

**A Traffic Impact Analysis of:**

**Causeway Cove**  
**Conditional Use Site Plan**  
For Dockmaster's Quarters &  
RV Lots with Boat Slips

Located in:

**City of Fort Pierce, Florida**

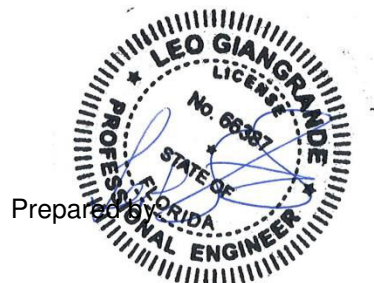
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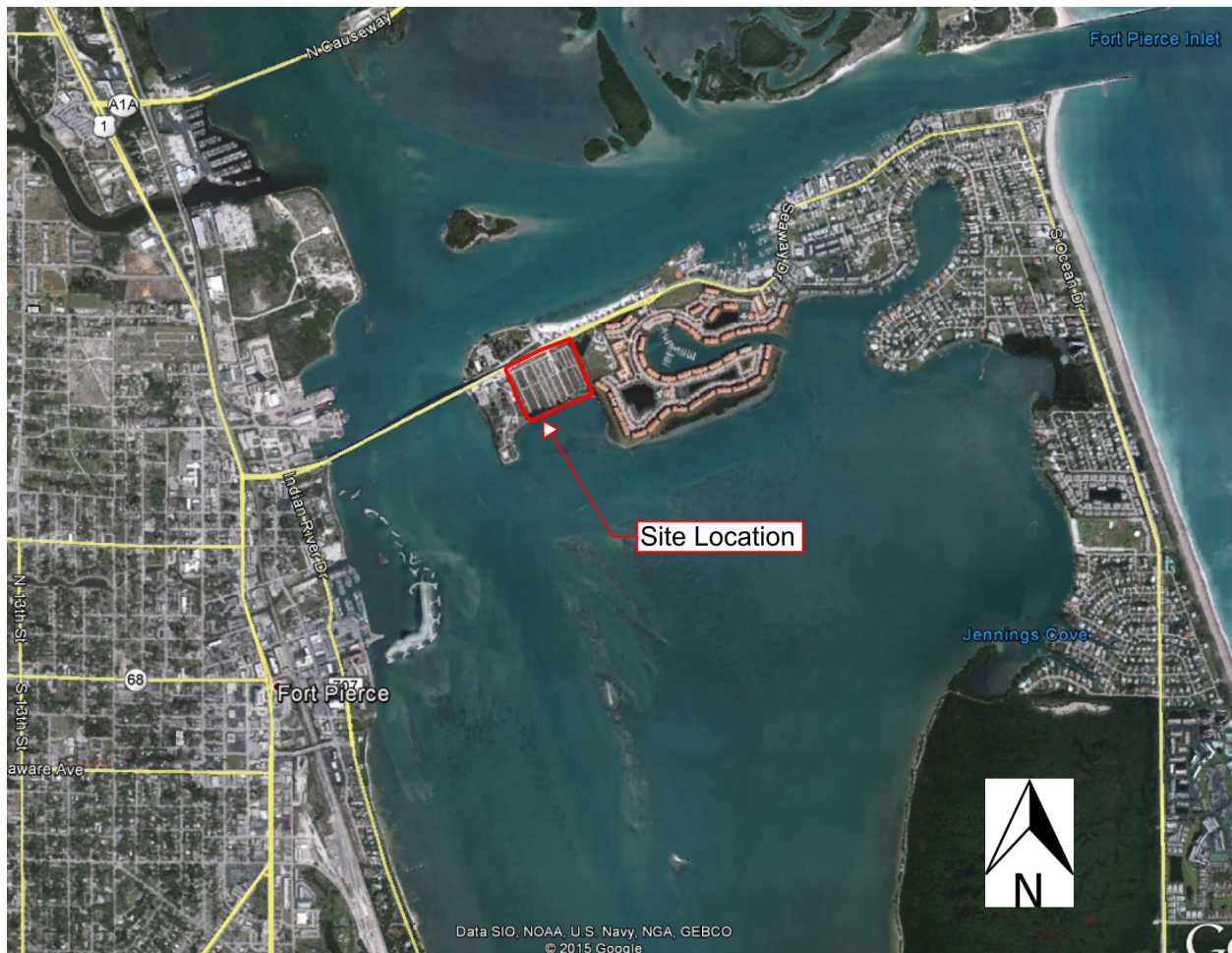
**APPENDICES**

