

TECHNICAL MEMORANDUM

To: Ms. Heather Garcia
From: Mike Woodward, P.E.
Kimley-Horn and Associates, Inc.
Date: May 27, 2015
Subject: Future Condition Evaluation and Identification of Corridor Needs

1.0 Introduction & Purpose

The purpose of this Technical Memorandum is to summarize the future condition evaluation and identification of corridor needs. This document is intended to set the stage for discussions at the public involvement kickoff workshop.

SR 518 is the main east/west corridor traveling between the Indian River Lagoon and the Atlantic Ocean. The limits for this project are from SR 513 (Riverside Drive/S Patrick Drive) to SR A1A, as shown in **Exhibit 1**. The Roadway ID is 70120000. The study area includes three municipalities: Brevard County, the City of Melbourne, and the City of Indian Harbour Beach.

Land use fronting the corridor is primarily commercial, with single family and multi-family residential representing the majority of the land uses in the overall area.

An existing conditions report is available separately.

Intersections

- SR 518 & SR 513
- SR 518 & Burns Blvd
- SR 518 & Brittany Dr
- SR 518 & Wal-Mart/Winn Dixie Entrance
- SR 518 & SR A1A
- SR A1A & Wal-Mart/Winn Dixie Entrance
- SR A1A & Oceanside Blvd
- SR 513 & Pedestrian Signal
- SR 513 & Shopping Center



Exhibit 1: Study Area

2.0 Existing Intersection and Roadway Operations

Existing intersection operating conditions were determined using seasonally adjusted turning movement counts at study area intersections. The intersections were analyzed using Synchro software. Results are shown in **Table 1**. Existing turning movement volumes are shown in **Exhibits 2 and 3**. The roadway segment operating conditions for Existing are shown in **Table 2**.

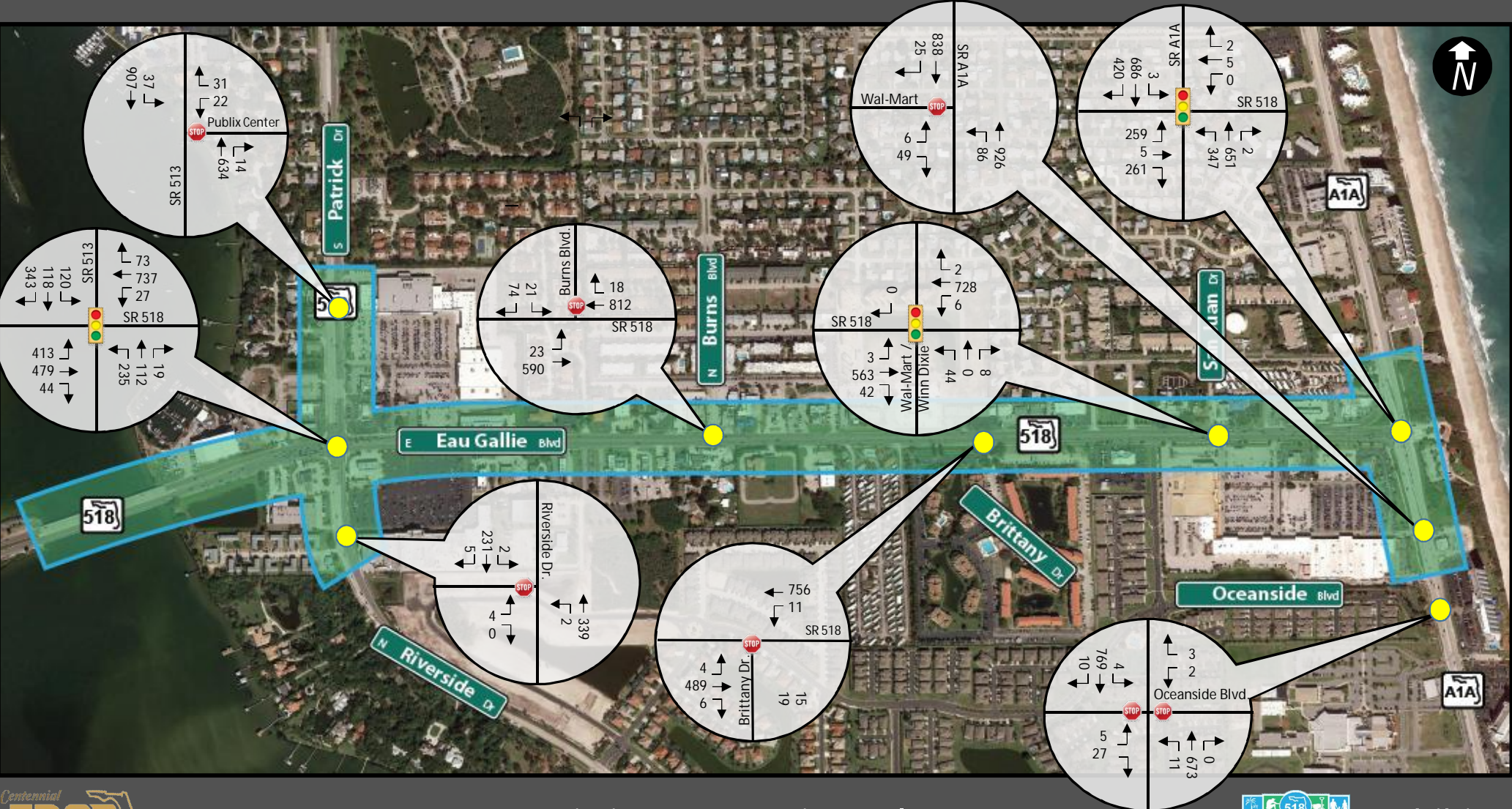
Table 1: Existing Intersection Operation Conditions

