wondermere
garden preschool

1841 Windermere Rd. • Requesting Special Exception

Public Hearing D.10 Exhibit 1 - Scott Baker

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gather and grow

We are a green preschool. We foster a love of learning through our play based, developmentally appropriate and experiential approach. We develop the whole child offering a nurturing, healthy, safe and supportive environment, that is both engaging and challenging. In our organic garden children will learn the importance of environmental awareness and sustainability and can draw upon our natural surroundings to bring mindfulness and kindness to the classroom and surrounding community.

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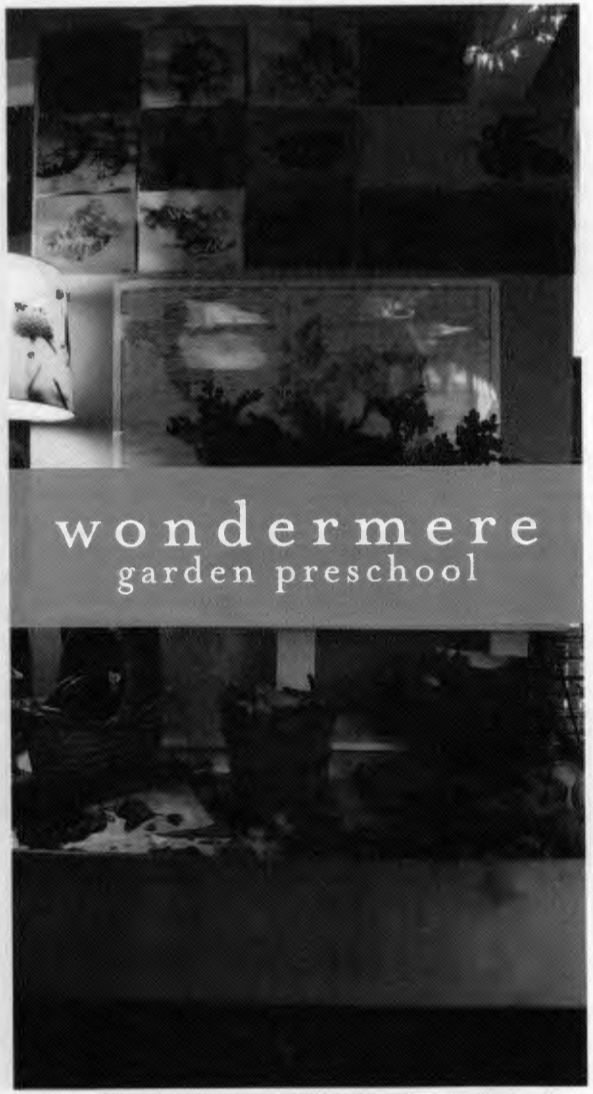
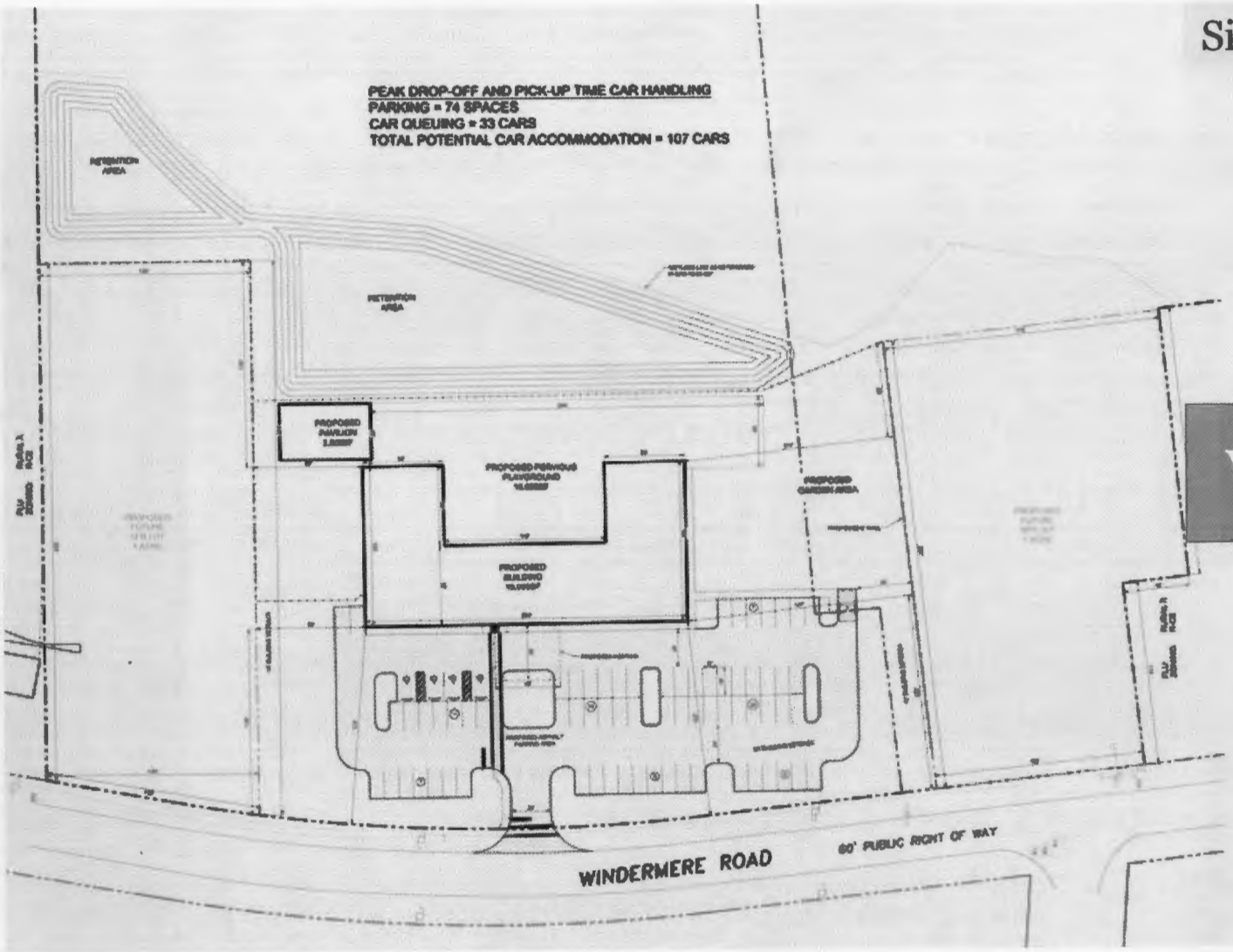
Farmhouse - Rural Country Estate Design

Site Plan Details

- 22.6 Acre Parcel
- Preschool is only building on **3 Acres**
- 1 acre on either side not included in special exception, will stay RCE
- 100% Wetlands Preserve (16+ Acres) to stay protected
- Portico for Drop-off/Pick up
- 74 parking spaces
- Setback is 150 feet from the street.
- In 2015, the site was given a special exception to build a 21,000 sqft 300 capacity church with 75 parking spaces on 22 Acre parcel.



