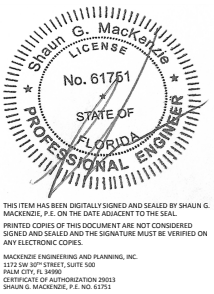
TRAFFIC IMPACT ANALYSIS

Central Parkway Lofts
Stuart, FL

Prepared for:
Velcon Engineering & Surveying LLC
Port St. Lucie, Florida

Prepared by:

MacKenzie
Engineering & Planning, Inc.
1172 SW 30th Street, Suite 500
Palm City, FL 34990
(772) 286-8030



Digitally signed by Shaun G MacKenzie
Date: 2021.01.17 18:01:43 -05'00'

Shaun G. MacKenzie P.E.
PE Number 61751

213001
January 2021
© MacKenzie Engineering and Planning, Inc.
CA 29013

EXECUTIVE SUMMARY

MacKenzie Engineering & Planning, Inc. was has been retained to prepare a traffic statement for the RPUD application for the for the Central Parkway Lofts project in Stuart Florida (PCN: 09-38-41-000-000-00530-4). The site is located on Central Parkway 2,000 feet east of Kanner Highway and 2,200 feet west of US 1.

The applicant proposes 196 mid-rise multi-family dwelling units. The development is planned for completion by the end of 2024. The analysis was performed for the 2024 roadway conditions.

The traffic analysis was performed in accordance with the City of Stuart Code, Section 4.00.00 Traffic Impact Analysis. The project meets the thresholds of Section 4.00.00. The results of the analysis show that the roadways are projected to operate acceptably with the addition of the proposed development and the project meets Stuart's concurrency requirements.

The proposed project is expected to generate the following net external and driveway trips:

- 1,066 daily, 66 AM peak hour (17 in/49 out), and 85 PM peak hour (52 in/33 out)

All roadway segments are projected to operate acceptably in 2024 with the proposed development.

Based on project traffic volumes, the driveways are projected to operate acceptably. Turn lanes are not recommended.

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Exhibit 1. Trip Generation

MacKenzie
Engineering & Planning, Inc.

INTRODUCTION

MacKenzie Engineering & Planning, Inc. was has been retained to prepare a traffic statement for the RPUD application for the for the Central Parkway Lofts project in Stuart Florida (PCN: 09-38-41-000-000-00530-4). The site is bisected by Central Parkway 2,000 feet east of Kanner Highway and 2,200 feet west of US 1.

The applicant proposes 196 mid-rise multi-family dwelling units. The development is planned for completion by the end of 2024. The analysis was performed for the 2024 roadway conditions. A site location map is shown below in Figure 1.

Figure 1. Site Location Map



INVENTORY AND PLANNING DATA

The traffic data used in this analysis were obtained from Martin County, MacKenzie Engineering and Planning, Inc. (MEP), and FDOT. The data included:

- FDOT's Q/LOS Manual
- *Trip Generation, 10th Edition* (ITE report)
- Martin County's 2019 Roadway Level of Service Inventory Report

Velcon Engineering & Surveying LLC provided project development information.

PROJECT TRAFFIC

Traffic Generation

The daily and peak hour traffic generation for the development used the trip generation rates published by the Institute of Transportation Engineers (ITE)'s report, *Traffic Generation (10th Edition)* for Land Use 221, Multi-Family Housing (Mid-Rise). The proposed development plan consists of the following:

Proposed Uses

- 196 Mid-Rise Multi-Family Dwelling Units (ITE Land Use 221)

The proposed project is expected to generate the following net external and driveway trips:

- 1,066 daily, 66 AM peak hour (17 in/49 out), and 85 PM peak hour (52 in/33 out)

Internal Capture

In order to provide a conservative analysis, internal capture is not utilized.

Pass-by Capture

The site contains no pass-by capture.

Table 1. Trip Generation

Land Use	Intensity	Daily	AM Peak Hour			PM Peak Hour		
		Trips	Total	In	Out	Total	In	Out
Proposed Site Traffic								
Multifamily Housing(Mid-Rise)	196 DU	1,066	66	17	49	85	52	33
NET CHANGE IN TRIPS (FOR THE PURPOSES OF CONCURRENCY)		**1,066**	**66**	**17**	**49**	**85**	**52**	**33**
NET CHANGE IN DRIVEWAY VOLUMES		**1,066**	**66**	**17**	**49**	**85**	**52**	**33**

Note: Trip generation was calculated using the following data:

