	-
26020X Class 2 Aggregate Base	TON/CY	x	= \$	-
250401 Class 4 Aggregate Subbase	CY	x	= \$	-
130620 Temporary Drainage Inlet Protection	EA	x	= \$	-
129000 Temporary Railing (Type K)	LF	x	= \$	-
128601 Temporary Signal System	LS	x	= \$	-
120149 Temporary Pavement Marking (Paint)	SQFT	x	= \$	-
80010X Temporary Fence (Type X)	LF	x	= \$	-
XXXXXX Some Item	LS	x	= \$	-

* Includes constructing, maintaining, and removal

TOTAL DETOURS	\$	-
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SUBTOTAL SECTIONS 1 through 7	\$	2,032,000
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SECTION 8: MINOR ITEMS**8A - Americans with Disabilities Act Items**

ADA Items	1.0%	\$	20,320
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8B - Bike Path Items

Bike Path Items	1.0%	\$	20,320
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8C - Other Minor Items

Other Minor Items	8.0%	\$	162,560
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Total of Section 1-7	\$	2,032,000	x	10.0%	= \$	203,200
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TOTAL MINOR ITEMS	\$	203,200
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SECTIONS 9: ROADWAY MOBILIZATION

Item code						
999990	Total Section 1-8	\$	2,235,200	x	10%	= \$ 223,520

TOTAL ROADWAY MOBILIZATION	\$	223,600
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SECTION 10: SUPPLEMENTAL WORK

Item code	Unit	Quantity	Unit Price (\$)	Cost
066670 Payment Adjustments For Price Index Fluctuations	LS	x	= \$	-
066094 Value Analysis	LS	x	= \$	-
066070 Maintain Traffic	LS	x	= \$	-
066919 Dispute Resolution Board	LS	x	= \$	-
066921 Dispute Resolution Advisor	LS	x	= \$	-
066015 Federal Trainee Program	LS	x	= \$	-
066610 Partnering	LS	x	= \$	-
066204 Remove Rock and Debris	LS	x	= \$	-
066222 Locate Existing Crossover	LS	x	= \$	-
XXXXXX Some Item	Unit	x	= \$	-

Cost of NPDES Supplemental Work specified in Section 5D	= \$	-
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Total Section 1-8	\$	2,235,200	4%	= \$	89,408
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TOTAL SUPPLEMENTAL WORK	\$	89,500
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SECTION 11: CITY FURNISHED MATERIALS AND EXPENSES

Item code		Unit	Quantity	Unit Price (\$)		Cost
066105	Resident Engineers Office	LS	x	=		\$0
066063	Traffic Management Plan - Public Information	LS	x	=		\$0
066901	Water Expenses	LS	x	=		\$0
8609XX	Traffic Monitoring Station (X)	LS	x	=		\$0
066841	Traffic Controller Assembly	LS	x	=		\$0
066840	Traffic Signal Controller Assembly	LS	x	=		\$0
066062	COZEEP Contract	LS	x	=		\$0
066838	Reflective Numbers and Edge Sealer	LS	x	=		\$0
066065	Tow Truck Service Patrol	LS	x	=		\$0
066916	Annual Construction General Permit Fee	LS	x	=		\$0
XXXXXX	Some Item	Unit	x	=		\$0
Total Section 1-8		\$	2,235,200	2%	= \$	44,704

TOTAL CITY FURNISHED	\$44,800
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SECTION 12: TIME-RELATED OVERHEAD

Total of Roadway and Structures Contract Items excluding Mobilization \$2,235,200 (used to calculate TRO)
Total Construction Cost (excluding TRO and Contingency) \$2,593,100 (used to check if project is greater than \$5 million excluding contingency)

Estimated Time-Related Overhead (TRO) Percentage (0% to 10%) = **6%**

Item code		Unit	Quantity	Unit Price (\$)		Cost
090100	Time-Related Overhead	WD	180	X	\$0 =	\$0

TOTAL TIME-RELATED OVERHEAD	\$0
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SECTION 13: ROADWAY CONTINGENCY

Total Section 1-12 \$ 2,593,100 x 30% = \$777,930

TOTAL CONTINGENCY	\$778,000
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II. STRUCTURE ITEMS

	<u>Bridge 1</u>		<u>Bridge 2</u>		
DATE OF ESTIMATE	00/00/00		00/00/00		00/00/00
Bridge Name	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Bridge Number	57-XXX		57-XXX		57-XXX
Structure Type	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Width (Feet) [out to out]	0 LF		0 LF		0 LF
Total Bridge Length (Feet)	0 LF		0 LF		0 LF
Total Area (Square Feet)	0 SQFT		0 SQFT		0 SQFT
Structure Depth (Feet)	0 LF		0 LF		0 LF
Footing Type (pile or spread)	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Cost Per Square Foot	\$0		\$0		\$0
COST OF EACH	\$0		\$0		\$0

	<u>Building 1</u>				
DATE OF ESTIMATE	00/00/00		00/00/00		00/00/00
Building Name	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Bridge Number	57-XXX		57-XXX		57-XXX
Structure Type	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Width (Feet) [out to out]	0 LF		0 LF		0 LF
Total Building Length (Feet)	0 LF		0 LF		0 LF
Total Area (Square Feet)	0 SQFT		0 SQFT		0 SQFT
Structure Depth (Feet)	0 LF		0 LF		0 LF
Footing Type (pile or spread)	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Cost Per Square Foot	\$0		\$0		\$0
COST OF EACH	\$0		\$0		\$0

TOTAL COST OF BRIDGES	\$0
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TOTAL COST OF BUILDINGS	\$0
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STRUCTURES MOBILIZATION	10%	\$0
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Recommended Contingency: (Pre-PSR 30%-50%, PSR 25%, Draft PR 20%, PR 15%, after PR approval 10%, Final PS&E 5%)

Total recommended percentages includes any quantified risk based contingency from the risk register.

STRUCTURES CONTINGENCY	10%	\$0
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TOTAL COST OF STRUCTURES	\$0
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Estimate Prepared By: _____

XXXXXXXXXXXXXXXXXXXX ----- Division of Structures

Date

III. RIGHT OF WAY

Fill in all of the available information from the Right of Way Data Sheet.

A)	A1)	Acquisition, including Excess Land Purchases, Damages & Goodwill, Fees	\$	147,900
	A2)	SB-1210	\$	0
B)		Acquisition of Offsite Mitigation	\$	0
C)	C1)	Utility Relocation (City Share)	\$	0
	C2)	Potholing (Design Phase)	\$	25,000
D)		Railroad Acquisition	\$	0
E)		Clearance / Demolition	\$	0
F)		Relocation Assistance (RAP and/or Last Resort Housing Costs)	\$	0
G)		Title and Escrow	\$	0
H)		Environmental Review	\$	0
I)		Condemnation Settlements <u>0%</u>	\$	0
J)		Design Appreciation Factor <u>0%</u>	\$	0
K)		Utility Relocation (Construction Cost)	\$	0

L)	TOTAL RIGHT OF WAY ESTIMATE	\$172,900
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M)	TOTAL R/W ESTIMATE: Escalated	\$196,000
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N)	RIGHT OF WAY SUPPORT	\$0
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Support Cost Estimate Prepared By	Project Coordinator ¹	Phone
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Utility Estimate Prepared By	Utility Coordinator ²	Phone
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R/W Acquisition Estimate Prepared By	Right of Way Estimator ³	Phone
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Note: Items G & H applied to items A + B

¹ When estimate has Support Costs only² When estimate has Utility Relocation³ When R/W Acquisition is required

PROJECT

PLANNING COST ESTIMATE ©

EA: DS-123456

EA: DS-123456 PID: DS1234567

PID: DS1234567

District-County-Route: 00-XXX-X-000

PM: 00.0 - 00.0

Type of Estimate : Traffic Study Estimate

Program Code : None

Project Limits : Intersection of E Park Avenue and Scott Avenue

Project Description: Construction of Traffic Signal

Scope : Intersection Construction

Alternative : 3-Leg Signal with 4th leg stub for U turns and future fairground access

SUMMARY OF PROJECT COST ESTIMATE

	Current Year Cost	Escalated Cost
TOTAL ROADWAY COST	\$ 2,605,900	\$ 3,201,079
TOTAL STRUCTURES COST	\$ -	\$ -
SUBTOTAL CONSTRUCTION COST	\$ 2,605,900	\$ 3,201,079
TOTAL RIGHT OF WAY COST	\$ 84,500	\$ 96,000
TOTAL CAPITAL OUTLAY COSTS	\$ 2,691,000	\$ 3,298,000
PA/ED SUPPORT	\$ -	\$ -
PS&E SUPPORT	\$ -	\$ -
RIGHT OF WAY SUPPORT	\$ -	\$ -
CONSTRUCTION SUPPORT	\$ -	\$ -
TOTAL SUPPORT COST	\$ -	\$ -

TOTAL PROJECT COST	\$ 2,700,000	\$ 3,300,000
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Programmed Amount

Month / Year

Date of Estimate (Month/Year) 2 / 2022

Estimated Construction Start (Month/Year) 4 / 2026

Number of Working Days = 150

Estimated Mid-Point of Construction (Month/Year) 6 / 2026

Estimated Construction End (Month/Year) 9 / 2026

Number of Plant Establishment Days

Estimated Project Schedule

PID Approval

PA/ED Approval

PS&E

RTL

Begin Construction

Reviewed by District O.E. or
Cost Estimate Certifier

xx/xx/xxxx

(xxx) xxx-xxxx

Office Engineer / Cost Estimate Certifier

Date

Phone

Approved by Project Manager

xx/xx/xxxx

(xxx) xxx-xxxx

Project Manager

Date

Phone

I. ROADWAY ITEMS SUMMARY

	Section	Cost
1	Earthwork	\$ 27,500
2	Pavement Structural Section	\$ 394,700
3	Drainage	\$ 122,000
4	Specialty Items	\$ -
5	Environmental	\$ 106,600
6	Traffic Items	\$ 920,000
7	Detours	\$ -
8	Minor Items	\$ 157,100
9	Roadway Mobilization	\$ 172,800
10	Supplemental Work	\$ 69,200
11	City Furnished	\$ 34,600
12	Time-Related Overhead	\$ -
13	Roadway Contingency	\$ 601,400

TOTAL ROADWAY ITEMS	\$ 2,605,900
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Estimate Prepared By :

Name and Title	Date	Phone
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Estimate Reviewed By :

Name and Title	Date	Phone
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By signing this estimate you are attesting that you have discussed your project with all functional units and have incorporated all their comments or have discussed with them why they will not be incorporated.

