

Appendix

Accident Data

FULTON COUNTY, Old Roswell Road (CR 1811) @ Old Ellis Road (CR 96)																			
Accident No	Date	Time	County	Route Type	Route	Milelog	Intersecting Rt Type	Intersecting Rt	Injuries	Fatalities	Harml Event	Collision	Location of Impact	Light	Surface	DirVeh1	DirVeh2	MnvrVeh1	MnvrVeh2
60910334	3/16/2006	6:48 PM	Fulton	County Road	009600	0	2	0	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	E	E	Straight	Stopped
72380247	5/30/2007	4:55 PM	Fulton	County Road	009600	0	2	0	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Right	Straight
82010257	5/28/2008	5:17 PM	Fulton	County Road	009600	0	2	0	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Straight	Stopped
80380528	2/6/2008	4:47 PM	Fulton	County Road	009600	0	2	0	0	0	Motor Vehicle in Motion	Sidewipe - Opposite Direction	On Roadway	Daylight	Dry	N	E	Turning Left	Turning Left
FULTON COUNTY, Mansell Road (SR 140) @ Old Roswell Road (SR 1169)																			
Accident No	Date	Time	County	Route Type	Route	Milelog	Intersecting Rt Type	Intersecting Rt	Injuries	Fatalities	Harml Event	Collision	Location of Impact	Light	Surface	DirVeh1	DirVeh2	MnvrVeh1	MnvrVeh2
60220242	1/20/2006	9:16 AM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	S	E	Turning Left	Straight
60110022	1/17/2006	6:00 PM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Dark- Lighted	Wet	N	E	Straight	Stopped
60690019	2/25/2006	6:40 PM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Angle	On Roadway	Daylight	Wet	E	E	Changing Lanes	Straight
60990500	3/21/2006	11:54 PM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Sidewipe - Same Direction	On Roadway	Lighted	Dry	E	E	Straight	Straight
60790322	3/9/2006	12:31 PM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Straight	Stopped
60790270	3/9/2006	5:09 PM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	N	N	Changing Lanes	Straight
62360466	6/26/2006	11:24 AM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Wet	W	W	Straight	Stopped
62380443	6/27/2006	9:32 AM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	S	S	Straight	Stopped
62380432	6/28/2006	10:46 AM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Straight	Straight
62380427	6/28/2006	4:08 PM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Sidewipe - Same Direction	On Roadway	Daylight	Dry	W	W	Straight	Straight
61980155	5/26/2006	7:50 PM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	E	E	Straight	Stopped
62190685	6/14/2006	7:19 PM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	N	W	Turning Left	Straight
61640320	4/28/2006	10:41 AM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Straight	Stopped
61640005	4/29/2006	7:50 AM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	W	E	Turning Left	Straight
60990501	3/21/2006	5:18 PM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	E	W	Backing	Stopped
64840355	12/14/2006	9:48 AM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Straight	Stopped
64520386	11/14/2006	10:39 AM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Straight	Stopped
64020027	10/15/2006	9:05 PM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Dark- Lighted	Dry	W	W	Straight	Straight
63370568	9/5/2006	10:36 AM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	S	E	Straight	Straight
63370555	9/6/2006	9:20 PM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Dark- Lighted	Dry	W	W	Straight	Straight
63290359	8/29/2006	8:25 PM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Lighted	Dry	W	W	Straight	Straight
63180469	8/19/2006	7:09 AM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	E	E	Turning Left	Turning Left
63180185	8/23/2006	6:04 PM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	E	E	Right	Straight
63010557	8/8/2006	4:20 PM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	E	W	Turning Left	Straight
65260018	12/29/2006	10:38 AM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Angle	On Roadway	Dark-					Straight
64570523	11/20/2006	8:45 AM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Angle	On Roadway	Lighted	Dry	N	W	Turning Left	Straight
64970192	12/12/2006	12:55 PM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	E	E	Straight	Straight
62890194	7/28/2006	8:29 AM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Sidewipe - Same Direction	On Roadway	Daylight	Dry	E	E	Turning Left	Straight
62720171	7/13/2006	10:50 PM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Angle	On Roadway	Dark- Lighted	Dry	E	S	Straight	Turning Left
62710050	7/14/2006	4:55 PM	Fulton	State Route	014000	6.99	2	0	0	0	Pedestrian	Not A Collision With A Motor Vehicle	On Roadway	Daylight	Wet	S		Turning Right	
62610746	7/9/2006	8:14 PM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	E	E	Straight	Stopped
62460054	6/7/2006	5:37 PM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	S	S	Straight	Stopped
62290289	6/22/2006	7:50 PM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	S	S	Straight	Turning Left
60670450	2/26/2006	10:45 AM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Right	Straight
61300392	4/12/2006	8:40 AM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	S	E	Turning Left	Straight
61230099	3/5/2006	7:35 PM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Dark- Not				Turning Left	Turning Left
73490216	8/23/2007	5:48 PM	Fulton	State Route	014000	6.99	1	0	0	0	Motor Vehicle in Motion	Sidewipe - Same Direction	On Roadway	Daylight	Dry	N	S	Straight	Straight
70710327	3/1/2007	6:58 PM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Angle	On Roadway	Dark-				Turning Left	Straight
70710329	3/1/2007	4:22 PM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Rear End	On Shoulder	Daylight	Wet	E	E	Straight	Stopped
72060535	5/20/2007	2:53 PM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Straight	Stopped
72520208	6/15/2007	6:35 AM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	S	S	Straight	Stopped
73790231	9/8/2007	11:40 PM	Fulton	State Route	014000	6.99	1	0	0	0	Motor Vehicle in Motion	Angle	On Roadway	Dark- Lighted	Dry	E	W	Turning Left	Straight
711100371	3/22/2007	5:10 PM	Fulton	State Route	014000	6.99	1	0	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	S	S	Straight	Straight
74110461	9/22/2007	6:20 PM	Fulton	State Route	014000	6.99	1	0	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Straight	Stopped
74010277	9/19/2007	12:12 PM	Fulton	State Route	014000	6.99	2	0	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Straight	Stopped

730750190	9/8/2007	10:10 AM	Fulton	State Route	'014000	6.99	2	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight Dry	W	W	Straight	Stopped
72430471	8/14/2007	4:38 PM	Fulton	State Route	'014000	6.99	2	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight Dry	W	W	Straight	Stopped
75610291	12/19/2007	2:29 PM	Fulton	State Route	'014000	6.99	2	0	0	Motor Vehicle in Motion	Angle	On Roadway	Daylight Dry	N	W	Turning Left	Straight
75590086	12/17/2007	1:34 PM	Fulton	State Route	'014000	6.99	1	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight Dry	W	W	Turning Left	Stopped
75110129	11/21/2007	10:34 AM	Fulton	State Route	'014000	6.99	2	1	0	Motor Vehicle in Motion	Angle	On Shoulder	Dawn Dry	S	S	Straight	Stopped
751101089	11/19/2007	7:01 PM	Fulton	State Route	'014000	6.99	2	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight Dry	W	W	Straight	Stopped
74580067	9/21/2007	11:14 AM	Fulton	State Route	'014000	6.99	2	1	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight Dry	S	S	Straight	Stopped
70920188	3/3/2007	12:10 AM	Fulton	State Route	'014000	6.99	2	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Dark-Lighted	E	E	Straight	Stopped
70490350	2/13/2007	9:10 PM	Fulton	State Route	'014000	6.99	2	0	0	Median Barrier	Not A Collision With A Motor Vehicle	Median	Dark-Lighted	Wet	E	Turning Right	
70470296	2/6/2007	1:34 PM	Fulton	State Route	'014000	6.99	2	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight Dry	E	E	Straight	Stopped
70020284	1/4/2007	1:36 PM	Fulton	State Route	'014000	6.99	2	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight Dry	W	W	Straight	Stopped
72970401	7/17/2007	9:10 AM	Fulton	State Route	'014000	6.99	2	0	0	Motor Vehicle in Motion	Angle	On Roadway	Daylight Dry	W	E	Making U-Turn	Straight
72970368	7/17/2007	12:43 PM	Fulton	State Route	'014000	6.99	2	0	0	Motor Vehicle in Motion	Angle	On Roadway	Daylight Dry	W	N	Turning Left	Stopped
72970365	7/15/2007	11:49 AM	Fulton	State Route	'014000	6.99	2	1	0	Motor Vehicle in Motion	Sideswipe - Same Direction	On Roadway	Dark-Lighted	Dry	N	Turning Left	Straight
72970364	7/15/2007	11:49 AM	Fulton	State Route	'014000	6.99	2	0	0	Motor Vehicle in Motion	Sideswipe - Same Direction	On Roadway	Dark-Lighted	Dry	N	Turning Left	Straight
71160525	3/24/2007	12:38 PM	Fulton	State Route	'014000	6.99	2	0	0	Motor Vehicle in Motion	Angle	On Roadway	Daylight Dry	N	W	Turning Left	Stopped
72520252	6/21/2007	9:10 AM	Fulton	State Route	'014000	6.99	2	0	0	Motor Vehicle in Motion	Sideswipe - Same Direction	On Roadway	Daylight Dry	W	W	Changing Lanes	Straight
72060472	5/23/2007	6:49 PM	Fulton	State Route	'014000	6.99	2	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight Dry	W	W	Straight	Stopped
72060540	5/21/2007	7:53 AM	Fulton	State Route	'014000	6.99	2	1	0	Motor Vehicle in Motion	Head On	On Roadway	Daylight Dry	W	W	Backing	Stopped
70850132	3/3/2007	7:01 PM	Fulton	State Route	'014000	6.99	2	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Dark-Lighted	Dry	E	Straight	Stopped
80010268	1/2/2008	1:23 PM	Fulton	State Route	'014000	6.99	2	0	0	Motor Vehicle in Motion	Angle	On Roadway	Daylight Dry	E	N	Straight	Turning Left
80510441	2/9/2008	4:10 PM	Fulton	State Route	'014000	6.99	1	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight Dry	W	W	Straight	Straight
80950445	3/9/2008	2:31 PM	Fulton	State Route	'014000	6.99	1	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight Dry	W	W	Straight	Stopped
80570059	2/14/2008	4:00 PM	Fulton	State Route	'014000	6.99	1	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight Dry	N	S	Turning Left	Stopped
84080449	10/9/2008	4:05 PM	Fulton	State Route	'014000	6.99	1	0	0	Motor Vehicle in Motion	Angle	On Roadway	Daylight Dry	W	E	Turning Left	Straight
83950226	9/28/2008	11:47 AM	Fulton	State Route	'014000	6.99	1	0	0	Motor Vehicle in Motion	Angle	On Roadway	Daylight Dry	W	E	Turning Left	Straight
83800055	9/19/2008	7:26 AM	Fulton	State Route	'014000	6.99	1	0	0	Motor Vehicle in Motion	Sideswipe - Same Direction	On Roadway	Daylight Dry	N	W	Straight	Straight
83700008	9/6/2008	1:24 AM	Fulton	State Route	'014000	6.99	1	0	0	Curb	Not A Collision With A Motor Vehicle	On Shoulder	Dark-Lighted	Dry	W	Straight	
83950538	9/27/2008	3:25 PM	Fulton	State Route	'014000	6.99	1	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight Dry	N	N	Right	Right
83630329	9/3/2008	4:40 PM	Fulton	State Route	'014000	6.99	1	0	0	Motor Vehicle in Motion	Sideswipe - Same Direction	On Roadway	Daylight Dry	W	W	Changing Lanes	Stopped
83120058	7/23/2008	7:44 PM	Fulton	State Route	'014000	6.99	1	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight Dry	E	E	Straight	Right
83140091	8/20/2008	1:56 PM	Fulton	State Route	'014000	6.99	1	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight Dry	E	E	Straight	Stopped
82830135	7/31/2008	4:43 PM	Fulton	State Route	'014000	6.99	1	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight Dry	N	N	Straight	Straight
85430276	12/29/2008	11:33 AM	Fulton	State Route	'014000	6.99	1	0	0	Motor Vehicle in Motion	Angle	On Roadway	Daylight Dry	W	E	Turning Left	Straight
85430266	12/31/2008	11:13 AM	Fulton	State Route	'014000	6.99	1	0	0	Motor Vehicle in Motion	Angle	On Roadway	Daylight Dry	E	W	Turning Left	Straight
85020490	11/29/2008	7:14 PM	Fulton	State Route	'014000	6.99	1	0	0	Motor Vehicle in Motion	Angle	On Roadway	Dark-Lighted	Wet	E	S	Turning Left
84820222	11/21/2008	8:58 AM	Fulton	State Route	'014000	6.99	1	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight Dry	W	W	Straight	Straight
84770294	11/12/2008	8:19 AM	Fulton	State Route	'014000	6.99	1	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight Dry	N	N	Straight	Right
84710186	10/27/2008	7:19 PM	Fulton	State Route	'014000	6.99	1	0	0	Motor Vehicle in Motion	Sideswipe - Same Direction	On Roadway	Not				Straight
84710179	10/27/2008	6:52 AM	Fulton	State Route	'014000	6.99	1	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Dark-Lighted	Dry	E	E	Turning Left
84710162	10/24/2008	7:17 AM	Fulton	State Route	'014000	6.99	1	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight Dry	N	N	Straight	Straight
84640149	11/7/2008	6:39 PM	Fulton	State Route	'014000	6.99	1	0	0	Motor Vehicle in Motion	Angle	On Roadway	Dark-Lighted	Wet	S	E	Turning Left
84640162	11/8/2008	12:05 AM	Fulton	State Route	'014000	6.99	1	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Dark-Lighted	Wet	N	E	Turning Left
82980053	8/12/2008	4:24 PM	Fulton	State Route	'014000	6.99	1	0	0	Motor Vehicle in Motion	Angle	On Roadway	Daylight Dry	N	W	Right	Stopped
81740446	6/2/2008	11:56 AM	Fulton	State Route	'014000	6.99	1	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight Dry	E	E	Straight	Stopped
81610321	4/28/2008	2:50 PM	Fulton	State Route	'014000	6.99	1	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight Dry	E	E	Straight	Stopped
81380029	4/4/2008	11:18 AM	Fulton	State Route	'014000	6.99	1	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight Wet	W	W	Right	Right
81220016	4/12/2008	9:01 AM	Fulton	State Route	'014000	6.99	1	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight Wet	E	E	Straight	Stopped
81220003	3/26/2008	11:52 AM	Fulton	State Route	'014000	6.99	1	0	0	Motor Vehicle in Motion	Angle	On Roadway	Daylight Dry	W	S	Straight	Straight
80950475	3/13/2008	7:05 AM	Fulton	State Route	'014000	6.99	1	0	0	Motor Vehicle in Motion	Angle	On Roadway	Dark-Lighted	Dry	W	W	Turning Right
80950473	3/13/2008	9:30 AM	Fulton	State Route	'014000	6.99	1	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight Dry	E	E	Straight	Stopped
80570064	2/17/2008	8:26 PM	Fulton	State Route	'014000	6.99	1	0	0	Motor Vehicle in Motion	Angle	On Roadway	Dusk	Wet	E	W	Turning Left
80670526	2/23/2008	5:47 PM	Fulton	State Route	'014000	6.99	1	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Dusk Dry	S	S	Straight	Straight

FULTON COUNTY, Old Roswell Road (CR 1312)																	
Case No.	Date	Time	County	Route Type	Route	Intersecting R/T	Injuries	Fatalities	Harmful Event	Location of Impact			Dir/Veh1	Dir/Veh2	Mnrv/Veh1	Mnrv/Veh2	
										Motor Vehicle in Motion	Motor Vehicle in Motion	Motor Vehicle in Motion					
80510436	2/8/2008	3:45 PM	Fulton	State Route	1014000	6:59	1			116900	0	0	Motor Vehicle in Motion	Rear End		N	Straight
801513020	1/13/2008	4:48 PM	Fulton	State Route	1014000	6:59	1			116900	4	0	Motor Vehicle in Motion	Rear End		W	Straight
FULTON COUNTY, Old Roswell Road (CR 1312)																	
Case No.	Date	Time	County	Route Type	Route	Intersecting R/T	Injuries	Fatalities	Harmful Event	Location of Impact			Dir/Veh1	Dir/Veh2	Mnrv/Veh1	Mnrv/Veh2	
										Motor Vehicle in Motion	Motor Vehicle in Motion	Motor Vehicle in Motion					
64160428	2/13/2006	7:12 PM	Fulton	County Road	133200	1:43	2			181100	0	0	Motor Vehicle in Motion	Side/Swipe - Same Direction		S	Turning Left
63100170	8/1/2006	10:40 AM	Fulton	County Road	133200	1:43	1			181100	0	0	Motor Vehicle in Motion	Angle		S	Straight
64120103	4/13/2006	1:40 PM	Fulton	County Road	133200	1:43	2			181100	0	0	Motor Vehicle in Motion	Rear End		S	Straight
72760342	6/30/2007	8:30 PM	Fulton	County Road	133200	1:43	2			181100	0	0	Guardrail Face	Vehicle		E	Straight
818600310	5/13/2008	5:35 PM	Fulton	State Route	116900	1:43	2			181100	0	0	Motor Vehicle in Motion	Rear End		S	Stopped
83050142	8/12/2008	11:46 AM	Fulton	State Route	116900	1:43	2			181100	0	0	Motor Vehicle in Motion	Rear End		N	Turning Right
8042060112	10/15/2008	1:11 PM	Fulton	State Route	116900	1:43	2			181100	0	0	Motor Vehicle in Motion	Angle		S	Straight

Existing AM Intersection Analysis

Lanes, Volumes, Timings
1: Old Roswell Rd & Mansell Rd

Existing AM
11/10/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	36	193	511	218	359	273	28	1212	629	392	1300	45
Act Effct Green (s)	38.0	31.0	31.0	8.0	35.8	35.8	7.0	42.0	42.0	69.0	61.9	61.9
Actuated g/C Ratio	0.32	0.26	0.26	0.07	0.30	0.30	0.06	0.35	0.35	0.58	0.52	0.52
v/c Ratio	0.12	0.21	0.98	0.95	0.34	0.41	0.27	0.98	0.80	0.98	0.71	0.05
Control Delay	27.6	35.7	67.9	94.5	22.2	6.8	60.3	59.7	22.8	74.9	25.9	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.6	35.7	67.9	94.5	22.2	6.8	60.3	59.7	22.8	74.9	25.9	9.3
LOS	C	D	E	F	C	A	E	E	C	E	C	A
Approach Delay	57.5											
Approach LOS	E											
Queue Length 50th (ft)	18	62	300	92	96	52	21	485	195	252	423	8
Queue Length 95th (ft)	42	94	#532 m#171	86	41	52	#639	366	#455	519	29	29
Internal Link Dist (ft)	1067											
Turn Bay Length (ft)	500	150	425	150	300	118	1239	791	401	1827	830	150
Base Capacity (vph)	323	914	519	229	1056	663	118	1239	791	401	1827	830
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.21	0.98	0.95	0.34	0.41	0.24	0.98	0.80	0.98	0.71	0.05

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 14' (12%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.98

Intersection Signal Delay: 43.3

Intersection Capacity Utilization 77.9%

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
1: Old Roswell Rd & Mansell Rd

Existing AM
11/10/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Flt	1.00	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.44	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95
Satd. Flow (perm)	811	3539	1583	3433	3539	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	33	178	470	201	330	251	26	1115	579	361	1196	41
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	36	193	511	218	359	273	28	1212	629	392	1300	45
RTOR Reduction (vph)	0	0	110	0	0	192	0	0	241	0	0	13
Lane Group Flow (vph)	36	193	401	218	359	81	28	1212	388	392	1300	32
Turn Type	pm+pt	Perm	Prot	Perm	Prot	Perm	Prot	Perm	pm+pt	Perm	pm+pt	Perm
Protected Phases	7	4	4	3	8	8	5	2	1	6	1	6
Permitted Phases	4	35.8	31.0	31.0	9.6	35.8	35.8	4.7	40.4	40.4	67.4	58.7
Actuated Green, G (s)	35.8	31.0	31.0	9.6	35.8	35.8	4.7	40.4	40.4	67.4	58.7	58.7
Effective Green, g (s)	0.30	0.26	0.26	0.08	0.30	0.30	0.04	0.34	0.34	0.56	0.49	0.49
Actuated g/C Ratio	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Extension (s)	280	914	409	275	1056	472	69	1191	533	401	1731	774
Lane Grp Cap (vph)	0.01	0.05	c0.25	c0.06	0.10	0.05	0.02	0.34	c0.19	0.37	0.02	0.02
v/s Ratio Prot	0.03	0.13	0.21	0.98	0.79	0.34	0.17	0.41	1.02	0.73	0.98	0.75
v/s Ratio Perm	35.1	34.9	44.2	54.2	32.9	31.1	56.3	39.8	35.0	38.0	24.7	16.0
Uniform Delay, d1	1.00	1.00	1.00	0.85	0.62	1.18	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	0.2	0.5	40.0	13.3	0.8	0.7	3.9	30.6	8.4	38.6	3.1	0.1
Incremental Delay, d2	35.3	35.4	84.2	59.5	21.3	37.5	60.2	70.4	43.4	76.6	27.8	16.1
Delay (s)	D	D	F	E	C	D	E	E	D	E	C	B
Level of Service	D	D	F	E	C	D	E	E	D	E	C	B
Approach Delay (s)	69.1											
Approach LOS	E											

Intersection Summary

HCM Average Control Delay 50.6 HCM Level of Service D

HCM Volume to Capacity ratio 0.95

Actuated Cycle Length (s) 120.0 Sum of lost time (s) 12.0

Intersection Capacity Utilization 77.9% ICU Level of Service D

Analysis Period (min) 15

c Critical Lane Group



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	614	601	485	30	27	363
Act Effct Green (s)	96.5	96.5	66.8	66.8	15.5	15.5
Actuated g/C Ratio	0.80	0.80	0.56	0.56	0.13	0.13
v/c Ratio	0.86	0.21	0.25	0.03	0.12	0.70
Control Delay	26.0	2.8	17.1	10.1	30.9	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.0	2.8	17.1	10.1	30.9	11.9
LOS	C	A	B	B	C	B
Approach Delay	14.5 16.7 13.2					
Approach LOS	B B B					
Queue Length 50th (ft)	138	16	91	1	13	0
Queue Length 95th (ft)	m433	m113	139	20	m16	54
Internal Link Dist (ft)	1273 3111 2523					
Turn Bay Length (ft)	400	235				
Base Capacity (vph)	1041	2863	1970	894	437	664
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.21	0.25	0.03	0.06	0.55

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 40 (33%), Referenced to phase 2:WBTU and 6:EBTL, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 14.8
 Intersection Capacity Utilization 57.0%
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	WBU	WBT	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	1.00
Flt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3539	1583	1770	1583
Flt Permitted	0.44	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	826	3539	3539	1583	1770	1583
Volume (vph)	565	553	0	446	28	334
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	614	601	0	485	30	363
RTOR Reduction (vph)	0	0	0	0	13	0
Lane Group Flow (vph)	614	601	0	485	17	47
Turn Type	pm+pt	Perm	Perm	Perm	Perm	Perm
Protected Phases	1	6	2	2	8	8
Permitted Phases	6	2				
Actuated Green, G (s)	96.5	96.5	66.8	66.8	15.5	15.5
Effective Green, g (s)	96.5	96.5	66.8	66.8	15.5	15.5
Actuated g/C Ratio	0.80	0.80	0.56	0.56	0.13	0.13
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	866	2846	1970	881	229	204
v/s Ratio Prot	c0.15	0.17	0.14			
v/s Ratio Perm	c0.42	0.01				
v/c Ratio	0.71	0.21	0.25	0.02	0.12	0.23
Uniform Delay, d1	10.9	2.8	13.7	11.9	46.2	46.9
Progression Factor	0.94	0.70	0.83	0.96	0.74	1.22
Incremental Delay, d2	1.7	0.1	0.3	0.0	0.2	0.5
Delay (s)	11.9	2.1	11.7	11.5	34.4	57.9
Level of Service	B	A	B	B	C	E
Approach Delay (s)	7.0					
Approach LOS	A B B					
Intersection Summary						
HCM Average Control Delay	17.2		HCM Level of Service B			
HCM Volume to Capacity ratio	0.63					
Actuated Cycle Length (s)	120.0		Sum of lost time (s) 8.0			
Intersection Capacity Utilization	57.0%		ICU Level of Service B			
Analysis Period (min)	15					
c Critical Lane Group						

Intersection Summary

HCM Average Control Delay
 HCM Volume to Capacity ratio
 Actuated Cycle Length (s)
 Intersection Capacity Utilization
 Analysis Period (min)
 c Critical Lane Group



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	293	3	67	25	20	520	183	193	483	193
Act Effct Green (s)	31.0	31.0	31.0	31.0	65.4	65.4	65.4	76.2	76.2	76.2
Actuated g/C Ratio	0.26	0.26	0.26	0.26	0.54	0.54	0.54	0.64	0.64	0.64
v/c Ratio	0.88	0.01	0.17	0.06	0.04	0.51	0.19	0.65	0.41	0.18
Control Delay	68.1	17.3	38.7	15.7	10.2	12.4	0.9	24.2	15.0	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.1	17.3	38.7	15.7	10.2	12.4	0.9	24.2	15.0	5.2
LOS	E	B	D	B	B	B	A	C	B	A
Approach Delay	67.6		32.4			9.4			14.8	
Approach LOS	E		C			A			B	
Queue Length 50th (ft)	219	0	47	1	5	154	0	50	149	14
Queue Length 95th (ft)	292	7	m81	m11	m7	m206	m6	149	356	65
Internal Link Dist (ft)	1205		1883			2523			1023	
Turn Bay Length (ft)	160		200		235	150			120	
Base Capacity (vph)	451	556	521	570	553	1016	946	381	1183	1054
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.01	0.13	0.04	0.04	0.51	0.19	0.51	0.41	0.18

Intersection Summary

Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 96 (80%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 21.6	Intersection LOS: C
Intersection Capacity Utilization 66.5%	ICU Level of Service C
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4	4		4	4		4	4	4	4	4	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.96	1.00		0.98	1.00		0.95	1.00	0.85	1.00	1.00	0.85
Satd. Flow (prot)	1780	1583		1819	1583		1770	1863	1583	1770	1863	1583
Flt Permitted	0.69	1.00		0.68	1.00		0.49	1.00	1.00	0.30	1.00	1.00
Satd. Flow (perm)	1289	1583		1272	1583		909	1863	1583	565	1863	1583
Volume (vph)	251	18	3	29	32	23	18	478	168	178	444	178
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	273	20	3	32	35	25	20	520	183	193	483	193
RTOR Reduction (vph)	0	0	2	0	0	19	0	0	83	0	0	52
Lane Group Flow (vph)	0	293	1	0	67	6	20	520	100	193	483	141
Turn Type	Perm	Perm	Perm	Perm	Perm	Perm	pm+pt	Perm	pm+pt	Perm	pm+pt	Perm
Protected Phases	8	8	4	4	4	4	1	6	5	2	2	2
Permitted Phases	8	8	4	4	4	4	6	6	6	6	6	6
Actuated Green, G (s)	31.0	31.0		31.0	31.0		65.4	65.4	65.4	73.8	73.8	73.8
Effective Green, g (s)	31.0	31.0		31.0	31.0		65.4	65.4	65.4	73.8	73.8	73.8
Actuated g/C Ratio	0.26	0.26		0.26	0.26		0.55	0.55	0.55	0.62	0.62	0.62
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	333	409		329	409		518	1015	863	464	1146	974
v/s Ratio Prot							0.00	c0.28	0.04	c0.26		
v/s Ratio Perm	c0.23	0.00		0.05	0.00	0.02	0.00	0.06	0.06	0.22	0.09	0.09
v/c Ratio	0.88	0.00		0.20	0.02	0.04	0.51	0.12	0.12	0.42	0.14	0.14
Uniform Delay, d1	42.7	33.0		34.8	33.1	12.7	17.2	13.3	12.6	12.0	9.8	9.8
Progression Factor	1.00	1.00		1.19	1.57	0.56	0.54	0.21	0.21	1.00	1.00	1.00
Incremental Delay, d2	22.2	0.0		0.3	0.0	0.0	1.2	0.2	0.2	0.6	1.1	0.3
Delay (s)	64.9	33.0		41.8	52.1	7.1	10.6	2.9	13.2	13.1	10.1	10.1
Level of Service	E	C		D	D	A	B	A	B	B	B	B
Approach Delay (s)	64.6			44.6			8.5			12.5		
Approach LOS	E			D			A			B		

Intersection Summary

HCM Average Control Delay	20.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	441	305	3	652	501	33	18
Act Effct Green (s)	108.5	110.1	91.7	91.7	91.7	7.5	7.5
Actuated g/C Ratio	0.90	0.92	0.76	0.76	0.76	0.06	0.06
v/c Ratio	0.78	0.09	0.00	0.24	0.38	0.30	0.16
Control Delay	18.4	0.8	4.7	4.0	0.8	57.3	22.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.4	0.8	4.7	4.0	0.8	57.3	22.5
LOS	B	A	A	A	A	E	C
Approach Delay	11.2						
Approach LOS	B						
Queue Length 50th (ft)	52	10	0	52	0	25	1
Queue Length 95th (ft)	90	4	m2	89	0	m49	m16
Internal Link Dist (ft)	265						
Turn Bay Length (ft)	240	150	150	150	150	765	
Base Capacity (vph)	870	3246	805	2704	1324	339	318
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.09	0.00	0.24	0.38	0.10	0.06

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 24 (20%), Referenced to phase 2:WBTU and 6:EBTL, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 7.0
 Intersection Capacity Utilization 57.7%
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.85
Satd. Flow (prot)	1770	3539	1770	3539	1583	1770	1583
Flt Permitted	0.37	1.00	0.57	1.00	1.00	0.95	1.00
Satd. Flow (perm)	696	3539	1054	3539	1583	1770	1583
Volume (vph)	406	281	3	600	461	30	17
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	441	305	3	652	501	33	18
RTOR Reduction (vph)	0	0	0	0	0	121	0
Lane Group Flow (vph)	441	305	3	652	380	33	1
Turn Type	pm+pt	Perm	Perm	Perm	Perm	Perm	Perm
Protected Phases	1	6	2	2	8	8	
Permitted Phases	6						
Actuated Green, G (s)	106.9	106.9	90.1	90.1	90.1	5.1	5.1
Effective Green, g (s)	106.9	106.9	90.1	90.1	90.1	5.1	5.1
Actuated g/C Ratio	0.89	0.89	0.75	0.75	0.75	0.04	0.04
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	735	3153	791	2657	1189	75	67
v/s Ratio Prot	c0.06	0.09		0.18		c0.02	
v/s Ratio Perm	c0.47		0.00		0.24		0.00
v/c Ratio	0.60	0.10	0.00	0.25	0.32	0.44	0.01
Uniform Delay, d1	1.5	0.8	3.7	4.6	4.9	56.1	55.0
Progression Factor	1.88	0.82	0.68	0.67	0.04	0.96	0.93
Incremental Delay, d2	1.4	0.1	0.0	0.2	0.7	3.8	0.1
Delay (s)	4.1	0.7	2.5	3.3	0.8	57.4	51.3
Level of Service	A	A	A	A	A	E	D
Approach Delay (s)	2.7						
Approach LOS	A						

Intersection Summary

HCM Average Control Delay
 HCM Volume to Capacity ratio
 Actuated Cycle Length (s)
 Intersection Capacity Utilization
 Analysis Period (min)
 c Critical Lane Group

Lanes, Volumes, Timings
5: First Drwy (Commercial) & Sanctuary Pkwy

Existing AM
11/10/2009



Lane Group	EBL	EBR	NBL	NBT	SBU	SBT
Lane Group Flow (vph)	5	41	623	363	1	365
Sign Control	Stop		Free	Free	Free	Free
Intersection Summary						
Control Type: Unsignalized						
Intersection Capacity Utilization 54.9%						
Analysis Period (min) 15						
ICU Level of Service A						

HCM Unsignalized Intersection Capacity Analysis
5: First Drwy (Commercial) & Sanctuary Pkwy

Existing AM
11/10/2009



Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔
Sign Control	Stop		Free	Free	Free	Free	Free
Grade	0%		0%	0%	0%	0%	0%
Volume (veh/h)	5	38	573	334	1	205	131
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	41	623	363	0	223	142
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type							
Median storage (veh)	1						
Upstream signal (ft)			845				
pX, platoon unblocked				0.00			
VC, conflicting volume	1721	183	365	0			
VC1, stage 1 conf vol	294						
VC2, stage 2 conf vol	1427						
vCu, unblocked vol	1721	183	365	0			
tC, single (s)	6.8	6.9	4.1	0.0			
tC, 2 stage (s)	5.8						
tF (s)	3.5	3.3	2.2	0.0			
p0 queue free %	93	95	48	0			
cM capacity (veh/h)	78	829	1190	0			
Direction, Lane #							
	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	5	41	623	182	182	149	217
Volume Left	5	0	623	0	0	0	0
Volume Right	0	41	0	0	0	0	142
cSH	78	829	1190	1700	1700	1700	1700
Volume to Capacity	0.07	0.05	0.52	0.11	0.11	0.09	0.13
Queue Length 95th (ft)	5	4	79	0	0	0	0
Control Delay (s)	54.4	9.6	11.3	0.0	0.0	0.0	0.0
Lane LOS	F	A	B				
Approach Delay (s)	14.8		7.1			0.0	
Approach LOS	B						
Intersection Summary							
Average Delay	5.5						
Intersection Capacity Utilization	54.9%			ICU Level of Service			
Analysis Period (min)	15			A			

Lanes, Volumes, Timings
7: Westside Pkwy & Encore Pkwy

Existing AM
11/10/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	1	212	143	288	798	5	341	22	116	8	7
Act Effct Green (s)	80.9	75.3	75.3	91.0	89.1	89.1	16.7	21.0	21.0	6.1	6.1
Actuated g/C Ratio	0.67	0.63	0.63	0.76	0.74	0.74	0.14	0.18	0.18	0.05	0.05
v/c Ratio	0.00	0.10	0.14	0.36	0.30	0.00	0.71	0.07	0.31	0.09	0.08
Control Delay	3.0	6.4	1.5	6.6	7.0	6.0	57.8	37.3	8.5	55.9	32.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.0	6.4	1.5	6.6	7.0	6.0	57.8	37.3	8.5	55.9	32.2
LOS	A	A	A	A	A	A	E	D	A	E	C
Approach Delay	4.4				6.9			44.9		44.8	
Approach LOS	A				A			D		D	
Queue Length 50th (ft)	0	21	0	45	70	0	131	15	0	6	0
Queue Length 95th (ft)	m1	34	0	121	206	6	175	34	45	23	16
Internal Link Dist (ft)		1317			1332			929		924	
Turn Bay Length (ft)	260	130	270	901	2628	1176	715	512	519	357	309
Base Capacity (vph)	512	2222	1047	901	2628	1176	715	512	519	357	309
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.10	0.14	0.32	0.30	0.00	0.48	0.04	0.22	0.02	0.02

Intersection Summary

Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 45 (38%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 16.1	Intersection LOS: B
Intersection Capacity Utilization 49.2%	ICU Level of Service A
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