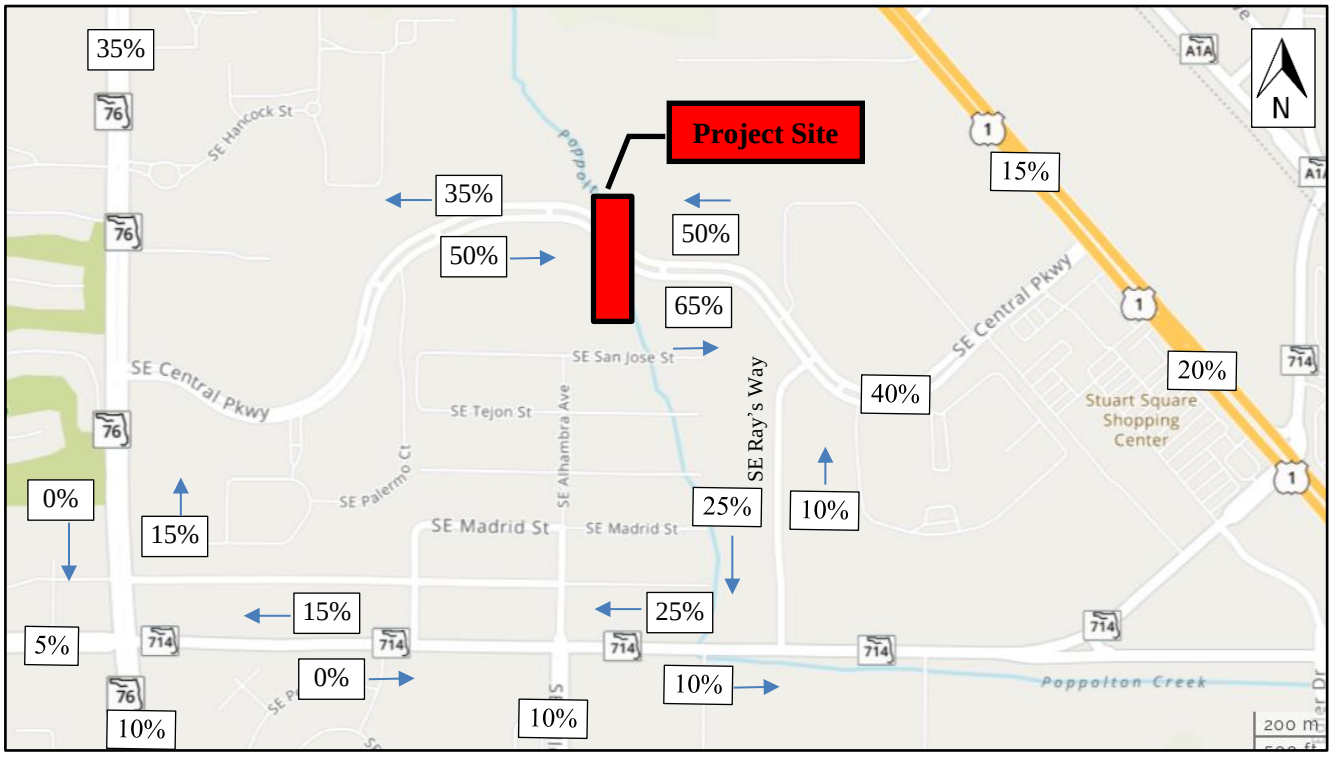
Land Use	ITE Code	Unit	Daily Rate	Pass-by Rate	AM Peak Hour in/out	AM Peak Hour Rate	PM Peak Hour in/out	PM Peak Hour Equation
Multifamily Housing(Mid-Rise)	221	DU	T = 5.45 (X) + -1.75	0%	26/74	Ln(T) = 0.98 Ln(X) + -0.98	61/39	Ln(T) = 0.96 Ln(X) + -0.63

TRAFFIC ASSIGNMENT

The traffic assignment was developed based upon existing and proposed developments, generators, destinations, and knowledge of the local area. These factors were applied using traffic engineering rationale similar to the gravity model.

- North – 50%
- South – 40%
- West – 5%
- East – 5%

- **Figure 2. Traffic Assignment**



SIGNIFICANCE

Significant Impact

A project significantly impacts a facility if its peak hour trips use more than five percent (5%) of a roadway's capacity (City of Stuart Code, 4.05.02 Traffic Impact Analysis). The project's traffic assignment and net external trips were utilized to determine the number of project trips on each road segment. Central Parkway is unclassified in the City's comprehensive plan. Therefore, Central Parkway service volumes are estimated based on FDOT's 2020 Q/LOS Manual. Central Parkway is a 4-lane divided roadway and is a Class II based on its 25 MPH posted speed limit. In addition, a 10 percent reduction in capacity was applied because this is a local roadway. The resultant estimated peak hour peak direction capacity is 1,530 based on the City's adopted LOS E standard (1,700 x 0.9).

In order to determine the project significance, the project's trips were divided by the roadway segment capacity. Based on the City's significance methodology, the proposed project does not significantly impact Central Parkway. The roadway capacities and the project significance are shown in Table 2.

Study Area

Based on Section 4.05.02 of the Code, the study area for transportation concurrency is all links and aggregated segments or parts thereof, on the major road network on which the project traffic has an impact of at least 5 percent and the first directly accessed roadway link (segment).