SECTION 1: EARTHWORK

Item code		Unit	Quantity		Unit Price (\$)		Cost
190101	Roadway Excavation	CY	550	x	50.00	= \$	27,500
152320	Lead Compliance Plan	LS		x		= \$	-
194001	Ditch Excavation	CY		x		= \$	-
19801X	Imported Borrow	CY/TON		x		= \$	-
192037	Structure Excavation (Retaining Wall)	CY		x		= \$	-
193013	Structure Backfill (Retaining Wall)	CY		x		= \$	-
193031	Pervious Backfill Material (Retaining Wall)	CY		x		= \$	-
16010X	Clearing & Grubbing	LS/ACRE		x		= \$	-
170101	Develop Water Supply	LS		x		= \$	-
19801X	Imported Borrow	CY/TON		x		= \$	-
210130	Duff	ACRE		x		= \$	-
XXXXXX	Some Item	Unit		x		= \$	-

TOTAL EARTHWORK SECTION ITEMS	\$	27,500
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SECTION 2: PAVEMENT STRUCTURAL SECTION

Item code		Unit	Quantity		Unit Price (\$)		Cost
401050	Jointed Plain Concrete Pavement	CY		x		= \$	-
400050	Continuously Reinforced Concrete Pavement	CY		x		= \$	-
404092	Seal Pavement Joint	LF		x		= \$	-
404093	Seal Isolation Joint	LF		x		= \$	-
413117	Seal Concrete Pavement Joint (Silicone)	LF		x		= \$	-
413118	Seal Pavement Joint (Asphalt Rubber)	LF		x		= \$	-
280010	Rapid Strength Concrete Base	CY		x		= \$	-
410095	Dowel Bar (Drill and Bond)	EA		x		= \$	-
390132	Hot Mix Asphalt (Type A)	TON	1,100	x	135.00	= \$	148,500
390137	Rubberized Hot Mix Asphalt (Gap Graded)	TON		x		= \$	-
395041	RHMA-O (Open Graded Fiction Course)	TON		x		= \$	-
393006	Geosynthetic Pavement Interlayer (Paving Grid)	SQYD		x		= \$	-
260203	Class 2 Aggregate Base	CY	410	x	90.00	= \$	36,900
290201	Asphalt Treated Permeable Base	CY		x		= \$	-
250401	Class 4 Aggregate Subbase	CY		x		= \$	-
374002	Asphaltic Emulsion (Fog Seal Coat)	TON		x		= \$	-
397005	Tack Coat	TON	4	x	1,700.00	= \$	6,800
390100	Prime Coat	TON	1	x	1,500.00	= \$	1,500
377501	Slurry Seal	TON		x		= \$	-
3750XX	Screenings (Type XX)	TON		x		= \$	-
374492	Asphaltic Emulsion (Polymer Modified)	TON		x		= \$	-
370001	Sand Cover (Seal)	TON		x		= \$	-
731530A	Hot Mix Asphalt (Textured Paving)	TONS		x		= \$	-
730020	Minor Concrete (Curb)	CY	10	x	1,700.00	= \$	17,000
731504	Minor Concrete (Curb and Gutter)	CY	50	x	1,200.00	= \$	60,000
731516	Minor Concrete (Driveway)	CY		x		= \$	-
731521	Minor Concrete (Sidewalk)	CY	40	x	1,000.00	= \$	40,000
39407X	Place Hot Mix Asphalt Dike (Type E)	LF		x		= \$	-
150771	Remove Asphalt Concrete Dike	LF		x		= \$	-
420201	Grind Existing Concrete Pavement	SQYD		x		= \$	-
150860	Remove Base and Surfacing	CY		x		= \$	-
390095	Replace Asphalt Concrete Surfacing	CY		x		= \$	-
15312X	Remove Concrete	LF/CY/LS	1	x	25,000.00	= \$	25,000
394090	Place Hot Mix Asphalt (Miscellaneous Area)	SQYD		x		= \$	-
153103	Cold Plane Asphalt Concrete Pavement	SQYD	5,900	x	10.00	= \$	59,000
39405X	Shoulder Rumble Strip (HMA, X-In Indentations)	STA		x		= \$	-
413113	Repair Spalled Joints, Polyester Grout	SQYD		x		= \$	-
420102	Groove Existing Concrete Pavement	SQYD		x		= \$	-
390136	Minor Hot Mix Asphalt	TON		x		= \$	-
394095	Roadside Paving (Miscellaneous Areas)	SQYD		x		= \$	-
XXXXXX	Some Item	Unit		x		= \$	-

TOTAL PAVEMENT STRUCTURAL SECTION ITEMS	\$	394,700
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SECTION 3: DRAINAGE

Item code		Unit	Quantity	Unit Price (\$)	Cost
15080X	Remove Culvert	EA/LF	x	= \$	-
150820	Modify Inlet	EA	x	= \$	-
155232	Sand Backfill	CY	x	= \$	-
15020X	Abandon Culvert	EA/LF	x	= \$	-
152430	Adjust Inlet	LF	x	= \$	-
155003	Cap Inlet	EA	x	= \$	-
510501	Minor Concrete	CY	x	= \$	-
510502	Minor Concrete (Minor Structure)	CY	x	= \$	-
5105XX	Minor Concrete (Type XX)	CY	x	= \$	-
620XXX	XX" Alternative Pipe Culvert (Type X)	LF	x	= \$	-
6411XX	XX" Plastic Pipe	LF	x	= \$	-
65XXXX	XX" Reinforced Concrete Pipe (Type X)	LF	x	= \$	-
6650XX	XX" Corrugated Steel Pipe (0.XXX" Thick)	LF	x	= \$	-
68XXXX	XX" Plastic Pipe (Edge Drain)	LF	x	= \$	-
69011X	XX" Corrugated Steel Pipe Downrain (0.XXX" Th	LF	x	= \$	-
70321X	XX" Corrugated Steel Pipe Inlet (0.XXX" Thick)	LF	x	= \$	-
70XXXX	XX" Corrugated Steel Pipe Riser (0.XXX" Thick)	LF	x	= \$	-
7050XX	XX" Steel Flared End Section	EA	x	= \$	-
703233	Grated Line Drain	LF	x	= \$	-
72XXXX	Rock Slope Protection (Type and Method)	CY/TON	x	= \$	-
72901X	Rock Slope Protection Fabric (Class X)	SQYD	x	= \$	-
721420	Concrete (Ditch Lining)	CY	x	= \$	-
721430	Concrete (Channel Lining)	CY	x	= \$	-
750001	Miscellaneous Iron and Steel	LB	x	= \$	-
XXXXXX	Additional Drainage	LS	1 x	122,000.00 = \$	122,000

TOTAL DRAINAGE ITEMS	\$	122,000
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SECTION 4: SPECIALTY ITEMS

Item code		Unit	Quantity	Unit Price (\$)	Cost
080050	Progress Schedule (Critical Path Method)	LS	x	= \$	-
582001	Sound Wall (Masonry Block)	SQFT	x	= \$	-
510530	Minor Concrete (Wall)	CY	x	= \$	-
15325X	Remove Sound Wall	LF/LS	x	= \$	-
070030	Lead Compliance Plan	LS	x	= \$	-
141120	Treated Wood Waste	LB	x	= \$	-
153221	Remove Concrete Barrier	LF	x	= \$	-
150662	Remove Metal Beam Guard Railing	LF	x	= \$	-
150668	Remove Flared End Section	EA	x	= \$	-
8000XX	Chain Link Fence (Type XX)	LF	x	= \$	-
80XXXX	XX" Chain Link Gate (Type CL-6)	EA	x	= \$	-
832005	Midwest Guardrail System	LF	x	= \$	-
839301	Single Thrie Beam Barrier	LF	x	= \$	-
839310	Double Thrie Beam Barrier	LF	x	= \$	-
839521	Cable Railing	LF	x	= \$	-
8395XX	Terminal System (Type WB-31)	EA	x	= \$	-
839585	Alternative Flared Terminal System	EA	x	= \$	-
839584	Alternative In-line Terminal System	EA	x	= \$	-
498052	60" CIDH Concrete Pile (Sign Foundation)	LF	x	= \$	-
839XXX	Crash Cushion (Insert Type)	EA	x	= \$	-
520103	Bar Reinforced Steel (Retaining Wall)	LB	x	= \$	-
510060	Structural Concrete, Retaining Wall	CY	x	= \$	-
513553	Retaining Wall (Masonry Wall)	SQFT	x	= \$	-
511035	Architectural Treatment	SQFT	x	= \$	-
598001	Anti-Graffiti Coating	SQFT	x	= \$	-
203070	Rock Stain	SQFT	x	= \$	-
5136XX	Reinforced Concrete Crib Wall (Type X)	SQFT	x	= \$	-
839543	Transition Railing (Type WB-31)	EA	x	= \$	-
780440	Prepare and Stain Concrete	SQFT	x	= \$	-
839561	Rail Tensioning Assembly	EA	x	= \$	-
83958X	End Anchor Assembly (Type X)	EA	x	= \$	-
XXXXXX	Some Item	Unit	x	= \$	-

TOTAL SPECIALTY ITEMS	\$	-
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SECTION 5: ENVIRONMENTAL**5A - ENVIRONMENTAL MITIGATION**

Item code	Unit	Quantity	Unit Price (\$)	Cost
Biological Mitigation	LS	1	x 25,000.00 = \$	25,000
130670 Temporary Reinforced Silt Fence	LF		x = \$	-
141000 Temporary Fence (Type ESA)	LF		x = \$	-
Subtotal Environmental Mitigation				\$ 25,000

5B - LANDSCAPE AND IRRIGATION

Item code	Unit	Quantity	Unit Price (\$)	Cost
20XXXX Highway Planting	LS	1	x 5,000.00 = \$	5,000
20XXXX Irrigation System	LS	1	x 10,000.00 = \$	10,000
204099 Plant Establishment Work	LS		x = \$	-
204101 Extend Plant Establishment Work	LS		x = \$	-
20XXXX Follow-up Landscape Project	LS		x = \$	-
150685 Remove Irrigation Facility	LS		x = \$	-
20XXXX Maintain Existing (Irrigation or Planted Areas)	LS		x = \$	-
206400 Check and Test Existing Irrigation Facilities	LS		x = \$	-
21011X Imported Topsoil (X)	CY/TON		x = \$	-
20XXXX Rock Blanket, Rock Mulch, DG, Gravel Mulch	SQFT/SQYD		x = \$	-
200122 Weed Germination	SQYD		x = \$	-
208304 Water Meter	EA		x = \$	-
2087XX XX" Conduit (Use for Irrigation x-overs)	LF		x = \$	-
20890X Extend X" Conduit (Use for Extension of Irrigation x-overs)	LF		x = \$	-
Subtotal Landscape and Irrigation				\$ 15,000

