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MEMORANDUM

To: Greg Mattson
Land Use & Environmental Planner
Planning & Development Services
5510 Overland Avenue, Suite 310
San Diego CA 92123

From: Rachel Price, Reid Middleton

Date: 03-23-2017

Project: Otay Ranch Village 14 & Planning Areas 16/19

Subject: Roundabout Conceptual Review

Introduction

Reid Middleton (RM) was contracted by the Jackson Pendo Development Company to provide a third party peer review for the conceptual development of five single-lane roundabouts. These roundabouts are part of the Otay Ranch Development, specifically Village 14 and Planning Areas 16 and 19. These roundabouts will be in the jurisdiction of San Diego County and are located at the following locations:

- Proctor Valley Road and Project Driveway 1
- Proctor Valley Road and Project Driveway 3
- Proctor Valley Road and Project Driveway 4
- Proctor Valley Road and Project Driveway 5
- Proctor Valley Road and Project Driveway 8

RM was given the following assumptions for the design:

- The design vehicle for these roundabouts is a WB-40, emergency response vehicles, and bus.
- The approach speeds for these roundabouts are 45 mph or below.

Using guidelines from NCHRP 672 Roundabouts: An Informational Guide, RM evaluated the conceptual design of these roundabouts and offered recommendations for final design.

Traffic Analysis

RM verified the traffic analysis using the SIDRA standard model, Version 7.0. Roundabout configurations were analyzed for each intersection and RM concurred that single-lane roundabouts were appropriate to handle the projected traffic volume at each location for the Year 2030 Cumulative Conditions. The roundabout traffic analysis can be seen in Appendix A.

RM analyzed each single lane roundabout operation under the Year 2030 Cumulative Conditions with Full GDP/SRP Buildout. It was confirmed that the single lane roundabouts at Driveway 1, Driveway 3, and Driveway 4 along Proctor Valley Road would not have enough capacity to accommodate the traffic volume in this scenario. At these intersections, signalization would mitigate the cumulative impact.

It should be noted that this impact will only occur with the development of the Rancho Jamul Preserve, which is not anticipated. This impact would occur with the full development of the Proposed Project as well as the development of 74 additional units within the Rancho Jamul Preserve. The single lane roundabouts at Driveway 5 and Driveway 8 along Proctor Valley Road would have sufficient capacity to accommodate this traffic volume. The roundabout traffic analysis can be seen in Appendix B.

Conceptual Geometrics

RM evaluated the conceptual geometrics for the Proctor Valley Roundabouts and determined that the inscribed circle diameter was appropriate for projected traffic volumes, number of legs, and expected design vehicle at each intersection. The right-of-way provided appears sufficient to accommodate well-designed geometrics that will slow and direct vehicles appropriately, while providing safe facilities for non-motorized users. Individual design vehicle movements were not verified in this conceptual design and should be reviewed when final geometrics are established.

RM reviewed the geometry of the conceptual roundabouts and provided comments that can be addressed in final design. These comments can be seen in Appendix C, and should be incorporated in the final geometrics to ensure the roundabouts will operate with sufficient safety and capacity. A summary of the comments is provided below:

- Driveway 1: No exception taken to the conceptual geometry.
- Driveway 3: Conceptual geometry needs to be refined to ensure proper speed and direction into the roundabout. The west leg needs positive geometry to direct motor vehicles into and out of the roundabout.

- Driveway 4: The northeast leg is awkward and should be refined to direct vehicles appropriately into and out of the roundabout.
- Driveway 5: Minor revision needed to pedestrian refuge island to obtain minimum widths, and a small adjustment is recommended to the exit splitter island curbing on Proctor Valley Road to help achieve a natural exiting path for motor vehicles.
- Driveway 8: Splitter islands are not providing enough influence for speed reduction and proper direction for the motor vehicles.

Conclusion

With the safety and operational benefits, as well as community enhancement that roundabouts can provide, this project appears to be a great location for the construction of single-lane roundabouts. RM takes no exception to the proposed conceptual roundabouts and concurs that enough right-of-way is being preserved to construct suitable single-lane roundabout geometrics for the Otay Ranch Village 14 & Planning Areas 16/19. RM recommends a review of the final geometrics to ensure the comments were incorporated appropriately and that the various design vehicles will be adequately accommodated in the design.

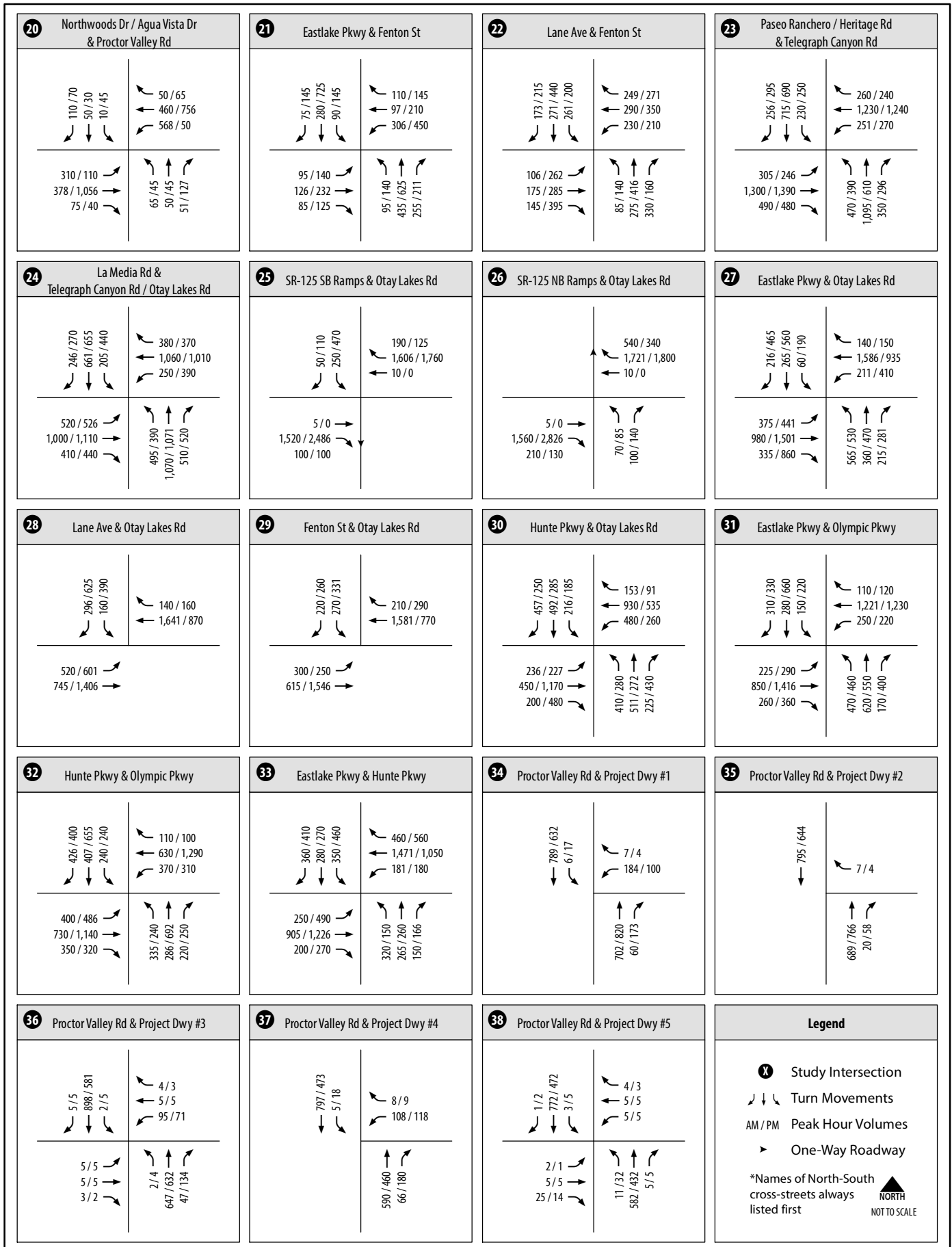
The engineering material and data contained in this memo were prepared under the supervision and direction of the undersigned, whose seal as a registered professional engineer is affixed below.

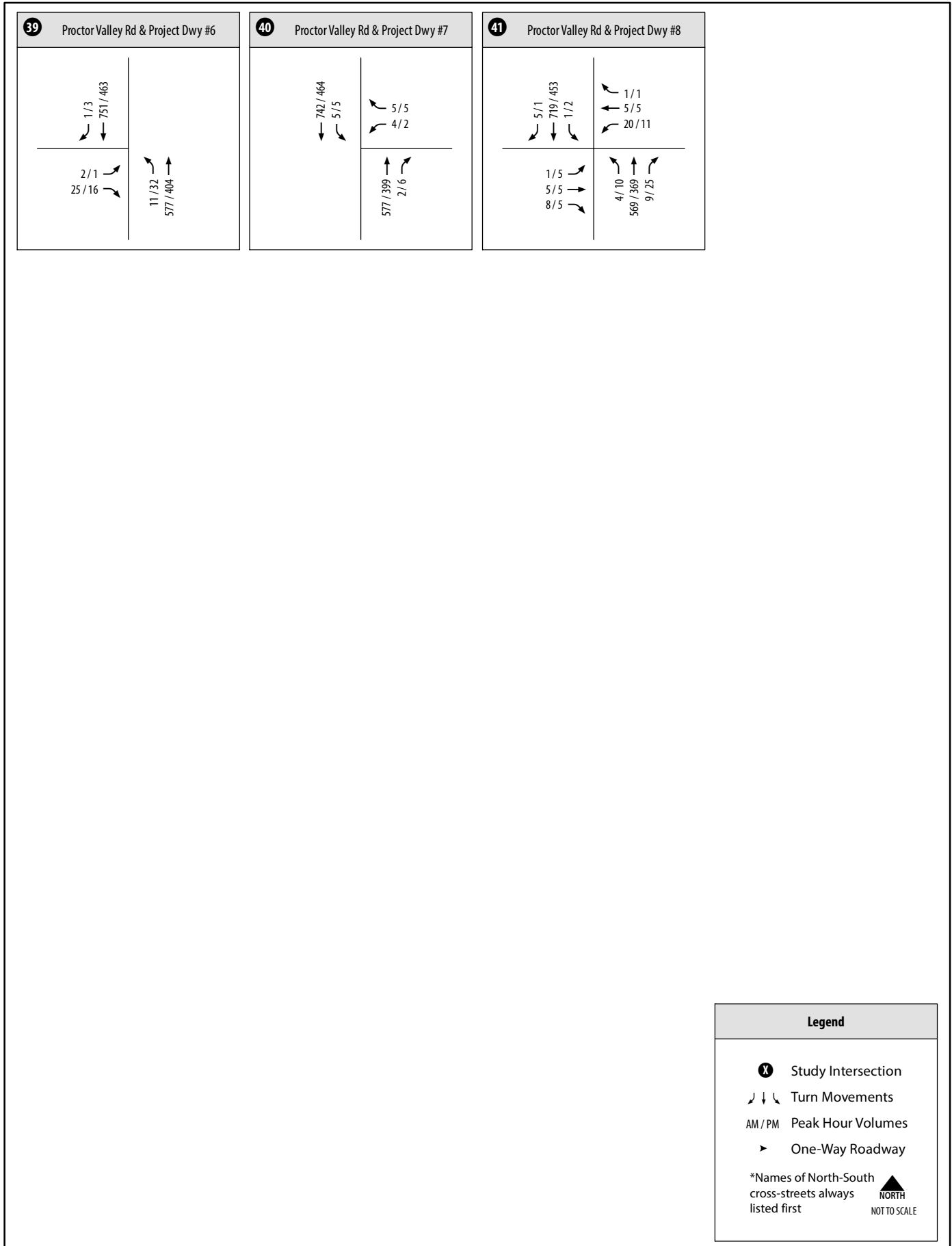


Reid Middleton

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Appendix A
Year 2030 Cumulative Conditions
Traffic Analysis





