Stantec

Memo

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Reference: Atlanta Highway at SR 10 Loop Traffic Analysis Summary

INTRODUCTION

Atlanta Highway is an east-west corridor on the west side of Athens, Georgia. In the study area, it is a divided, four-lane arterial, with the westernmost portion being a six-lane arterial, having three westbound lanes, two eastbound lanes, and a two-way left turn lane. There is a strong commercial presence along the corridor within the study area, particularly near the Atlanta Highway / SR 10 Loop interchange.

The purpose of this technical memo is to evaluate the operation of the corridor under existing conditions, to analyze its operation under various future improvement scenarios, and to provide recommendations for these and other possible improvements to ensure an acceptable operation of the corridor. Components included in this memo are the methodology used, the alternatives considered, and the results of the analysis.

This study consists of an evaluation of the Atlanta Highway at SR 10 Loop interchange in Athens, Georgia. The following scenarios were studied:

- Existing (2014) No Build
- Opening Year (2021) No Build
- Opening Year (2021) Build Scenario 2
- Opening Year (2021) Build Scenario 3
- Design Year (2041) No Build
- Design Year (2041) Build Scenario 2
- Design Year (2041) Build Scenario 3
- Design Year (2041) Build Scenario 2 with Improvements
- Design Year (2041) Build Scenario 3 with Improvements

The following intersections were included in the study area for each scenario:

- Atlanta Highway at Georgia Square Mall Drive
- Atlanta Highway at Huntington Road
- Atlanta Highway at SR 10 Loop
- Atlanta Highway at Logan's Roadhouse Driveway / Jennings Mill Road
- Atlanta Highway at Mitchell Bridge Road / Timothy Road

The following table summarizes the level of service and delay at the study area intersections for each of the study scenarios.

Reference: Atlanta Highway at SR 10 Loop Traffic Analysis Summary

LOS / Delay Summary Table		2014 Existing		2021 No-Build		2021 Build				2041 No-Build		2041 Build				2041 Build with Improvements			
Intersection						Scenario 2		Scenario 3				Scenario 2		Scenario 3		Scenario 2		Scenario 3	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Atlanta Hwy. @ GA Square Mall Dr.	**Overall**	**A (3.1)**	**A (4.2)**	**A (3.3)**	**A (4.7)**	**A (4.0)**	**A (6.5)**	**A (4.2)**	**A (5.2)**	**A (4.3)**	**A (6.3)**	**A (4.5)**	**A (8.4)**	**A (4.9)**	**A (6.6)**	**A (4.5)**	**A (8.1)**	**A (4.9)**	**A (8.7)**
	EB	A (2.9)	A (3.5)	A (3.2)	A (4.4)	A (3.3)	A (5.0)	A (3.0)	A (5.0)	A (4.4)	A (5.6)	A (4.7)	A (6.8)	A (4.5)	A (6.7)	A (4.7)	A (6.7)	A (4.7)	A (6.7)
	WB	A (1.3)	A (0.8)	A (1.2)	A (1.0)	A (2.5)	A (4.1)	A (3.9)	A (1.4)	A (2.1)	A (1.8)	A (2.1)	A (5.6)	A (3.4)	A (2.0)	A (2.3)	A (5.5)	A (3.1)	A (6.7)
	SB	D (42.5)	D (43.7)	D (41.7)	D (43.7)	D (44.1)	D (43.2)	D (39.9)	D (43.2)	D (40.8)	E (55.7)	D (39.2)	D (49.6)	D (43.0)	D (46.8)	D (39.2)	D (46.8)	D (39.2)	D (46.8)
Atlanta Hwy. @ Huntington Rd.	**Overall**	**B (17.5)**	**D (39.9)**	**B (18.3)**	**D (45.6)**	**B (16.6)**	**D (41.6)**	**B (14.8)**	**C (31.5)**	**C (22.3)**	**F (104.0)**	**C (21.2)**	**E (66.3)**	**B (16.7)**	**D (41.4)**	**B (19.3)**	**D (37.5)**	**B (16.8)**	**C (33.0)**
	EB	B (14.8)	C (32.7)	B (16.6)	C (33.9)	B (14.8)	D (40.2)	A (9.7)	C (27.5)	C (21.7)	F (88.7)	C (26.8)	D (43.1)	B (12.1)	C (31.3)	B (13.5)	E (57.3)	B (11.8)	C (32.5)
	WB	A (9.0)	C (31.8)	A (8.7)	C (32.8)	A (6.5)	C (21.2)	A (9.9)	C (24.8)	B (11.5)	F (103.5)	A (5.9)	E (59.8)	B (10.5)	C (28.8)	A (4.8)	C (20.7)	B (12.6)	C (25.1)
	NB	D (53.7)	D (44.5)	D (53.4)	E (56.6)	E (56.8)	D (42.1)	D (51.2)	D (42.4)	D (52.7)	F (88.8)	D (49.4)	D (53.4)	E (55.0)	D (41.0)	F (140.5)	D (51.3)	D (49.6)	D (35.3)
	SB	E (57.2)	E (74.3)	E (58.3)	F (99.4)	E (55.0)	F (103.1)	D (47.7)	D (53.6)	E (63.7)	F (138.9)	D (50.4)	F (132.0)	D (51.6)	F (96.1)	D (46.5)	D (45.1)	D (46.7)	E (55.7)
Atlanta Hwy. @ SR 10 Loop SB Ramps	**Overall**	**C (23.6)**	**D (40.0)**	**C (27.1)**	**E (60.7)**	**C (23.4)**	**C (27.6)**	**A (9.7)**	**B (10.6)**	**D (36.8)**	**F (123.3)**	**C (29.0)**	**E (58.0)**	**B (11.5)**	**B (13.5)**	**C (31.4)**	**D (51.3)**	**B (11.0)**	**B (13.7)**
	EB	B (16.3)	D (35.4)	B (19.0)	E (69.2)	B (18.5)	B (19.6)	A (6.8)	A (6.7)	C (31.2)	F (132.3)	C (23.9)	E (66.3)	A (8.7)	A (8.8)	C (28.3)	D (49.7)	A (8.4)	B (10.6)
	WB	B (15.1)	C (34.1)	C (22.4)	D (42.6)	A (9.9)	C (20.9)	A (5.1)	B (10.9)	B (19.5)	F (103.9)	B (17.3)	C (33.2)	A (7.0)	B (15.2)	B (18.4)	C (31.7)	A (6.2)	B (13.4)
	SB	D (44.9)	E (60.3)	D (46.3)	E (75.3)	D (44.5)	E (56.5)	B (19.1)	B (18.5)	E (62.3)	F (139.4)	D (48.8)	F (85.0)	C (20.6)	C (20.9)	D (48.8)	F (90.2)	B (19.7)	C (20.9)
Atlanta Hwy. @ SR 10 Loop NB Ramps	**Overall**	**A (7.6)**	**A (8.7)**	**A (8.3)**	**B (11.1)**	**B (12.5)**	**A (9.7)**	**A (7.0)**	**A (8.0)**	**B (11.3)**	**B (18.2)**	**B (12.8)**	**B (15.0)**	**A (7.2)**	**A (7.2)**	**B (12.8)**	**B (14.7)**	**A (7.4)**	**A (9.2)**
	EB	A (5.5)	A (5.4)	A (6.7)	A (3.8)	A (4.7)	A (3.8)	A (4.7)	B (11.0)	B (11.7)	A (9.0)	A (5.5)	A (4.7)	A (4.1)	A (4.0)	A (5.6)	A (6.0)	A (4.2)	A (9.2)
	WB	A (3.0)	A (6.9)	A (3.1)	A (4.3)	A (2.1)	A (1.2)	A (2.3)	A (1.6)	A (4.2)	A (9.9)	A (2.3)	A (9.9)	A (2.5)	A (5.2)	A (2.0)	A (9.4)	A (4.8)	A (5.5)
	NB	C (20.4)	C (20.7)	C (20.5)	D (45.6)	D (49.4)	D (45.6)	C (20.4)	B (19.5)	C (20.7)	E (60.4)	D (48.0)	D (51.2)	C (22.3)	B (19.6)	D (48.0)	D (47.6)	C (20.0)	B (19.6)
Atlanta Hwy. @ Logan's Roadhouse Driveway / Jennings Mill Rd.	**Overall**	**B (14.8)**	**B (14.7)**	**C (31.0)**	**F (117.9)**	**-**	**-**	**-**	**-**	**F (##)**	**F (120.8)**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	EB	A (0.1)	A (0.3)	A (0.1)	A (0.4)	-	-	-	-	A (0.1)	A (0.6)	-	-	-	-	-	-	-	-
	WB	A (1.4)	A (0.6)	A (1.4)	A (0.7)	-	-	-	-	A (2.1)	A (1.0)	-	-	-	-	-	-	-	-
	NB	F (148.9)	F (235.6)	F (##)	F (##)	-	-	-	-	F (##)	F (##)	-	-	-	-	-	-	-	-
	SB	B (10.0)	B (17.1)	B (10.3)	B (19.3)	-	-	-	-	B (10.8)	C (25.8)	-	-	-	-	-	-	-	-
Atlanta Hwy. @ Logan's Roadhouse Driveway	**Overall**	**-**	**-**	**-**	**-**	**A (0.0)**	**A (0.0)**	**# (#)**	**# (#)**	**-**	**-**	**A (0.0)**	**A (0.1)**	**# (#)**	**# (#)**	**A (0.0)**	**A (0.1)**	**# (#)**	**# (#)**
	EB	-	-	-	-	A (0.0)	A (0.0)	# (#)	# (#)	-	-	A (0.0)	A (0.0)	# (#)	# (#)	A (0.0)	A (0.0)	# (#)	# (#)
	WB	-	-	-	-	A (0.0)	A (0.0)	# (#)	# (#)	-	-	A (0.0)	A (0.0)	# (#)	# (#)	A (0.0)	A (0.0)	# (#)	# (#)
	SB	-	-	-	-	A (9.4)	B (11.9)	# (#)	# (#)	-	-	A (9.6)	B (13.2)	# (#)	# (#)	A (9.6)	B (13.2)	# (#)	# (#)
Atlanta Hwy. @ Jennings Mill Rd.	**Overall**	**-**	**-**	**-**	**-**	**A (5.8)**	**A (4.5)**	**A (6.1)**	**A (4.6)**	**-**	**-**	**A (6.3)**	**A (7.3)**	**A (7.3)**	**A (6.5)**	**A (6.5)**	**A (7.9)**	**B (12.1)**	**A (7.3)**
	EB	-	-	-	-	A (3.5)	A (2.7)	A (5.3)	A (3.2)	-	-	A (2.1)	A (4.1)	A (7.1)	A (5.7)	A (2.5)	A (4.7)	B (10.8)	A (4.6)
	WB	-	-	-	-	A (1.7)	A (3.3)	A (5.8)	A (5.6)	-	-	A (4.7)	A (5.4)	A (4.9)	A (4.9)	A (4.4)	A (6.9)	A (6.1)	A (7.3)
	NB	-	-	-	-	C (32.2)	C (28.2)	B (12.7)	A (6.0)	-	-	D (37.3)	D (46.1)	B (15.2)	C (26.1)	D (37.3)	D (39.4)	D (37.5)	C (26.1)
	SB	-	-	-	-	A (0.0)	A (0.5)	A (0.0)	A (0.1)	-	-	A (0.0)	A (0.3)	# (#)	A (0.3)	# (#)	A (0.2)	# (#)	A (0.3)
Atlanta Hwy. @ Mitchell Bridge Rd. / Timothy Rd.	**Overall**	**B (19.7)**	**D (46.7)**	**C (20.6)**	**E (59.1)**	**B (15.3)**	**D (49.7)**	**C (20.9)**	**D (51.7)**	**C (26.3)**	**F (99.3)**	**B (19.5)**	**F (85.5)**	**C (25.2)**	**F (92.1)**	**B (17.0)**	**D (53.4)**	**B (18.0)**	**D (54.7)**
	EB	B (12.2)	C (33.4)	B (12.7)	C (32.2)	A (4.3)	C (26.2)	B (15.2)	C (32.2)	B (19.9)	E (56.1)	B (11.3)	D (46.0)	B (19.4)	D (49.6)	A (9.1)	C (29.8)	B (10.6)	D (37.4)
	WB	C (22.5)	D (49.7)	C (22.7)	E (74.8)	B (15.2)	E (59.2)	B (15.4)	E (59.6)	C (26.6)	F (133.0)	B (17.7)	F (107.1)	B (17.7)	F (124.2)	B (17.1)	E (72.6)	B (17.4)	E (68.1)
	NB	D (42.5)	E (69.4)	D (44.0)	F (87.4)	D (48.9)	E (75.2)	D (45.3)	E (74.9)	D (47.5)	F (125.4)	D (48.4)	F (117.0)	D (52.8)	F (120.5)	D (40.7)	E (59.0)	D (40.6)	E (58.6)
	SB	C (27.6)	D (47.1)	C (30.1)	E (56.4)	C (32.1)	F (95.1)	C (29.5)	E (56.7)	C (32.8)	F (96.5)	C (29.5)	F (99.8)	C (32.9)	F (88.5)	C (29.5)	E (64.6)	C (29.5)	E (62.7)