INTERSECTION	Intersection Control	AM Peak Hour			PM Peak Hour		
		Overall		Max	Overall		Max
		Delay	LOS	V/C	Delay	LOS	V/C
SR 518 & SR 513	Signalized	49.4	D	0.91	63	E	0.99
SR 518 & Burns Blvd	Unsignalized	1.3	A	0.18	3.1	A	0.37
SR 518 & Brittany Dr	Unsignalized	0.8	A	0.09	0.8	A	0.08
SR 518 & WalMart / Winn Dixie Entrance	Signalized	2.3	A	0.26	12.2	B	0.68
SR 518 & SR A1A	Signalized	26.4	C	0.84	35.9	D	0.89
SR A1A & WalMart / Winn Dixie Entrance	Unsignalized	1.1	A	0.43	6.7	A	0.98
SR A1A & Oceanside Blvd	Unsignalized	1.1	A	0.10	2.9	A	0.80
SR 513 & Garden Apartments	Unsignalized, Near Ped. Signal	0.3	A	0.02	0.5	A	0.07
SR 513 & Shopping Center	Unsignalized	1	A	0.10	5.1	A	0.69

Table 2: Roadway Segment Operating Conditions

Roadway	From	To	Number of Lanes	FDOT LOS STD	Daily Service Volume	Existing (2015) AADT	Existing LOS
SR 518	US 1	SR 513	4	D	41,790	36,700	C
	SR 513	San Juan Dr	4	D	41,790	27,200	C
	San Juan Dr	SR A1A	4	D	41,790	22,100	C
Riverside Dr	Oceanside Blvd	SR 518	2	D	16,815	9,000	C
SR 513	SR 518	Banana River Dr	4	D	41,790	23,300	C
SR A1A	Oceanside Blvd	SR 518	4	D	41,790	29,100	C
	SR 518	Palm Springs Blvd	4	D	41,790	29,800	C