MOVEMENT SUMMARY

 Site: 1 [2030 AM PH (AG) - SL]

Proctor Valley Rd & Project Dwy #1
2030 AM PH (AG)
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Proctor Valley Rd											
8	T1	731	2.0	0.470	2.2	LOS A	3.7	94.3	0.07	0.27	29.8
18	R2	63	2.0	0.470	2.6	LOS A	3.7	94.3	0.07	0.27	29.1
Approach		794	2.0	0.470	2.2	LOS A	3.7	94.3	0.07	0.27	29.7
East: WB Project Dwy #1											
1	L2	200	2.0	0.240	9.5	LOS A	1.3	33.2	0.65	0.77	23.6
16	R2	8	2.0	0.240	5.5	LOS A	1.3	33.2	0.65	0.77	22.9
Approach		208	2.0	0.240	9.3	LOS A	1.3	33.2	0.65	0.77	23.6
North: SB Proctor Valley Rd											
7	L2	6	2.0	0.662	8.4	LOS A	6.0	152.1	0.62	0.45	28.8
4	T1	822	2.0	0.662	3.6	LOS A	6.0	152.1	0.62	0.45	28.6
Approach		828	2.0	0.662	3.6	LOS A	6.0	152.1	0.62	0.45	28.6
All Vehicles		1829	2.0	0.662	3.7	LOS A	6.0	152.1	0.39	0.41	28.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

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

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

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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MOVEMENT SUMMARY

 Site: 1 [2030 PM PH (AG) - SL]

Proctor Valley Rd & Project Dwy #1
2030 PM PH (AG)
Roundabout

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed	
		Total veh/h	HV %	v/c	sec		veh	ft		per veh	mph	
South: NB Proctor Valley Rd												
8	T1	854	2.0	0.630	2.3	LOS A	6.0	151.6	0.16	0.29	29.6	
18	R2	180	2.0	0.630	2.6	LOS A	6.0	151.6	0.16	0.29	28.9	
Approach		1034	2.0	0.630	2.3	LOS A	6.0	151.6	0.16	0.29	29.5	
East: WB Project Dwy #1												
1	L2	109	2.0	0.149	10.3	LOS B	0.8	21.2	0.70	0.77	23.4	
16	R2	4	2.0	0.149	6.4	LOS A	0.8	21.2	0.70	0.77	22.7	
Approach		113	2.0	0.149	10.2	LOS B	0.8	21.2	0.70	0.77	23.4	
North: SB Proctor Valley Rd												
7	L2	18	2.0	0.514	7.6	LOS A	4.0	102.3	0.39	0.35	29.2	
4	T1	687	2.0	0.514	2.8	LOS A	4.0	102.3	0.39	0.35	29.0	
Approach		705	2.0	0.514	2.9	LOS A	4.0	102.3	0.39	0.35	29.0	
All Vehicles		1853	2.0	0.630	3.0	LOS A	6.0	151.6	0.28	0.34	28.8	

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

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

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

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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MOVEMENT SUMMARY

 **Site: 3 [2030 AM PH (AG) - SL]**

Proctor Valley Rd & Project Dwy #3
2030 AM PH (AG)
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Proctor Valley Rd											
3	L2	2	2.0	0.440	7.1	LOS A	3.4	86.3	0.11	0.27	29.9
8	T1	674	2.0	0.440	2.2	LOS A	3.4	86.3	0.11	0.27	29.7
18	R2	49	2.0	0.440	2.6	LOS A	3.4	86.3	0.11	0.27	29.0
Approach		725	2.0	0.440	2.3	LOS A	3.4	86.3	0.11	0.27	29.7
East: WB Project Dwy #3											
1	L2	103	2.0	0.127	8.7	LOS A	0.6	16.3	0.60	0.71	23.9
6	T1	5	2.0	0.127	4.1	LOS A	0.6	16.3	0.60	0.71	23.6
16	R2	4	2.0	0.127	4.8	LOS A	0.6	16.3	0.60	0.71	23.1
Approach		113	2.0	0.127	8.3	LOS A	0.6	16.3	0.60	0.71	23.8
North: SB Proctor Valley Rd											
7	L2	2	2.0	0.676	7.9	LOS A	6.7	171.0	0.49	0.37	29.1
4	T1	935	2.0	0.676	3.0	LOS A	6.7	171.0	0.49	0.37	28.9
14	R2	5	2.0	0.676	3.3	LOS A	6.7	171.0	0.49	0.37	28.2
Approach		943	2.0	0.676	3.0	LOS A	6.7	171.0	0.49	0.37	28.9
West: EB Project Dwy #3											
5	L2	5	2.0	0.026	12.3	LOS B	0.2	4.1	0.82	0.68	23.6
2	T1	5	2.0	0.026	7.6	LOS A	0.2	4.1	0.82	0.68	23.3
12	R2	3	2.0	0.026	8.3	LOS A	0.2	4.1	0.82	0.68	22.8
Approach		14	2.0	0.026	9.6	LOS A	0.2	4.1	0.82	0.68	23.3
All Vehicles		1795	2.0	0.676	3.1	LOS A	6.7	171.0	0.35	0.36	28.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.

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

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

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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MOVEMENT SUMMARY

 Site: 3 [2030 PM PH (AG) - SL]

Proctor Valley Rd & Project Dwy #3
2030 PM PH (AG)
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Proctor Valley Rd											
3	L2	4	2.0	0.490	7.1	LOS A	3.6	91.8	0.12	0.29	29.9
8	T1	658	2.0	0.490	2.2	LOS A	3.6	91.8	0.12	0.29	29.7
18	R2	140	2.0	0.490	2.6	LOS A	3.6	91.8	0.12	0.29	28.9
Approach		802	2.0	0.490	2.3	LOS A	3.6	91.8	0.12	0.29	29.5
East: WB Project Dwy #3											
1	L2	77	2.0	0.096	8.5	LOS A	0.5	12.1	0.58	0.68	23.9
6	T1	5	2.0	0.096	3.9	LOS A	0.5	12.1	0.58	0.68	23.7
16	R2	3	2.0	0.096	4.6	LOS A	0.5	12.1	0.58	0.68	23.2
Approach		86	2.0	0.096	8.1	LOS A	0.5	12.1	0.58	0.68	23.9
North: SB Proctor Valley Rd											
7	L2	5	2.0	0.437	7.5	LOS A	3.0	75.9	0.30	0.32	29.5
4	T1	605	2.0	0.437	2.6	LOS A	3.0	75.9	0.30	0.32	29.3
14	R2	5	2.0	0.437	2.9	LOS A	3.0	75.9	0.30	0.32	28.6
Approach		616	2.0	0.437	2.6	LOS A	3.0	75.9	0.30	0.32	29.3
West: EB Project Dwy #3											
5	L2	5	2.0	0.015	8.4	LOS A	0.1	2.0	0.60	0.55	24.5
2	T1	5	2.0	0.015	3.8	LOS A	0.1	2.0	0.60	0.55	24.2
12	R2	2	2.0	0.015	4.4	LOS A	0.1	2.0	0.60	0.55	23.6
Approach		13	2.0	0.015	5.8	LOS A	0.1	2.0	0.60	0.55	24.2
All Vehicles		1517	2.0	0.490	2.8	LOS A	3.6	91.8	0.22	0.33	29.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.

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

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

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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MOVEMENT SUMMARY

 Site: 4 [2030 AM PH (AG) - SL]

Proctor Valley Rd & Project Dwy #4
2030 AM PH (AG)
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Proctor Valley Rd											
8	T1	615	2.0	0.404	2.2	LOS A	2.7	68.4	0.05	0.27	29.8
18	R2	69	2.0	0.404	2.5	LOS A	2.7	68.4	0.05	0.27	29.1
Approach		683	2.0	0.404	2.2	LOS A	2.7	68.4	0.05	0.27	29.8
East: WB Project Dwy #4											
1	L2	117	2.0	0.134	8.3	LOS A	0.7	16.5	0.56	0.69	24.0
16	R2	9	2.0	0.134	4.3	LOS A	0.7	16.5	0.56	0.69	23.2
Approach		126	2.0	0.134	8.0	LOS A	0.7	16.5	0.56	0.69	23.9
North: SB Proctor Valley Rd											
7	L2	5	2.0	0.607	7.8	LOS A	5.2	133.3	0.45	0.36	29.2
4	T1	830	2.0	0.607	2.9	LOS A	5.2	133.3	0.45	0.36	28.9
Approach		835	2.0	0.607	2.9	LOS A	5.2	133.3	0.45	0.36	29.0
All Vehicles		1645	2.0	0.607	3.0	LOS A	5.2	133.3	0.29	0.35	28.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

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

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

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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MOVEMENT SUMMARY

 Site: 4 [2030 PM PH (AG) - SL]

Proctor Valley Rd & Project Dwy #4
2030 PM PH (AG)
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Proctor Valley Rd											
8	T1	479	2.0	0.413	2.2	LOS A	2.6	67.1	0.11	0.30	29.7
18	R2	188	2.0	0.413	2.6	LOS A	2.6	67.1	0.11	0.30	29.0
Approach		667	2.0	0.413	2.3	LOS A	2.6	67.1	0.11	0.30	29.5
East: WB Project Dwy #4											
1	L2	128	2.0	0.136	7.5	LOS A	0.6	16.1	0.49	0.65	24.1
16	R2	10	2.0	0.136	3.5	LOS A	0.6	16.1	0.49	0.65	23.4
Approach		138	2.0	0.136	7.2	LOS A	0.6	16.1	0.49	0.65	24.1
North: SB Proctor Valley Rd											
7	L2	19	2.0	0.385	7.6	LOS A	2.4	60.3	0.34	0.35	29.3
4	T1	493	2.0	0.385	2.8	LOS A	2.4	60.3	0.34	0.35	29.1
Approach		511	2.0	0.385	2.9	LOS A	2.4	60.3	0.34	0.35	29.1
All Vehicles		1316	2.0	0.413	3.1	LOS A	2.6	67.1	0.24	0.36	28.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