HCM Signalized Intersection Capacity Analysis
7: Westside Pkwy & Encore Pkwy

Existing AM
11/10/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	0.85	1.00
Fit	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	1.00	0.85	1.00
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	1863	1583	1863	1583
Fit Permitted	0.35	1.00	1.00	0.59	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Satd. Flow (perm)	652	3539	1583	1093	3539	1583	3433	1863	1583	3433	1583
Volume (vph)	1	195	132	265	734	5	314	20	107	0	7
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	212	143	288	798	5	341	22	116	0	7
RTOR Reduction (vph)	0	0	56	0	0	0	1	0	93	0	0
Lane Group Flow (vph)	1	212	87	288	798	4	341	22	23	0	8
Turn Type	pm+pt	pm	pm+pt	pm	pm+pt	pm	pm	pm+pt	pm	pm+pt	pm
Protected Phases	1	6	5	2	2	2	7	4	3	8	8
Permitted Phases	6	6	6	2	2	2	7	4	4	8	8
Actuated Green, G (s)	74.0	72.9	72.9	88.6	83.5	83.5	16.7	23.4	23.4	2.7	2.7
Effective Green, g (s)	74.0	72.9	72.9	88.6	83.5	83.5	16.7	23.4	23.4	2.7	2.7
Actuated g/C Ratio	0.62	0.61	0.61	0.74	0.70	0.70	0.14	0.19	0.19	0.02	0.02
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	412	2150	962	873	2463	1102	478	363	309	42	36
v/s Ratio Prot	0.00	0.06	0.05	c0.03	0.23	c0.10	0.01	0.01	0.01	c0.00	0.00
v/s Ratio Perm	0.00	0.00	0.05	c0.21	0.32	0.00	0.71	0.06	0.07	0.01	0.00
Uniform Delay, d1	8.8	9.8	9.8	5.0	7.2	5.6	49.4	39.3	39.4	57.6	57.3
Progression Factor	0.50	0.57	0.48	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.1	0.2	0.2	0.3	0.0	5.0	0.1	0.1	2.2	0.0
Delay (s)	4.4	5.7	4.9	5.2	7.5	5.6	54.4	39.4	39.5	59.8	57.4
Level of Service	A	A	A	A	A	A	D	D	D	E	E
Approach Delay (s)	5.4			6.9			50.1		58.7		
Approach LOS	A			A			D		E		

Intersection Summary

HCM Average Control Delay	17.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	49.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Existing PM Intersection Analysis

Lanes, Volumes, Timings

1: Old Roswell Rd & Mansell Rd

Existing PM
11/10/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	34	175	380	385	347	411	62	1457	285	302	1309	73
Act Effct Green (s)	27.0	20.0	20.0	14.0	30.8	30.8	8.2	53.0	53.0	63.8	63.8	63.8
Actuated g/C Ratio	0.22	0.17	0.17	0.12	0.28	0.26	0.07	0.44	0.44	0.53	0.53	0.53
v/c Ratio	0.16	0.30	0.96	0.96	0.38	0.62	0.51	0.93	0.36	0.95	0.70	0.08
Control Delay	32.6	45.4	67.0	77.9	28.8	7.7	68.9	43.8	10.7	84.4	24.1	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.6	45.4	67.0	77.9	28.8	7.7	68.9	43.8	10.7	84.4	24.1	7.3
LOS	C	D	E	E	C	A	E	D	B	F	C	A
Approach Delay	58.6											
Approach LOS	E											
Queue Length 50th (ft)	18	63	184	162	101	17	47	552	58	183	402	11
Queue Length 95th (ft)	43	98	#383	m#243	m108	m40	94	#712	122	#364	488	35
Internal Link Dist (ft)	1067											
Turn Bay Length (ft)	500	150	425	150	300	133	1563	788	317	1881	863	150
Base Capacity (vph)	231	590	394	401	909	662	133	1563	788	317	1881	863
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.30	0.96	0.96	0.38	0.62	0.47	0.93	0.36	0.95	0.70	0.08

Intersection Summary

Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 104 (87%). Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 39.5	Intersection LOS: D
Intersection Capacity Utilization 80.3%	ICU Level of Service D
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

HCM Signalized Intersection Capacity Analysis

1: Old Roswell Rd & Mansell Rd

Existing PM
11/10/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	1.00	0.95	1.00	0.95	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.38	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (perm)	705	3539	1583	3433	3539	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	31	161	350	354	319	378	57	1340	262	278	1204	67
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	175	380	385	347	411	62	1457	285	302	1309	73
RTOR Reduction (vph)	0	0	130	0	0	255	0	0	93	0	0	22
Lane Group Flow (vph)	34	175	250	385	347	156	62	1457	192	302	1309	51
Turn Type	pm+pt	Perm	Prot	Perm	Prot	Perm	pm+pt	Perm	pm+pt	Perm	pm+pt	Perm
Protected Phases	7	4	4	3	8	8	5	2	1	6	6	6
Permitted Phases	4	24.8	20.0	20.0	15.6	30.8	30.8	7.0	50.6	50.6	61.4	61.4
Actuated Green, G (s)	24.8	20.0	20.0	15.6	30.8	30.8	7.0	50.6	50.6	61.4	61.4	61.4
Effective Green, g (s)	0.21	0.17	0.17	0.13	0.26	0.26	0.06	0.42	0.42	0.51	0.51	0.51
Actuated g/C Ratio	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Extension (s)	188	590	264	446	908	406	103	1492	667	325	1811	810
Lane Grp Cap (vph)	0.01	0.05	c0.16	c0.11	0.10	0.10	0.04	c0.41	0.12	c0.14	0.37	0.03
v/s Ratio Prot	0.18	0.30	0.95	0.86	0.38	0.38	0.60	0.98	0.29	0.93	0.72	0.06
v/c Ratio	44.2	43.8	49.5	51.2	36.8	36.8	55.1	34.1	22.8	45.7	22.7	14.8
Uniform Delay, d1	1.00	1.00	1.00	0.83	0.72	0.46	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	0.5	1.3	43.3	14.0	1.1	2.4	9.5	18.3	1.1	31.8	2.5	0.1
Incremental Delay, d2	44.7	45.1	92.8	56.4	27.6	19.3	64.7	52.5	23.9	77.4	25.2	14.9
Delay (s)	D	D	F	E	C	B	E	D	C	E	C	B
Level of Service	D	D	F	E	C	B	E	D	C	E	C	B
Approach Delay (s)	75.8											
Approach LOS	E											

Intersection Summary

HCM Average Control Delay	43.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	80.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	345	420	588	9	25	555
Act Effct Green (s)	95.6	95.6	78.2	78.2	16.4	16.4
Actuated g/C Ratio	0.80	0.80	0.65	0.65	0.14	0.14
v/c Ratio	0.65	0.15	0.25	0.01	0.10	0.80
Control Delay	13.8	2.6	5.6	2.4	35.1	12.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.8	2.6	5.6	2.4	35.1	12.0
LOS	B	A	A	A	D	B
Approach Delay	7.6 5.6					
Approach LOS	A A					
Queue Length 50th (ft)	35	9	48	0	13	15
Queue Length 95th (ft)	m101	m54	85	m1	m20	14
Internal Link Dist (ft)	1273 3111					
Turn Bay Length (ft)	400	2819	2307	1035	634	923
Base Capacity (vph)	802	2819	2307	1035	634	923
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.15	0.25	0.01	0.04	0.60

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 44 (37%), Referenced to phase 2:WBTU and 6:EBTL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 8.6
Intersection Capacity Utilization 53.3%
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3539	1583	1770	1583
Flt Permitted	0.41	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	756	3539	3539	1583	1770	1583
Volume (vph)	317	386	0	541	8	23
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	345	420	0	588	9	25
RTOR Reduction (vph)	0	0	0	0	3	0
Lane Group Flow (vph)	345	420	0	588	6	25
Turn Type	pm+pt	Perm	Perm	Perm	Perm	Perm
Protected Phases	1	6	2	2	8	8
Permitted Phases	6	95.6	78.2	78.2	16.4	16.4
Actuated Green, G (s)	95.6	95.6	78.2	78.2	16.4	16.4
Effective Green, g (s)	95.6	95.6	78.2	78.2	16.4	16.4
Actuated g/C Ratio	0.80	0.80	0.65	0.65	0.14	0.14
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	716	2819	2306	1032	242	216
v/s Ratio Prot	c0.05	0.12	0.17	0.00	0.01	c0.05
v/s Ratio Perm	c0.33	0.48	0.15	0.25	0.01	0.35
Uniform Delay, d1	6.2	2.8	8.7	7.3	45.4	47.0
Progression Factor	0.67	0.64	0.46	0.27	0.85	1.05
Incremental Delay, d2	0.4	0.1	0.2	0.0	0.2	0.9
Delay (s)	4.5	1.9	4.3	2.0	38.6	50.1
Level of Service	A	A	A	A	D	D
Approach Delay (s)	3.1	4.2	4.2	4.2	49.6	D
Approach LOS	A	A	A	A	D	D

Intersection Summary

HCM Average Control Delay
HCM Volume to Capacity ratio
Actuated Cycle Length (s)
Intersection Capacity Utilization
Analysis Period (min)
c Critical Lane Group

17.3
0.46
120.0
53.3%
15

HCM Level of Service
Sum of lost time (s)
ICU Level of Service
ICU Level of Service

B
8.0
A



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	151	7	109	180	87	415	14	12	565	107
Act Effct Green (s)	19.8	19.8	19.8	19.8	92.5	90.2	90.2	90.1	84.5	84.5
Actuated g/C Ratio	0.16	0.16	0.16	0.16	0.77	0.75	0.75	0.75	0.70	0.70
v/c Ratio	0.79	0.03	0.61	0.44	0.20	0.30	0.01	0.02	0.43	0.09
Control Delay	73.6	20.7	61.0	10.6	3.7	4.1	1.0	5.0	10.3	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.6	20.7	61.0	10.6	3.7	4.1	1.0	5.0	10.3	3.9
LOS	E	C	E	B	A	A	A	A	B	A
Approach Delay	71.3	29.6				4.0			9.2	
Approach LOS	E	C				A			A	
Queue Length 50th (ft)	114	0	80	0	13	73	0	2	176	10
Queue Length 95th (ft)	175	13	m133	m61	m10	69	m1	9	315	35
Internal Link Dist (ft)	1205		1883			2523			1023	
Turn Bay Length (ft)	340	467	319	589	580	1401	1194	739	1312	1134
Base Capacity (vph)	0	0	0	0	0	0	0	0	0	0
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.01	0.34	0.31	0.15	0.30	0.01	0.02	0.43	0.09

Intersection Summary

Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 77 (64%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 17.1	Intersection LOS: B
Intersection Capacity Utilization 56.2%	ICU Level of Service B
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4											
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1776	1583	1776	1583	1776	1583	1776	1583	1776	1583	1776	1583
Flt Permitted	0.57	1.00	0.57	1.00	0.46	1.00	0.38	1.00	0.46	1.00	0.48	1.00
Satd. Flow (perm)	1064	1583	1064	1583	855	1583	708	1583	855	1583	898	1583
Volume (vph)	136	3	6	99	1	166	80	382	13	11	520	98
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	148	3	7	108	1	180	87	415	14	12	565	107
RTOR Reduction (vph)	0	0	6	0	0	150	0	0	4	0	0	20
Lane Group Flow (vph)	0	151	1	0	109	30	87	415	10	12	565	87
Turn Type	Perm	Perm	Perm	Perm	Perm	pm+pt	Perm	pm+pt	Perm	pm+pt	Perm	Perm
Protected Phases	8	8	8	4	4	4	1	6	6	5	2	2
Permitted Phases	8	8	8	4	4	4	6	6	6	6	2	2
Actuated Green, G (s)	19.8	19.8	19.8	19.8	19.8	19.8	92.2	87.1	87.1	82.5	81.4	81.4
Effective Green, g (s)	19.8	19.8	19.8	19.8	19.8	19.8	92.2	87.1	87.1	82.5	81.4	81.4
Actuated g/C Ratio	0.16	0.16	0.16	0.16	0.16	0.16	0.77	0.73	0.73	0.69	0.68	0.68
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	176	261	261	141	261	604	1352	1149	625	1264	1074	
v/s Ratio Prot						c0.01	c0.22				c0.30	
v/s Ratio Perm	c0.14	0.00	0.00	0.13	0.02	0.10	0.01	0.01	0.01	0.01	0.05	
v/c Ratio	0.86	0.00	0.00	0.77	0.11	0.14	0.31	0.01	0.01	0.02	0.45	0.08
Uniform Delay, d1	48.7	41.9	41.9	47.9	42.6	8.0	5.8	4.5	7.9	8.9	6.6	
Progression Factor	1.00	1.00	1.00	1.04	1.28	0.49	0.58	0.29	1.00	1.00	1.00	
Incremental Delay, d2	31.5	0.0	0.0	22.7	0.2	0.1	0.5	0.0	0.0	0.0	1.1	0.1
Delay (s)	80.2	41.9	41.9	72.6	54.9	4.0	3.9	1.3	7.9	10.1	6.7	
Level of Service	F	D	D	E	D	A	A	A	A	A	B	A
Approach Delay (s)		78.5			61.6		3.9				9.5	
Approach LOS		E			E		A				A	

Intersection Summary

HCM Average Control Delay	23.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	14	600	2	649	27	552	384
Act Effct Green (s)	66.6	66.6	59.4	59.4	59.4	45.4	45.4
Actuated g/C Ratio	0.56	0.56	0.50	0.50	0.50	0.38	0.38
v/c Ratio	0.04	0.31	0.01	0.37	0.03	0.82	0.47
Control Delay	9.6	11.2	11.5	12.7	1.4	44.0	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.6	11.2	11.5	12.7	1.4	44.0	5.2
LOS	A	B	B	B	A	D	A
Approach Delay	11.2 12.3 28.1						
Approach LOS	B B B C						
Queue Length 50th (ft)	4	90	1	190	3	377	16
Queue Length 95th (ft)	7	136	m2	81	m1	465	m73
Internal Link Dist (ft)	265 540 765						
Turn Bay Length (ft)	240	150	150	150	150	150	150
Base Capacity (vph)	407	1963	283	1751	795	856	945
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.31	0.01	0.37	0.03	0.64	0.41

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 92 (77%), Referenced to phase 2:WBTU and 6:EBTL, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.82
 Intersection Signal Delay: 18.6
 Intersection Capacity Utilization 51.3%
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (prot)	1770	3539	1770	3539	1583	1770	1583
Flt Permitted	0.33	1.00	0.37	1.00	1.00	0.95	1.00
Satd. Flow (perm)	622	3539	690	3539	1583	1770	1583
Volume (vph)	13	552	2	597	25	508	353
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	14	600	2	649	27	552	384
RTOR Reduction (vph)	0	0	0	0	13	0	217
Lane Group Flow (vph)	14	600	2	649	14	552	167
Turn Type	pm+pt	Perm	Perm	Perm	Perm	Perm	Perm
Protected Phases	1	6	2	2	8	8	8
Permitted Phases	6	66.6	57.0	57.0	45.4	45.4	45.4
Actuated Green, G (s)	66.6	66.6	57.0	57.0	45.4	45.4	45.4
Effective Green, g (s)	0.55	0.55	0.48	0.48	0.48	0.38	0.38
Actuated g/C Ratio	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Extension (s)	399	1964	328	1681	752	670	599
Lane Grp Cap (vph)	0.00	c0.17	0.00	c0.18	c0.31	c0.31	c0.31
v/s Ratio Prot	0.02	0.04	0.01	0.01	0.02	0.02	0.11
v/s Ratio Perm	0.04	0.31	0.01	0.39	0.02	0.82	0.28
Uniform Delay, d1	17.5	14.3	16.6	20.3	16.7	33.7	25.9
Progression Factor	0.59	0.89	0.46	0.55	0.12	1.00	1.00
Incremental Delay, d2	0.0	0.4	0.0	0.6	0.0	8.1	0.3
Delay (s)	10.3	10.3	7.7	11.7	2.1	41.8	26.1
Level of Service	B	B	A	B	A	D	C
Approach Delay (s)	10.3 11.3 35.4						
Approach LOS	B B B						

Intersection Summary

HCM Average Control Delay
 HCM Volume to Capacity ratio
 Actuated Cycle Length (s)
 Intersection Capacity Utilization
 Analysis Period (min)
 c Critical Lane Group

21.1
0.55
120.0
51.3%
15

HCM Level of Service
 Sum of lost time (s)
 ICU Level of Service
 ICU Level of Service

C
8.0
A
15

Lanes, Volumes, Timings
5: First Drwy (Commercial) & Sanctuary Pkwy

Existing PM
11/10/2009

	↖	↗	↖	↗	↖	↗	↖	↗
Movement	EBL	EBR	NBL	NBT	SBU	SBT		
Lane Group	EBL	EBR	NBL	NBT	SBU	SBT		
Lane Group Flow (vph)	111	635	29	48	1	537		
Sign Control	Stop			Free	Free			
Intersection Summary								
Control Type: Unsignalized								
Intersection Capacity Utilization	56.6%						ICU Level of Service B	
Analysis Period (min)	15							

HCM Unsignalized Intersection Capacity Analysis
5: First Drwy (Commercial) & Sanctuary Pkwy

Existing PM
11/10/2009

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations	↰	↱	↰	↱	↰	↱	
Sign Control	Stop		Free	Free	Free	Free	
Grade	0%		0%		0%		
Volume (veh/h)	102	584	27	44	1	474	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	111	635	29	48	0	515	22
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	Raised						
Median storage (veh)	1						
Upstream signal (ft)	845						
pX, platoon unblocked	0.00						
VC, conflicting volume	609	268	537	0			
VC1, stage 1 conf vol	526						
VC2, stage 2 conf vol	83						
vCu, unblocked vol	609	268	537	0			
tC, single (s)	6.8	6.9	4.1	0.0			
tC, 2 stage (s)	5.8						
tF (s)	3.5	3.3	2.2	0.0			
p0 queue free %	77	13	97	0			
cM capacity (veh/h)	479	730	1027	0			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2 SB 3
Volume Total	111	635	29	24	24	343	193 0
Volume Left	111	0	29	0	0	0	0 0
Volume Right	0	635	0	0	0	0	22 0
cSH	479	730	1027	1700	1700	1700	1700
Volume to Capacity	0.23	0.87	0.03	0.01	0.01	0.20	0.11 0.00
Queue Length 95th (ft)	22	265	2	0	0	0	0 0
Control Delay (s)	14.8	33.5	8.6	0.0	0.0	0.0	0.0 0.0
Lane LOS	B	D	A	0.0			
Approach Delay (s)	30.7	3.3		0.0			
Approach LOS	D						
Intersection Summary							
Average Delay	17.0		ICU Level of Service		B		
Intersection Capacity Utilization	56.6%		15				
Analysis Period (min)							

Lanes, Volumes, Timings
7: Westside Pkwy & Encore Pkwy

Existing PM
11/10/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	7	740	399	235	349	5	348	26	251	2	20	2
Act Effct Green (s)	79.6	73.8	73.8	90.2	88.0	88.0	17.0	19.8	19.8	6.5	6.7	6.7
Actuated g/C Ratio	0.66	0.62	0.62	0.75	0.73	0.73	0.14	0.16	0.16	0.05	0.06	0.06
v/c Ratio	0.01	0.34	0.37	0.55	0.13	0.00	0.71	0.08	0.53	0.02	0.19	0.02
Control Delay	5.5	9.8	3.4	20.9	6.7	6.2	57.4	40.1	9.3	53.0	57.8	37.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.5	9.8	3.4	20.9	6.7	6.2	57.4	40.1	9.3	53.0	57.8	37.0
LOS	A	A	A	C	A	A	E	D	A	D	E	D
Approach Delay	12.3											
Approach LOS	B											
Queue Length 50th (ft)	1	88	11	36	26	0	134	18	0	2	15	0
Queue Length 95th (ft)	m4	215	m76	104	92	6	177	42	71	10	41	9
Internal Link Dist (ft)	1332											
Turn Bay Length (ft)	260	130	270	596	2594	1161	658	481	595	177	311	266
Base Capacity (vph)	730	2176	1080	596	2594	1161	658	481	595	177	311	266
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.34	0.37	0.39	0.13	0.00	0.53	0.05	0.42	0.01	0.06	0.01

Intersection Summary

Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 100 (83%). Referenced to phase 2:WBT and 6:EBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 17.0	Intersection LOS: B
Intersection Capacity Utilization 60.5%	ICU Level of Service B
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

HCM Signalized Intersection Capacity Analysis
7: Westside Pkwy & Encore Pkwy

Existing PM
11/10/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	1863	1583	1770	1863	1863
Flt Permitted	0.54	1.00	1.00	0.32	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00
Satd. Flow (perm)	1005	3539	1583	589	3539	1583	3433	1863	1583	1863	1863	1863
Volume (vph)	6	681	367	216	321	5	1	319	24	231	2	18
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	740	399	235	349	5	1	347	26	251	2	20
RTOR Reduction (vph)	0	0	121	0	0	2	0	0	0	210	0	0
Lane Group Flow (vph)	7	740	278	235	349	3	0	348	26	41	2	20
Turn Type	pm+pt	pm	pm+pt	pm	pm+pt	pm	pm	pm	pm+pt	pm	pm+pt	pm
Protected Phases	1	6	5	2	2	2	7	7	4	3	8	8
Permitted Phases	6	6	6	2	2	2	7	7	4	4	8	8
Actuated Green, G (s)	68.8	67.4	67.4	87.0	81.6	81.6	17.8	19.8	19.8	3.2	3.2	3.2
Effective Green, g (s)	68.8	67.4	67.4	87.0	81.6	81.6	17.8	19.8	19.8	3.2	3.2	3.2
Actuated g/C Ratio	0.57	0.56	0.56	0.72	0.68	0.68	0.15	0.16	0.16	0.03	0.03	0.03
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	585	1988	889	581	2407	1076	509	307	261	50	50	50
v/s Ratio Prot	0.00	0.21	0.18	c0.05	0.10	0.00	c0.10	0.01	0.00	0.00	c0.01	c0.01
v/s Ratio Perm	0.01	0.37	0.31	0.40	0.14	0.00	0.68	0.08	0.16	0.04	0.00	0.00
Uniform Delay, d1	11.2	14.6	14.0	12.0	6.8	6.2	48.4	42.4	43.0	58.9	57.5	57.5
Progression Factor	0.78	0.89	0.53	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.5	0.8	0.5	0.1	0.0	3.8	0.1	0.3	0.3	5.2	5.2
Delay (s)	8.7	10.6	8.1	12.4	6.9	6.2	52.2	42.5	43.2	59.2	62.6	62.6
Level of Service	A	B	A	B	A	A	D	D	D	D	E	E
Approach Delay (s)	9.7											
Approach LOS	A											

Intersection Summary

HCM Average Control Delay	20.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	7
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.0
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1583
Flt Permitted	1.00
Satd. Flow (perm)	1583
Volume (vph)	2
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	2
RTOR Reduction (vph)	2
Lane Group Flow (vph)	0
Turn Type	Perm
Protected Phases	
Permitted Phases	8
Actuated Green, G (s)	3.2
Effective Green, g (s)	3.2
Actuated g/C Ratio	0.03
Clearance Time (s)	4.0
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	42
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.00
Uniform Delay, d1	56.8
Progression Factor	1.00
Incremental Delay, d2	0.0
Delay (s)	56.9
Level of Service	E
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Base AM Intersection Analysis

Base 2014 AM

Lanes, Volumes, Timings
1: Old Roswell Rd & Mansell Rd

Base AM
11/10/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	41	223	588	251	413	314	33	1393	724	451	1495	51
Act Effct Green (s)	38.5	31.0	31.0	8.0	33.4	33.4	49.5	43.0	43.0	69.0	62.4	62.4
Actuated g/C Ratio	0.32	0.26	0.26	0.07	0.28	0.28	0.41	0.36	0.36	0.58	0.52	0.52
v/c Ratio	0.14	0.24	1.15	1.10	0.42	0.47	0.21	1.10	0.90	1.17	0.81	0.06
Control Delay	28.2	36.1	119.0	132.6	24.6	8.4	16.4	93.6	33.3	133.6	29.4	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.2	36.1	119.0	132.6	24.6	8.4	16.4	93.6	33.3	133.6	29.4	9.9
LOS	C	D	F	F	C	A	B	F	C	F	C	A
Approach Delay	92.9											
Approach LOS	D											
Queue Length 50th (ft)	21	72	~451	~117	141	87	11	~643	294	~366	524	10
Queue Length 95th (ft)	46	107	#676	m#202	133	31	25	#782	#557	#574	646	32
Internal Link Dist (ft)	1067											
Turn Bay Length (ft)	500	150	425	150	300	150	300	888	175	475	820	150
Base Capacity (vph)	299	914	512	229	985	667	180	1268	804	386	1841	836
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.24	1.15	1.10	0.42	0.47	0.18	1.10	0.90	1.17	0.81	0.06

Intersection Summary

Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 16 (13%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.17	
Intersection Signal Delay: 64.4	Intersection LOS: E
Intersection Capacity Utilization 88.1%	ICU Level of Service E
Analysis Period (min) 15	
~ Volume exceeds capacity, queue is theoretically infinite.	
# Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

HCM Signalized Intersection Capacity Analysis
1: Old Roswell Rd & Mansell Rd

Base AM
11/10/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.38	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	708	3539	1583	3433	3539	1583	177	3539	1583	161	3539	1583
Volume (vph)	38	205	541	231	380	289	30	1282	666	415	1375	47
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	41	223	588	251	413	314	33	1393	724	451	1495	51
RTOR Reduction (vph)	0	0	103	0	0	227	0	0	239	0	0	13
Lane Group Flow (vph)	41	223	485	251	413	87	33	1393	485	451	1495	38
Turn Type	pm+pt	Perm	Prot	Perm	pm+pt	Perm	pm+pt	Perm	pm+pt	Perm	pm+pt	Perm
Protected Phases	7	4	4	3	8	8	5	2	2	1	6	6
Permitted Phases	4											
Actuated Green, G (s)	37.4	31.0	31.0	8.8	33.4	33.4	46.4	42.2	42.2	68.2	60.0	60.0
Effective Green, g (s)	37.4	31.0	31.0	8.8	33.4	33.4	46.4	42.2	42.2	68.2	60.0	60.0
Actuated g/C Ratio	0.31	0.26	0.26	0.07	0.28	0.28	0.39	0.35	0.35	0.57	0.50	0.50
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	277	914	409	252	985	441	124	1245	557	386	1770	792
v/s Ratio Prot	0.01	0.06	c0.31	c0.07	0.12	0.06	0.01	0.39	0.31	c0.21	0.42	0.02
v/s Ratio Perm	0.15	0.24	1.19	1.00	0.42	0.20	0.27	1.12	0.87	1.17	0.84	0.05
Uniform Delay, d1	35.7	35.2	44.5	55.6	35.4	33.1	25.8	38.9	36.3	51.2	26.0	15.4
Progression Factor	1.00	1.00	1.00	0.94	0.64	1.59	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.6	105.7	51.5	1.1	0.9	1.2	64.7	16.8	100.2	5.1	0.1
Delay (s)	35.9	35.9	150.2	103.6	23.9	53.5	26.9	103.6	53.2	151.4	31.1	15.5
Level of Service	D	D	F	F	C	D	C	F	D	F	C	B
Approach Delay (s)	114.8											
Approach LOS	F											

Intersection Summary

HCM Average Control Delay	75.3	HCM Level of Service	E
HCM Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	88.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	707	691	558	35	32	417
Act Effct Green (s)	95.6	95.6	53.8	53.8	16.4	16.4
Actuated g/C Ratio	0.80	0.80	0.45	0.45	0.14	0.14
v/c Ratio	0.91	0.25	0.35	0.05	0.13	0.72
Control Delay	28.7	2.0	14.4	9.2	39.3	13.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.7	2.0	14.4	9.2	39.3	13.5
LOS	C	A	B	A	D	B
Approach Delay	15.5 14.1 15.3					
Approach LOS	B B B					
Queue Length 50th (ft)	292	17	101	1	16	28
Queue Length 95th (ft)	m279	m84	261	34	m22	54
Internal Link Dist (ft)	1273 3111 2523					
Turn Bay Length (ft)	400	235				
Base Capacity (vph)	1022	2819	1585	728	369	660
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.25	0.35	0.05	0.09	0.63

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 32 (27%), Referenced to phase 2:WBTU and 6:EBTL, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 15.1
 Intersection Capacity Utilization 63.5%
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3539	1583	1770	1583
Flt Permitted	0.37	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	698	3539	3539	1583	1770	1583
Volume (vph)	650	636	0	513	32	29
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	707	691	0	558	35	32
RTOR Reduction (vph)	0	0	0	0	19	0
Lane Group Flow (vph)	707	691	0	558	16	32
Turn Type	pm+pt Perm Perm					
Protected Phases	1	6	2	2	8	8
Permitted Phases	6					
Actuated Green, G (s)	95.6	95.6	53.8	53.8	16.4	16.4
Effective Green, g (s)	95.6	95.6	53.8	53.8	16.4	16.4
Actuated g/C Ratio	0.80	0.80	0.45	0.45	0.14	0.14
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	894	2819	1587	710	242	216
v/s Ratio Prot	c0.25	0.20	0.16	0.01	0.02	c0.04
v/s Ratio Perm	c0.38					
v/c Ratio	0.79	0.25	0.35	0.02	0.13	0.26
Uniform Delay, d1	13.4	3.1	21.7	18.4	45.5	46.4
Progression Factor	0.84	0.53	0.51	0.84	0.91	1.59
Incremental Delay, d2	2.2	0.1	0.6	0.1	0.2	0.6
Delay (s)	13.4	1.7	11.7	15.5	41.6	74.2
Level of Service	B	A	B	B	D	E
Approach Delay (s)	7.6 11.9 71.9 E					
Approach LOS	A B B					

Intersection Summary

HCM Average Control Delay
 HCM Volume to Capacity ratio
 Actuated Cycle Length (s)
 Intersection Capacity Utilization
 Analysis Period (min)
 c Critical Lane Group



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	337	3	76	28	23	598	210	223	555	223
Act Effct Green (s)	34.6	34.6	34.6	34.6	67.8	61.9	61.9	77.4	71.2	71.2
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.56	0.52	0.52	0.64	0.59	0.59
v/c Ratio	0.91	0.01	0.19	0.06	0.06	0.62	0.23	0.66	0.50	0.22
Control Delay	69.9	16.7	27.9	6.5	9.3	15.8	2.8	20.6	18.8	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.9	16.7	27.9	6.5	9.3	15.8	2.8	20.6	18.8	6.9
LOS	E	B	C	A	A	B	A	C	B	A
Approach Delay	69.4		22.2			12.4			16.5	
Approach LOS	E		C			B			B	
Queue Length 50th (ft)	249	0	52	3	2	134	1	67	262	32
Queue Length 95th (ft)	345	7	m53	m6	m8	m277	m27	130	424	85
Internal Link Dist (ft)	1205		1883			2523			1023	
Turn Bay Length (ft)	160		200		200	235		150	120	
Base Capacity (vph)	458	569	505	585	402	961	909	369	1106	994
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.01	0.15	0.05	0.06	0.62	0.23	0.60	0.50	0.22

Intersection Summary

Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 84 (70%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 23.2	Intersection LOS: C
Intersection Capacity Utilization 74.1%	ICU Level of Service D
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4	4	4	4	4	4	4	4	4	4	4	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85
Flt Protected	0.96	1.00	0.96	1.00	0.98	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1780	1583	1780	1583	1820	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.69	1.00	0.64	1.00	0.64	1.00	0.38	1.00	0.64	1.00	0.25	1.00
Satd. Flow (perm)	1278	1583	1197	1583	1197	1583	704	1863	1583	1197	1583	1583
Volume (vph)	289	21	3	33	37	26	21	550	193	205	511	205
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	314	23	3	36	40	28	23	598	210	223	555	223
RTOR Reduction (vph)	0	0	2	0	0	0	0	0	0	92	0	0
Lane Group Flow (vph)	0	337	1	0	76	8	23	598	118	223	555	167
Turn Type	Perm	Perm	Perm	Perm	Perm	Perm	pm+pt	Perm	pm+pt	Perm	pm+pt	Perm
Protected Phases	8	8	4	4	4	4	1	6	6	5	2	2
Permitted Phases	8	8	4	4	4	4	6	6	6	6	2	2
Actuated Green, G (s)	34.6	34.6	34.6	34.6	34.6	34.6	65.6	61.9	61.9	77.4	69.7	69.7
Effective Green, g (s)	34.6	34.6	34.6	34.6	34.6	34.6	65.6	61.9	61.9	77.4	69.7	69.7
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.29	0.29	0.55	0.52	0.52	0.64	0.58	0.58
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	368	456	345	456	418	961	817	422	1082	919		
v/s Ratio Prot							0.00	c0.32		c0.05	0.30	
v/s Ratio Perm	c0.26	0.00	0.06	0.01	0.03	0.06	0.01	0.07	0.29	0.11		
v/c Ratio	0.92	0.00	0.22	0.02	0.06	0.62	0.14	0.53	0.51	0.18		
Uniform Delay, d1	41.3	30.4	32.4	30.5	13.0	20.7	15.2	13.4	15.0	11.8		
Progression Factor	1.00	1.00	0.91	0.71	0.87	0.59	0.64	1.00	1.00	1.00		
Incremental Delay, d2	26.7	0.0	0.2	0.0	0.0	1.8	0.2	1.2	1.7	0.4		
Delay (s)	68.0	30.4	29.8	21.6	11.4	14.0	9.9	14.6	16.8	12.2		
Level of Service	E	C	C	C	C	B	B	A	B	B		
Approach Delay (s)	67.7		27.6							15.3		
Approach LOS	E		C							B		

Intersection Summary

HCM Average Control Delay	22.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	74.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBU	WBT	SBL	SBR
Lane Group Flow (vph)	508	351	3	750	576	38
Act Effct Green (s)	105.9	106.7	79.2	79.2	79.2	8.0
Actuated g/C Ratio	0.88	0.89	0.66	0.66	0.66	0.07
v/c Ratio	0.85	0.11	0.00	0.32	0.48	0.32
Control Delay	30.2	1.4	15.3	12.8	7.4	58.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.2	1.4	15.3	12.8	7.4	58.9
LOS	C	A	B	B	A	E
Approach Delay	18.4			10.5		46.6
Approach LOS	B			B		D
Queue Length 50th (ft)	179	16	1	77	0	30
Queue Length 95th (ft)	385	27	m3	259	237	m19
Internal Link Dist (ft)	265			540		765
Turn Bay Length (ft)	240	150			150	
Base Capacity (vph)	845	3148	665	2336	1209	295
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.11	0.00	0.32	0.48	0.13

