

BABCOCK
MIXED USE PLANNED DEVELOPMENT
SUPPLEMENTAL TRAFFIC STUDY

Project #16531

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Introduction

The Babcock Ranch holdings encompass approximately 4,200 acres in northeast Lee County, Florida and within the North Olga Community Planning Area (Exhibit 1). A comprehensive plan amendment (CPA) has been submitted and reviewed to include the designated DR/GR and Rural lands within a new overlay known as the Environmental Enhancement Overlay, which will be specific to the North Olga area.

The zoning of the property as a Mixed Use Planned Development (MPD) is currently under review by the Lee County Hearing Examiner. The Zoning Traffic Impact Statement (ZTIS) titled, Babcock Mixed Use Planned Development Zoning Traffic Study and dated March 17, 2017 – Revised was prepared in support of the MPD application (DCI2016-00022). The Lee County ZTIS reflected a “worst-case” development scenario that included a 42-field baseball complex of which has been withdrawn from the current MPD.

At the request of the Florida Department of Transportation (FDOT), this supplemental traffic study was prepared to address the Babcock MPD traffic impacts on state roads without the baseball complex (Appendix A).

Scope of Study

The scope of the supplemental traffic assessment reflects the following:

- Year 2021 – Short-term (5-Year) and Year 2026 – Buildout Analysis Years
- Future Conditions With Project
- PM Peak Hour
- Roadway and Intersection Capacity Analysis
- Recommended Improvements
- Proportionate Share Estimates
- Road Impact Fee Estimates

Transportation Methodology

This supplemental traffic study reflects the methodology consistent with the following Babcock Ranch traffic studies.

- Babcock Comprehensive Plan Amendment Traffic Study
(December 5, 2016 – Revised)

- Babcock Mixed Use Planned Development Zoning Traffic Study (March 17, 2017 - Revised)
- Babcock Ranch Community DRI, Increment 1, Notice of Proposed Change Traffic Study (April 28, 2017 - Updated)

Furthermore, the methodology is consistent with the FDOT recommendations from the following review comments (Appendix A).

- Lee County 17-4DRI Proposed Comprehensive Plan Amendment (Babcock) State Coordinated Review – Traffic Study Memorandum (July 14, 2017)
- Lee County 17-4DRI Proposed Comprehensive Plan Amendment (Babcock) State Coordinated Review – FDOT Review Comments and Recommendations (July 14, 2017)
- Babcock Comprehensive Plan Amendment (17-4DRI) Meeting Summary (August 16, 2017)
- Babcock Mixed Use Planned Development Zoning Traffic Study Review (September 15, 2017)
- Lee County 17-4DRI Proposed Comprehensive Plan Amendment – FDOT Courtesy Review (October 09, 2017)

MPD Master Concept Plan

The MPD Master Concept Plan (MCP) development area is presented in Exhibit 1. The MCP reflects the proposed residential, hotel and commercial land uses.

Three primary access points to serve the MPD are provided on SR 31: 1) opposite Busbee Lane (North Access); 2) opposite Fox Hill Road (Middle Access) and; 3) opposite Shirley Lane (South Access). The connection shown on North River Road (CR 78) is provided for emergency only access.

Access to the proposed residential pods is provided via the internal roadway system of the Babcock Ranch Community (BRC) DRI internal road system in Charlotte County. Planned internal interconnections between the DRI in Charlotte County and the MPD Lee County will minimize the overall Babcock Ranch traffic impacts on SR 31.

MPD Development Parameters

For purposes of this supplemental traffic study, the Short-Term (Year 2021) and Buildout (Year 2026) and the cumulative buildout development parameters of the MPD are summarized in the matrix below.

Babcock MPD Development Parameters			
Land Use Type	Unit	Size	
		Year 2021 (Short-Term ⁽¹⁾)	Buildout Year 2026 (Cumulative)
Single-Family	d.u.	400	980
Multifamily	d.u.	0	650
Hotel ⁽²⁾	Rooms	0	600
Retail ⁽²⁾	sq. ft.	100,000	870,000
Office – General ⁽²⁾	sq. ft.	0	257,000
Office – Medical ⁽²⁾	sq. ft.	0	43,000
Park	Acres	48	48

Footnote:

(1) For CPA analysis requirement only.

(2) Subject to Charlotte County BROD maximum threshold of 6 million sq. ft. non-residential.

Background Development

The approved BRC DRI - Increment 1 NOPC in Charlotte County has been specifically included as background development in the analysis. The anticipated BRC DRI development levels coincident with Phase 1 and Buildout of the Babcock MPD are shown as follow.

BRC DRI - Increment 1 NOPC Background Development Parameters			
Land Use Type	Unit	Size	
		Year 2021 (Short-Term ^(1,2))	Buildout ⁽³⁾ Year 2026 (Cumulative)
Single-Family	d.u.	475	1,200
Multifamily	d.u.	200	800
Retail	sq. ft.	25,000	50,000
Office – General	sq. ft.	62,500	125,000
Civic	sq. ft.	15,000	30,000
Park	Acres	10	10 ⁽³⁾
Elementary School	students	175	350 ⁽²⁾
Golf Course	holes	9	18 ⁽³⁾

Footnotes:

(1) For CPA analysis requirement only.

(2) Year 2021 estimate only - Subject to change reflective of IDO conversion matrix.

(3) Babcock Ranch Community DRI, Increment 1 Notice of Proposed Change Traffic Study, April 28, 2017 – Updated.

Future Traffic Assumptions

Committed Improvements

Roadway improvements scheduled for construction within the first three years of the Lee County Capital Improvement Program, the Charlotte County Capital Improvement Program, and the FDOT Work Program were considered to be committed improvements. For SIS and other state roadways, the first three years of the FDOT's five-year work program is considered to be committed.

The review of the jurisdictional improvement programs indicates that there were no significant roadway improvements that were considered to be "committed" for construction in the areas of southeast Charlotte County and northeast Lee County.

Study Area

As a result of the methodology agreement, the study area reflected the Project's significant impact of roadway service volume consumption of 5% or more, consistent with DRI thresholds.

Travel Model

The FDOT - District 1 Regional Planning Model (D1RPM_v1.0.2_Babcock) was utilized to develop future traffic volumes. The sub-area validation was performed by FDOT/Traf-O-Data for purposes of this traffic study.