Table 2. Project Impacts 1-Way Peak Hour (Significance)

Roadway	From	To	Lanes	Generalized Service Capacity	Assign	Project Traffic	Significance	Significant Impact (Y/N)
Central Parkway	Kanner Hwy	Project	4	1,530	50%	26	1.70%	no
	Project	SE Ray's Way	4	1,530	65%	34	2.22%	no
	SE Ray's Way	US 1	4	1,530	40%	21	1.37%	no

As shown in Table 2, there are no roadways that are significantly impacted by the project.

Intersection Analysis

No intersection analysis are required or needed. It is acknowledged that performing a westbound left from Central Parkway to southbound Kanner Highway is very difficult during the peak hour of travel.

Roadway Analysis

Roadway volumes were not available on Central Parkway. Based on observations, the facility functions well below capacity.

ACCESS

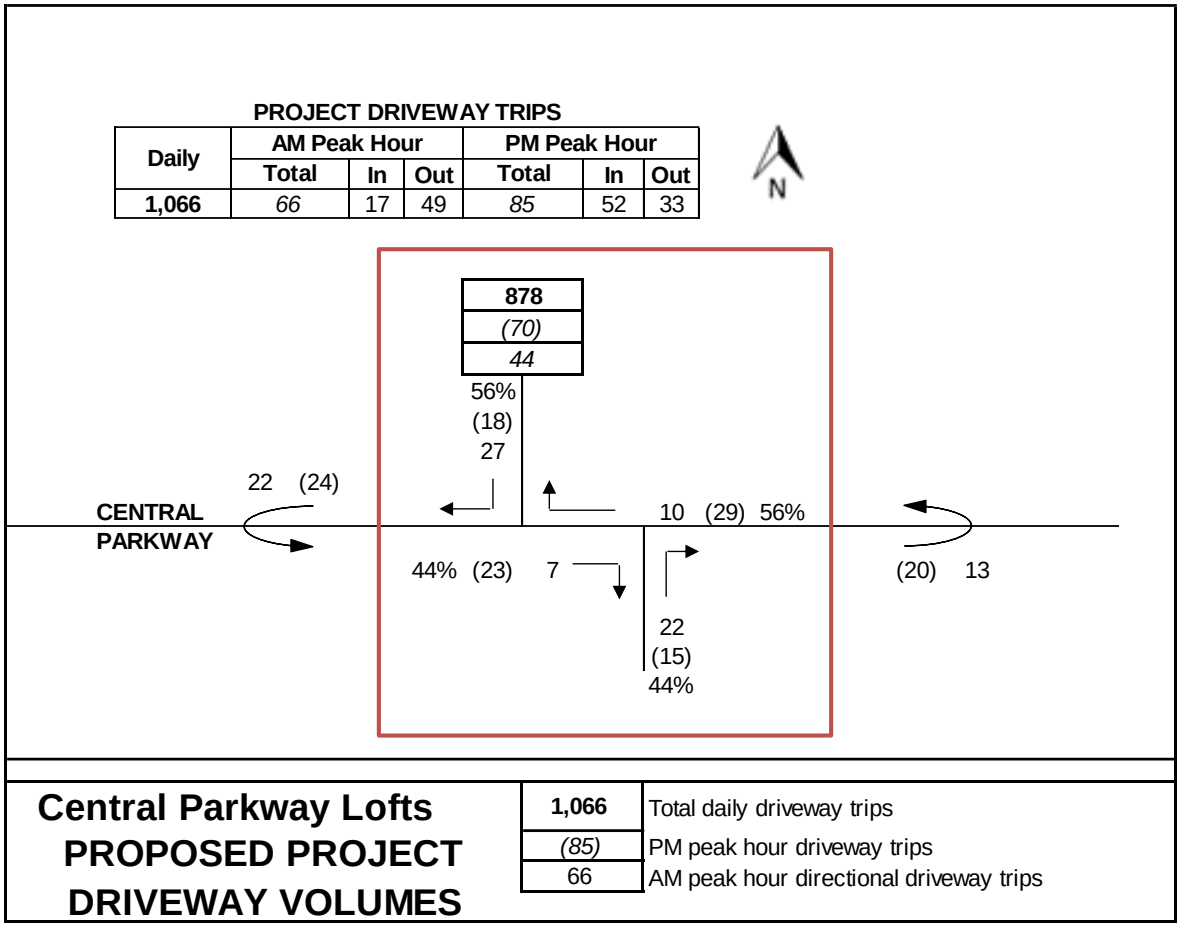
The project proposes two points of access as follows:

- Eastbound Central Parkway – Right-in / Right-Out
- Westbound Central Parkway – Right-in / Right-Out

Units on the south side of Central Parkway will be required to travel on eastbound Central Parkway. If residents desire to travel west to Kanner Highway, the vehicles will make a U-turn at the full median opening 815 west of SE Ray's Way, which is about 350 east of the south project entrance.