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

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

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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MOVEMENT SUMMARY

 Site: 5 [2030 AM PH (AG) - SL]

Proctor Valley Rd & Project Dwy #5
2030 AM PH (AG)
Roundabout

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue	Prop. Queued	Effective Stop Rate	Average Speed		
		Total	HV %	v/c	sec		Vehicles	Distance	per veh	mph		
		veh/h					veh	ft				
South: NB Proctor Valley Rd												
3	L2	11	2.0	0.377	7.1	LOS A	2.4	61.6	0.08	0.27	30.0	
8	T1	606	2.0	0.377	2.2	LOS A	2.4	61.6	0.08	0.27	29.7	
18	R2	5	2.0	0.377	2.6	LOS A	2.4	61.6	0.08	0.27	29.0	
Approach		623	2.0	0.377	2.3	LOS A	2.4	61.6	0.08	0.27	29.7	
East: WB Project Dwy #5												
1	L2	5	2.0	0.016	8.0	LOS A	0.1	1.9	0.53	0.51	24.6	
6	T1	5	2.0	0.016	3.3	LOS A	0.1	1.9	0.53	0.51	24.3	
16	R2	4	2.0	0.016	4.0	LOS A	0.1	1.9	0.53	0.51	23.8	
Approach		15	2.0	0.016	5.2	LOS A	0.1	1.9	0.53	0.51	24.3	
North: SB Proctor Valley Rd												
7	L2	3	2.0	0.501	7.2	LOS A	3.5	89.5	0.14	0.27	29.9	
4	T1	804	2.0	0.501	2.3	LOS A	3.5	89.5	0.14	0.27	29.6	
14	R2	1	2.0	0.501	2.6	LOS A	3.5	89.5	0.14	0.27	28.9	
Approach		808	2.0	0.501	2.3	LOS A	3.5	89.5	0.14	0.27	29.6	
West: EB Project Dwy #5												
5	L2	2	2.0	0.044	9.5	LOS A	0.2	5.8	0.65	0.59	24.5	
2	T1	5	2.0	0.044	4.9	LOS A	0.2	5.8	0.65	0.59	24.2	
12	R2	27	2.0	0.044	5.6	LOS A	0.2	5.8	0.65	0.59	23.7	
Approach		35	2.0	0.044	5.7	LOS A	0.2	5.8	0.65	0.59	23.8	
All Vehicles		1481	2.0	0.501	2.4	LOS A	3.5	89.5	0.13	0.28	29.4	

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.

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

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

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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Project: H:\25St15\012 Proctor Valley\Traffic\SIDRA\Proctor Valley & Dwy #5.sip7

MOVEMENT SUMMARY

 Site: 5 [2030 PM PH (AG) - SL]

Proctor Valley Rd & Project Dwy #5
2030 PM PH (AG)
Roundabout

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph	
		Total veh/h	HV %									
South: NB Proctor Valley Rd												
3	L2	33	2.0	0.299	7.1	LOS A	1.6	40.7	0.07	0.30	29.9	
8	T1	450	2.0	0.299	2.2	LOS A	1.6	40.7	0.07	0.30	29.7	
18	R2	5	2.0	0.299	2.6	LOS A	1.6	40.7	0.07	0.30	28.9	
Approach		489	2.0	0.299	2.5	LOS A	1.6	40.7	0.07	0.30	29.7	
East: WB Project Dwy #5												
1	L2	5	2.0	0.014	7.2	LOS A	0.1	1.5	0.45	0.47	24.8	
6	T1	5	2.0	0.014	2.6	LOS A	0.1	1.5	0.45	0.47	24.5	
16	R2	3	2.0	0.014	3.3	LOS A	0.1	1.5	0.45	0.47	23.9	
Approach		14	2.0	0.014	4.5	LOS A	0.1	1.5	0.45	0.47	24.4	
North: SB Proctor Valley Rd												
7	L2	5	2.0	0.331	7.2	LOS A	1.7	43.6	0.16	0.29	29.8	
4	T1	492	2.0	0.331	2.3	LOS A	1.7	43.6	0.16	0.29	29.6	
14	R2	2	2.0	0.331	2.7	LOS A	1.7	43.6	0.16	0.29	28.9	
Approach		499	2.0	0.331	2.4	LOS A	1.7	43.6	0.16	0.29	29.6	
West: EB Project Dwy #5												
5	L2	1	2.0	0.022	7.3	LOS A	0.1	2.5	0.48	0.44	25.1	
2	T1	5	2.0	0.022	2.7	LOS A	0.1	2.5	0.48	0.44	24.8	
12	R2	15	2.0	0.022	3.4	LOS A	0.1	2.5	0.48	0.44	24.2	
Approach		22	2.0	0.022	3.4	LOS A	0.1	2.5	0.48	0.44	24.4	
All Vehicles		1023	2.0	0.331	2.5	LOS A	1.7	43.6	0.13	0.30	29.4	

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.

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

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

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

MOVEMENT SUMMARY

 Site: 8 [2030 AM PH (AG) - SL]

Proctor Valley Rd & Project Dwy #8
2030 AM PH (AG)
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Proctor Valley Rd											
3	L2	4	2.0	0.363	7.1	LOS A	2.4	60.4	0.07	0.27	30.0
8	T1	593	2.0	0.363	2.2	LOS A	2.4	60.4	0.07	0.27	29.8
18	R2	9	2.0	0.363	2.6	LOS A	2.4	60.4	0.07	0.27	29.1
Approach		606	2.0	0.363	2.2	LOS A	2.4	60.4	0.07	0.27	29.8
East: WB Project Dwy #8											
1	L2	22	2.0	0.030	7.9	LOS A	0.1	3.4	0.52	0.59	24.2
6	T1	5	2.0	0.030	3.3	LOS A	0.1	3.4	0.52	0.59	23.9
16	R2	1	2.0	0.030	3.9	LOS A	0.1	3.4	0.52	0.59	23.4
Approach		28	2.0	0.030	6.8	LOS A	0.1	3.4	0.52	0.59	24.1
North: SB Proctor Valley Rd											
7	L2	1	2.0	0.481	7.2	LOS A	3.5	89.4	0.17	0.28	29.8
4	T1	749	2.0	0.481	2.3	LOS A	3.5	89.4	0.17	0.28	29.6
14	R2	5	2.0	0.481	2.7	LOS A	3.5	89.4	0.17	0.28	28.8
Approach		755	2.0	0.481	2.3	LOS A	3.5	89.4	0.17	0.28	29.6
West: EB Project Dwy #8											
5	L2	1	2.0	0.019	9.1	LOS A	0.1	2.4	0.62	0.53	24.7
2	T1	5	2.0	0.019	4.4	LOS A	0.1	2.4	0.62	0.53	24.4
12	R2	9	2.0	0.019	5.1	LOS A	0.1	2.4	0.62	0.53	23.8
Approach		15	2.0	0.019	5.1	LOS A	0.1	2.4	0.62	0.53	24.1
All Vehicles		1405	2.0	0.481	2.4	LOS A	3.5	89.4	0.14	0.28	29.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.

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

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

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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MOVEMENT SUMMARY

 Site: 8 [2030 PM PH (AG) - SL]

Proctor Valley Rd & Project Dwy #8
2030 PM PH (AG)
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Proctor Valley Rd											
3	L2	10	2.0	0.260	7.1	LOS A	1.4	35.7	0.08	0.28	29.9
8	T1	384	2.0	0.260	2.2	LOS A	1.4	35.7	0.08	0.28	29.7
18	R2	26	2.0	0.260	2.6	LOS A	1.4	35.7	0.08	0.28	29.0
Approach		421	2.0	0.260	2.3	LOS A	1.4	35.7	0.08	0.28	29.7
East: WB Project Dwy #8											
1	L2	12	2.0	0.017	6.9	LOS A	0.1	1.8	0.41	0.51	24.6
6	T1	5	2.0	0.017	2.2	LOS A	0.1	1.8	0.41	0.51	24.3
16	R2	1	2.0	0.017	2.9	LOS A	0.1	1.8	0.41	0.51	23.8
Approach		18	2.0	0.017	5.3	LOS A	0.1	1.8	0.41	0.51	24.4
North: SB Proctor Valley Rd											
7	L2	2	2.0	0.306	7.1	LOS A	1.6	41.6	0.12	0.27	29.9
4	T1	472	2.0	0.306	2.3	LOS A	1.6	41.6	0.12	0.27	29.7
14	R2	1	2.0	0.306	2.6	LOS A	1.6	41.6	0.12	0.27	28.9
Approach		475	2.0	0.306	2.3	LOS A	1.6	41.6	0.12	0.27	29.7
West: EB Project Dwy #8											
5	L2	5	2.0	0.016	7.2	LOS A	0.1	1.8	0.46	0.47	24.8
2	T1	5	2.0	0.016	2.6	LOS A	0.1	1.8	0.46	0.47	24.5
12	R2	5	2.0	0.016	3.3	LOS A	0.1	1.8	0.46	0.47	24.0
Approach		16	2.0	0.016	4.4	LOS A	0.1	1.8	0.46	0.47	24.4
All Vehicles		931	2.0	0.306	2.4	LOS A	1.6	41.6	0.11	0.29	29.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.