(#) – No value calculated by Synchro F (##) – Delay calculated by Synchro greater than 300 second

Reference: Atlanta Highway at SR 10 Loop Traffic Analysis Summary

METHODOLOGY

For this analysis, Synchro 8 was used to model the traffic conditions along the corridor. The traffic forecast used in this analysis, dated October 2014, was performed by the Georgia Department of Transportation and is included in the appendix. Several Synchro parameters were adjusted in the development of the corridor models; parameters not assigned a value were left at the Synchro default. The adjusted parameters include:

- Minimum Green time set to 12 seconds for phases 2 and 6, and 7 seconds for all other phases
- Yellow/Red/Loss times set to 4 sec/2 sec/-1 sec for all phases
- Vehicle Extensions set to 5 seconds for phases 2 and 6, and 3 seconds for all other phases
- Recall Modes set to "C-Max" for phases 2 and 6, and "None" for all other phases
- Allowance of protected/permitted left turns
- Allowance of lead/lag optimization of phasing
- Inclusion of pedestrian timings at signals – default walk times were used
- Removal of volume-density timings
- Peak Hour Factor set to 0.92
- Heavy Vehicle Percentage set to 4% as shown in forecast

The future scenarios 2 and 3 were developed by ARCADIS and Heath & Linebeck Engineers, respectively. A design drawing of each scenario is included in the appendix. In order to represent these designs as accurately as possible in the simulation, the distances between intersections and storage lengths of turn lanes as shown on the designs were used in Synchro.

In order to achieve reasonable simulation results, the Mandatory Distance and Positioning Distance were changed in the 2041 Build with Improvements Scenario 3 PM file. This was done to obtain a more realistic lane utilization distribution and, in turn, generate more reliable results. Specifically, these parameters were manually changed at the eastbound approach of Huntington Road and the westbound approach of the SR 10 Loop NB On-Loop. The distances were changed in such a way that the vehicles wishing to turn right at each location passed the nearest upstream intersection before they were required to be in the rightmost lane. As a result of manually setting these parameters, the simulation displayed more realistic driver behavior and produced more reliable results.

ALTERNATIVES

Existing Conditions

The existing conditions of the corridor were used in the 2014 Existing, 2021 No-Build, and 2041 No-Build analyses. Included in these conditions are the existing roadway geometry and the existing laneage. Synchro was used to optimize the signal timings for each of these scenarios. The existing laneage configuration is shown in Figure 1.

Reference: Atlanta Highway at SR 10 Loop Traffic Analysis Summary

2014 Existing Results

The 2014 Existing scenario operates at LOS C or better in the AM peak hour and LOS D or better in the PM peak hour. There are no significant queueing issues in either peak hour.

2014 Existing LOS / Delay		Atlanta Highway @ GA Square Mall Dr.	Atlanta Hwy. @ Huntington Rd.	Atlanta Hwy. @ SR 10 Loop SB Ramps	Atlanta Hwy. @ SR 10 Loop NB Ramps	Atlanta Hwy. @ Logan's Roadhouse Driveway / Jennings Mill Rd.	Atlanta Hwy. @ Mitchell Bridge Rd. / Timothy Rd.
AM	**Overall**	**A (3.1)**	**B (17.5)**	**C (23.6)**	**A (7.6)**	**B (14.8)**	**B (19.7)**
	EB	A (2.9)	B (14.8)	B (16.3)	A (5.5)	A (0.1)	B (12.2)
	WB	A (1.3)	A (9.0)	B (15.1)	A (3.0)	A (1.4)	C (22.5)
	NB	-	D (53.7)	-	C (20.4)	F (148.9)	D (42.5)
	SB	D (42.5)	E (57.2)	D (44.9)	-	B (10.0)	C (27.6)
PM	**Overall**	**A (4.2)**	**D (39.9)**	**D (40.0)**	**A (8.7)**	**B (14.7)**	**D (46.7)**
	EB	A (3.5)	C (32.7)	D (35.4)	A (5.4)	A (0.3)	C (33.4)
	WB	A (0.8)	C (31.8)	C (34.1)	A (6.9)	A (0.6)	D (49.7)
	NB	-	D (44.5)	-	C (20.7)	F (235.6)	E (69.4)
	SB	D (43.7)	E (74.3)	E (60.3)	-	B (17.1)	D (47.1)

2021 No-Build Results

The 2021 No-Build scenario operates at an unacceptable level of service at two intersections in the PM peak hour, as shown in the summary table. The AM peak hour continues to operate at LOS C or better at all intersections. As with the 2014 Existing scenario, there are no queueing problems in the AM peak hour. However, the PM peak hour experiences queueing at several locations.

At Huntington Road, the eastbound approach backs up to the next intersection at Georgia Square Mall Drive. The southbound approach backs up greater than 150 feet and does not clear within one cycle. Similarly, the northbound right movement experiences a queue of 275 feet, spilling back past its 175-foot storage lane.

At the SR 10 Loop southbound on-ramp intersection, the southbound traffic off of the ramp queues back onto the highway and does not clear within two cycles. At this intersection, the westbound left also queues past its storage lane. This causes the westbound throughs to queue past the northbound ramps intersection, which, in turn, prevents the northbound left-turning traffic off of the ramp from entering Atlanta Highway. As a result, the northbound traffic on the ramps also backs up onto the highway.

Reference: Atlanta Highway at SR 10 Loop Traffic Analysis Summary

Further to the east, at the Atlanta Highway at Mitchell Bridge Road / Timothy Road intersection, the westbound traffic experiences queues greater than 500 feet, as does the northbound traffic.

2021 No-Build LOS / Delay		Atlanta Highway @ GA Square Mall Dr.	Atlanta Hwy. @ Huntington Rd.	Atlanta Hwy. @ SR 10 Loop SB Ramps	Atlanta Hwy. @ SR 10 Loop NB Ramps	Atlanta Hwy. @ Logan's Roadhouse Driveway / Jennings Mill Rd.	Atlanta Hwy. @ Mitchell Bridge Rd. / Timothy Rd.
AM	**Overall**	**A (3.3)**	**B (18.3)**	**C (27.1)**	**A (8.3)**	**C (31.0)**	**C (20.6)**
	EB	A (3.2)	B (16.6)	B (19.0)	A (6.7)	A (0.1)	B (12.7)
	WB	A (1.2)	A (8.7)	C (22.4)	A (3.1)	A (1.4)	C (22.7)
	NB	-	D (53.4)	-	C (20.5)	F (314.4)	D (44.0)
	SB	D (41.7)	E (58.3)	D (46.3)	-	B (10.3)	C (30.1)
PM	**Overall**	**A (4.7)**	**D (45.6)**	**E (60.7)**	**B (11.1)**	**F (117.9)**	**E (59.1)**
	EB	A (4.4)	C (33.9)	E (69.2)	A (3.8)	A (0.4)	C (32.2)
	WB	A (1.0)	C (32.8)	D (42.6)	A (4.3)	A (0.7)	E (74.8)
	NB	-	E (56.6)	-	D (45.6)	F (1961.3)	F (87.4)
	SB	D (43.7)	F (99.4)	E (75.3)	-	B (19.3)	E (56.4)

2041 No-Build Results

The 2041 No-Build scenario continues to operate at an acceptable level of service in the AM peak hour. During this time period, the intersections along the corridor operate at LOS D or better. Though the volumes are higher in this future year, there remains no significant queueing at any of the study intersections. The PM peak hour, however, fails at multiple locations in this future year. The queueing issues present in the 2021 No-Build scenario are compounded in this scenario, with additional problems appearing as a result of the higher volumes.

The additional queueing issues occur at the northbound approach of Jennings Mill Road and the southbound approach of Mitchell Bridge Road. The stop-controlled northbound lefts at Jennings Mill Road have difficulty finding a gap to be able to enter Atlanta Highway; since Jennings Mill Road is directly downstream of a yield-controlled northbound off-ramp, many of the available gaps in the eastbound traffic are filled by vehicles exiting the ramps.

Reference: Atlanta Highway at SR 10 Loop Traffic Analysis Summary

2041 No-Build LOS / Delay		Atlanta Highway @ GA Square Mall Dr.	Atlanta Hwy. @ Huntington Rd.	Atlanta Hwy. @ SR 10 Loop SB Ramps	Atlanta Hwy. @ SR 10 Loop NB Ramps	Atlanta Hwy. @ Logan's Roadhouse Driveway / Jennings Mill Rd.	Atlanta Hwy. @ Mitchell Bridge Rd. / Timothy Rd.
AM	**Overall**	**A (4.3)**	**C (22.3)**	**D (36.8)**	**B (11.3)**	**F (476.6)**	**C (26.3)**
	EB	A (4.4)	C (21.7)	C (31.2)	B (11.7)	A (0.1)	B (19.9)
	WB	A (2.1)	B (11.5)	B (19.5)	A (4.2)	A (2.1)	C (26.6)
	NB	-	D (52.7)	-	C (20.7)	F (4813.3)	D (47.5)
	SB	D (40.8)	E (63.7)	E (62.3)	-	B (10.8)	C (32.8)
PM	**Overall**	**A (6.3)**	**F (104.0)**	**F (123.3)**	**B (18.2)**	**F (120.8)**	**F (99.3)**
	EB	A (5.6)	F (88.7)	F (132.3)	A (9.0)	A (0.6)	E (56.1)
	WB	A (1.8)	F (103.5)	F (103.9)	A (9.9)	A (1.0)	F (133.0)
	NB	-	F (88.8)	-	E (60.4)	F (1970.5)	F (125.4)
	SB	E (55.7)	F (138.9)	F (139.4)	-	C (25.8)	F (96.5)

Scenario 2

Scenario 2 introduced various improvements into the layout of the corridor. Major changes to the corridor include the realignment of Jennings Mill Road to a new signalized intersection roughly 500 feet to the east of its previous location and the addition of a third westbound through lane between the realigned Jennings Mill Road intersection and the SR 10 Loop SB Ramps intersection. Other smaller improvements include the addition of mainline and sidestreet turn lanes. All the improvements included in Scenario 2 are contained between the intersections of Huntington Road and the realigned Jennings Road. The improvements also do not include the loop ramp from westbound Atlanta Highway to southbound SR 10. The Scenario 2 proposed laneage configuration is shown in Figure 2. In this scenario, the westbound right turn at Huntington Road requires 1,200 feet of storage, a greater length than is available between the Huntington Road and SR 10 Loop SB Ramps intersections. The maximum available length, 400 feet, is shown in the figure.