Site Plan



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Aerial View with Site Plan, Wetlands and Willows Subdivision

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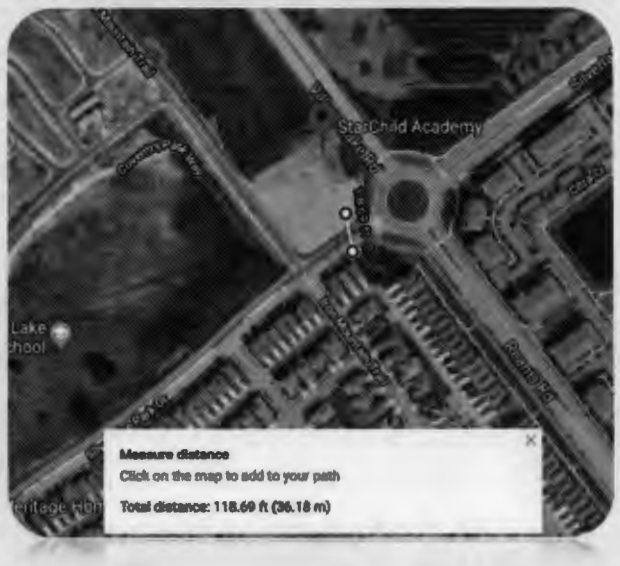
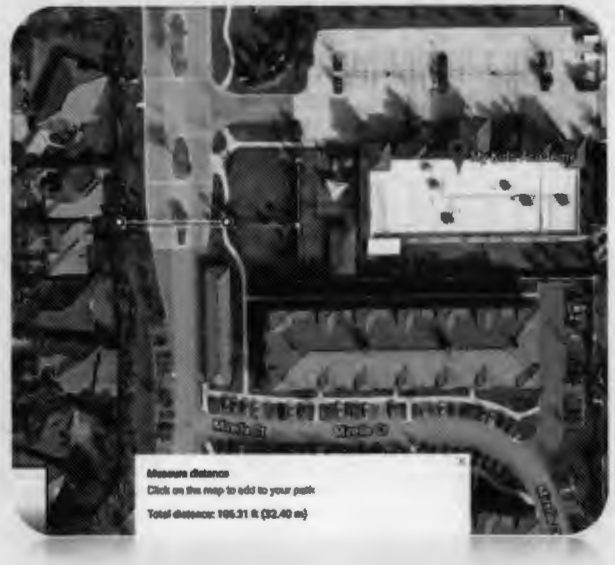
Area Schools Proximity to Nearby Homes – Less than 120 Feet

La Petite Academy
24'



Star Child Academy
118'



My Kids Academy
106'

Proximity to Elementary Schools

- Preschool will serve as a feeder to the local public and private elementary schools
- Windermere Elementary is 1.8 miles from the preschool site
- Lake Whitney Elementary is 0.6 of a mile from the preschool site and located on Windermere Rd.

Lake Whitney Elementary
544 students

Wondermere Garden Preschool
200 students

Windermere Elementary
754 students

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Special Exception Criteria Met

- **On February 7, 2019 the BZA Voted YES 6-1 that Wondermere Garden Preschool meets all criteria**

- Section 38-78, Orange County Code stipulates specific criteria to be met for all Special Exception requests.
  No application for a Special Exception can be approved unless the BZA finds that the following criteria are met:

1. The use shall be consistent with the Comprehensive Policy Plan.

- The Future Land Use of the parcels are Rural Settlement along Windermere Rd. and Rural in the rear portion. Approval of the special exception will render the use consistent with the Comprehensive Plan.

2. The use shall be similar and compatible with the surrounding area and shall be consistent with the pattern of surrounding development.

- The proposed use as preschool is a neighborhood commercial use and shall serve the residents in the area. There is an elementary school located less than 1/2 mile to the north along Windermere Rd. and another one located less than 1 mile to the southwest.

3. The use shall not act as a detrimental intrusion into a surrounding area.

- The proposed site plan will preserve 1 acre on each side of the development for future residential development, which will provide a transition from the existing residential development. Also, the operating hours of the preschool are proposed to be Monday through Friday, 8:00AM - 6:00 PM. In addition, the playground will be situated in the rear of the building facing the wetland area, which will buffer it from the existing homes nearby.

4. The use shall meet the performance standards of the district in which the use is permitted.

- The proposed site plan is meeting setback, open space, parking and height requirements as required per code.

5. The use shall be similar in noise, vibration, dust, odor, glare, heat producing and other characteristics that are associated with the majority of uses currently permitted in the zoning district.

- The proposed use will include a majority of indoor uses and activities which shall not produce any uncharacteristic dust, glare, odor, noise or heat in the immediate area. The outdoor uses will be limited to the playground behind the structure and there will be a condition of approval limiting any outdoor special events in other areas.

6. Landscape buffer yards shall be in accordance with section 24-5 of the Orange County Code. Buffer yard types shall track the district in which the use is permitted.

- The landscape plan provided overall meets the requirements of Chapter 24-5. The applicant will need to add building perimeter landscaping and shrubs along the north and south property lines (per condition of approval).

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Special Exception Criteria

- Statement from BZA Board Representative Wesley A. Hodge, District 5
- *"Is this use allowed as a zoning exception for this piece of property? Yes it is. You have 2 people that are respected in the community, Mr. Irwin and Mr. Coudriet, both who know the area and respect the area and I think have made extremely diligent efforts to make something that fits into the profile of what Windermere has and the reputation of Windermere....You see an extreme willingness to protect the Wetlands. In fact, there isn't even going to be an encroachment on the Wetlands. So when we're looking at an applicant that went above and beyond to accommodate you know what is expected from a property owner to meet the criteria I think we have that in this case and I applaud you all for this."*

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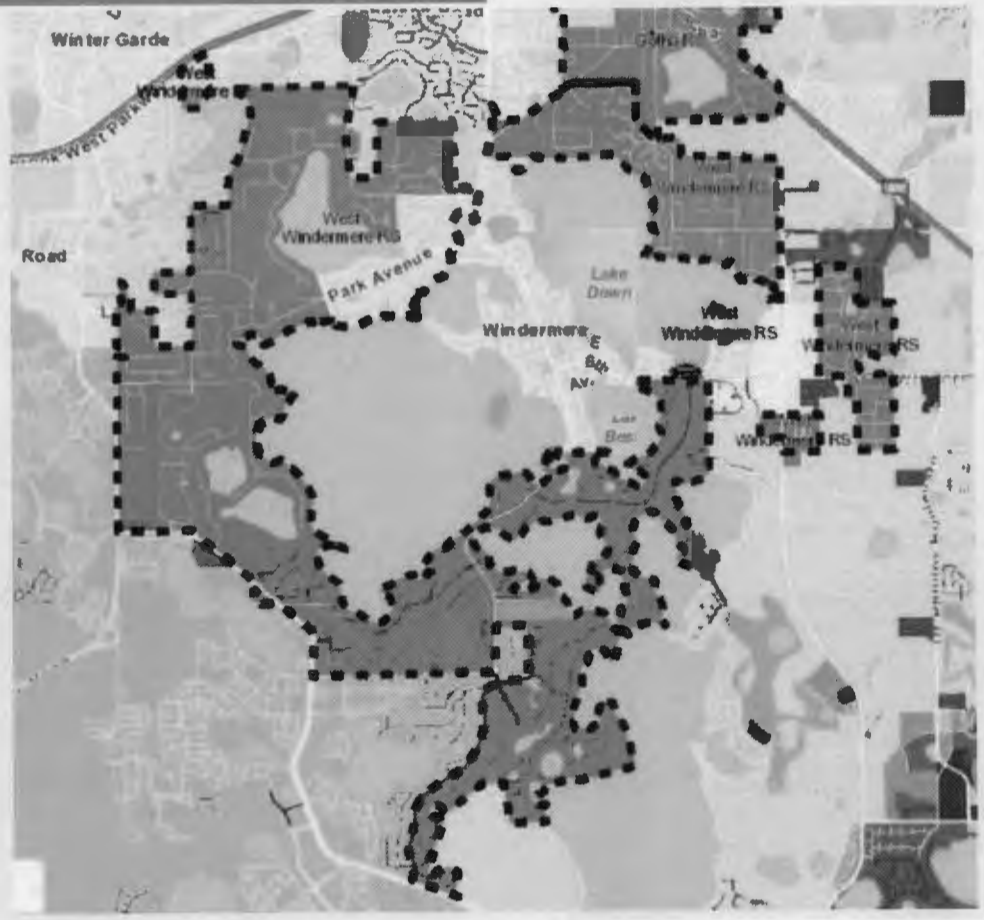
West Windermere Rural Settlement

- Population nearly 9,000*
- Largest Rural Settlement Acreage 5,835*
- No private preschool serves this rural settlement. Driving outside of the rural settlement to find goods and services creates significant leakage and is an inconvenience and burden on families.