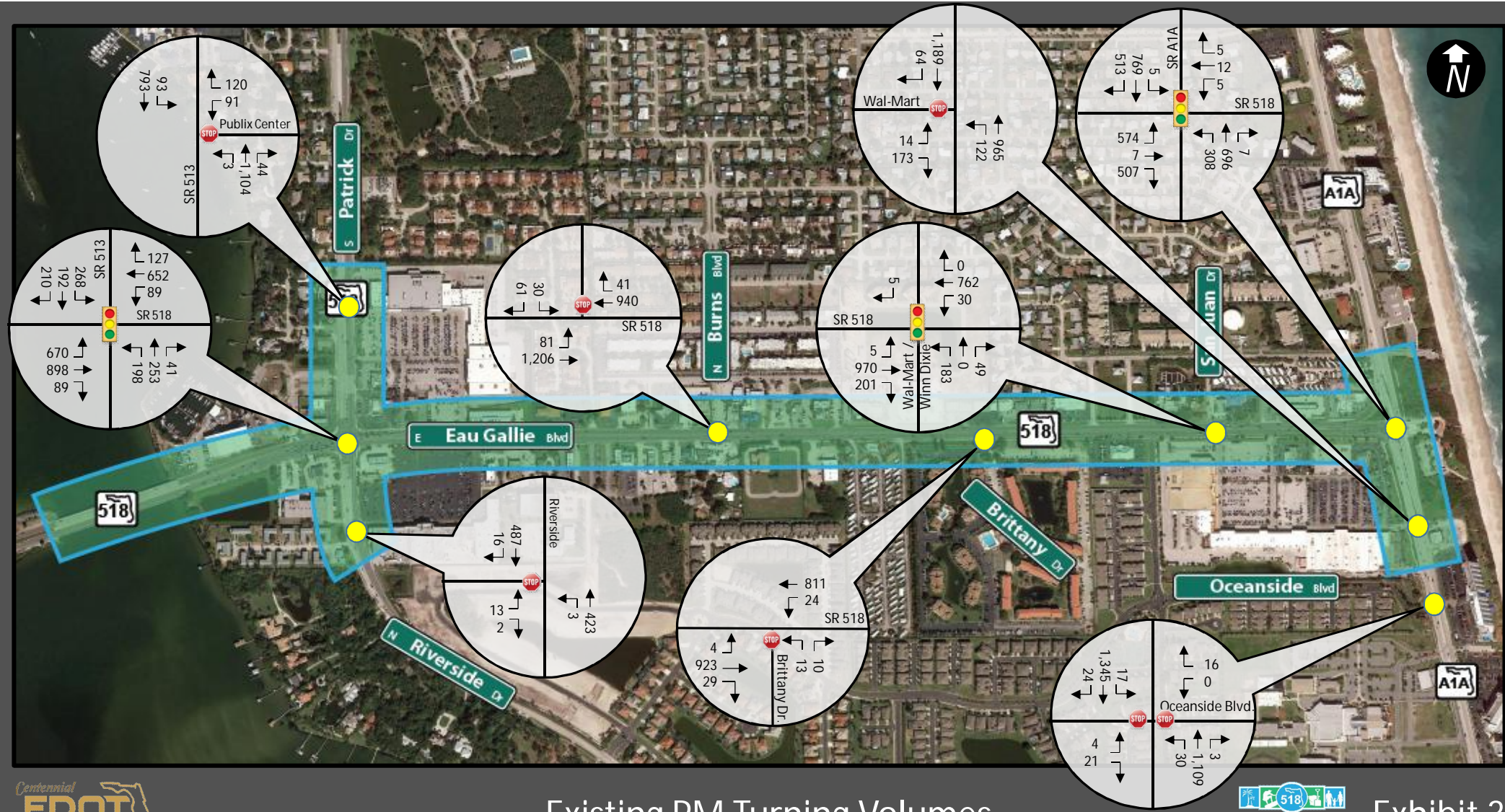
As shown in the table, all existing roadway segments operate acceptably.