2021 Build Scenario 2 Results

The 2021 Build Scenario 2 operates at a level of service comparable to the 2014 existing scenario in both peak hours. As shown in the summary table above, the corridor is at LOS C or better in the AM peak hour and LOS D in the PM peak hour. There is little to no queueing in the AM peak hour. The longest AM queues occur on the southbound approach at the SR 10 Loop SB Ramps intersection. However, while this is the longest queue present in the AM, it is cleared within one cycle.

The PM peak hour, on the other hand, experiences very long queues on both the southbound and eastbound approaches of Huntington Road. The queue on the eastbound approach at Huntington

Reference: Atlanta Highway at SR 10 Loop Traffic Analysis Summary

Road extends back more than 1400 feet, backing up past Georgia Square Mall Drive, while the southbound approach queue extends back more than 500 feet. Also, the westbound right turn at Huntington Road at times can back up to the southbound right off of the SR 10 SB Off-Ramp. The short distance between these intersections, roughly 400 feet, causes any amount of queueing to impede the movement of the southbound rights off of SR 10 Loop. This problem occurs somewhat infrequently in simulation, with the queue backing up to the ramp roughly 20% of the time.

2021 Build Scenario 2 LOS / Delay		Atlanta Highway @ GA Square Mall Dr.	Atlanta Hwy. @ Huntington Rd.	Atlanta Hwy. @ SR 10 Loop SB Ramps	Atlanta Hwy. @ SR 10 Loop NB Ramps	Atlanta Hwy. @ Logan's Roadhouse Driveway	Atlanta Hwy. @ Jennings Mill Rd.	Atlanta Hwy. @ Mitchell Bridge Rd. / Timothy Rd.
AM	**Overall**	**A (4.0)**	**B (16.6)**	**C (23.4)**	**B (12.5)**	**A (0.0)**	**A (5.8)**	**B (15.3)**
	EB	A (3.3)	B (14.8)	B (18.5)	A (4.7)	A (0.0)	A (3.5)	A (4.3)
	WB	A (2.5)	A (6.5)	A (9.9)	A (2.1)	A (0.0)	A (1.7)	B (15.2)
	NB	-	E (56.8)	-	D (49.4)	-	C (32.2)	D (48.9)
	SB	D (44.1)	E (55.0)	D (44.5)	-	A (9.4)	A (0.0)	C (32.1)
PM	**Overall**	**A (6.5)**	**D (41.6)**	**C (27.6)**	**A (9.7)**	**A (0.0)**	**A (4.5)**	**D (49.7)**
	EB	A (5.0)	D (40.2)	B (19.6)	A (3.8)	A (0.0)	A (2.7)	C (26.2)
	WB	A (4.1)	C (21.2)	C (20.9)	A (1.2)	A (0.0)	A (3.3)	E (59.2)
	NB	-	D (42.1)	-	D (45.6)	-	C (28.2)	E (75.2)
	SB	D (43.2)	F (103.1)	E (56.5)	-	B (11.9)	A (0.5)	F (95.1)

2041 Build Scenario 2 Results

The 2041 Build Scenario 2 functions at LOS C or better in AM peak hour at each intersection. It fails at one intersection in the PM peak hour and operates at LOS E at two others in the same time frame. The only major queueing in the AM peak hour is on the eastbound approach at Huntington Road. On this approach, the queues extend back past Georgia Square Mall Drive.

In the PM peak hour, the issues that were present in the 2021 Build Scenario 2 are worsened. In addition, there is queueing on the northbound and westbound approaches of Huntington Road, the latter of which extends back past the SR 10 NB Ramps intersection. Also in this scenario, the eastbound queue at Mitchell Bridge Road / Timothy Road consistently backs up past both the realigned Jennings Mill Road and the SR 10 NB Ramps intersections.

Reference: Atlanta Highway at SR 10 Loop Traffic Analysis Summary

2041 Build Scenario 2 LOS / Delay		Atlanta Highway @ GA Square Mall Dr.	Atlanta Hwy. @ Huntington Rd.	Atlanta Hwy. @ SR 10 Loop SB Ramps	Atlanta Hwy. @ SR 10 Loop NB Ramps	Atlanta Hwy. @ Logan's Roadhouse Driveway	Atlanta Hwy. @ Jennings Mill Rd.	Atlanta Hwy. @ Mitchell Bridge Rd. / Timothy Rd.
AM	**Overall**	**A (4.5)**	**C (21.2)**	**C (29.0)**	**B (12.8)**	**A (0.0)**	**A (6.3)**	**B (19.5)**
	EB	A (4.7)	C (26.8)	C (23.9)	A (5.5)	A (0.0)	A (2.1)	B (11.3)
	WB	A (2.1)	A (5.9)	B (17.3)	A (2.3)	A (0.0)	A (4.7)	B (17.7)
	NB	-	D (49.4)	-	D (48.0)	-	D (37.3)	D (48.4)
	SB	D (39.2)	D (50.4)	D (48.8)	-	A (9.6)	A (0.0)	C (29.5)
PM	**Overall**	**A (8.4)**	**E (66.3)**	**E (58.0)**	**B (15.0)**	**A (0.1)**	**A (7.3)**	**F (85.5)**
	EB	A (6.8)	D (43.1)	E (66.3)	A (4.7)	A (0.0)	A (4.1)	D (46.0)
	WB	A (5.6)	E (59.8)	C (33.2)	A (9.9)	A (0.0)	A (5.4)	F (107.1)
	NB	-	D (43.4)	-	D (51.2)	-	D (46.1)	F (117.0)
	SB	D (49.6)	F (132.0)	F (85.0)	-	B (13.2)	A (0.3)	F (99.8)

Scenario 3

Scenario 3 contains more major alterations to the existing geometry than does Scenario 2. While it proposes the same realignment of Jennings Mill Road as Scenario 2 does, Scenario 3 widens the westbound direction to four lanes from Mitchell Bridge Road / Timothy Road in the east to Huntington Road in the west. Further, it widens the westbound direction to four lanes between Huntington Road and the new Jennings Mill Road intersection, and to five lanes over the SR 10 Loop bridge. Scenario 3 also adds a loop from westbound Atlanta Highway to southbound SR 10 and removes the westbound left turn onto the southbound on-ramp. As with Scenario 2, other minor improvements are also included in this scenario. The ultimate project improvements are from GA Square Mall Drive to Mitchell Bridge Road / Timothy Road. The laneage configuration for this scenario is shown in Figure 3.

2021 Build Scenario 3 Results

The intersection in the 2021 Build Scenario 3 operate at an acceptable level of service in both peak hours, as shown in the summary table. There are no queueing problems in the AM peak hour for this scenario. The only queueing issues that exist in Scenario 3 are located at the Huntington Road and Mitchell Bridge Road / Timothy Road intersections in the PM peak hour. The southbound left turns at the Huntington Road intersection experience queue distances greater than 500 feet, and do not clear in one cycle length. At the Mitchell Bridge Road / Timothy Road intersection, the northbound, southbound, and westbound approaches all experience queues greater than 600 feet in the PM peak hour.

Reference: Atlanta Highway at SR 10 Loop Traffic Analysis Summary

2021 Build Scenario 3 LOS / Delay		Atlanta Highway @ GA Square Mall Dr.	Atlanta Hwy. @ Huntington Rd.	Atlanta Hwy. @ SR 10 Loop SB Ramps	Atlanta Hwy. @ SR 10 Loop NB Ramps	Atlanta Hwy. @ Logan's Roadhouse Driveway	Atlanta Hwy. @ Jennings Mill Rd.	Atlanta Hwy. @ Mitchell Bridge Rd. / Timothy Rd.
AM	**Overall**	**A (4.2)**	**B (14.8)**	**A (9.7)**	**A (7.0)**	**# (#)**	**A (6.1)**	**C (20.9)**
	EB	A (3.0)	A (9.7)	A (6.8)	A (4.7)	# (#)	A (5.3)	B (15.2)
	WB	A (3.9)	A (9.9)	A (5.1)	A (2.3)	# (#)	A (5.8)	B (15.4)
	NB	-	D (51.2)	-	C (20.4)	-	B (12.7)	D (45.3)
	SB	D (39.9)	D (47.7)	B (19.1)	-	# (#)	A (0.0)	C (29.5)
PM	**Overall**	**A (5.2)**	**C (31.5)**	**B (10.6)**	**A (8.0)**	**# (#)**	**A (4.6)**	**D (51.7)**
	EB	A (5.0)	C (27.5)	A (6.7)	B (11.0)	# (#)	A (3.2)	C (32.2)
	WB	A (1.4)	C (24.8)	B (10.9)	A (1.6)	# (#)	A (5.6)	E (59.6)
	NB	-	D (42.4)	-	B (19.5)	-	A (6.0)	E (74.9)
	SB	D (43.2)	D (53.6)	B (18.5)	-	# (#)	A (0.1)	E (56.7)

2041 Build Scenario 3 Results

The 2041 Build Scenario 3 fails at the Mitchell Bridge Road / Timothy Road intersection in the PM peak hour, and operates at LOS C or better in the AM peak hour, as shown in the summary table above. Just as in the 2021 Build Scenario 3, there are no queueing issues present in the AM peak hour. However, in the PM peak hour, there are significant queues on each approach at the Mitchell Bridge Road / Timothy Road intersection. The eastbound queue at this location extends past the SR 10 NB Ramps intersection at its worst condition. Elsewhere along the corridor, the southbound approach at Huntington Road experiences very long queues as well, as it did in the 2021 analysis of this scenario.