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

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

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

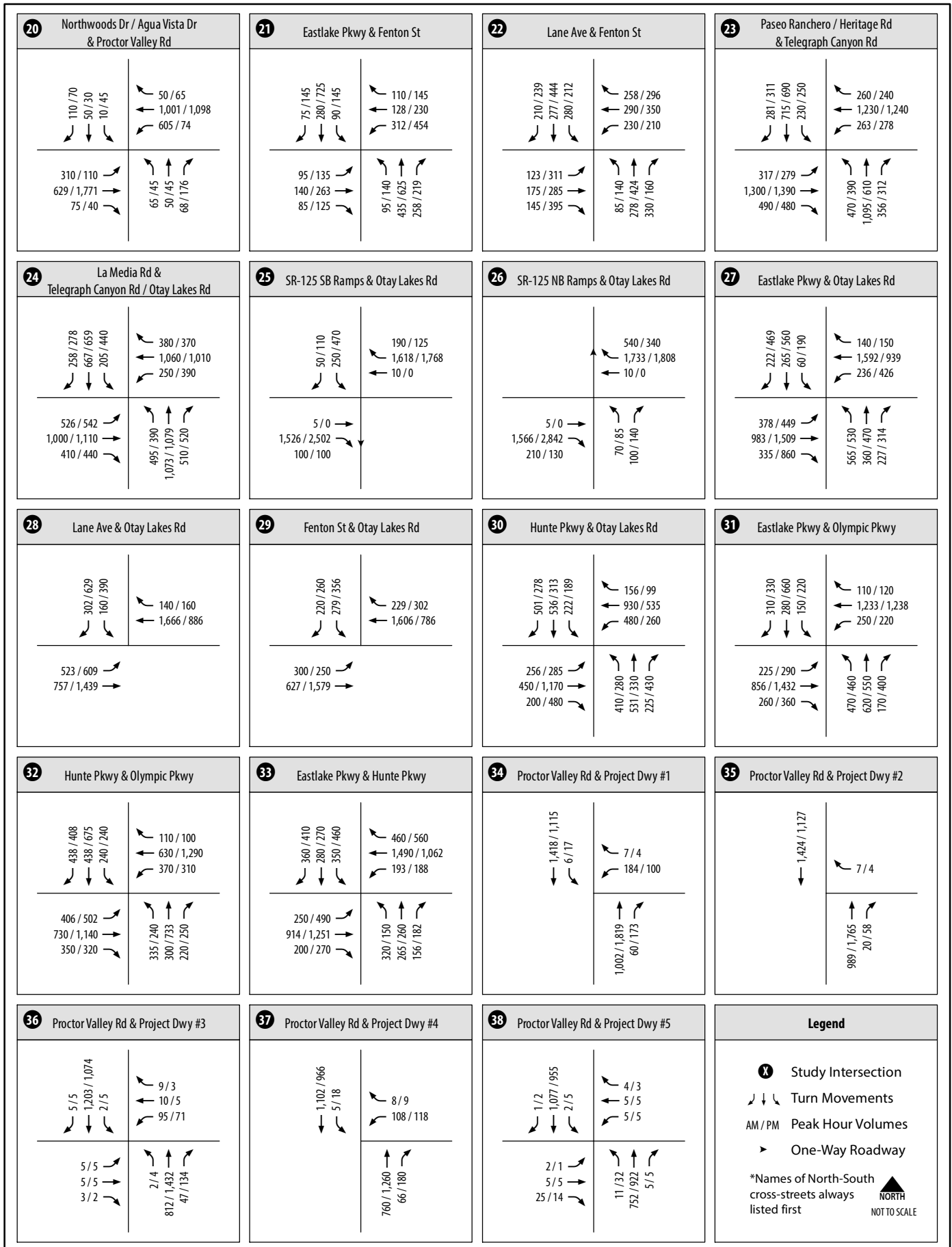
Roundabout Capacity Model: SIDRA Standard.

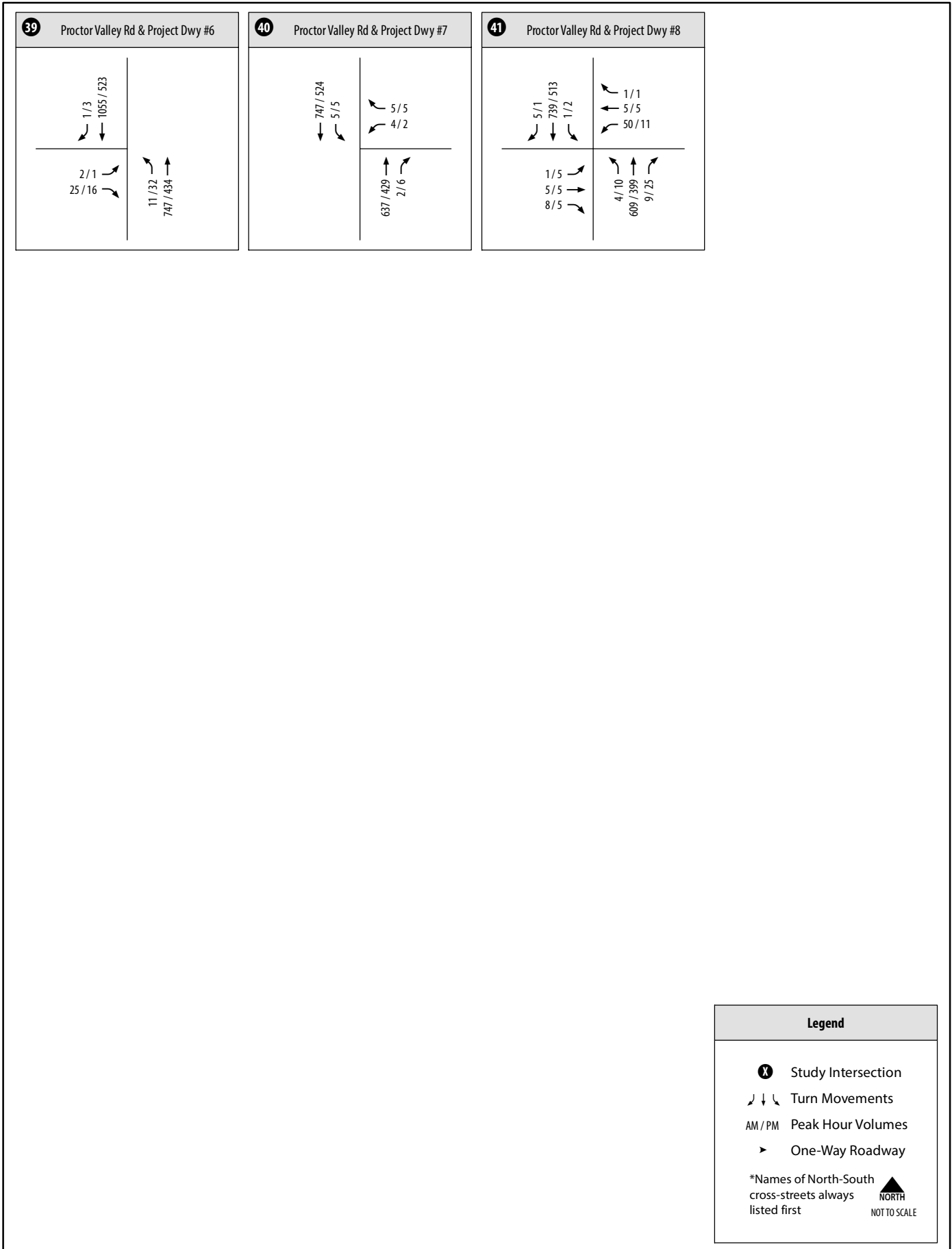
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

Appendix B
Year 2030 Cumulative Conditions
with Full GDP/SRP Buildout
Traffic Analysis





MOVEMENT SUMMARY

 Site: 1 [2030 AM PH (AG) - SL]

Proctor Valley Rd & Project Dwy #1
2030 AM PH (AG)
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Proctor Valley Rd											
8	T1	1044	2.0	0.650	2.2	LOS A	8.3	211.0	0.10	0.26	29.7
18	R2	63	2.0	0.650	2.6	LOS A	8.3	211.0	0.10	0.26	29.0
Approach		1106	2.0	0.650	2.2	LOS A	8.3	211.0	0.10	0.26	29.7
East: WB Project Dwy #1											
1	L2	200	2.0	0.324	13.8	LOS B	2.1	52.6	0.84	0.90	22.6
16	R2	8	2.0	0.324	9.8	LOS A	2.1	52.6	0.84	0.90	21.9
Approach		208	2.0	0.324	13.7	LOS B	2.1	52.6	0.84	0.90	22.6
North: SB Proctor Valley Rd											
7	L2	6	2.0	1.164	87.3	LOS F	97.5	2475.9	1.00	2.61	14.6
4	T1	1477	2.0	1.164	82.4	LOS F	97.5	2475.9	1.00	2.61	14.5
Approach		1483	2.0	1.164	82.5	LOS F	97.5	2475.9	1.00	2.61	14.5
All Vehicles		2797	2.0	1.164	45.6	LOS E	97.5	2475.9	0.63	1.56	18.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

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

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

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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Project: H:\25St\15\012 Proctor Valley\Traffic\SIDRA\Proctor Valley & Dwy #1.sip7

MOVEMENT SUMMARY

 Site: 1 [2030 PM PH (AG) - SL]

Proctor Valley Rd & Project Dwy #1
2030 PM PH (AG)
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Proctor Valley Rd											
8	T1	1895	2.0	1.246	115.6	LOS F	338.0	8585.1	1.00	0.63	11.9
18	R2	180	2.0	1.246	116.0	LOS F	338.0	8585.1	1.00	0.63	11.8
Approach		2075	2.0	1.246	115.7	LOS F	338.0	8585.1	1.00	0.63	11.9
East: WB Project Dwy #1											
1	L2	109	2.0	0.889	105.8	LOS F	7.9	200.0	1.00	1.44	11.9
16	R2	4	2.0	0.889	101.8	LOS F	7.9	200.0	1.00	1.44	11.7
Approach		113	2.0	0.889	105.6	LOS F	7.9	200.0	1.00	1.44	11.9
North: SB Proctor Valley Rd											
7	L2	18	2.0	0.880	8.5	LOS A	17.2	436.4	0.89	0.45	28.2
4	T1	1212	2.0	0.880	3.6	LOS A	17.2	436.4	0.89	0.45	28.0
Approach		1230	2.0	0.880	3.7	LOS A	17.2	436.4	0.89	0.45	28.0
All Vehicles		3418	2.0	1.246	75.0	LOS F	338.0	8585.1	0.96	0.59	15.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.

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

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

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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MOVEMENT SUMMARY

 Site: 3 [2030 AM PH (AG) - SL]

Proctor Valley Rd & Project Dwy #3
2030 AM PH (AG)
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Proctor Valley Rd											
3	L2	2	2.0	0.542	7.1	LOS A	5.2	131.9	0.13	0.27	29.9
8	T1	846	2.0	0.542	2.2	LOS A	5.2	131.9	0.13	0.27	29.6
18	R2	49	2.0	0.542	2.6	LOS A	5.2	131.9	0.13	0.27	28.9
Approach		897	2.0	0.542	2.3	LOS A	5.2	131.9	0.13	0.27	29.6
East: WB Project Dwy #3											
1	L2	103	2.0	0.161	10.4	LOS B	0.9	22.9	0.70	0.77	23.6
6	T1	11	2.0	0.161	5.8	LOS A	0.9	22.9	0.70	0.77	23.3
16	R2	10	2.0	0.161	6.4	LOS A	0.9	22.9	0.70	0.77	22.8
Approach		124	2.0	0.161	9.7	LOS A	0.9	22.9	0.70	0.77	23.5
North: SB Proctor Valley Rd											
7	L2	2	2.0	0.900	8.7	LOS A	17.7	449.6	0.92	0.48	28.2
4	T1	1253	2.0	0.900	3.9	LOS A	17.7	449.6	0.92	0.48	28.0
14	R2	5	2.0	0.900	4.2	LOS A	17.7	449.6	0.92	0.48	27.3
Approach		1260	2.0	0.900	3.9	LOS A	17.7	449.6	0.92	0.48	28.0
West: EB Project Dwy #3											
5	L2	5	2.0	0.059	22.2	LOS C	0.4	11.3	1.00	0.85	21.4
2	T1	5	2.0	0.059	17.6	LOS C	0.4	11.3	1.00	0.85	21.1
12	R2	3	2.0	0.059	18.3	LOS C	0.4	11.3	1.00	0.85	20.7
Approach		14	2.0	0.059	19.5	LOS C	0.4	11.3	1.00	0.85	21.1
All Vehicles		2295	2.0	0.900	3.7	LOS A	17.7	449.6	0.60	0.42	28.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.