The existing plus committed (E+C) network reflective of year 2018 conditions and the socio-economic input data coincident with Year 2026 were provided by FDOT as part of the D1RPM_v1.0.2_Babcock, sub-area validated travel model. The Year 2021 socioeconomic zonal data was interpolated from the base year 2010 and year 2040 datasets.

Two Lee County traffic analysis zones were utilized to represent the Babcock Ranch developments in the 2018 E+C Plan Network.

- TAZ #4070 – Babcock Ranch Community DRI (Charlotte County)
- TAZ #3121 – Babcock MPD (Lee County)

Notable adjustments to the network to reflect the MPD TAZs included the inter-connection between the Lee and Charlotte County via the Babcock Ranch Community DRI (TAZ #4070) internal road system.

The D1RPM_v1.0.2_Babcock model input and output files are available for download at the following link: ftp://ftpfm.dplummer.com/Public/16531_FDOT_Babcock_CPA_MPD.

Link and Segment Volumes

A roadway segment is typically comprised of multiple links (nodes and connectors) in the travel model. The selection of the link volume to represent the roadway segment volume was determined by the following priority order.

- Link corresponding to the FDOT Count Location
- Link corresponding to a Lee County Permanent Count Station
- Link located nearest to the Project

Therefore, the selected link volumes presented in the roadway segment analysis may differ from the intersection turn volumes located at either end of that particular roadway segment.

Future Functional Classification

The future roadway area type (i.e., urbanized/transitional/rural) and functional classification designation for state roads were reflective of FDOT's 2016 District 1 LOS spreadsheets (Appendix D).

Traffic Data and Conversion Factors

For future year background (non-Project) traffic, the Peak Season Weekday Average Daily Traffic (PSWADT) derived by the travel model were converted to Annual Average Daily Traffic (AADT) using the following Model Output Conversion Factor (MOCF) consistent with the MOCF provided by the database from FDOT Florida Traffic Online (2016) (Appendix C).

- Charlotte County (Countywide) – 0.91
 - SR 31 – 0.93
 - I-75 – 0.91
- DeSoto County (Rural State Roads) – 0.92
- Glades County (Countywide) – 0.91
- Lee County (Countywide) – 0.92
 - SR 31 – 0.93
 - SR 78 – 0.93
 - SR 80 (East of I-75) – 0.93
 - (West of I-75) – 0.96
 - I-75 – 0.91
 - US 41 – 0.90

The AADT was then converted to peak hour, peak season, peak direction volumes using the standard K and D factors reflective of the appropriate FDOT count locations for all state and Charlotte County facilities.

For purposes of this supplemental traffic study, the most recent FDOT and Lee County traffic information were compiled from the following sources.

- FDOT Florida Traffic Online (2016)
- 2017 Lee County Concurrency Report

The reported traffic volumes by roadway segments are documented in Appendix C and Appendix D.

Furthermore and while the FDOT database indicates the D factor, it did not explicitly indicate the actual peak direction (i.e., NB, SB, EB or WB) Where available, the FDOT site synopsis or actual intersection counts were relied on to establish the existing peak direction.

For Lee County roadways, the peak season directional volumes were based on the appropriate permanent count station (PCS) data provided in the 2016 Lee County Traffic Count Report, Appendix D.

Future Model Volumes Check

In addition to the sub-area validation of the D1RPM, the model derived traffic volumes reflective of Year 2021 and Year 2026 socioeconomic data and the 2018 E+C network were compared with growth trends for state roads. The trends analysis reflective of historic AADT is provided as part of Appendix C. If the D1RPM derived traffic volumes and resultant growth rate was the same or higher than the historic AADT growth rate, it was deemed to have met the “reasonableness” criteria.

In addition to the “reasonable” check performed for growth rates, the model derived volumes for state roads were further reviewed and adjusted to ensure the following.

- “Future With Project” background traffic volumes are no lower than “Existing”.
- Where applicable, “Future With Project” background traffic volumes are no lower than “Future Without Project”.

The volume comparisons and adjustments on a segment basis are provided in Appendix O.

Future Conditions Service Volumes (Peak Direction)

The existing service volumes for state roads are established in FDOT’s 2016 District 1 LOS spreadsheets (Appendix D). The service volumes in the spreadsheets reflect the generalized service volumes contained in FDOT’s 2013 Quality/Level of Service Handbook. The “Generalized Peak Hour Directional Service Volumes” from Table 7 – Urbanized Areas, Table 8 – Transitional Areas and Table 9 – Rural Developed Areas are referenced in Appendix D.

Furthermore, it was further clarified by FDOT on March 7, 2017 that the peak hour directional service volume of the segment of SR 31 from SR 80 to Old Rodeo Road is 924 vph at LOS D (urban standard), Appendix D.

From the Charlotte County data, the service volumes are expressed as peak hour, two-way. For conversion to peak direction, the D-factors provided in the FDOT 2013 Quality/Level of Service Handbook, “Generalized Peak Hour Directional Service Volumes” (Appendix D) were applied to derive the peak directional service volumes.

Consistent with Lee County requirements, roadway directional service volumes under future conditions (greater than 5 years) were based on Lee County Generalized Peak Hour Directional Service Volumes Urbanized Areas (Appendix D). For consistency with the Year 2026 analysis, the Year 2021 traffic analysis also utilized the more conservative generalized service volumes.

Future Intersection Turn Volumes

Future turn volumes at the intersections under study were developed based on the model generated turn volumes and the use of the FDOT TURNS5 program. The resultant TURNS5 volumes were then further adjusted for reasonableness and checked against available traffic counts. Where necessary, individual turn movements were further reviewed and adjusted to ensure the following.

- Where warranted, “Future With Project” background turn volumes are no lower than “Existing”.

All documentation associated with the development of the intersection turn volumes are provided in Appendix J and K.

Future Intersection Analysis

Intersection LOS analysis were performed in conjunction with the development of the turn volumes. The LOS of the overall intersection is reported reflective of HCM and ICU (i.e., TWSC intersections) methods. The complete HCM and ICU output are provided for all intersections (Appendix L).