Units on the north side of Central Parkway will be required to travel on westbound Central Parkway. If residents desire to travel east to US-1 or SE Ray's Way, the vehicles will make a U-turn at the full median opening 1,450 west of SE Ray's Way, which is about 200-250 feet west of the north project entrance.

Figure 3. Driveway Volume



Driveways

Westbound Central Parkway & North Project Entrance

The westbound peak hour right-turn volume is 29. A right-turn lane is not warranted and is significantly less than the 80-125 peak hour right-turns recommended in the FDOT *Driveway Handbook.*

Eastbound Central Parkway & South Project Entrance

The eastbound peak hour right-turn volume is 23. A right-turn lane is not warranted and is significantly less than the 80-125 peak hour right-turns recommended in the FDOT *Driveway Handbook.*

CONCLUSION

MacKenzie Engineering & Planning, Inc. was has been retained to prepare a traffic statement for the RPUD application for the for the Central Parkway Lofts project in Stuart Florida (PCN: 09-38-41-000-000-00530-4). The site is located on Central Parkway 2,000 feet east of Kanner Highway and 2,200 feet west of US 1.

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The proposed project is expected to generate the following net external and driveway trips:

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All roadway segments are projected to operate acceptably in 2024 with the proposed development.

Based on project traffic volumes, the driveways are projected to operate acceptably. Turn lanes are not recommended.

APPENDICES

Institute of Traffic Engineers' (ITE) Report, Trip Generation (10th Edition)

Site Plan

Land Use: 221
Multifamily Housing (Mid-Rise)

Description

Mid-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have between three and 10 levels (floors). Multifamily housing (low-rise) (Land Use 220), multifamily housing (high-rise) (Land Use 222), off-campus student apartment (Land Use 225), and mid-rise residential with 1st-floor commercial (Land Use 231) are related land uses.

Additional Data

In prior editions of *Trip Generation Manual*, the mid-rise multifamily housing sites were further divided into rental and condominium categories. An investigation of vehicle trip data found no clear differences in trip making patterns between the rental and condominium sites within the ITE database. As more data are compiled for future editions, this land use classification can be reinvestigated.

For the six sites for which both the number of residents and the number of occupied dwelling units were available, there were an average of 2.46 residents per occupied dwelling unit.

For the five sites for which the numbers of both total dwelling units and occupied dwelling units were available, an average of 95.7 percent of the total dwelling units were occupied.

Time-of-day distribution data for this land use are presented in Appendix A. For the eight general urban/suburban sites with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 7:00 and 8:00 a.m. and 4:45 and 5:45 p.m., respectively.

For the four dense multi-use urban sites with 24-hour count data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 7:15 and 8:15 a.m. and 4:15 and 5:15 p.m., respectively. For the three center city core sites with 24-hour count data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 6:45 and 7:45 a.m. and 5:00 and 6:00 p.m., respectively.

For the six sites for which data were provided for both occupied dwelling units and residents, there was an average of 2.46 residents per occupied dwelling unit.

For the five sites for which data were provided for both occupied dwelling units and total dwelling units, an average of 95.7 percent of the units were occupied.

The average numbers of person trips per vehicle trip at the five center city core sites at which both person trip and vehicle trip data were collected were as follows:

- 1.84 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 7 and 9 a.m.
- 1.94 during Weekday, AM Peak Hour of Generator
- 2.07 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 4 and 6 p.m.
- 2.59 during Weekday, PM Peak Hour of Generator

The average numbers of person trips per vehicle trip at the 32 dense multi-use urban sites at which both person trip and vehicle trip data were collected were as follows:

- 1.90 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 7 and 9 a.m.
- 1.90 during Weekday, AM Peak Hour of Generator
- 2.00 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 4 and 6 p.m.
- 2.08 during Weekday, PM Peak Hour of Generator

The average numbers of person trips per vehicle trip at the 13 general urban/suburban sites at which both person trip and vehicle trip data were collected were as follows:

- 1.56 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 7 and 9 a.m.
- 1.88 during Weekday, AM Peak Hour of Generator
- 1.70 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 4 and 6 p.m.
- 2.07 during Weekday, PM Peak Hour of Generator

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Alberta (CAN), British Columbia (CAN), California, Delaware, District of Columbia, Florida, Georgia, Illinois, Maryland, Massachusetts, Minnesota, New Hampshire, New Jersey, Ontario, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Utah, Virginia, and Wisconsin.