Reference: Atlanta Highway at SR 10 Loop Traffic Analysis Summary

2041 Build Scenario 3 LOS / Delay		Atlanta Highway @ GA Square Mall Dr.	Atlanta Hwy. @ Huntington Rd.	Atlanta Hwy. @ SR 10 Loop SB Ramps	Atlanta Hwy. @ SR 10 Loop NB Ramps	Atlanta Hwy. @ Logan's Roadhouse Driveway	Atlanta Hwy. @ Jennings Mill Rd.	Atlanta Hwy. @ Mitchell Bridge Rd. / Timothy Rd.
AM	**Overall**	**A (4.9)**	**B (16.7)**	**B (11.5)**	**A (7.2)**	**# (#)**	**A (7.3)**	**C (25.2)**
	EB	A (4.5)	B (12.1)	A (8.7)	A (4.1)	# (#)	A (7.1)	B (19.4)
	WB	A (3.4)	B (10.5)	A (7.0)	A (2.5)	# (#)	A (4.9)	B (17.7)
	NB	-	E (55.0)	-	C (22.3)	-	B (15.2)	D (52.8)
	SB	D (43.0)	D (51.6)	C (20.6)	-	# (#)	# (#)	C (32.9)
PM	**Overall**	**A (6.6)**	**D (41.4)**	**B (13.5)**	**A (7.2)**	**# (#)**	**A (6.5)**	**F (92.1)**
	EB	A (6.7)	C (31.3)	A (8.8)	A (4.0)	# (#)	A (5.7)	D (49.6)
	WB	A (2.0)	C (28.8)	B (15.2)	A (5.2)	# (#)	A (4.9)	F (124.2)
	NB	-	D (41.0)	-	B (19.6)	-	C (26.1)	F (120.5)
	SB	D (46.8)	F (96.1)	C (20.9)	-	# (#)	A (0.3)	F (88.5)

Scenario 2 with Improvements

Scenario 2 was also analyzed with the inclusion of further improvements with the intent of maintaining a minimum of level of service (LOS) D at each intersection along the corridor. The additional recommended improvements to Scenario 2 include:

- The addition of a third southbound left turn lane at Huntington Road
- The conversion of the Huntington Road signal from split phasing to standard phasing
- The addition of a second eastbound left turn lane at Mitchell Bridge Road / Timothy Road
- The addition of a second northbound left turn lane at Mitchell Bridge Road / Timothy Road
- The conversion of the northbound thru/left lane to an exclusive through lane at Mitchell Bridge Road / Timothy Road

In order to apply these additional improvements, the project limits will need to be extended past their current boundaries. Specifically, Mitchell Bridge Road and Timothy Road would need to be widened to accommodate the extra lanes. Timothy Road would need to be widened for the length of the northbound left turn lane, and Mitchell Bridge Road would need to be widened in order to add a second northbound lane. The alterations to Mitchell Bridge Road would be the more substantial of the two, as the second lane would need to be carried for at least 1000 feet before merging it back into a one-lane northbound section.

These improvements allow Scenario 2 to operate at LOS D or better at each intersection in both peak hours. The laneage configuration for the Build with Improvements Scenario 2 is shown in Figure 4. As with Build Scenario 2, the westbound right turn lane at Huntington Road requires a greater length of storage than can be accommodated between the Huntington Road and SR 10 Loop SB

Ramps intersections. In this scenario, the turn lane requires 1,100 feet of storage. As before, the maximum available storage of 400 feet is shown in the figure.

2041 Build Scenario 2 with Improvements Results

The 2041 Build with Improvements Scenario 2 operates at LOS C or better in the AM peak hour and at LOS D or better in the PM peak hour. There is AM queueing only at the northbound approaches of Huntington Road and the SR 10 Loop off-ramp intersections. In the PM peak hour, there is queueing at these locations as well as on the eastbound approach at Huntington Road, the SR 10 SB off-ramp, and both the eastbound and westbound approaches at the Mitchell Bridge Road / Timothy Road intersection.

2041 Build with Improvements Scenario 2 LOS / Delay		Atlanta Highway @ GA Square Mall Dr.	Atlanta Hwy. @ Huntington Rd.	Atlanta Hwy. @ SR 10 Loop SB Ramps	Atlanta Hwy. @ SR 10 Loop NB Ramps	Atlanta Hwy. @ Logan's Roadhouse Driveway	Atlanta Hwy. @ Jennings Mill Rd.	Atlanta Hwy. @ Mitchell Bridge Rd. / Timothy Rd.
AM	**Overall**	**A (4.5)**	**B (19.3)**	**C (31.4)**	**B (12.8)**	**A (0.0)**	**A (6.5)**	**B (17.0)**
	EB	A (4.7)	B (13.5)	C (28.3)	A (5.6)	A (0.0)	A (2.5)	A (9.1)
	WB	A (2.3)	A (4.8)	B (18.4)	A (2.0)	A (0.0)	A (4.4)	B (17.1)
	NB	-	F (140.5)	-	D (48.0)	-	D (37.3)	D (40.7)
	SB	D (39.2)	D (46.5)	D (48.8)	-	A (9.6)	# (#)	C (29.5)
PM	**Overall**	**A (8.1)**	**D (37.5)**	**D (51.3)**	**B (14.7)**	**A (0.1)**	**A (7.9)**	**D (53.4)**
	EB	A (6.7)	E (57.3)	D (49.7)	A (6.0)	A (0.0)	A (4.7)	C (29.8)
	WB	A (5.5)	C (20.7)	C (31.7)	A (9.4)	A (0.0)	A (6.9)	E (72.6)
	NB	-	D (51.3)	-	D (47.6)	-	D (39.4)	E (59.0)
	SB	D (46.8)	D (45.1)	F (90.2)	-	B (13.2)	A (0.2)	E (64.6)

Scenario 3 with Improvements

As with Scenario 2, Scenario 3 was analyzed with several additional improvements that raise the level of service of each intersection to LOS D or better. The recommended improvements to Scenario 3 include:

- The addition of a second eastbound left turn lane at Mitchell Bridge Road / Timothy Road
- The addition of a second northbound left turn lane at Mitchell Bridge Road / Timothy Road
- The conversion of the northbound thru/left lane to an exclusive through lane at Mitchell Bridge Road / Timothy Road
- The conversion of the westbound thru/right lane to an exclusive right lane at Huntington Road
- The addition of a second westbound right turn lane at Huntington Road
- The removal of the fourth westbound lane for 500 feet west of Huntington Road

Reference: Atlanta Highway at SR 10 Loop Traffic Analysis Summary

In order for these additional improvements to be applied to Scenario 3, the project limits will need to be extended to include Mitchell Bridge Road and Timothy Road. Timothy Road will need to be widened to accommodate the additional northbound left turn lane. Similarly, Mitchell Bridge Road will need to be widened to two lanes to receive the dual eastbound lefts off of Atlanta Highway. This second northbound lane would likely be required for at least 1000 feet before being merged back into a single lane.

These changes to the Scenario 3 design allow the corridor intersections to operate at LOS D in both peak hours. The laneage configuration for the Build with Improvements Scenario 3 is shown in Figure 5. With the addition of the exclusive westbound turn lanes at Huntington Road, this scenario experiences the same storage issues as Build Scenario 2 and Build with Improvements Scenario 2. Namely, the two westbound right turn lanes require more storage than is available between the Huntington Road and SR 10 Loop SB Ramps intersections. In this scenario, 550 feet of storage is required for each lane; since this distance is not available, the maximum possible distance of 400 feet is shown in the figure.

2041 Build Scenario 3 with Improvements Results

The intersections in the 2041 Build with Improvements Scenario 3 operate at LOS B or better in the AM peak hour and LOS D or better in the PM peak hour. There is significant queueing at the eastbound approach of the Mitchell Bridge Road / Timothy Road intersection. The queue at this approach extends back past the SR 10 NB Ramps intersection in its worst case. Elsewhere, the westbound approach at the Mitchell Bridge Road / Timothy Road intersection and the southbound approach at the Huntington Road intersection experienced long queues as well.

2041 Build with Improvements Scenario 3 LOS / Delay		Atlanta Highway @ GA Square Mall Dr.	Atlanta Hwy. @ Huntington Rd.	Atlanta Hwy. @ SR 10 Loop SB Ramps	Atlanta Hwy. @ SR 10 Loop NB Ramps	Atlanta Hwy. @ Logan's Roadhouse Driveway	Atlanta Hwy. @ Jennings Mill Rd.	Atlanta Hwy. @ Mitchell Bridge Rd. / Timothy Rd.
AM	**Overall**	**A (4.9)**	**B (16.8)**	**B (11.0)**	**A (7.4)**	**# (#)**	**B (12.1)**	**B (18.0)**
	EB	A (4.7)	B (11.8)	A (8.4)	A (4.2)	# (#)	B (10.8)	B (10.6)
	WB	A (3.1)	B (12.6)	A (6.2)	A (4.8)	# (#)	A (6.1)	B (17.4)
	NB	-	D (49.6)	-	C (20.0)	-	D (37.5)	D (40.6)
	SB	D (39.2)	D (46.7)	B (19.7)	-	# (#)	# (#)	C (29.5)
PM	**Overall**	**A (8.7)**	**C (33.0)**	**B (13.7)**	**A (9.2)**	**# (#)**	**A (7.3)**	**D (54.7)**
	EB	A (6.7)	C (32.5)	B (10.6)	A (9.2)	# (#)	A (4.6)	D (37.4)
	WB	A (6.7)	C (25.1)	B (13.4)	A (5.5)	# (#)	A (7.3)	E (68.1)
	NB	-	D (35.3)	-	B (19.6)	-	C (26.1)	E (58.6)
	SB	D (46.8)	E (55.7)	C (20.9)	-	# (#)	A (0.3)	E (62.7)

Reference: Atlanta Highway at SR 10 Loop Traffic Analysis Summary

Crash Analysis

Records of vehicular crashes that were reported along SR 10/Atlanta Hwy during the most recent available three year period (2011, 2012, and 2013) were provided by the Georgia Electronic Accident Reporting System (GEARS) website as well as GDOT GeoTRAQS online mapping database. The statewide accident rates, in million vehicle miles (MVM), for an Urban Minor Arterial were also from GDOT. The statewide accident rates for an Urban Principal Arterial are listed below.

Year	Accidents/MVM	
	Total GA Urban Principal Arterials Avg	Injury Accidents GA Urban Principal Arterials Avg
2011	4.08	1.03
2012	4.22	0.99
2013	4.61	1.19

A summary of the accident history along SR 10/Atlanta Hwy is provided in the table below. The table also includes accident history at the intersections along the corridor. Note, GDOT does not calculate statewide averages for intersections accidents. With the exception of the road segment between Timothy Rd/Mitchell Bridge Rd and Athens Town Blvd, all road segments within the study are have crash rates higher than the statewide average for one of more years between 2011 and 2013. Over 57% of the crashes throughout the corridor are rear ends and 25% are angle crashes.