5C - EROSION CONTROL

Item code	Unit	Quantity	Unit Price (\$)	Cost
210010 Move In/Move Out (Erosion Control)	EA	1	x 5,000.00 = \$	5,000
210350 Fiber Rolls	LF	2,000	x 5.00 = \$	10,000
210360 Compost Sock	LF		x = \$	-
2102XX Rolled Erosion Control Product (X)	SQFT		x = \$	-
21025X Bonded Fiber Matrix	SQFT/ACRE		x = \$	-
210300 Hydromulch	SQFT	1,500	x 0.25 = \$	375
210420 Straw	SQFT		x = \$	-
210430 Hydroseed	SQFT	7,000	x 0.20 = \$	1,400
210600 Compost	CY	20	x 150.00 = \$	3,000
210630 Incorporate Materials	SQFT	7,000	x 0.50 = \$	3,500
Subtotal Erosion Control				\$ 23,275

5D - NPDES

Item code	Unit	Quantity	Unit Price (\$)	Cost
130300 Prepare SWPPP	LS	1	x 10,000.00 = \$	10,000
130200 Prepare WPCP	LS		x = \$	-
130100 Job Site Management	LS		x = \$	-
130330 Storm Water Annual Report	EA		x = \$	-
130310 Rain Event Action Plan (REAP)	EA		x = \$	-
130320 Storm Water Sampling and Analysis Day	EA		x = \$	-
130520 Temporary Hydraulic Mulch	SQYD	780	x 2.50 = \$	1,950
130550 Temporary Hydroseed	SQYD	780	x 1.70 = \$	1,326
130505 Move-In/Move-Out (Temporary Erosion Control)	EA		x = \$	-
130640 Temporary Fiber Roll	LF		x = \$	-
130900 Temporary Concrete Washout	LS	1	x 5,000.00 = \$	5,000
130710 Temporary Construction Entrance	EA	1	x 10,000.00 = \$	10,000
130610 Temporary Check Dam	LF		x = \$	-
130620 Temporary Drainage Inlet Protection	EA		x = \$	-
130730 Street Sweeping	LS	1	x 15,000.00 = \$	15,000
Subtotal NPDES				\$ 43,276

Supplemental Work for NPDES

066595 Water Pollution Control Maintenance Sharing*	LS		x = \$	-
066596 Additional Water Pollution Control**	LS		x = \$	-
066597 Storm Water Sampling and Analysis***	LS		x = \$	-
XXXXXX Some Item	LS		x = \$	-
Subtotal Supplemental Work for NDPS				\$ -

*Applies to all SWPPPs and those WPCPs with sediment control or soil stabilization BMPs.

**Applies to both SWPPPs and WPCP projects.

*** Applies only to project with SWPPPs.

TOTAL ENVIRONMENTAL	\$ 106,600
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SECTION 6: TRAFFIC ITEMS**6A - Traffic Electrical**

Item code	Unit	Quantity	Unit Price (\$)	Cost
860460 Lighting and Sign Illumination	LS	x	= \$	-
860201 Signal and Lighting	LS	1 x	700,000.00 = \$	700,000
860990 Closed Circuit Television System	LS	x	= \$	-
86110X Ramp Metering System (Location X)	LS	x	= \$	-
86070X Interconnection Conduit and Cable	LF/LS	x	= \$	-
5602XX Furnish Sign Structure (Type X)	LB	x	= \$	-
5602XX Install Sign Structure (Type X)	LB	x	= \$	-
498040 XX" CIDHC Pile (Sign Foundation)	LF	x	= \$	-
86080X Inductive Loop Detectors	EA/LS	x	= \$	-
8609XX Traffic Monitoring Station (Type X)	LS	x	= \$	-
15075X Remove Sign Structure	EA/LS	x	= \$	-
151581 Reconstruct Sign Structure	EA	x	= \$	-
152641 Modify Sign Structure	EA	x	= \$	-
860090 Maintain Existing Traffic Management System Ele	LS	x	= \$	-
86XXXX Fiber Optic Conduit System	LS	x	= \$	-
XXXXX Some Item	Unit	x	= \$	-
Subtotal Traffic Electrical				\$ 700,000

6B - Traffic Signing and Striping

Item code	Unit	Quantity	Unit Price (\$)	Cost
566011 Roadside Sign - One Post	EA	x	= \$	-
566012 Roadside Sign - Two Post	EA	x	= \$	-
5602XX Furnish Sign	SQFT	x	= \$	-
568016 Install Sign Panel on Existing Frame	SQFT	x	= \$	-
150711 Remove Painted Traffic Stripe	LF	x	= \$	-
141101 Remove Yellow Painted Traffic Stripe (Hazardous Waste)	LF	x	= \$	-
150712 Remove Painted Pavement Marking	SQFT	x	= \$	-
150742 Remove Roadside Sign	EA	x	= \$	-
152320 Reset Roadside Sign	EA	x	= \$	-
152390 Relocate Roadside Sign	EA	x	= \$	-
82010X Delineator (Class X)	EA	x	= \$	-
840502 Thermoplastic Traffic Stripe (Enhanced Wet Night	LF	x	= \$	-
846012 Thermoplastic Crosswalk and Pavement Marking (	SQFT	x	= \$	-
120090 Construction Area Signs	LS	x	= \$	-
84XXXX Permanent Pavement Delineation	LS	1 x	20,000.00 = \$	20,000
Subtotal Traffic Signing and Striping				\$ 20,000

6C - Traffic Management Plan

Item code	Unit	Quantity	Unit Price (\$)	Cost
12865X Portable Changeable Message Signs	EA/LS	x	= \$	-
Subtotal Traffic Management Plan				\$ -

6C - Stage Construction and Traffic Handling

Item code	Unit	Quantity	Unit Price (\$)	Cost
120199 Traffic Plastic Drum	EA	x	= \$	-
12016X Channelizer (Type X)	EA	x	= \$	-
120120 Type III Barricade	EA	x	= \$	-
129100 Temporary Crash Cushion Module	EA	x	= \$	-
120100 Traffic Control System	LS	x	= \$	-
129110 Temporary Crash Cushion	EA	x	= \$	-
129000 Temporary Railing (Type K)	LF	x	= \$	-
120149 Temporary Pavement Marking (Paint)	SQFT	x	= \$	-
82010X Delineator (Class X)	EA	x	= \$	-
XXXXXX Stage Construction	Unit	1 x	200,000.00 = \$	200,000
Subtotal Stage Construction and Traffic Handling				\$ 200,000

TOTAL TRAFFIC ITEMS	\$ 920,000
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SECTION 7: DETOURS

Includes constructing, maintaining, and removal

Item code		Unit	Quantity	Unit Price (\$)	Cost
190101	Roadway Excavation	CY	x	= \$	-
19801X	Imported Borrow	CY/TON	x	= \$	-
390132	Hot Mix Asphalt (Type A)	TON	x	= \$	-
26020X	Class 2 Aggregate Base	TON/CY	x	= \$	-
250401	Class 4 Aggregate Subbase	CY	x	= \$	-
130620	Temporary Drainage Inlet Protection	EA	x	= \$	-
129000	Temporary Railing (Type K)	LF	x	= \$	-
128601	Temporary Signal System	LS	x	= \$	-
120149	Temporary Pavement Marking (Paint)	SQFT	x	= \$	-
80010X	Temporary Fence (Type X)	LF	x	= \$	-
XXXXXX	Some Item	LS	x	= \$	-

* Includes constructing, maintaining, and removal

TOTAL DETOURS	\$	-
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SUBTOTAL SECTIONS 1 through 7	\$	1,570,800
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SECTION 8: MINOR ITEMS**8A - Americans with Disabilities Act Items**

ADA Items	1.0%	\$	15,708
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8B - Bike Path Items

Bike Path Items	1.0%	\$	15,708
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8C - Other Minor Items

Other Minor Items	8.0%	\$	125,664
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Total of Section 1-7	\$	1,570,800	x	10.0%	= \$	157,080
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TOTAL MINOR ITEMS	\$	157,100
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SECTIONS 9: ROADWAY MOBILIZATION

Item code					
999990	Total Section 1-8	\$	1,727,900	x	10% = \$ 172,790

TOTAL ROADWAY MOBILIZATION	\$	172,800
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SECTION 10: SUPPLEMENTAL WORK

Item code		Unit	Quantity	Unit Price (\$)	Cost
066670	Payment Adjustments For Price Index Fluctuations	LS	x	= \$	-
066094	Value Analysis	LS	x	= \$	-
066070	Maintain Traffic	LS	x	= \$	-
066919	Dispute Resolution Board	LS	x	= \$	-
066921	Dispute Resolution Advisor	LS	x	= \$	-
066015	Federal Trainee Program	LS	x	= \$	-
066610	Partnering	LS	x	= \$	-
066204	Remove Rock and Debris	LS	x	= \$	-
066222	Locate Existing Crossover	LS	x	= \$	-
XXXXXX	Some Item	Unit	x	= \$	-

Cost of NPDES Supplemental Work specified in Section 5D	= \$	-
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Total Section 1-8	\$	1,727,900	4%	= \$	69,116
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TOTAL SUPPLEMENTAL WORK	\$	69,200
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SECTION 11: CITY FURNISHED MATERIALS AND EXPENSES

Item code		Unit	Quantity	Unit Price (\$)		Cost
066105	Resident Engineers Office	LS		x	=	\$0
066063	Traffic Management Plan - Public Information	LS		x	=	\$0
066901	Water Expenses	LS		x	=	\$0
8609XX	Traffic Monitoring Station (X)	LS		x	=	\$0
066841	Traffic Controller Assembly	LS		x	=	\$0
066840	Traffic Signal Controller Assembly	LS		x	=	\$0
066062	COZEEP Contract	LS		x	=	\$0
066838	Reflective Numbers and Edge Sealer	LS		x	=	\$0
066065	Tow Truck Service Patrol	LS		x	=	\$0
066916	Annual Construction General Permit Fee	LS		x	=	\$0
XXXXXX	Some Item	Unit		x	=	\$0
Total Section 1-8		\$	1,727,900	2%	= \$	34,558