Source Numbers

168, 188, 204, 305, 306, 321, 357, 390, 436, 525, 530, 579, 638, 818, 857, 866, 901, 904, 910, 912, 918, 934, 936, 939, 944, 947, 948, 949, 959, 963, 964, 966, 967, 969, 970

Multifamily Housing (Mid-Rise)
(221)

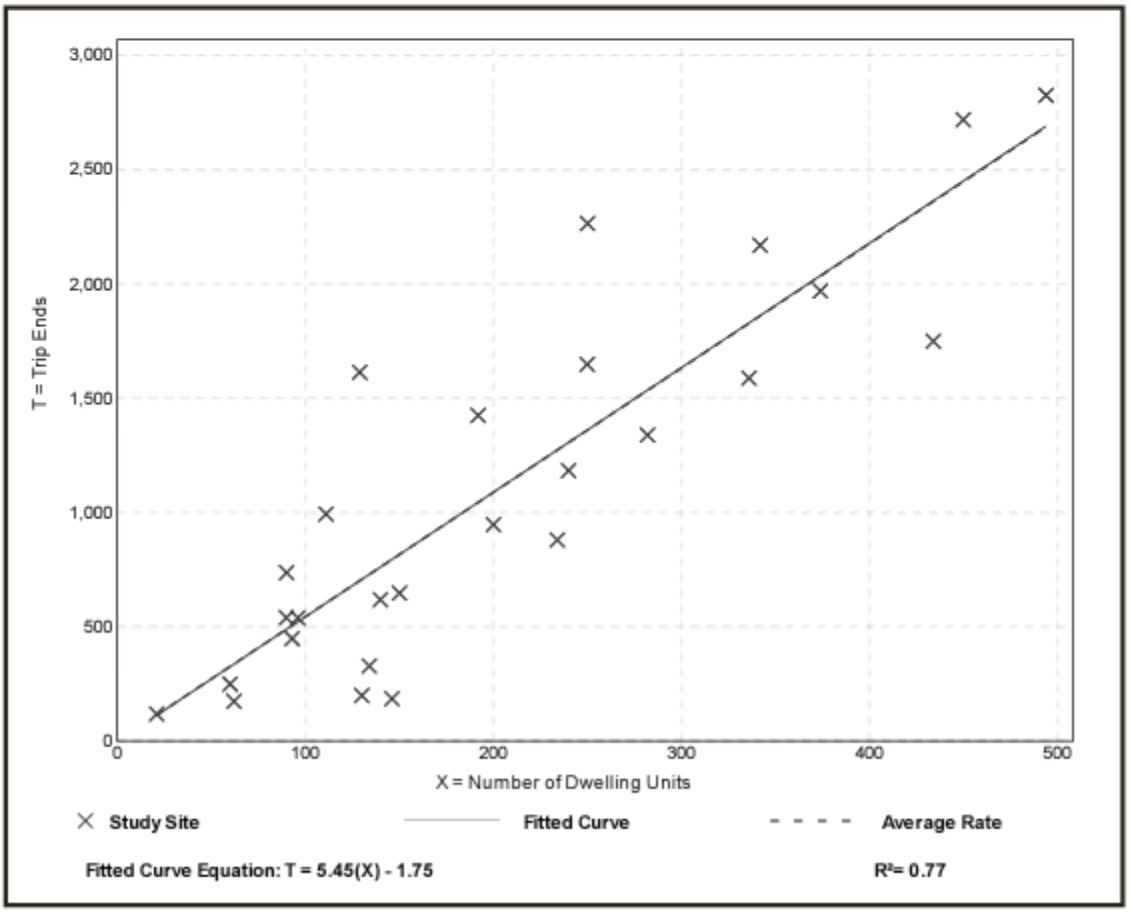
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 27
Avg. Num. of Dwelling Units: 205
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
5.44	1.27 - 12.50	2.03