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

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

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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MOVEMENT SUMMARY

 Site: 3 [2030 PM PH (AG) - SL]

Proctor Valley Rd & Project Dwy #3
2030 PM PH (AG)
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Proctor Valley Rd											
3	L2	4	2.0	0.980	9.8	LOS A	116.3	2954.2	1.00	0.27	28.0
8	T1	1492	2.0	0.980	5.0	LOS A	116.3	2954.2	1.00	0.27	27.8
18	R2	140	2.0	0.980	5.3	LOS A	116.3	2954.2	1.00	0.27	27.2
Approach		1635	2.0	0.980	5.0	LOS A	116.3	2954.2	1.00	0.27	27.8
East: WB Project Dwy #3											
1	L2	77	2.0	0.628	61.6	LOS F	4.7	118.1	1.00	1.21	15.4
6	T1	5	2.0	0.628	57.0	LOS F	4.7	118.1	1.00	1.21	15.3
16	R2	3	2.0	0.628	57.7	LOS F	4.7	118.1	1.00	1.21	15.1
Approach		86	2.0	0.628	61.2	LOS F	4.7	118.1	1.00	1.21	15.4
North: SB Proctor Valley Rd											
7	L2	5	2.0	0.785	7.9	LOS A	11.5	293.1	0.62	0.38	28.8
4	T1	1119	2.0	0.785	3.0	LOS A	11.5	293.1	0.62	0.38	28.6
14	R2	5	2.0	0.785	3.4	LOS A	11.5	293.1	0.62	0.38	27.9
Approach		1129	2.0	0.785	3.0	LOS A	11.5	293.1	0.62	0.38	28.6
West: EB Project Dwy #3											
5	L2	5	2.0	0.033	15.8	LOS C	0.2	5.7	0.93	0.76	22.7
2	T1	5	2.0	0.033	11.2	LOS B	0.2	5.7	0.93	0.76	22.5
12	R2	2	2.0	0.033	11.8	LOS B	0.2	5.7	0.93	0.76	22.0
Approach		13	2.0	0.033	13.2	LOS B	0.2	5.7	0.93	0.76	22.5
All Vehicles		2863	2.0	0.980	5.9	LOS A	116.3	2954.2	0.85	0.34	27.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.

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

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

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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Project: H:\25St15\012 Proctor Valley\Traffic\SIDRA\Proctor Valley & Dwy #3.sip7

MOVEMENT SUMMARY

 Site: 4 [2030 AM PH (AG) - SL]

Proctor Valley Rd & Project Dwy #4
2030 AM PH (AG)
Roundabout

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue	Prop. Queued	Effective Stop Rate	Average Speed		
		Total	HV %	v/c	sec		Vehicles	Distance	per veh	mph		
		veh/h					veh	ft				
South: NB Proctor Valley Rd												
8	T1	792	2.0	0.507	2.2	LOS A	4.4	112.5	0.07	0.27	29.8	
18	R2	69	2.0	0.507	2.5	LOS A	4.4	112.5	0.07	0.27	29.1	
Approach		860	2.0	0.507	2.2	LOS A	4.4	112.5	0.07	0.27	29.7	
East: WB Project Dwy #4												
1	L2	117	2.0	0.153	9.7	LOS A	0.8	20.7	0.66	0.75	23.6	
16	R2	9	2.0	0.153	5.8	LOS A	0.8	20.7	0.66	0.75	22.9	
Approach		126	2.0	0.153	9.5	LOS A	0.8	20.7	0.66	0.75	23.6	
North: SB Proctor Valley Rd												
7	L2	5	2.0	0.827	8.3	LOS A	12.0	305.9	0.72	0.43	28.6	
4	T1	1148	2.0	0.827	3.5	LOS A	12.0	305.9	0.72	0.43	28.4	
Approach		1153	2.0	0.827	3.5	LOS A	12.0	305.9	0.72	0.43	28.4	
All Vehicles		2140	2.0	0.827	3.3	LOS A	12.0	305.9	0.45	0.39	28.5	

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

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

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

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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Project: H:\25St\15\012 Proctor Valley\Traffic\SIDRA\Proctor Valley & Dwy #4.sip7

MOVEMENT SUMMARY

 Site: 4 [2030 PM PH (AG) - SL]

Proctor Valley Rd & Project Dwy #4
2030 PM PH (AG)
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Proctor Valley Rd											
8	T1	1313	2.0	0.907	2.6	LOS A	32.7	831.3	0.48	0.28	28.9
18	R2	188	2.0	0.907	2.9	LOS A	32.7	831.3	0.48	0.28	28.2
Approach		1500	2.0	0.907	2.6	LOS A	32.7	831.3	0.48	0.28	28.8
East: WB Project Dwy #4											
1	L2	128	2.0	0.396	24.3	LOS C	3.1	79.8	1.00	1.07	20.5
16	R2	10	2.0	0.396	20.4	LOS C	3.1	79.8	1.00	1.07	20.0
Approach		138	2.0	0.396	24.0	LOS C	3.1	79.8	1.00	1.07	20.5
North: SB Proctor Valley Rd											
7	L2	19	2.0	0.759	8.2	LOS A	9.7	245.9	0.68	0.41	28.6
4	T1	1006	2.0	0.759	3.3	LOS A	9.7	245.9	0.68	0.41	28.4
Approach		1025	2.0	0.759	3.4	LOS A	9.7	245.9	0.68	0.41	28.4
All Vehicles		2663	2.0	0.907	4.0	LOS A	32.7	831.3	0.58	0.37	28.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

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

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

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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MOVEMENT SUMMARY

 Site: 5 [2030 AM PH (AG) - SL]

Proctor Valley Rd & Project Dwy #5
2030 AM PH (AG)
Roundabout

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue	Distance	Prop. Queued	Effective Stop Rate	Average Speed	
		Total	HV %	v/c	sec		Vehicles	ft		per veh	mph	
South: NB Proctor Valley Rd												
3	L2	11	2.0	0.479	7.1	LOS A	3.9	98.4	0.09	0.27	29.9	
8	T1	783	2.0	0.479	2.2	LOS A	3.9	98.4	0.09	0.27	29.7	
18	R2	5	2.0	0.479	2.6	LOS A	3.9	98.4	0.09	0.27	29.0	
Approach		800	2.0	0.479	2.3	LOS A	3.9	98.4	0.09	0.27	29.7	
East: WB Project Dwy #5												
1	L2	5	2.0	0.019	9.3	LOS A	0.1	2.4	0.62	0.57	24.3	
6	T1	5	2.0	0.019	4.6	LOS A	0.1	2.4	0.62	0.57	24.0	
16	R2	4	2.0	0.019	5.3	LOS A	0.1	2.4	0.62	0.57	23.5	
Approach		15	2.0	0.019	6.5	LOS A	0.1	2.4	0.62	0.57	24.0	
North: SB Proctor Valley Rd												
7	L2	2	2.0	0.690	7.2	LOS A	7.2	182.6	0.20	0.27	29.7	
4	T1	1122	2.0	0.690	2.3	LOS A	7.2	182.6	0.20	0.27	29.5	
14	R2	1	2.0	0.690	2.7	LOS A	7.2	182.6	0.20	0.27	28.8	
Approach		1125	2.0	0.690	2.3	LOS A	7.2	182.6	0.20	0.27	29.5	
West: EB Project Dwy #5												
5	L2	2	2.0	0.063	14.3	LOS B	0.4	9.9	0.83	0.74	23.3	
2	T1	5	2.0	0.063	9.6	LOS A	0.4	9.9	0.83	0.74	23.0	
12	R2	27	2.0	0.063	10.3	LOS B	0.4	9.9	0.83	0.74	22.6	
Approach		35	2.0	0.063	10.5	LOS B	0.4	9.9	0.83	0.74	22.7	
All Vehicles		1975	2.0	0.690	2.5	LOS A	7.2	182.6	0.17	0.28	29.4	

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.

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

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

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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MOVEMENT SUMMARY

 Site: 5 [2030 PM PH (AG) - SL]

Proctor Valley Rd & Project Dwy #5
2030 PM PH (AG)
Roundabout

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph	
South: NB Proctor Valley Rd												
3	L2	33	2.0	0.598	7.1	LOS A	5.4	137.9	0.12	0.28	29.8	
8	T1	960	2.0	0.598	2.2	LOS A	5.4	137.9	0.12	0.28	29.6	
18	R2	5	2.0	0.598	2.6	LOS A	5.4	137.9	0.12	0.28	28.9	
Approach		999	2.0	0.598	2.4	LOS A	5.4	137.9	0.12	0.28	29.6	
East: WB Project Dwy #5												
1	L2	5	2.0	0.021	11.5	LOS B	0.1	3.0	0.73	0.63	23.7	
6	T1	5	2.0	0.021	6.9	LOS A	0.1	3.0	0.73	0.63	23.5	
16	R2	3	2.0	0.021	7.6	LOS A	0.1	3.0	0.73	0.63	23.0	
Approach		14	2.0	0.021	8.8	LOS A	0.1	3.0	0.73	0.63	23.5	
North: SB Proctor Valley Rd												
7	L2	5	2.0	0.644	7.3	LOS A	5.6	142.9	0.25	0.30	29.6	
4	T1	995	2.0	0.644	2.5	LOS A	5.6	142.9	0.25	0.30	29.4	
14	R2	2	2.0	0.644	2.8	LOS A	5.6	142.9	0.25	0.30	28.7	
Approach		1002	2.0	0.644	2.5	LOS A	5.6	142.9	0.25	0.30	29.4	
West: EB Project Dwy #5												
5	L2	1	2.0	0.035	11.8	LOS B	0.2	5.2	0.77	0.65	24.0	
2	T1	5	2.0	0.035	7.1	LOS A	0.2	5.2	0.77	0.65	23.7	
12	R2	15	2.0	0.035	7.8	LOS A	0.2	5.2	0.77	0.65	23.2	
Approach		22	2.0	0.035	7.9	LOS A	0.2	5.2	0.77	0.65	23.3	
All Vehicles		2037	2.0	0.644	2.5	LOS A	5.6	142.9	0.19	0.30	29.4	

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.