Existing AM Turning Volumes



Exhibit 2



Existing PM Turning Volumes



Exhibit 3

3.0 Future Intersection Operations

Future intersection volumes were determined by applying growth rates to the existing turning movement volumes. Future volumes were developed for AM and PM peak-hours for the short term – year 2020, and the long term – year 2035.

Growth rates were selected in a process that considered historic growth, model growth (from the adopted travel demand model, and countywide population estimates from the Bureau of Economic and Business Research (BEBR). Historic growth was negative for each study area segment based on six years of data. It is assumed that the negative growth trend will not continue and is not indicative of future growth. Annual model growth rates, as shown in **Table 3**, average to 0.15% for the period from 2015 to 2020 and 0.61% for the period from 2015 to 2035. The 0.61% growth rate is between the BEBR low and medium forecasts. The BEBR population forecast is shown in **Table 4**. Based on this comparison, the growth rate of 0.61% was selected and applied uniformly to all movements.

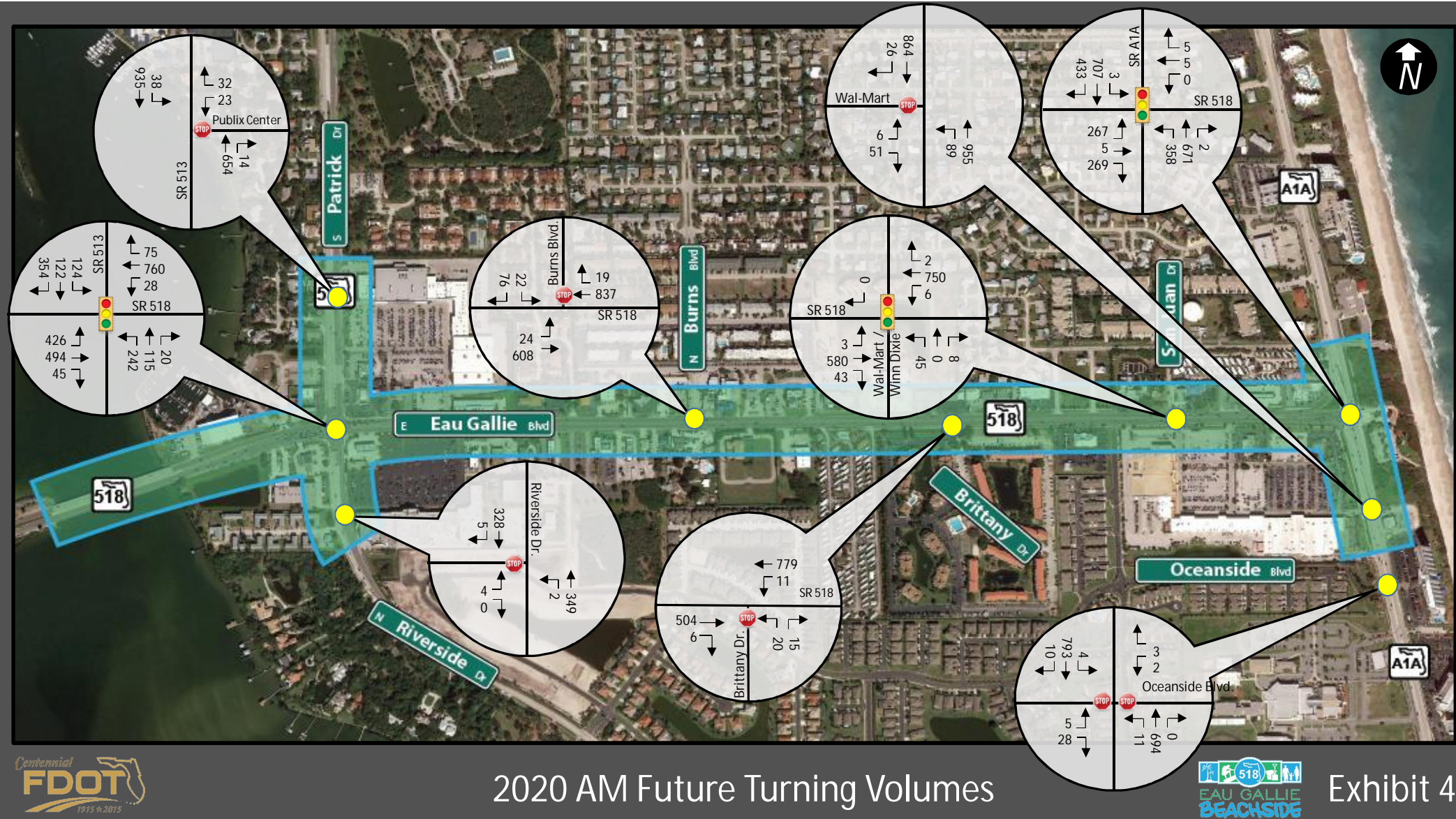
Future turning movement volumes are shown for years 2020 and 2035 in **Exhibits 4 through 7**. The intersections were analyzed using Synchro software. Results are shown in **Table 5 and Table 6**. The future roadway segment operating conditions are shown in **Table 7 and Table 8**