Intersection Summary
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 75 (63%), Referenced to phase 2:WBTU and 6:EBTL, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.85
 Intersection Signal Delay: 14.5
 Intersection Capacity Utilization 65.4%
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	WBU	WBT	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95
Satd. Flow (prot)	1770	3539	1770	3539	1583	1770
Flt Permitted	0.31	1.00	0.54	1.00	1.00	0.95
Satd. Flow (perm)	587	3539	1009	3539	1583	1770
Volume (vph)	467	323	3	690	530	35
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	508	351	3	750	576	38
RTOR Reduction (vph)	0	0	0	0	168	0
Lane Group Flow (vph)	508	351	3	750	408	38
Turn Type	pm+pt	Perm	Perm	Perm	Perm	Perm
Protected Phases	1	6	2	2	8	8
Permitted Phases	6					
Actuated Green, G (s)	105.1	105.1	78.4	78.4	78.4	6.9
Effective Green, g (s)	105.1	105.1	78.4	78.4	78.4	6.9
Actuated g/C Ratio	0.88	0.88	0.65	0.65	0.65	0.06
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	738	3100	659	2312	1034	91
v/s Ratio Prot	c0.13	0.10		0.21	c0.02	
v/s Ratio Perm	c0.47		0.00		0.26	0.00
v/c Ratio	0.69	0.11	0.00	0.32	0.39	0.01
Uniform Delay, d1	3.5	1.0	7.2	9.1	9.7	54.5
Progression Factor	1.32	1.12	1.15	1.09	2.19	0.99
Incremental Delay, d2	2.7	0.1	0.0	0.3	1.0	2.1
Delay (s)	7.3	1.2	8.3	10.3	22.3	56.0
Level of Service	A	A	A	B	C	E
Approach Delay (s)		4.8		15.5		58.2
Approach LOS		A		B		E

Intersection Summary		
HCM Average Control Delay	12.5	HCM Level of Service B
HCM Volume to Capacity ratio	0.66	
Actuated Cycle Length (s)	120.0	Sum of lost time (s) 8.0
Intersection Capacity Utilization	65.4%	ICU Level of Service C
Analysis Period (min)	15	
c Critical Lane Group		



Lane Group	EBL	EBR	NBL	NBT	SBU	SBT
Lane Group Flow (vph)	5	41	623	417	1	399
Sign Control	Stop		Free	Free	Free	Free
Intersection Summary						
Control Type: Unsignalized						
Intersection Capacity Utilization 55.8%						
Analysis Period (min) 15						
ICU Level of Service B						



Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔
Sign Control	Stop		Free	Free	Free	Free	Free
Grade	0%		0%	0%	0%	0%	0%
Volume (veh/h)	5	38	573	384	1	236	131
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	41	623	417	0	257	142
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type							
Median storage (veh)	1						
Upstream signal (ft)			845				
pX, platoon unblocked				0.00			
VC, conflicting volume	1782	199	399	0			
VC1, stage 1 conf vol	328						
VC2, stage 2 conf vol	1454						
vCu, unblocked vol	1782	199	399	0			
tC, single (s)	6.8	6.9	4.1	0.0			
tC, 2 stage (s)	5.8						
tF (s)	3.5	3.3	2.2	0.0			
p0 queue free %	93	95	46	0			
cM capacity (veh/h)	73	808	1156	0			
Direction, Lane #							
	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	5	41	623	209	171	228	0
Volume Left	5	0	623	0	0	0	0
Volume Right	0	41	0	0	0	142	0
cSH	73	808	1156	1700	1700	1700	1700
Volume to Capacity	0.07	0.05	0.54	0.12	0.12	0.13	0.00
Queue Length 95th (ft)	6	4	83	0	0	0	0
Control Delay (s)	58.2	9.7	11.7	0.0	0.0	0.0	0.0
Lane LOS	F	A	B				
Approach Delay (s)	15.3		7.0		0.0		
Approach LOS	C						
Intersection Summary							
Average Delay	5.4			B			
Intersection Capacity Utilization	55.8%			ICU Level of Service			
Analysis Period (min)	15						

Lanes, Volumes, Timings
7: Westside Pkwy & Encore Pkwy

Base AM
11/10/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	1	243	165	332	917	7	392	25	134	9	8
Act Effct Green (s)	77.4	71.8	71.8	89.2	87.2	87.2	18.5	22.8	22.8	6.1	6.1
Actuated g/C Ratio	0.64	0.60	0.60	0.74	0.73	0.73	0.15	0.19	0.19	0.05	0.05
v/c Ratio	0.00	0.11	0.16	0.43	0.36	0.01	0.74	0.07	0.33	0.09	0.09
Control Delay	10.0	15.4	6.5	7.9	8.2	6.5	57.1	35.8	7.7	56.0	31.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.0	15.4	6.5	7.9	8.2	6.5	57.1	35.8	7.7	56.0	31.0
LOS	A	B	A	A	A	A	E	D	A	E	C
Approach Delay	11.8										
Approach LOS	B										
Queue Length 50th (ft)	0	40	0	58	92	0	151	17	0	7	0
Queue Length 95th (ft)	m2	72	33	151	259	7	195	36	47	24	17
Internal Link Dist (ft)	1317										
Turn Bay Length (ft)	260	130	270	862	2572	1152	715	517	536	326	284
Base Capacity (vph)	424	2118	1014	862	2572	1152	715	517	536	326	284
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.11	0.16	0.39	0.36	0.01	0.55	0.05	0.25	0.03	0.03

Intersection Summary

Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 15 (13%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 17.9	Intersection LOS: B
Intersection Capacity Utilization 53.6%	ICU Level of Service A
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

HCM Signalized Intersection Capacity Analysis
7: Westside Pkwy & Encore Pkwy

Base AM
11/10/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	0.85	1.00
Flt	1.00	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	1863	1583	1863	1583
Flt Permitted	0.31	1.00	1.00	0.57	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Satd. Flow (perm)	580	3539	1583	1058	3539	1583	3433	1863	1583	3433	1583
Volume (vph)	1	224	152	305	844	6	361	23	123	0	8
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	243	165	332	917	7	392	25	134	0	8
RTOR Reduction (vph)	0	0	69	0	0	2	0	0	106	0	0
Lane Group Flow (vph)	1	243	96	332	917	5	392	25	28	0	9
Turn Type	pm+pt	Perm	pm+pt	Perm	pm+pt	Perm	Prot	Perm	pm+pt	Perm	pm+pt
Protected Phases	1	6	5	2	2	7	4	3	8	8	8
Permitted Phases	6	6	6	2	2	2	4	4	8	8	8
Actuated Green, G (s)	70.6	69.5	69.5	86.8	81.7	81.7	18.5	25.2	25.2	2.7	2.7
Effective Green, g (s)	70.6	69.5	69.5	86.8	81.7	81.7	18.5	25.2	25.2	2.7	2.7
Actuated g/C Ratio	0.59	0.58	0.58	0.72	0.68	0.68	0.15	0.21	0.21	0.02	0.02
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	352	2050	917	844	2409	1078	529	391	332	42	36
v/s Ratio Prot	0.00	0.07	0.06	c0.04	0.26	c0.11	0.01	0.01	0.02	c0.00	0.00
v/s Ratio Perm	0.00	0.12	0.10	0.39	0.38	0.01	0.74	0.06	0.08	0.21	0.00
Uniform Delay, d1	10.2	11.4	11.3	5.7	8.3	6.1	48.5	38.0	38.1	57.6	57.3
Progression Factor	1.25	1.18	2.17	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.1	0.2	0.3	0.5	0.0	5.5	0.1	0.1	2.6	0.1
Delay (s)	12.7	13.5	24.8	6.1	8.7	6.1	54.0	38.0	38.2	60.2	57.4
Level of Service	B	B	C	A	A	A	D	D	D	E	E
Approach Delay (s)	18.1										
Approach LOS	B										

Intersection Summary

HCM Average Control Delay	20.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	53.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Base 2014 AM Improved

Lanes, Volumes, Timings

1: Old Roswell Rd & Mansell Rd

Base AM - Improved
11/10/2009

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	41	223	588	251	413	314	33	1393	724	451	1495	51
Act Effct Green (s)	16.9	16.9	120.0	12.0	23.6	43.5	63.0	56.0	56.0	19.1	71.9	71.9
Actuated g/C Ratio	0.14	0.14	1.00	0.10	0.20	0.36	0.52	0.47	0.47	0.16	0.60	0.60
v/c Ratio	0.23	0.45	0.37	0.73	0.59	0.49	0.20	0.84	0.77	0.83	0.71	0.05
Control Delay	49.6	50.9	0.7	54.0	38.5	9.3	15.7	34.1	18.7	62.3	19.7	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.6	50.9	0.7	54.0	38.5	9.3	15.7	34.1	18.7	62.3	19.7	6.1
LOS	D	D	A	D	D	A	B	C	B	E	B	A
Approach Delay	16.2											
Approach LOS	B											
Queue Length 50th (ft)	29	85	0	105	175	42	8	487	231	174	435	7
Queue Length 95th (ft)	64	126	0	m#151	230	m160	19	589	408	#237	524	24
Internal Link Dist (ft)	1067											
Turn Bay Length (ft)	500	150	425	343	695	150	300	180	1652	938	572	2120
Base Capacity (vph)	187	499	1583	343	695	636	180	1652	938	572	2120	961
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.45	0.37	0.73	0.59	0.49	0.18	0.84	0.77	0.79	0.71	0.05

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 107 (89%). Referenced to phase 2:NBTL and 6:SBT; Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 27.7

Intersection Capacity Utilization 74.4%

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

1: Old Roswell Rd & Mansell Rd

Base AM - Improved
11/10/2009

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.95	1.00	0.95	1.00	0.97	0.95
Flt	1.00	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.37	1.00	1.00	0.95	1.00	1.00	0.07	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	690	3539	1583	3433	3539	1583	139	3539	1583	3433	3539	1583
Volume (vph)	38	205	541	231	380	289	30	1282	666	415	1375	47
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	41	223	588	251	413	314	33	1393	724	451	1495	51
RTOR Reduction (vph)	0	0	0	0	0	0	62	0	0	207	0	13
Lane Group Flow (vph)	41	223	588	251	413	252	33	1393	517	451	1495	38
Turn Type	pm+pt	Free	Prot	Free	Prot	pm+ov	pm+pt	Perm	Prot	Perm	Prot	Perm
Protected Phases	7	4	8	3	8	1	5	2	1	6	6	6
Permitted Phases	4	Free	Free	Free	Free	8	2	2	2	69.5	69.5	69.5
Actuated Green, G (s)	16.9	16.9	120.0	12.8	23.6	44.3	58.4	53.6	53.6	20.7	73.3	73.3
Effective Green, g (s)	16.9	16.9	120.0	12.8	23.6	44.3	58.4	53.6	53.6	20.7	73.3	73.3
Actuated g/C Ratio	0.14	0.14	1.00	0.11	0.20	0.37	0.49	0.45	0.45	0.17	0.58	0.58
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	152	498	1583	366	696	584	133	1581	707	592	2050	917
v/s Ratio Prot	0.01	0.06	0.07	0.07	0.12	0.07	0.01	0.39	0.13	0.42	0.02	0.02
v/s Ratio Perm	0.02	0.45	0.37	0.69	0.59	0.43	0.25	0.88	0.73	0.76	0.73	0.04
v/c Ratio	0.27	0.45	0.37	0.69	0.59	0.43	0.25	0.88	0.73	0.76	0.73	0.04
Uniform Delay, d1	45.8	47.3	0.0	51.7	43.8	28.4	42.5	30.3	27.3	47.3	18.4	10.9
Progression Factor	1.00	1.00	1.00	0.81	0.78	0.47	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	2.9	0.7	4.5	3.1	0.4	1.0	7.4	6.6	5.8	2.3	0.1
Delay (s)	46.8	50.2	0.7	46.2	37.2	13.7	43.5	37.7	33.9	53.1	20.7	11.0
Level of Service	D	D	A	D	D	B	D	D	C	D	C	B
Approach Delay (s)	15.8											
Approach LOS	B											

Intersection Summary

HCM Average Control Delay 29.9 HCM Level of Service C

HCM Volume to Capacity ratio 0.72

Actuated Cycle Length (s) 120.0

Intersection Capacity Utilization 74.4%

Analysis Period (min) 15

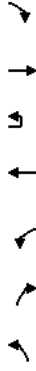
c Critical Lane Group

Lanes, Volumes, Timings
5: First Drwy (Commercial) & Sanctuary Pkwy

HCM Unsignalized Intersection Capacity Analysis
5: First Drwy (Commercial) & Sanctuary Pkwy

Base AM - Improved
11/10/2009

Base AM - Improved
11/10/2009



Lane Group	EBL	EBR	NBL	NBT	SBU	SBT
Lane Group Flow (vph)	5	41	623	417	1	399
Sign Control	Stop			Free		Free
Intersection Summary						
Control Type: Unsignalized						
Intersection Capacity Utilization 55.8%						
Analysis Period (min) 15						
ICU Level of Service B						

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	
Sign Control	Stop		Free	Free	Free	Free	
Grade	0%		0%	0%	0%	0%	
Volume (veh/h)	5	38	573	384	1	236	131
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	41	623	417	0	257	142
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None						
Median storage (veh)							
Upstream signal (ft)				845			
pX, platoon unblocked					0.00		
vC, conflicting volume	1782	199	399		0		
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1782	199	399		0		
tC, single (s)	6.8	6.9	4.1		0.0		
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.2		0.0		
p0 queue free %	84	95	46		0		
cM capacity (veh/h)	34	808	1156		0		
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	5	41	623	209	171	228	0
Volume Left	5	0	623	0	0	0	0
Volume Right	0	41	0	0	0	142	0
cSH	34	808	1156	1700	1700	1700	1700
Volume to Capacity	0.16	0.05	0.54	0.12	0.12	0.10	0.13
Queue Length 95th (ft)	13	4	83	0	0	0	0
Control Delay (s)	131.2	9.7	11.7	0.0	0.0	0.0	0.0
Lane LOS	F	A	B				
Approach Delay (s)	23.8		7.0		0.0		
Approach LOS	C						
Intersection Summary							
Average Delay	5.6						
Intersection Capacity Utilization	55.8%						
Analysis Period (min)	15						
	ICU Level of Service						
	B						

Base PM Intersection Analysis

Base 2014 PM

Lanes, Volumes, Timings
1: Old Roswell Rd & Mansell Rd

Base PM
11/10/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	39	201	438	442	399	473	72	1675	327	348	1505	84
Act Effct Green (s)	28.0	21.0	21.0	13.0	30.8	30.8	7.7	54.0	54.0	64.4	64.4	64.4
Actuated g/C Ratio	0.23	0.18	0.18	0.11	0.28	0.26	0.06	0.45	0.45	0.54	0.54	0.54
v/c Ratio	0.19	0.32	1.13	1.19	0.44	0.74	0.64	1.05	0.41	1.16	0.79	0.10
Control Delay	33.9	45.0	118.4	142.0	30.6	14.6	79.6	70.2	12.3	132.6	27.0	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.9	45.0	118.4	142.0	30.6	14.6	79.6	70.2	12.3	132.6	27.0	7.8
LOS	C	D	F	F	C	B	E	E	B	F	C	A
Approach Delay	91.7											
Approach LOS	E											
Queue Length 50th (ft)	21	72	~304	~219	143	203	55	~745	78	~270	497	14
Queue Length 95th (ft)	48	110	#511	m#306	m141	m#106	#119	#885	152	#460	601	40
Internal Link Dist (ft)	1067											
Turn Bay Length (ft)	500	150	425	372	909	643	118	1593	801	301	1899	871
Base Capacity (vph)	219	619	387	372	909	643	118	1593	801	301	1899	871
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.32	1.13	1.19	0.44	0.74	0.61	1.05	0.41	1.16	0.79	0.10

Intersection Summary

Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 108 (90%). Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.19	
Intersection Signal Delay: 59.8	Intersection LOS: E
Intersection Capacity Utilization 90.4%	ICU Level of Service E
Analysis Period (min) 15	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

HCM Signalized Intersection Capacity Analysis
1: Old Roswell Rd & Mansell Rd

Base PM
11/10/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	1.00	0.95	1.00	0.95	1.00	0.85	1.00	0.85
Fit	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Fit Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	1770	3539	1583	1770	3539	1583
Fit Permitted	0.33	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (perm)	606	3539	1583	3433	3539	1583	1770	3539	1583	162	3539	1583
Volume (vph)	36	185	403	407	367	435	66	1541	301	320	1385	77
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	39	201	438	442	399	473	72	1675	327	348	1505	84
RTOR Reduction (vph)	0	0	110	0	0	237	0	0	91	0	0	22
Lane Group Flow (vph)	39	201	328	442	399	236	72	1675	236	348	1505	62
Turn Type	pm+pt	Perm	Prot	Perm	Prot	Perm	Prot	Perm	pm+pt	Perm	pm+pt	Perm
Protected Phases	7	4	4	3	8	8	5	2	1	6	6	6
Permitted Phases	4								2			
Actuated Green, G (s)	25.8	21.0	21.0	14.6	30.8	30.8	6.4	52.4	52.4	62.0	62.0	62.0
Effective Green, g (s)	25.8	21.0	21.0	14.6	30.8	30.8	6.4	52.4	52.4	62.0	62.0	62.0
Actuated g/C Ratio	0.22	0.18	0.18	0.12	0.26	0.26	0.05	0.44	0.44	0.52	0.52	0.52
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	177	619	277	418	908	406	94	1545	691	298	1828	818
v/s Ratio Prot	0.01	0.06		c0.13	0.11	0.15	0.04	c0.47		c0.16	0.43	
v/s Ratio Perm	0.04		c0.21			0.15			0.15	c0.45		0.04
v/c Ratio	0.22	0.32	1.19	1.06	0.44	0.58	0.77	1.08	0.34	1.17	0.82	0.08
Uniform Delay, d1	45.2	43.3	49.5	52.7	37.4	39.0	56.1	33.8	22.4	54.2	24.4	14.6
Progression Factor	1.00	1.00	1.00	0.76	0.75	0.57	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	1.4	113.8	55.9	1.3	4.9	30.4	49.4	1.3	105.6	4.4	0.2
Delay (s)	45.8	44.7	163.3	95.8	29.5	27.2	86.4	83.2	23.7	159.8	28.7	14.8
Level of Service	D	D	F	F	C	C	F	F	C	F	C	B
Approach Delay (s)	121.4											
Approach LOS	F											

Intersection Summary

HCM Average Control Delay	67.1	HCM Level of Service	E
HCM Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	90.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	397	483	676	10	28	639
Act Effct Green (s)	84.3	84.3	60.2	60.2	27.7	27.7
Actuated g/C Ratio	0.70	0.70	0.50	0.50	0.23	0.23
v/c Ratio	0.80	0.19	0.38	0.01	0.07	0.79
Control Delay	36.3	8.6	16.0	5.0	21.5	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.3	8.6	16.0	5.0	21.5	10.9
LOS	D	A	B	A	C	B
Approach Delay	21.1 15.8					
Approach LOS	C B					
Queue Length 50th (ft)	133	70	129	0	11	15
Queue Length 95th (ft)	m232	m136	220	m1	m16	15
Internal Link Dist (ft)	1273 3111					
Turn Bay Length (ft)	400	2522	1782	802	652	944
Base Capacity (vph)	672	2522	1782	802	652	944
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.19	0.38	0.01	0.04	0.68

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 28 (23%), Referenced to phase 2:WBTU and 6:EBTL, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 16.6
 Intersection Capacity Utilization 60.3%
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3539	1583	1770	1583
Flt Permitted	0.33	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	612	3539	3539	1583	1770	1583
Volume (vph)	365	444	0	622	9	26
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	397	483	0	676	10	28
RTOR Reduction (vph)	0	0	0	0	5	0
Lane Group Flow (vph)	397	483	0	676	5	28
Turn Type	pm+pt	Perm	Perm	Perm	Perm	Perm
Protected Phases	1	6	2	2	8	8
Permitted Phases	6	84.3	84.3	60.2	27.7	27.7
Actuated Green, G (s)	84.3	84.3	60.2	60.2	27.7	27.7
Effective Green, g (s)	84.3	84.3	60.2	60.2	27.7	27.7
Actuated g/C Ratio	0.70	0.70	0.50	0.50	0.23	0.23
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	624	2486	1775	794	409	365
v/s Ratio Prot	c0.11	0.14	0.19	0.00	0.02	
v/s Ratio Perm	c0.34					c0.13
v/c Ratio	0.64	0.19	0.38	0.01	0.07	0.55
Uniform Delay, d1	19.6	6.1	18.4	14.9	36.1	40.6
Progression Factor	1.06	0.94	0.58	0.30	0.76	0.94
Incremental Delay, d2	1.5	0.1	0.6	0.0	0.1	1.4
Delay (s)	22.2	5.9	11.3	4.5	27.5	39.6
Level of Service	C	A	B	A	C	D
Approach Delay (s)	13.3					
Approach LOS	B					

Intersection Summary

HCM Average Control Delay
 HCM Volume to Capacity ratio
 Actuated Cycle Length (s)
 Intersection Capacity Utilization
 Analysis Period (min)
 c Critical Lane Group



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	173	8	125	208	100	477	16	14	650	123
Act Effct Green (s)	22.9	22.9	22.9	22.9	87.5	85.3	85.3	85.1	79.6	79.6
Actuated g/C Ratio	0.19	0.19	0.19	0.19	0.73	0.71	0.71	0.71	0.66	0.66
v/c Ratio	0.81	0.03	0.66	0.44	0.28	0.36	0.01	0.03	0.53	0.11
Control Delay	72.9	18.1	61.8	9.1	4.2	3.7	0.0	6.2	13.7	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.9	18.1	61.8	9.1	4.2	3.7	0.0	6.2	13.7	4.8
LOS	E	B	E	A	A	A	A	A	B	A
Approach Delay	70.5		28.9			3.6			12.2	
Approach LOS	E		C			A			B	
Queue Length 50th (ft)	130	0	89	1	6	39	0	2	238	14
Queue Length 95th (ft)	194	13	m144	m60	m11	m67	m0	11	425	45
Internal Link Dist (ft)	1205		1883			2523			1023	
Turn Bay Length (ft)	160		200		235	150			120	
Base Capacity (vph)	325	467	287	609	453	1324	1130	612	1235	1072
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.02	0.44	0.34	0.22	0.36	0.01	0.02	0.53	0.11

Intersection Summary

Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 73 (61%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 18.0	Intersection LOS: B
Intersection Capacity Utilization 62.0%	ICU Level of Service B
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4	4	4	4	4	4	4	4	4	4	4	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1776	1583	1776	1583	1776	1583	1776	1583	1776	1583	1776	1583
Flt Permitted	0.55	1.00	0.44	1.00	0.31	1.00	1.00	0.43	1.00	1.00	0.43	1.00
Satd. Flow (perm)	1024	1583	819	1583	585	1863	1583	803	1863	1583	803	1863
Volume (vph)	156	3	7	114	1	191	92	439	15	13	598	113
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	170	3	8	124	1	208	100	477	16	14	650	123
RTOR Reduction (vph)	0	0	6	0	0	168	0	0	5	0	0	24
Lane Group Flow (vph)	0	173	2	0	125	40	100	477	11	14	650	99
Turn Type	Perm	Perm	Perm	Perm	Perm	pm+pt	Perm	pm+pt	Perm	pm+pt	Perm	Perm
Protected Phases	8	8	4	4	4	1	6	5	2	2	2	2
Permitted Phases	8	8	8	4	4	4	6	6	6	6	6	2
Actuated Green, G (s)	22.9	22.9	22.9	22.9	22.9	89.1	82.9	82.9	82.9	79.4	77.2	77.2
Effective Green, g (s)	22.9	22.9	22.9	22.9	22.9	89.1	82.9	82.9	82.9	79.4	77.2	77.2
Actuated g/C Ratio	0.19	0.19	0.19	0.19	0.19	0.74	0.69	0.69	0.69	0.66	0.64	0.64
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	195	302	156	302	512	1287	1094	549	1199	1018	1018	1018
v/s Ratio Prot	0.17	0.00	0.15	0.03	0.13	0.01	0.26	0.01	0.02	0.00	0.35	0.06
v/c Ratio Perm	0.89	0.01	0.80	0.13	0.20	0.37	0.01	0.03	0.03	0.54	0.10	0.10
Uniform Delay, d1	47.3	39.3	46.4	40.3	12.5	7.7	5.8	10.6	11.7	8.1	8.1	8.1
Progression Factor	1.00	1.00	1.03	1.27	0.33	0.34	0.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	34.8	0.0	24.8	0.2	0.2	0.7	0.0	0.0	0.0	1.8	0.2	0.2
Delay (s)	82.1	39.3	72.3	51.4	4.3	3.3	0.0	10.6	13.5	8.3	8.3	8.3
Level of Service	F	D	E	D	A	A	A	A	B	B	A	A
Approach Delay (s)	80.2		59.3			3.4			12.6			
Approach LOS	F		E			A			B			

Intersection Summary

HCM Average Control Delay	24.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBU	WBT	SBL	SBR
Lane Group Flow (vph)	16	690	2	747	32	635
Act Effct Green (s)	59.9	59.9	55.6	55.6	52.1	52.1
Actuated g/C Ratio	0.50	0.50	0.46	0.46	0.43	0.43
v/c Ratio	0.08	0.39	0.01	0.46	0.04	0.83
Control Delay	16.8	18.3	14.0	16.4	3.9	39.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.8	18.3	14.0	16.4	3.9	39.1
LOS	B	B	B	B	A	D
Approach Delay	18.2					
Approach LOS	B					
Queue Length 50th (ft)	5	204	0	64	0	418
Queue Length 95th (ft)	14	145	m3	272	m15	497
Internal Link Dist (ft)	265					
Turn Bay Length (ft)	240	150	150	150	150	150
Base Capacity (vph)	271	1765	336	1641	747	915
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.39	0.01	0.46	0.04	0.69

Intersection Summary
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 90 (75%), Referenced to phase 2:WBTU and 6:EBTL, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 21.1
 Intersection Capacity Utilization 58.0%
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	WBU	WBT	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	1770	3539	1583	1770
Flt Permitted	0.25	1.00	0.36	1.00	1.00	0.95
Satd. Flow (perm)	463	3539	663	3539	1583	1770
Volume (vph)	15	635	2	687	29	584
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	690	2	747	32	635
RTOR Reduction (vph)	0	0	0	0	13	0
Lane Group Flow (vph)	16	690	2	747	19	635
Turn Type	pm+pt	Perm	Perm	Perm	Perm	Perm
Protected Phases	1	6	2	2	8	8
Permitted Phases	6	2	2	2	2	8
Actuated Green, G (s)	59.9	59.9	53.3	53.3	52.1	52.1
Effective Green, g (s)	59.9	59.9	53.3	53.3	52.1	52.1
Actuated g/C Ratio	0.50	0.50	0.44	0.44	0.44	0.43
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	259	1767	294	1572	703	768
v/s Ratio Prot	0.00	c0.19	0.00	c0.21	c0.36	0.18
v/s Ratio Perm	0.03	0.00	0.00	0.01	0.03	0.41
v/c Ratio	0.06	0.39	0.01	0.48	0.03	0.83
Uniform Delay, d1	16.7	18.7	18.6	23.5	18.8	30.0
Progression Factor	0.85	0.87	0.56	0.63	0.31	1.00
Incremental Delay, d2	0.1	0.6	0.0	0.9	0.1	7.3
Delay (s)	14.3	16.9	10.4	15.7	5.8	37.3
Level of Service	B	B	B	B	A	D
Approach Delay (s)	16.8					
Approach LOS	B					

Intersection Summary		
HCM Average Control Delay	22.6	HCM Level of Service C
HCM Volume to Capacity ratio	0.65	
Actuated Cycle Length (s)	120.0	Sum of lost time (s) 12.0
Intersection Capacity Utilization	58.0%	ICU Level of Service B
Analysis Period (min)	15	
c Critical Lane Group		

Lanes, Volumes, Timings
5: First Drwy (Commercial) & Sanctuary Pkwy

Base PM
11/10/2009

Movement	EBL	EBR	NBL	NBT	SBU	SBT
Lane Group Flow (vph)	111	635	29	55	1	614
Sign Control	Stop		Free	Free	Free	Free
Intersection Summary						
Control Type: Unsignalized						
Intersection Capacity Utilization 58.5%						
Analysis Period (min) 15						
ICU Level of Service B						

HCM Unsignalized Intersection Capacity Analysis
5: First Drwy (Commercial) & Sanctuary Pkwy

Base PM
11/10/2009

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔
Sign Control	Stop		Free	Free	Free	Free	Free
Grade	0%		0%	0%	0%	0%	0%
Volume (veh/h)	102	584	27	51	1	545	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	111	635	29	55	0	592	22
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type							
Median storage (veh)	1						
Upstream signal (ft)			845				
pX, platoon unblocked				0.00			
VC, conflicting volume	690	307	614	0			
VC1, stage 1 conf vol	603						
VC2, stage 2 conf vol	86						
VCu, unblocked vol	690	307	614	0			
tC, single (s)	6.8	6.9	4.1	0.0			
tC, 2 stage (s)	5.8						
tF (s)	3.5	3.3	2.2	0.0			
p0 queue free %	75	8	97	0			
cM capacity (veh/h)	437	689	961	0			
Direction, Lane #							
	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2 SB 3
Volume Total	111	635	29	28	28	395	219 0
Volume Left	111	0	29	0	0	0	0 0
Volume Right	0	635	0	0	0	0	22 0
cSH	437	689	961	1700	1700	1700	1700 1700
Volume to Capacity	0.25	0.92	0.03	0.02	0.02	0.23	0.13 0.00
Queue Length 95th (ft)	25	310	2	0	0	0	0 0
Control Delay (s)	16.0	42.4	8.9	0.0	0.0	0.0	0.0 0.0
Lane LOS	C	E	A				
Approach Delay (s)	38.4		3.1			0.0	
Approach LOS	E						
Intersection Summary							
Average Delay			20.0				
Intersection Capacity Utilization			58.5%				B
Analysis Period (min)			15				

Lanes, Volumes, Timings
7: Westside Pkwy & Encore Pkwy

Base PM
11/10/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	8	851	459	270	401	7	400	30	289	2	23	2
Act Effct Green (s)	73.8	68.2	68.2	86.0	84.0	84.0	18.9	24.0	24.0	6.9	7.0	7.0
Actuated g/C Ratio	0.62	0.57	0.57	0.72	0.70	0.70	0.16	0.20	0.20	0.06	0.06	0.06
v/c Ratio	0.01	0.42	0.45	0.75	0.16	0.01	0.74	0.08	0.53	0.02	0.21	0.02
Control Delay	4.9	10.6	4.6	26.4	8.1	6.2	56.4	36.6	8.0	52.5	57.9	37.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.9	10.6	4.6	26.4	8.1	6.2	56.4	36.6	8.0	52.5	57.9	37.0
LOS	A	B	A	C	A	A	E	D	A	D	E	D
Approach Delay	8.4											
Approach LOS	B											
Queue Length 50th (ft)	1	167	61	76	52	0	154	18	0	2	17	0
Queue Length 95th (ft)	m2	229	m114	184	110	7	197	45	72	10	44	9
Internal Link Dist (ft)	1317											
Turn Bay Length (ft)	260	130	270	488	2477	1110	642	474	619	133	264	226
Base Capacity (vph)	679	2011	1025	488	2477	1110	642	474	619	133	264	226
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.42	0.45	0.55	0.16	0.01	0.62	0.06	0.47	0.02	0.09	0.01

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 96 (80%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.75
 Intersection Signal Delay: 17.9
 Intersection Capacity Utilization 67.0%
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
7: Westside Pkwy & Encore Pkwy

Base PM
11/10/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	0.85	1.00	1.00
Flt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	1863	1583	1770	1863	1863
Flt Permitted	0.52	1.00	1.00	0.24	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00
Satd. Flow (perm)	961	3539	1583	455	3539	1583	3433	1863	1583	1863	1863	1863
Volume (vph)	7	783	422	248	369	6	1	367	28	266	2	21
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	8	851	459	270	401	7	1	399	30	289	2	23
RTOR Reduction (vph)	0	0	132	0	0	2	0	0	0	231	0	0
Lane Group Flow (vph)	8	851	327	270	401	5	0	400	30	58	2	23
Turn Type	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	Prot	Prot	Prot	pm+pt	pm+pt	pm+pt
Protected Phases	1	6	5	2	2	2	7	7	4	3	8	8
Permitted Phases	6	65.0	65.0	82.8	77.6	77.6	20.5	24.0	24.0	4.7	4.7	4.7
Actuated Green, G (s)	66.2	65.0	65.0	82.8	77.6	77.6	20.5	24.0	24.0	4.7	4.7	4.7
Effective Green, g (s)	66.2	65.0	65.0	82.8	77.6	77.6	20.5	24.0	24.0	4.7	4.7	4.7
Actuated g/C Ratio	0.55	0.54	0.54	0.69	0.65	0.65	0.17	0.20	0.20	0.04	0.04	0.04
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	538	1917	857	465	2289	1024	586	373	317	73	73	73
v/s Ratio Prot	0.00	0.24	0.21	c0.07	0.11	0.00	c0.12	0.02	0.00	c0.01	c0.01	c0.01
v/s Ratio Perm	0.01	0.44	0.38	0.58	0.18	0.00	0.68	0.08	0.18	0.03	0.03	0.03
Uniform Delay, d1	12.1	16.6	15.9	9.3	8.4	7.5	46.7	39.0	39.9	58.9	56.1	56.1
Progression Factor	0.53	0.57	0.47	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.6	1.0	1.8	0.2	0.0	3.3	0.1	0.3	0.2	2.5	2.5
Delay (s)	6.4	10.0	8.4	11.1	8.6	7.5	50.0	39.1	40.1	59.0	58.6	58.6
Level of Service	A	A	A	B	A	A	D	D	D	D	E	E
Approach Delay (s)	9.4											
Approach LOS	A											

Intersection Summary

HCM Average Control Delay
 HCM Volume to Capacity ratio
 Actuated Cycle Length (s)
 Intersection Capacity Utilization
 Analysis Period (min)
 c Critical Lane Group



Movement	SBR
Lane Configurations	7
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.0
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1583
Flt Permitted	1.00
Satd. Flow (perm)	1583
Volume (vph)	2
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	2
RTOR Reduction (vph)	2
Lane Group Flow (vph)	0
Turn Type	Perm
Protected Phases	
Permitted Phases	8
Actuated Green, G (s)	4.7
Effective Green, g (s)	4.7
Actuated g/C Ratio	0.04
Clearance Time (s)	4.0
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	62
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.00
Uniform Delay, d1	55.4
Progression Factor	1.00
Incremental Delay, d2	0.0
Delay (s)	55.4
Level of Service	E
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Base 2014 PM Improved

Lanes, Volumes, Timings

1: Old Roswell Rd & Mansell Rd

Base PM - Improved
11/10/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	39	201	438	442	399	473	72	1675	327	348	1505	84
Ideal Flow (vphpl)	23.0	16.0	120.0	16.0	28.8	41.6	68.0	60.8	60.8	76.0	66.8	66.8
Act Effct Green (s)	0.19	0.13	1.00	0.13	0.24	0.35	0.57	0.51	0.51	0.63	0.56	0.56
Actuated g/C Ratio	0.23	0.43	0.28	0.97	0.47	0.78	0.42	0.93	0.37	0.79	0.76	0.09
v/c Ratio	38.4	50.9	0.4	68.9	33.7	27.8	19.5	38.9	9.1	38.5	24.5	6.9
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.4	50.9	0.4	68.9	33.7	27.8	19.5	38.9	9.1	38.5	24.5	6.9
LOS	D	D	A	E	C	C	B	D	A	D	C	A
Approach Delay	17.6											
Approach LOS	B											
Queue Length 50th (ft)	22	76	0	183	145	319	20	627	62	84	472	13
Queue Length 95th (ft)	49	115	0	m#266	m151	m#326	48	#810	127	#137	578	38
Internal Link Dist (ft)	1067											
Turn Bay Length (ft)	500	150	425	150	300	175	475	150	175	475	150	150
Base Capacity (vph)	180	472	1583	458	850	617	184	1793	890	463	1970	903
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.43	0.28	0.97	0.47	0.77	0.39	0.93	0.37	0.75	0.76	0.09