Data Plot and Equation



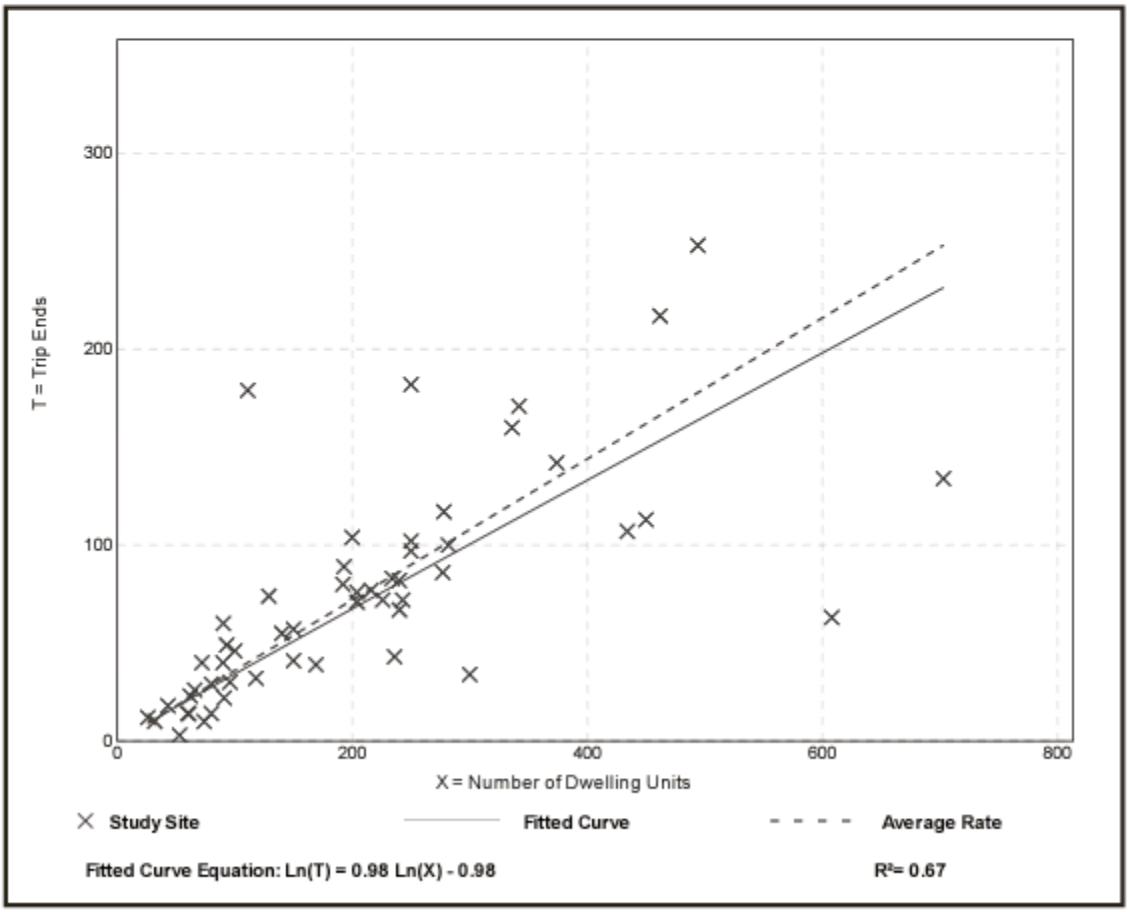
Multifamily Housing (Mid-Rise)
(221)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 53
Avg. Num. of Dwelling Units: 207
Directional Distribution: 26% entering, 74% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.36	0.06 - 1.61	0.19

Data Plot and Equation



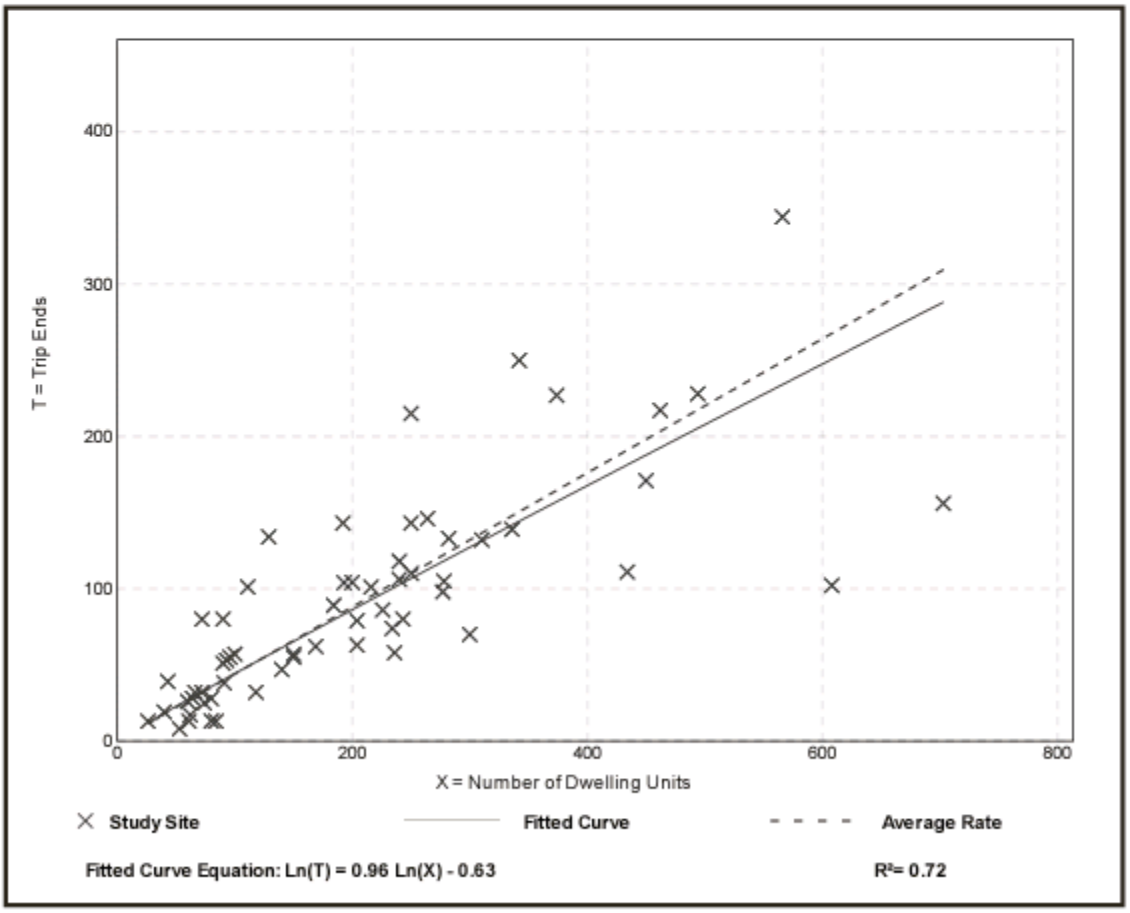
Multifamily Housing (Mid-Rise)
(221)