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

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

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

MOVEMENT SUMMARY

 Site: 8 [2030 AM PH (AG) - SL]

Proctor Valley Rd & Project Dwy #8
2030 AM PH (AG)
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Proctor Valley Rd											
3	L2	4	2.0	0.387	7.1	LOS A	2.7	67.7	0.07	0.27	30.0
8	T1	634	2.0	0.387	2.2	LOS A	2.7	67.7	0.07	0.27	29.8
18	R2	9	2.0	0.387	2.6	LOS A	2.7	67.7	0.07	0.27	29.1
Approach		648	2.0	0.387	2.2	LOS A	2.7	67.7	0.07	0.27	29.8
East: WB Project Dwy #8											
1	L2	54	2.0	0.066	8.3	LOS A	0.3	8.0	0.55	0.65	24.0
6	T1	5	2.0	0.066	3.6	LOS A	0.3	8.0	0.55	0.65	23.7
16	R2	1	2.0	0.066	4.3	LOS A	0.3	8.0	0.55	0.65	23.2
Approach		61	2.0	0.066	7.8	LOS A	0.3	8.0	0.55	0.65	24.0
North: SB Proctor Valley Rd											
7	L2	1	2.0	0.525	7.4	LOS A	4.1	104.3	0.29	0.31	29.5
4	T1	770	2.0	0.525	2.5	LOS A	4.1	104.3	0.29	0.31	29.3
14	R2	5	2.0	0.525	2.9	LOS A	4.1	104.3	0.29	0.31	28.6
Approach		776	2.0	0.525	2.5	LOS A	4.1	104.3	0.29	0.31	29.3
West: EB Project Dwy #8											
5	L2	1	2.0	0.020	9.5	LOS A	0.1	2.8	0.67	0.56	24.6
2	T1	5	2.0	0.020	4.9	LOS A	0.1	2.8	0.67	0.56	24.3
12	R2	9	2.0	0.020	5.6	LOS A	0.1	2.8	0.67	0.56	23.7
Approach		15	2.0	0.020	5.6	LOS A	0.1	2.8	0.67	0.56	24.0
All Vehicles		1500	2.0	0.525	2.6	LOS A	4.1	104.3	0.21	0.31	29.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.

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

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

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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MOVEMENT SUMMARY

 Site: 8 [2030 PM PH (AG) - SL]

Proctor Valley Rd & Project Dwy #8
2030 PM PH (AG)
Roundabout

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph	
		Total veh/h	HV %									
South: NB Proctor Valley Rd												
3	L2	10	2.0	0.279	7.1	LOS A	1.6	39.6	0.08	0.28	29.9	
8	T1	416	2.0	0.279	2.2	LOS A	1.6	39.6	0.08	0.28	29.7	
18	R2	26	2.0	0.279	2.6	LOS A	1.6	39.6	0.08	0.28	29.0	
Approach		452	2.0	0.279	2.3	LOS A	1.6	39.6	0.08	0.28	29.7	
East: WB Project Dwy #8												
1	L2	12	2.0	0.018	7.0	LOS A	0.1	1.9	0.43	0.52	24.5	
6	T1	5	2.0	0.018	2.4	LOS A	0.1	1.9	0.43	0.52	24.3	
16	R2	1	2.0	0.018	3.1	LOS A	0.1	1.9	0.43	0.52	23.7	
Approach		18	2.0	0.018	5.4	LOS A	0.1	1.9	0.43	0.52	24.4	
North: SB Proctor Valley Rd												
7	L2	2	2.0	0.344	7.1	LOS A	1.9	49.2	0.13	0.28	29.9	
4	T1	534	2.0	0.344	2.3	LOS A	1.9	49.2	0.13	0.28	29.7	
14	R2	1	2.0	0.344	2.6	LOS A	1.9	49.2	0.13	0.28	28.9	
Approach		538	2.0	0.344	2.3	LOS A	1.9	49.2	0.13	0.28	29.7	
West: EB Project Dwy #8												
5	L2	5	2.0	0.017	7.6	LOS A	0.1	1.9	0.50	0.49	24.7	
2	T1	5	2.0	0.017	2.9	LOS A	0.1	1.9	0.50	0.49	24.4	
12	R2	5	2.0	0.017	3.6	LOS A	0.1	1.9	0.50	0.49	23.9	
Approach		16	2.0	0.017	4.7	LOS A	0.1	1.9	0.50	0.49	24.4	
All Vehicles		1024	2.0	0.344	2.4	LOS A	1.9	49.2	0.12	0.29	29.5	

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.

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

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

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

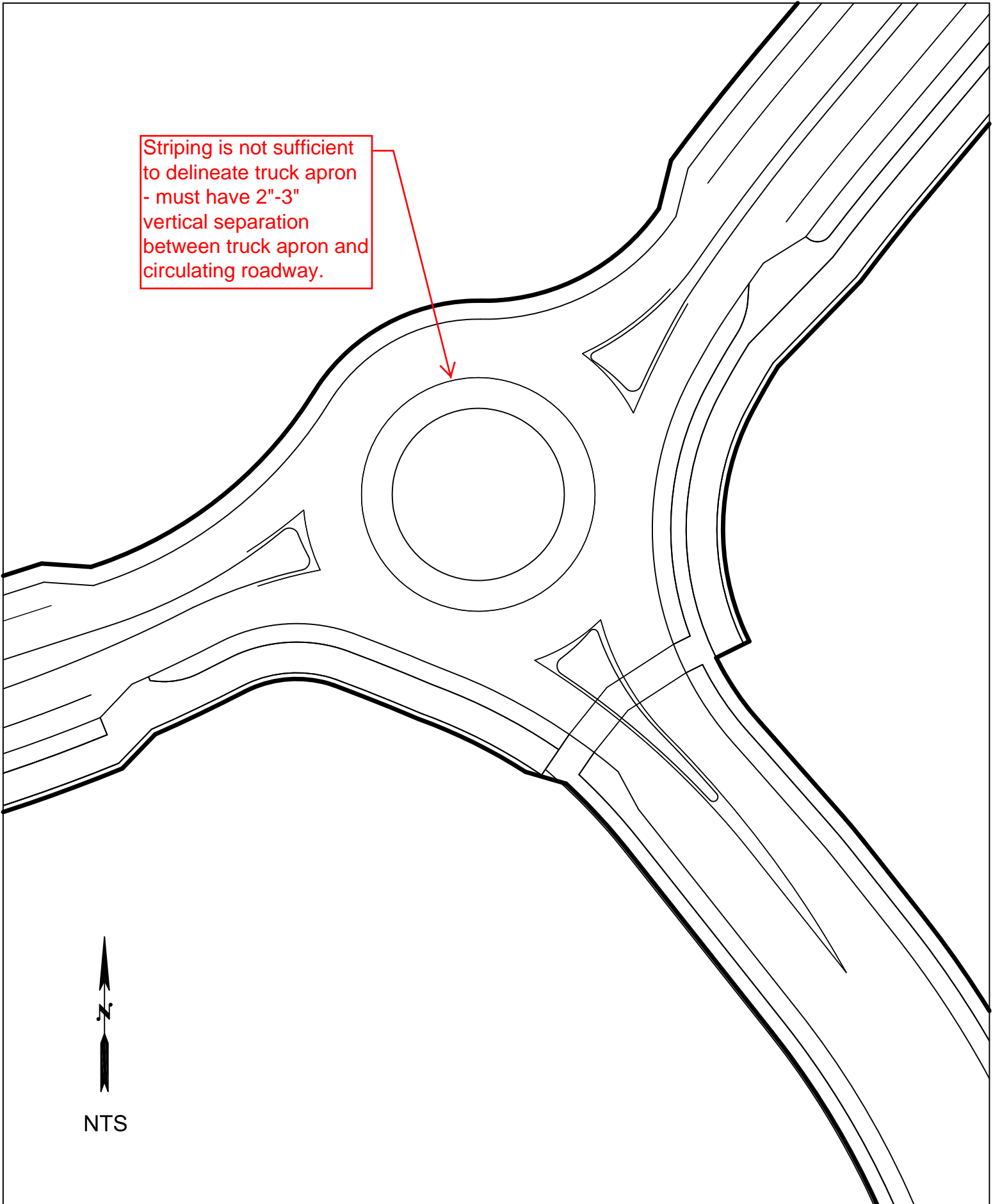
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

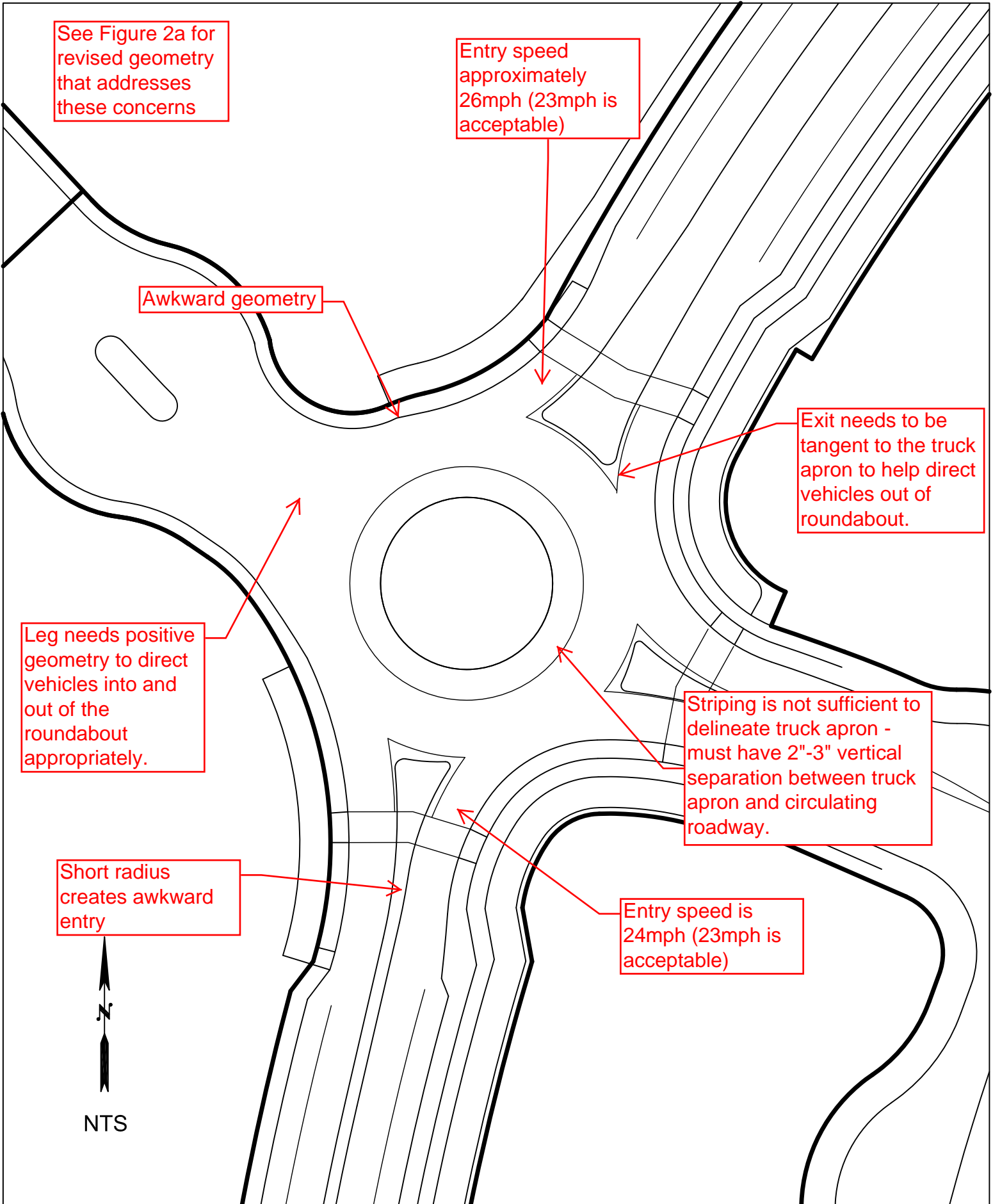
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Appendix C