Intersection Summary

Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 105 (88%). Referenced to phase 2:NBT and 6:SBTL. Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 31.6	Intersection LOS: C
Intersection Capacity Utilization 82.9%	ICU Level of Service E
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

HCM Signalized Intersection Capacity Analysis

1: Old Roswell Rd & Mansell Rd

Base PM - Improved
11/10/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	39	201	438	442	399	473	72	1675	327	348	1505	84
Ideal Flow (vphpl)	23.0	16.0	120.0	16.0	28.8	41.6	68.0	60.8	60.8	76.0	66.8	66.8
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.85
Fit Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.85
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	1770	3539	1583	3433	3539	1583
Fit Permitted	0.26	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.85
Satd. Flow (perm)	479	3539	1583	3433	3539	1583	134	3539	1583	3433	3539	1583
Volume (vph)	36	185	403	407	367	435	66	1541	301	320	1385	77
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	39	201	438	442	399	473	72	1675	327	348	1505	84
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	39	201	438	442	399	473	72	1675	327	348	1505	84
Turn Type	pm+pt	Free	Prot	pm+ov	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt
Protected Phases	7	4	8	8	8	8	5	2	1	6	6	6
Permitted Phases	4	Free	Free	8	8	8	2	59.2	59.2	74.4	64.4	64.4
Actuated Green, G (s)	20.8	16.0	120.0	17.6	28.8	40.0	65.2	59.2	59.2	74.4	64.4	64.4
Effective Green, g (s)	20.8	16.0	120.0	17.6	28.8	40.0	65.2	59.2	59.2	74.4	64.4	64.4
Actuated g/C Ratio	0.17	0.13	1.00	0.15	0.24	0.33	0.54	0.49	0.49	0.62	0.54	0.54
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	135	472	1583	504	849	528	155	1746	781	441	1899	850
v/s Ratio Prot	0.01	0.06	c0.13	0.11	c0.07	0.02	c0.47	0.02	c0.07	0.43	0.43	0.43
v/s Ratio Perm	0.04	0.28	0.28	0.88	0.47	0.78	0.46	0.96	0.30	0.79	0.79	0.07
Uniform Delay, d1	49.9	47.8	0.0	50.1	39.1	36.1	19.4	29.2	18.1	34.8	22.4	13.4
Progression Factor	1.00	1.00	1.00	0.72	0.79	0.79	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	2.8	0.4	13.3	1.5	6.2	2.2	13.8	1.0	9.1	3.5	0.2
Delay (s)	51.1	50.6	0.4	49.2	32.4	34.9	21.6	43.1	19.1	43.9	25.9	13.6
Level of Service	D	D	A	D	C	C	C	D	B	D	C	B
Approach Delay (s)	18.2											
Approach LOS	B											

Intersection Summary

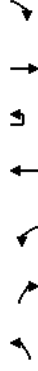
HCM Average Control Delay	33.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	82.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
5: First Drwy (Commercial) & Sanctuary Pkwy

HCM Unsignalized Intersection Capacity Analysis
5: First Drwy (Commercial) & Sanctuary Pkwy

Base PM - Improved
11/10/2009

Base PM - Improved
11/10/2009



Movement	EBL	EBR	NBL	NBT	SBU	SBT
Lane Group	EBL	EBR	NBL	NBT	SBU	SBT
Lane Group Flow (vph)	111	635	29	55	1	614
Sign Control	Stop	Stop	Free	Free	Free	Free
Intersection Summary						
Control Type: Unsignalized	ICU Level of Service B					
Intersection Capacity Utilization	58.5%					
Analysis Period (min)	15					

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%
Volume (veh/h)	102	584	27	51	1	545	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	111	635	29	55	0	592	22
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	Raised						
Median storage (veh)	1						
Upstream signal (ft)	845						
pX, platoon unblocked	0.00						
VC, conflicting volume	690	307	614		0		
VC1, stage 1 conf vol	603						
VC2, stage 2 conf vol	86						
VCu, unblocked vol	690	307	614		0		
tC, single (s)	6.8	6.9	4.1		0		
tC, 2 stage (s)	5.8						
tF (s)	3.5	3.3	2.2		0.0		
p0 queue free %	75	8	97		0		
cM capacity (veh/h)	437	689	961		0		
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	111	635	29	28	395	219	0
Volume Left	111	0	29	0	0	0	0
Volume Right	0	635	0	0	0	22	0
cSH	437	689	961	1700	1700	1700	1700
Volume to Capacity	0.25	0.92	0.03	0.02	0.02	0.23	0.13
Queue Length 95th (ft)	25	310	2	0	0	0	0
Control Delay (s)	16.0	42.4	8.9	0.0	0.0	0.0	0.0
Lane LOS	C	E	A	A			
Approach Delay (s)	38.4		3.1		0.0		
Approach LOS	E						
Intersection Summary							
Average Delay	20.0						
Intersection Capacity Utilization	58.5%						
Analysis Period (min)	15						
	ICU Level of Service						
	B						

Future AM Intersection Analysis

Future 2014 AM

Lanes, Volumes, Timings

1: Old Roswell Rd & Mansell Rd

Future AM
11/10/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	41	283	588	265	422	326	33	1393	829	541	1495	51
Act Effct Green (s)	36.5	29.0	29.0	8.0	31.4	31.4	7.1	41.0	41.0	71.0	63.9	63.9
Actuated g/C Ratio	0.30	0.24	0.24	0.07	0.26	0.26	0.06	0.34	0.34	0.59	0.53	0.53
v/c Ratio	0.15	0.33	1.21	1.16	0.46	0.50	0.32	1.15	1.14	1.21	0.79	0.06
Control Delay	30.1	38.8	143.4	153.2	32.5	14.0	62.0	115.0	102.4	147.7	27.8	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.1	38.8	143.4	153.2	32.5	14.0	62.0	115.0	102.4	147.7	27.8	9.3
LOS	C	D	F	F	C	B	E	F	F	F	C	A
Approach Delay	105.8											
Approach LOS	E											
Queue Length 50th (ft)	21	95	~472	~128	161	114	25	~668	~593	~464	516	9
Queue Length 95th (ft)	48	136	#697	#218	202	196	59	#807	#839	#685	627	31
Internal Link Dist (ft)	1067											
Turn Bay Length (ft)	500	150	425	150	300	118	1209	730	446	1884	855	150
Base Capacity (vph)	277	855	486	229	926	655	118	1209	730	446	1884	855
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.33	1.21	1.16	0.46	0.50	0.28	1.15	1.14	1.21	0.79	0.06

Intersection Summary

Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 101 (84%). Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.21	
Intersection Signal Delay: 83.7	Intersection LOS: F
Intersection Capacity Utilization 92.0%	ICU Level of Service F
Analysis Period (min) 15	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

HCM Signalized Intersection Capacity Analysis

1: Old Roswell Rd & Mansell Rd

Future AM
11/10/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.36	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	667	3539	1583	3433	3539	1583	1770	3539	1583	169	3539	1583
Volume (vph)	38	260	541	244	388	300	30	1282	763	498	1375	47
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	41	283	588	265	422	326	33	1393	829	541	1495	51
RTOR Reduction (vph)	0	0	104	0	0	241	0	0	191	0	0	13
Lane Group Flow (vph)	41	283	484	265	422	85	33	1393	638	541	1495	38
Turn Type	pm+pt	Perm	Prot	Perm	Prot	Perm	Prot	Perm	pm+pt	Perm	pm+pt	Perm
Protected Phases	7	4	4	3	8	8	5	2	2	1	6	6
Permitted Phases	4											
Actuated Green, G (s)	35.4	29.0	29.0	8.8	31.4	31.4	4.7	40.2	40.2	70.2	61.5	61.5
Effective Green, g (s)	35.4	29.0	29.0	8.8	31.4	31.4	4.7	40.2	40.2	70.2	61.5	61.5
Actuated g/C Ratio	0.30	0.24	0.24	0.07	0.26	0.26	0.04	0.34	0.34	0.59	0.51	0.51
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	256	855	383	252	926	414	69	1186	530	446	1814	811
v/s Ratio Prot	0.01	0.08		c0.08	0.12	0.05	0.02	0.39		c0.26	0.42	
v/s Ratio Perm	0.04											
v/c Ratio	0.16	0.33	1.26	1.05	0.46	0.21	0.48	1.17	1.20	1.21	0.82	0.05
Uniform Delay, d1	37.7	37.5	45.5	55.6	37.1	34.6	56.4	39.9	39.9	49.2	24.7	14.6
Progression Factor	1.00	1.00	1.00	1.01	0.81	2.83	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	1.0	138.1	66.3	1.4	0.9	5.1	87.7	108.7	115.0	4.4	0.1
Delay (s)	38.0	38.5	183.6	122.4	31.6	98.8	61.6	127.6	148.6	164.2	29.1	14.7
Level of Service	D	D	F	F	C	F	E	F	F	F	C	B
Approach Delay (s)	132.1											
Approach LOS	F											

Intersection Summary

HCM Average Control Delay	101.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	92.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	707	947	592	35	32	417
Act Effct Green (s)	93.9	93.9	45.2	45.2	18.1	18.1
Actuated g/C Ratio	0.78	0.78	0.38	0.38	0.15	0.15
v/c Ratio	0.89	0.34	0.44	0.06	0.12	0.70
Control Delay	22.9	5.8	18.3	7.4	25.6	15.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.9	5.8	18.3	7.4	25.6	15.0
LOS	C	A	B	A	C	B
Approach Delay	13.1 17.6 15.8					
Approach LOS	B B B					
Queue Length 50th (ft)	407	150	214	6	21	135
Queue Length 95th (ft)	m364	m127	260	30	m27	294
Internal Link Dist (ft)	1273 3111 2523					
Turn Bay Length (ft)	400	2772	1332	618	341	150
Base Capacity (vph)	939	2772	1332	618	341	641
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.34	0.44	0.06	0.09	0.65

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 89 (74%), Referenced to phase 2:WBTU and 6:EBTL, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.89
 Intersection Signal Delay: 14.6
 Intersection Capacity Utilization 64.4%
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3539	1583	1770	1583
Flt Permitted	0.29	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	544	3539	3539	1583	1770	1583
Volume (vph)	650	871	0	545	32	384
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	707	947	0	592	35	417
RTOR Reduction (vph)	0	0	0	0	22	0
Lane Group Flow (vph)	707	947	0	592	13	63
Turn Type	pm+pt	Perm	Perm	Perm	Perm	Perm
Protected Phases	1	6	2	2	8	8
Permitted Phases	6					
Actuated Green, G (s)	93.9	93.9	45.2	45.2	18.1	18.1
Effective Green, g (s)	93.9	93.9	45.2	45.2	18.1	18.1
Actuated g/C Ratio	0.78	0.78	0.38	0.38	0.15	0.15
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	882	2769	1333	596	267	239
v/s Ratio Prot	c0.30	0.27	0.17	0.01		
v/s Ratio Perm	c0.33					c0.04
v/c Ratio	0.80	0.34	0.44	0.02	0.12	0.26
Uniform Delay, d1	14.0	3.9	28.0	23.5	44.1	45.1
Progression Factor	0.99	1.29	0.53	0.63	0.60	2.09
Incremental Delay, d2	0.5	0.0	1.0	0.1	0.2	0.5
Delay (s)	14.3	5.0	16.0	14.9	26.8	94.9
Level of Service	B	A	B	B	C	F
Approach Delay (s)		9.0	15.9		90.0	
Approach LOS		A	B		F	

Intersection Summary

HCM Average Control Delay
 HCM Volume to Capacity ratio
 Actuated Cycle Length (s)
 Intersection Capacity Utilization
 Analysis Period (min)
 c Critical Lane Group

Lanes, Volumes, Timings
3: Old Ellis Rd & Old Roswell Rd

Future AM
11/10/2009



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	344	3	79	35	23	598	225	268	555	223
Act Effct Green (s)	35.4	35.4	35.4	35.4	64.4	58.6	58.6	76.6	72.5	72.5
Actuated g/C Ratio	0.30	0.30	0.30	0.30	0.54	0.49	0.49	0.64	0.60	0.60
v/c Ratio	0.91	0.01	0.20	0.07	0.06	0.66	0.26	0.79	0.49	0.22
Control Delay	68.5	16.7	32.4	11.2	5.4	15.5	0.9	33.6	17.7	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.5	16.7	32.4	11.2	5.4	15.5	0.9	33.6	17.7	6.4
LOS	E	B	C	B	A	B	A	C	B	A
Approach Delay	68.1	25.9				11.3			19.4	
Approach LOS	E	C				B			B	
Queue Length 50th (ft)	252	0	52	4	2	149	0	93	214	25
Queue Length 95th (ft)	#380	7	m63	m9	m4	m336	m6	200	411	81
Internal Link Dist (ft)	1205		1883			2523			1023	
Turn Bay Length (ft)	160				200	235	150		120	
Base Capacity (vph)	449	556	470	577	416	910	873	389	1126	1010
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.01	0.17	0.06	0.06	0.66	0.26	0.69	0.49	0.22

Intersection Summary

Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 76 (63%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 24.0	Intersection LOS: C
Intersection Capacity Utilization 76.8%	ICU Level of Service D
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

HCM Signalized Intersection Capacity Analysis
3: Old Ellis Rd & Old Roswell Rd

Future AM
11/10/2009



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			4			4			4	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85
Flt Protected	0.96	1.00	0.98	1.00	0.98	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1781	1583	1819	1583	1770	1863	1583	1770	1863	1583	1770	1863
Flt Permitted	0.69	1.00	0.63	1.00	0.40	1.00	0.40	1.00	0.40	1.00	0.22	1.00
Satd. Flow (perm)	1282	1583	1173	1583	752	1863	1583	752	1863	1583	418	1863
Volume (vph)	289	28	3	35	38	32	21	550	207	247	511	205
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	314	30	3	38	41	35	23	598	225	268	555	223
RTOR Reduction (vph)	0	0	2	0	0	25	0	0	100	0	0	56
Lane Group Flow (vph)	0	344	1	0	79	10	23	598	125	268	555	167
Turn Type	Perm	Perm	Perm	Perm	Perm	pm+pt	Perm	pm+pt	Perm	pm+pt	Perm	Perm
Protected Phases	8	8	4	4	4	1	6	1	6	5	2	2
Permitted Phases												
Actuated Green, G (s)	35.4	35.4		35.4	35.4	61.1	58.6	58.6	76.6	70.1	70.1	70.1
Effective Green, g (s)	35.4	35.4		35.4	35.4	61.1	58.6	58.6	76.6	70.1	70.1	70.1
Actuated g/C Ratio	0.30	0.30		0.30	0.30	0.51	0.49	0.49	0.64	0.58	0.58	0.58
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	378	467		346	467	404	910	773	425	1088	925	
v/s Ratio Prot						0.00	0.32		c0.07	0.30		
v/s Ratio Perm	c0.27	0.00		0.07	0.01	0.03		0.08	c0.33	0.11		
v/c Ratio	0.91	0.00		0.23	0.02	0.06	0.66	0.16	0.63	0.51	0.18	
Uniform Delay, d1	40.8	29.8		32.0	30.0	14.8	23.1	17.1	15.0	14.8	11.6	
Progression Factor	1.00	1.00		1.06	1.32	0.48	0.49	0.08	1.00	1.00	1.00	
Incremental Delay, d2	25.4	0.0		0.2	0.0	0.0	2.4	0.3	3.0	1.7	0.4	
Delay (s)	66.1	29.8		34.3	39.5	7.1	13.6	1.7	18.1	16.5	12.0	
Level of Service	E	C		C	D	A	B	A	B	B	B	
Approach Delay (s)	65.8			35.9			10.3			15.9		
Approach LOS	E			D			B			B		

Intersection Summary

HCM Average Control Delay	22.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBU	WBT	SBL	SBR
Lane Group Flow (vph)	597	518	3	773	703	64
Act Effct Green (s)	104.4	105.2	73.6	73.6	73.6	9.6
Actuated g/C Ratio	0.87	0.88	0.61	0.61	0.61	0.08
v/c Ratio	0.89	0.17	0.01	0.36	0.62	0.45
Control Delay	22.8	0.5	10.3	10.0	4.8	54.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.8	0.5	10.3	10.0	4.8	54.4
LOS	C	A	B	B	A	D
Approach Delay	12.5					
Approach LOS	B					
Queue Length 50th (ft)	56	5	1	114	48	46
Queue Length 95th (ft)	111	11	m1	200	163	m76
Internal Link Dist (ft)	265					
Turn Bay Length (ft)	240	150	150	150	150	150
Base Capacity (vph)	834	3103	527	2169	1143	236
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.17	0.01	0.36	0.62	0.27

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 8 (7%), Referenced to phase 2:WBTU and 6:EBTL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 10.8
Intersection Capacity Utilization 77.1%
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	WBU	WBT	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	1.00
Flt Protected	1.00	1.00	1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95
Satd. Flow (prot)	1770	3539	1770	3539	1583	1770
Flt Permitted	0.29	1.00	0.46	1.00	1.00	0.95
Satd. Flow (perm)	548	3539	858	3539	1583	1770
Volume (vph)	549	477	3	711	647	59
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	597	518	3	773	703	64
RTOR Reduction (vph)	0	0	0	0	175	0
Lane Group Flow (vph)	597	518	3	773	528	64
Turn Type	pm+pt					
Protected Phases	1	6	2	2	8	8
Permitted Phases	6	2	2	2	2	8
Actuated Green, G (s)	103.6	103.6	72.7	72.7	72.7	8.4
Effective Green, g (s)	103.6	103.6	72.7	72.7	72.7	8.4
Actuated g/C Ratio	0.86	0.86	0.61	0.61	0.61	0.07
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	747	3055	520	2144	959	124
v/s Ratio Prot	c0.18	0.15	0.00	0.22	c0.04	1.11
v/s Ratio Perm	c0.51	0.00	0.00	0.36	0.55	0.00
v/c Ratio	0.80	0.17	0.01	0.36	0.55	0.02
Uniform Delay, d1	9.1	1.3	9.4	11.9	14.0	53.8
Progression Factor	0.49	0.28	0.61	0.65	0.38	0.87
Incremental Delay, d2	5.8	0.1	0.0	0.4	1.9	3.3
Delay (s)	10.3	0.5	5.8	8.1	7.2	50.0
Level of Service	B	A	A	A	A	D
Approach Delay (s)	5.7					
Approach LOS	A					

Intersection Summary

HCM Average Control Delay	8.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	77.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
5: First Drwy (Commercial) & Sanctuary Pkwy

Future AM
11/10/2009

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	41	29	8	623	418	215	60	407
Sign Control	Stop	Stop	Stop			Free			Free
Intersection Summary									
Control Type: Unsignalized									
Intersection Capacity Utilization 60.8%									
Analysis Period (min) 15									



HCM Unsignalized Intersection Capacity Analysis

Future AM
11/10/2009

[illegible]

HCM Unsignalized Intersection Capacity Analysis
5: First Drwy (Commercial) & Sanctuary Pkwy

Future AM
11/10/2009



Movement	SBR
Lane Configurations	
Sign Control	
Grade	
Volume (veh/h)	131
Peak Hour Factor	0.92
Hourly flow rate (vph)	142
Pedestrians	
Lane Width (ft)	
Walking Speed (ft/s)	
Percent Blockage	
Right turn flare (veh)	
Median type	
Median storage (veh)	
Upstream signal (ft)	
pX, platoon unblocked	
vC, conflicting volume	
vC1, stage 1 conf vol	
vC2, stage 2 conf vol	
vCu, unblocked vol	
tC, single (s)	
tC, 2 stage (s)	
tF (\$))	
p0 queue free %	
cM capacity (veh/h)	
Direction, Lane #	

Lanes, Volumes, Timings
7: Westside Pkwy & Encore Pkwy

Future AM
11/10/2009



	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group	2	275	191	332	1151	7	580	25	134	9	15
Lane Group Flow (vph)	74.7	69.2	69.2	80.1	78.2	78.2	25.5	31.9	31.9	6.2	6.2
Act Effct Green (s)	0.62	0.58	0.58	0.67	0.65	0.65	0.21	0.27	0.27	0.05	0.05
Actuated g/C Ratio	0.01	0.13	0.19	0.46	0.50	0.01	0.79	0.05	0.26	0.09	0.16
v/c Ratio	7.5	8.1	1.5	14.7	14.1	9.3	53.0	28.2	5.6	55.9	26.9
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	7.5	8.1	1.5	14.7	14.1	9.3	53.0	28.2	5.6	55.9	26.9
Total Delay	7.5	8.1	1.5	14.7	14.1	9.3	53.0	28.2	5.6	55.9	26.9
LOS	A	A	A	B	B	A	D	C	A	E	C
Approach Delay	5.4				14.2			43.5		37.8	
Approach LOS	A				B			D		D	
Queue Length 50th (ft)	0	33	3	104	228	1	223	14	0	7	0
Queue Length 95th (ft)	m3	71	16	191	424	9	263	32	41	24	23
Internal Link Dist (ft)		1317			1332			929		924	
Turn Bay Length (ft)	260	130	270		170	180		135			
Base Capacity (vph)	214	2042	994	849	2307	1034	831	594	596	248	224
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.13	0.19	0.39	0.50	0.01	0.70	0.04	0.22	0.04	0.07

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 115 (96%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.79
 Intersection Signal Delay: 20.9
 Intersection LOS: C
 Intersection Capacity Utilization 64.5%
 Analysis Period (min) 15
 ICU Level of Service C
 m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
7: Westside Pkwy & Encore Pkwy

Future AM
11/10/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.85	1.00	0.85
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	1863	1583	1863	1583	1863
Flt Permitted	0.17	1.00	1.00	0.58	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	319	3539	1583	1072	3539	1583	3433	1863	1583	3433	1863	1583
Volume (vph)	2	253	176	305	1059	6	534	23	123	0	8	14
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	275	191	332	1151	7	580	25	134	0	9	15
RTOR Reduction (vph)	0	0	88	0	0	2	0	0	97	0	0	15
Lane Group Flow (vph)	2	275	103	332	1151	5	580	25	37	0	9	1
Turn Type	pm+pt	Perm	pm+pt	Perm	pm+pt	Perm	pm+pt	Perm	pm+pt	Perm	pm+pt	Perm
Protected Phases	1	6	5	2	7	4	3	8				
Permitted Phases	6	6	6	2	2	4	8					
Actuated Green, G (s)	65.5	64.4	64.4	78.5	73.4	73.4	25.5	33.5	33.5	4.0	4.0	4.0
Effective Green, g (s)	65.5	64.4	64.4	78.5	73.4	73.4	25.5	33.5	33.5	4.0	4.0	4.0
Actuated g/C Ratio	0.55	0.54	0.54	0.65	0.61	0.61	0.21	0.28	0.28	0.03	0.03	0.03
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	187	1899	850	760	2165	968	730	520	442		62	53
v/s Ratio Prot	0.00	0.08		c0.04	c0.33		c0.17	0.01			c0.00	
v/s Ratio Perm	0.01	0.06	0.25			0.00		0.02				0.00
v/c Ratio	0.01	0.14	0.12	0.44	0.53	0.01	0.79	0.05	0.08		0.15	0.01
Uniform Delay, d1	23.0	14.0	13.8	10.8	13.4	9.1	44.8	31.6	31.9		56.3	56.1
Progression Factor	0.70	0.57	0.39	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	0.2	0.3	0.4	0.9	0.0	6.0	0.0	0.1		1.1	0.1
Delay (s)	16.1	8.1	5.6	11.2	14.3	9.1	50.7	31.6	32.0		57.4	56.2
Level of Service	B	A	A	B	B	A	D	C	C		E	E
Approach Delay (s)	7.1			13.6			46.7				56.6	
Approach LOS	A			B			D				E	
Intersection Summary												
HCM Average Control Delay			21.9			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			64.5%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

Future 2014 AM Improved

Lanes, Volumes, Timings
1: Old Roswell Rd & Mansell Rd

Future AM - Improved
11/10/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	41	283	588	265	422	326	33	1393	829	541	1495	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.85	1.00	0.95	1.00	0.95	1.00
Fit Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	1770	3539	1583	3433	3539	1583
Fit Permitted	0.25	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	466	3539	1583	3433	3539	1583	146	3539	1583	3433	3539	1583
Volume (vph)	38	260	541	244	388	300	30	1282	763	498	1375	47
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	41	283	588	265	422	326	33	1393	829	541	1495	51
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	41	283	588	265	422	259	33	1393	707	541	1495	38
Turn Type	pm+pt	Free	Prot	Prot	pm+ov	pm+pt	Free	Prot	Prot	pm	Prot	Perm
Protected Phases	7	4	8	1	5	2	1	6				
Permitted Phases	4	Free	Free	8	2	2	2	6				
Actuated Green, G (s)	22.4	16.0	120.0	10.8	20.4	42.0	55.6	55.6	21.6	72.8	72.8	6
Effective Green, g (s)	22.4	16.0	120.0	10.8	20.4	42.0	55.6	55.6	21.6	72.8	72.8	6
Actuated g/C Ratio	0.19	0.13	1.00	0.09	0.17	0.35	0.46	0.46	0.18	0.61	0.61	0.61
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	157	472	1583	309	602	607	127	1640	733	618	2147	960
v/s Ratio Prot	0.01	0.08	c0.08	c0.12	0.08	0.01	0.39	c0.16	0.42			
v/s Ratio Perm	0.03	0.37	0.37	0.86	0.70	0.43	0.26	0.85	0.96	0.88	0.70	0.04
Uniform Delay, d1	49.9	49.0	0.0	53.8	46.9	29.8	23.6	28.5	31.2	47.9	16.1	9.5
Progression Factor	1.00	1.00	1.00	0.75	0.57	0.18	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	5.5	0.7	17.5	5.6	0.4	1.1	5.7	25.7	13.1	1.9	0.1
Delay (s)	50.8	54.5	0.7	58.1	32.3	5.6	24.7	34.2	56.9	61.0	18.0	9.6
Level of Service	D	D	A	E	C	A	C	C	E	E	B	A
Approach Delay (s)	19.6			30.5				42.4		28.9		C
Approach LOS	B			C				D				

Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 19 (16%), Referenced to phase 2:NBT and 6:SBT, Start of Green												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.95												
Intersection Signal Delay: 31.8												
Intersection Capacity Utilization 78.6%												
Analysis Period (min) 15												
# 95th percentile volume exceeds capacity, queue may be longer.												
Queue shown is maximum after two cycles.												
m Volume for 95th percentile queue is metered by upstream signal.												

HCM Signalized Intersection Capacity Analysis
1: Old Roswell Rd & Mansell Rd

Future AM - Improved
11/10/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	41	283	588	265	422	326	33	1393	829	541	1495	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.85	1.00	0.95	1.00	0.95	1.00
Fit Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	1770	3539	1583	3433	3539	1583
Fit Permitted	0.25	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	466	3539	1583	3433	3539	1583	146	3539	1583	3433	3539	1583
Volume (vph)	38	260	541	244	388	300	30	1282	763	498	1375	47
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	41	283	588	265	422	326	33	1393	829	541	1495	51
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	41	283	588	265	422	259	33	1393	707	541	1495	38
Turn Type	pm+pt	Free	Prot	Prot	pm+ov	pm+pt	Free	Prot	Prot	pm	Prot	Perm
Protected Phases	7	4	8	1	5	2	1	6				
Permitted Phases	4	Free	Free	8	2	2	2	6				
Actuated Green, G (s)	22.4	16.0	120.0	10.8	20.4	42.0	55.6	55.6	21.6	72.8	72.8	6
Effective Green, g (s)	22.4	16.0	120.0	10.8	20.4	42.0	55.6	55.6	21.6	72.8	72.8	6
Actuated g/C Ratio	0.19	0.13	1.00	0.09	0.17	0.35	0.46	0.46	0.18	0.61	0.61	0.61
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	157	472	1583	309	602	607	127	1640	733	618	2147	960
v/s Ratio Prot	0.01	0.08	c0.08	c0.12	0.08	0.01	0.39	c0.16	0.42			
v/s Ratio Perm	0.03	0.37	0.37	0.86	0.70	0.43	0.26	0.85	0.96	0.88	0.70	0.04
Uniform Delay, d1	49.9	49.0	0.0	53.8	46.9	29.8	23.6	28.5	31.2	47.9	16.1	9.5
Progression Factor	1.00	1.00	1.00	0.75	0.57	0.18	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	5.5	0.7	17.5	5.6	0.4	1.1	5.7	25.7	13.1	1.9	0.1
Delay (s)	50.8	54.5	0.7	58.1	32.3	5.6	24.7	34.2	56.9	61.0	18.0	9.6
Level of Service	D	D	A	E	C	A	C	C	E	E	B	A
Approach Delay (s)	19.6			30.5				42.4		28.9		C
Approach LOS	B			C				D				

Intersection Summary												
HCM Average Control Delay	32.7	HCM Level of Service										
HCM Volume to Capacity ratio	0.87											
Actuated Cycle Length (s)	120.0	Sum of lost time (s)										
Intersection Capacity Utilization	78.6%	ICU Level of Service										
Analysis Period (min)	15											
c Critical Lane Group												

Future PM Intersection Analysis

Future 2014 PM

Lanes, Volumes, Timings

1: Old Roswell Rd & Mansell Rd

Future PM
11/10/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	39	212	438	537	453	554	72	1675	347	364	1505	84
Act Effct Green (s)	28.0	21.0	21.0	16.0	33.8	33.8	7.7	50.0	50.0	61.4	61.4	61.4
Actuated g/C Ratio	0.23	0.18	0.18	0.13	0.28	0.28	0.06	0.42	0.42	0.51	0.51	0.51
v/c Ratio	0.21	0.34	1.14	1.17	0.45	0.80	0.64	1.14	0.46	1.15	0.83	0.10
Control Delay	33.1	45.2	123.0	133.4	25.9	16.4	79.6	103.4	15.0	129.8	30.7	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.1	45.2	123.0	133.4	25.9	16.4	79.6	103.4	15.0	129.8	30.7	8.9
LOS	C	D	F	F	C	B	E	F	B	F	C	A
Approach Delay	94.0											
Approach LOS	F											
Queue Length 50th (ft)	20	76	~310	~264	145	121	55	~795	97	~285	526	16
Queue Length 95th (ft)	46	115	#516	m#357	m140	m#61	#119	#935	180	#478	636	43
Internal Link Dist (ft)	1067											
Turn Bay Length (ft)	500	150	425	458	997	693	118	1475	754	316	1811	832
Base Capacity (vph)	202	619	383	458	997	693	118	1475	754	316	1811	832
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.34	1.14	1.17	0.45	0.80	0.61	1.14	0.46	1.15	0.83	0.10

Intersection Summary

Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 22 (18%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.17	
Intersection Signal Delay: 69.4	Intersection LOS: E
Intersection Capacity Utilization 94.0%	ICU Level of Service F
Analysis Period (min) 15	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

HCM Signalized Intersection Capacity Analysis

1: Old Roswell Rd & Mansell Rd

Future PM
11/10/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.28	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.10	1.00	1.00
Satd. Flow (perm)	515	3539	1583	3433	3539	1583	1770	3539	1583	177	3539	1583
Volume (vph)	36	195	403	494	417	510	66	1541	319	335	1385	77
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	39	212	438	537	453	554	72	1675	347	364	1505	84
RTOR Reduction (vph)	0	0	106	0	0	246	0	0	97	0	0	22
Lane Group Flow (vph)	39	212	332	537	453	308	72	1675	250	364	1505	62
Turn Type	pm+pt	Perm	Prot	Perm	Prot	Perm	Prot	Perm	pm+pt	Perm	pm+pt	Perm
Protected Phases	7	4	4	3	8	8	5	2	2	1	6	6
Permitted Phases	4	25.8	21.0	21.0	17.6	33.8	33.8	6.4	48.4	48.4	59.0	59.0
Actuated Green, G (s)	25.8	21.0	21.0	17.6	33.8	33.8	6.4	48.4	48.4	59.0	59.0	59.0
Effective Green, g (s)	0.22	0.18	0.18	0.15	0.28	0.28	0.05	0.40	0.40	0.49	0.49	0.49
Actuated g/C Ratio	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	161	619	277	504	997	446	94	1427	638	313	1740	778
v/s Ratio Prot	0.01	0.06	c0.21	c0.16	0.13	0.19	0.04	c0.47	0.16	c0.16	0.43	0.04
v/s Ratio Perm	0.24	0.34	1.20	1.07	0.45	0.69	0.77	1.17	0.39	1.16	0.86	0.08
Uniform Delay, d1	46.5	43.4	49.5	51.2	35.5	38.4	56.1	35.8	25.4	53.7	27.0	16.1
Progression Factor	1.00	1.00	1.00	0.84	0.67	0.53	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	1.5	118.3	53.1	1.1	6.3	30.4	86.0	1.8	102.6	6.0	0.2
Delay (s)	47.3	44.9	167.8	96.2	24.9	26.6	86.4	121.8	27.2	156.3	33.0	16.3
Level of Service	D	D	F	F	C	C	F	F	C	F	C	B
Approach Delay (s)	123.2											
Approach LOS	F											

Intersection Summary

HCM Average Control Delay	78.0	HCM Level of Service	E
HCM Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	94.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	397	530	907	10	28	639
Act Effct Green (s)	85.8	85.8	58.5	58.5	26.2	26.2
Actuated g/C Ratio	0.72	0.72	0.49	0.49	0.22	0.22
v/c Ratio	0.84	0.21	0.53	0.01	0.07	0.88
Control Delay	43.0	5.2	16.2	5.6	25.4	17.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.0	5.2	16.2	5.6	25.4	17.1
LOS	D	A	B	A	C	B
Approach Delay	21.4 16.1 17.4					
Approach LOS	C B B					
Queue Length 50th (ft)	153	12	123	0	13	23
Queue Length 95th (ft)	m216	m98	277	m1	m21	93
Internal Link Dist (ft)	1273 3111 2523					
Turn Bay Length (ft)	400		235			150
Base Capacity (vph)	565	2532	1725	777	575	844
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.21	0.53	0.01	0.05	0.76