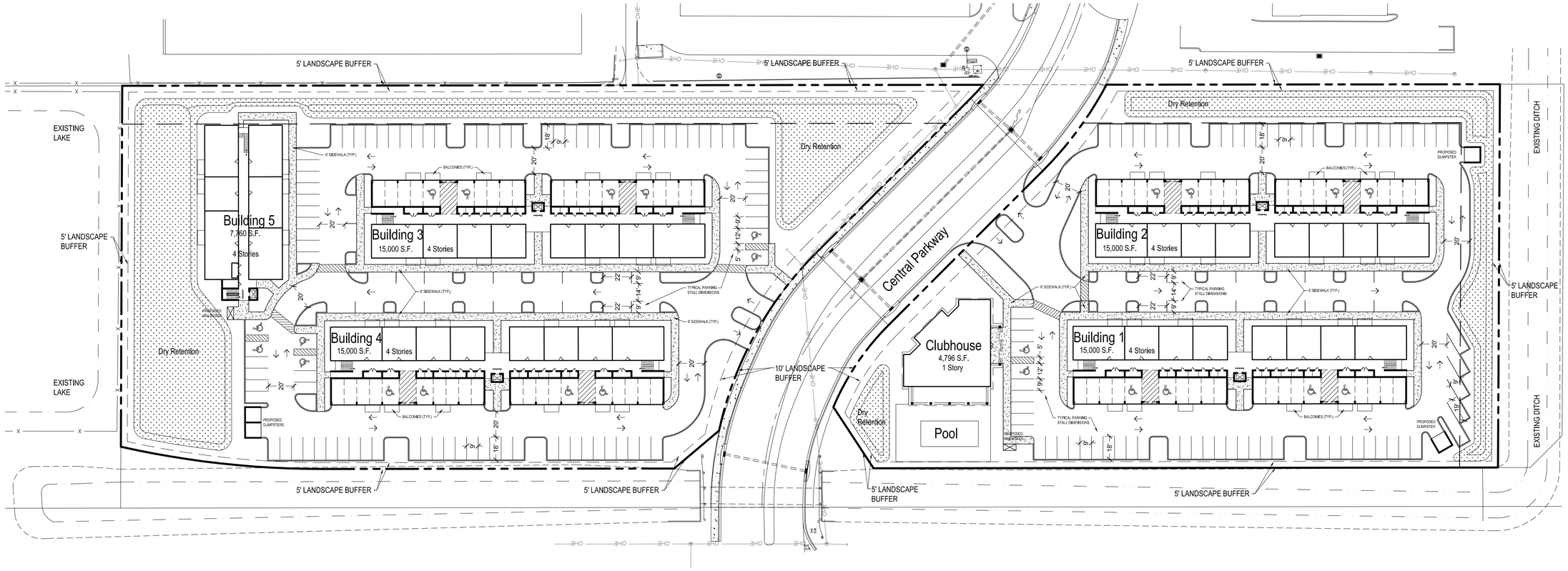
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 60
Avg. Num. of Dwelling Units: 208
Directional Distribution: 61% entering, 39% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.44	0.15 - 1.11	0.19

Data Plot and Equation





Site Data

Parcel Size:	290,098.29 s.f.	6.65 Acres
North:	161,340.52 s.f.	3.70 Acres
South:	128,757.77 s.f.	2.95 Acres
Total Residential Units:		196
Density:		29.47 D.U. / Acre
Building Height:		45' Maximum (4 Stories)
Parcel Control Number:		093841000000005304
Existing Use:		Vacant
Proposed Use:		Multifamily Residential
Existing Zoning:		RPUD
Proposed Zoning:		RPUD
Future Land Use:		Office / Residential

Impervious:	188,757.56 s.f.	4.33 Acres	65%
Buildings: (Plan view outline)	72,556 s.f.	1.66 Acres	25%
Vehicular Use Area: (Excludes area inside building)	97,392.56 s.f.	2.24 Acres	33%
Sidewalks & Pool Deck:	17,909 s.f.	.41 Acres	6%
Pool:	900 s.f.	.02 Acres	1%
Pervious (Open Space):	101,340.73 s.f.	2.32 Acres	35%
Landscape Area:	60,161.84 s.f.	1.38 Acres	21%
Dry Retention Area:	41,178.89 s.f.	.94 Acres	14%