Intersection / Roadway Section	Year	Total Crashes	Total Accidents		Injury Accidents	
			Actual Rate	State Avg. Rate	Actual Rate	State Avg. Rate
Between Crane Dr and Mall Access Rd	2011	**3**	**4.3**	4.2	**1.4**	1
	2012	**2**	2.9	4.6	0	1.2
	2013	**2**	2.9	4.1	**1.4**	1
Mall Access Rd	2011	**5**	N/A			
	2012	**4**				
	2013	**5**				
Between Mall Access Rd and Arrowhead Rd	2011	**15**	**7.1**	4.2	1	1
	2012	**4**	1.9	4.6	0.5	1.2
	2013	**16**	**7.6**	4.1	**3.3**	1
Arrowhead Rd	2011	**6**	N/A			
	2012	**6**				
	2013	**8**				
Between Arrowhead Rd and Huntington Rd	2011	**7**	**5.8**	4.2	0.8	1
	2012	**5**	4.2	4.6	0	1.2
	2013	**13**	**10.8**	4.1	**4.2**	1
Huntington Rd	2011	**20**	N/A			
	2012	**23**				
	2013	**11**				

Reference: Atlanta Highway at SR 10 Loop Traffic Analysis Summary

Intersection / Roadway Section	Year	Total Crashes	Total Accidents		Injury Accidents	
			Actual Rate	State Avg. Rate	Actual Rate	State Avg. Rate
Between Huntington Rd and Athens Hwy SB Ramps (Outer Loop 10 Ramps)	2011	**10**	**7.7**	4.2	**3.1**	1
	2012	**4**	2.9	4.6	0	1.2
	2013	**21**	**15**	4.1	**2.9**	1
Athens Hwy SB Ramps (Outer Loop 10 Ramps)	2011	**16**	N/A			
	2012	**8**				
	2013	**5**				
Between Athens Hwy SB & NB Ramps (Outer & Inner Loop 10 ramps)	2011	**2**	1.1	4.2	0	1
	2012	**9**	**4.7**	4.6	1.1	1.2
	2013	**17**	**8.9**	4.1	**3.7**	1
Athens Hwy NB Ramps (Inner Loop 10 Ramps)	2011	**6**	N/A			
	2012	**7**				
	2013	**1**				
Between Athens Hwy NB Ramps (Inner Loop 10 ramps) and Jennings Mill Rd	2011	**2**	3.3	4.2	**1.7**	1
	2012	**0**	0	4.6	0	1.2
	2013	**4**	**6.7**	4.1	**1.7**	1
Jennings Mill Rd	2011	**11**	N/A			
	2012	**10**				
	2013	**7**				
Between Jennings Mill Rd and Timothy Rd/Mitchell Bridge Rd	2011	**25**	**7.4**	4.2	**1.8**	1
	2012	**2**	0.6	4.6	0	1.2
	2013	**21**	**6**	4.1	**1.4**	1
Timothy Rd/Mitchell Bridge Rd	2011	**37**	N/A			
	2012	**31**				
	2013	**21**				
Between Timothy Rd/Mitchell Bridge Rd and Athens Town Blvd/Athens West Pkwy	2011	**2**	0.6	4.2	0.3	1
	2012	**2**	0.6	4.6	0	1.2
	2013	**7**	2	4.1	0.6	1

Reference: Atlanta Highway at SR 10 Loop Traffic Analysis Summary

SUMMARY

The analysis of each of these scenarios indicates that, in the future year of 2041, Scenario 3 will perform better than Scenario 2. The overall levels of service at each of the intersections along the SR 10 corridor is generally better under Scenario 3 than Scenario 2, as shown in the table below.

LOS / Delay Summary Table		2041 Build			
Intersection		Scenario 2		Scenario 3	
		AM	PM	AM	PM
Atlanta Hwy. @ GA Square Mall Dr.	**Overall**	**A (4.5)**	**A (8.4)**	**A (4.9)**	**A (6.6)**
Atlanta Hwy. @ Huntington Rd.	**Overall**	**C (21.2)**	**E (66.3)**	**B (16.7)**	**D (41.4)**
Atlanta Hwy. @ SR 10 Loop SB Ramps	**Overall**	**C (29.0)**	**E (58.0)**	**B (11.5)**	**B (13.5)**
Atlanta Hwy. @ SR 10 Loop NB Ramps	**Overall**	**B (12.8)**	**B (15.0)**	**A (7.2)**	**A (7.2)**
Atlanta Hwy. @ Logan's Roadhouse Driveway / Jennings Mill Rd.	**Overall**	**-**	**-**	**-**	**-**
Atlanta Hwy. @ Logan's Roadhouse Driveway	**Overall**	**A (0.0)**	**A (0.1)**	**# (#)**	**# (#)**
Atlanta Hwy. @ Jennings Mill Rd.	**Overall**	**A (6.3)**	**A (7.3)**	**A (7.3)**	**A (6.5)**
Atlanta Hwy. @ Mitchell Bridge Rd. / Timothy Rd.	**Overall**	**B (19.5)**	**F (85.5)**	**C (25.2)**	**F (92.1)**

In addition to the improved level of service performance, Scenario 3 also experiences less queueing along the corridor than does Scenario 2 in the future year of 2041. Though both alternatives experience PM queuing at the Mitchell Bridge Road / Timothy Road intersection and at the Huntington Road intersection, the queues are not as severe in Scenario 3. Most notably, in Scenario 2, the PM westbound queue at Huntington Road extended past the SR 10 Loop SB Off-Ramp, causing traffic to back up on the ramp and onto the SR 10 Loop. This issue was not present in the

simulation of Scenario 3. The combination of the improved levels of service and the lesser queues results in Scenario 3 being the recommended alternative.

Conclusions

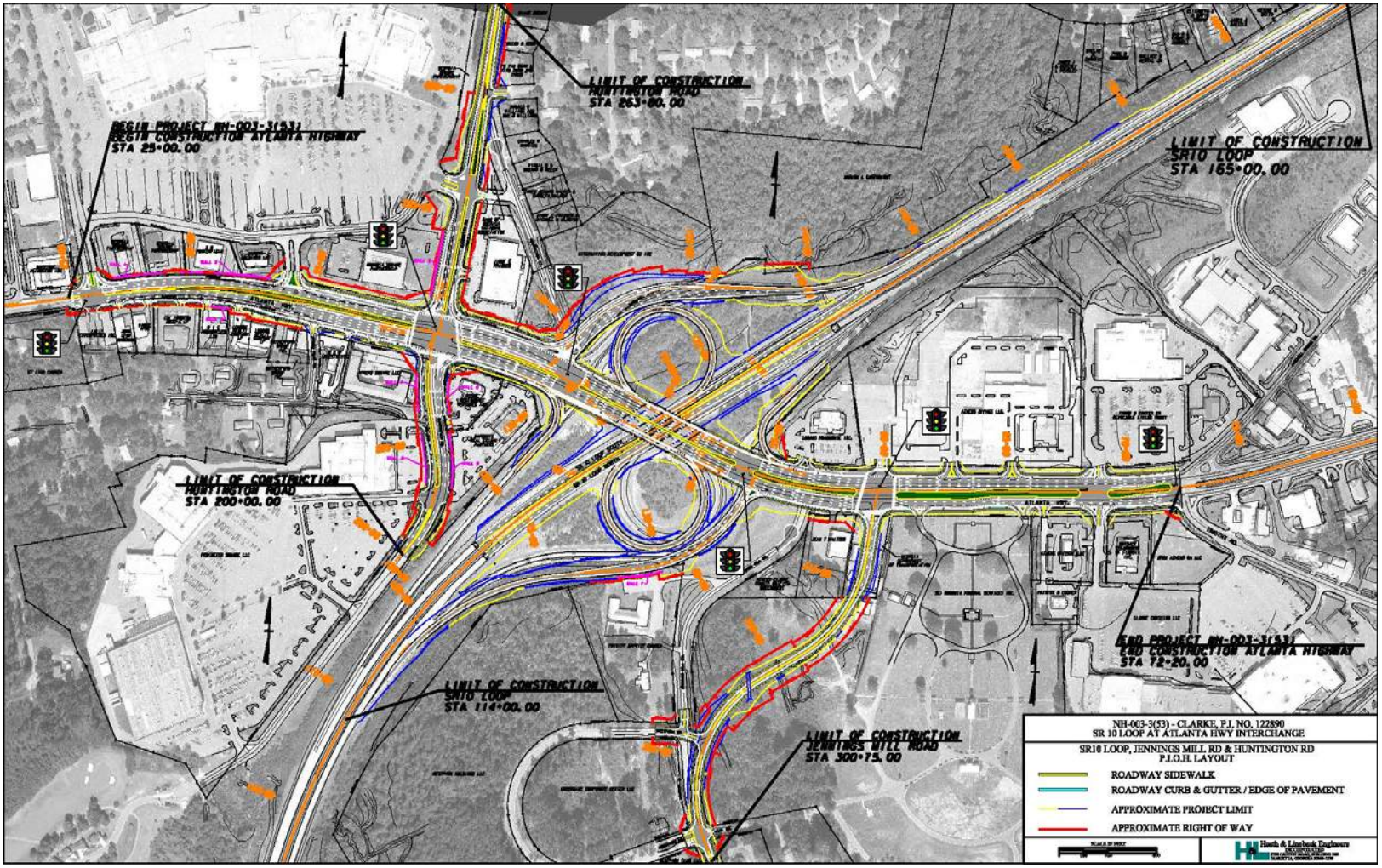
Atlanta Highway is a heavily-traveled corridor, and the traffic utilizing this route is expected to grow in the coming years. The scenarios analyzed in this technical memo improve the operation of Atlanta Highway in both the 2021 and 2041 analysis years when compared to the No-Build condition. As a result of the analysis, Scenario 3, as designed by Heath & Linebeck Engineers, is the recommended alternative. This scenario provides LOS D at all but one intersection in both peak hours and does so while maintaining logical termini for the project.