Future Traffic Conditions Without Project

For purposes of this supplemental traffic study, Future Traffic Conditions Without Project is not performed. Instead, reference to Future Traffic Conditions Without Project would rely on the Year 2026 Traffic Conditions Without Project analysis provided in the document, Babcock Ranch Community DRI, Increment 1, Notice of Proposed Change Traffic Study (April 28, 2017 - Updated).

As such, the comparison between the “Without” and “With” Project conditions would be consistent with the same comparison as the traffic assessment between the “Without” and “With” Project conditions performed for the approved BRC DRI – Increment 1 traffic study.

Year 2021 (Short-Term, 5-Year)

Under the short-term analysis as required by the CPA, the Year 2021 analysis does not represent a phase of the Project. The purpose of the 5-Year analysis is to establish the short-term needs of the MPO Long-Range Transportation Plan that were established by the Year 2040 Babcock CPA analysis (Babcock Comprehensive Plan Amendment Traffic Study, December 5, 2016 – Revised) and by the Year 2026 Babcock MPD analysis (this document).

Road Impact Fee Estimate

Road impact fees were estimated for the Project through Year 2021 and Year 2026 (cumulative) reflective of the Lee County Roads Impact Fee Schedule listed in the current Lee County Land Development Code (discounted to 45%) and at 100%.

Proportionate Share Calculation

For purposes of this supplemental traffic study, the MPD’s proportionate share estimates were calculated reflective of the same roadway and intersection improvements as identified in the BRC DRI – Increment 1 proportionate share estimate. In addition, improvements that were triggered by the MPD beyond those triggered by the BRC DRI at Year 2026 were identified and included in the MPD proportionate share calculation.

It should be noted that while the BRC DRI – Increment 1 traffic impacts on the external road network would be reduced when assessed with the Babcock MPD development (due to community capture between the DRI and MPD), the approved mitigation plan identified in the Babcock Ranch Community DRI’s Master Development Order and Incremental Development Order would remain unchanged.

Under the short-term analysis, the Year 2021 MPD proportionate share calculation assumed the same roadway and intersection improvements as those identified at buildout in Year 2026, regardless of whether those improvements are needed at Year 2021. This simplified approach may lead to higher proportionate share in the short-term but would ensure consistency with the MPD mitigation plan at buildout.

Documentation and Appendices

The documentation provided in the Appendices section of this document was numbered for easier reference. A listing of the Appendices is provided at the beginning of the section.

Future 2021 (Short-Term) Traffic Conditions With Project

This supplemental traffic study assesses the traffic impacts of the proposed Babcock MPD development, coincident with Year 2021.

Year 2021 SR 31 Segment Volumes

For purposes of this supplemental traffic study, the anticipated Babcock Ranch Community DRI – Increment 1 in Charlotte County, coincident with Year 2021, is reflected in the overall background traffic (non-Project). Based on the review of the model derived traffic volumes in comparison with existing growth trends on state roads, it was apparent that the anticipated growth in the background traffic within the study area would be sufficiently accounted for by the approved BRC DRI traffic alone. Nonetheless, the resultant background (Non-Babcock plus BRC DRI) traffic with the MPD was adjusted, where necessary to ensure that it is no less than the existing AADT volumes for state roads.

Year 2021 Development Parameters

The proposed Babcock MPD development parameters are as follows.

Babcock MPD Buildout Development Parameters		
Land Use Type	Unit	Size ⁽¹⁾
Single-Family	d.u.	400
Multifamily	d.u.	0
Hotel ⁽¹⁾	rooms	0
Retail ⁽¹⁾	sq. ft.	100,000
Office – General ⁽¹⁾	sq. ft.	0
Office – Medical ⁽¹⁾	sq. ft.	0
Park	Acres	48

Footnote:

- (1) Subject to Charlotte County BROD threshold of 6 million sq. ft. for non-residential uses.

Year 2021 Project Trip Generation

The Project's trip generation was established based on the trip rates from the Institute of Transportation Engineers (ITE), Trip Generation, 9th Edition. All trip generation land use assumptions and calculations are provided in Appendix N.

The resultant Daily and PM peak hour trip generation estimates are presented in Exhibits 5a (FDOT) and 5b (FDOT), respectively. For convenience, the PM peak hour trip generation is summarized below.

Babcock MPD				
Year 2021 ITE Trip Generation – PM Peak Hour ⁽¹⁾				
Land Use	LUC	In	Out	Total
Single-Family	210	231	135	366
Multifamily	230	0	0	0
Hotel	310	0	0	0
Retail	820	288	311	599
Office – General	710	0	0	0
Office – Medical	720	0	0	0
Park	411	96	72	168
Total		615	518	1,133

Footnotes:

(1) ITE, Trip Generation, 9th Edition.

Year 2021 Internal Capture

The internal trip capture of traditional land use categories within the MPD were estimated based on the methodology described on ITE, Trip Generation Handbook, 3rd Edition and shown in Exhibits 5a (FDOT) and 5b (FDOT).

The resultant PM peak hour trip interaction of the land use components within the MPD is summarized in the matrix below and detailed in Exhibit 5b (FDOT).

The trip interaction between the MPD and the Babcock Ranch Community DRI in Charlotte County were established by the travel model and summarized in the matrix below. The trip capture of 56 trips (5% of MPD Total) during the PM peak hour between the MPD and DRI are identified. Therefore, the remaining 799 (70% of MPD Total) net new external trips are to/from all other TAZs beyond Babcock Ranch, as distributed and assigned by the D1RPM travel model.

Babcock MPD Year 2021 Development Trip Distribution PM Peak Hour – Two-way Trips		
To / From	MPD ⁽¹⁾ Development	Babcock Ranch ⁽²⁾ Community DRI (Charlotte County)
Total Trip Generation	1,133 ⁽³⁾ (100%)	1,023 ⁽³⁾ (100%)
MPD Development	258 ⁽⁴⁾ (23%)	56 ⁽⁶⁾ (5%)
Retail Pass-by	20 ⁽⁵⁾ (2%)	7 ⁽⁵⁾ (1%)
Babcock Ranch Community DRI (Charlotte County)	56 ⁽⁶⁾ (5%)	328 ⁽⁴⁾ (32%)
All Other External TAZs Beyond Babcock Ranch	799 ⁽⁶⁾ (70%)	632 ⁽⁶⁾ (62%)

Footnote:

- (1) D1RPM TAZ #3121.
- (2) D1RPM TAZ #4070.
- (3) ITE, Trip Generation, 9th Edition.
- (4) ITE, Trip Generation Handbook – An ITE Proposed Recommended Practice, 3rd Edition.
- (5) Retail pass-by trips less than standard ITE pass-by rates and less than 10% of passing traffic on SR 31.
- (6) D1RPM travel model derived.