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 47 (39%), Referenced to phase 2:WBTU and 6:EBTL, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.88
 Intersection Signal Delay: 18.4
 Intersection Capacity Utilization 66.1%
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3539	1583	1770	1583
Flt Permitted	0.22	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	415	3539	3539	1583	1770	1583
Volume (vph)	365	488	0	834	9	26
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	397	530	0	907	10	28
RTOR Reduction (vph)	0	0	0	0	5	0
Lane Group Flow (vph)	397	530	0	907	5	28
Turn Type	pm+pt		Perm	Perm	Perm	Perm
Protected Phases	1	6	2	2	8	8
Permitted Phases	6					
Actuated Green, G (s)	85.8	85.8		58.5	58.5	26.2
Effective Green, g (s)	85.8	85.8		58.5	58.5	26.2
Actuated g/C Ratio	0.72	0.72		0.49	0.49	0.22
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	560	2530		1725	772	386
v/s Ratio Prot	c0.14	0.15		0.26	0.02	
v/s Ratio Perm	c0.37					c0.16
v/c Ratio	0.71	0.21		0.53	0.01	0.74
Uniform Delay, d1	22.5	5.7		21.2	15.8	37.3
Progression Factor	0.96	0.88		0.58	0.40	0.80
Incremental Delay, d2	2.9	0.1		0.9	0.0	0.1
Delay (s)	24.5	4.0		13.2	6.4	29.1
Level of Service	C	A		B	A	C
Approach Delay (s)	12.8					
Approach LOS	B					

Intersection Summary

HCM Average Control Delay
 HCM Volume to Capacity ratio
 Actuated Cycle Length (s)
 Intersection Capacity Utilization
 Analysis Period (min)
 c Critical Lane Group

Lanes, Volumes, Timings
3: Old Ellis Rd & Old Roswell Rd

Future PM
11/10/2009



Lane Group	EBT	EBR	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	174	8	145	248	100	477	20	23	650
Act Effct Green (s)	23.7	23.7	23.7	23.7	85.9	82.4	82.4	84.3	78.6
Actuated g/C Ratio	0.20	0.20	0.20	0.20	0.72	0.69	0.69	0.70	0.66
v/c Ratio	0.83	0.03	0.74	0.49	0.30	0.37	0.02	0.05	0.53
Control Delay	74.6	17.6	66.8	9.0	4.9	4.0	0.1	6.6	14.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.6	17.6	66.8	9.0	4.9	4.0	0.1	6.6	14.5
LOS	E	B	E	A	A	A	A	A	B
Approach Delay	72.1	30.3			4.0				12.8
Approach LOS	E	C			A				B
Queue Length 50th (ft)	131	0	105	3	8	56	0	4	244
Queue Length 95th (ft)	195	12	m161	m62	m12	m79	m0	15	446
Internal Link Dist (ft)	1205		1883		2523				1023
Turn Bay Length (ft)	160		200		235		150		120
Base Capacity (vph)	329	494	308	660	428	1279	1094	593	1221
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.02	0.47	0.38	0.23	0.37	0.02	0.04	0.53

Intersection Summary

Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 100 (83%). Referenced to phase 2:SBTLL and 6:NBTL. Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 19.1	Intersection LOS: B
Intersection Capacity Utilization 62.1%	ICU Level of Service B
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

HCM Signalized Intersection Capacity Analysis
3: Old Ellis Rd & Old Roswell Rd

Future PM
11/10/2009



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4				4						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1776	1583	1776	1583	1776	1583	1776	1583	1776	1583	1776	1583
Flt Permitted	0.51	1.00	0.51	1.00	0.51	1.00	0.51	1.00	0.51	1.00	0.51	1.00
Satd. Flow (perm)	952	1583	952	1583	952	1583	952	1583	952	1583	952	1583
Volume (vph)	156	4	7	126	7	228	92	439	18	21	598	113
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	170	4	8	137	8	248	100	477	20	23	650	123
RTOR Reduction (vph)	0	0	6	0	0	199	0	0	7	0	0	23
Lane Group Flow (vph)	0	174	2	0	145	49	100	477	13	23	650	100
Turn Type	Perm	Perm	Perm	Perm	Perm	Perm	pm+pt	Perm	pm+pt	Perm	pm+pt	Perm
Protected Phases	8	8	4	4	4	4	1	6	6	5	2	2
Permitted Phases	8	8	4	4	4	4	6	6	6	2	2	2
Actuated Green, G (s)	23.7	23.7	23.7	23.7	23.7	23.7	88.1	80.8	80.8	80.5	77.0	77.0
Effective Green, g (s)	23.7	23.7	23.7	23.7	23.7	23.7	88.1	80.8	80.8	80.5	77.0	77.0
Actuated g/C Ratio	0.20	0.20	0.20	0.20	0.20	0.20	0.73	0.67	0.67	0.67	0.64	0.64
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	188	313	167	313	500	1254	1066	560	1195	1016		
v/s Ratio Prot	0.18	0.00	0.17	0.03	0.13	0.01	0.26	0.01	0.03	0.06		
v/s Ratio Perm	0.93	0.01	0.87	0.16	0.20	0.38	0.01	0.04	0.04	0.10		
Uniform Delay, d1	47.3	38.7	46.6	39.9	13.0	8.6	6.5	10.5	11.8	8.2		
Progression Factor	1.00	1.00	1.04	1.31	0.35	0.32	0.01	1.00	1.00	1.00		
Incremental Delay, d2	44.5	0.0	34.8	0.2	0.2	0.7	0.0	0.0	0.0	1.8		
Delay (s)	91.8	38.7	83.1	52.5	4.7	3.5	0.1	10.6	13.6	8.4		
Level of Service	F	D	F	D	A	A	A	A	B	B		
Approach Delay (s)	89.5		63.8				3.6			12.7		
Approach LOS	F		E				A			B		

Intersection Summary

HCM Average Control Delay	27.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Group	33	721	2	897	63	750	522
Lane Group Flow (vph)	55.2	55.2	48.5	48.5	48.5	56.8	56.8
Act Effct Green (s)	0.46	0.46	0.40	0.40	0.40	0.47	0.47
Actuated g/C Ratio	0.19	0.44	0.01	0.63	0.09	0.89	0.61
v/c Ratio	19.1	18.4	16.5	21.9	3.8	43.1	16.0
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.1	18.4	16.5	21.9	3.8	43.1	16.0
LOS	B	B	B	C	A	D	B
Approach Delay	18.5			20.7		32.0	
Approach LOS	B			C		C	
Queue Length 50th (ft)	10	182	0	301	0	528	175
Queue Length 95th (ft)	24	153	m2	346	m8	659	m259
Internal Link Dist (ft)	265			540		765	
Turn Bay Length (ft)	240		150			150	
Base Capacity (vph)	189	1629	264	1431	665	915	919
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.44	0.01	0.63	0.09	0.82	0.57

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 108 (90%). Referenced to phase 2:WBTU and 6:EBTL, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.89
 Intersection Signal Delay: 24.9
 Intersection Capacity Utilization 69.8%
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	1770	3539	1583	1770	1583
Flt Permitted	0.16	1.00	0.34	1.00	1.00	0.95	1.00
Satd. Flow (perm)	289	3539	628	3539	1583	1770	1583
Volume (vph)	30	663	2	825	58	690	480
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	721	2	897	63	750	522
RTOR Reduction (vph)	0	0	0	0	0	25	0
Lane Group Flow (vph)	33	721	2	897	38	750	412
Turn Type	pm+pt	Perm	Perm	Perm	Perm	Perm	Perm
Protected Phases	1	6	2	2	8	8	8
Permitted Phases	6	2	2	2	2	2	8
Actuated Green, G (s)	55.2	55.2	46.9	46.9	46.9	56.8	56.8
Effective Green, g (s)	55.2	55.2	46.9	46.9	46.9	56.8	56.8
Actuated g/C Ratio	0.46	0.46	0.39	0.39	0.39	0.47	0.47
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	186	1628	245	1383	619	838	749
v/s Ratio Prot	0.01	c0.20		c0.25		c0.42	
v/s Ratio Perm	0.08		0.00		0.02		0.26
v/c Ratio	0.18	0.44	0.01	0.65	0.06	0.89	0.55
Uniform Delay, d1	20.8	22.0	22.3	29.8	22.8	28.9	22.5
Progression Factor	0.83	0.76	0.59	0.64	0.27	1.00	1.01
Incremental Delay, d2	0.5	0.9	0.1	2.2	0.2	12.0	0.8
Delay (s)	17.7	17.6	13.3	21.4	6.4	41.0	23.5
Level of Service	B	B	B	C	A	D	C
Approach Delay (s)		17.6		20.4		33.8	
Approach LOS		B		C		C	

Intersection Summary

HCM Average Control Delay
 HCM Volume to Capacity ratio
 Actuated Cycle Length (s)
 Intersection Capacity Utilization
 Analysis Period (min)
 c Critical Lane Group

Lanes, Volumes, Timings
5: First Drwy (Commercial) & Sanctuary Pkwy

Future PM
11/10/2009

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	111	635	193	53	29	63	40	12	617
Sign Control	Stop	Stop	Stop			Free			Free
Intersection Summary									
Control Type: Unsignalized									
Intersection Capacity Utilization 71.8%									
Analysis Period (min) 15									



HCM Unsignalized Intersection Capacity Analysis
5: First Drwy (Commercial) & Sanctuary Pkwy

Future PM
11/10/2009

[illegible]

HCM Unsignalized Intersection Capacity Analysis
5: First Drwy (Commercial) & Sanctuary Pkwy

Future PM
11/10/2009



Movement	SBR
Lane Configurations	
Sign Control	
Grade	
Volume (veh/h)	20
Peak Hour Factor	0.92
Hourly flow rate (vph)	22
Pedestrians	
Lane Width (ft)	
Walking Speed (ft/s)	
Percent Blockage	
Right turn flare (veh)	
Median type	
Median storage (veh)	
Upstream signal (ft)	
pX, platoon unblocked	
vC, conflicting volume	
vC1, stage 1 conf vol	
vC2, stage 2 conf vol	
vCu, unblocked vol	
tC, single (s)	
tC, 2 stage (s)	
tF (\$))	
p0 queue free %	
cM capacity (veh/h)	
Direction, Lane #	

Lanes, Volumes, Timings
7: Westside Pkwy & Encore Pkwy

Future PM
11/10/2009



	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	14	1061	628	270	445	7	435	30	289	2	23	3
Lane Group Flow (vph)	73.1	66.6	66.6	86.1	81.4	81.4	18.8	23.9	23.9	10.3	7.0	7.0
Act Effct Green (s)	0.61	0.56	0.56	0.72	0.68	0.68	0.16	0.20	0.20	0.09	0.06	0.06
Actuated g/C Ratio	0.03	0.54	0.61	0.75	0.19	0.01	0.81	0.08	0.53	0.01	0.21	0.03
v/c Ratio	6.5	12.6	5.5	42.5	9.2	6.5	61.2	37.8	8.3	33.5	57.9	34.7
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.5	12.6	5.5	42.5	9.2	6.5	61.2	37.8	8.3	33.5	57.9	34.7
LOS	A	B	A	D	A	A	E	D	A	C	E	C
Approach Delay	9.9			21.6			40.0			53.7		
Approach LOS	A			C			D			D		
Queue Length 50th (ft)	3	238	97	96	62	0	167	18	0	1	17	0
Queue Length 95th (ft)	m6	m286	m124	193	116	7	225	47	76	8	44	10
Internal Link Dist (ft)	1317			1332			929			924		
Turn Bay Length (ft)	260	130	270	170	180	135						
Base Capacity (vph)	576	1965	1034	429	2400	1076	576	457	606	172	248	214
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.54	0.61	0.63	0.19	0.01	0.76	0.07	0.48	0.01	0.09	0.01

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 108 (90%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.81
 Intersection Signal Delay: 20.0
 Intersection LOS: C
 Intersection Capacity Utilization 77.6%
 Analysis Period (min) 15
 ICU Level of Service D
 m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
7: Westside Pkwy & Encore Pkwy

Future PM
11/10/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	1.00	1.00
Flt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	1863	1583	1770	1863
Flt Permitted	0.47	1.00	1.00	0.18	1.00	1.00	0.95	1.00	1.00	0.74	1.00
Satd. Flow (perm)	881	3539	1583	328	3539	1583	3433	1863	1583	1374	1863
Volume (vph)	13	976	578	248	409	6	1	399	28	266	2
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	14	1061	628	270	445	7	1	434	30	289	2
RTOR Reduction (vph)	0	0	172	0	0	3	0	0	0	231	0
Lane Group Flow (vph)	14	1061	456	270	445	4	0	435	30	58	2
Turn Type	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	Prot	Prot	Perm	pm+pt	pm+pt
Protected Phases	1	6	6	5	2	2	7	7	4	4	8
Permitted Phases	6	6	6	2	2	2	7	7	4	4	8
Actuated Green, G (s)	64.1	61.0	61.0	82.9	75.8	75.8	18.8	23.9	23.9	7.5	6.3
Effective Green, g (s)	64.1	61.0	61.0	82.9	75.8	75.8	18.8	23.9	23.9	7.5	6.3
Actuated g/C Ratio	0.53	0.51	0.51	0.69	0.63	0.63	0.16	0.20	0.20	0.06	0.05
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	494	1799	805	442	2235	1000	538	371	315	90	98
v/s Ratio Prot	0.00	0.30	0.09	0.13	0.00	0.00	0.13	0.02	0.02	0.00	0.01
v/s Ratio Perm	0.01	0.29	0.33	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00
v/c Ratio	0.03	0.59	0.57	0.61	0.20	0.00	0.81	0.08	0.18	0.02	0.23
Uniform Delay, d1	14.5	20.7	20.4	25.9	9.3	8.2	48.9	39.1	39.9	52.8	54.5
Progression Factor	0.82	0.60	0.36	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	1.2	2.4	2.5	0.2	0.0	8.7	0.1	0.3	0.1	1.2
Delay (s)	11.8	13.7	9.7	28.4	9.5	8.2	57.6	39.2	40.2	52.9	55.8
Level of Service	B	B	A	C	A	A	E	D	D	D	E
Approach Delay (s)	12.2			16.6				50.2			55.4
Approach LOS	B			B				D			E
Intersection Summary											
HCM Average Control Delay	22.5 HCM Level of Service										
HCM Volume to Capacity ratio	0.59										
Actuated Cycle Length (s)	120.0 Sum of lost time (s)										
Intersection Capacity Utilization	77.6% ICU Level of Service										
Analysis Period (min)	15										
c Critical Lane Group											

Baseline
A & R Engineering Inc.

Synchro 6 Report
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HCM Signalized Intersection Capacity Analysis
7: Westside Pkwy & Encore Pkwy

Future PM
11/10/2009

Movement	SBR
Lane Configurations	↔
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.0
Lane Util. Factor	1.00
Flt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1583
Flt Permitted	1.00
Satd. Flow (perm)	1583
Volume (vph)	3
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	3
RTOR Reduction (vph)	3
Lane Group Flow (vph)	0
Turn Type	Perm
Protected Phases	
Permitted Phases	8
Actuated Green, G (s)	6.3
Effective Green, g (s)	6.3
Actuated g/C Ratio	0.05
Clearance Time (s)	4.0
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	83
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.00
Uniform Delay, d1	53.9
Progression Factor	1.00
Incremental Delay, d2	0.0
Delay (s)	53.9
Level of Service	D
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Baseline
A & R Engineering Inc.

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Future 2014 PM Improved

Lanes, Volumes, Timings
1: Old Roswell Rd & Mansell Rd

HCM Signalized Intersection Capacity Analysis
1: Old Roswell Rd & Mansell Rd

Future PM - Improved
11/10/2009



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	39	212	438	537	453	554	72	1675	347	364	1505	84
Act Effct Green (s)	23.0	16.0	120.0	18.0	30.8	47.8	57.0	57.0	57.0	13.0	64.6	64.6
Actuated g/C Ratio	0.19	0.13	1.00	0.15	0.28	0.40	0.48	0.48	0.48	0.11	0.54	0.54
v/c Ratio	0.23	0.45	0.28	1.04	0.50	0.81	0.42	1.00	0.41	0.98	0.79	0.10
Control Delay	37.0	51.3	0.4	88.1	26.9	22.0	24.8	52.8	10.9	95.2	26.9	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.0	51.3	0.4	88.1	26.9	22.0	24.8	52.8	10.9	95.2	26.9	7.8
LOS	D	D	A	F	C	C	C	D	B	F	C	A
Approach Delay	18.2			46.4			44.9			38.8		
Approach LOS	B			D			D			D		
Queue Length 50th (ft)	21	81	0	~240	168	370	30	662	75	147	497	14
Queue Length 95th (ft)	48	121	0	m#336	m161	m#501	57	#847	148	#245	601	40
Internal Link Dist (ft)	1067			1273			229			820		
Turn Bay Length (ft)	500	150	425	150	300	180	1681	846	372	1904	873	150
Base Capacity (vph)	180	472	1583	515	909	688	180	1681	846	372	1904	873
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.45	0.28	1.04	0.50	0.81	0.40	1.00	0.41	0.98	0.79	0.10

Intersection Summary

Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 21 (18%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.04	
Intersection Signal Delay: 40.5	Intersection LOS: D
Intersection Capacity Utilization 87.5%	ICU Level of Service E
Analysis Period (min) 15	
~ Volume exceeds capacity, queue is theoretically infinite.	
# Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
# Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.85	1.00	0.95	1.00	0.97	0.95
Fit Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	1770	3539	1583	3433	3539	1583
Fit Permitted	0.25	1.00	1.00	0.95	1.00	1.00	0.08	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	466	3539	1583	3433	3539	1583	154	3539	1583	3433	3539	1583
Volume (vph)	36	195	403	494	417	510	66	1541	319	335	1385	77
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	39	212	438	537	453	554	72	1675	347	364	1505	84
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	39	212	438	537	453	494	72	1675	249	364	1505	62
Turn Type	pm+pt	Free	Free	Prot	Prot	pm+ov	pm+pt	Free	Prot	Prot	Perm	Perm
Protected Phases	7	4	8	1	5	2	1	6				
Permitted Phases	4	Free	Free	8	8	2	2	6				
Actuated Green, G (s)	20.8	16.0	120.0	19.6	30.8	44.6	54.6	54.6	13.8	62.2	62.2	62.2
Effective Green, g (s)	20.8	16.0	120.0	19.6	30.8	44.6	54.6	54.6	13.8	62.2	62.2	62.2
Actuated g/C Ratio	0.17	0.13	1.00	0.16	0.26	0.37	0.46	0.46	0.12	0.52	0.52	0.52
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	133	472	1583	561	908	641	154	1610	720	395	1834	821
v/s Ratio Prot	0.01	0.06	0.16	0.13	0.09	0.02	0.07	0.11	0.04	0.43		
v/s Ratio Perm	0.04	0.28	0.28	0.96	0.50	0.77	0.47	1.04	0.35	0.92	0.82	0.08
v/c Ratio	0.29	0.45	0.28	0.96	0.50	0.77	0.47	1.04	0.35	0.92	0.82	0.08
Uniform Delay, d1	51.0	47.9	0.0	49.8	38.0	33.2	27.4	32.7	21.1	52.6	24.2	14.5
Progression Factor	1.00	1.00	1.00	0.85	0.64	0.49	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	3.1	0.4	22.0	1.4	4.1	2.2	33.7	1.3	26.6	4.3	0.2
Delay (s)	52.3	51.0	0.4	64.3	25.9	20.5	29.7	66.4	22.5	79.2	28.5	14.7
Level of Service	D	D	A	E	C	C	C	E	C	E	C	B
Approach Delay (s)	18.9			37.3			57.9			37.3		
Approach LOS	B			D			E			D		

Intersection Summary

HCM Average Control Delay	42.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	87.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Future Site Access Analysis

Future 2014 AM Site Access Analysis

Lanes, Volumes, Timings
5: First Drwy (Commercial) & Sanctuary Pkwy

Future AM - Improved
11/10/2009

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	41	29	8	623	418	215	60	407
Sign Control	Stop	Stop	Stop			Free			Free
Intersection Summary									
Control Type: Unsignalized									
Intersection Capacity Utilization 60.8%									
Analysis Period (min) 15									



HCM Unsignalized Intersection Capacity Analysis		Future AM - Improved
5: First Drwy (Commercial) & Sanctuary Pkwy		11/10/2009

Future AM - Improved
11/10/2009[illegible]

HCM Unsignalized Intersection Capacity Analysis
5: First Drwy (Commercial) & Sanctuary Pkwy

Future AM - Improved
11/10/2009



Movement	SBR
Lane Configurations	
Sign Control	
Grade	
Volume (veh/h)	131
Peak Hour Factor	0.92
Hourly flow rate (vph)	142
Pedestrians	
Lane Width (ft)	
Walking Speed (ft/s)	
Percent Blockage	
Right turn flare (veh)	
Median type	
Median storage (veh)	
Upstream signal (ft)	
pX, platoon unblocked	
vC, conflicting volume	
vC1, stage 1 conf vol	
vC2, stage 2 conf vol	
vCu, unblocked vol	
tC, single (s)	
tC, 2 stage (s)	
tF (\$))	
p0 queue free %	
cM capacity (veh/h)	
Direction, Lane #	

Lanes, Volumes, Timings
6: Westside Pkwy & Sanctuary Park Site Drwy 2

Future AM - Improved
11/10/2009



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	176	403	1452	302	41	24
Act Effct Green (s)	106.6	106.6	106.6	106.6	8.1	8.1
Actuated g/C Ratio	0.89	0.89	0.89	0.89	0.07	0.07
v/c Ratio	0.68	0.13	0.46	0.21	0.34	0.18
Control Delay	21.5	1.3	0.8	0.3	60.3	21.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.5	1.3	0.8	0.3	60.3	21.9
LOS	C	A	A	A	E	C
Approach Delay	7.5 0.7 46.2					
Approach LOS	A A D					
Queue Length 50th (ft)	30	18	0	0	31	0
Queue Length 95th (ft)	#225	33	4	m0	67	27
Internal Link Dist (ft)	540 1317 231					
Turn Bay Length (ft)	150	150				
Base Capacity (vph)	258	3143	3143	1439	236	232
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.13	0.46	0.21	0.17	0.10

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 88 (73%), Referenced to phase 2:WBTU and 6:EBTL, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.68
 Intersection Signal Delay: 3.6
 Intersection Capacity Utilization 59.2%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 m Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
6: Westside Pkwy & Sanctuary Park Site Drwy 2

Future AM - Improved
11/10/2009



Movement	EBL	EBT	WBU	WBT	SBL	SBR
Lane Configurations	↔↔	↔↔	↔↔	↔↔	↔↔	↔↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.85	1.00	0.95
Satd. Flow (prot)	1770	3539	3539	1583	1770	1583
Flt Permitted	0.17	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	316	3539	3539	1583	1770	1583
Volume (vph)	162	371	0	1336	278	38
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	176	403	0	1452	302	41
RTOR Reduction (vph)	0	0	0	0	38	0
Lane Group Flow (vph)	176	403	0	1452	264	41
Turn Type	Perm	Perm	Perm	Perm	Perm	Perm
Protected Phases	6	6	2	2	8	8
Permitted Phases	6	2	2	2	8	8
Actuated Green, G (s)	105.0	105.0	105.0	105.0	7.0	7.0
Effective Green, g (s)	105.0	105.0	105.0	105.0	7.0	7.0
Actuated g/C Ratio	0.88	0.88	0.88	0.88	0.06	0.06
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	277	3097	3097	1385	103	92
v/s Ratio Prot		0.11		0.41		c0.02
v/s Ratio Perm	c0.56				0.17	0.00
v/c Ratio	0.64	0.13	0.47	0.19	0.40	0.02
Uniform Delay, d1	2.1	1.1	1.6	1.1	54.5	53.3
Progression Factor	1.40	1.01	0.23	0.19	1.00	1.00
Incremental Delay, d2	10.5	0.1	0.4	0.2	2.5	0.1
Delay (s)	13.5	1.2	0.8	0.5	57.0	53.3
Level of Service	B	A	A	A	E	D
Approach Delay (s)		4.9	0.7		55.6	
Approach LOS		A	A		E	
Intersection Summary						
HCM Average Control Delay			3.2		HCM Level of Service	A
HCM Volume to Capacity ratio			0.62			
Actuated Cycle Length (s)			120.0		Sum of lost time (s)	8.0
Intersection Capacity Utilization			59.2%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings
5: First Drwy (Commercial) & Sanctuary Pkwy

Future AM - Improved
11/10/2009

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	41	29	8	623	418	215	60	407
Act Effct Green (s)	7.7	7.7	7.9	7.9	109.7	109.7	109.7	109.7	109.7
Actuated g/C Ratio	0.06	0.06	0.07	0.07	0.91	0.91	0.91	0.91	0.91
v/c Ratio	0.06	0.29	0.32	0.07	0.71	0.13	0.15	0.07	0.13
Control Delay	52.2	20.7	61.4	28.6	4.6	0.2	0.2	1.6	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.2	20.7	61.4	28.6	4.6	0.2	0.2	1.6	1.0
LOS	D	C	E	C	A	A	A	A	A
Approach Delay	24.1		54.3			2.4			1.1
Approach LOS	C		D			A			A
Queue Length 50th (ft)	4	0	22	0	9	0	0	5	12
Queue Length 95th (ft)	17	35	53	16	24	7	m0	m10	m23
Internal Link Dist (ft)	243		209			765			772
Turn Bay Length (ft)	183	247	187	218	874	3234	1465	863	3078
Base Capacity (vph)	0	0	0	0	0	0	0	0	0
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.17	0.16	0.04	0.71	0.13	0.15	0.07	0.13

Intersection Summary

Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 8 (7%), Referenced to phase 2:SBTTL and 6:NBTTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 3.7	Intersection LOS: A
Intersection Capacity Utilization 60.8%	ICU Level of Service B
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

HCM Signalized Intersection Capacity Analysis
5: First Drwy (Commercial) & Sanctuary Pkwy

Future AM - Improved
11/10/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	0.95	1.00	0.95
Fr	1.00	0.85		1.00	0.85		1.00	0.85	1.00	0.85	1.00
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	0.95	1.00	0.95
Satd. Flow (prot)	1770	1583		1770	1583		1770	3539	1583	1770	3354
Flt Permitted	0.74	1.00		0.75	1.00		0.51	1.00	1.00	0.51	1.00
Satd. Flow (perm)	1375	1583		1405	1583		955	3539	1583	945	3354
Volume (vph)	5	0	38	27	0	7	573	385	198	1	54
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	0	41	29	0	8	623	418	215	1	59
RTOR Reduction (vph)	0	0	39	0	0	8	0	0	24	0	16
Lane Group Flow (vph)	0	5	2	0	29	0	623	418	191	0	60
Turn Type	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Protected Phases	8	8	8	4	4	4	6	6	2	2	2
Permitted Phases	8	8	8	4	4	4	6	6	2	2	2
Actuated Green, G (s)	5.5	5.5	5.5	5.5	5.5	5.5	106.5	106.5	106.5	106.5	106.5
Effective Green, g (s)	5.5	5.5	5.5	5.5	5.5	5.5	106.5	106.5	106.5	106.5	106.5
Actuated g/C Ratio	0.05	0.05	0.05	0.05	0.05	0.05	0.89	0.89	0.89	0.89	0.89
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	63	73		64	73	848	3141	1405	839	2977	
v/s Ratio Prot	0.00	0.00		c0.02	0.00		c0.65	0.12	0.12	0.06	
v/s Ratio Perm	0.08	0.03		0.45	0.01		0.73	0.13	0.14	0.07	0.13
w/c Ratio	54.8	54.7		55.8	54.6	2.2	0.9	0.9	0.9	0.8	0.9
Uniform Delay, d1	1.00	1.00		1.00	1.00	0.28	0.14	0.00	1.20	1.30	0.1
Progression Factor	0.5	0.1		5.0	0.0	4.0	0.1	0.1	0.1	0.1	0.1
Incremental Delay, d2	55.4	54.8		60.8	54.7	4.6	0.2	0.1	1.1	1.2	0.1
Delay (s)	E	D		E	D	A	A	A	A	A	A
Level of Service	E	D		E	D	A	A	A	A	A	A
Approach Delay (s)	54.9			59.5			2.4			1.2	
Approach LOS	D			E			A			A	
Intersection Summary											
HCM Average Control Delay	4.6						HCM Level of Service				
HCM Volume to Capacity ratio	0.72						A				
Actuated Cycle Length (s)	120.0						Sum of lost time (s)				
Intersection Capacity Utilization	60.8%						ICU Level of Service				
Analysis Period (min)	15						B				
c Critical Lane Group											



Movement	SBR
Lane Configurations	
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Flt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Volume (vph)	131
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	142
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Future 2014 PM Site Access Analysis

Lanes, Volumes, Timings
5: First Drwy (Commercial) & Sanctuary Pkwy

Future PM - Improved
11/10/2009

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	111	635	193	53	29	63	40	12	617
Sign Control	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free
Intersection Summary									
Control Type: Unsignalized									
Intersection Capacity Utilization	71.8%								
Analysis Period (min)	15								

HCM Unsignalized Intersection Capacity Analysis
5: First Drwy (Commercial) & Sanctuary Pkwy

Future PM - Improved
11/10/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Volume (veh/h)	102	0	584	178	0	49	27	58	37	1	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	111	0	635	193	0	53	29	63	40	0	11
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)											
Median type											
Median storage (veh)											
Upstream signal (ft)											
pX, platoon unblocked											
VC, conflicting volume	771	789	308	1076	760	32	616			0	103
VC1, stage 1 conf vol	627	627		122	122						
VC2, stage 2 conf vol	143	162		954	638						
VCu, unblocked vol	771	789	308	1076	760	32	616			0	103
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			0.0	4.1
tC, 2 stage (s)	6.5	5.5		6.5	5.5						
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			0.0	2.2
p0 queue free %	69	100	8	0	100	95	97			0	99
cM capacity (veh/h)	358	389	688	13	377	1035	960			0	1486
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3
Volume Total	111	635	193	53	29	32	32	40	11	396	220
Volume Left	111	0	193	0	29	0	0	0	11	0	0
Volume Right	0	635	0	53	0	0	0	40	0	0	22
cSH	358	688	13	1035	960	1700	1700	1700	1486	1700	1700
Volume to Capacity	0.31	0.92	14.89	0.05	0.03	0.02	0.02	0.02	0.01	0.23	0.13
Queue Length 95th (ft)	32	312	Err	4	2	0	0	0	1	0	0
Control Delay (s)	19.5	42.7	Err	8.7	8.9	0.0	0.0	0.0	7.4	0.0	0.0
Lane LOS	C	E	F	A	A	A	A	A	A	A	A
Approach Delay (s)	39.2		7842.5		2.0				0.1		
Approach LOS	E		F								
Intersection Summary											
Average Delay	1121.3										
Intersection Capacity Utilization	71.8%										
Analysis Period (min)	15										
C											

HCM Unsignalized Intersection Capacity Analysis
5: First Drwy (Commercial) & Sanctuary Pkwy

Future PM - Improved
11/10/2009

Movement	SBR
Lane Configurations	
Sign Control	
Grade	
Volume (veh/h)	20
Peak Hour Factor	0.92
Hourly flow rate (vph)	22
Pedestrians	
Lane Width (ft)	
Walking Speed (ft/s)	
Percent Blockage	
Right turn flare (veh)	
Median type	
Median storage (veh)	
Upstream signal (ft)	
pX, platoon unblocked	
vC, conflicting volume	
vC1, stage 1 conf vol	
vC2, stage 2 conf vol	
vCu, unblocked vol	
tC, single (s)	
tC, 2 stage (s)	
tF (\$))	
p0 queue free %	
cM capacity (veh/h)	
Direction, Lane #	

Lanes, Volumes, Timings
6: Westside Pkwy & Sanctuary Park Site Drwy 2

Future PM - Improved
11/10/2009



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	33	1434	801	55	272	159
Act Effct Green (s)	89.2	89.2	89.2	89.2	22.8	22.8
Actuated g/C Ratio	0.74	0.74	0.74	0.74	0.19	0.19
v/c Ratio	0.08	0.55	0.30	0.05	0.81	0.37
Control Delay	4.7	5.8	2.6	0.1	64.3	8.0
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	4.7	5.8	2.6	0.1	64.3	8.0
LOS	A	A	A	A	E	A
Approach Delay	5.8 2.4 43.5					
Approach LOS	A A D					
Queue Length 50th (ft)	4	156	40	0	205	0
Queue Length 95th (ft)	m14	331	44	m0	275	53
Internal Link Dist (ft)	540 1317 231					
Turn Bay Length (ft)	150	150				
Base Capacity (vph)	409	2631	1191	605	646	
Starvation Cap Reductn	0	202	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.59	0.30	0.05	0.45	0.25

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 97 (81%), Referenced to phase 2:WBTU and 6:EBTL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 10.7
Intersection Capacity Utilization 57.0%
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
6: Westside Pkwy & Sanctuary Park Site Drwy 2

Future PM - Improved
11/10/2009



Movement	EBL	EBT	WBU	WBT	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	1.00
Flt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3539	1583	1770	1583
Flt Permitted	0.33	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	611	3539	3539	1583	1770	1583
Volume (vph)	30	1319	0	737	51	250
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	1434	0	801	55	272
RTOR Reduction (vph)	0	0	0	0	14	0
Lane Group Flow (vph)	33	1434	0	801	41	272
Turn Type	Perm	Perm	Perm	Perm	Perm	Perm
Protected Phases	6	6	2	2	8	8
Permitted Phases	6	6	2	2	8	8
Actuated Green, G (s)	89.2	89.2	89.2	89.2	22.8	22.8
Effective Green, g (s)	89.2	89.2	89.2	89.2	22.8	22.8
Actuated g/C Ratio	0.74	0.74	0.74	0.74	0.19	0.19
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	454	2631	2631	1177	336	301
v/s Ratio Prot	c0.41	c0.41	0.23	0.23	c0.15	c0.15
v/s Ratio Perm	0.05	0.55	0.30	0.03	0.81	0.10
v/c Ratio	0.07	0.55	0.30	0.03	0.81	0.10
Uniform Delay, d1	4.2	6.6	5.1	4.1	46.5	40.1
Progression Factor	0.76	0.68	0.40	0.00	1.00	1.00
Incremental Delay, d2	0.2	0.6	0.3	0.0	13.4	0.1
Delay (s)	3.4	5.1	2.3	0.0	59.9	40.3
Level of Service	A	A	A	A	E	D
Approach Delay (s)	5.1	5.1	2.2	2.2	52.7	40.3
Approach LOS	A	A	A	A	D	D
Intersection Summary						
HCM Average Control Delay	11.6		11.6		HCM Level of Service	
HCM Volume to Capacity ratio	0.60		0.60		B	
Actuated Cycle Length (s)	120.0		120.0		Sum of lost time (s)	
Intersection Capacity Utilization	57.0%		57.0%		ICU Level of Service	
Analysis Period (min)	15		15		B	
Critical Lane Group						

[illegible][illegible]

Movement	SBR
Lane Configurations	
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Volume (vph)	20
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	22
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Traffic Volume Worksheets

09-042 Sanctuary Park - DRI
Traffic Volumes
Future Conditions

A&R Engineering
November-09

Mansell Road/Old Roswell Road

A.M. Peak Hour

Condition	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing:	4	1246	0	1250	0	1387	11	1398	33	0	647	680
Existing Diverted:	26	1115	579	1720	361	1196	41	1598	33	178	470	681
Growth Factor (%):	3	3	3		3	3	3		3	3	3	
Base Condition:	30	1282	666	1978	415	1375	47	1838	38	205	541	783
Total New Trips	0	0	97	97	83	0	0	83	0	55	0	55
Future Traffic Volumes:	30	1282	763	2075	498	1375	47	1921	38	260	541	838