Source : Orlando Sentinel 2013, 2012 BCC Orange County presentation

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FLU Policy Allows Neighborhood Commercial Use

FLU6.2.9	Neighborhood commercial and office uses shall be allowed in Rural Settlements in areas designated for such on the Future Land Use Map. Only those commercial and office uses that will support existing residential uses, i.e., neighborhood commercial, shall be permitted in Rural Settlements. The scale and intensity of commercial and office uses must be compatible with the development pattern of the existing Rural Settlement. Corner stores, professional services that utilize existing structures, small scale personal services permitted within agricultural zoning are the type of non-residential uses consistent with Rural Settlements. Limited C-1 zoning uses and FARs up to 0.15 shall be considered suitable for Rural Settlements that have maintained their historic character. (Added 12/00,
FLU6.2.10	Neighborhood commercial uses in Rural Settlements shall be developed according to the following criteria: A. These uses shall be located to serve the residents of the rural area and not primarily to attract "pass-by" trips; and, B. These uses shall contain retail and personal services intended to serve the immediate population. (Added 12/00, Ord. 00-25, Policy 2.1.14)

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Serving the Immediate Population

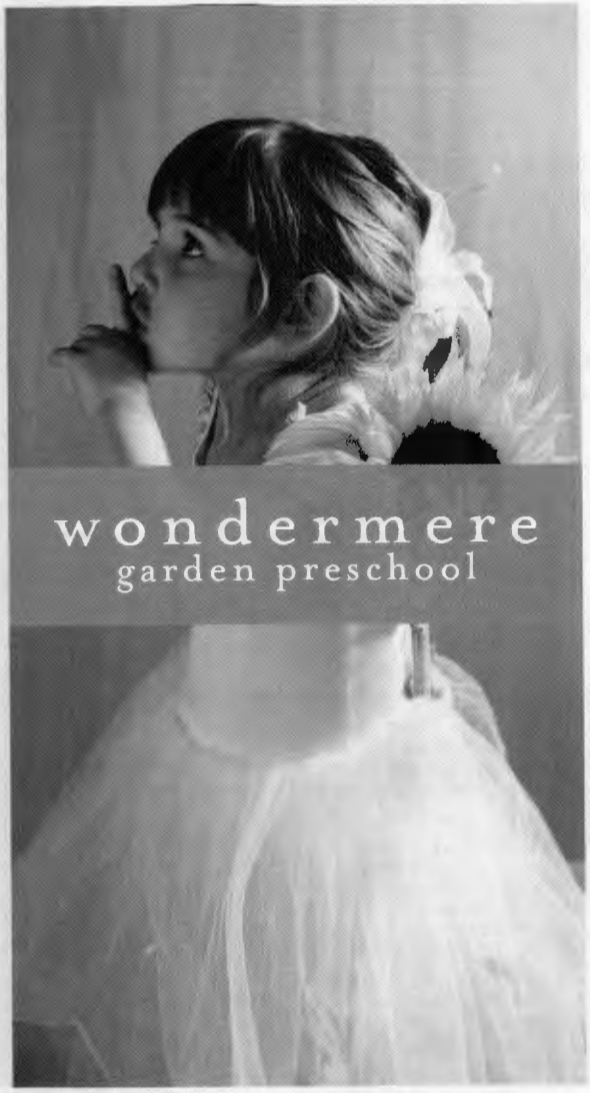
- The proposed use is exactly the type of locally-oriented, low impact non-residential use contemplated for rural settlements.
- This neighborhood commercial private preschool will serve the immediate population of West Windermere RS
- Parents of young children prefer to keep their children close to home during the day not only to minimize travel times but also to participate in their local community in a meaningful way.
- Other Examples: Tangerine Schoolhouse is a commercial for profit private preschool serving the residents of the Tangerine RS and Premier Academy is a commercial for profit private preschool serving the residents of Gotha RS. These preschools are assets to the rural settlements in which they reside.


Orange County
Public
Navigation
Identification
Search
Selection
Reports
Markup
Tasks
Tool Labels
Premier Academy
A Private School for the Very Young
Premier Academy
Property Name
PREMIER ACADEMY
Owner City
Layers
Parcel - 2822333100...
Base Map
0
0.2
0.4km
Institutional
R-CE
R-1A
R-1
A-1
R-L-D
Low Density Residential


Orange County
Public
Markup
Tasks
Tool Labels
I want to...
TANGERINE
SCHOOLHOUSE
Tangerine Schoolhouse
R-CE
A-1
R-1A
R-1AA
R-2
R-CE-2
P-D
See Restrictions
Low Density Residential
Rural
Office
Water Body

Sound Mitigation

- Building Design – Courtyard Plan
- Classrooms rotate on playground, not all children are on playground at one time
- Landscaping and Fencing system
- Building entrance is approx 150 ft setback from the road
- 16+ wetlands acreage protection between preschool and closest neighborhood behind property
- **Professional noise study confirms no issue**



RML Acoustics – Noise Study

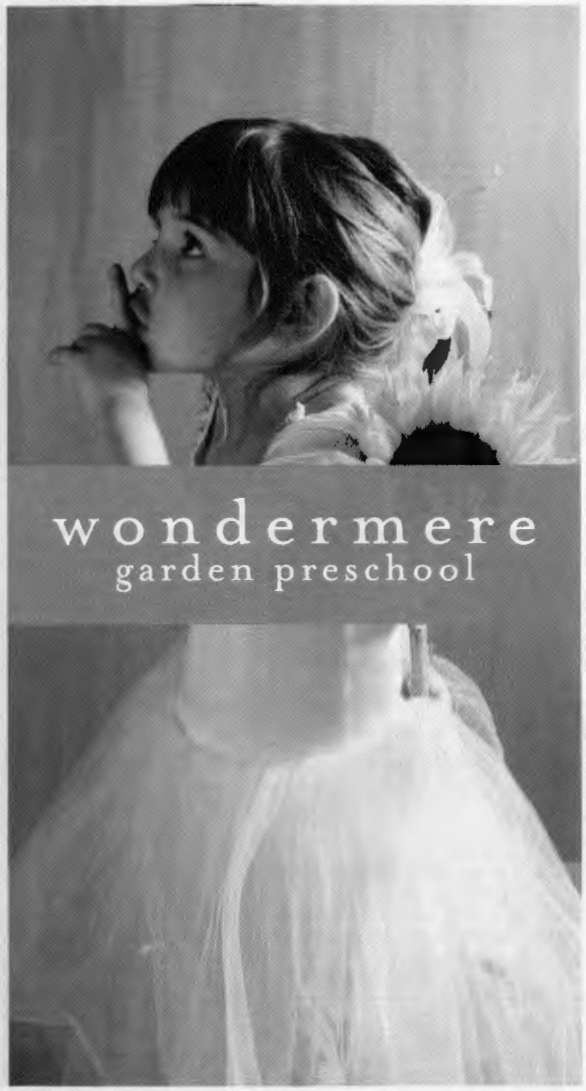
Engaged professional consultant RML Acoustics to study noise impacts.

CONCLUSIONS AND RECOMMENDATIONS

1. Average sound levels from children playing on the proposed playground will be 30 dB or more **below** the Windermere Noise Control Ordinance's sound level limit of 60 dBA.

2. It is very unlikely that even the loudest sounds made by children playing on a playground at the proposed Wondermere Garden Preschool will be heard during the quietest time of the day at the residences in The Willows, as calculated sound levels in the critical frequencies at which the children generate their loudest sounds were approximately 10 dB below the quietest ambient sound levels at The Willows residences. Regardless, the possibility of very faint sounds of children playing in the distance occasionally being heard would not be out of character with the typical sounds heard in a residential community.

3. During the time ambient sound levels were measured at the residences in The Willows, sounds from highway traffic, lawn maintenance, UPS and Fed Ex trucks, pressure washing, sprinklers, planes passing overhead, birds chirping and wind in the trees were all a minimum of 10 dB greater (i.e., twice as loud), with some sources as much as 35 dB greater (i.e., five to seven 7 times louder) than any sounds from children playing on the proposed preschool playground would be at The Willows residences.