Year 2021 Retail Pass-by Trips

A modest pass-by trip deduction of 20 pm peak hour external trips was assumed for the retail component of the MPD. The retail pass-by traffic assumed is less than 10% of the passing traffic on SR 31.

A modest 20 retail pass-by trips during the pm peak hour was assumed for the MPD at Year 2021.

Year 2021 Net New External Trips

The Project is estimated to generate 855 net new external trips (or 75% of total) during the PM peak hour as summarized below.

Babcock MPD			
Year 2021 Trip Generation – PM Peak Hour			
Trip Type	In	Out	Total
Total ⁽¹⁾	615	518	1,133
Internal ⁽²⁾	129	129	258
External ⁽³⁾	486	389	875
Pass-by ⁽⁴⁾	10	10	20
Net New ⁽⁵⁾	476	379	855

Footnotes:

- (1) ITE, Trip Generation, 9th Edition.
- (2) Internal captured trips within MPD.
- (3) Project trips beyond MPD boundaries.
- (4) Retail Pass-by Trips, if applicable.
- (5) External trip assignment.

Year 2021 Model - Project TAZs

Project TAZ #3121 was assigned to represent Babcock MPD in the D1RPM travel model. The MPD development parameters were entered into the D1RPM model in standard ZONEDATA format. The D1RPM model was then run and adjustments made to the model derived daily trip generation using the SPECGEN parameters for the Project TAZs. The model was then rerun and the SPECGEN person trip generation readjusted in an iterative process until the model derived BRC cumulative daily trip generation to be within five percent (5%) of the ITE daily net trip estimate.

The replication of the ITE daily trip loading in the year 2021 travel model for the Babcock MPD was within 4% (317 external daily trips) as summarized below.

Babcock MPD	
Year 2021 Project TAZ Trip Loading Comparison	
External Daily Trips	
ITE – Project Net New External Trips	7,966
Project TAZs Trip Loading ⁽¹⁾	8,283
Model Trip Difference from ITE	317
Model Trip % Difference from ITE	4.0%

Footnote:

- (1) FSUTMS TAZ #3121.

Year 2021 Segment Analysis With Project

Under future conditions “With” the Project, the segment analysis coincident with Year 2021 is presented Exhibits 6b (FDOT). As shown, all components of the segment analysis is provided including background (All Other plus BRC DRI) traffic, Project (MPD) traffic, significant and

adverse impacts, services volumes, LOS and recommended number of lanes to maintain LOS standard.

Year 2021 Project Trip Distribution/Assignment

The Project Trip Distribution and Assignment based on the D1RPM model is summarized as follows. The PM peak hour trip distribution at the Project access points are included as part of Appendix K.

Babcock MPD Year 2021 Project Trip Distribution/Assignment	
Direction	Percent
North	15%
Southeast	25%
Southwest	55%
West	5%
Total	100%

Year 2021 Project Significant Impact

The Project's net new external trips as a percentage of service volume consumption are identified in Exhibit 6b (FDOT). The Project is deemed to have significant impact on a roadway segment if the Project's consumption of the roadway service volume is five percent (5%) or greater. Therefore, Babcock MPD is expected to have significant impact on the following state roads as summarized below.

Babcock MPD Year 2021 Project Significant Impact		
Roadway	From	To
Bayshore Road (SR 78)	I-75	Nalle Rd.
	Nalle Rd.	Palm Creek Dr.
	Palm Creek Dr.	SR 31
SR 31	SR 80	Bayshore Rd. (SR 78)
	Bayshore Rd. (SR 78)	Old Rodeo Dr.
	Old Rodeo Dr.	North River Rd.
SR 80	North River Rd.	Lee/Charlotte Co. Line
	I-75	SR 31

Year 2021 Project Significant and Adverse Impact

As presented in Exhibit 6b (FDOT), Babcock MPD is expected to have significant and adverse impact on the following state roads.

Babcock MPD Year 2021 Project Significant and Adverse Impact		
Roadway	From	To
SR 31	Bayshore Rd. (SR 78)	Old Rodeo Dr.
	Old Rodeo Dr.	North River Rd.

As identified in Exhibits 6b (FDOT), the future roadway levels of service were determined based on current area (i.e., urbanized/transitional/rural) designation and generalized service volumes.

Year 2021 Syncho Arterial Analysis

The detailed arterial analysis was performed on SR 31. The arterial analysis was performed using Synrho that takes into consideration of the future intersection improvements and signal timing along the SR 31 corridor. (Please refer to the intersection LOS analysis in the next section of this document).

The results of the Synchro arterial analysis for SR 31 are summarized below and included in Appendix P.

Babcock MPD – Year 2021				
Synchro Arterial Level of Service				
Roadway	From	To	Northbound	Southbound
SR 31	Charlotte County Line	Busbee Ln. (MPD-N)	A	A
	Busbee Ln. (MPD-N)	Fox Hill Rd. (MPD-M)	A	A
	Fox Hill Rd. (MPD-M)	Shirley Ln. (MPD-S)	A	A
	Shirley Ln. (MPD-S)	North River Rd.	C	C
	North River Rd.	Bayshore Rd. (SR 78)	A	B
Overall			A	A

The Synchro arterial analysis indicates that all segments of SR 31 (including overall segment LOS) are expected operate within FDOT LOS standards with the existing two-lanes, coincident with the Year 2021.

The Synchro input and output files are available for download at the following link:
ftp://ftpfm.dplummer.com/Public/16531_FDOT_Babcock_CPA_MPD .

Year 2021 Intersection Volumes With Project

The turning movement volumes at the intersections under study are presented in Appendix F, Appendix J and Appendix K, coincident with Year 2021.

2021 Intersection LOS With Project

The operation of the intersections were evaluated based on methodologies from the Highway Capacity Manual, 6th Edition (HCM) using the Synchro_9 software. For unsignalized intersections (i.e., TWSC), the Intersection Capacity Utilization (ICU) LOS from Synchro_9 is reported to provide the LOS of the overall operations of the intersection. The complete HCM and ICU analysis and output are included in Appendix L.