Open Space:	Required:	Provided:
	30% Minimum	35%

Parking Calculations:	Required:	Provided:
1 Space per 1 Bedroom Unit 44 Units x 1 = 44 Spaces	44	44
1.5 Spaces per 2 Bedroom Units 120 Units x 1.5 = 180 Spaces	180	180
1.5 Spaces per 3 Bedroom Units 32 Units x 1.5 = 48 Spaces	48	48
Guest / Clubhouse	0	10
Total:	272	282

Building Data:

Total Proposed Building Areas: (All Buildings All Floors Including Clubhouse)	275,836 s.f.
Total Proposed Residential Building Areas: (All Residential Buildings All Floors)	271,040 s.f.
Buildings #1 - 4 (Shown as each building)	
Total Proposed Building Areas: (All Floors)	60,000 s.f.
Ground Floor	15,000 s.f.
Second Floor	15,000 s.f.
Third Floor	15,000 s.f.
Fourth Floor	15,000 s.f.
Buildings #5	
Total Proposed Building Areas: (All Floors)	31,040 s.f.
Ground Floor	7,760 s.f.
Second Floor	7,760 s.f.
Third Floor	7,760 s.f.
Fourth Floor	7,760 s.f.
Clubhouse Building	
Total Proposed Building Areas:	4,796 s.f.
Building Area	3,711 s.f.
Entrance Area	245 s.f.
Outdoor Sitting Area	840 s.f.

Total Residential Units: (All Floors) 196

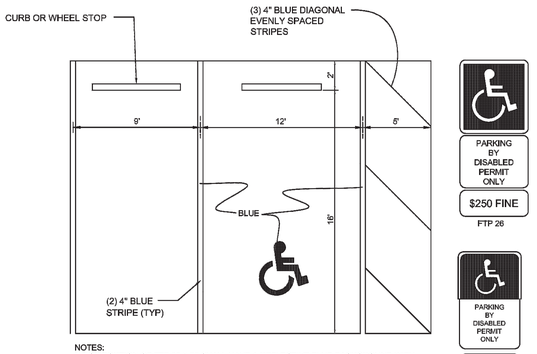
Building#	1 Bedroom	2 Bedrooms	3 Bedrooms
Building 1	10	26	7
Building 2	10	26	7
Building 3	10	26	7
Building 4	10	26	7
Building 5	4	16	4
Sub-total:	44	120	32

General Notes

1. This project shall be completed in one phase.
2. All prohibited exotic plant species shall be removed prior to the issuance of a Certificate of Occupancy.
3. All required landscaping shall be installed prior to the issuance of a Certificate of Occupancy. Refer to the Landscape Plans for landscape details and specifications.
4. Refer to Construction Drawings for location of traffic control devices.
5. The applicant will request in writing, prior to any land clearing, that a field inspection be performed to determine if barricades have been properly installed on the site.
6. All signs will be reviewed for compliance with the applicable regulations at the time the sign permit is issued.
7. During construction activities, existing native vegetation shall be retained to act as buffers between adjacent land uses, and to minimize nuisance dust and noise. Barricades shall be used on site to preserve the vegetation to be retained.
8. All building, parking and access areas shall document compliance with the requirements of the American Disabilities Act prior to the issuance of a building permit.
9. The property owner shall be required to provide adequate easements to ensure non-exclusive access to duly licensed cable television services to persons residing in this development. The easement shall specifically provide for the use by the franchised cable television system.
10. The parking areas shown hereon are private and will be owned and maintained by the homeowners association.
11. Finished Floor Elevations 'FFE' are NAVD 88.
12. Water and sewer service shall be provided by City of Stuart Utilities.
13. Photometric site lighting plans shall be provided to the City of Stuart for review and approval prior to site development permit approval.

Standard & Handicap Parking Space Detail

Not To Scale



NOTES:
1. TOP PORTION OF FTP 25 & 26 SHALL HAVE A REFLECTIVE BLUE BACKGROUND WITH WHITE REFLECTIVE SYMBOL AND BORDER.
2. BOTTOM PORTION SHALL HAVE A REFLECTIVE WHITE BACKGROUND WITH BLACK OPAQUE LEGEND AND BORDER.
3. FTP 25 & 26 MAY BE FABRICATED ON ONE PANEL OR TWO.
4. FTP 25 IS FOR USE IN AREAS WHERE SPACE IS LIMITED.

Preliminary Site Plan

North
Scale: 1" = 40'
0 20' 40' 80'

Conceptual Design Group, Inc.
Landscape Architecture - Site Planning
900 East Ocean Boulevard, Suite 130d
Stuart, Florida 34994
(772) 344-2340
LC: 26000198

Central Parkway

City of Stuart, Florida

Job No. 19-1002
Drawn By JWS
Submittal Dates 5-21-2020

Revision Dates

These drawings are the property of the landscape architect and are not to be used for other projects except by written permission from the landscape architect. Report any discrepancies immediately to the landscape architect.

Sheet 1 of 1