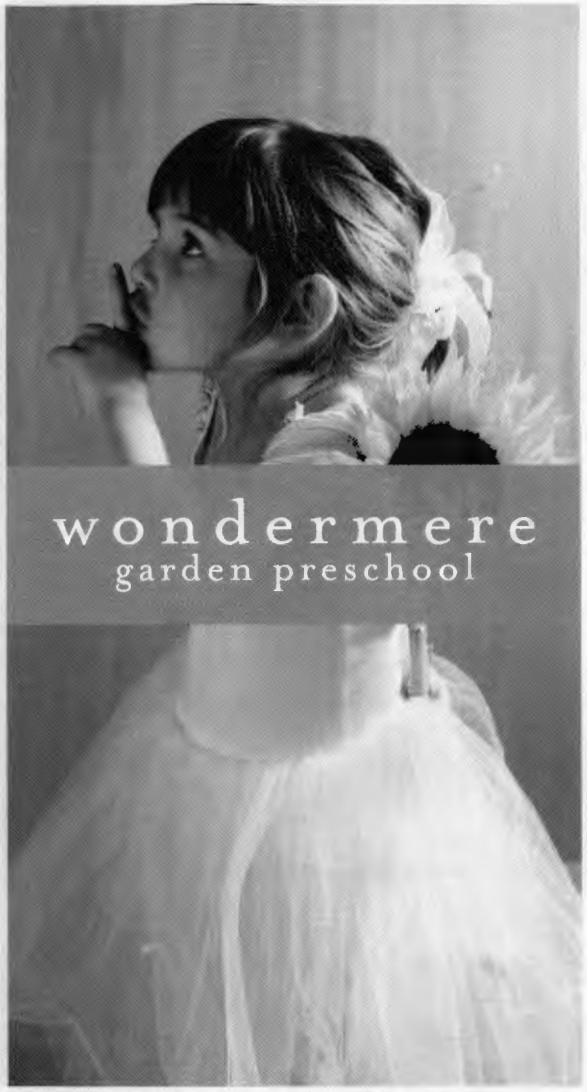


Noise Study Conclusions and Recommendations Continued

4. The results of the study are based on a very conservative approach to determining the audibility of sound from the children. There is a solid, 8 foot high fence that will be constructed around the playground that was not included in the analysis and the study looked at the loudest sounds from children occurring instantaneously and compared that sound to the very quietest sound level occurring at the residences, assuming those events happen simultaneously.

5. It is our understanding that there may be occasional (three or four times a year) preschool functions that would result in a larger number of students gathering outside at one time, along with their parents. Even with the full 200 students outside, the combined sound level would only increase by 7 to 10 dB compared to 40 students being present, which will still be more than 20 dB below the Windermere Noise Control Ordinance sound level limit of 60 dBA.

UNAMPLIFIED HUMAN VOICES ARE ALSO EXEMPT FROM THE NOISE ORDINANCE



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Traffic Study

- 15,000 SF / 200-Student Preschool
- Full access on Windermere Road (2 lane roadway)
- School will generate approx. 500 new trips per day
- School traffic mostly distributed as follows:
  - Early drop-off 8am
  - Regular drop-off from 9am
  - Half-day pick up at 12:00 pm
  - Full day pick up from 2:30 pm to 6:00 pm

- *Note: In 2015, the site was given a special exception to build a **21,000 SF** with **300-seat church** with **75 parking spaces***

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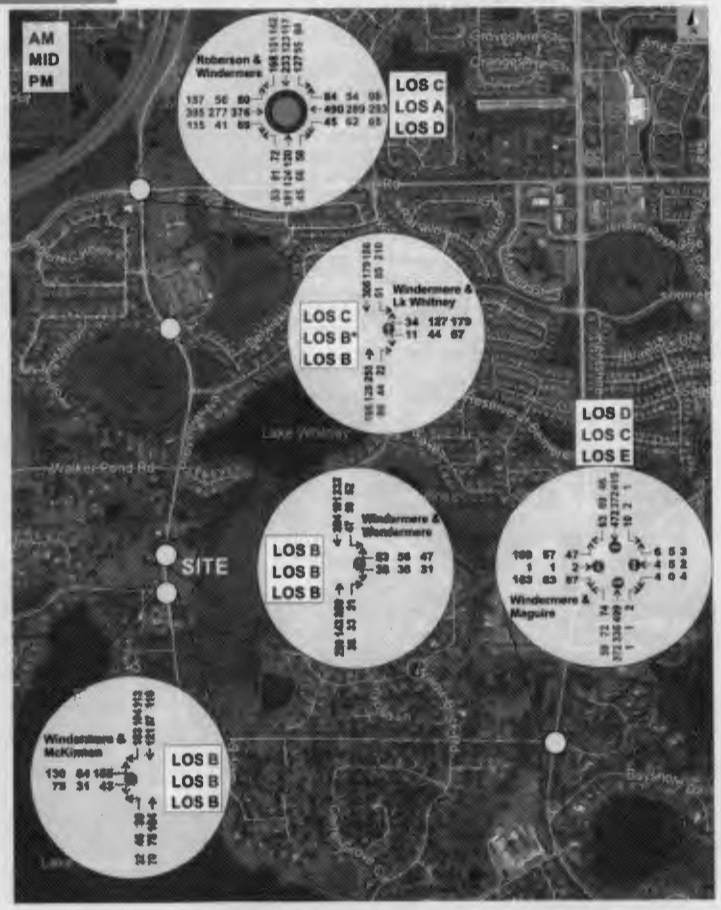
Traffic Study

- Extensive traffic analysis conducted on Windermere Road
- Collected current peak traffic data during morning, mid-day, & afternoon
- All intersections operate <u>adequately</u>
- Windermere Road operates at <u>35%</u> of its peak capacity
- Localized congestion at Lake Whitney Elementary driveway for 20-minute pick-up period



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Site Circulation

- 74 parking spaces on-site
- On-site queue capacity of 33 vehicles
- Staggered arrivals and pick-ups reduce one time rush
- Approx. 30% of students have siblings at the school
- A peak of 75-80 cars per hour during drop-off & pick up
- No projected back up of traffic onto Windermere Rd

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Wondermere Parking / Queuing Capacity

First Baptist	130 children	40 parking spaces	
Wondermere	**200 children**	**74 parking spaces**	**33 vehicle queue capacity**
Primrose Ocoee	240 children	42 parking spaces	
Ladybird Academy	250 children	33 parking spaces	15 vehicle queue capacity
Windermere Union	250 children	38 parking spaces	
Cranium Academy	350 children	28 parking spaces	
Star Child Academy	370 children	55 parking spaces	

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Thank you for your consideration.

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Additional Slides

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Property Values

- As BZA board representative for District 1, Carolyn Cappleman Karraker stated during the BZA hearing *"Private schools do bring good things to neighborhoods. Look at Windermere Prep, the amount of houses that have been built around that since it was built. The homes that were built around it have certainly not lost value."*
- National Association of Realtors survey found that a home's proximity to a school plays big part in buying decision.
- Survey says buyers pay between 6-10% MORE for a home near a school
- 1 out of 10 people stated they would pay up to 20% MORE for a home in a good school area.
- Another survey showed 91% respondents included school boundaries in decision making process for choosing a home.

TMC
Traffic & Mobility Consultants

MEMORANDUM

April 2, 2019

Re: Wondermere Academy
Traffic Assessment
Orange County, Florida
Project № 19017

This traffic assessment was conducted to determine the traffic operations conditions in the vicinity of the proposed Wondermere Academy. The project site is located on Windermere Road north of McKinnon Road, as illustrated in **Figure 1**.

Figure 1 – Site Location

The proposed development is a 15,000 square foot preschool with an enrollment of 200 students. The site is proposed to be served by one full access point on Windermere Road. **Figure 2** illustrates the preliminary site plan.