The resultant intersection LOS “With” the Project, under PM peak hour, peak season conditions, is summarized below.

Babcock MPD Year 2021 Traffic Conditions With Project Intersection Level of Service			
Ref. #	Major Street	Minor Street	LOS
			With Needed Improvements
18	SR 31	SR 78 (Bayshore Rd.)	D ^(1,2)
19	SR 31	North River Rd. (CR 78)	B ^(1,2)
25	SR 31	Shirley Lane/ Babcock MPD South Access	B ^(1,3)
26	SR 31	Fox Hill Road/ Babcock MPD Middle Access	A ^(3,4)
27	SR 31	Busbee Lane/ Babcock MPD North Access	B ^(1,3)

Footnotes:

- (1) Signalized Intersection – HCM Overall intersection LOS reported.
- (2) Potential Mitigation.
- (3) Potential Site-related Improvement.
- (4) Unsignalized Intersection – Overall Intersection ICU LOS reported.

Year 2021 Recommended Improvements

Roadways

No roadway widening improvement needs have been identified coincident with the short-term, Year 2021.

The recommended roadway improvements to accommodate future Babcock MPD and area-wide traffic coincident with horizon year 2026 is summarized as follows.

Babcock MPD Year 2021 Recommended Improvements Roadways			
Roadway	From	To	Recommended Improvement
SR 78	Hart Rd.	Slater Rd.	Widen from 4L to 6L ⁽¹⁾ Consistent with MPO LRTP Traffic Monitoring
	I-75	Nalle Rd.	Widen from 2L to 4L ⁽¹⁾ Traffic Monitoring

Footnote:

(1) Subject to detailed arterial analysis and traffic monitoring.

SR 78 from Hart Road to SR 31

The anticipated need for the widening of some segments of SR 78 from Hart Road to SR 31 is based on assessment using generalized service volumes. The actual need and timing of the improvement is subject to detailed arterial analysis and traffic monitoring.

SR 31 from SR 80 to Charlotte County Line

The anticipated need for the widening of some segments of SR 31 from SR 80 to the Charlotte County Line from two to four lanes is consistent with the Lee County MPO Long-Range Transportation Plan.

The SR 31 PD&E Study from SR 80 to SR 78, the SR 31 SEIR (South) between SR 78 to North River Road (CR 78) and the SR 31 SEIR (North) from North River Road (CR 78) to the Babcock Ranch Community DRI North Entrance(s) (Charlotte County) are underway and conducted by FDOT.

Intersections

The recommended intersection improvements to accommodate future Babcock MPD traffic and area-wide traffic coincident with horizon year 2021 is summarized as follows.

Babcock MPD Year 2021 Recommended Improvements with Project Intersections			
Ref. #	Major Street	Minor Street	Description
4b	SR 78	I-75 East Ramp	
11b	SR 80	I-75 East Ramp	
12	SR 80	Orange River Boulevard	
13	SR 80	SR 31	Add NB – Turn Lane Channelize NB – RT Lane Add SB – Left-Turn Lane Channelize SB – RT Lane Add EB – Left-Turn Lane Add EB – Thru Lane Add WB – Left-Turn Lane Signal Retiming Traffic Monitoring
14	SR 80	Davis Avenue	Add EB – Thru Lane
15	SR 80	Tropic Avenue	Add NB – Right-Turn Lane Add SB – Right-Turn Lane Add EB – Thru Lane
17	SR 80	Buckingham Road	
18	SR 31	SR 78	Add NB – Thru Lane Add SB – Thru Lane Signal Retiming Traffic Monitoring
19	SR 31	North River Rd. (CR 78)	Add NB – Thru Lane Add SB – Thru Lane Add SB – Right-Turn Lane Add EB – Left-Turn Lane Add EB – Right-Turn Lane Add WB – Left-Turn Lane Add WB – Right-Turn Lane Signalization, if and when warranted Traffic Monitoring

Babcock MPD Year 2021 Recommended Improvements with Project Intersections (Continued)	
1	10000
2	10000
3	10000
4	10000
5	10000
6	10000
7	10000
8	10000
9	10000
10	10000
11	10000
12	10000
13	10000
14	10000
15	10000
16	10000
17	10000
18	10000
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Ref. #	Major Street	Minor Street	Description
25	SR 31	Shirley Lane/ Babcock MPD South Access	Add NB – Left-Turn Lane Add NB – Two Thru Lanes Add NB – Right-Turn Lane Add SB – Left-Turn Lane Add SB – Thru Lane Add SB – Right-Turn Lane Add EB – Left-Turn Lane Configure EB – Thru/RT Lane Add WB – Dual Left-Turn Lane Add WB - Thru/Right-Turn Lane Signalization, if and when warranted Traffic Monitoring
26	SR 31	Fox Hill Road/ Babcock MPD Middle Access	Add NB – Left-Turn Lane Add NB – Thru Lane Add NB – Right-Turn Lane Add SB – Left-Turn Lane Add SB – Thru Lane Add SB – Right-Turn Lane Add EB – Left-Turn Lane Configure EB – Thru/RT Lane Add WB – Dual Left-Turn Lane Add WB - Thru/Right-Turn Lane Signalization, if and when warranted Traffic Monitoring
27	SR 31	Busbee Lane/ Babcock MPD North Access	Add NB – Left-Turn Lane Add NB – Thru Lane Add NB – Right-Turn Lane Add SB – Left-Turn Lane Add SB – Thru Lane Add SB – Right-Turn Lane Add EB – Left-Turn Lane Configure EB – Thru/RT Lane Add WB – Left-Turn Lane Add WB - Thru/Right-Turn Lane Signalization, if and when warranted Traffic Monitoring

Year 2021 - Road Impact Fee Estimate

In accordance with the Roads Impact Fee Schedule contained in the current Lee County LDC, the MPD is estimated to generate between \$1.5 Million to \$3.4 Million through to Year 2021, Exhibit 7a (FDOT).

Babcock MPD Year 2021 – Road Impact Fee Estimate	
At 45% Discount	\$1.5 Million
At 100%	\$3.4 Million

Year 2021 – Proportionate Share Estimate

Based on the same methodology and FDOT improvement cost assumptions of the BRC DRI – Increment 1, the MPD proportionate share estimate through to Year 2021 is summarized below and presented in Exhibits 7b (FDOT) and 7c (FDOT).