St. Lucie County Traffic Counts  
Site Plan Prepared by Giangrande Engineering and Planning

## INTRODUCTION

Giangrande Engineering and Planning has been requested to provide traffic impact analysis in support of a site plan application for the proposed project located at 601 Seaway Drive. The site plan application proposes the development of 1,296 square foot Dockmaster's Quarters, a 831 square foot laundry/variety store, 47 boat slips and 10 RV Lots. The site is currently vacant land with an existing roadway network from the prior military residential facility. It is the intent to utilize the existing infrastructure with the understanding that this project will have future phases that will require a complete site design. The future phases are anticipated to have a considerable project density which will require many infrastructure upgrades. Future phases of this project are not proposed or included in this site plan application.

The analysis performed in this report provides the potential impacts to the City's transportation system brought about by the proposed development. The analysis includes existing, background, committed trips, and the projected traffic volumes and the capacity analysis for required roadways. **Figure 1** below shows the location of the parcel in relation to the surrounding roadways.



**Figure 1 – Site Location**

**TRIP GENERATION**

Trip generation has been based on the proposed development of a Dockmaster’s residential quarters, an 831 square foot laundry/variety store, 47 boat slips and 10 RV Lots. The peak hour traffic generation for the site was available from the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 9<sup>th</sup> Edition. The development will consist of the development as described in the *Introduction*. No pass-by reduction was assumed for the any of the components of the project. The calculation of the trip generation is summarized below in **Table 1**.

**Table 1 – Proposed Phase I Trip Generation**

Causeway Cove Site Plan									
Conditional Use Submittal									
9th Edition ITE Generation Rates									
			AM			PM			ADT
ITE Code	Type	Amount	In	Out	Total	In	Out	Total	Total
210	Single-Family Detached	1 Units	1	1	2	1	1	2	10
814	Variety Store	831 Sf.	2	2	4	3	3	6	53
416	Rec Veh Park	10 Camp Sites	1	1	2	2	1	3	27
420	Marina	47 Boat Slips	1	3	4	5	4	9	139
Total			5	7	12	12	8	19	229

The equations utilized in the trip generation shown in **Table 1** are summarized as follows where T is equal to vehicle trips and X is the independent variable:

- **Single-Family Attached Housing – ITE Code 210 (X = # of dwelling units)**
  - AM Peak Hour:  $T = X * 0.75$ 
    - Entrance Split: 0.25
    - Exit Split: 0.75
  - PM Peak Hour:  $T = X * 1.00$ 
    - Entrance Split: 0.63
    - Exit Split: 0.37
- **Variety Store – ITE Code 814 (X = 1,000 sq. ft of gross building area)**
  - AM Peak Hour:  $T = X * 3.81$ 
    - Entrance Split: 0.50
    - Exit Split: 0.50
  - PM Peak Hour:  $T = X * 6.82$ 
    - Entrance Split: 0.50
    - Exit Split: 0.50
- **Recreational Vehicle Park – ITE Code 416 (X = # of Sites)**
  - AM Peak Hour:  $T = X * 0.21$ 
    - Entrance Split: 0.36
    - Exit Split: 0.64
  - PM Peak Hour:  $T = X * 0.27$ 
    - Entrance Split: 0.65
    - Exit Split: 0.35

- **Marina – ITE Code 420 (X = # of Boat Slips)**
  - AM Peak Hour:  $T = X * 0.08$ 
    - Entrance Split: 0.33
    - Exit Split: 0.67
  - PM Peak Hour:  $T = X * 0.19$ 
    - Entrance Split: 0.60
    - Exit Split: 0.40

**Phase II**

Trip generation has been based on the proposed development of a Dockmaster’s residential quarters, an 831 square foot laundry/variety store, 212 boat slips and 10 RV Lots. Phase II includes the Phase I development and the addition of 165 boat slips and moorings. The peak hour traffic generation for the site was available from the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 9<sup>th</sup> Edition. The calculation of the trip generation is summarized below in **Table 2**.