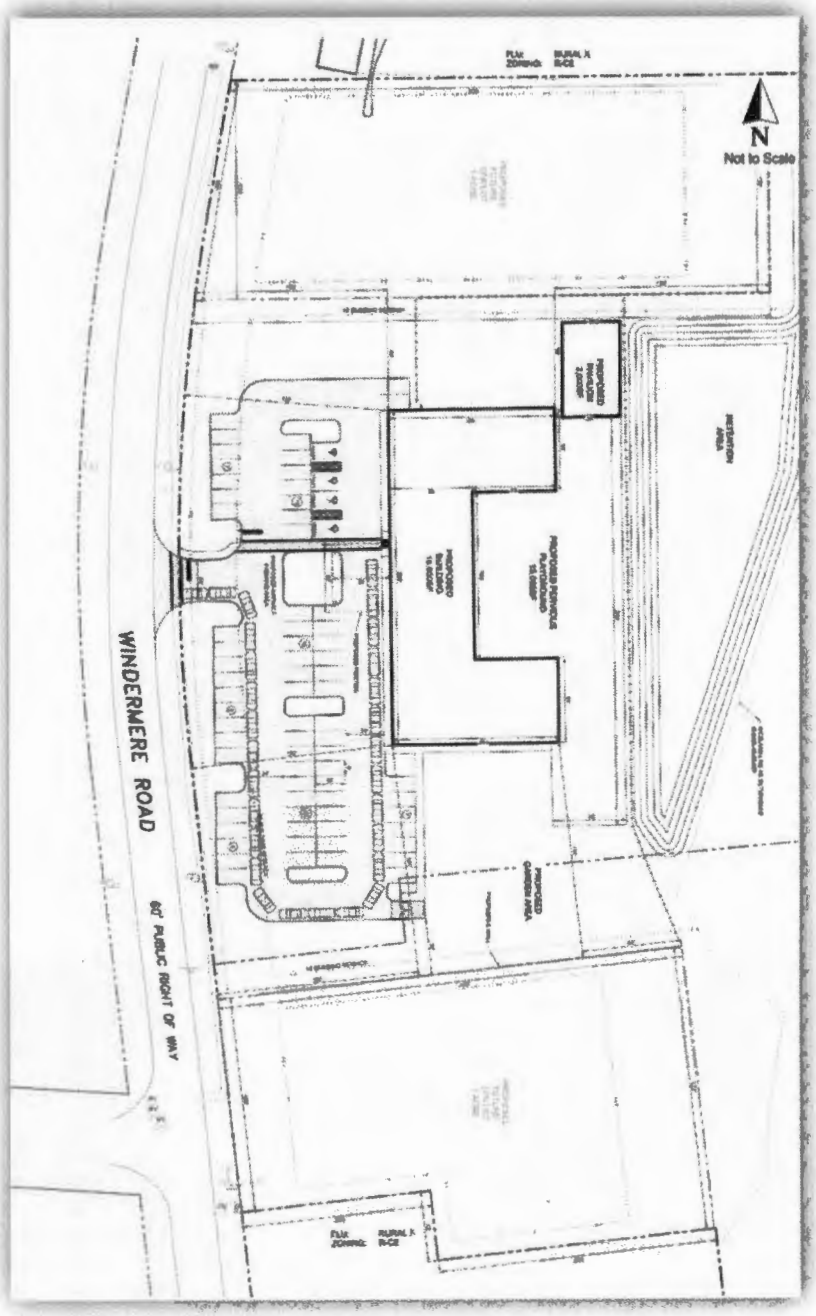


Figure 2 – Preliminary Site Plan

A trip generation analysis was prepared using information form the Institute of Transportation Engineers (ITE) *Trip Generation Report, 10th Edition.* Table 1 summarizes the results of the analysis for the 15,000 square foot preschool.

Table 1
Trip Generation Analysis

Analysis Period	Generation Rate	Total Trips	Directional Trips Enter	Exit
Daily	47.62 Trips/KSF	714	357	357
AM Peak	11.00 Trips/KSF	165	87	78
Mid Peak	11.82 Trips/KSF	177	83	94
PM Peak	11.12 Trips/KSF	167	78	89

Trip Generation analysis based on ITE Trip Generation Manual, 10th Edition

It should be noted that, given the nature of the proposed development, it is likely that some of these trips will be chained with trips to the nearby Lake Whitney Elementary School and/or work trips already existing on the roadway network. Based on information from Orange County's *Transportation Impact Fee Study* more than 25% of the trips will be existing trips on the network.

Therefore, the development is anticipated to generate approximately 520 new trips per day to the roadway network. These trips will be mainly drawn from area neighborhoods and businesses resulting in an estimated trip distribution of:

- To/From North 60%
- To/From South 40%

This distribution was used to allocate trips at the driveway and on the roadway network.

In order to assess traffic conditions in the area, traffic volume counts were collected at four existing intersections on Windermere Road. The data collection was conducted for a period of 8 hours at each of the locations listed below:

1. Windermere Road and Roberson Road
2. Windermere Road and Lake Whitney ES
3. Windermere Road and McKinnon Road
4. Windermere Road and Maguire Road

The data collection was performed using video traffic data recorders in order to observe operations and obtain vehicle turning movements at each location. The resulting traffic volumes counts are attached herewith.

In addition to the intersections above, traffic volumes were projected at the proposed Wondermere Academy driveway on Windermere Road. Using these volumes, intersection operations were evaluated using the methods of the *Highway Capacity Manual, 6th Edition* (HCM) and the Synchro analytical software. The AM, Mid-day, and PM peak hour traffic volumes and resulting Level of Service (LOS) at each intersection, are presented in **Figure 3**.

The analysis indicates that the intersections are all operating within an adequate LOS during the peak hours. It is noted that the four-way stop controlled intersection at Maguire Boulevard approaches capacity during the PM peak hour.