Babcock MPD Year 2021 – Proportionate Share Estimate	
Roadways	\$0.8 Million
Intersections	\$3.4 Million
Total	\$4.2 Million

Year 2021 – Traffic Mitigation Plan

Babcock MPD is expected to mitigate its traffic impacts through: 1) Payment of roads impact fees; and/or 2) Participate in the payment of proportionate share; and 3) Provide for site-related improvements.

Future 2026 (Buildout) Traffic Conditions With Project

This supplemental traffic study assesses the traffic impacts of the proposed Babcock MPD development, coincident with Year 2026.

Year 2021 SR 31 Segment Volumes

For purposes of this supplemental traffic study, the anticipated Babcock Ranch Community DRI – Increment 1 in Charlotte County, coincident with Year 2026, is reflected in the overall background traffic (non-Project). Based on the review of the model derived traffic volumes in comparison with existing growth trends on state roads, it was apparent that the anticipated growth in the background traffic within the study area would be sufficiently accounted for by the approved BRC DRI traffic alone. Nonetheless, the resultant background (Non-Babcock plus BRC DRI) traffic with the MPD was adjusted, where necessary to ensure that it is no less than the existing AADT volumes for state roads.

Year 2026 Development Parameters

The proposed Babcock MPD development parameters are as follows.

Babcock MPD Buildout Development Parameters		
Land Use Type	Unit	Size ⁽¹⁾
Single-Family	d.u.	980
Multifamily	d.u.	650
Hotel ⁽¹⁾	rooms	600
Retail ⁽¹⁾	sq. ft.	870,000
Office – General ⁽¹⁾	sq. ft.	257,000
Office – Medical ⁽¹⁾	sq. ft.	43,000
Park	acres	48

Footnote:

- (1) Subject to Charlotte County BROD threshold of 6 million sq. ft. non-residential.

Year 2026 Project Trip Generation

The Project's trip generation was established based on the trip rates from the Institute of Transportation Engineers (ITE), Trip Generation, 9th Edition. All trip generation land use assumptions and calculations are provided in Appendix N.

The resultant Daily and PM peak hour trip generation estimates are presented in Exhibits 8a (FDOT) and 8b (FDOT), respectively. For convenience, the PM peak hour trip generation is summarized below.

Babcock MPD				
Year 2026 ITE Trip Generation – PM Peak Hour ⁽¹⁾				
Land Use	LUC	In	Out	Total
Single-Family	210	517	303	820
Multifamily	230	187	92	279
Hotel	310	206	214	420
Retail	820	1,225	1,328	2,553
Office – General	710	62	304	366
Office – Medical	720	38	98	136
Park	411	96	72	168
Total		2,331	2,411	4,742

Footnotes:

(1) ITE, Trip Generation, 9th Edition.

Year 2026 Internal Capture

The internal trip capture of traditional land use categories within the MPD were estimated based on the methodology described on ITE, Trip Generation Handbook, 3rd Edition and shown in Exhibit 8a (FDOT) and Exhibit 8b (FDOT).

The resultant PM peak hour trip interaction of the land use components within the MPD is summarized in the matrix below and detailed in Exhibit 8b (FDOT).

The trip interaction between the MPD and the Babcock Ranch Community DRI in Charlotte County were established by the travel model and summarized in the matrix below. The trip capture of 393 trips (9% of MPD Total) during the PM peak hour between the MPD and DRI are identified. Therefore, the remaining 2861 (60% of MPD Total) net new external trips are to/from all other TAZs beyond Babcock Ranch, as distributed and assigned by the D1RPM travel model.

Babcock MPD Year 2026 Development Trip Distribution PM Peak Hour – Two-way Trips		
To / From	MPD ⁽¹⁾ Development	Babcock Ranch ⁽²⁾ Community DRI (Charlotte County)
Total Trip Generation	4,742 ⁽³⁾ (100%)	2,086 ⁽³⁾ (100%)
MPD Development	1,410 ⁽⁴⁾ (30%)	393 ⁽⁶⁾ (19%)
Retail Pass-by	78 ⁽⁵⁾ ($< 2\%$)	11 ⁽⁵⁾ ($< 1\%$)
Babcock Ranch Community DRI (Charlotte County)	393 ⁽⁶⁾ (9%)	598 ⁽⁴⁾ (29%)
All Other External TAZs Beyond Babcock Ranch	2,861 ⁽⁶⁾ (60%)	1,084 ⁽⁶⁾ (52%)

Footnote:

- (1) D1RPM TAZ #3121.
- (2) D1RPM TAZ #4070.
- (3) ITE, Trip Generation, 9th Edition.
- (4) ITE, Trip Generation Handbook – An ITE Proposed Recommended Practice, 3rd Edition.
- (5) Retail pass-by trips less than standard ITE pass-by rates and less than 10% of passing traffic on SR 31.
- (6) D1RPM travel model derived.

Year 2026 Retail Pass-by Trips

A modest pass-by trip deduction of 78 external trips was assumed for the retail component of the MPD. The retail pass-by traffic assumed is less than 10% of the passing traffic on SR 31.

Year 2026 Net New External Trips

The Project is estimated to generate 3,254 net new external trips (69% of total) during the PM peak hour as summarized below.

Babcock MPD			
Year 2026 Trip Generation – PM Peak Hour			
Trip Type	In	Out	Total
Total ⁽¹⁾	2,331	2,411	4,742
Internal ⁽²⁾	705	705	1,410
External ⁽³⁾	1,626	1,706	3,332
Pass-by ⁽⁴⁾	39	39	78
Net New ⁽⁵⁾	1,587	1,667	3,254

Footnotes:

- (1) ITE, Trip Generation, 9th Edition.
- (2) Internal captured trips within MPD.
- (3) Project trips beyond MPD boundaries.
- (4) Retail Pass-by Trips.
- (5) External trip assignment.

Year 2026 Model - Project TAZs

Project TAZ #3121 was assigned to represent Babcock MPD in the D1RPM travel model. The MPD development parameters were entered into the D1RPM model in standard ZONEDATA format. The D1RPM model was then run and adjustments made to the model derived daily trip generation using the SPECGEN parameters for the Project TAZs. The model was then rerun and the SPECGEN person trip generation readjusted in an iterative process until the model derived BRC cumulative daily trip generation was within five percent (5%) of the ITE daily net trip estimate.