Table 3: Model Annual Growth

Roadway	From	To	2015 Model AADT	2020 Model AADT	Growth	2015 - 2020 Annual Model Growth Rate	2035 Model AADT	Growth	2015 - 2035 Annual Model Growth Rate
SR 518	US 1	SR 513	42,000	42,100	100	0.0%	44,400	2,400	0.3%
	SR 513	San Juan Dr	21,700	22,000	300	0.3%	21,900	200	0.0%
	San Juan Dr	SR A1A	16,300	16,800	500	0.6%	17,100	800	0.2%
Riverside Dr	Oceanside Blvd	SR 518	4,500	4,700	200	0.9%	7,200	2,700	3.0%
SR 513	SR 518	Banana River Dr	22,400	22,100	-300	-0.3%	24,600	2,200	0.5%
SR A1A	Oceanside Blvd	SR 518	29,000	29,000	0	0.0%	32,000	3,000	0.5%
	SR 518	Palm Springs Blvd	25,600	26,000	400	0.3%	29,000	3,400	0.7%
Total / Combined					1,200	0.15%		14,700	0.61%

Table 4: BEBR Population Forecast

County Forecast	2015	2020	Growth (2015-2020)	Annual Growth Rate	2035	Growth (2015-2035)	Annual Growth Rate
Low	525,000	536,300	11,300	0.43%	541,200	16,200	0.15%
Medium	558,500	589,300	30,800	1.10%	660,000	101,500	0.91%
High	592,000	642,400	50,400	1.70%	778,800	186,800	1.58%