Conceptual Layout

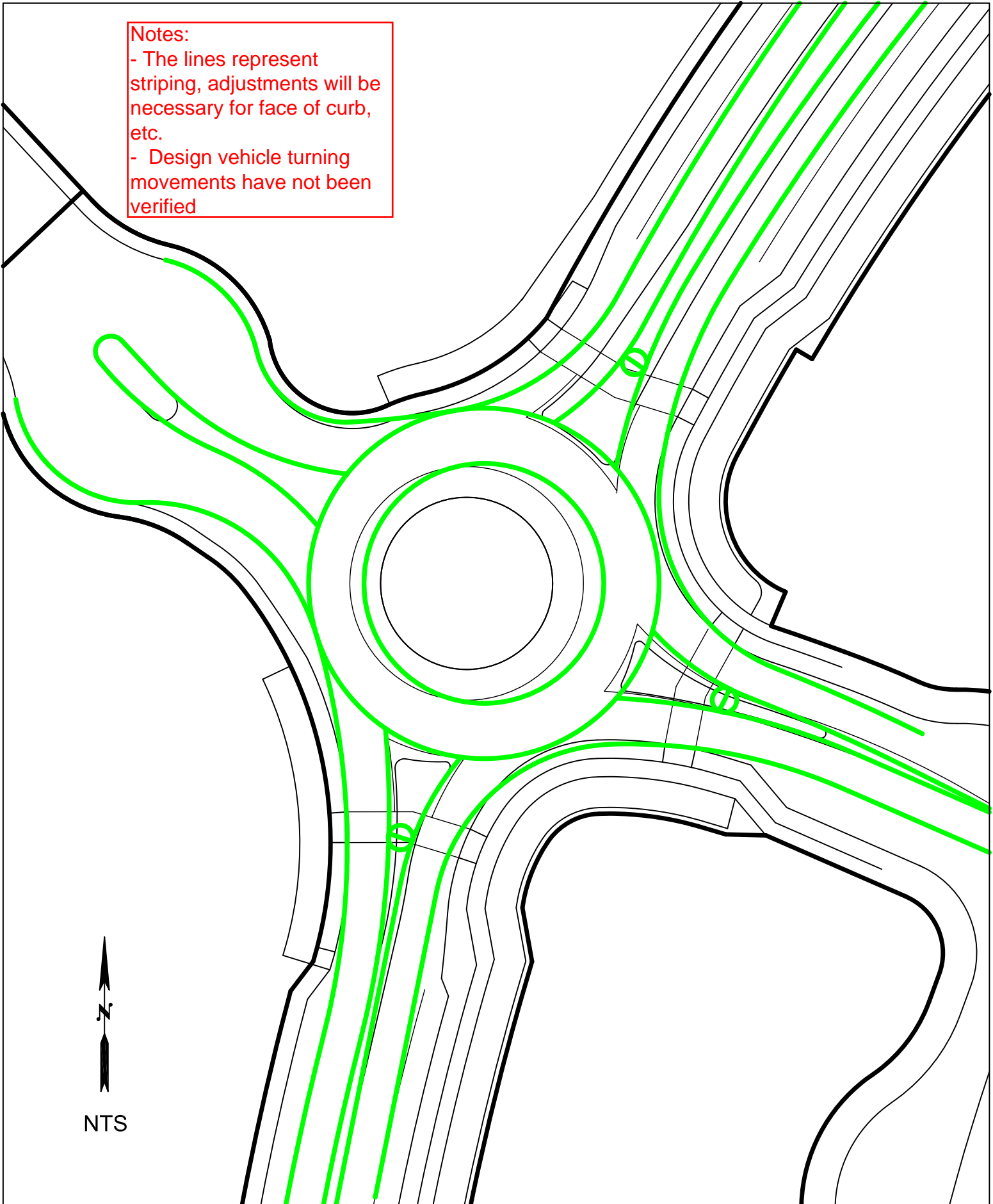
Geometric Comments

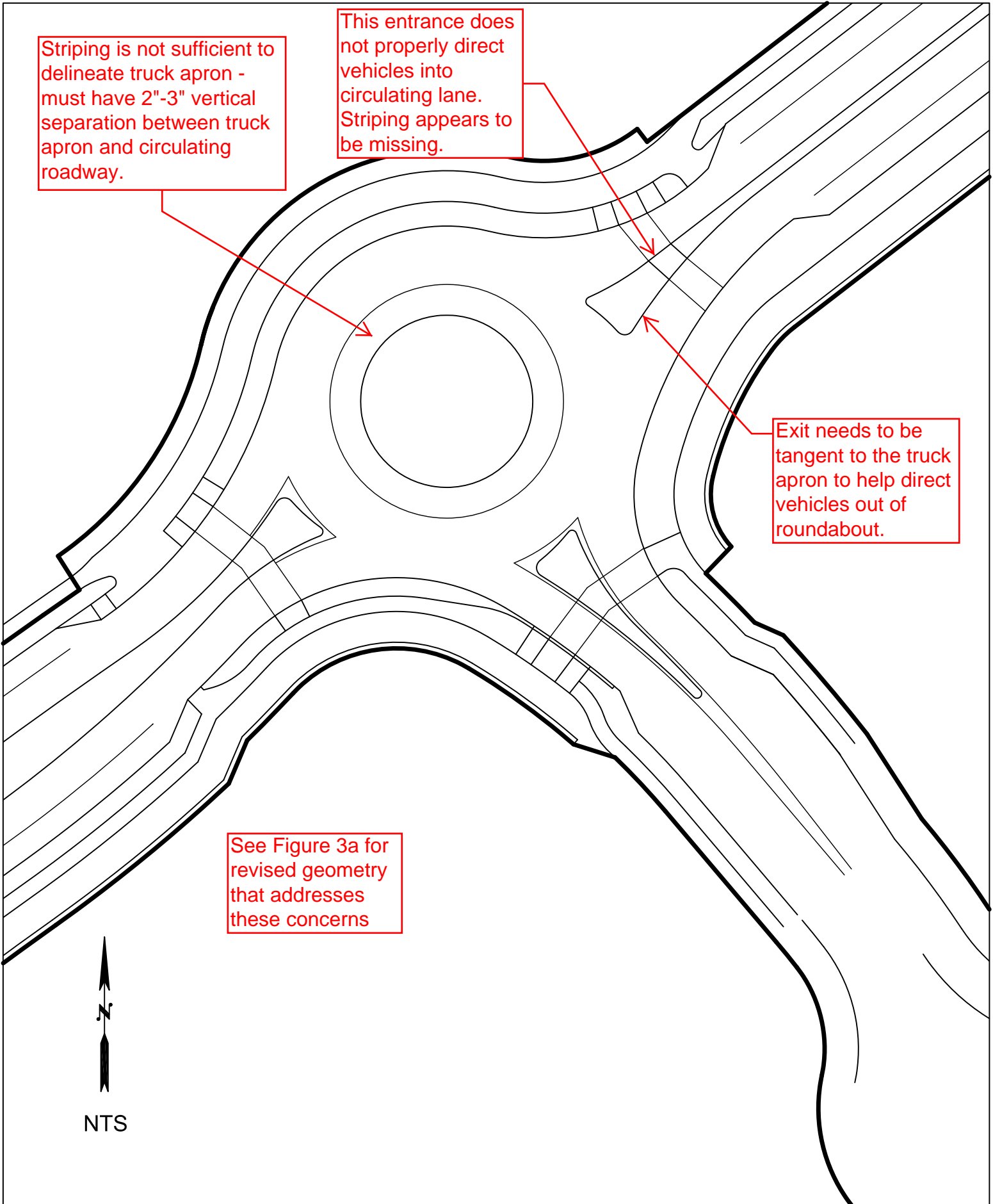




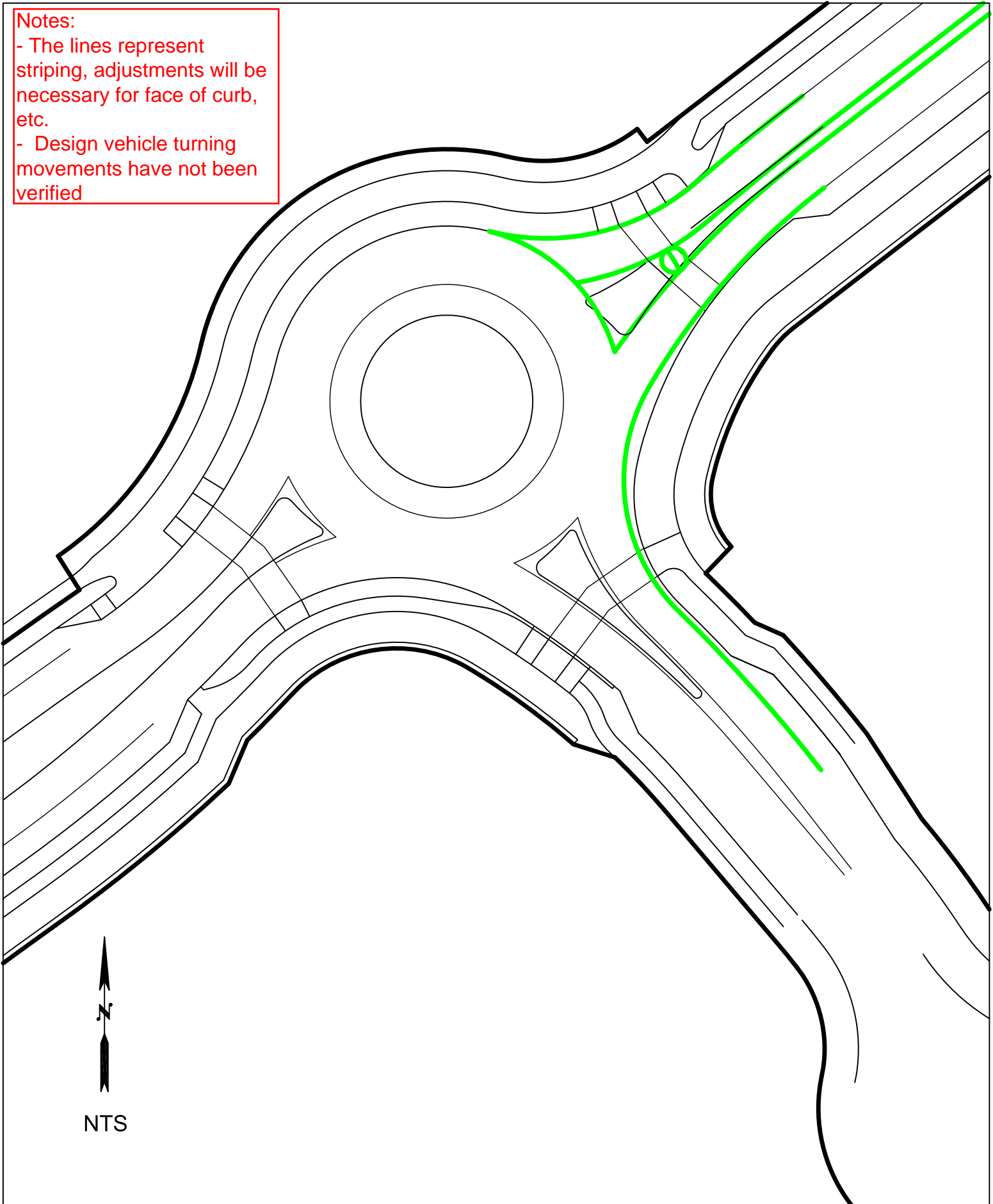
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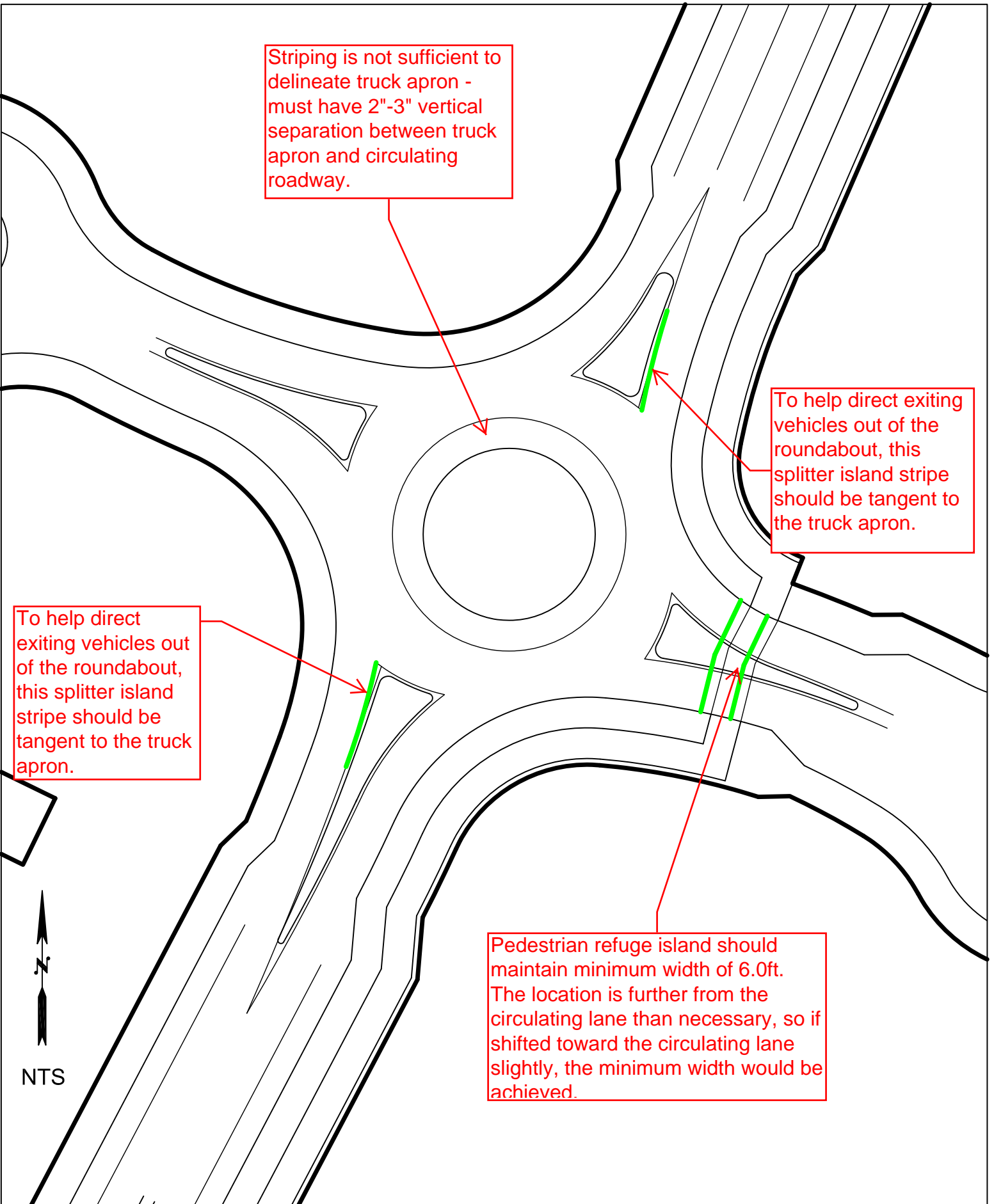
- The lines represent striping, adjustments will be necessary for face of curb, etc.
- Design vehicle turning movements have not been verified





Notes:
- The lines represent striping, adjustments will be necessary for face of curb, etc.
- Design vehicle turning movements have not been verified





Striping is not sufficient to delineate truck apron - must have 2"-3" vertical separation between truck apron and circulating roadway.

To help direct exiting vehicles out of the roundabout, this splitter island stripe should be tangent to the truck apron.

To help direct exiting vehicles out of the roundabout, this splitter island stripe should be tangent to the truck apron.