The replication of the ITE daily trip loading in the travel model for the Project was within one percent (1%) or 63 external daily trips as summarized below.

Babcock MPD	
Year 2026 Project TAZ Trip Loading Comparison	
External Daily Trips	
ITE – Project Net New External Trips	36,249
Project TAZs Trip Loading ⁽¹⁾	36,312
Model Trip Difference from ITE	63
Model Trip % Difference from ITE	0.17%

Footnote:

- (1) FSUTMS TAZ #3121.

Year 2026 Segment Analysis With Project

Under future conditions “With” the Project, the segment analysis coincident with Year 2026 is presented Exhibits 9b (FDOT). As shown, all components of the segment analysis is provided including background (All Other plus BRC DRI) traffic, Project (MPD) traffic, significant and

adverse impacts, services volumes, LOS and recommended number of lanes to maintain LOS standard.

Year 2026 Project Trip Distribution/Assignment

The Project Trip Distribution and Assignment based on the D1RPM model is summarized as follows. The PM peak hour trip distribution at the Project access points are included as part of Appendix K.

Babcock MPD Year 2026 Project Trip Distribution/Assignment	
Direction	Percent
North	20%
Southeast	23%
Southwest	55%
West	2%
Total	100%

Year 2026 Project Significant Impact

The Project's net new external trips as a percentage of service volume consumption are identified in Exhibit 9b (FDOT). The Project is deemed to have significant impact on a roadway segment if the Project's consumption of the roadway service volume is five percent (5%) or greater. Therefore, Babcock MPD is expected to have significant impact on the following state roads as summarized below.

Babcock MPD Year 2026 Project Significant Impact		
Roadway	From	To
Bayshore Road (SR 78)	Business 41	Hart Rd.
	Hart Rd.	Slater Rd.
	Slater Rd.	I-75
	I-75	Nalle Rd.
	Nalle Rd.	Palm Creek Dr.
SR 31	Palm Creek Dr.	SR 31
	SR 80	Bayshore Rd. (SR 78)
	Bayshore Rd. (SR 78)	Old Rodeo Dr.
	Old Rodeo Dr.	North River Road
	North River Road	Lee/Charlotte Co. Line
SR 80	I-75	SR 31
	SR 31	Buckingham Rd.

Year 2026 Project Significant and Adverse Impact

As presented in Exhibit 9b (FDOT), Babcock MPD is expected to have significant and adverse impact on the following state roads.

Babcock MPD Year 2026 Project Significant and Adverse Impact		
Roadway	From	To
SR 78	Business 41	Hart Rd. ⁽¹⁾
	Hart Rd.	Slater Rd.
	I-75	Nalle Rd.
	Nalle Rd.	Palm Creek Dr.
SR 31	SR 80	Bayshore Rd. (SR 78)
	Bayshore Rd. (SR 78)	Old Rodeo Dr.
	Old Rodeo Dr.	North River Rd.
	North River Rd.	Lee/Charlotte Co. Line

Footnote:

(1) Transportation Deficient per Chapter 168.3180, F.S.

As identified in Exhibits 9b (FDOT), the future roadway levels of service were determined based on current area (i.e., urbanized/transitional/rural) designation and generalized service volumes.

Year 2026 Syncho Arterial Analysis

The detailed arterial analysis was performed on SR 31. The arterial analysis was performed using Synrho that takes into consideration of the future intersection improvements and signal timing along the SR 31 corridor. (Please refer to the intersection LOS analysis in the next section of this document).

The results of the Synchro arterial analysis for SR 31 are summarized below and included in Appendix P.

Babcock MPD – Year 2026				
Synchro Arterial Level of Service				
Roadway	From	To	Northbound	Southbound
SR 31	Charlotte County Line	Busbee Ln. (MPD-N)	B	A
	Busbee Ln. (MPD-N)	Fox Hill Rd. (MPD-M)	B	B
	Fox Hill Rd. (MPD-M)	Shirley Ln. (MPD-S)	B	B
	Shirley Ln. (MPD-S)	North River Rd.	C	B
	North River Rd.	Bayshore Rd. (SR 78)	A	C
	Bayshore Rd. (SR 78)	SR 80	C	C
Overall			B	A

The Synchro arterial analysis indicates that all segments of SR 31 (including overall segment LOS) are expected operate within FDOT LOS standards with the existing two-lanes, coincident with the Year 2021.

The Synchro input and output files are available for download at the following link:
ftp://ftpfm.dplummer.com/Public/16531_FDOT_Babcock_CPA_MPD .

Year 2026 Intersection Volumes With Project

The turning movement volumes at the intersections under study are presented in Appendix F, Appendix J and Appendix K, coincident with Year 2026.

Year 2026 Intersection LOS With Project

The operation of the intersections were evaluated based on methodologies from the Highway Capacity Manual, 6th Edition (HCM) using the Synchro_9 software. For unsignalized intersections (i.e., TWSC), the Intersection Capacity Utilization (ICU) LOS from Synchro_9 is reported to provide the LOS of the overall operations of the intersection. The complete HCM and ICU analysis and output are included in Appendix L.

The resultant intersection LOS “With” the Project, under PM peak hour, peak season conditions, is summarized below.

Babcock MPD Year 2026 Traffic Conditions With Project Intersection Level of Service			
Ref. #	Major Street	Minor Street	LOS
			With Recommended Improvements
4a	SR 78	I-75 West Ramp	A ⁽¹⁾
4b	SR 78	I-75 East Ramp	D ⁽¹⁾
11a	SR 80	I-75 West Ramp	C ⁽¹⁾
11b	SR 80	I-75 East Ramp	D ⁽¹⁾
12	SR 80	Orange River Blvd.	C ⁽¹⁾
13	SR 80	SR 31	D ^(1,2)
14	SR 80	Davis Blvd.	B ^(1,2)
15	SR 80	Tropic Blvd.	C ^(1,2)
17	SR 80	Buckingham Rd.	C ⁽¹⁾
18	SR 31	SR 78 (Bayshore Rd.)	D ^(1,2)
19	SR 31	North River Rd. (CR 78)	C ^(1,2)
25	SR 31	Shirley Lane/ Babcock MPD South Access	C ^(1,3)
26	SR 31	Fox Hill Road/ Babcock MPD Middle Access	A ^(3,4)
27	SR 31	Busbee Lane/ Babcock MPD North Access	C ^(1,3)

Footnotes:

- (1) Signalized Intersection – HCM Overall intersection LOS reported.
- (2) Potential Mitigation.
- (3) Potential Site-related Improvement.
- (4) Unsignalized Intersection – Overall Intersection ICU LOS reported.