P.M. Peak Hour

Condition	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing:	12	1681	0	1693	0	1277	37	1314	31	0	393	424
Existing Diverted:	57	1340	262	1659	278	1204	67	1549	31	161	350	542
Growth Factor (%):	3	3	3		3	3	3		3	3	3	
Base Condition:	66	1541	301	1908	320	1385	77	1781	36	185	403	623
Total New Trips	0	0	18	18	15	0	0	15	0	10	0	10
Future Traffic Volumes:	66	1541	319	1926	335	1385	77	1796	36	195	403	633

**A&R Engineering
November-09**

A.M. Peak Hour

P.M. Peak Hour

Condition	Northbound						Southbound						Eastbound						Westbound					
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot				
Existing:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Existing Diverted:	0	0	0	0	23	0	511	534	317	386	0	703	0	541	8	549								
Growth Factor (%):	3	3	3		3	3	3		3	3	3		3	3	3									
Base Condition:	0	0	0	0	26	0	588	614	365	444	0	808	0	622	9	631								
Total New Trips	0	0	0	0	0	0	0	0	0	44	0	44	0	212	0	212								
Future Traffic Volumes:	0	0	0	0	26	0	588	614	365	488	0	852	0	834	9	843								

**A&R Engineering
November-09**

A.M. Peak Hour

P.M. Peak Hour

Condition	Northbound						Southbound						Eastbound						Westbound					
	L	T	R	Tot	L	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot						
Existing:	3	139	8	150	15		15	82	98	195	136	3	6	145	3	2	207	212						
Existing Diverted:	80	382	13	475	11		11	520	98	629	136	3	6	145	99	1	166	266						
Growth Factor (%):	3	3	3		3		3	3	3		3	3	3		3	3	3							
Base Condition:	92	439	15	546	13		13	598	113	723	156	3	7	167	114	1	191	306						
Total New Trips	0	0	3	3	8		8	0	0	8	0	1	0	1	12	6	37	55						
Future Traffic Volumes:	92	439	18	549	21		21	598	113	731	156	4	7	168	126	7	228	361						

09-042 Sanctuary Park - DRI
Traffic Volumes
Future Conditions

A&R Engineering
November-09

Rock Mill Road / Westside Parkway / Sanctuary Parkway

A.M. Peak Hour

Condition	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	Tot	L	T	L	T	R	Tot	U	Tot
Existing:	0	0	0	0	73	0	0	2	0	2	3	1052
Existing Diverted:	0	0	0	0	30	0	406	281	0	687	3	1064
Growth Factor (%):	3	3	3		3	3	3	3	3		3	3
Base Condition:	0	0	0	0	35	0	467	323	0	790	3	1224
Total New Trips	0	0	0	0	24	0	82	154	0	236	0	138
Future Traffic Volumes:	0	0	0	0	59	0	549	477	0	1026	3	1362

P.M. Peak Hour

Condition	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	Tot	L	T	L	T	R	Tot	U	Tot
Existing:	0	0	0	0	961	0	0	4	0	4	2	85
Existing Diverted:	0	0	0	0	508	0	13	552	0	565	2	624
Growth Factor (%):	3	3	3		3	3	3	3	3		3	3
Base Condition:	0	0	0	0	584	0	15	635	0	650	2	718
Total New Trips	0	0	0	0	106	0	15	28	0	43	0	167
Future Traffic Volumes:	0	0	0	0	690	0	30	663	0	693	2	885

Traffic Volumes

Future Conditions

A&R Engineering
November-09

Westside Parkway / Sanctuary Park Site Driveway 2

A.M. Peak Hour

Condition	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Existing:	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diverted:	0	0	0	0	0	0	0	309	0	0	1061	0
Growth Factor (%);	3	3	3	3	3	3	3	3	3	3	3	3
Base Condition:	0	0	0	0	0	0	0	355	0	0	1220	0
Total New Trips	0	0	0	38	0	22	60	162	16	0	116	278
Future Traffic Volumes:	0	0	0	38	0	22	60	162	371	0	1336	278

P.M. Peak Hour

Condition	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Existing:	0	0	0	0	0	0	0	0	0	0	0	0
Existing Diverted:	0	0	0	0	0	0	0	1056	0	0	622	0
Growth Factor (%):	3	3	3	3	3	3	3	3	3	3	3	3
Base Condition:	0	0	0	0	0	0	0	1214	0	0	715	0
Total New Trips	0	0	0	250	0	146	396	30	105	0	22	51
Future Traffic Volumes:	0	0	0	250	0	146	396	30	1319	0	737	51

09-042 Sanctuary Park - DRI

Traffic Volumes

Future Conditions

Westside Parkway / Encore Parkway

A.M. Peak Hour

Condition	Northbound					Southbound					Eastbound					Westbound				
	U	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot			
Existing:	0	644	20	133	797	0	7	6	13	1	22	69	92	348	397	5	750			
Existing Diverted:	0	314	20	107	441	0	7	6	13	1	195	132	328	265	734	5	1004			
Growth Factor (%):	3	3	3	3		3	3	3		3	3	3		3	3	3				
Base Condition:	0	361	23	123	507	0	8	7	15	1	224	152	377	305	844	6	2953			
Total New Trips	0	173	0	0	173	0	0	7	7	1	29	24	54	0	215	0	683			
Future Traffic Volumes:	0	534	23	123	680	0	8	14	22	2	253	176	431	305	1059	6	3636			

P.M. Peak Hour

Condition	Northbound					Southbound					Eastbound					Westbound				
	U	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot			
Existing:	1	61	24	287	373	2	18	2	22	6	424	529	959	284	41	5	330			
Existing Diverted:	1	319	24	231	575	2	18	2	22	6	681	367	1054	216	321	5	542			
Growth Factor (%):	3	3	3	3		3	3	3		3	3	3		3	3	3				
Base Condition:	1	367	28	266	661	2	21	2	25	7	783	422	1212	248	369	6	4421			
Total New Trips	0	32	0	0	32	0	0	1	1	6	193	156	355	0	40	0	816			
Future Traffic Volumes:	1	399	28	266	693	2	21	3	26	13	976	578	1567	248	409	6	5237			

Planned and Programmed Improvements

Short Title

SR 400 FLEXIBLE SHOULDER LANES FROM SPALDING DRIVE IN NORTH FULTON COUNTY TO MCFARLAND ROAD IN FORSYTH COUNTY

GDOT Project No.

0008444

Federal ID No.

Status

Programmed

Detailed Description and Justification

This project will upgrade the shoulders of SR 400 to permit their use as general purpose travel lanes during peak periods. HB273 directed GDOT to identify 20 areas around the state for potential implementation of this type of project. The lanes will be striped, marked and signed and their use is to not exceed eight hours per day. Only automobiles, light trucks and motorcycles will be eligible to use the lanes.

Service Type

General Purpose Roadway Capacity

Sponsor

GDOT

Jurisdiction

Multi-County

Existing Thru Lane

0 (applicable for road projects only)

Planned Thru Lane

2 (applicable for road projects only)

Corridor Length

13.7 miles (not applicable for all project types)

Network Year

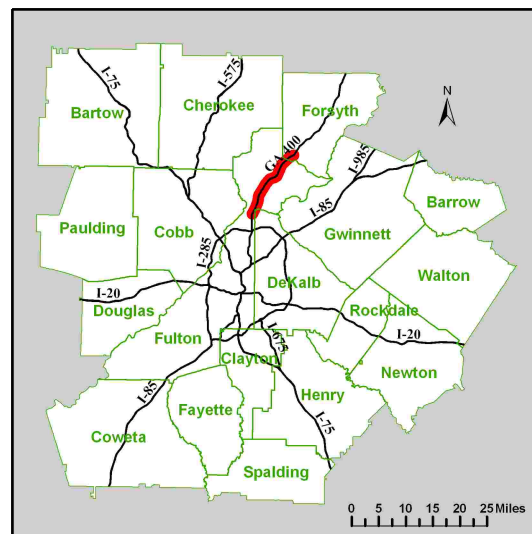
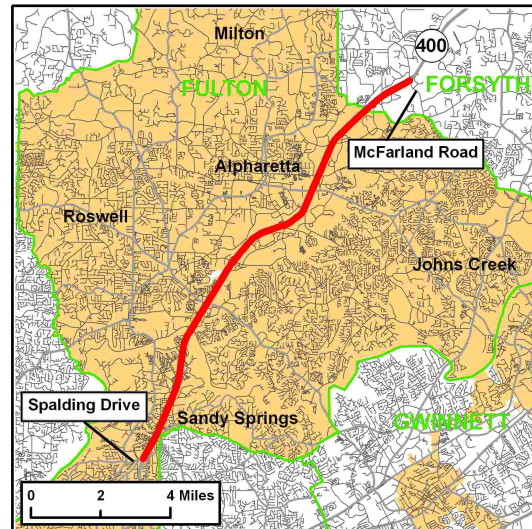
2020 (required if modeled for conformity)

Completion Date

2011

Analysis Level

In the Region's Air Quality Conformity Analysis



Phase Status & Funding Information		FISCAL YEAR	TOTAL PHASE COST	BREAKDOWN OF TOTAL PHASE COST BY FUNDING SOURCE			
				FEDERAL	STATE	BONDS	LOCAL/OTHER
PE	National Highway System	2009	\$200,000	\$160,000	\$40,000	\$0,000	\$0,000
CST	National Highway System	2009	\$5,000,000	\$4,000,000	\$1,000,000	\$0,000	\$0,000
				\$4,160,000	\$1,040,000	\$0,000	\$0,000

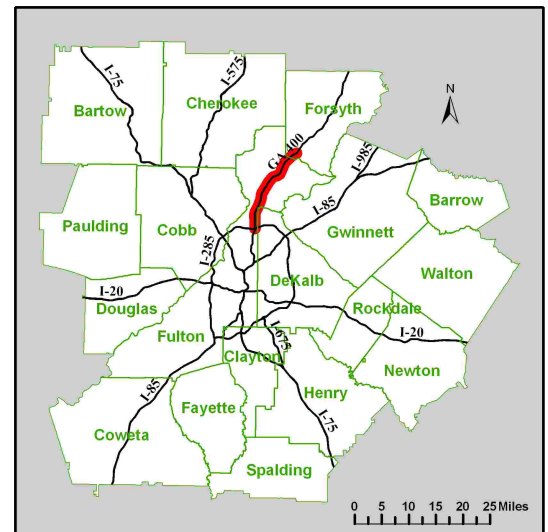
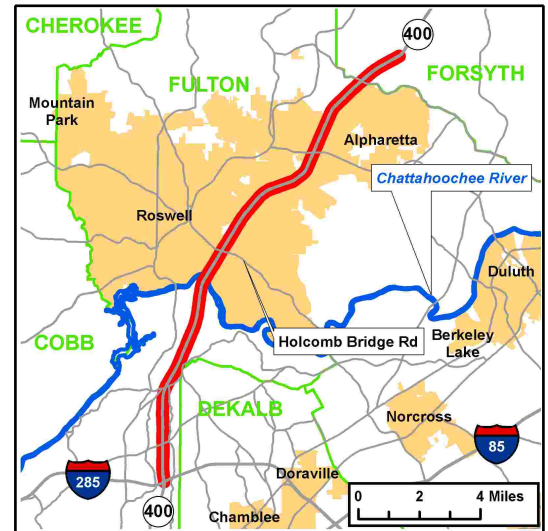
PE: Preliminary Engineering / Design / Study

ROW: Right-of-way Acquisition

CST: Construction / Implementation

For additional information about this project, please visit the Atlanta Regional Commission at www.atlantaregional.com or call (404) 463-3100.

Short Title	SR 400 MANAGED LANES FROM I-285 TO MCFARLAND ROAD IN FORSYTH COUNTY
GDOT Project No.	0001757
Federal ID No.	MSL-0001-00(757)
Status	Programmed
Detailed Description and Justification	Addition of two managed lanes in both directions for 8.1 miles between I-285 North and McFarland Road. Dedicated ramps serving these lanes will be provided but locations have not been determined at this time. It is anticipated that all future managed lanes constructed in the Atlanta region will be barrier separated, but engineering and design will determine the most appropriate configuration. Operating characteristics such as occupancy restrictions and tolling levels will also be established during concept development in accordance with regional and state managed lane policies.
Service Type	Managed Lanes - Auto / Bus
Sponsor	GDOT
Jurisdiction	Multi-County
Existing Thru Lane	0 (applicable for road projects only)
Planned Thru Lane	4 (applicable for road projects only)
Corridor Length	16.9 miles (not applicable for all project types)
Network Year	2020 (required if modeled for conformity)
Completion Date	2020
Analysis Level	In the Region's Air Quality Conformity Analysis



Phase Status & Funding Information		FISCAL YEAR	TOTAL PHASE COST	BREAKDOWN OF TOTAL PHASE COST BY FUNDING SOURCE			
				FEDERAL	STATE	BONDS	LOCAL/OTHER
PE	National Highway System	2005	\$0,000	\$0,000	\$0,000	\$0,000	\$0,000
PE	SAFETEA-LU Earmark	2010	\$890,000	\$712,000	\$178,000	\$0,000	\$0,000
PE	General Federal Aid - 2014-2030	LR 2014-2020	\$11,619,000	\$10,457,100	\$1,161,900	\$0,000	\$0,000
ROW	Toll Revenue Bonds	LR 2014-2020	\$60,000,000	\$0,000	\$0,000	\$60,000,000	\$0,000
CST	Toll Revenue Bonds	LR 2014-2020	\$205,000,000	\$0,000	\$0,000	\$205,000,000	\$0,000
				\$11,169,100	\$1,339,900	\$265,000,000	\$0,000

PE: Preliminary Engineering / Design / Study

ROW: Right-of-way Acquisition

CST: Construction / Implementation

For additional information about this project, please visit the Atlanta Regional Commission at www.atlantaregional.com or call (404) 463-3100.

Short Title

SR 9 (SOUTH MAIN STREET) FROM UPPER HEMBREE ROAD TO ACADEMY STREET

GDOT Project No.

721790-

Federal ID No.

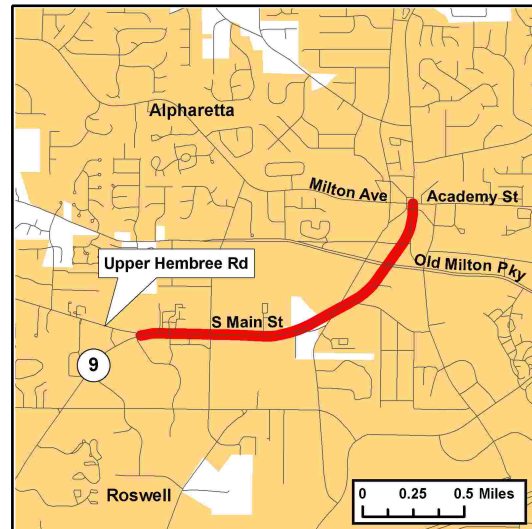
STP-114-1(85)

Status

Long Range

Detailed Description and Justification

This project is the widening of SR 9/South Main Street from Upper Hembree Road to Academy Street. The project will be 1.7 miles in length.



Service Type

General Purpose Roadway Capacity

Sponsor

GDOT

Jurisdiction

Fulton (North)

Existing Thru Lane

2 (applicable for road projects only)

Planned Thru Lane

4 (applicable for road projects only)

Corridor Length

1.7 miles (not applicable for all project types)

Network Year

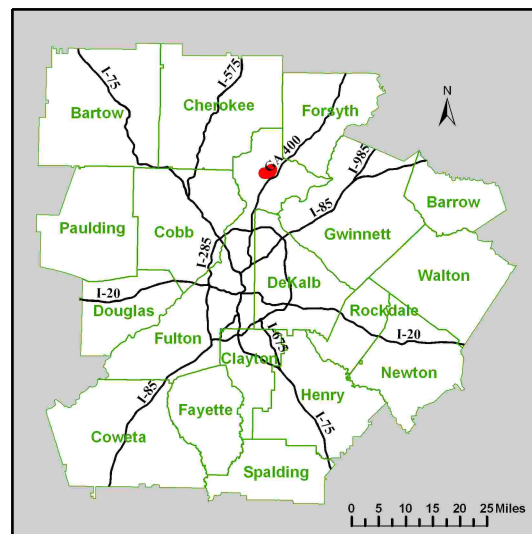
2030 (required if modeled for conformity)

Completion Date

2030

Analysis Level

In the Region's Air Quality Conformity Analysis



Phase Status & Funding Information		FISCAL YEAR	TOTAL PHASE COST	BREAKDOWN OF TOTAL PHASE COST BY FUNDING SOURCE			
				FEDERAL	STATE	BONDS	LOCAL/OTHER
PE	STP - Statewide Flexible (GDOT)	2007	\$0,000	\$0,000	\$0,000	\$0,000	\$0,000
ROW	General Federal Aid - 2014-2030	LR 2021-2030	\$3,342,000	\$2,673,600	\$668,400	\$0,000	\$0,000
CST	General Federal Aid - 2014-2030	LR 2021-2030	\$8,976,000	\$7,180,800	\$1,795,200	\$0,000	\$0,000
				\$9,854,400	\$2,463,600	\$0,000	\$0,000

PE: Preliminary Engineering / Design / Study

ROW: Right-of-way Acquisition

CST: Construction / Implementation



For additional information about this project, please visit the Atlanta Regional Commission at www.atlantaregional.com or call (404) 463-3100.



Short Title

COMMERCE PARKWAY EXTENSION FROM OLD ROSWELL ROAD TO SR 140 (HOLCOMB BRIDGE ROAD)

GDOT Project No.

N/A

Federal ID No.

Status

Programmed

Detailed Description and Justification

This project involves construction of a new four-lane roadway from near the intersection of Old Roswell Road and Commerce Parkway to near the intersection SR 140 (Holcomb Bridge Road) and Market Place.

Service Type

General Purpose Roadway Capacity

Sponsor

City of Roswell

Jurisdiction

Fulton (North)

Existing Thru Lane

0 (applicable for road projects only)

Planned Thru Lane

4 (applicable for road projects only)

Corridor Length

0.4 miles (not applicable for all project types)

Network Year

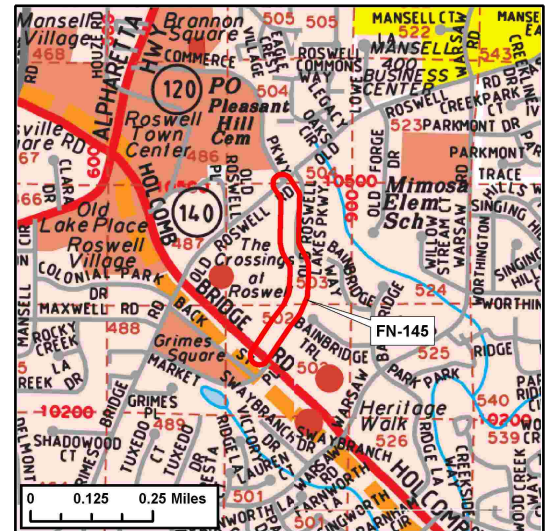
2020 (required if modeled for conformity)

Completion Date

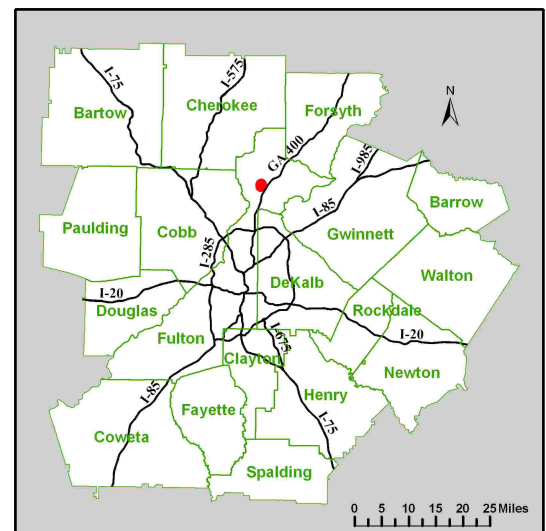
2020

Analysis Level

In the Region's Air Quality Conformity Analysis



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Phase Status & Funding Information		FISCAL YEAR	TOTAL PHASE COST	BREAKDOWN OF TOTAL PHASE COST BY FUNDING SOURCE			
				FEDERAL	STATE	BONDS	LOCAL/OTHER
PE	Local Jurisdiction/Municipality Funds	2012	\$600,000	\$0,000	\$0,000	\$0,000	\$600,000
ROW	Local Jurisdiction/Municipality Funds	LR 2014-2020	\$2,000,000	\$0,000	\$0,000	\$0,000	\$2,000,000
CST	Local Jurisdiction/Municipality Funds	LR 2014-2020	\$6,000,000	\$0,000	\$0,000	\$0,000	\$6,000,000
				\$0,000	\$0,000	\$0,000	\$8,600,000

PE: Preliminary Engineering / Design / Study

ROW: Right-of-way Acquisition

CST: Construction / Implementation



For additional information about this project, please visit the Atlanta Regional Commission at www.atlantaregional.com or call (404) 463-3100.



Short Title

WESTSIDE PARKWAY: SEGMENT 2 - ROCK MILL ROAD / OLD ROSWELL ROAD FROM 1000 FT SOUTH OF MANSELL ROAD TO ROCK MILL ROAD AT SANCTUARY PARK

GDOT Project No.

N/A

Federal ID No.

Status

Programmed

Detailed Description and Justification

This project will widen Rock Mill Road/Old Roswell Road from 2 to 4 lanes from 1000' south of Mansell Road to Rock Mill Road at Sanctuary Park. See also FN-173B.

Service Type

General Purpose Roadway Capacity

Sponsor

City of Alpharetta

Jurisdiction

Fulton (North)

Existing Thru Lane

2 (applicable for road projects only)

Planned Thru Lane

4 (applicable for road projects only)

Corridor Length

1.0 miles (not applicable for all project types)

Network Year

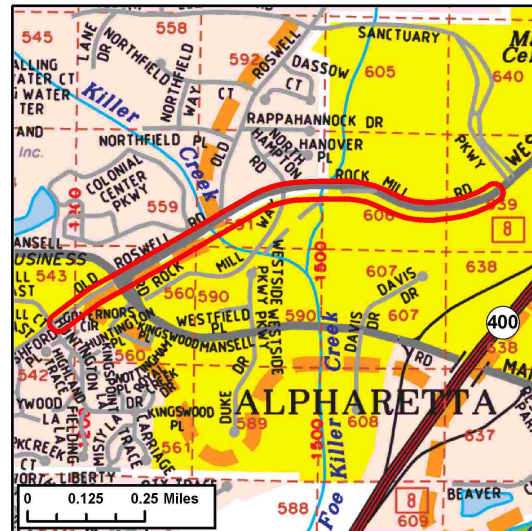
2010 (required if modeled for conformity)

Completion Date

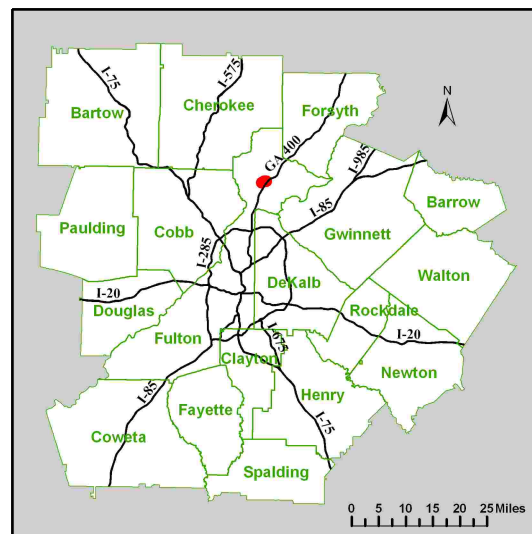
2009

Analysis Level

In the Region's Air Quality Conformity Analysis



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Phase Status & Funding Information		FISCAL YEAR	TOTAL PHASE COST	BREAKDOWN OF TOTAL PHASE COST BY FUNDING SOURCE			
				FEDERAL	STATE	BONDS	LOCAL/OTHER
PE	Local Jurisdiction/Municipality Funds	AUTH	\$0,000	\$0,000	\$0,000	\$0,000	\$0,000
ROW	Local Jurisdiction/Municipality Funds	2005	\$0,000	\$0,000	\$0,000	\$0,000	\$0,000
CST	Local Jurisdiction/Municipality Funds	2008	\$0,000	\$0,000	\$0,000	\$0,000	\$0,000

PE: Preliminary Engineering / Design / Study

ROW: Right-of-way Acquisition

CST: Construction / Implementation



For additional information about this project, please visit the Atlanta Regional Commission at www.atlantaregional.com or call (404) 463-3100.



Short Title

WESTSIDE PARKWAY: SEGMENT 2 - ROCK MILL ROAD /
OLD ROSWELL ROAD AT Foe KILLER CREEK

GDOT Project No.

752970-

Federal ID No.

BRLB-9407(1)

Status

Programmed

Detailed Description
and Justification

This project will widen the bridge on Rock Mill Road/Old Roswell Road at Foe Killer Creek from 2 to 4 lanes. The project begins 1000' south of Foe Killer Creek and ends 1000' north of Foe Killer Creek. See also FN-173A.

Service Type

Bridge Capacity

Sponsor

City of Alpharetta

Jurisdiction

Fulton (North)

Existing Thru Lane

2 (applicable for road projects only)

Planned Thru Lane

4 (applicable for road projects only)

Corridor Length

0.4 miles (not applicable for all project types)

Network Year

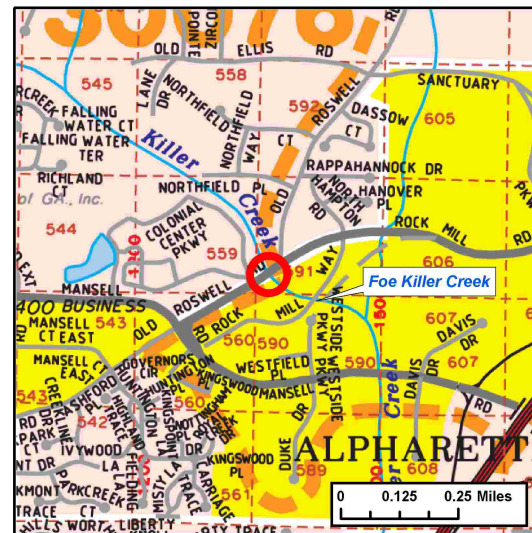
2010 (required if modeled for conformity)

Completion Date

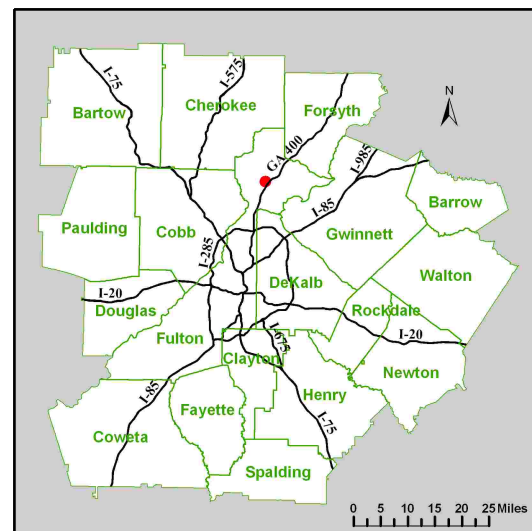
2009

Analysis Level

In the Region's Air Quality Conformity Analysis



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Phase Status & Funding Information		FISCAL YEAR	TOTAL PHASE COST	BREAKDOWN OF TOTAL PHASE COST BY FUNDING SOURCE			
				FEDERAL	STATE	BONDS	LOCAL/OTHER
PE	Bridge (Off-System)	AUTH	\$0,000	\$0,000	\$0,000	\$0,000	\$0,000
ROW	Bridge (Off-System)	2007	\$0,000	\$0,000	\$0,000	\$0,000	\$0,000
ROW	SAFETEA-LU Earmark	2007	\$0,000	\$0,000	\$0,000	\$0,000	\$0,000
CST	GA Department of Transportation Funds	2008	\$0,000	\$0,000	\$0,000	\$0,000	\$0,000
CST	Bridge (Off-System)	2008	\$0,000	\$0,000	\$0,000	\$0,000	\$0,000

PE: Preliminary Engineering / Design / Study

ROW: Right-of-way Acquisition

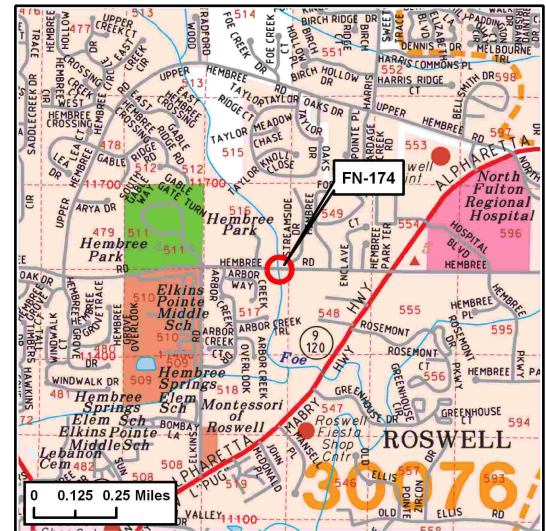
CST: Construction / Implementation



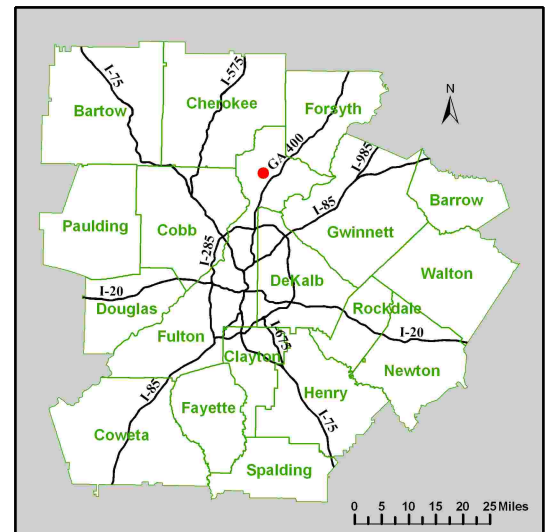
For additional information about this project, please visit the Atlanta Regional Commission at www.atlantaregional.com or call (404) 463-3100.



Short Title	HEMBREE ROAD AT FOE KILLER CREEK
GDOT Project No.	752960-
Federal ID No.	BRLB-9430(1)
Status	Programmed
Detailed Description and Justification	FN 174A includes reconstructing an existing bridge on Hembree Road over Foe Killer Creek. This project is a safety improvement, and will not add capacity.
Service Type	Bridge Upgrade
Sponsor	City of Roswell
Jurisdiction	Fulton (North)
Existing Thru Lane	2 (applicable for road projects only)
Planned Thru Lane	2 (applicable for road projects only)
Corridor Length	N/A miles (not applicable for all project types)
Network Year	2010 (required if modeled for conformity)
Completion Date	2009
Analysis Level	Exempt from Air Quality Analysis (40 CFR 93)



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Phase Status & Funding Information		FISCAL YEAR	TOTAL PHASE COST	BREAKDOWN OF TOTAL PHASE COST BY FUNDING SOURCE			
				FEDERAL	STATE	BONDS	LOCAL/OTHER
PE	Bridge (On-System)	AUTH	\$0,000	\$0,000	\$0,000	\$0,000	\$0,000
PE	STP - Statewide Flexible (GDOT)	AUTH	\$0,000	\$0,000	\$0,000	\$0,000	\$0,000
ROW	Bridge (On-System)	AUTH	\$0,000	\$0,000	\$0,000	\$0,000	\$0,000
CST	Bridge (On-System)	2008	\$0,000	\$0,000	\$0,000	\$0,000	\$0,000
CST	STP - Statewide Flexible (GDOT)	2008	\$0,000	\$0,000	\$0,000	\$0,000	\$0,000

PE: Preliminary Engineering / Design / Study

ROW: Right-of-way Acquisition

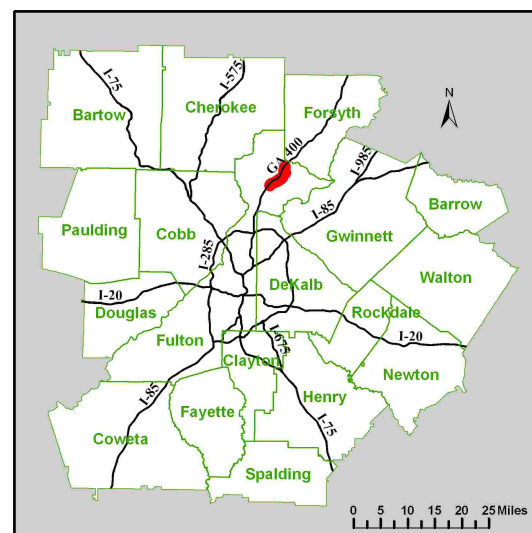
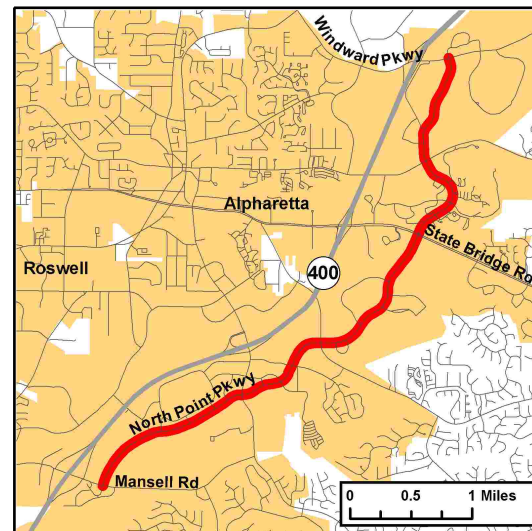
CST: Construction / Implementation



For additional information about this project, please visit the Atlanta Regional Commission at www.atlantaregional.com or call (404) 463-3100.