TOTAL CITY FURNISHED	\$34,600
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SECTION 12: TIME-RELATED OVERHEAD

Total of Roadway and Structures Contract Items excluding Mobilization	\$1,727,900 (used to calculate TRO)
Total Construction Cost (excluding TRO and Contingency)	\$2,004,500 (used to check if project is greater than \$5 million excluding contingency)

Estimated Time-Related Overhead (TRO) Percentage (0% to 10%) = 6%

Item code		Unit	Quantity	Unit Price (\$)		Cost
090100	Time-Related Overhead	WD	150	X	\$0 =	\$0

TOTAL TIME-RELATED OVERHEAD	\$0
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SECTION 13: ROADWAY CONTINGENCY

Total Section 1-12	\$	2,004,500	x	30%	=	\$601,350
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TOTAL CONTINGENCY	\$601,400
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II. STRUCTURE ITEMS

	<u>Bridge 1</u>		<u>Bridge 2</u>		
DATE OF ESTIMATE	00/00/00		00/00/00		00/00/00
Bridge Name	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Bridge Number	57-XXX		57-XXX		57-XXX
Structure Type	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Width (Feet) [out to out]	0 LF		0 LF		0 LF
Total Bridge Length (Feet)	0 LF		0 LF		0 LF
Total Area (Square Feet)	0 SQFT		0 SQFT		0 SQFT
Structure Depth (Feet)	0 LF		0 LF		0 LF
Footing Type (pile or spread)	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Cost Per Square Foot	\$0		\$0		\$0
COST OF EACH	\$0		\$0		\$0

	<u>Building 1</u>				
DATE OF ESTIMATE	00/00/00		00/00/00		00/00/00
Building Name	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Bridge Number	57-XXX		57-XXX		57-XXX
Structure Type	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Width (Feet) [out to out]	0 LF		0 LF		0 LF
Total Building Length (Feet)	0 LF		0 LF		0 LF
Total Area (Square Feet)	0 SQFT		0 SQFT		0 SQFT
Structure Depth (Feet)	0 LF		0 LF		0 LF
Footing Type (pile or spread)	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Cost Per Square Foot	\$0		\$0		\$0
COST OF EACH	\$0		\$0		\$0

TOTAL COST OF BRIDGES	\$0
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TOTAL COST OF BUILDINGS	\$0
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STRUCTURES MOBILIZATION	10%	\$0
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Recommended Contingency: (Pre-PSR 30%-50%, PSR 25%, Draft PR 20%, PR 15%, after PR approval 10%, Final PS&E 5%)

Total recommended percentages includes any quantified risk based contingency from the risk register.

STRUCTURES CONTINGENCY	10%	\$0
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TOTAL COST OF STRUCTURES	\$0
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Estimate Prepared By: _____
 XXXXXXXXXXXXXXXXXXXX ----- Division of Structures

 Date

III. RIGHT OF WAY

Fill in all of the available information from the Right of Way Data Sheet.

A)	A1)	Acquisition, including Excess Land Purchases, Damages & Goodwill, Fees	\$	59,500
	A2)	SB-1210	\$	0
B)	Acquisition of Offsite Mitigation		\$	0
C)	C1)	Utility Relocation (City Share)	\$	0
	C2)	Potholing (Design Phase)	\$	25,000
D)	Railroad Acquisition		\$	0
E)	Clearance / Demolition		\$	0
F)	Relocation Assistance (RAP and/or Last Resort Housing Costs)		\$	0
G)	Title and Escrow		\$	0
H)	Environmental Review		\$	0
I)	Condemnation Settlements	<u>0%</u>	\$	0
J)	Design Appreciation Factor	<u>0%</u>	\$	0
K)	Utility Relocation (Construction Cost)		\$	0

L)	TOTAL RIGHT OF WAY ESTIMATE	\$84,500
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M)	TOTAL R/W ESTIMATE: Escalated	\$96,000
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N)	RIGHT OF WAY SUPPORT	\$0
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Support Cost Estimate Prepared By	Project Coordinator ¹	Phone
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Utility Estimate Prepared By	Utility Coordinator ²	Phone
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R/W Acquisition Estimate Prepared By	Right of Way Estimator ³	Phone
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Note: Items G & H applied to items A + B

¹ When estimate has Support Costs only² When estimate has Utility Relocation³ When R/W Acquisition is required

Appendix I

Phase II Exhibits and Preliminary Cost Estimate



LEGEND:

- STAMPED CONCRETE
- CONCRETE
- LANDSCAPE
- ASPHALT
- R/W LINE
- EASEMENT LINE
- PROPERTY LINE



PRELIMINARY
SUBJECT TO CHANGE

HEGAN LANE CONGESTION RELIEF SOUTH GREENWAY EXTENSION



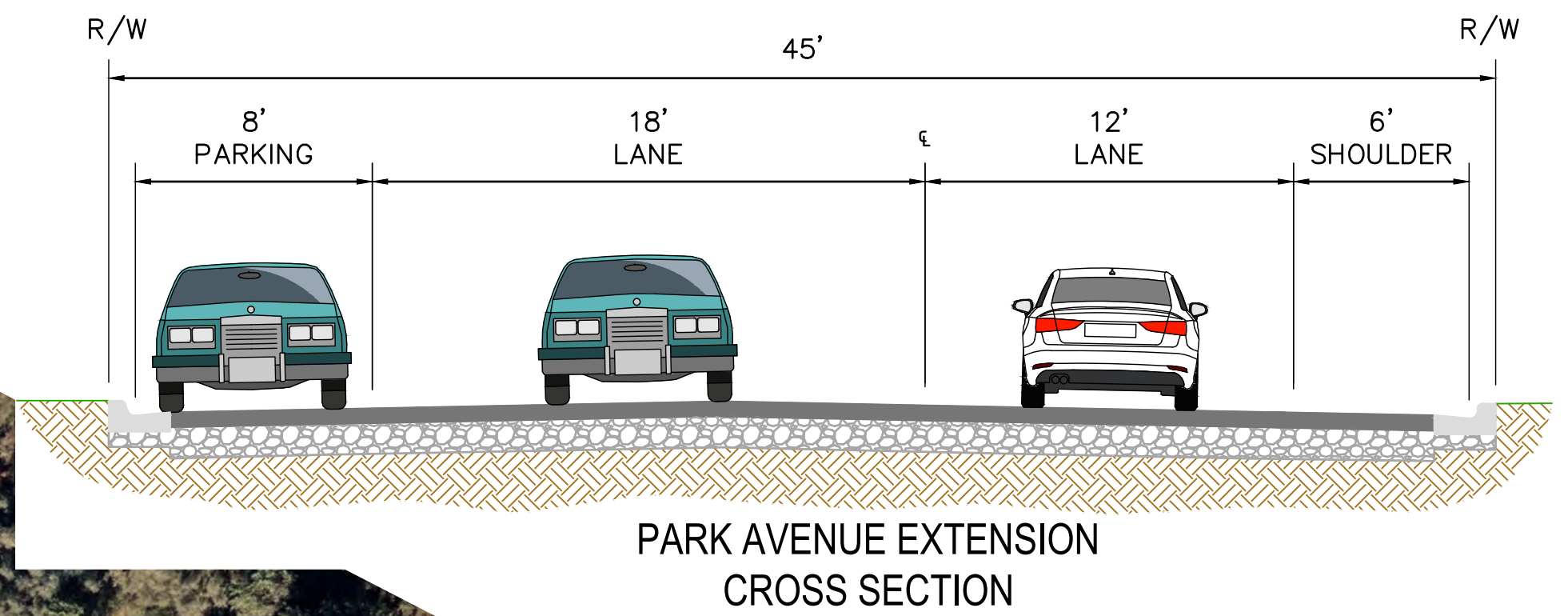
943 Reserve Drive, Suite 100
Roseville, CA 95678 USA
T 1 916 782 8688 W www.ghd.com

Project No. 11217309
Date 2/8/21

SHEET 1 OF 3

LEGEND:

- STAMPED CONCRETE
- CONCRETE
- LANDSCAPE
- ASPHALT
- R/W LINE
- EASEMENT LINE
- PROPERTY LINE



PRELIMINARY
SUBJECT TO CHANGE

HEGAN LANE CONGESTION RELIEF SOUTH GREENWAY EXTENSION



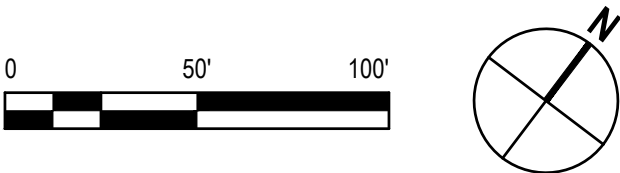
943 Reserve Drive, Suite 100
Roseville, CA 95678 USA
T 1 916 782 8688 W www.ghd.com

Project No. 11217309
Date 2/8/21

SHEET 2 OF 3

LEGEND:

- STAMPED CONCRETE
- CONCRETE
- LANDSCAPE
- ASPHALT
- R/W LINE
- EASEMENT LINE
- PROPERTY LINE



PRELIMINARY
SUBJECT TO CHANGE

HEGAN LANE CONGESTION RELIEF SOUTH GREENWAY EXTENSION



943 Reserve Drive, Suite 100
Roseville, CA 95678 USA
T 1 916 782 8688 W www.ghd.com

Project No. 11217309
Date 2/8/21

SHEET 3 OF 3

PROJECT PLANNING COST ESTIMATE ©

EA:

EA: PID:

PID:

District-County-Route:

PM:

Type of Estimate : Traffic Study Estimate

Program Code : None

Project Limits : Intersection of E Park Avenue and Midway

Project Description: Roadway Extension of E Park Avenue to Otterson Way Cul-de-Sac

Scope : Roadway Extension

Alternative : Extension

SUMMARY OF PROJECT COST ESTIMATE

	Current Year Cost	Escalated Cost
TOTAL ROADWAY COST	\$ 6,742,500	\$ 7,948,622
TOTAL STRUCTURES COST	\$ 4,032,000	\$ 4,753,258
SUBTOTAL CONSTRUCTION COST	\$ 10,774,500	\$ 12,701,880
TOTAL RIGHT OF WAY COST	\$ 4,260,000	\$ 4,260,000
TOTAL CAPITAL OUTLAY COSTS	\$ 15,035,000	\$ 16,962,000
PAVED SUPPORT	\$ -	\$ -
PS&E SUPPORT	\$ -	\$ -
RIGHT OF WAY SUPPORT	\$ -	\$ -
CONSTRUCTION SUPPORT	\$ -	\$ -
TOTAL SUPPORT COST	\$ -	\$ -