Reference: Atlanta Highway at SR 10 Loop Traffic Analysis Summary

Scenario 2

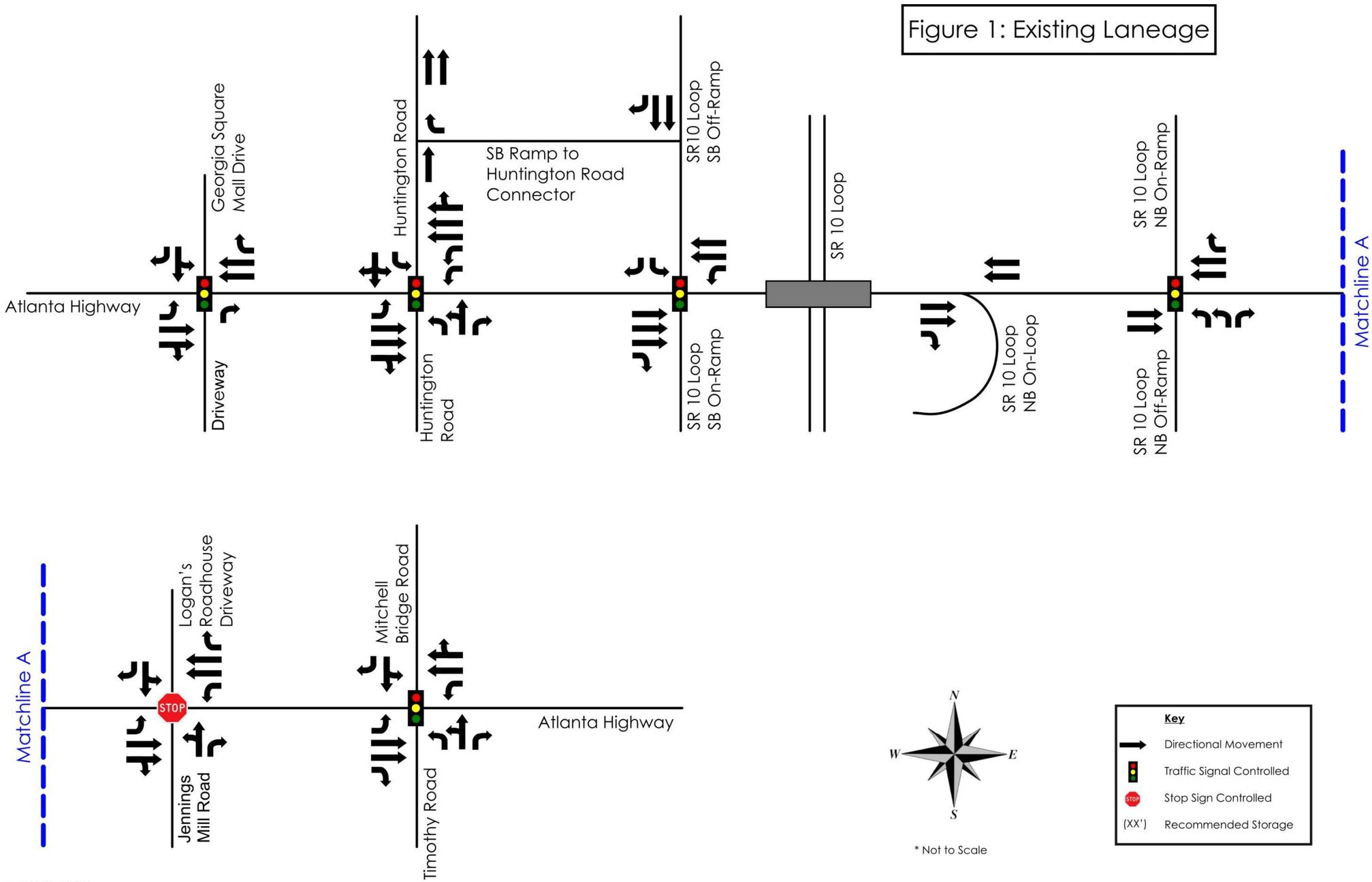
Reference: Atlanta Highway at SR 10 Loop Traffic Analysis Summary

Scenario 3



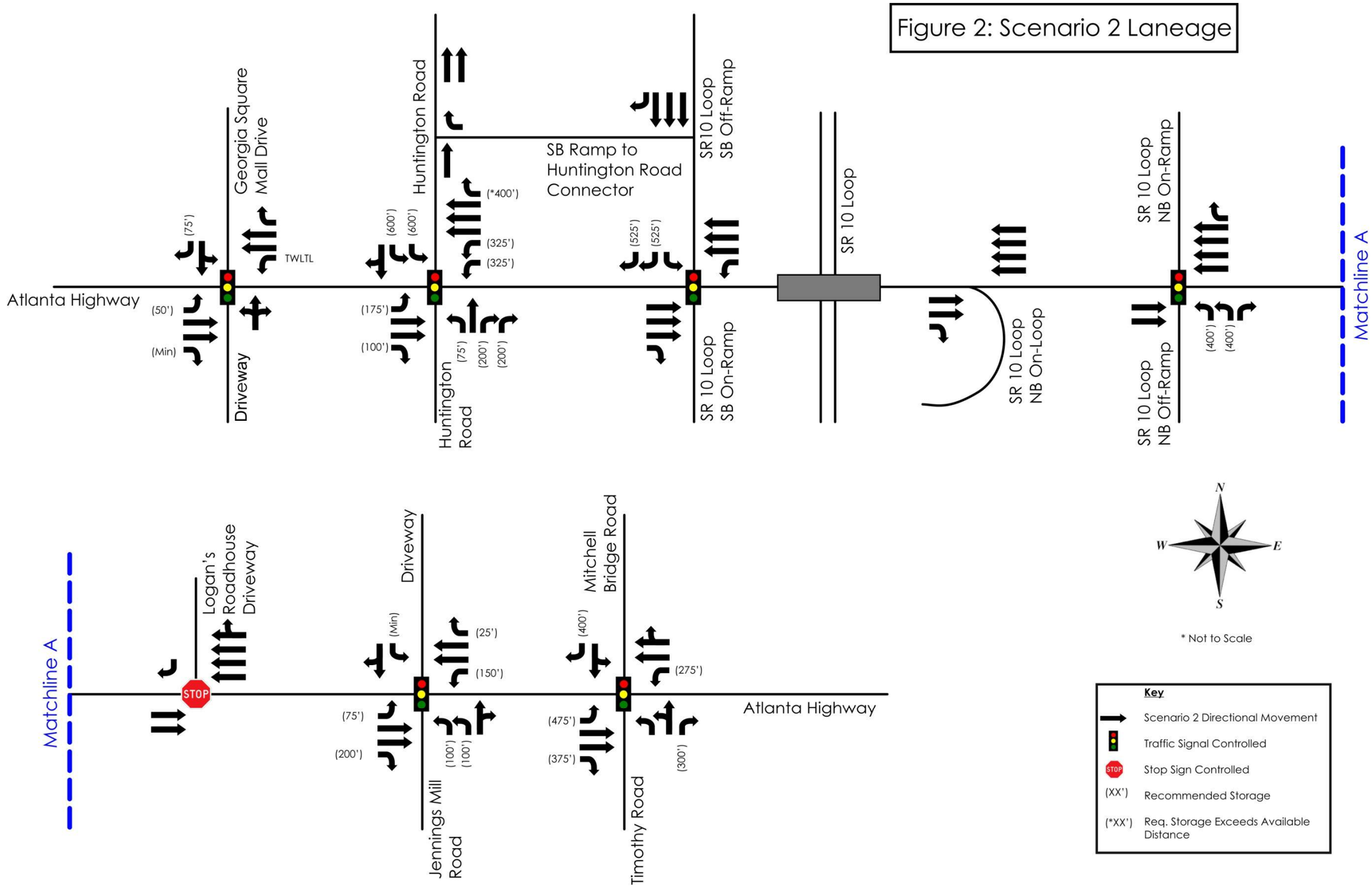
Reference: Atlanta Highway at SR 10 Loop Traffic Analysis Summary

Figure 1: Existing Laneage



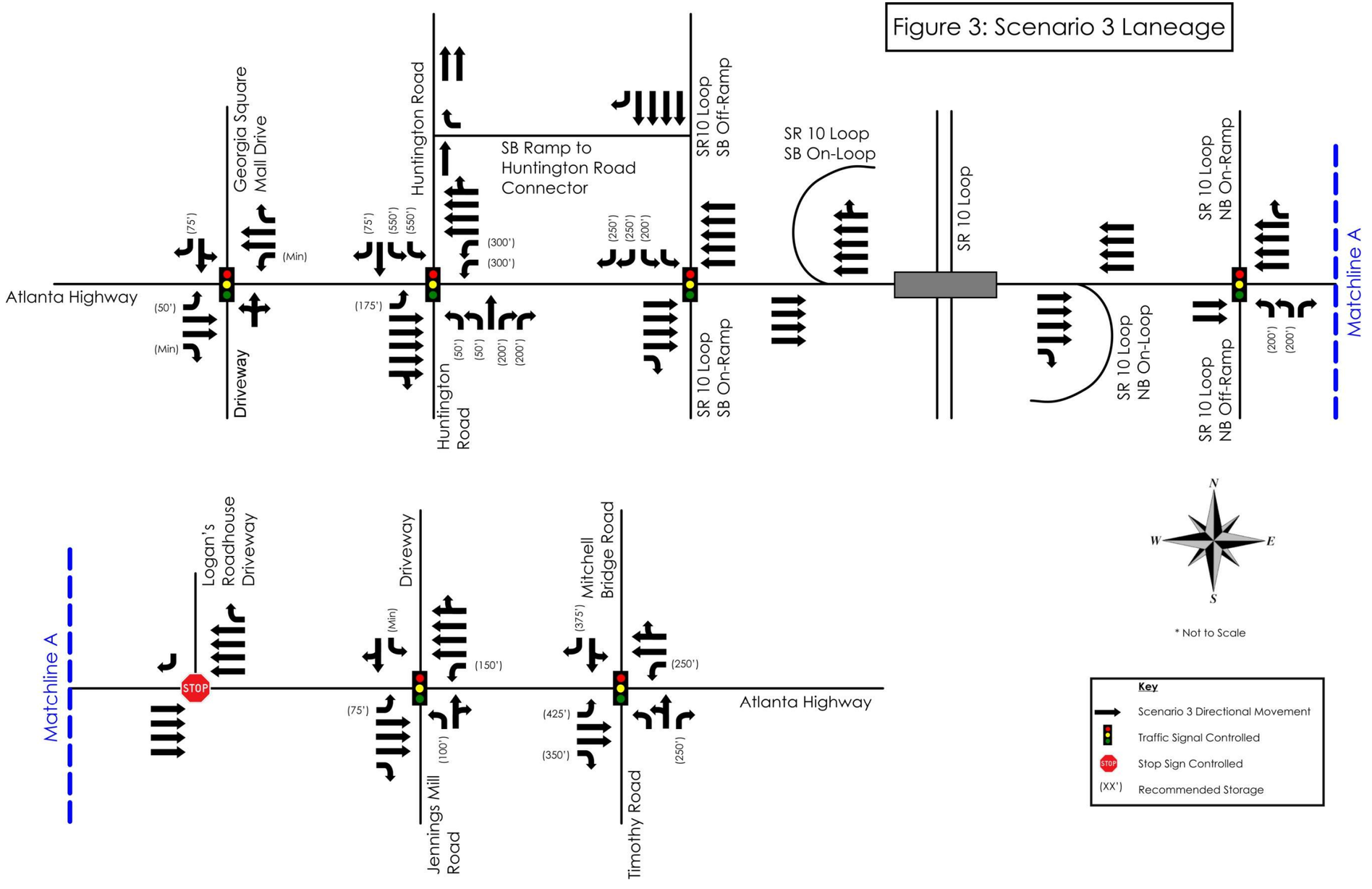
Reference: Atlanta Highway at SR 10 Loop Traffic Analysis Summary