Short Title	NORTH POINT PARKWAY TRAFFIC SIGNAL INTERCONNECTIONS FROM MANSELL ROAD TO WINWARD PARKWAY
GDOT Project No.	0006819
Federal ID No.	CSCMQ-0006-00(819)
Status	Programmed
Detailed Description and Justification	FN-202 is an ATMS project on Northpoint Parkway from Mansell Road to Winward Parkway.
Service Type	ITS-Other
Sponsor	City of Alpharetta
Jurisdiction	Fulton (North)
Existing Thru Lane	N/A (applicable for road projects only)
Planned Thru Lane	N/A (applicable for road projects only)
Corridor Length	5.3 miles (not applicable for all project types)
Network Year	2020 (required if modeled for conformity)
Completion Date	2011
Analysis Level	Exempt from Air Quality Analysis (40 CFR 93)



Phase Status & Funding Information		FISCAL YEAR	TOTAL PHASE COST	BREAKDOWN OF TOTAL PHASE COST BY FUNDING SOURCE			
				FEDERAL	STATE	BONDS	LOCAL/OTHER
PE	Local Jurisdiction/Municipality Funds	2007	\$0,000	\$0,000	\$0,000	\$0,000	\$0,000
CST	Congestion Mitigation and Air Quality	2010	\$1,070,000	\$856,000	\$0,000	\$0,000	\$214,000
				\$856,000	\$0,000	\$0,000	\$214,000

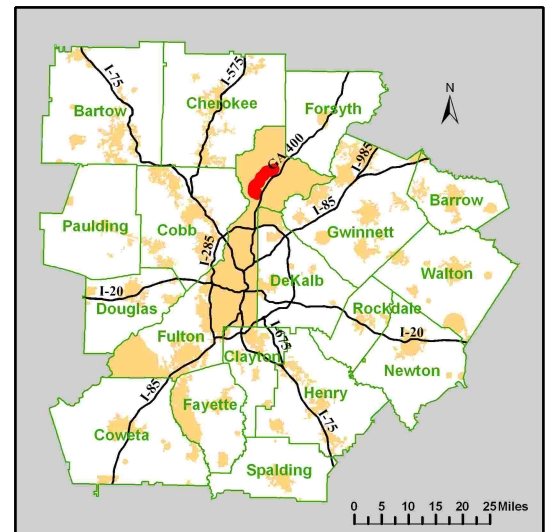
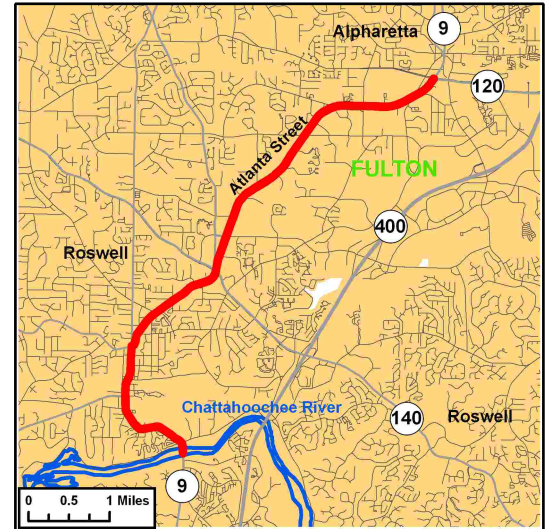
PE: Preliminary Engineering / Design / Study

ROW: Right-of-way Acquisition

CST: Construction / Implementation

For additional information about this project, please visit the Atlanta Regional Commission at www.atlantaregional.com or call (404) 463-3100.

Short Title	SR 9 (ATLANTA STREET) REPAVING FROM CHATTAHOOCHEE RIVER TO SR 120 (MARIETTA HIGHWAY)
GDOT Project No.	M003942
Federal ID No.	
Status	Programmed
Detailed Description and Justification	This project will repave SR 9 (Atlanta Street) from the Chattahoochee River to SR 120 (Marietta Highway).
Service Type	Roadway Maintenance / Operations
Sponsor	GDOT
Jurisdiction	Fulton (North)
Existing Thru Lane	N/A (applicable for road projects only)
Planned Thru Lane	N/A (applicable for road projects only)
Corridor Length	1.21 miles (not applicable for all project types)
Network Year	2020 (required if modeled for conformity)
Completion Date	2010
Analysis Level	Exempt from Air Quality Analysis (40 CFR 93)



Phase Status & Funding Information	FISCAL YEAR	TOTAL PHASE COST	BREAKDOWN OF TOTAL PHASE COST BY FUNDING SOURCE			
			FEDERAL	STATE	BONDS	LOCAL/OTHER
CST ARRA - Statewide Flexible (GDOT)	2009	\$0,000	\$0,000	\$0,000	\$0,000	\$0,000

PE: Preliminary Engineering / Design / Study

ROW: Right-of-way Acquisition

CST: Construction / Implementation

For additional information about this project, please visit the Atlanta Regional Commission at www.atlantaregional.com or call (404) 463-3100.

Current Road Improvement Project (PI 752970)
Project Info and Striping Plans

PRECONSTRUCTION STATUS REPORT FOR PI:752970-

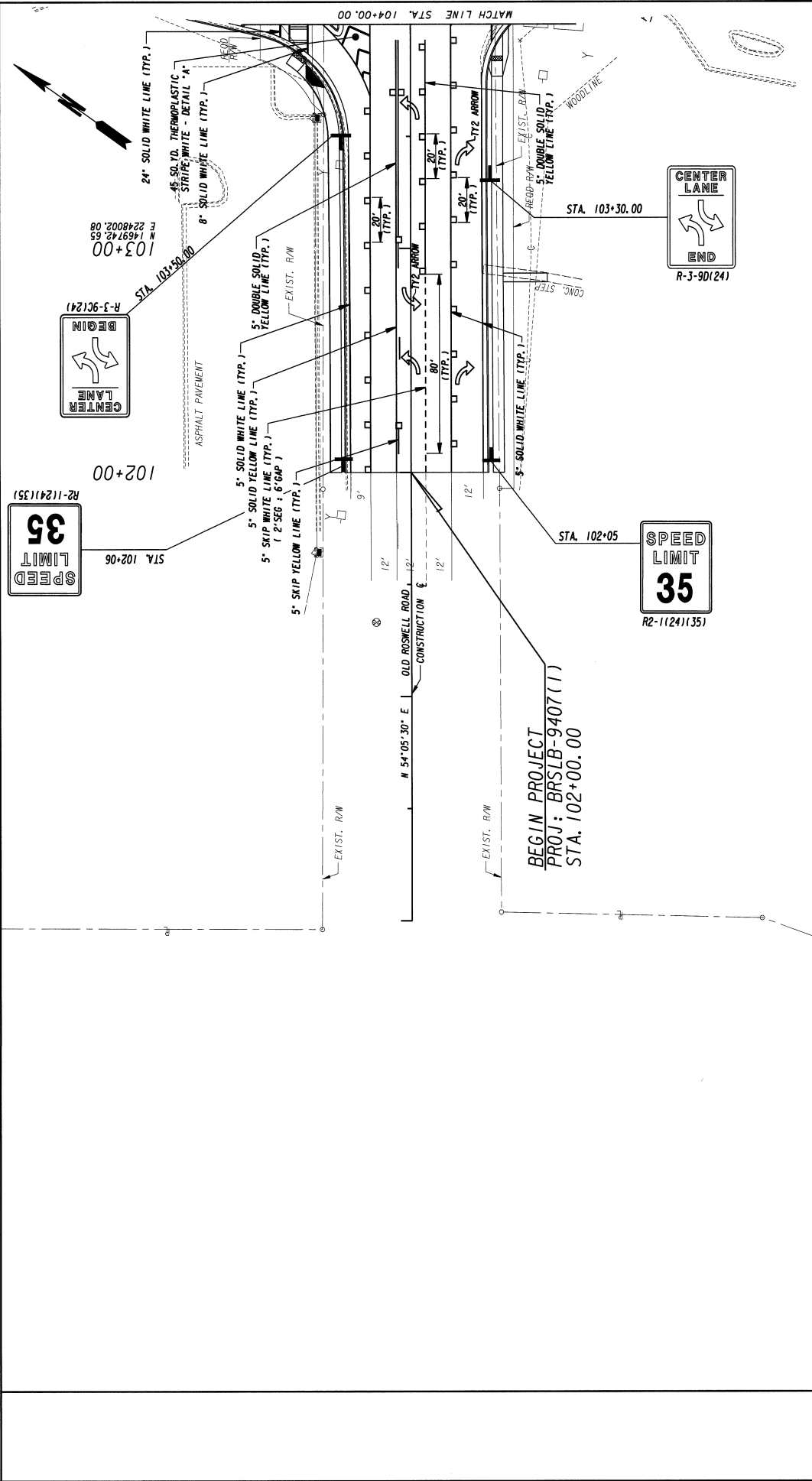
CR 1332/OLD ROSWELL RD FM .20 MI W OF MANSELL RD TO PR 9517

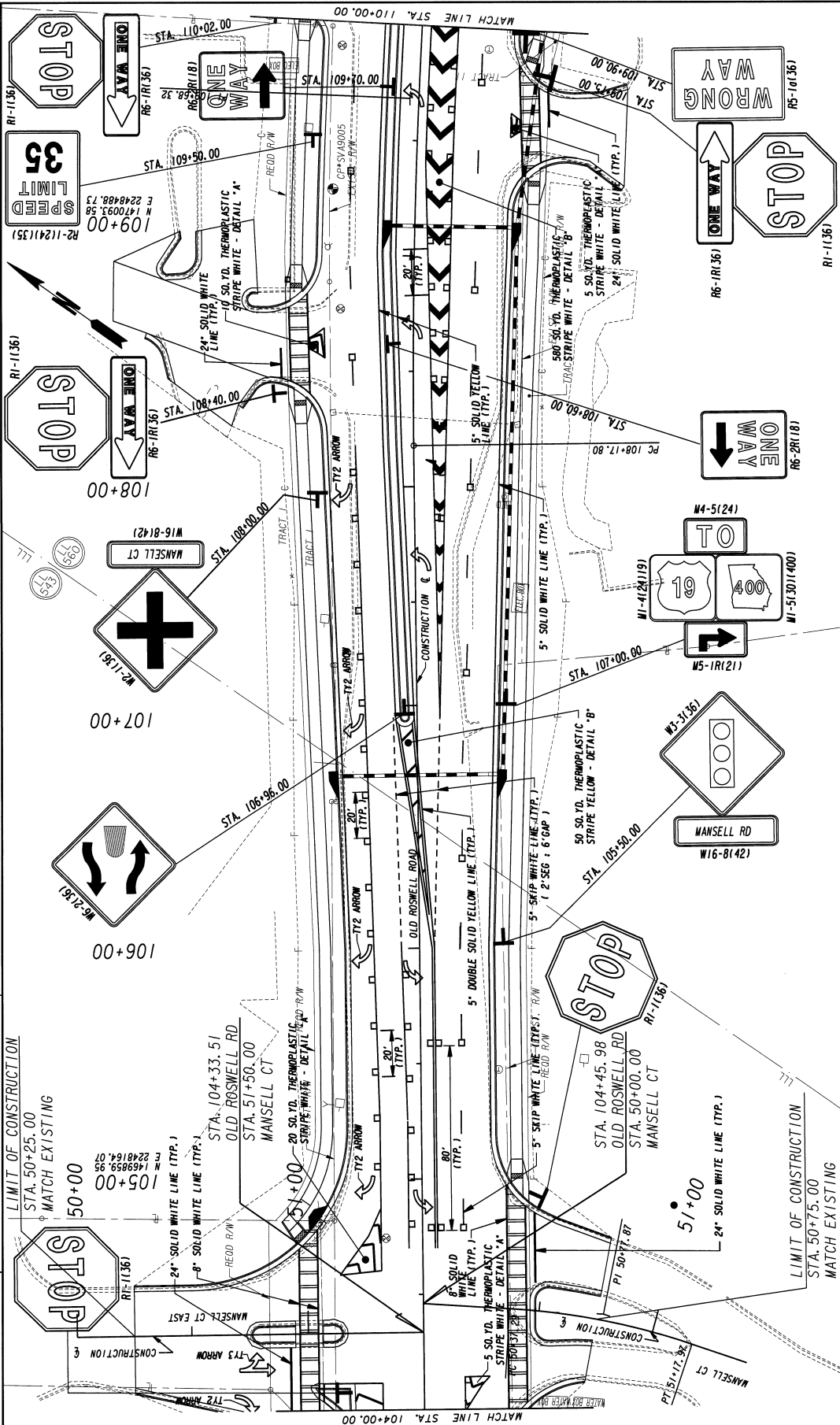
PROJ ID : 752970-
COUNTY : Fulton
LENGTH (MD) : 1.12
PROJ NO.: BRSLB-9407-00(001)
PROJ MGR: Lobdell, Mike
OFFICE : District 7
CONSULTANT: Local Design, Local PE funds
SPONSOR : Roswell

MGMT LET DATE : 01/18/2008
MGMT ROW DATE : 07/18/2006
SCHED LET DATE : 10/24/2008
WHO LETS?: GDOT Let
LET WITH : S009748,
0008818

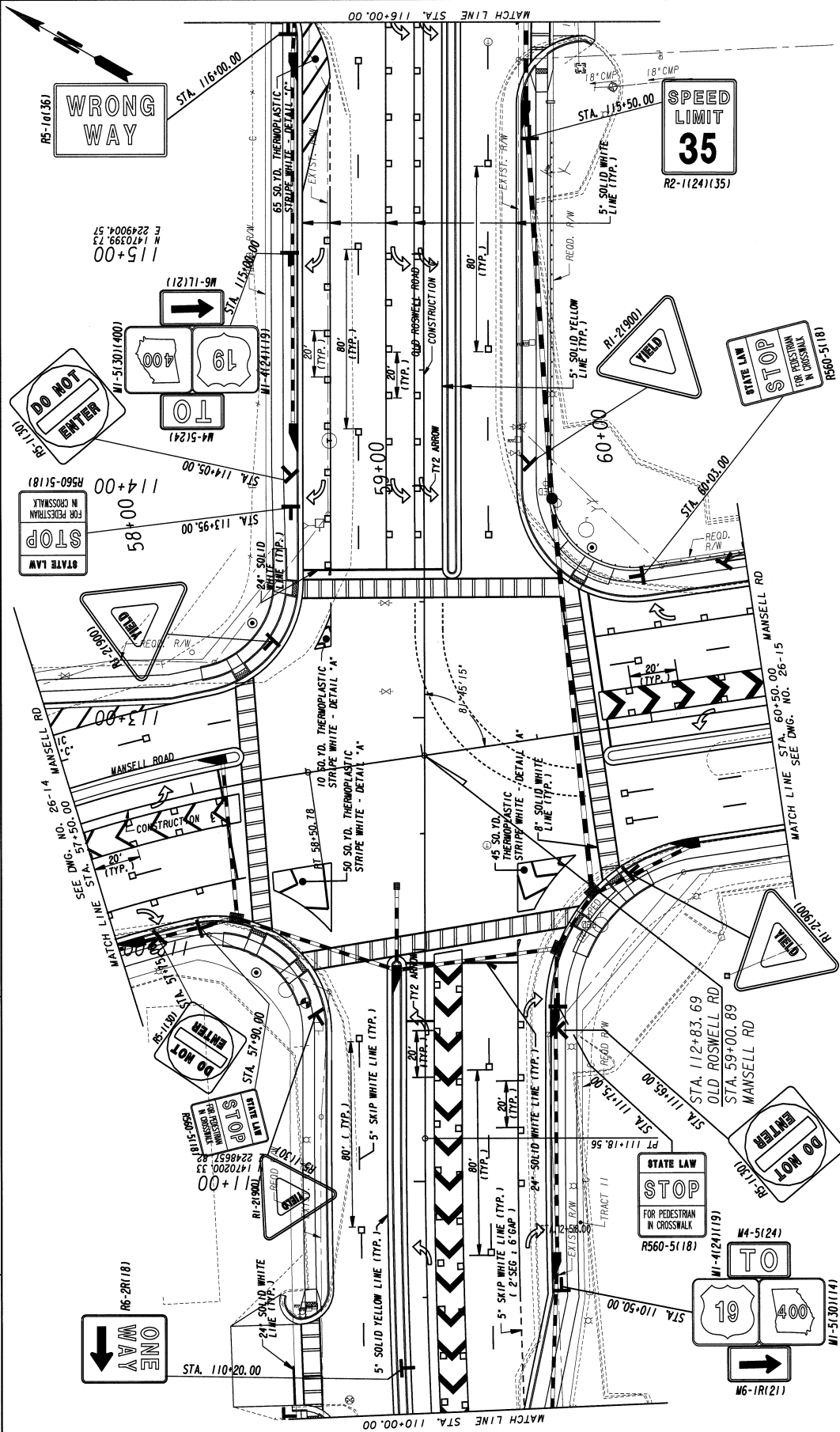
MPO: Atlanta TMA
TIP #: FN-173B
MODEL YR : 2010
TYPE WORK: Bridges
CONCEPT: BRIDGE
PROG TYPE: Replacement
BOND PROJ :
DOT DIST: 7
CONG. DIST: 6
BIKE: N
MEASURE: E
NEEDS SCORE: 06
BRIDGE SUFE: 42.89

SCHED		SCHED	ACTIVITY		ACTUAL	ACTUAL	%	PROGRAMMED FUNDS										
START	FINISH	FINISH			START	FINISH		Phase	Approved	Proposed	Cost	Fund	Status	Date Auth				
2/18/2008			Concept Development		2/15/2001	7/13/2005	100	PE	2000	2000	39,625.60	Q10	AUTHORIZED	2/16/2000				
			Concept Meeting		1/20/2004	1/20/2004	100	ROW	2007	2007	684,377.50	HY10	AUTHORIZED	6/29/2007				
			Concept Submittal and Review		3/24/2005	6/14/2005	100	ROW	2007	2007	736,980.00	LY10	AUTHORIZED	6/29/2007				
			Receive Preconstruction Concept Approval		6/22/2005	7/7/2005	100	ROW	2007	2007	5,857,642.50	Q11	AUTHORIZED	6/29/2007				
			Management Concept Approval Complete		7/7/2005	7/13/2005	100	ROW	2007	2007	5,857,642.50	Q11	AUTHORIZED	6/29/2007				
			Public Information Open House Held		1/27/2005	1/27/2005	100	CST	2008	2008	2,319,904.93	L1C0	AUTHORIZED	12/19/2007				
			Environmental Approval		2/17/2006	2/17/2006	100	CST	2008	2008	5,893,569.00	L240	AUTHORIZED	12/19/2007				
			Field Surveys/SDE		12/12/2003		0	PE Cost Est Amt:	2008	2008	2,229,373.28	L1C0	AUTHORIZED	12/19/2007				
			Preliminary Plans		2/12/2004		68	ROW Cost Est Amt:	2008	2008	684,377.50	PE		0.00	Q10			
			Preliminary Bridge Design		10/23/2006	7/10/2005	100	ROW Cost Est Amt:			1/19/2007	ROW		0.00	LY10			
5/23/2008			Underground Storage Tanks		7/27/2006		60	ROW Cost Est Amt:			1/19/2007	ROW		0.00	Q11			
			404 Permit Obtainment		4/11/2006	8/10/2006	100	CST Cost Est Amt:			2/7/2007	ROW		0.00	HY10			
			PFPR Inspection		4/13/2006	4/13/2006	100	CST Cost Est Amt:			2/7/2007	CST		2,000,000.00	L1C0			
			R/W Plans Preparation		5/2/2006	6/22/2006	100	CST Cost Est Amt:			2/7/2007	CST		0.00	LS30			
			R/W Plans Final Approval		5/10/2006	5/17/2006	100	CST Cost Est Amt:			2/7/2007	CST		2,727,000.00	L240			
			L & D Report Development and Approval		11/2/2007		38											
			R/W Acquisition		12/27/2005	3/8/2006	0											
			Stake R/W		6/27/2006	8/25/2006	100											
			Soil Survey		5/12/2006		15											
			Bridge Foundation Investigation		10/25/2006	2/13/2007	100											
	12/19/2008		Final Design		2/22/2007	2/22/2007	100											
			Final Bridge Plans Preparation		3/7/2007	3/21/2007	100											
			FPFR Inspection															
			FPFR Response															
			PDD: JUNE 30/1998 ASSIGNED DISTRICT 7. ARE LOCALS DOING PE? 8/24/98								District Comments							
			Bridge: WEI 08/02/07 CONSUL - RKS (FINAL PLANS SENT 7/18/07)								CITY OF ROSWELL. SUFF RATING =41.7. CONSULTANT - R.K. SHAH. ALPHARETTA							
			Design: WSL								ACQUIRING R/W (422/05) LOCALS RESUBMITTED CONCEPT REPORT; ENV.							
			EIS: CE I Aprvd 2.17.06 I R 11-8-07 OnSched I Treadway 10.23.08								SUBMITTED. (7/7/05) CONCEPT SUBMITTED FOR APPVL. (2/8/06) ALPHARETTA WILL							
			LGPA: REV PFA SGN ALPHARETTA DO PE & 20% ROW 4-2-07.								TAKE OVER PE AFTER R/W PLANS APPVD. (1/4/07) FUNDING ISSUES. (11/5/07) R/W TO							
Prog. Develop: LS30 SAFETY FUNDS MAX @ \$2MIL; THIS PROJECT INCLUDES MONEY FOR DEMO GA108 & GA210								MAKE LET DATE.										
Programming: #1 5-05/#2 5-06/PI# 0007014; 0007530 &S007228 WAS ADDED TO THIS PROJECT 6-06;SEE																		
ROW: S009748/TEMP SR 1169; 1169TA-TB/#3 6-07/COMP 4-10/#4 2-08/#6 3-09/#7 3-09/#9 8-09																		
Traffic Op: Pre-Acq D. Reddick, Hill (CC), Williamson (C) Appeals																		
Utility: CAHIBR REP PRJ/S&M PLNS N/R/032001\$FFPR sent 1.25.07 w/r																		
EMG: CC: CLEAR																		
BRIDGE REPLACEMENT																		

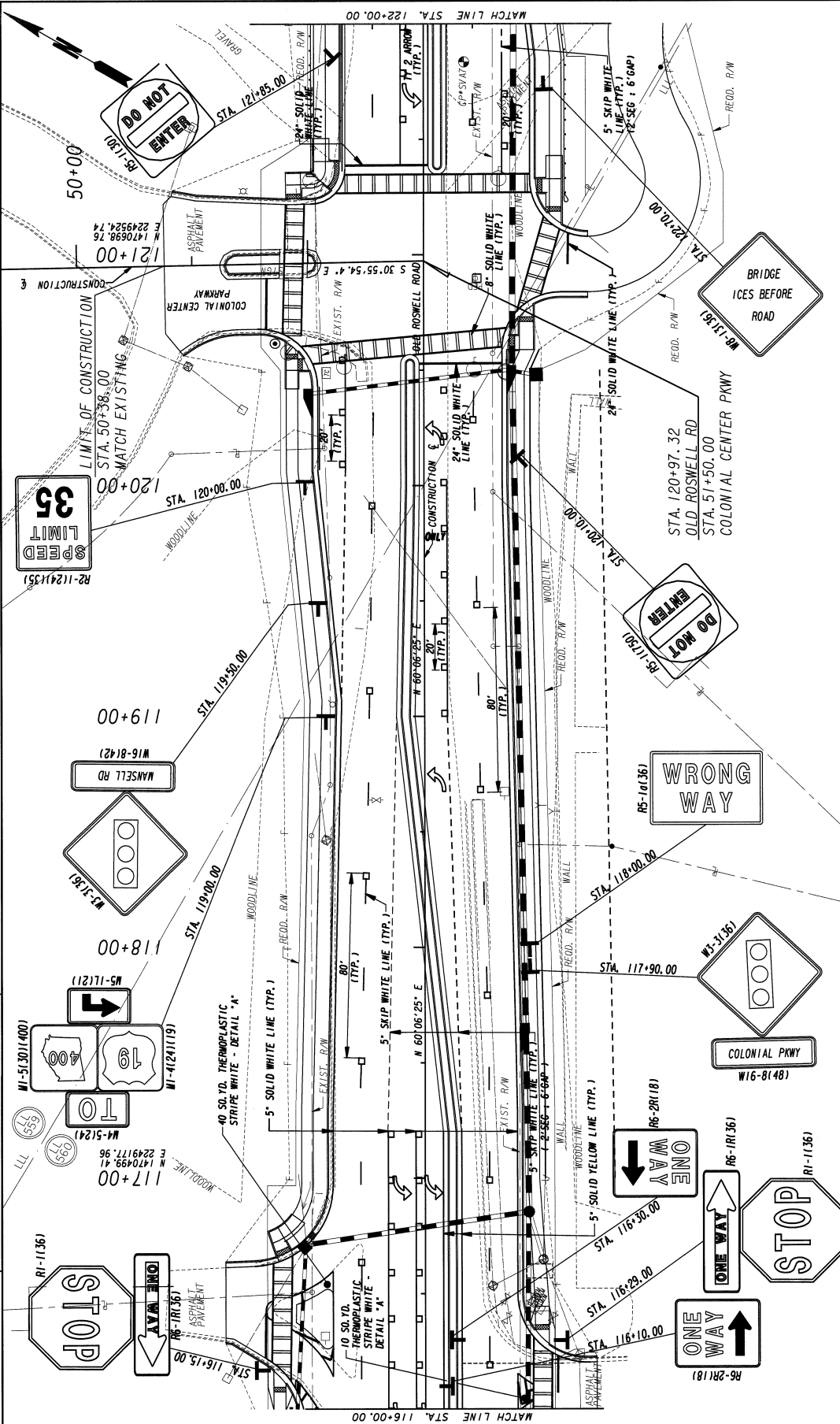
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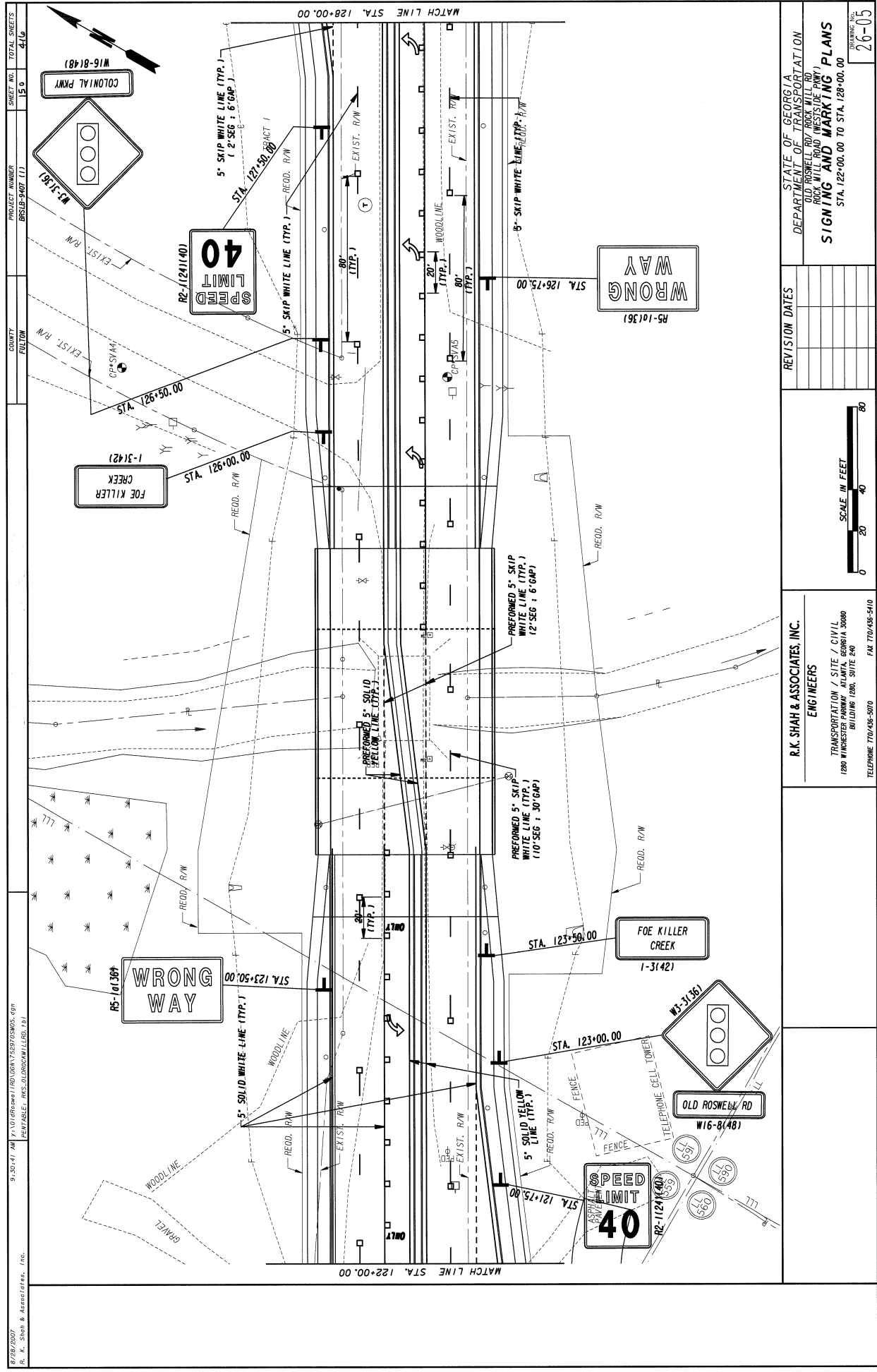
STATE OF GEORGIA DEPARTMENT OF TRANSPORTATION	OLD ROSWELL ROAD ROCK WILL RD ROCK WILL ROAD (WESTSIDE PARK) STA. 104+00.00 TO STA. 110+00.00	REVISION DATES	SCALE IN FEET 	DATE: 26-02
R.K. SHAH & ASSOCIATES, INC.	ENGINEERS		TRANSPORTATION / SITE / CIVIL 1280 WINCHESTER PARKWAY ATLANTA, GEORGIA 30080 BUILDING 1280, SUITE 240 TELEPHONE 770/435-9070 FAX 770/435-5410	

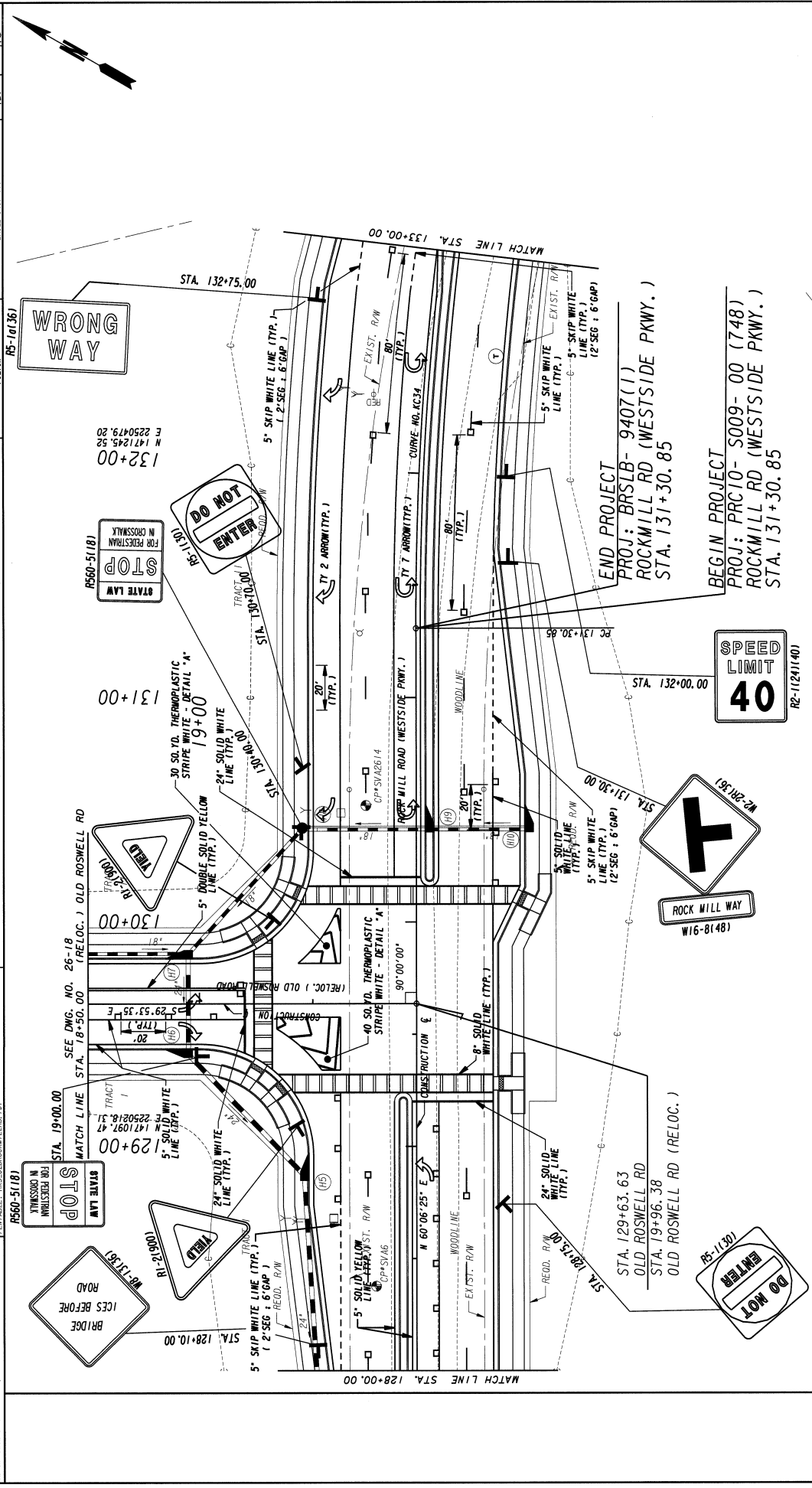


R.K. SHAH & ASSOCIATES, INC. ENGINEERS TRANSPORTATION / SITE / CIVIL 1280 WINCHESTER PARKWAY ATLANTA, GEORGIA 30080 BUILDING 1280, SUITE 240 TELEPHONE 770/438-5070 FAX 770/438-5410	SCALE IN FEET	STATE OF GEORGIA DEPARTMENT OF TRANSPORTATION OLD ROSWELL RD / ROCK HILL RD ROCK WILL ROAD (WESTSIDE PARK) SIGNING AND MARKING PLANS STA. 110+00.00 TO STA. 116+00.00	REVISION DATES <table border="1"> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </table>																					DATE: 05-10-00 DRAWING NO.: 20-03