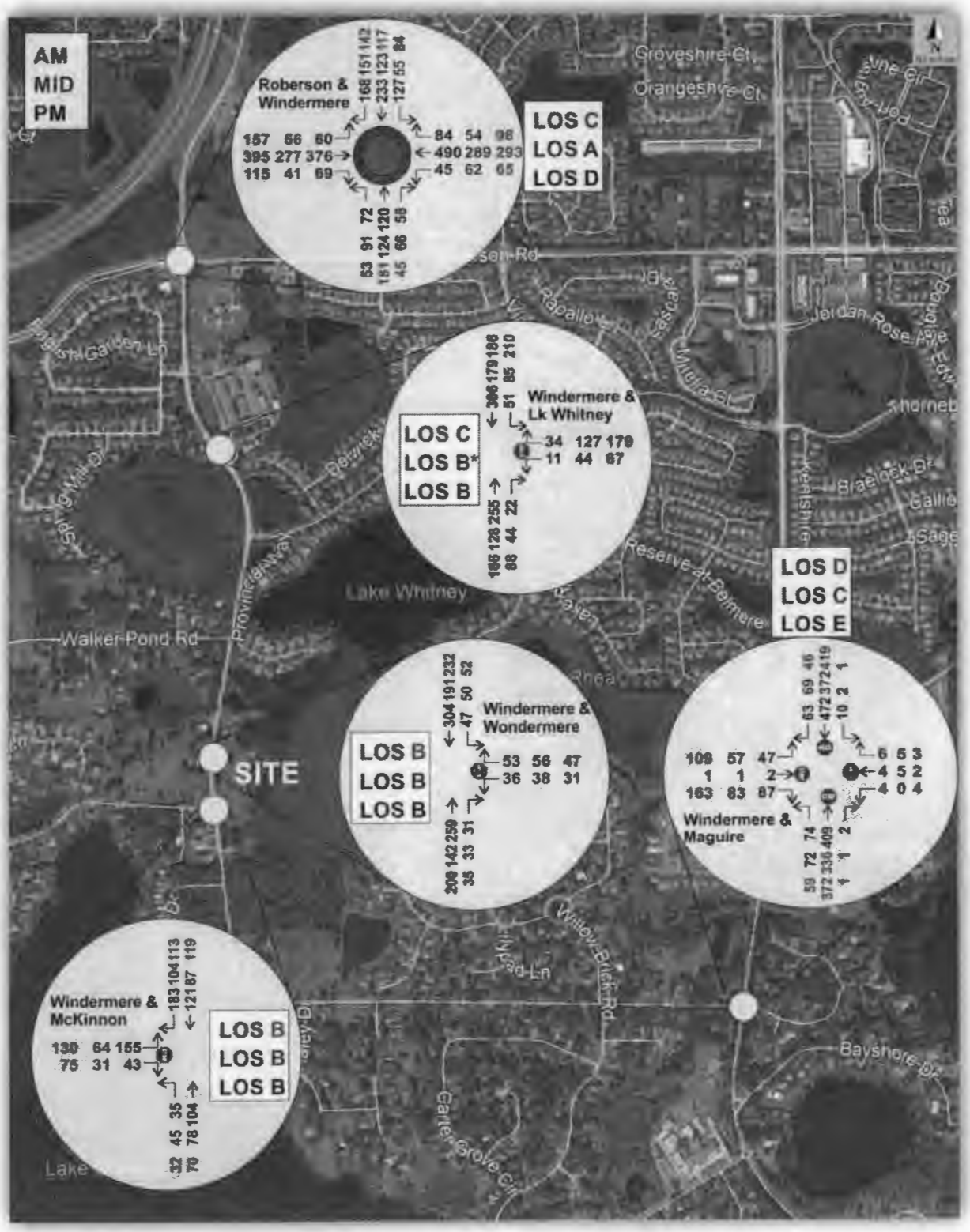


Figure 3 – Traffic Evaluation

ATTACHMENTS

Day Care Center
(565)

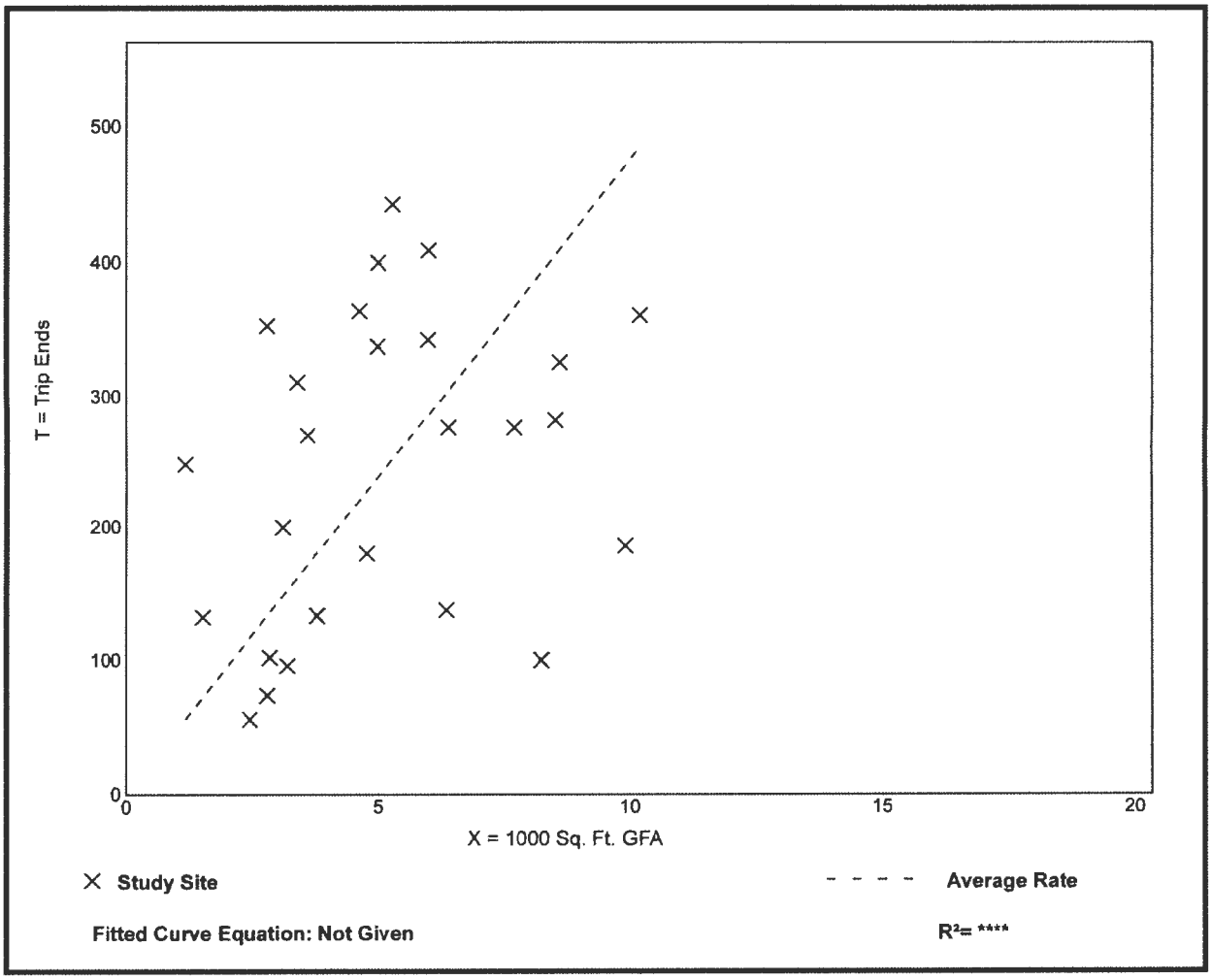
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 27
1000 Sq. Ft. GFA: 5
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
47.62	12.12 - 211.06	29.78

Data Plot and Equation



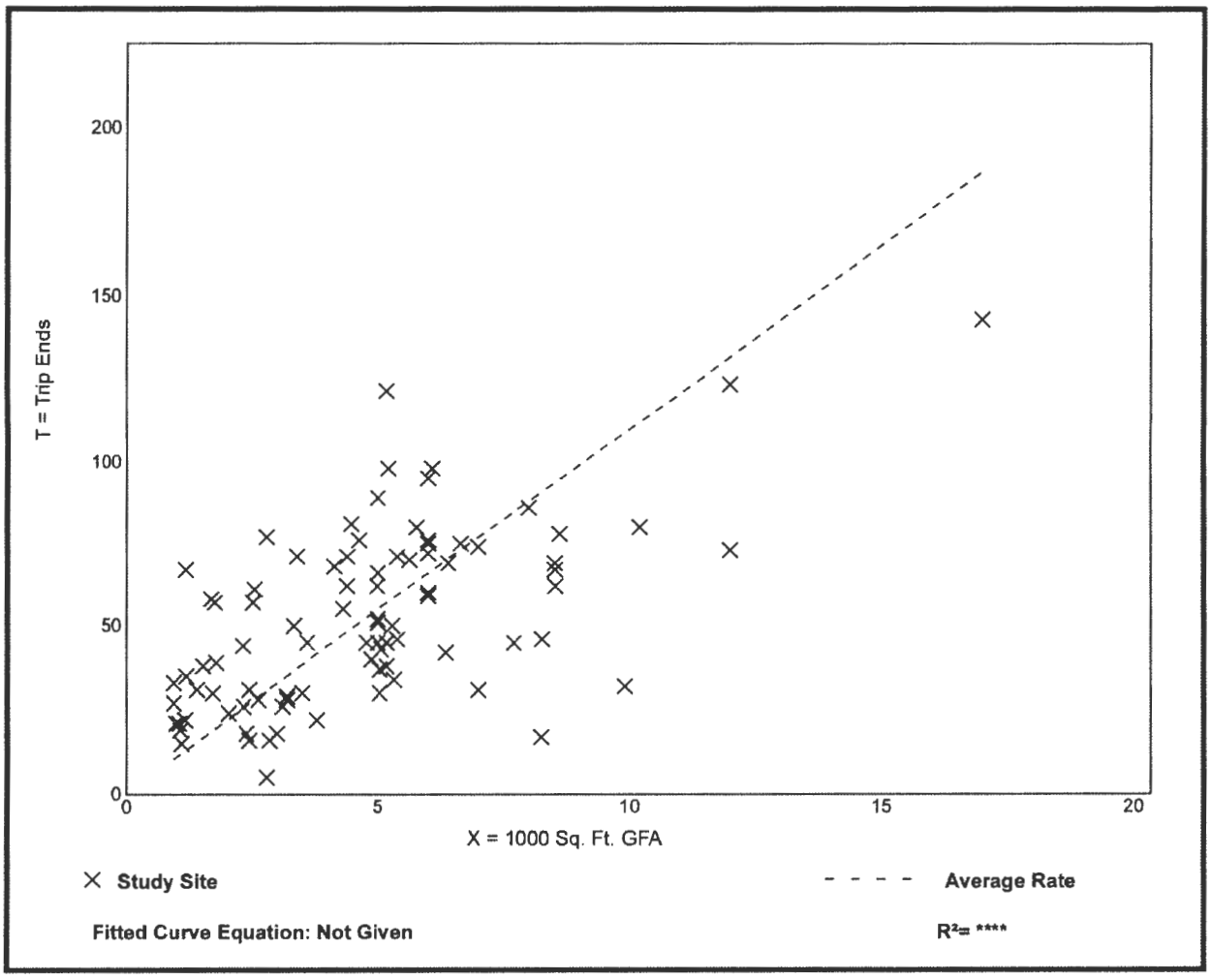
Day Care Center
(565)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
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: 89
1000 Sq. Ft. GFA: 5
Directional Distribution: 53% entering, 47% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
11.00	1.79 - 57.02	6.08