2020 PM Future Turning Volumes



Exhibit 5

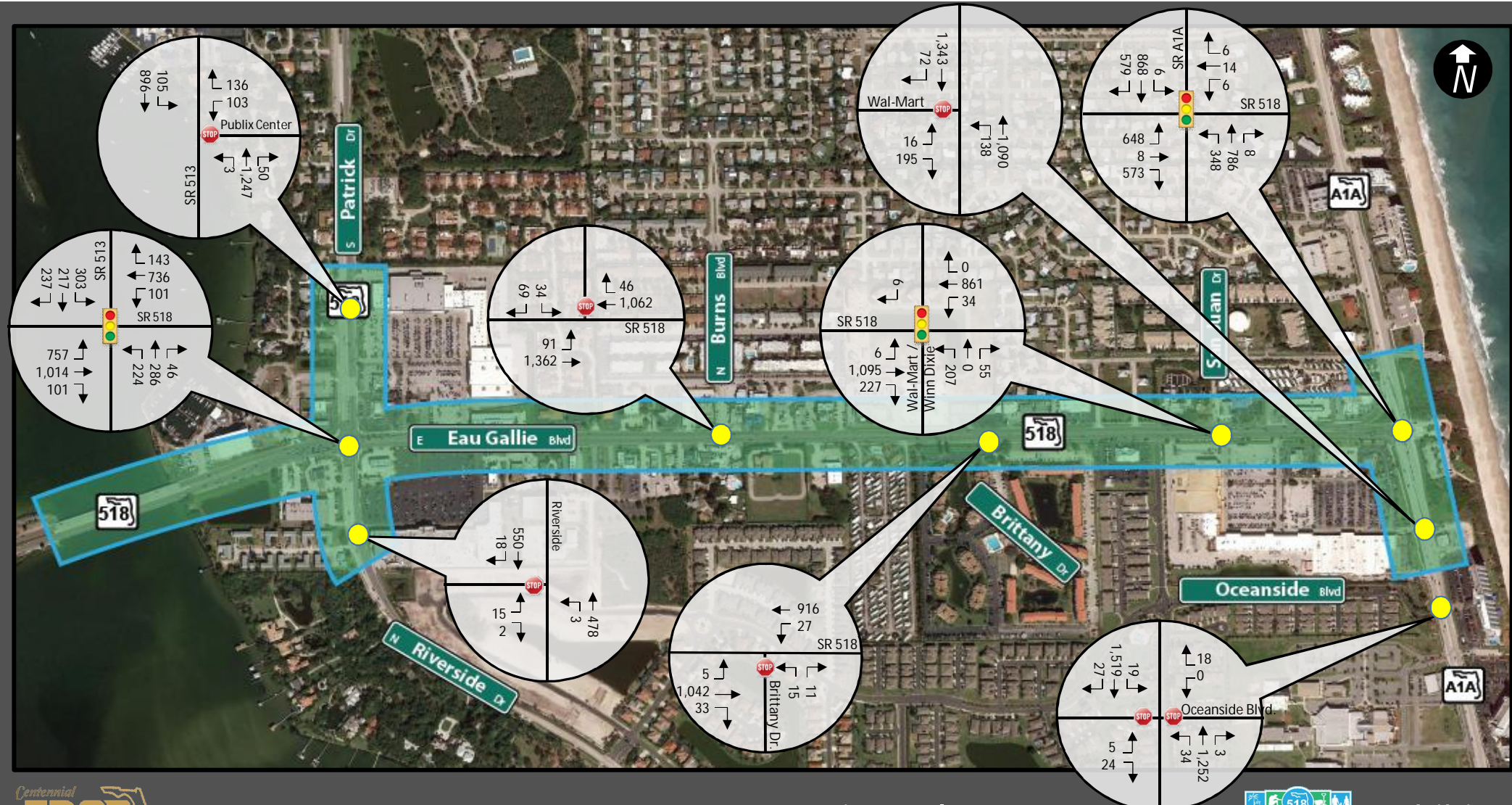




2035 AM Future Turning Volumes



Exhibit 6



2035 PM Future Turning Volumes



Exhibit 7

Table 5: Future 2020 Intersection Operation Conditions

INTERSECTION	Intersection Control	AM Peak Hour			PM Peak Hour		
		Overall		Max	Overall		Max
		Delay	LOS	V/C	Delay	LOS	V/C
SR 518 & SR 513	Signalized	51.7	D	0.85	66.7	E	0.98
SR 518 & Burns Blvd	Unsignalized	1.3	A	0.19	1.5	A	0.27
SR 518 & Brittany Dr	Unsignalized	0.7	A	0.09	0.5	A	0.08
SR 518 & WalMart / Winn Dixie Entrance	Signalized	4.5	A	0.30	12.5	B	0.70
SR 518 & SR A1A	Signalized	26.2	C	0.81	37.2	D	0.97
SR A1A & WalMart / Winn Dixie Entrance	Unsignalized	1.3	A	0.15	4	A	0.65
SR A1A & Oceanside Blvd	Unsignalized	1	A	0.10	3.4	A	0.94
SR 513 & Garden Apartments	Unsignalized, Near Ped. Signal	0.3	A	0.02	0.5	A	0.07
SR 513 & Shopping Center	Unsignalized	1.1	A	0.12	4.4	A	0.68