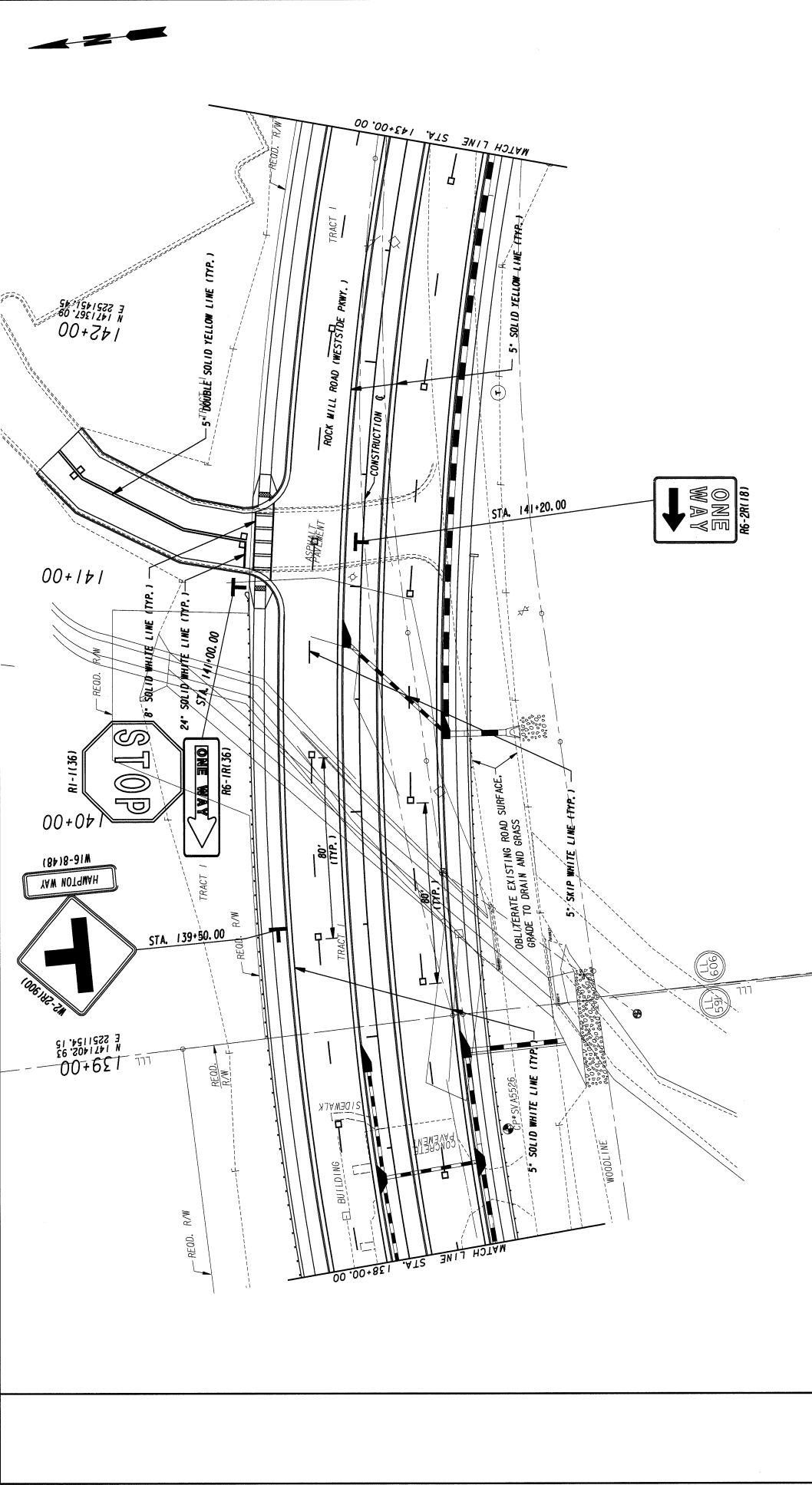


STATE OF GEORGIA DEPARTMENT OF TRANSPORTATION OLD RISNELL RD / ROCK WILL RD ROCK WILL ROAD (WESTSIDE PARK)	STATIONING No. 26-00	STA. 116+00.00 TO STA. 122+00.00	ENGINEERING TRANSPORTATION / SITE / CIVIL 1280 WINCHESTER PARKWAY ATLANTA, GEORGIA 30080 BUILDING 1280, SUITE 240 TELEPHONE 770/435-5070 FAX 770/435-5410	SCALE IN FEET 0 20 40 60 80	REVISION DATES

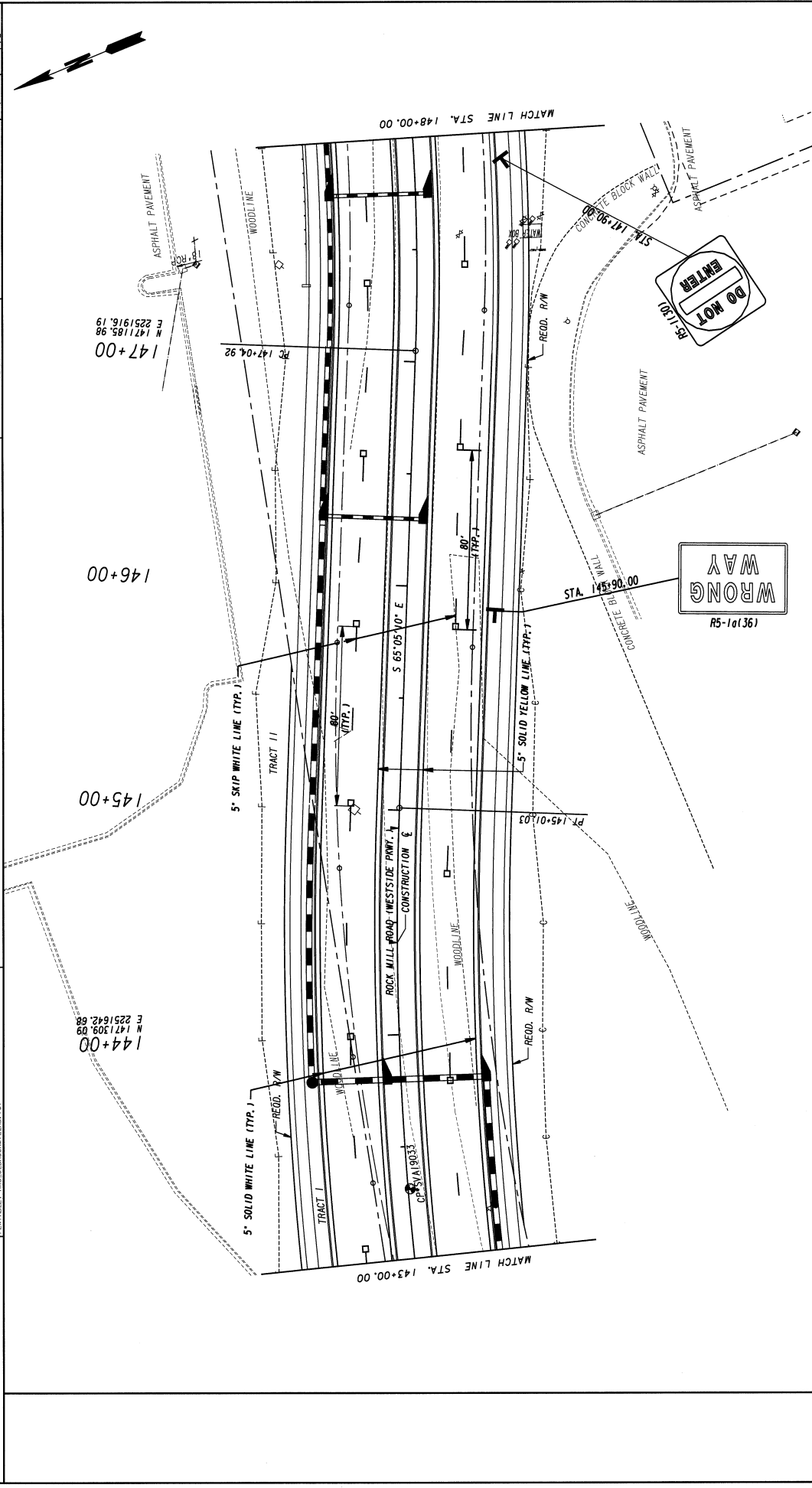




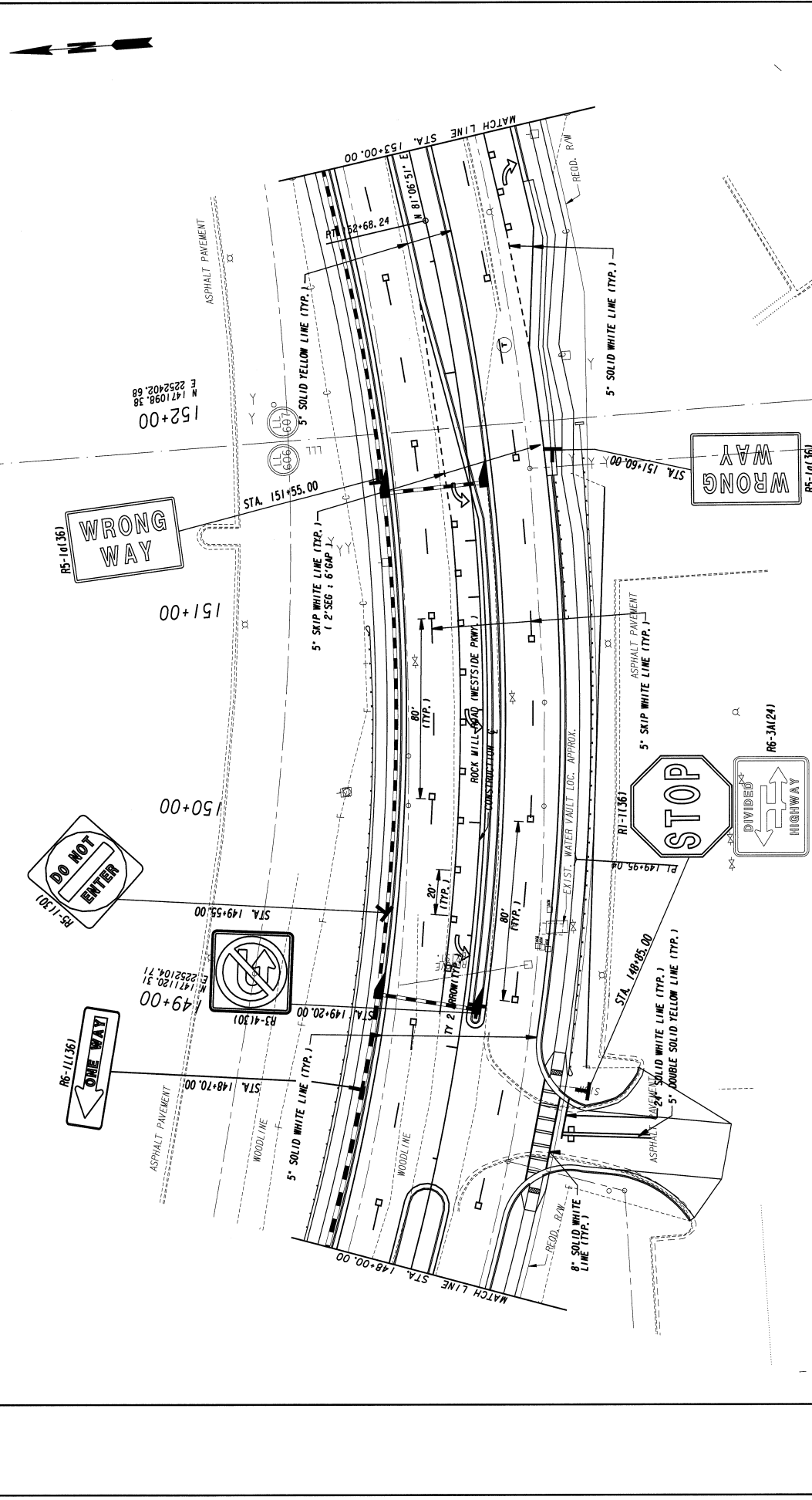
R.K. SHAW & ASSOCIATES, INC. ENGINEERS TRANSPORTATION / SITE / CIVIL 1280 WINCHESTER PARKWAY ATLANTA, GEORGIA 30080 BUILDING 1280, SUITE 240 TELEPHONE 770-435-5070 FAX 770-435-5410	REVISION DATES <table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																																					SCALE IN FEET
STATE OF GEORGIA DEPARTMENT OF TRANSPORTATION OLD ROSWELL RD / ROCKMILL RD BRSLB-9407(1) SIGNING AND MARKING PLANS STA. 128+00.00 TO STA. 133+00.00 26-06																																						



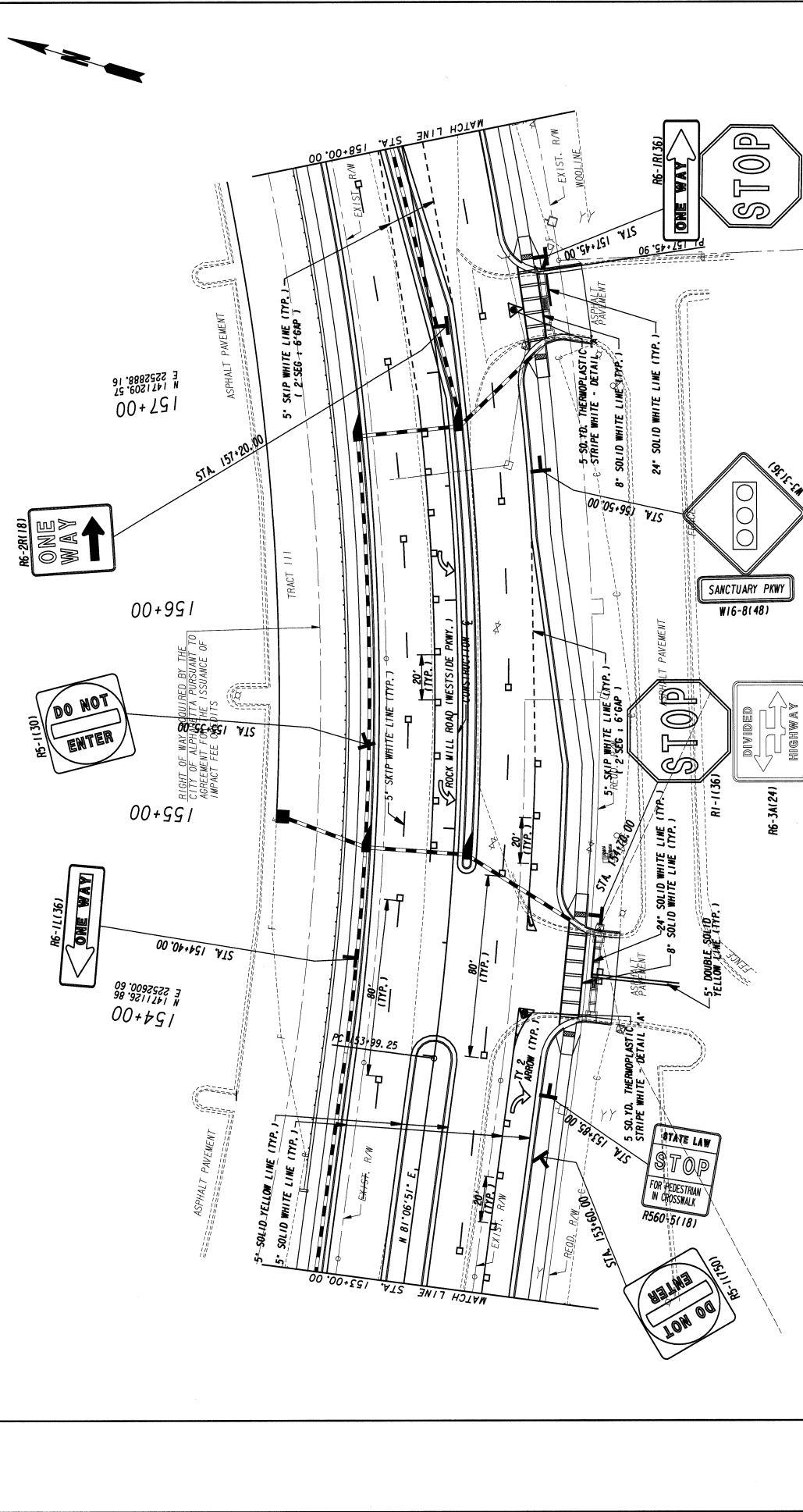
R.K. SHAH & ASSOCIATES, INC. ENGINEERS TRANSPORTATION / SITE / CIVIL 1280 WINCHESTER PARKWAY, ATLANTA, GEORGIA 30380 BUILDING 1500, SUITE 240 TELEPHONE 770/438-5070 FAX 770/438-5410	REVISION DATES	STATE OF GEORGIA DEPARTMENT OF TRANSPORTATION OLD ROSWELL ROAD / ROCK MILL ROAD ROCK MILL ROAD (R/W) SIGNING AND MARKING PLANS STA. 138+00.00 TO STA. 143+00.00 DRAWING NO. 26-08



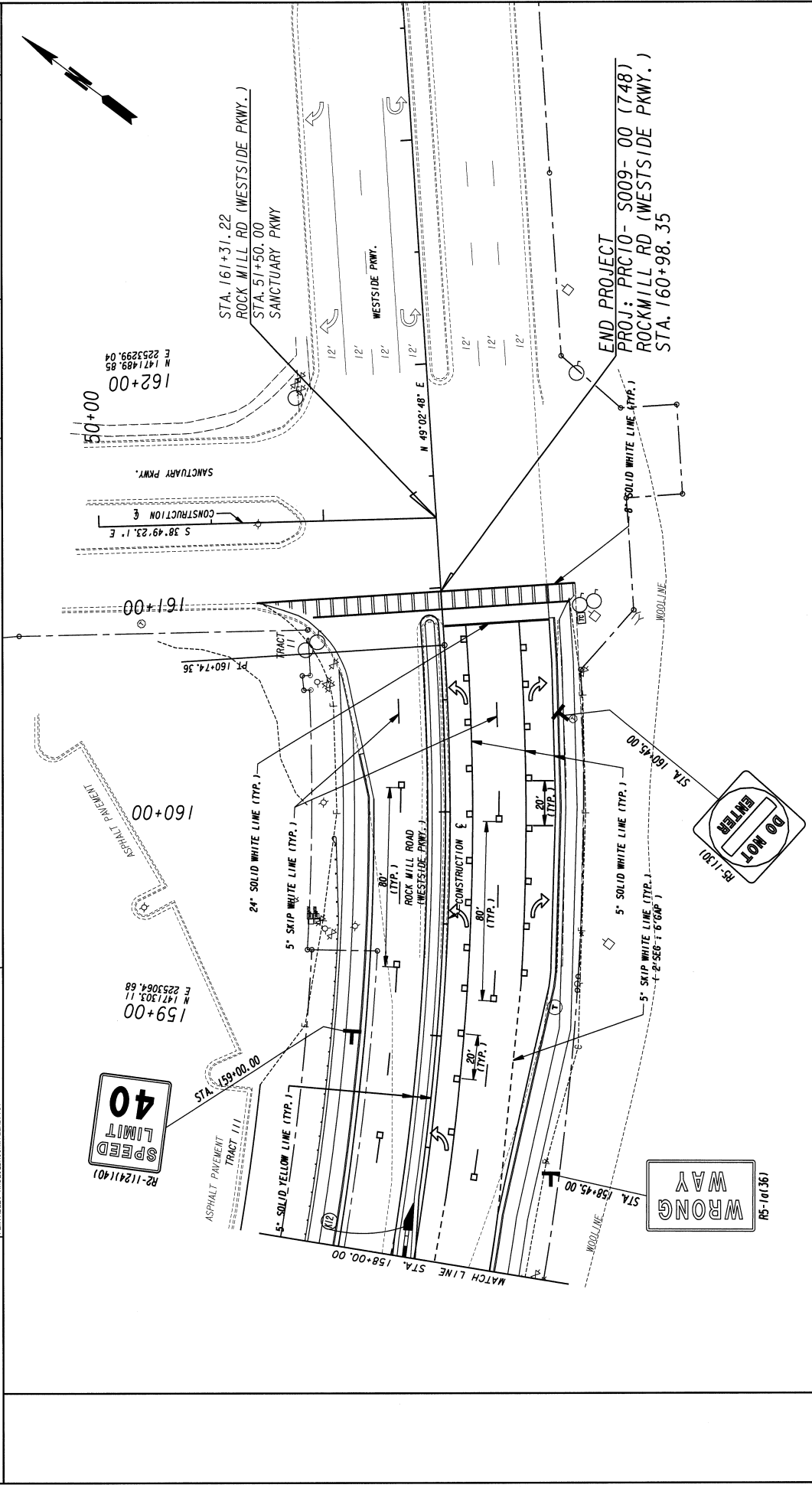
R.K. SHAH & ASSOCIATES, INC. ENGINEERS TRANSPORTATION / SITE / CIVIL 1280 WINCHESTER PARKWAY ATLANTA, GEORGIA 30080 BUILDING 1590, SUITE 240 TELEPHONE 770-435-5070 FAX 770-435-5410	STATE OF GEORGIA DEPARTMENT OF TRANSPORTATION OLD ROSWELL RD / ROCK MILL RD ROCK MILL RD / ROCK MILL RD SIGNING AND MARKING PLANS STA. 143+00.00 TO STA. 148+00.00	REVISION DATES <table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>							SCALE IN FEET	26-09
DO NOT ENTER WRONG WAY	ASPHALT PAVEMENT WOOD LINE TRACT I TRACT II 5' SOLID WHITE LINE (TYP.) 5' SKIP WHITE LINE (TYP.) 5' SOLID YELLOW LINE (TYP.) ROCK MILL ROAD WESTSIDE POINT CONSTRUCTION CONCRETE BLOCK WALL ASPHALT PAVEMENT WOOD LINE REDD. R/W STA. 143+00.00 STA. 144+00.00 STA. 145+00.00 STA. 146+00.00 STA. 147+00.00 STA. 148+00.00									



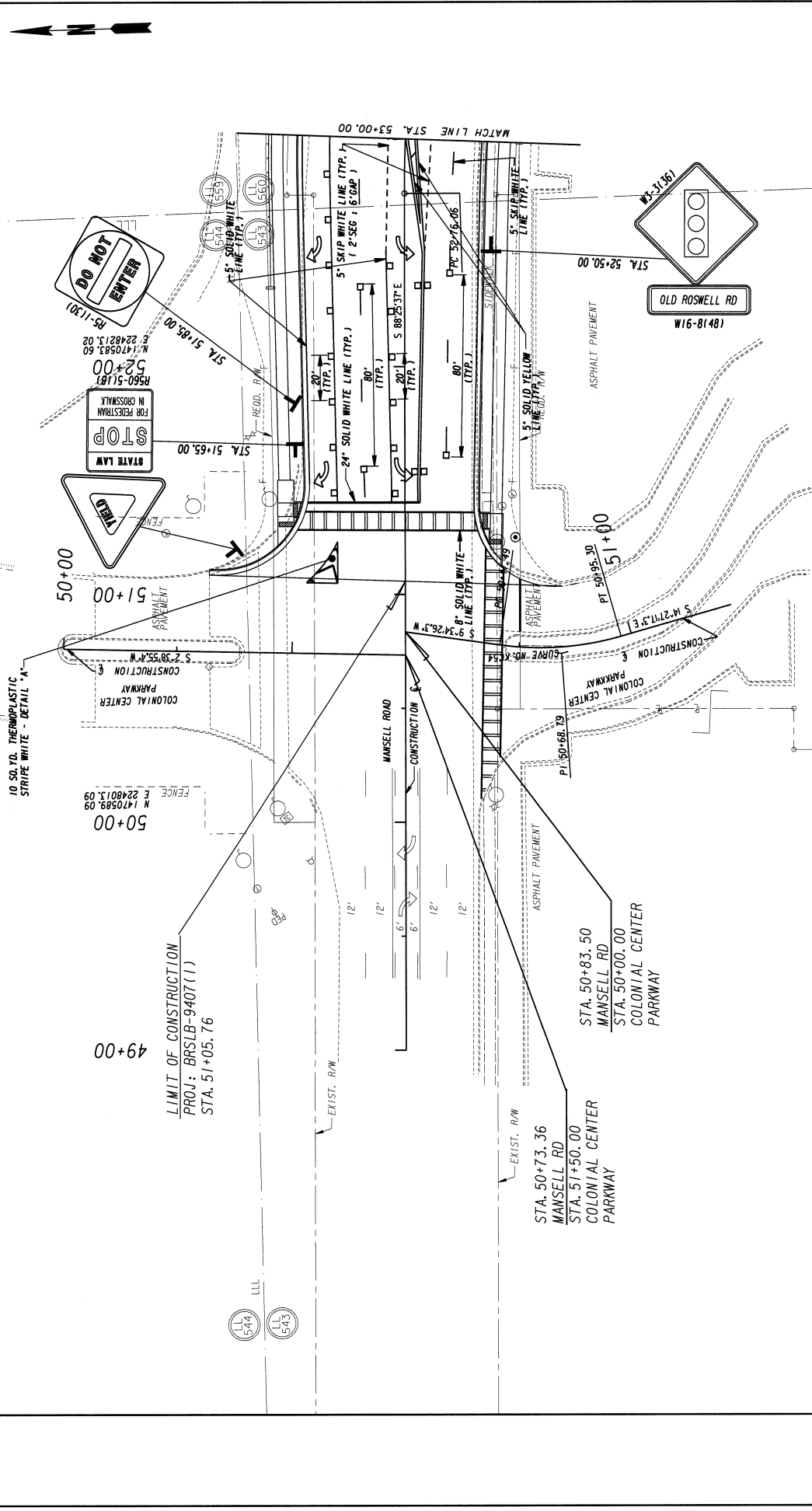
R.K. SHAH & ASSOCIATES, INC. ENGINEERS TRANSPORTATION / SITE / CIVIL 1200 WINCHESTER PARKWAY ATLANTA, GEORGIA 30080 BUILDING 1200, SUITE 240 TELEPHONE 770/435-5070 FAX 770/435-5410	REVISION DATES <table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>							STATE OF GEORGIA DEPARTMENT OF TRANSPORTATION OLD ASHLEY RD / ROCK MILL RD (AT INTERSECTION) SIGNING AND MARKING PLANS STA. 148+00.00 TO STA. 153+00.00 DRAWING NO. 26-10
SCALE IN FEET 								



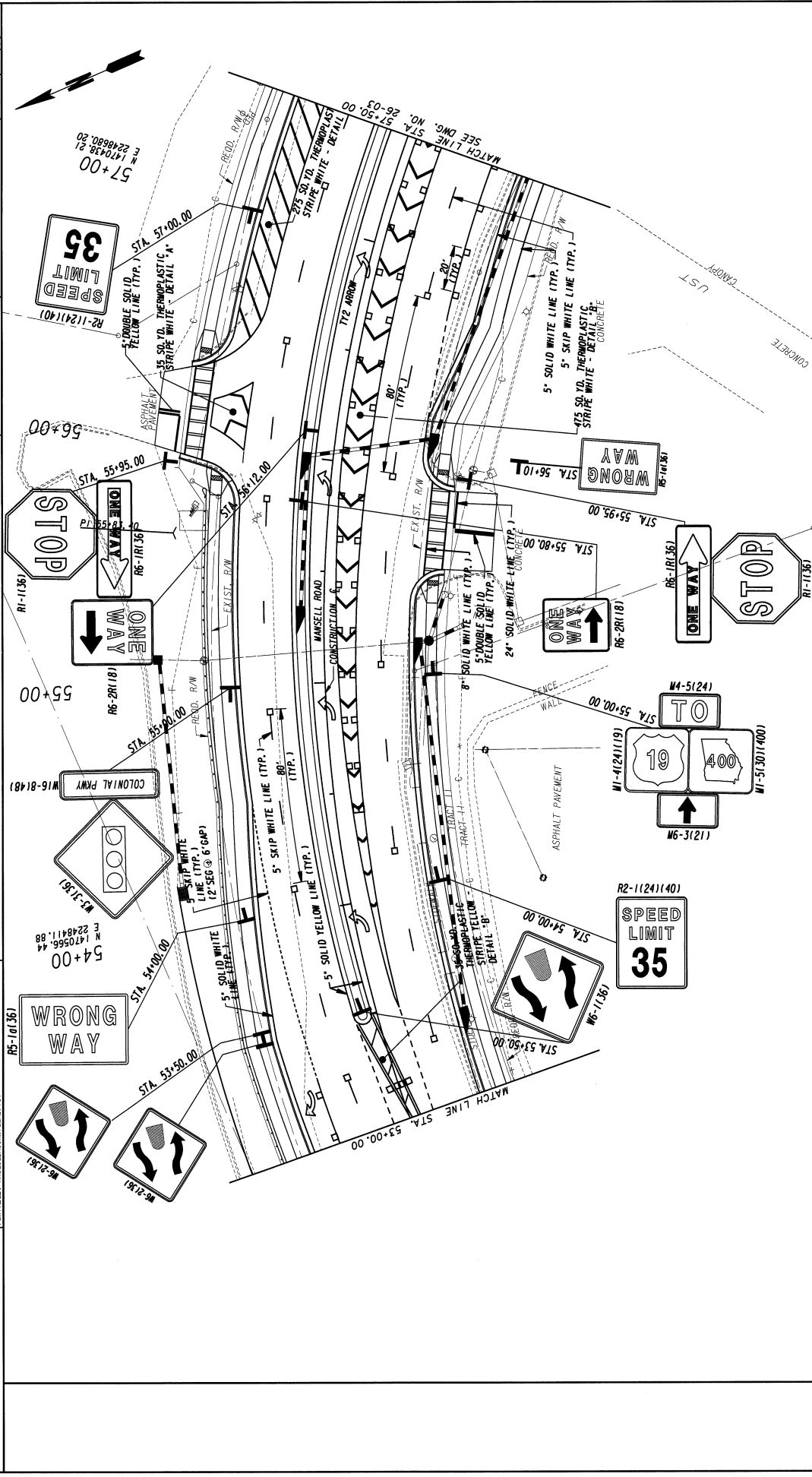
			STATE OF GEORGIA DEPARTMENT OF TRANSPORTATION SIGNING AND MARKING PLANS STA. 153+00.00 TO STA. 159+00.00 OLD ROSSELL RD. ROCK WILL RD. ROCK WILL ROAD (WESTSIDE PNTY) DATE: 10-1-81 26-11



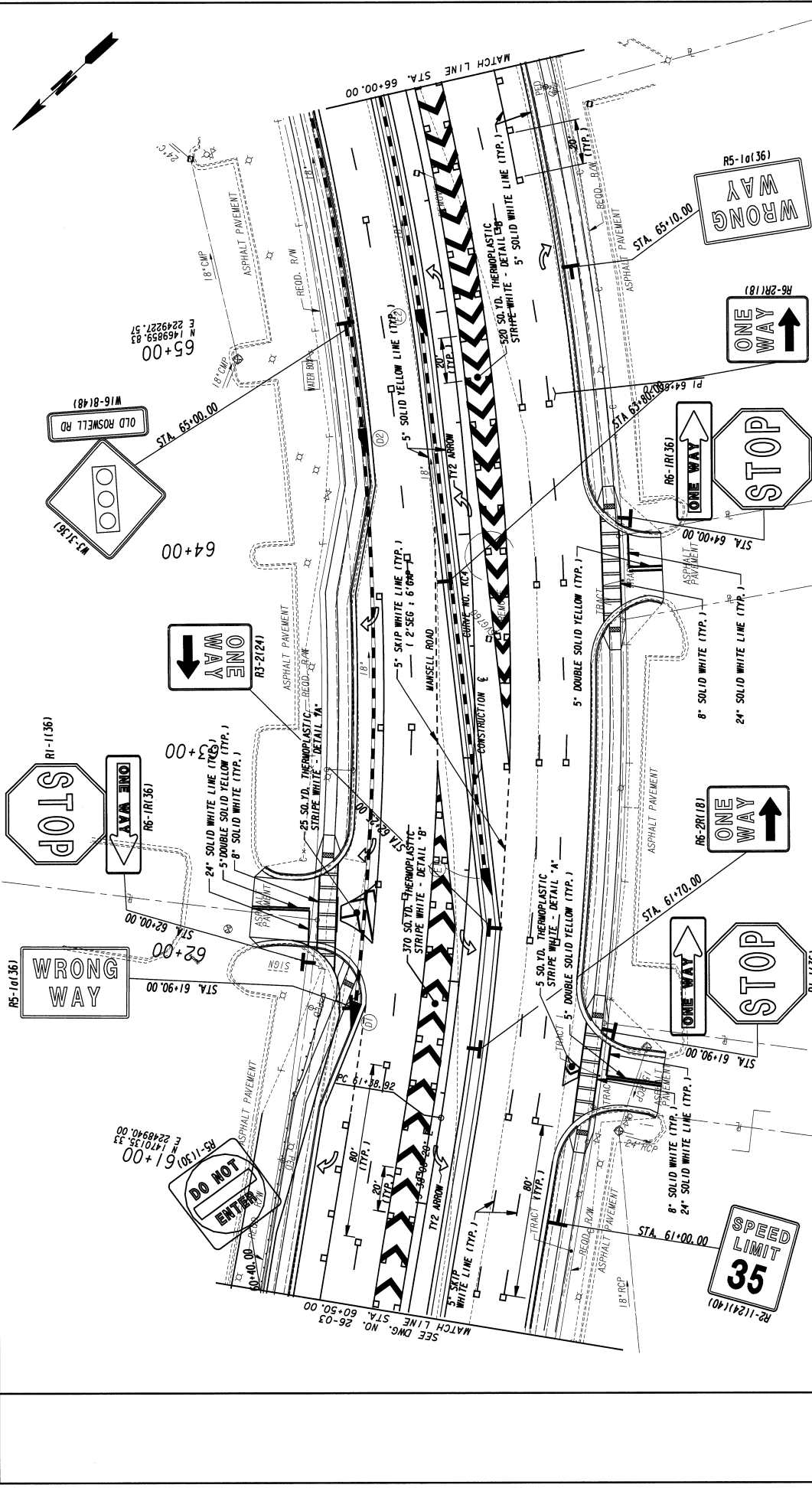
R.K. SHAH & ASSOCIATES, INC. ENGINEERS TRANSPORTATION / SITE / CIVIL 1280 WINCHESTER PARKWAY ATLANTA, GEORGIA 30380 BUILDING 1280, SUITE 240 TELEPHONE 770-435-5070 FAX 770-435-5410	REVISION DATES	STATE OF GEORGIA DEPARTMENT OF TRANSPORTATION OLD ROSWELL RD / ROCK MILL RD ROCK MILL RD (WESTSIDE PKWY.) SIGNING AND MARKING PLANS STA. 158+00.00 TO STA. 161+00.00 DRAWING NO. 26-12
	SCALE IN FEET 0 20 40 80	26-12



R.K. SHAH & ASSOCIATES, INC. ENGINEERS TRANSPORTATION / SITE / CIVIL 1280 WINCHESTER PARKWAY ATLANTA, GEORGIA 30080 BUILDING 1280, SUITE 240 TELEPHONE 770-435-5070 FAX 770-435-5410	REVISION DATES <table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																																					STATE OF GEORGIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS DISTRICT 11 OLD ROSWELL ROAD (W16-814) (W16-814) 91W STA. 50+00.00 TO STA. 53+00.00 SIGNING AND MARKING PLANS 26-13
SCALE IN FEET 0 20 40 80																																						
10 SO.YD. THERMOPLASTIC STRIPE WHITE - DETAIL 'A'																																						



STATE OF GEORGIA DEPARTMENT OF TRANSPORTATION OLD NORFOLK RD. / ROCKY HILL RD. MANSSELL ROAD / COLONIAL PARKWAY	
SIGNING AND MARKING PLANS STA. 53+00.00 TO STA. 57+50.00	
REVISION DATES	
R.K. SHAH & ASSOCIATES, INC. ENGINEERS TRANSPORTATION / SITE / CIVIL 1280 WINCHESTER PARKWAY ATLANTA, GEORGIA 30080 BUILDING 1280, SUITE 2ND TELEPHONE 770-435-5070 FAX 770-435-5410	
SCALE IN FEET 0 20 40 80	
SHEET NO. 159 TOTAL SHEETS 416	



STATE OF GEORGIA DEPARTMENT OF TRANSPORTATION OLD ROSWELL ROAD / ROCK MILL ROAD BRISB-3407 (1)																					
REVISION DATES <table border="1"> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </table>																					SIGNING AND MARKING PLANS STA. 60+00 TO STA. 66+00
R.K. SHAH & ASSOCIATES, INC. ENGINEERS TRANSPORTATION / SITE / CIVIL 1280 WINCHESTER PARKWAY ATLANTA, GEORGIA 30300 BUILDING 1500, SUITE 240 TELEPHONE 770/435-5410 FAX 770/435-5070																					
SCALE IN FEET 0 20 40 80																					
26-15																					

Proposed Facility Site Plan