**Table 2 – Proposed Phase II Trip Generation**

Causeway Cove Site Plan									
Phase II Conditional Use Submittal									
9th Edition ITE Generation Rates									
			AM			PM			ADT
ITE Code	Type	Amount	In	Out	Total	In	Out	Total	Total
210	Single-Family Detached	1 Units	1	1	2	1	1	2	10
814	Variety Store	831 Sf.	2	2	4	3	3	6	53
416	Rec Veh Park	10 Camp Sites	1	1	2	2	1	3	27
420	Marina	212 Boat Slips	6	11	17	24	16	40	628
<b>Total</b>			<b>9</b>	<b>16</b>	<b>25</b>	<b>31</b>	<b>21</b>	<b>51</b>	<b>717</b>

**TRIP DISTRIBUTION**

A trip distribution was performed to show the traffic impact based on the total trips generated from the proposed project. The trip distribution has 90% of the project trips utilizing the project access from the west (mainland side) and 10% from the east (island side).

The project trips generated as shown in **Table 1** are distributed to the surrounding roadway system based on anticipated vehicular routes used to access and exit the site. Distribution is based on the potential population growth, demographics of the potential clients in the vicinity of the site and other similar uses of the surrounding area. **Figure 2** is provided as a graphical representation of the trip distribution percentages to roadway links and intersections within the project vicinity. Project trip distribution can also be viewed in **Table 2**.

**Figure 2 – Trip Distribution**



**BACKGROUND & BUILD-OUT CONDITIONS**

Background conditions for the completion year, 2017, have been calculated using the annual growth percentages shown in **Table 3**. Due to the population and economic trends of the Treasure Coast area, many of the roadway links have experienced a negative growth rate recently. Based on this information it has been estimated that an average of a 1.5% growth rate is a conservative approach for the surrounding roadway links.

**Table 4** tabulates the expected traffic volumes for the roadway links in the vicinity of the project for the design year compared to the LOS service volume. Based on the build-out traffic for the proposed project, all the links that are expected to be utilized are below the LOS service volume established for that segment.

**Table 3 – Phase I Build-Out Calculation**

Road Name	From	To	Ex. LOS	2014 AADT	AM Peak HR Ex. Volume	Pm Peak HR Ex. Volume	Annual Growth	Project Assign.	AM Project Trips	PM Project Trips	2017 Peak Am Growth	2017 Peak PM Growth	2017 Peak AM Build-out	2017 Peak PM Build-Out
SR A1A South	Binney Dr	S Causeway Park	D	11,338	564	590	1.50%	10%	1	1	590	617	590	618
SR A1A South	S Causeway Park	Indian River Dr	C	9,799	539	487	1.50%	90%	7	11	564	509	570	520
SR A1A South	Indian River Dr	US 1	C	9,799	539	487	1.50%	90%	7	11	564	509	570	520

**Table 4 –Phase I LOS Build-Out Link Data**

Road Name	From	To	Type	AM Project Trips	PM Project Trips	2017 AM Buildout	2017 PM Buildout	LOS Service Volume	Below LOS Service Volume
SR A1A South	Binney Dr	S Causeway Park	4-In	1	1	590	618	790	YES
SR A1A South	S Causeway Park	Indian River Dr	4-In	7	11	570	520	1,550	YES
SR A1A South	Indian River Dr	US 1	4-In	7	11	570	520	1,710	YES

**Phase II**

Phase II Background conditions for the completion year, 2022, have been calculated using the annual growth percentages shown in **Table 5**. Based on this information it has been estimated that an average of a 1.5% growth rate is a conservative approach for the surrounding roadway links.