TOTAL PROJECT COST	\$ 15,050,000	\$ 17,000,000
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Programmed Amount

Month / Year

Date of Estimate (Month/Year) 2 / 2022

Estimated Construction Start (Month/Year) 3 / 2025

Number of Working Days = 180

Estimated Mid-Point of Construction (Month/Year) 7 / 2025

Estimated Construction End (Month/Year) 12 / 2025

Number of Plant Establishment Days

Estimated Project Schedule

PID Approval
PAVED Approval
PS&E
RTL
Begin Construction

Reviewed by District O.E. or
Cost Estimate Certifier

xx/xx/xxxx

(xxx) xxx-xxxx

Office Engineer / Cost Estimate Certifier

Date

Phone

Approved by Project Manager

xx/xx/xxxx

(xxx) xxx-xxxx

Project Manager

Date

Phone

PROJECT COST ESTIMATE

EA: PID:

I. ROADWAY ITEMS SUMMARY

	Section	Cost
1	Earthwork	\$ 433,500
2	Pavement Structural Section	\$ 1,983,200
3	Drainage	\$ 150,000
4	Specialty Items	\$ 70,000
5	Environmental	\$ 592,600
6	Traffic Items	\$ 470,000
7	Detours	\$ -
8	Minor Items	\$ 370,000
9	Roadway Mobilization	\$ 407,000
10	Supplemental Work	\$ 162,800
11	City Furnished	\$ 81,400
12	Time-Related Overhead	\$ 466,000
13	Roadway Contingency	\$ 1,556,000
TOTAL ROADWAY ITEMS		\$ 6,742,500

Estimate Prepared By :

Michael C Pitcock, Staff Engineer

Date

Phone

Estimate Reviewed By :

Name and Title

Date

Phone

By signing this estimate you are attesting that you have discussed your project with all functional units and have incorporated all their comments or have discussed with them why they will not be incorporated.

SECTION 1: EARTHWORK

Item code		Unit	Quantity		Unit Price (\$)		Cost
190101	Roadway Excavation	CY	9,200	x	30.00	= \$	276,000
152320	Lead Compliance Plan	LS		x		= \$	-
194001	Ditch Excavation	CY		x		= \$	-
19801X	Imported Borrow	CY	4,500	x	35.00	= \$	157,500
192037	Structure Excavation (Retaining Wall)	CY		x		= \$	-
193013	Structure Backfill (Retaining Wall)	CY		x		= \$	-
193031	Pervious Backfill Material (Retaining Wall)	CY		x		= \$	-
16010X	Clearing & Grubbing	LS/ACRE		x		= \$	-
170101	Develop Water Supply	LS		x		= \$	-
19801X	Imported Borrow	CY/TON		x		= \$	-
210130	Duff	ACRE		x		= \$	-
XXXXXX	Some Item	Unit		x		= \$	-

TOTAL EARTHWORK SECTION ITEMS	\$	433,500
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SECTION 2: PAVEMENT STRUCTURAL SECTION

Item code		Unit	Quantity		Unit Price (\$)		Cost
401050	Jointed Plain Concrete Pavement	CY		x		= \$	-
400050	Continuously Reinforced Concrete Pavement	CY		x		= \$	-
404092	Seal Pavement Joint	LF		x		= \$	-
404093	Seal Isolation Joint	LF		x		= \$	-
413117	Seal Concrete Pavement Joint (Silicone)	LF		x		= \$	-
413118	Seal Pavement Joint (Asphalt Rubber)	LF		x		= \$	-
280010	Rapid Strength Concrete Base	CY		x		= \$	-
410095	Dowel Bar (Drill and Bond)	EA		x		= \$	-
390132	Hot Mix Asphalt (Type A)	TON	6,505	x	135.00	= \$	878,175
390137	Rubberized Hot Mix Asphalt (Gap Graded)	TON		x		= \$	-
395041	RHMA-O (Open Graded Fiction Course)	TON		x		= \$	-
393006	Geosynthetic Pavement Interlayer (Paving Grid)	SQYD		x		= \$	-
260203	Class 2 Aggregate Base	CY	6,300	x	90.00	= \$	567,000
290201	Asphalt Treated Permeable Base	CY		x		= \$	-
250401	Class 4 Aggregate Subbase	CY		x		= \$	-
374002	Asphaltic Emulsion (Fog Seal Coat)	TON		x		= \$	-
397005	Tack Coat	TON	8	x	1,700.00	= \$	13,600
390100	Prime Coat	TON	13	x	1,500.00	= \$	19,500
377501	Slurry Seal	TON		x		= \$	-
3750XX	Screenings (Type XX)	TON		x		= \$	-
374492	Asphaltic Emulsion (Polymer Modified)	TON		x		= \$	-
370001	Sand Cover (Seal)	TON		x		= \$	-
731530A	Hot Mix Asphalt (Textured Paving)	TONS		x		= \$	-
730020	Minor Concrete (Curb)	CY		x		= \$	-
731504	Minor Concrete (Curb and Gutter)	CY	330	x	1,200.00	= \$	396,000
731516	Minor Concrete (Driveway)	CY	10	x	1,000.00	= \$	10,000
731521	Minor Concrete (Sidewalk)	CY	70	x	1,000.00	= \$	70,000
39407X	Place Hot Mix Asphalt Dike (Type E)	LF		x		= \$	-
150771	Remove Asphalt Concrete Dike	LF		x		= \$	-
420201	Grind Existing Concrete Pavement	SQYD		x		= \$	-
150860	Remove Base and Surfacing	CY		x		= \$	-
390095	Replace Asphalt Concrete Surfacing	CY		x		= \$	-
15312X	Remove Concrete	LS	1	x	20,000.00	= \$	20,000
394090	Place Hot Mix Asphalt (Miscellaneous Area)	SQYD		x		= \$	-
153103	Cold Plane Asphalt Concrete Pavement	SQYD	890	x	10.00	= \$	8,900
39405X	Shoulder Rumble Strip (HMA, X-In Indentations)	STA		x		= \$	-
413113	Repair Spalled Joints, Polyester Grout	SQYD		x		= \$	-
420102	Groove Existing Concrete Pavement	SQYD		x		= \$	-
390136	Minor Hot Mix Asphalt	TON		x		= \$	-
394095	Roadside Paving (Miscellaneous Areas)	SQYD		x		= \$	-
XXXXXX	Some Item	Unit		x		= \$	-

TOTAL PAVEMENT STRUCTURAL SECTION ITEMS	\$	1,983,200
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SECTION 3: DRAINAGE

Item code		Unit	Quantity	Unit Price (\$)	Cost
15080X	Remove Culvert	EA/LF	x	= \$	-
150820	Modify Inlet	EA	x	= \$	-
155232	Sand Backfill	CY	x	= \$	-
15020X	Abandon Culvert	EA/LF	x	= \$	-
152430	Adjust Inlet	LF	x	= \$	-
155003	Cap Inlet	EA	x	= \$	-
510501	Minor Concrete	CY	x	= \$	-
510502	Minor Concrete (Minor Structure)	CY	x	= \$	-
5105XX	Minor Concrete (Type XX)	CY	x	= \$	-
620XXX	XX" Alternative Pipe Culvert (Type X)	LF	x	= \$	-
6411XX	XX" Plastic Pipe	LF	x	= \$	-
65XXXX	XX" Reinforced Concrete Pipe (Type X)	LF	x	= \$	-
6650XX	XX" Corrugated Steel Pipe (0.XXX" Thick)	LF	x	= \$	-
68XXXX	XX" Plastic Pipe (Edge Drain)	LF	x	= \$	-
69011X	XX" Corrugated Steel Pipe Down drain (0.XXX" Thi	LF	x	= \$	-
70321X	XX" Corrugated Steel Pipe Inlet (0.XXX" Thick)	LF	x	= \$	-
70XXXX	XX" Corrugated Steel Pipe Riser (0.XXX" Thick)	LF	x	= \$	-
7050XX	XX" Steel Flared End Section	EA	x	= \$	-
703233	Grated Line Drain	LF	x	= \$	-
72XXXX	Rock Slope Protection (Type and Method)	CY/TON	x	= \$	-
72901X	Rock Slope Protection Fabric (Class X)	SQYD	x	= \$	-
721420	Concrete (Ditch Lining)	CY	x	= \$	-
721430	Concrete (Channel Lining)	CY	x	= \$	-
750001	Miscellaneous Iron and Steel	LB	x	= \$	-
XXXXXX	Additional Drainage	LS	1 x	150,000.00 = \$	150,000

TOTAL DRAINAGE ITEMS	\$	150,000
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SECTION 4: SPECIALTY ITEMS

Item code		Unit	Quantity	Unit Price (\$)	Cost
080050	Progress Schedule (Critical Path Method)	LS	x	= \$	-
582001	Sound Wall (Masonry Block)	SQFT	x	= \$	-
510530	Minor Concrete (Wall)	CY	x	= \$	-
15325X	Remove Sound Wall	LF/LS	x	= \$	-
070030	Lead Compliance Plan	LS	x	= \$	-
141120	Treated Wood Waste	LB	x	= \$	-
153221	Remove Concrete Barrier	LF	x	= \$	-
150662	Remove Metal Beam Guard Railing	LF	x	= \$	-
150668	Remove Flared End Section	EA	x	= \$	-
8000XX	Chain Link Fence (Type XX)	LF	x	= \$	-
80XXXX	XX" Chain Link Gate (Type CL-6)	EA	x	= \$	-
832005	Midwest Guardrail System	LF	400 x	100.00 = \$	40,000
839301	Single Thrie Beam Barrier	LF	x	= \$	-
839310	Double Thrie Beam Barrier	LF	x	= \$	-
839521	Cable Railing	LF	x	= \$	-
8395XX	Terminal System (Type WB-31)	EA	4 x	4,000.00 = \$	16,000
839585	Alternative Flared Terminal System	EA	x	= \$	-
839584	Alternative In-line Terminal System	EA	4 x	3,500.00 = \$	14,000
498052	60" CIDH Concrete Pile (Sign Foundation)	LF	x	= \$	-
839XXX	Crash Cushion (Insert Type)	EA	x	= \$	-
520103	Bar Reinforced Steel (Retaining Wall)	LB	x	= \$	-
510060	Structural Concrete, Retaining Wall	CY	x	= \$	-
513553	Retaining Wall (Masonry Wall)	SQFT	x	= \$	-
511035	Architectural Treatment	SQFT	x	= \$	-
598001	Anti-Graffiti Coating	SQFT	x	= \$	-
203070	Rock Stain	SQFT	x	= \$	-
5136XX	Reinforced Concrete Crib Wall (Type X)	SQFT	x	= \$	-
839543	Transition Railing (Type WB-31)	EA	x	= \$	-
780440	Prepare and Stain Concrete	SQFT	x	= \$	-
839561	Rail Tensioning Assembly	EA	x	= \$	-
83958X	End Anchor Assembly (Type X)	EA	x	= \$	-
XXXXXX	Some Item	Unit	x	= \$	-