Figure 2: Scenario 2 Laneage

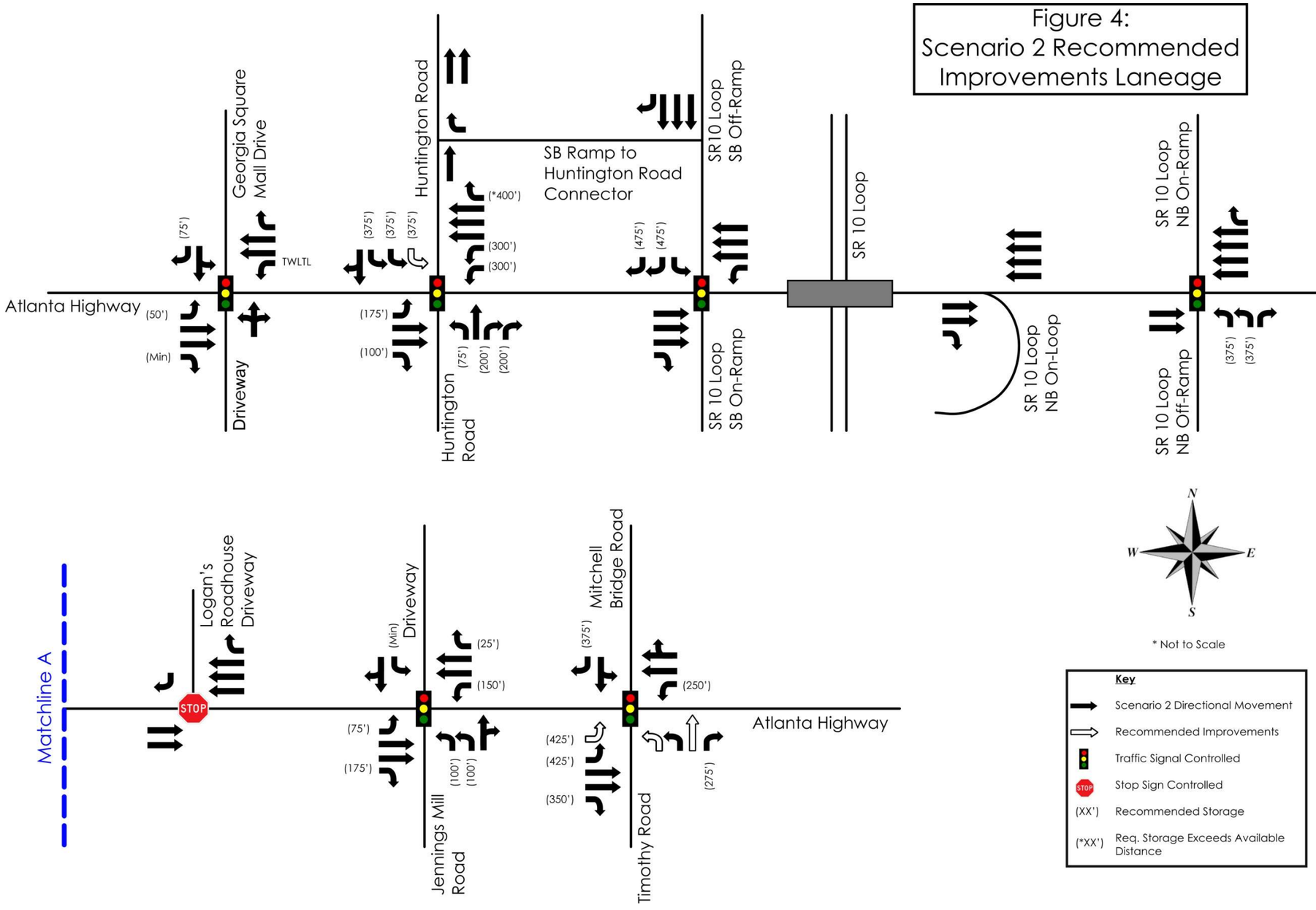


Reference: Atlanta Highway at SR 10 Loop Traffic Analysis Summary

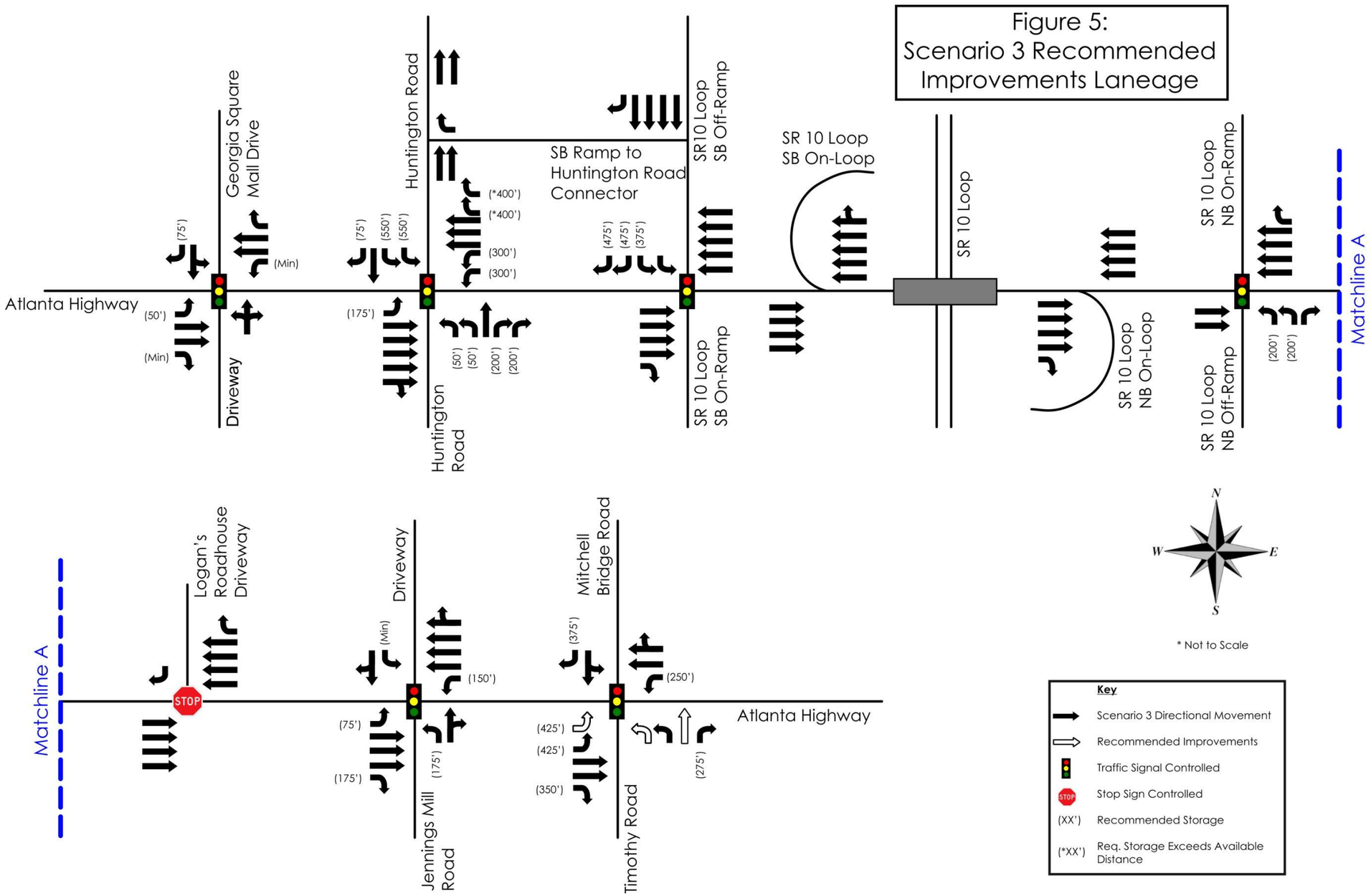
Figure 3: Scenario 3 Laneage



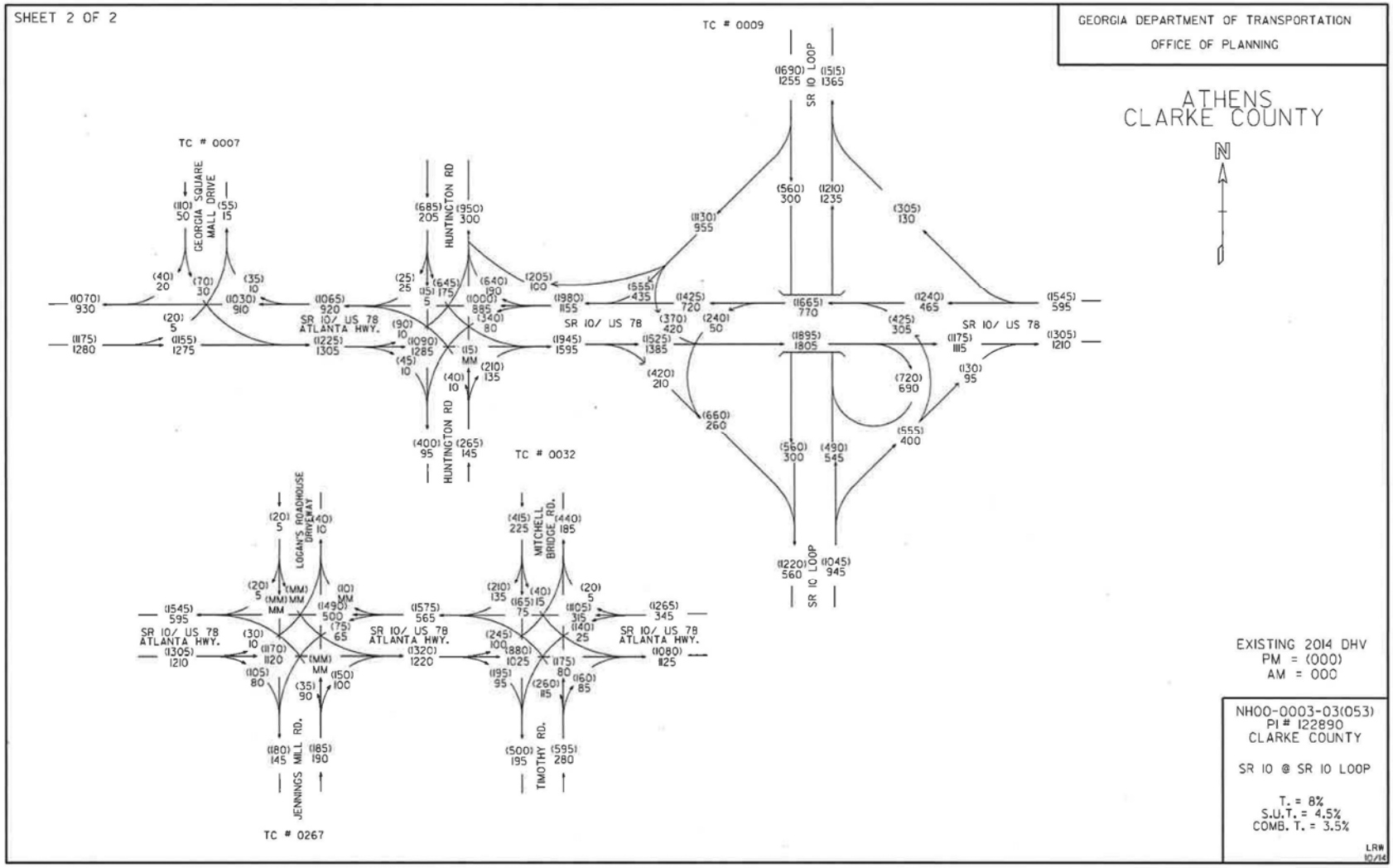
Reference: Atlanta Highway at SR 10 Loop Traffic Analysis Summary