**Table 6** tabulates the expected traffic volumes for the roadway links in the vicinity of the project for Phase II compared to the LOS service volume. Based on the Phase II build-out traffic for the proposed project, all the links that are expected to be utilized are below the LOS service volume established for that segment.

**Table 5 – Phase II Build-Out Calculation**

Road Name	From	To	Ex. LOS	2014 AADT	AM Peak HR Ex. Volume	Pm Peak HR Ex. Volume	Annual Growth	Project Assign.	AM Project Trips	PM Project Trips	2022 Peak Am Growth	2022 Peak PM Growth	2022 Peak AM Build-out	2022 Peak PM Build-Out
SR A1A South	Binney Dr	S Causeway Park	D	11,338	564	590	1.50%	10%	2	3	635	665	637	668
SR A1A South	S Causeway Park	Indian River Dr	C	9,799	539	487	1.50%	90%	14	28	607	549	622	576
SR A1A South	Indian River Dr	US 1	C	9,799	539	487	1.50%	90%	14	28	607	549	622	576

**Table 6 –Phase II LOS Build-Out Link Data**

Road Name	From	To	Type	AM Project Trips	PM Project Trips	2022 AM Buildout	2022 PM Buildout	LOS Service Volume	Below LOS Service Volume
SR A1A South	Binney Dr	S Causeway Park	4-In	2	3	637	668	790	YES
SR A1A South	S Causeway Park	Indian River Dr	4-In	14	28	622	576	1,550	YES
SR A1A South	Indian River Dr	US 1	4-In	14	28	622	576	1,710	YES

**PROJECT ACCESS**

The site is located on the south side of State Road A1A, southwest of the Ft. Pierce Inlet, and within the northwest area of Hutchinson Island. Access to the site will be via an existing asphalt drive that intersects the south side of State Road A1A, entering the north portion of the property. It is anticipated that a FDOT access permit for a driveway connection off of US 1 Highway will not be required. Any modifications to the existing driveway access will require FDOT approval. A site access plan has also been provided in the **Appendix** of this report.

**CONCLUSION**

Based on this traffic analysis, the proposed development is not anticipated to have detrimental adverse impacts to the surrounding roadway network based on build-out conditions. The projected volumes generated by the anticipated use indicate that the adjacent roadway links will operate at an acceptable Level of Service with no mitigation improvements. The existing roadway network is capable of accommodating the additional new vehicle trips the development is anticipated to generate.

# **APPENDIX**



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 Port St. Lucie, FL 34953  
 772-462-1593 www.stlucietpo.org