Pedestrian refuge island should maintain minimum width of 6.0ft. The location is further from the circulating lane than necessary, so if shifted toward the circulating lane slightly, the minimum width would be achieved.

NTS




Striping is not sufficient to delineate truck apron - must have 2"-3" vertical separation between truck apron and circulating roadway.

Entry speed is 28mph (23mph is acceptable).

Entry speed is over 30mph (23mph is acceptable). The splitter island is not directing vehicles into circulating lane

See Figure 5a for revised geometry that addresses these concerns

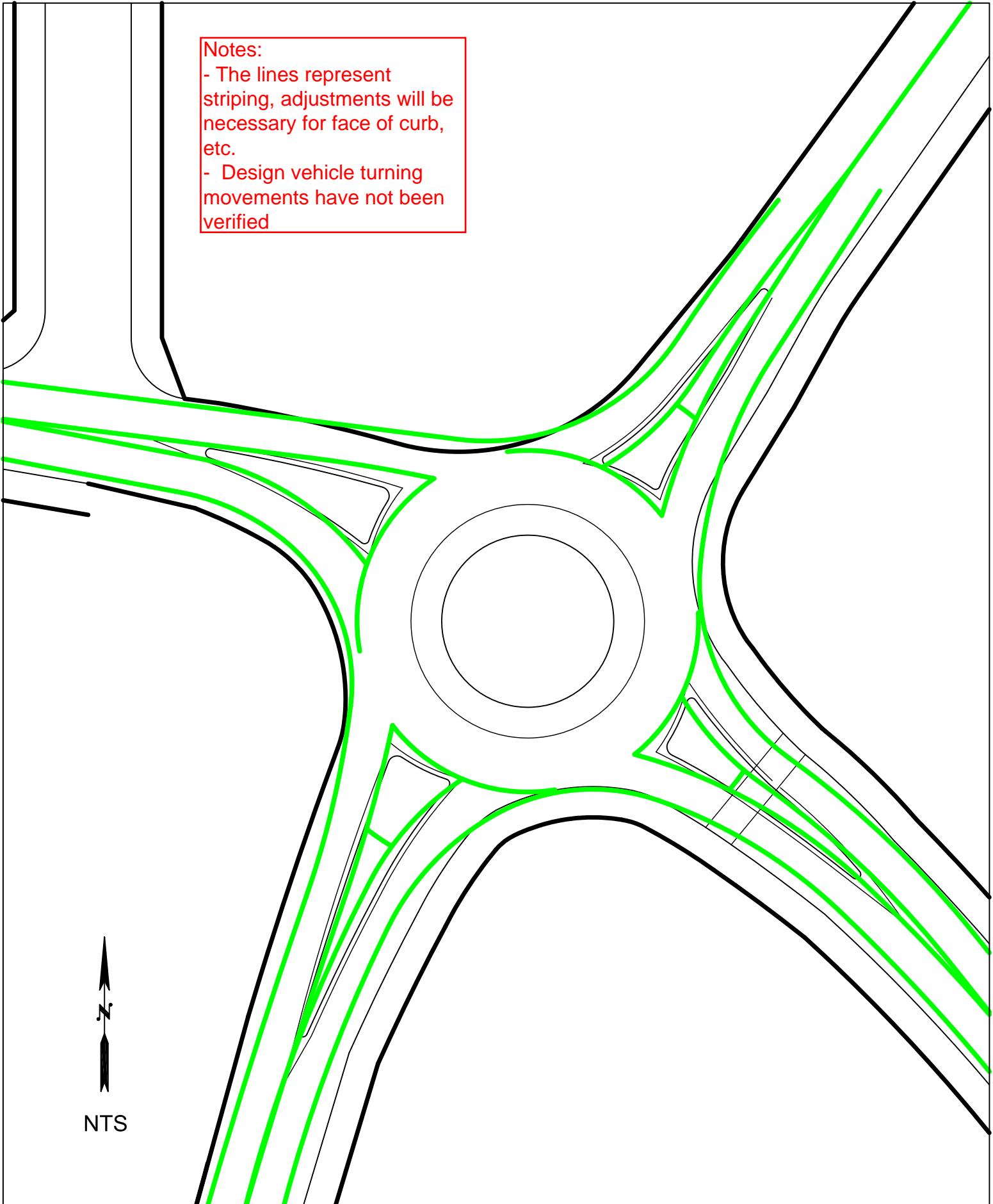
The splitter island should be tangent to truck apron on exit and entrance to influence drivers sufficiently. All four splitter islands are lacking.

Deflection of splitter island is not sufficient



NTS

Notes:
- The lines represent striping, adjustments will be necessary for face of curb, etc.
- Design vehicle turning movements have not been verified



↑
N
NTS