TOTAL SPECIALTY ITEMS	\$	70,000
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SECTION 5: ENVIRONMENTAL**5A - ENVIRONMENTAL MITIGATION**

Item code	Unit	Quantity	Unit Price (\$)	Cost
Biological Mitigation	LS	1	x 250,000.00 = \$	250,000
130670 Temporary Reinforced Silt Fence	LF		x = \$	-
141000 Temporary Fence (Type ESA)	LF		x = \$	-
Subtotal Environmental Mitigation				\$ 250,000

5B - LANDSCAPE AND IRRIGATION

Item code	Unit	Quantity	Unit Price (\$)	Cost
20XXXX Highway Planting	LS	1	x 50,000.00 = \$	50,000
20XXXX Irrigation System	LS	1	x 100,000.00 = \$	100,000
204099 Plant Establishment Work	LS		x = \$	-
204101 Extend Plant Establishment Work	LS		x = \$	-
20XXXX Follow-up Landscape Project	LS		x = \$	-
150685 Remove Irrigation Facility	LS		x = \$	-
20XXXX Maintain Existing (Irrigation or Planted Areas)	LS		x = \$	-
206400 Check and Test Existing Irrigation Facilities	LS		x = \$	-
21011X Imported Topsoil (X)	CY/TON		x = \$	-
20XXXX Rock Blanket, Rock Mulch, DG, Gravel Mulch	SQFT/SQYD		x = \$	-
200122 Weed Germination	SQYD		x = \$	-
208304 Water Meter	EA		x = \$	-
2087XX XX" Conduit (Use for Irrigation x-overs)	LF		x = \$	-
20890X Extend X" Conduit (Use for Extension of Irrigation x-overs)	LF		x = \$	-
Subtotal Landscape and Irrigation				\$ 150,000

5C - EROSION CONTROL

Item code	Unit	Quantity	Unit Price (\$)	Cost
210010 Move In/Move Out (Erosion Control)	EA	1	x 5,000.00 = \$	5,000
210350 Fiber Rolls	LF	9,000	x 5.00 = \$	45,000
210360 Compost Sock	LF		x = \$	-
2102XX Rolled Erosion Control Product (X)	SQFT		x = \$	-
21025X Bonded Fiber Matrix	SQFT/ACRE		x = \$	-
210300 Hydromulch	SQFT	45,000	x 0.25 = \$	11,250
210420 Straw	SQFT		x = \$	-
210430 Hydroseed	SQFT	45,000	x 0.20 = \$	9,000
210600 Compost	CY	139	x 150.00 = \$	20,850
210630 Incorporate Materials	SQFT	45,000	x 0.50 = \$	22,500
Subtotal Erosion Control				\$ 113,600

5D - NPDES

Item code	Unit	Quantity	Unit Price (\$)	Cost
130300 Prepare SWPPP	LS	1	x 10,000.00 = \$	10,000
130200 Prepare WPCP	LS		x = \$	-
130100 Job Site Management	LS		x = \$	-
130330 Storm Water Annual Report	EA		x = \$	-
130310 Rain Event Action Plan (REAP)	EA		x = \$	-
130320 Storm Water Sampling and Analysis Day	EA		x = \$	-
130520 Temporary Hydraulic Mulch	SQYD	5,000	x 2.50 = \$	12,500
130550 Temporary Hydroseed	SQYD	5,000	x 1.70 = \$	8,500
130505 Move-In/Move-Out (Temporary Erosion Control)	EA		x = \$	-
130640 Temporary Fiber Roll	LF	9,000	x 2.00 = \$	18,000
130900 Temporary Concrete Washout	LS	1	x 5,000.00 = \$	5,000
130710 Temporary Construction Entrance	EA	1	x 10,000.00 = \$	10,000
130610 Temporary Check Dam	LF		x = \$	-
130620 Temporary Drainage Inlet Protection	EA		x = \$	-
130730 Street Sweeping	LS	1	x 15,000.00 = \$	15,000
Subtotal NPDES				\$ 79,000

TOTAL ENVIRONMENTAL	\$ 592,600
----------------------------	-------------------

Supplemental Work for NPDES

066595 Water Pollution Control Maintenance Sharing*	LS		x = \$	-
066596 Additional Water Pollution Control**	LS		x = \$	-
066597 Storm Water Sampling and Analysis***	LS		x = \$	-
XXXXXX Some Item	LS		x = \$	-
Subtotal Supplemental Work for NDPS				\$ -

*Applies to all SWPPPs and those WPCPs with sediment control or soil stabilization BMPs.

**Applies to both SWPPPs and WPCP projects.

*** Applies only to project with SWPPPs.

SECTION 6: TRAFFIC ITEMS**6A - Traffic Electrical**

Item code	Unit	Quantity	Unit Price (\$)	Cost
860460 Lighting and Sign Illumination	LS	x	= \$	-
860201 Signal and Lighting	LS	1 x	350,000.00 = \$	350,000
860990 Closed Circuit Television System	LS	x	= \$	-
86110X Ramp Metering System (Location X)	LS	x	= \$	-
86070X Interconnection Conduit and Cable	LF/LS	x	= \$	-
5602XX Furnish Sign Structure (Type X)	LB	x	= \$	-
5602XX Install Sign Structure (Type X)	LB	x	= \$	-
498040 XX" CIDHC Pile (Sign Foundation)	LF	x	= \$	-
86080X Inductive Loop Detectors	EA/LS	x	= \$	-
8609XX Traffic Monitoring Station (Type X)	LS	x	= \$	-
15075X Remove Sign Structure	EA/LS	x	= \$	-
151581 Reconstruct Sign Structure	EA	x	= \$	-
152641 Modify Sign Structure	EA	x	= \$	-
860090 Maintain Existing Traffic Management System Elern	LS	x	= \$	-
86XXXX Fiber Optic Conduit System	LS	x	= \$	-
XXXXX Some Item	Unit	x	= \$	-
Subtotal Traffic Electrical				\$ 350,000

6B - Traffic Signing and Striping

Item code	Unit	Quantity	Unit Price (\$)	Cost
566011 Roadside Sign - One Post	EA	x	= \$	-
566012 Roadside Sign - Two Post	EA	x	= \$	-
5602XX Furnish Sign	SQFT	x	= \$	-
568016 Install Sign Panel on Existing Frame	SQFT	x	= \$	-
150711 Remove Painted Traffic Stripe	LF	x	= \$	-
141101 Remove Yellow Painted Traffic Stripe (Hazardous Waste)	LF	x	= \$	-
150712 Remove Painted Pavement Marking	SQFT	x	= \$	-
150742 Remove Roadside Sign	EA	x	= \$	-
152320 Reset Roadside Sign	EA	x	= \$	-
152390 Relocate Roadside Sign	EA	x	= \$	-
82010X Delineator (Class X)	EA	x	= \$	-
840502 Thermoplastic Traffic Stripe (Enhanced Wet Night)	LF	x	= \$	-
846012 Thermoplastic Crosswalk and Pavement Marking (E	SQFT	x	= \$	-
120090 Construction Area Signs	LS	x	= \$	-
84XXXX Permanent Pavement Delineation	LS	1 x	20,000.00 = \$	20,000
Subtotal Traffic Signing and Striping				\$ 20,000

6C - Traffic Management Plan

Item code	Unit	Quantity	Unit Price (\$)	Cost
12865X Portable Changeable Message Signs	EA/LS	x	= \$	-
Subtotal Traffic Management Plan				\$ -

6C - Stage Construction and Traffic Handling

Item code	Unit	Quantity	Unit Price (\$)	Cost
120199 Traffic Plastic Drum	EA	x	= \$	-
12016X Channelizer (Type X)	EA	x	= \$	-
120120 Type III Barricade	EA	x	= \$	-
129100 Temporary Crash Cushion Module	EA	x	= \$	-
120100 Traffic Control System	LS	x	= \$	-
129110 Temporary Crash Cushion	EA	x	= \$	-
129000 Temporary Railing (Type K)	LF	x	= \$	-
120149 Temporary Pavement Marking (Paint)	SQFT	x	= \$	-
82010X Delineator (Class X)	EA	x	= \$	-
XXXXXX Stage Construction	LS	1 x	100,000.00 = \$	100,000
Subtotal Stage Construction and Traffic Handling				\$ 100,000

TOTAL TRAFFIC ITEMS	\$ 470,000
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SECTION 7: DETOURS

Includes constructing, maintaining, and removal

Item code	Unit	Quantity	Unit Price (\$)	Cost
190101 Roadway Excavation	CY	x	= \$	-
19801X Imported Borrow	CY/TON	x	= \$	-
390132 Hot Mix Asphalt (Type A)	TON	x	= \$	-
26020X Class 2 Aggregate Base	TON/CY	x	= \$	-
250401 Class 4 Aggregate Subbase	CY	x	= \$	-
130620 Temporary Drainage Inlet Protection	EA	x	= \$	-
129000 Temporary Railing (Type K)	LF	x	= \$	-
128601 Temporary Signal System	LS	x	= \$	-
120149 Temporary Pavement Marking (Paint)	SQFT	x	= \$	-
80010X Temporary Fence (Type X)	LF	x	= \$	-
XXXXXX Some Item	LS	x	= \$	-

* Includes constructing, maintaining, and removal

TOTAL DETOURS	\$	-
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SUBTOTAL SECTIONS 1 through 7	\$	3,699,300
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SECTION 8: MINOR ITEMS**8A - Americans with Disabilities Act Items**

ADA Items

1.0% \$ 36,993

8B - Bike Path Items

Bike Path Items

1.0% \$ 36,993

8C - Other Minor Items

Other Minor Items

8.0% \$ 295,944

Total of Section 1-7	\$	3,699,300	x	10.0%	= \$	369,930
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TOTAL MINOR ITEMS	\$	370,000
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SECTIONS 9: ROADWAY MOBILIZATION