**Traffic Counts and Level of Service Report  
 Fall 2014**

Roadway Name	Location	AADT	Pk Hr Service Capacity	AM Pk Hr Pk Dir			PM Pk Hr Pk Dir		
				Volume	LOS	V/C	Volume	LOS	V/C
SHINN RD	OKEECHOBEE RD to ORANGE AVE	824	1,030	57	B	0.150	66	B	0.174
SNEED RD	OKEECHOBEE RD to ORANGE AVE	1,592	500	116	B	0.725	111	B	0.694
SOUTHBEND BLVD	BECKER RD to FLORESTA DR	12,000	710	726	E	0.955	651	D	0.917
SR A1A NORTH	US 1 to OLD DIXIE HWY	5,607	920	378	C	0.434	379	C	0.436
SR A1A NORTH	OLD DIXIE HWY to N HWY A1A	6,400	0	355	C	0.408	333	C	0.383
SR A1A NORTH	SHOREWINDS DR to INDIAN RIVER C.L.	6,876	920	370	C	0.425	406	C	0.467
SR A1A SOUTH	NETTLES ISLAND to FPL PLANT	7,055	920	432	C	0.497	387	C	0.445
SR A1A SOUTH	FPL PLANT to BLUE HERON BLVD	3,413	660	408	C	0.658	327	C	0.527
SR A1A SOUTH	BLUE HERON BLVD to SEAWAY DR	6,926	560	374	D	0.668	447	D	0.798
SR A1A SOUTH	OCEAN DR to BINNEY DR	11,338	560	564	E	0.940	590	E	0.983
<b>SR A1A SOUTH</b>	<b>BINNEY DR to S CAUSEWAY PARK</b>	<b>11,338</b>	<b>790</b>	<b>564</b>	<b>D</b>	<b>0.714</b>	<b>590</b>	<b>D</b>	<b>0.747</b>
<b>SR A1A SOUTH</b>	<b>S CAUSEWAY PARK to INDIAN RIVER DR</b>	<b>9,799</b>	<b>1,550</b>	<b>539</b>	<b>C</b>	<b>0.781</b>	<b>487</b>	<b>C</b>	<b>0.706</b>
<b>SR A1A SOUTH</b>	<b>INDIAN RIVER DR to US 1</b>	<b>9,799</b>	<b>1,710</b>	<b>539</b>	<b>C</b>	<b>0.700</b>	<b>487</b>	<b>C</b>	<b>0.632</b>
ST JAMES DR	AIROSO BLVD to ST JAMES BLVD	17,000	1,890	1,254	C	0.697	1,216	C	0.676
ST JAMES DR	ST JAMES BLVD to PEACHTREE BLVD	19,000	1,890	1,518	C	0.843	1,208	C	0.671
ST JAMES DR	PEACHTREE BLVD to TELFORD AVE	17,000	1,800	1,254	C	0.729	1,216	C	0.707
ST JAMES DR	TELFORD AVE to MIDWAY RD	21,000	1,890	1,163	C	0.646	1,414	C	0.786
ST JAMES BLVD	SELVITZ RD to ST JAMES DR	4,300	680	318	C	0.964	243	C	0.736
ST LUCIE BLVD	KINGS HWY to KEEN RD	4,821	750	384	C	0.541	364	C	0.513
ST LUCIE BLVD	KEEN RD to 25TH ST	4,821	750	384	C	0.541	364	C	0.513
ST LUCIE BLVD	25TH ST to SENECA AVE	3,784	710	194	C	0.554	197	C	0.563
ST LUCIE BLVD	SENECA AVE to US 1	3,784	790	194	C	0.497	197	C	0.505
ST LUCIE WEST BLVD	COMMERCE CENTER DR to W OF I-95	10,500	590	492	C	0.879	506	C	0.904
ST LUCIE WEST BLVD	I-95 to CALIFORNIA BLVD	35,000	1,890	1,679	C	0.933	1,542	C	0.857
ST LUCIE WEST BLVD	CALIFORNIA BLVD to COUNTRY CLUB DR	35,000	1,890	1,679	C	0.933	1,542	C	0.857
ST LUCIE WEST BLVD	COUNTRY CLUB DR to CASHMERE BLVD	35,000	1,890	1,679	C	0.933	1,542	C	0.857
ST LUCIE WEST BLVD	CASHMERE BLVD to BAYSHORE BLVD	44,000	2,850	2,285	C	0.822	2,125	C	0.764
SUNRISE BLVD	MIDWAY RD to BELL AVE	3,709	510	283	D	0.555	237	C	0.948
SUNRISE BLVD	BELL AVE to EDWARDS RD	4,016	640	254	C	0.794	265	C	0.828

\* Volumes shown were adjusted using FDOT Seasonal Factors  
 \* AADT = Annual Average Daily Traffic



DATE	BY	REVISIONS

Date: 01-09-2014  
 Scale: 1"=80'  
 Design By: LG  
 Drawn By: BCF  
 Check By: LG

CAUSEWAY COVE  
 FT. PIERCE, FLORIDA  
 601 SEAWAY DRIVE

SITE ACCESS PLAN

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SA-1