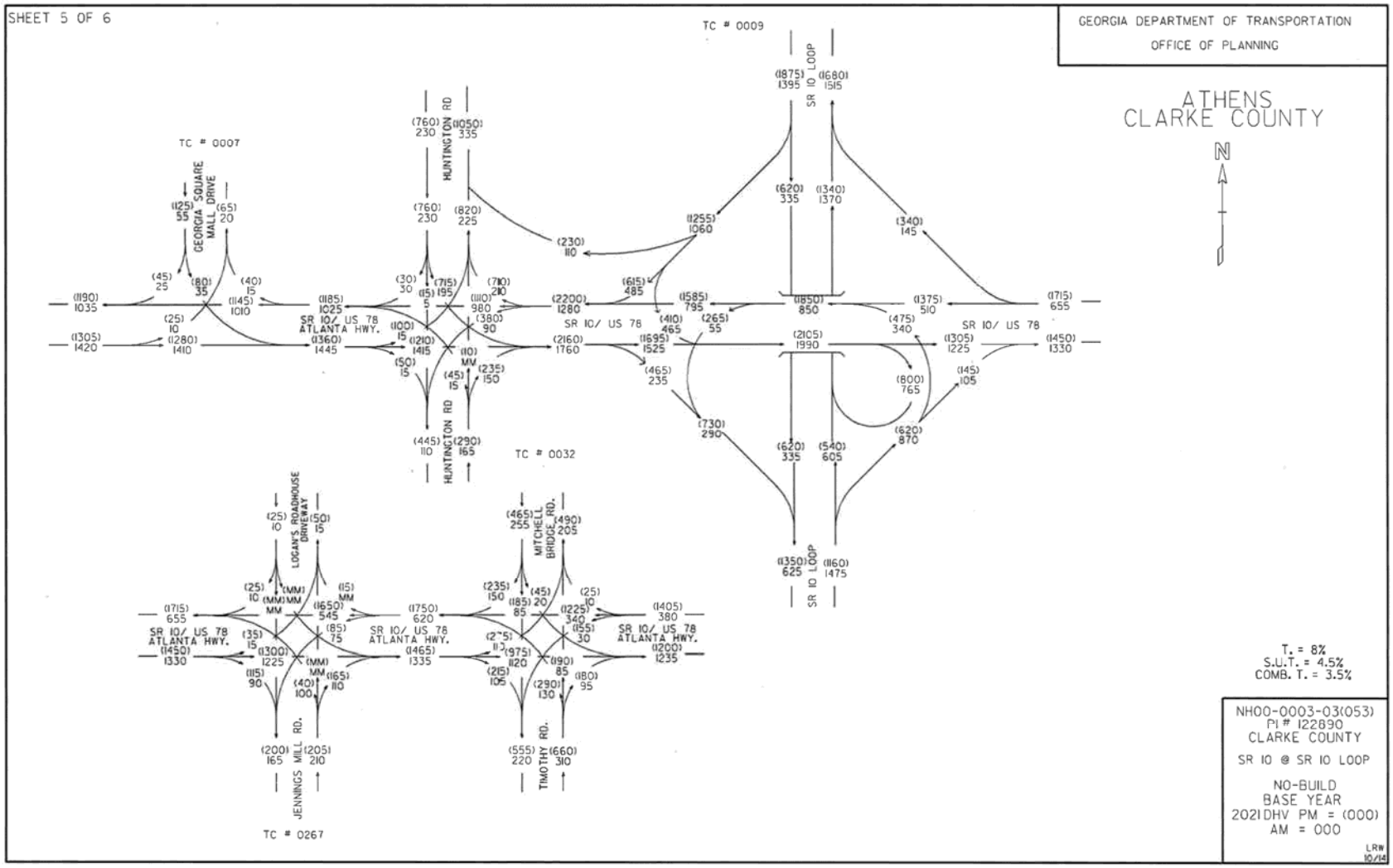
Reference: Atlanta Highway at SR 10 Loop Traffic Analysis Summary



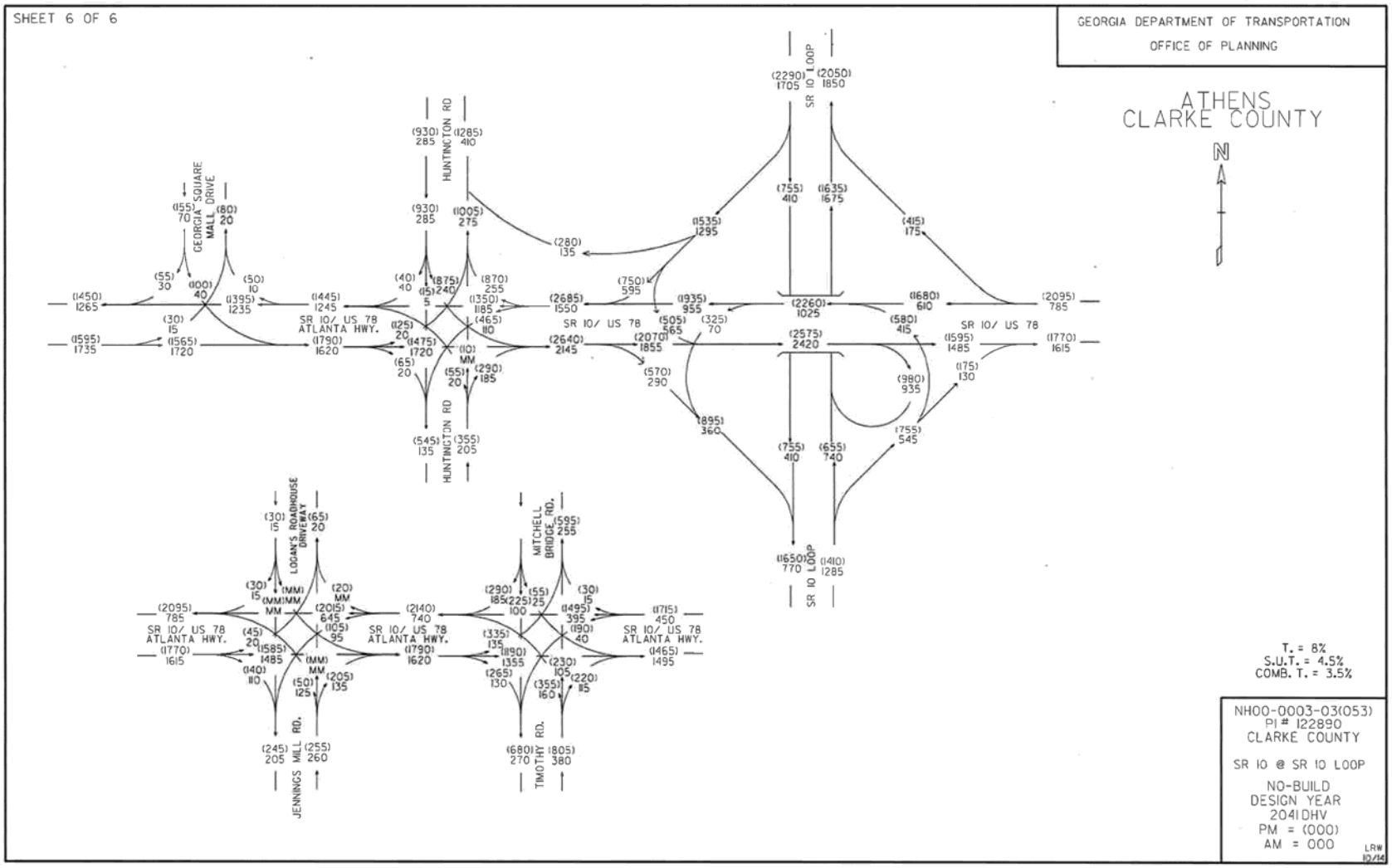
Reference: Atlanta Highway at SR 10 Loop Traffic Analysis Summary



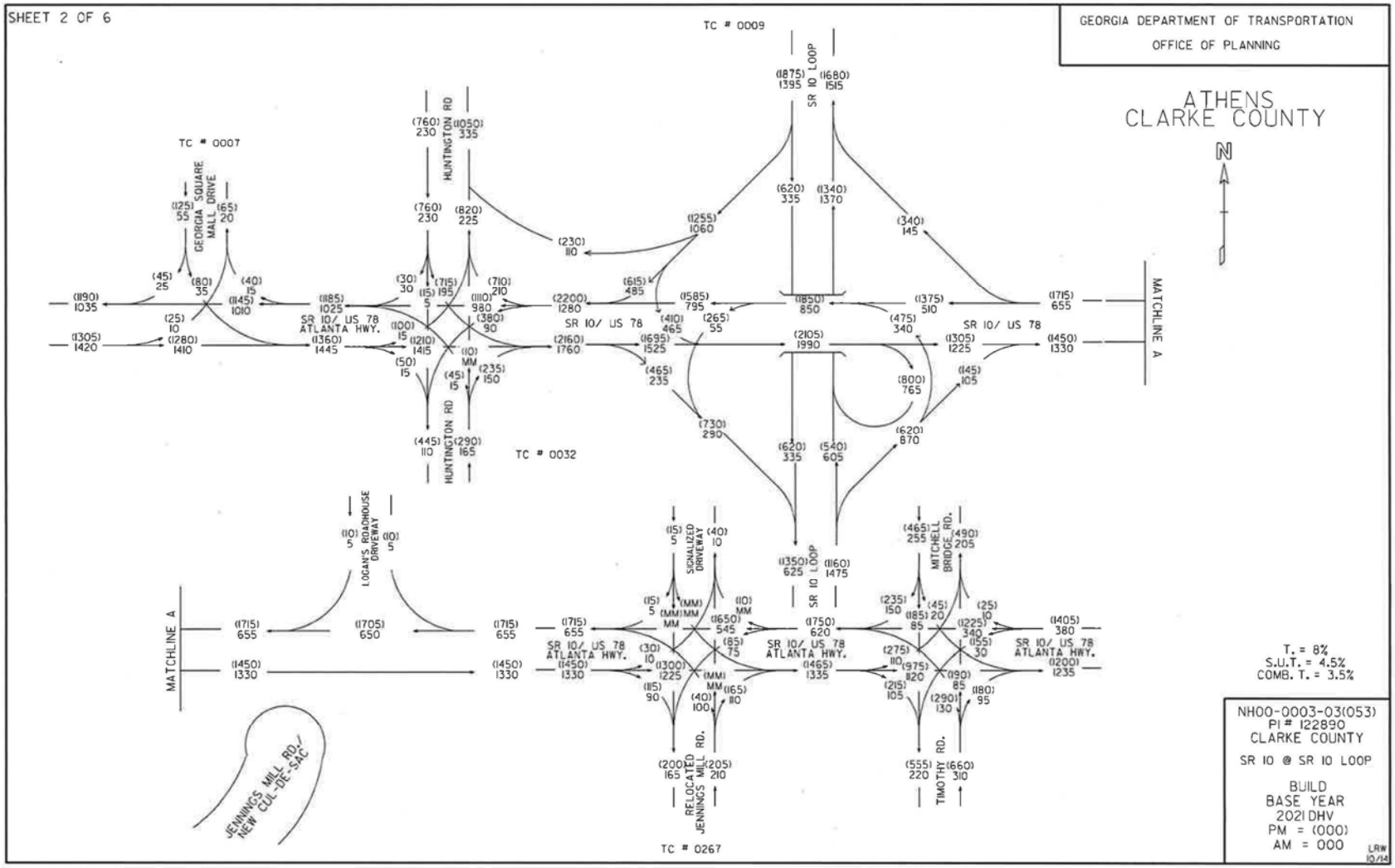
Reference: Atlanta Highway at SR 10 Loop Traffic Analysis Summary



Reference: Atlanta Highway at SR 10 Loop Traffic Analysis Summary



Reference: Atlanta Highway at SR 10 Loop Traffic Analysis Summary



Reference: Atlanta Highway at SR 10 Loop Traffic Analysis Summary