Item code

999990

Total Section 1-8

\$	4,069,300	x	10%	= \$	406,930
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TOTAL ROADWAY MOBILIZATION	\$	407,000
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SECTION 10: SUPPLEMENTAL WORK

Item code

066670

Payment Adjustments For Price Index
Fluctuations

Unit

LS

Quantity

Unit Price (\$)

x

= \$

Cost

-

066094

Value Analysis

LS

x

= \$

-

066070

Maintain Traffic

LS

x

= \$

-

066919

Dispute Resolution Board

LS

x

= \$

-

066921

Dispute Resolution Advisor

LS

x

= \$

-

066015

Federal Trainee Program

LS

x

= \$

-

066610

Partnering

LS

x

= \$

-

066204

Remove Rock and Debris

LS

x

= \$

-

066222

Locate Existing Crossover

LS

x

= \$

-

XXXXXX

Some Item

Unit

x

= \$

-

Cost of NPDES Supplemental Work specified in Section 5D	= \$	-
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Total Section 1-8	\$	4,069,300	4%	= \$	162,772
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TOTAL SUPPLEMENTAL WORK	\$	162,800
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SECTION 11: CITY FURNISHED MATERIALS AND EXPENSES

Item code		Unit	Quantity	Unit Price (\$)		Cost
066105	Resident Engineers Office	LS	x	=		\$0
066063	Traffic Management Plan - Public Information	LS	x	=		\$0
066901	Water Expenses	LS	x	=		\$0
8609XX	Traffic Monitoring Station (X)	LS	x	=		\$0
066841	Traffic Controller Assembly	LS	x	=		\$0
066840	Traffic Signal Controller Assembly	LS	x	=		\$0
066062	COZEEP Contract	LS	x	=		\$0
066838	Reflective Numbers and Edge Sealer	LS	x	=		\$0
066065	Tow Truck Service Patrol	LS	x	=		\$0
066916	Annual Construction General Permit Fee	LS	x	=		\$0
XXXXXX	Some Item	Unit	x	=		\$0
Total Section 1-8		\$	4,069,300	2%	= \$	81,386

TOTAL CITY FURNISHED	\$81,400
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SECTION 12: TIME-RELATED OVERHEAD

Total of Roadway and Structures Contract Items excluding Mobilization \$7,765,300 (used to calculate TRO)
Total Construction Cost (excluding TRO and Contingency) \$8,752,500 (used to check if project is greater than \$5 million excluding contingency)

Estimated Time-Related Overhead (TRO) Percentage (0% to 10%) = 6%

Item code		Unit	Quantity	Unit Price (\$)		Cost
090100	Time-Related Overhead	WD	180	X \$2,589	=	\$466,000

TOTAL TIME-RELATED OVERHEAD	\$466,000
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SECTION 13: ROADWAY CONTINGENCY

Total Section 1-12 \$ 5,186,500 x **30%** = \$1,555,950

TOTAL CONTINGENCY	\$1,556,000
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II. STRUCTURE ITEMS

	<u>Bridge 1</u>		<u>Bridge 2</u>		
DATE OF ESTIMATE	00/00/00		00/00/00		00/00/00
Bridge Name	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Bridge Number	57-XXX		57-XXX		57-XXX
Structure Type	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Width (Feet) [out to out]	112 LF		0 LF		0 LF
Total Bridge Length (Feet)	75 LF		0 LF		0 LF
Total Area (Square Feet)	8400 SQFT		0 SQFT		0 SQFT
Structure Depth (Feet)	6 LF		0 LF		0 LF
Footing Type (pile or spread)	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Cost Per Square Foot	\$400		\$0		\$0
COST OF EACH	\$3,360,000		\$0		\$0

	<u>Building 1</u>				
DATE OF ESTIMATE	00/00/00		00/00/00		00/00/00
Building Name	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Bridge Number	57-XXX		57-XXX		57-XXX
Structure Type	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Width (Feet) [out to out]	0 LF		0 LF		0 LF
Total Building Length (Feet)	0 LF		0 LF		0 LF
Total Area (Square Feet)	0 SQFT		0 SQFT		0 SQFT
Structure Depth (Feet)	0 LF		0 LF		0 LF
Footing Type (pile or spread)	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Cost Per Square Foot	\$0		\$0		\$0
COST OF EACH	\$0		\$0		\$0

TOTAL COST OF BRIDGES	\$3,360,000
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TOTAL COST OF BUILDINGS	\$0
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STRUCTURES MOBILIZATION	10%	\$336,000
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Recommended Contingency: (Pre-PSR 30%-50%, PSR 25%, Draft PR 20%, PR 15%, after PR approval 10%, Final PS&E 5%)

Total recommended percentages includes any quantified risk based contingency from the risk register.

STRUCTURES CONTINGENCY	10%	\$336,000
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TOTAL COST OF STRUCTURES	\$4,032,000
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Estimate Prepared By: _____
 XXXXXXXXXXXXXXXXXXXX ----- Division of Structures

 Date

III. RIGHT OF WAY

Fill in all of the available information from the Right of Way Data Sheet.

A)	A1)	Acquisition, including Excess Land Purchases, Damages & Goodwill, Fees	\$	4,000,000
	A2)	SB-1210	\$	0
B)		Acquisition of Offsite Mitigation	\$	0
C)	C1)	Utility Relocation (City Share)	\$	250,000
	C2)	Potholing (Design Phase)	\$	10,000
D)		Railroad Acquisition	\$	0
E)		Clearance / Demolition	\$	0
F)		Relocation Assistance (RAP and/or Last Resort Housing Costs)	\$	0
G)		Title and Escrow	\$	0
H)		Environmental Review	\$	0
I)		Condemnation Settlements <u>0%</u>	\$	0
J)		Design Appreciation Factor <u>0%</u>	\$	0
K)		Utility Relocation (Construction Cost)	\$	0

L)	TOTAL RIGHT OF WAY ESTIMATE	\$4,260,000
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M)	TOTAL R/W ESTIMATE: Escalated	\$4,260,000
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N)	RIGHT OF WAY SUPPORT	\$0
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Support Cost Estimate Prepared By	Project Coordinator ¹	Phone
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Utility Estimate Prepared By	Utility Coordinator ²	Phone
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R/W Acquisition Estimate Prepared By	Right of Way Estimator ³	Phone
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Note: Items G & H applied to items A + B

¹ When estimate has Support Costs only² When estimate has Utility Relocation³ When R/W Acquisition is required

Appendix J

Social Pinpoint Comments Received



Paper Size ANSI A
0 250 500 750
US Feet

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxiliary Sphere



**CITY OF CHICO
HEGAN LANE CONGESTION
RELIEF PROJECT
PUBLIC COMMENTS
RECEIVED BY
COMMENT TYPE**

Project No. 11217309
Revision No. -
Date Mar 2022

ID	Created on	Type	Comment	Up Votes	Down Votes	Email	First Name	Last Name
1	12/8/2021 18:22	Automobile Comment	There is a park here you cannot put a road here just because you hate unhoused people.	22	15	jeff2076@gmail.com	Jeff	Shaner
2	12/8/2021 21:29	Bicycle Comment	This is a park. I ride my bike here. You cannot put a road through a park and make it safer.	11	7	addisonparkerwinslow@gmail.com	Addison	Winslow
3	12/8/2021 22:05	Automobile Comment	I currently enjoy the park you are considering putting a road through! This park was part of a community project in the neighborhood in which I reside. Do not take it away from us just because there are unhoused people living there at the moment. They won't be there forever.	14	11	cohassethanson@yahoo.com	Dana	Hanson
4	12/9/2021 13:46	Automobile Comment	Lol. People don't have homes and are forced to camp in the Plaza? PUT IN AN ICE SKATING RINK! People don't have homes and are forced to live in a park? PUT IN A ROAD! So smart! Wow! Great job! Thank you for tackling our housing crisis head on &lt;3	17	13	jasongardinier@gmail.com	Jason	Gardinier
5	12/10/2021 5:12	Solution Idea	Round about	8	3	kendall.ross1@yahoo.com	Kendall	Ross
6	12/9/2021 20:55	Automobile Comment	This project is a great idea. The traffic in this area every day is dangerous and terrible for the environment!! How many cars sit here idling every day just waiting for the light?	11	14	getthegreen@gmail.com	Cody	Acco
7	12/10/2021 7:15	Truck Comment	I do not see any postings of how this intersection improvement is proposed.	4	0	matt@rgachico.com	Matt	Gallaway
8	12/9/2021 8:03	Bicycle Comment	Our family enjoys this bike bath connection and a major road would only add an unsafe element. As a daily user of this roadway/intersection, I do not find the traffic to be bad, certainly not enough to destroy a million dollar park. Improvements to Midway are needed and necessary, but a new road through the park is not the solution.	13	9	shandybev@gmail.com	Shannon	Costa
9	12/10/2021 9:32	Truck Comment	Truck Route	1	2	bill@gbrealestate.net	Bill	Brouhard
10	12/10/2021 9:32	Solution Idea	Small public park with road frontage would foster redevelopment of adjoining industrial back yards into neighborhood scale cafe's and meeting places.	6	2	bill@gbrealestate.net	Bill	Brouhard

ID	Created on	Type	Comment	Up Votes	Down Votes	Email	First Name	Last Name
11	1/13/2022 9:54	Automobile Comment	The proposed alternative through the Comanche Creek Greenway needs to be rejected immediately, with no further study needed. The people of Chico voted in a referendum to preserve this small but invaluable park almost surrounded by industrial parks and roads. A "Phase 2, as needed" can simply be taken off the table. Other Alternatives need to be pursued.	0	0	amargosa23@gmail.com	William	Helmer
12	12/10/2021 9:26	Automobile Comment	Sensible. Preserves greenspace while reducing VMT. Provides secondary emergency access while conserving fuel and reducing operational expenses. See attached conservation model.	11	8	bill@gbrealestate.net	Bill	Brouhard
13	12/10/2021 15:40	Automobile Comment	Secondary access to Otterson Dr. is a must, for several reasons. Alternate egress and access for emergencies is a big one. Easing congestion to and from the businesses on Otterson is another. A roadway here does not jeopardize bicyclist or pedestrian safety if there are bike lanes, proper signage, and bicyclist/pedestrian compliance with traffic and safety rules.	16	11	timothy.t.lynch@gmail.com	Tim	Lynch
14	12/10/2021 7:14	Solution Idea	provide as little impact on the Park as possible, but provide the much needed relief on Midway. This appears to be a creative solution to achieve some much needed relief to the gridlock that occurs.	12	7	matt@rgachico.com	Matt	Gallaway
15	12/11/2021 20:32	Automobile Comment	Roundabouts at both Hegan/Otterson and Hegan/Midway would improve traffic flow more than enough to obviate any need for an additional access through the Comanche creek area and be vastly less costly than building additional road and bridge.	7	2	davidwelch311@gmail.com	David	Welch
16	12/10/2021 15:44	Automobile Comment	Not as much of a comment, but is vehicle access by way of Meyers St. not a possibility here as an alternative to extending the roadway from the intersection of Park and Midway?	14	2	timothy.t.lynch@gmail.com	Tim	Lynch
17	12/12/2021 11:25	Automobile Comment	Time we start bringing pitchforks to the city council meetings!	1	4	jeff2076@gmail.com	Jeff	Shaner
18	12/11/2021 16:40	Solution Idea	Why not just widen Hegan and Midway? I don't think going through neighborhoods is a good idea.	7	2	vegantart@gmail.com	S	D