Data Plot and Equation



Day Care Center
(565)

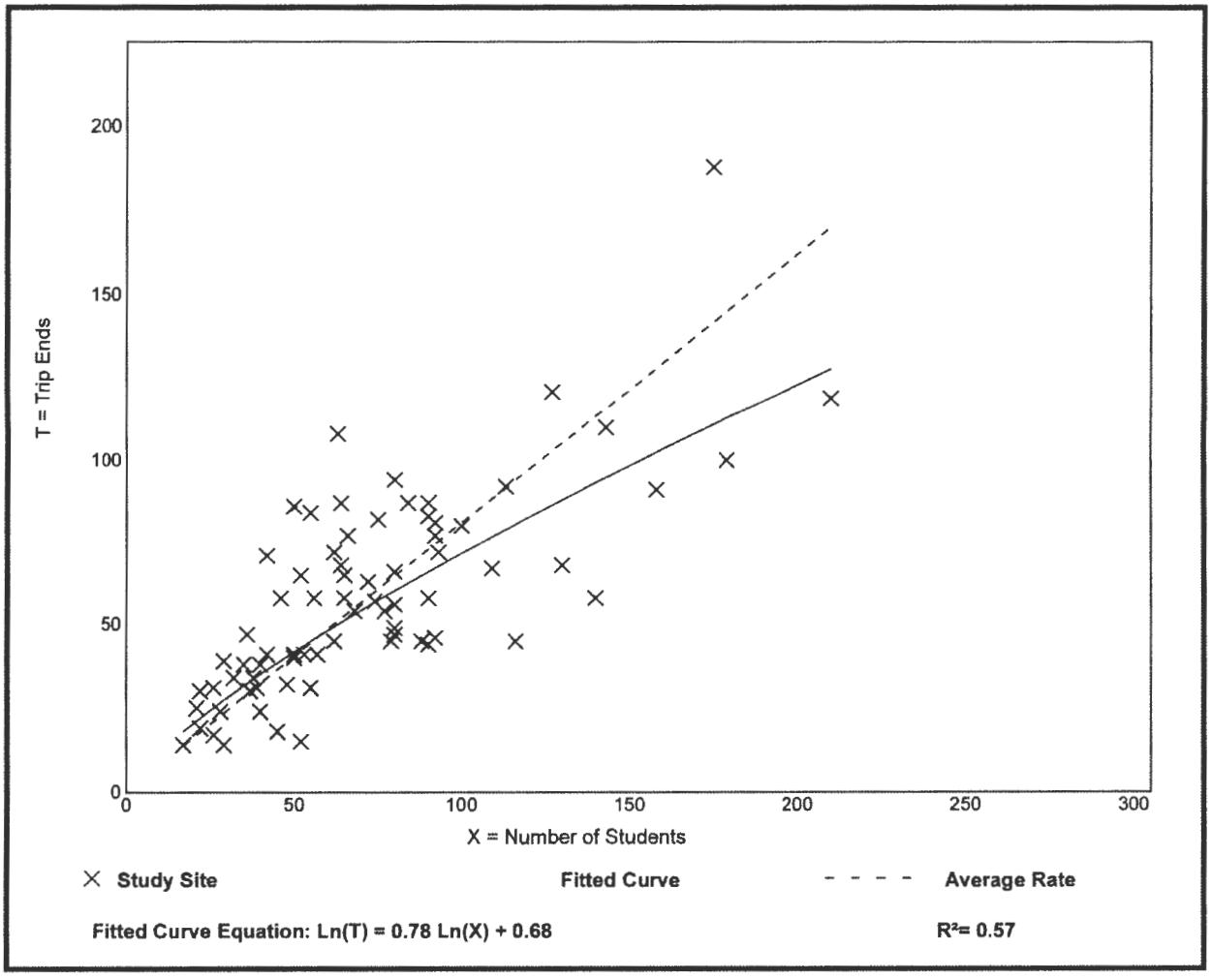
Vehicle Trip Ends vs: **Students**
On a: **Weekday,**
PM Peak Hour of Generator

Setting/Location: **General Urban/Suburban**
Number of Studies: 75
Avg. Num. of Students: 71
Directional Distribution: 47% entering, 53% exiting

Vehicle Trip Generation per Student

Average Rate	Range of Rates	Standard Deviation
0.81	0.29 - 1.72	0.30

Data Plot and Equation



Day Care Center
(565)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
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: 90
1000 Sq. Ft. GFA: 5
Directional Distribution: 47% entering, 53% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
11.12	1.56 - 40.85	6.28