Year 2026 Recommended Improvements

Roadways

The recommended roadway improvements to accommodate future Babcock MPD and area-wide traffic coincident with horizon year 2026 is summarized as follows.

Babcock MPD Year 2026 Recommended Improvements Roadways			
Roadway	From	To	Recommended Improvement
SR 78	Hart Rd.	Slater Rd.	Widen from 4L to 6L ⁽¹⁾ Consistent with MPO LRTP Traffic Monitoring
	I-75	Nalle Rd.	Widen from 2L to 4L ⁽¹⁾ Traffic Monitoring

Footnote:

(1) Subject to detailed arterial analysis and traffic monitoring.

SR 78 from Hart Road to SR 31

The anticipated need for the widening of some segments of SR 78 from Hart Road to SR 31 is based on assessment using generalized service volumes. The actual need and timing of the improvement is subject to detailed arterial analysis and traffic monitoring.

SR 31 from SR 80 to Charlotte County Line

The anticipated need for the widening of some segments of SR 31 from SR 80 to the Charlotte County Line from two to four lanes is consistent with the Lee County MPO Long-Range Transportation Plan.

The SR 31 PD&E Study from SR 80 to SR 78, the SR 31 SEIR (South) between SR 78 to North River Road (CR 78) and the SR 31 SEIR (North) from North River Road (CR 78) to the Babcock Ranch Community DRI North Entrance(s) (Charlotte County) are underway and conducted by FDOT.

Intersections

The recommended intersection improvements to accommodate future Babcock MPD traffic and area-wide traffic coincident with horizon year 2026 is summarized as follows.

Babcock MPD Year 2026 Recommended Improvements with Project Intersections			
Ref. #	Major Street	Minor Street	Description
4b	SR 78	I-75 East Ramp	
11b	SR 80	I-75 East Ramp	
12	SR 80	Orange River Boulevard	
13	SR 80	SR 31	Add NB – Turn Lane Channelize NB – RT Lane Add SB – Left-Turn Lane Channelize SB – RT Lane Add EB – Left-Turn Lane Add EB – Thru Lane Add WB – Left-Turn Lane Signal Retiming Traffic Monitoring
14	SR 80	Davis Avenue	Add EB – Thru Lane
15	SR 80	Tropic Avenue	Add NB – Right-Turn Lane Add SB – Right-Turn Lane Add EB – Thru Lane
17	SR 80	Buckingham Road	
18	SR 31	SR 78	Add NB – Thru Lane Add SB – Thru Lane Signal Retiming Traffic Monitoring
19	SR 31	North River Rd. (CR 78)	Add NB – Thru Lane Add SB – Thru Lane Add SB – Right-Turn Lane Add EB – Left-Turn Lane Add EB – Right-Turn Lane Add WB – Left-Turn Lane Add WB – Right-Turn Lane Signalization, if and when warranted Traffic Monitoring

Babcock MPD Year 2026 Recommended Improvements with Project Intersections (Continued)	
1	10000
2	10000
3	10000
4	10000
5	10000
6	10000
7	10000
8	10000
9	10000
10	10000
11	10000
12	10000
13	10000
14	10000
15	10000
16	10000
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Ref. #	Major Street	Minor Street	Description
25	SR 31	Shirley Lane/ Babcock MPD South Access	Add NB – Left-Turn Lane Add NB – Two Thru Lanes Add NB – Right-Turn Lane Add SB – Left-Turn Lane Add SB – Thru Lane Add SB – Right-Turn Lane Add EB – Left-Turn Lane Configure EB – Thru/RT Lane Add WB – Dual Left-Turn Lane Add WB - Thru/Right-Turn Lane Signalization, if and when warranted Traffic Monitoring
26	SR 31	Fox Hill Road/ Babcock MPD Middle Access	Add NB – Left-Turn Lane Add NB – Thru Lane Add NB – Right-Turn Lane Add SB – Left-Turn Lane Add SB – Thru Lane Add SB – Right-Turn Lane Add EB – Left-Turn Lane Configure EB – Thru/RT Lane Add WB – Dual Left-Turn Lane Add WB - Thru/Right-Turn Lane Signalization, if and when warranted Traffic Monitoring
27	SR 31	Busbee Lane/ Babcock MPD North Access	Add NB – Left-Turn Lane Add NB – Thru Lane Add NB – Right-Turn Lane Add SB – Left-Turn Lane Add SB – Thru Lane Add SB – Right-Turn Lane Add EB – Left-Turn Lane Configure EB – Thru/RT Lane Add WB – Left-Turn Lane Add WB - Thru/Right-Turn Lane Signalization, if and when warranted Traffic Monitoring

Year 2026 - Road Impact Fee Estimate

In accordance with the Roads Impact Fee Schedule contained in the current Lee County LDC, the MPD is estimated to generate between \$1.5 Million to \$3.4 Million through to Year 2026, Exhibit 10a (FDOT).

Babcock MPD Year 2026 – Road Impact Fee Estimate	
At 45% Discount	\$8.9 Million
At 100%	\$19.7 Million

Year 2026 – Proportionate Share Estimate

Based on the same methodology and FDOT improvement cost assumptions of the BRC DRI – Increment 1, the MPD proportionate share estimate through to Year 2026 is summarized below and presented in Exhibits 10b (FDOT) and 10c (FDOT).

Babcock MPD Year 2026 – Proportionate Share Estimate	
Roadways	\$2.5 Million
Intersections	\$5.7 Million
Total	\$8.2 Million

Traffic Mitigation – Year 2026

Babcock MPD is expected to mitigate its traffic impacts through: 1) Payment of roads impact fees; and/or 2) Participate in the payment of proportionate share; and 3) Provide for site-related improvements.