ID	Created on	Type	Comment	Up Votes	Down Votes	Email	First Name	Last Name
19	12/11/2021 20:29	Bicycle Comment	Either dedicated bike lanes on the section of the Midway between Hegan and E. Park OR figuring out better access to the existing bike path from the north would be important. The path is fine to ride, but anyone attempting to access it from Fair street has a real problem.	11	0	davidwelch311@gmail.com	David	Welch
20	12/13/2021 11:17	Automobile Comment	In my opinion, this proposal is a well reasoned solution to the significant traffic issues on Hegan and Midway. It does impact the Greenway, but only minimally, and actually adds additional dispersed parking for those wishing to access the area. This plan greatly improved truck and vehicular access without significant negative impact to bicycle traffic. Thank you for all your work in crafting this proposal.	4	5	cale.whitehouse@ferguson.com	Cale	Whitehouse
21	12/13/2021 11:31	Solution Idea	Roundabouts at every intersection that are a part of this project. The key component to traffic in this area is stopping at stop lights.	6	1	patrickabold@gmail.com	Patrick	Abold
22	12/13/2021 22:48	Solution Idea	Conect Otterson Dr to Meyers St as was the original plan.	4	3	mikeeggy47@gmail.com	Mike	Eggleston
23	12/10/2021 15:42	Bicycle Comment	Better bicycle and pedestrian access on the segment of Midway between Hegan and Park is badly needed. A dedicated bike lane should be under consideration. Also hoping the City will steer clear of roundabouts in this area; I'm aware of the statistical data that they reduce traffic and traffic-related collisions, but so many people don't use them properly and they're more frustrating than they're worth.	7	3	timothy.t.lynch@gmail.com	Tim	Lynch
24	12/8/2021 23:34	Automobile Comment	This is a park that exists because of work done by by the local community. The only payment they received was satisfaction of success after all their hard work. I don't see local residents rolling up their sleeves to build a road through it. Get real, why not throw a few more roundabouts down and call it good?!	13	11	flogoodnix@gmail.com	Jaime	Flores

ID	Created on	Type	Comment	Up Votes	Down Votes	Email	First Name	Last Name
25	12/9/2021 22:21	Truck Comment	The problem is the traffic between Mayers Otterson and Highway 99 trying to all use E. Park Ave. it seems to me they could go out the midway you could widen the midway to the speedway and make a freeway entrance onto 99 at the speedway there by all of that business traffic on this side of town could go in a different direction rather than building all of those traffic circles on E. Park Ave.	6	5	jkvandy@mail.com	Jill	VanderHeiden
26	12/14/2021 14:05	Bicycle Comment	Having a road cross this bike path would be dangerous and unnecessary, just build a bridge between Otterson and Meyer streets.	1	0	linuxdan@gmail.com	Daniel	Green
27	12/14/2021 14:00	Automobile Comment	This intersection could be improved by better traffic control, but it's still a single point of failure bottleneck if an additional egress route for Otterson isn't added.	0	1	linuxdan@gmail.com	Daniel	Green
28	12/14/2021 14:02	Automobile Comment	In my experience traffic issues in this location are almost never because traffic control issues at this intersection. Adding an additional egress route for Otterson drive would be more effective.	0	0	linuxdan@gmail.com	Daniel	Green
29	12/12/2021 11:54	Solution Idea	Let's be honest and admit this is an attempt to dislocate fire refuges and homeless encampment. Those people are goin to camp somewhere else close by if this becomes a construction zone. Solving nothing while spending lots of tax payer money. Let's address the homeless issue instead of pretending it's a construction project. We could build a tiny home village for the homeless, hire homeless to help build, and have job training programs and life skills programs to help people stay on their feet.	11	11	lyondream@gmail.com	Jesse	Lyon
30	12/8/2021 21:45	Bicycle Comment	I bike in Comanche Creek Greenway to enjoy nature and to bike somewhere without the noise and hazards created by vehicles everywhere else. Why would we put a road here? Can't we have anything nice? Please put this money (building a new bridge and even studying it is going to cost millions) toward improving public transit options and protected bikeways for our community so that we can actually reduce vehicle traffic and improve quality of life.	19	9	brycegoldstein@yahoo.com	Bryce	Goldstein

ID	Created on	Type	Comment	Up Votes	Down Votes	Email	First Name	Last Name
31	12/14/2021 13:53	Solution Idea	Creating a vehicle bridge in addition to the existing pedestrian bridge between Otterson and Meyers Streets would solve most of the issues being discussed here. It would be a much smaller construction effort than the proposed "Roadway Extension" which seems needlessly complex. It might even be more cost-effective than the proposed "Intersections Improvement". The priority should be adding an additional egress route to distribute the traffic rather than trying to improve existing intersections.	3	1	linuxdan@gmail.com	Daniel	Green
32	12/16/2021 18:25	Truck Comment	If we had done the original plan of Otterson Bridge, most of the trucks would have not had to turn left to come down to Hegan Lane to access the Industrial Park, therefore traffic would have flowed easier. Semi trucks with two trailers from the gas farm might not work well on roundabouts.	0	0	lhenderson237911@gmail.com	Linda	Henderson
33	1/4/2022 14:40	Bicycle Comment	I also ride my bike on these paths as part of my commute to Build. If full time office workers return to this Office Complex, the traffic problem will definitely be overwhelming and in need of relief, which connecting Meyer st to Otterson street would serve to improve. Also, if this is an effort to evict the "unhoused" from destroying this park, I am on board for that as well. It's really become an unsafe nightmare of pollution in this greenway.	0	1	maverick.watson@ferguson.com	m	w
34	1/5/2022 19:48	Automobile Comment	I have spent quite a bit of time counting cars and trucks at the hegan/midway intersection and found at no time was traffic backed up. Plus most traffic went straight on midway. All vehicles made it through each light cycle. The vehicles headed to hegan rarely had to stop because they were turning right. I don't see any need to do anything at this intersection. Spend the money on something noble, like housing for the homeless, at the very least a campground, and fix our horrible streets.	0	0	sbaldy20032003@yahoo.com	Susan	Baldwin

ID	Created on	Type	Comment	Up Votes	Down Votes	Email	First Name	Last Name
35	1/5/2022 19:55	Truck Comment	I have spent quite a bit of time watching traffic at the hegan/midway intersection, and during high use times. The trucks all made it through on one light cycle. If you were to put a bridge over the creek the gas trucks wouldn't even use it to get onto hegan. It would be more turns for them. There seemed to be no need for any changes at that intersection. After the camp fire traffic did back up significantly but it was the same all over town. Spend the money to help the fire victims.	0	0	sbaldy20032003@yahoo.com	Susan	Baldwin
36	1/5/2022 20:03	Bicycle Comment	I am a recreational cyclist and a bicycle commuter. I use the bike lane that cuts over to midway frequently. I appreciate it. I know that another expense for putting in a bridge would be paying back the grant that was used for the improvements along the creek. I don't want the city to spend any money on any changes on midway/hegan traffic. I don't think it's a problem area and I certainly don't want our grant money to have to be returned. I think that would be a ridiculous waste.	0	0	sbaldy20032003@yahoo.com	Susan	Baldwin
37	1/5/2022 20:07	Solution Idea	My idea is to spend the money where it should've been spent in the first place. Much of this money is campfire money. There are people living out in tents in our harsh summers and cold, wet winters. Spend the money on them, not some unnecessary project.	2	0	sbaldy20032003@yahoo.com	Susan	Baldwin
38	12/15/2021 10:14	Solution Idea	Connecting Meyer St to Otterson Drive makes much more sense than this proposed project! Aside from being far more cost-effective, it would of course be safer for pedestrians in the park. I love being able to ride my bike through the greenway and go for walks without fear of getting hit by a car, there is no way you're going to add a thoroughfare down the center of a park and make it safer. Aside from that, it is lovely to have green space free from the noise and exhaust of traffic close to home!	4	1	kascha.adelle1989@gmail.com	Kascha	Wilson

ID	Created on	Type	Comment	Up Votes	Down Votes	Email	First Name	Last Name
39	1/9/2022 8:46	Automobile Comment	I have worked on Park Ave for 26 years. This plan will CONGEST cars going S (& E Park going N) and WON'T HELP increase cars going N or E, which is where 100% of Otterson/Hegan cars are going in this intersection at present. Go sit there facing S until you "see" it. Do a computer model. It will gridlock Park Av AND E Park while cars cross their path. Only way to ease congestion is to connect Otterson to Ivy and Commerce to Westfield Ln for N bound. Feel free to email me. Thank you!	1	0	honeyrunwine@gmail.com	Amy	Hasle
40	12/12/2021 15:42	Bicycle Comment	The citizens of Chico worked hard to encourage the formation of and implementation of a nice little park with a great bike path along Comanche Creek. A lot of money has been spent in creating infrastructure and planting of oak trees in the park. Plowing a road through the park would serve to destroy it. Cars coming through the heart of the park would provide a hazard for bicycles and create air pollution. There are roads all around this little bit of green in south Chico. Let's all value it	11	2	booksontape@rocketmail.com	Suzette	Welch
41	12/14/2021 13:54	Solution Idea	Connecting Otterson to Meyers would be far more minimal an impact on the park than the proposed route, while still providing a secondary means of routing traffic that doesn't involve Hegan. This is vital in case of emergency in the area.	3	2	sayer.turcotte1@ferguson.com	Sayer	Turcotte