Table 6: Future 2035 Intersection Operation Conditions

INTERSECTION	Intersection Control	AM Peak Hour			PM Peak Hour		
		Overall		Max	Overall		Max
		Delay	LOS	V/C	Delay	LOS	V/C
SR 518 & SR 513	Signalized	57.6	E	0.91	81	F	1.10
SR 518 & Burns Blvd	Unsignalized	1.4	A	0.86	1.7	A	0.35
SR 518 & Brittany Dr	Unsignalized	0.7	A	0.35	0.6	A	0.10
SR 518 & WalMart / Winn Dixie Entrance	Signalized	4.5	A	0.32	13.8	B	0.74
SR 518 & SR A1A	Signalized	30.2	C	0.86	43.7	E	0.99
SR A1A & WalMart / Winn Dixie Entrance	Unsignalized	1.7	A	0.33	6.6	A	1.2*
SR A1A & Oceanside Blvd	Unsignalized	1.2	A	0.16	7.4	A	1.82*
SR 513 & Garden Apartments	Unsignalized, Near Ped. Signal	0.3	A	0.08	0.5	A	0.09
SR 513 & Shopping Center	Unsignalized	0.09	A	0.14	6.4	A	0.88

* Note that adverse results are due to limitations in the HCM calculations for stop control on a multi-lane road. Other methods of calculating and simulating conditions indicate that the movement will operate acceptably.

As noted, the unsignalized intersections shown to operate adversely should not be a concern since the adverse results are due to flaws in the equation from the industry standard manual.

Two intersections are anticipated to have congestion, SR 518 at SR 513 and SR 518 at SR A1A. The intersection with SR 513 is anticipated to operate with demand that exceeds the capacity during the PM peak-hour for the eastbound left turn, westbound through, and southbound left turn movements.

The SR A1A intersection is anticipated to operate with several movements near capacity during the PM peak-hour. The movements are anticipated to be within the capacity, but near the limits, indicating that some cycle failures are anticipated.

Table 7: Future roadway segment operating conditions – Year 2020

Roadway	From	To	Number of Lanes	FDOT LOS STD	Daily Service Volume	2020 AADT	2020 LOS
SR 518	US 1	SR 513	4	D	41,790	37,800	C
	SR 513	San Juan Dr	4	D	41,790	28,000	C
	San Juan Dr	SR A1A	4	D	41,790	22,800	C
Riverside Dr	Oceanside Blvd	SR 518	2	D	16,815	9,300	C
SR 513	SR 518	Banana River Dr	4	D	41,790	24,000	C
SR A1A	Oceanside Blvd	SR 518	4	D	41,790	30,000	C
	SR 518	Palm Springs Blvd	4	D	41,790	30,700	C

Table 8: Future roadway segment operating conditions – Year 2035

Roadway	From	To	Number of Lanes	FDOT LOS STD	Daily Service Volume	2035 AADT	2035 LOS
SR 518	US 1	SR 513	4	D	41,790	41,200	D
	SR 513	San Juan Dr	4	D	41,790	30,500	C
	San Juan Dr	SR A1A	4	D	41,790	24,800	C
Riverside Dr	Oceanside Blvd	SR 518	2	D	16,815	10,100	C
SR 513	SR 518	Banana River Dr	4	D	41,790	26,100	C
SR A1A	Oceanside Blvd	SR 518	4	D	41,790	32,600	C
	SR 518	Palm Springs Blvd	4	D	41,790	33,400	C

All roadway segments are anticipated to operate acceptably in the years 2020 and 2035.