Data Plot and Equation

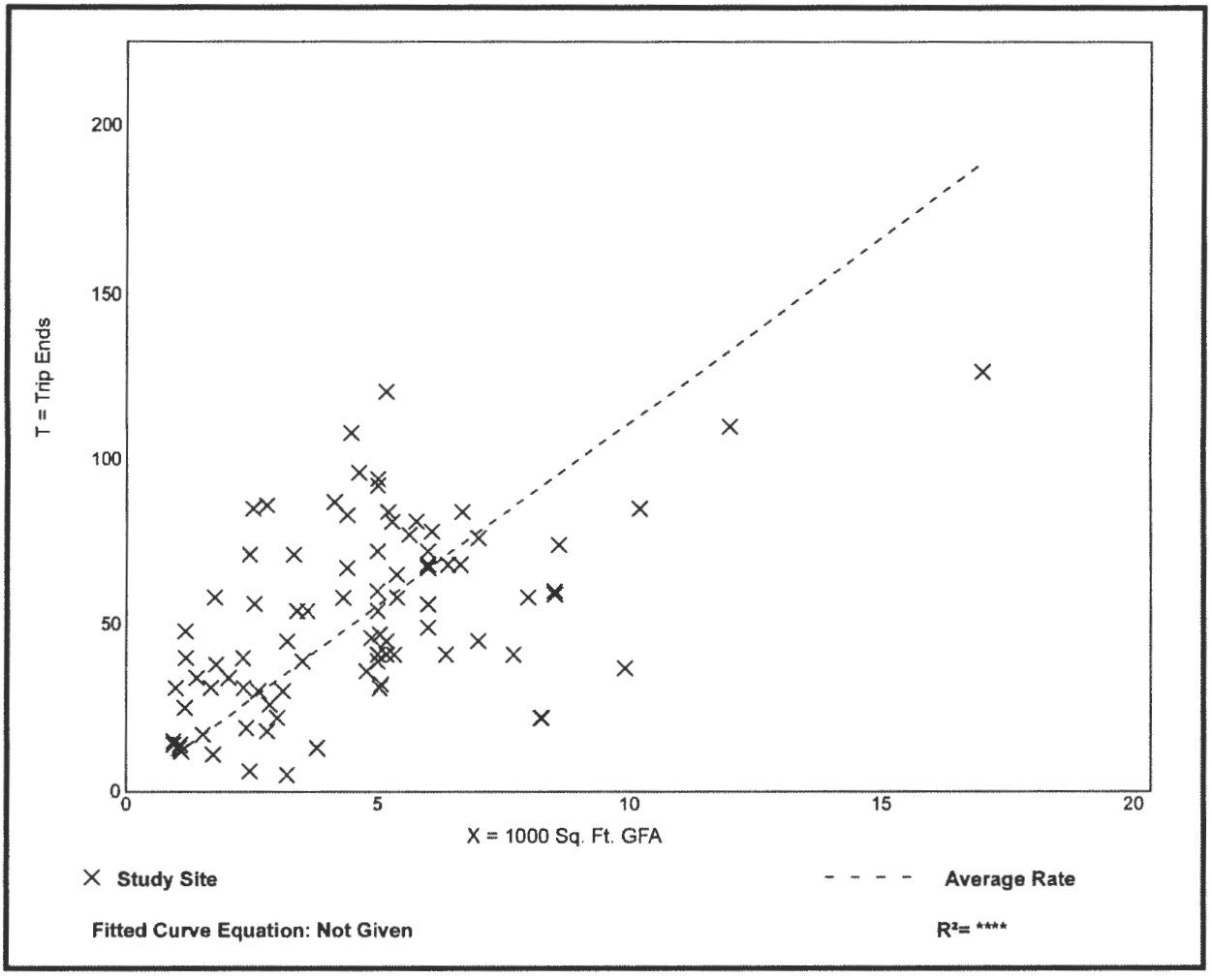


Table D-1
Calculated Transportation Impact Fee Schedule

Gasoline Tax							Unit Construction Cost:	$3,744,000						Interstate/Toll Facility Adjustment Factor:	28.8%		
$$ per gallon to capital:	$0.186		City Revenues:	$0.013			Capacity per lane mile:	9,506						Cost per VMC:	$393.86		
Facility life (years):	25		County Revenues:	$0.030			Fuel Efficiency:	18.19 mpg									
Interest rate:	5.0%		State Revenues:	$0.143			Effectivedays per year:	365									

ITE LUC	Land Use	Unit	Trip Rate	Trip Rate Source	Assessable Trip Length	Total Trip Length	Trip Length Source	% New Trips	% New Trips Source	Net VMT[1]	Total Impact Cost	Annual Gas Tax	Gas Tax Credit	Net Impact Fee	Curernt Adopted IF Rate	% Change
	RESIDENTIAL															
210	Single Family (Detached)	du	7.81	Florida Studies	7.94	8.44	FL Studies	100%	N/A	22.08	$8,695	$123	$1,734	$6,961	$2,869	143%
220	Multi-Family (Apartment)	du	6.60	Blend ITE 8th & FL Studies	6.12	6.62	FL Studies (LUC 220/230)	100%	N/A	14.38	$5,663	$82	$1,156	$4,507	$2,011	124%
230	Residential Condominium/Townhouse	du	5.76	Blend ITE 8th & FL Studies	6.12	6.62	FL Studies (LUC 220/230)	100%	N/A	12.55	$4,943	$71	$1,001	$3,942	n/a	n/a
232	High-Rise Residential Condo/Townhouse	du	4.18	ITE 8th Edition	6.12	6.62	Same as LUC 220	100%	N/A	9.11	$3,587	$52	$733	$2,854	n/a	n/a
240	Mobile Home Park	du	4.17	Florida Studies	5.52	6.02	FL Studies	100%	N/A	8.19	$3,227	$47	$662	$2,565	$1,497	71%
251	Retirement Community/Age-Restricted	du	3.13	Blend ITE 8th & FL Studies	6.50	7.00	FL Studies	100%	N/A	7.24	$2,853	$41	$578	$2,275	$646	252%
n/a	Student Housing	du	2.82	University of Minnesota Study	6.12	6.62	Same as LUC 220	100%	N/A	6.14	$2,420	$35	$493	$1,927	n/a	n/a
	LODGING															
310	Hotel	room	6.36	Blend ITE 8th & FL Studies	7.51	8.01	FL Studies	66%	FL Studies	11.22	$4,420	$63	$888	$3,532	$2,128	66%
320	Motel	room	5.63	ITE 8th Edition	5.21	5.71	FL Studies	77%	FL Studies	8.04	$3,167	$46	$648	$2,519	$2,128	18%
n/a	Tourist Hotel	room	5.77	Local TCS Studies	7.51	8.01	Same as LUC 310	66%	Same as LUC 310	10.18	$4,010	$57	$803	$3,207	$832	286%
n/a	Time Share	du	7.01	Previous TIF Study[3]	4.76	5.26	Previous TIF Study[3]	100%	Previous TIF Study[3]	11.88	$4,679	$69	$972	$3,707	$1,016	265%
	RECREATION															
430	Golf Course	acre	5.04	ITE 8th Edition	7.94	8.44	Same as LUC 210	90%	FL Schedules	12.82	$5,050	$71	$1,001	$4,049	n/a	n/a
437	Bowling Alley	1,000 sf	33.33	ITE 8th Edition	6.18	6.68	Same as LUC 710	90%	Same as LUC 430	66.00	$25,993	$374	$5,271	$20,722	n/a	n/a
443	Movie Theater without Matinee	1,000 sf	78.06	ITE 8th Edition	2.66	3.16	Same as LUC 444	88%	Same as LUC 444	65.05	$25,620	$405	$5,708	$19,912	n/a	n/a
491	Racquet Club	1,000 sf	14.03	ITE 8th Edition	6.18	6.68	Same as LUC 710	94%	Same as LUC 492	29.02	$11,428	$164	$2,311	$9,117	$2,461	271%
492	Health/Fitness Club	1,000 sf	32.93	ITE 8th Edition	6.18	6.68	Same as LUC 710	94%	FL Studies	68.10	$26,822	$386	$5,440	$21,382	n/a	n/a
	INSTITUTIONS															
565	Day Care	1,000 sf	75.07	ITE 8th Edition	2.13	2.63	FL Studies	73%	FL Studies	41.55	$16,367	$269	$3,791	$12,576	$5,543	127%
590	Library	1,000 sf	56.24	ITE 8th Edition	6.95	7.45	Same as LUC 210	49%	Previous TIF Study[3]	68.18	$26,854	$383	$5,398	$21,456	$7,377	191%

Cars & Light Trucks

Intersection: Windermere Rd & Lake Whitney Elementary School Parent Entrance

Site ID: 4

Date: March 28, 2019

Source:

Begin Time	Southbound Windermere Rd				Westbound School Entrance				Northbound Windermere Rd				Eastbound School Entrance				RAW TOTAL
	LT	T	RT	RTOR	LT	T	RT	RTOR	LT	T	RT	RTOR	LT	T	RT	RTOR	
7:00 AM	7	39	0	0	1	0	2	0	0	38	2	0	0	0	0	0	89
7:15 AM	8	39	0	0	3	0	1	0	0	27	2	0	0	0	0	0	80
7:30 AM	19	35	0	0	3	0	7	0	0	36	7	0	0	0	0	0	107
7:45 AM	56	51	0	0	7	0	24	0	0	61	18	0	0	0	0	0	217
8:00 AM	37	36	0	0	11	0	25	0	0	39	12	0	0	0	0	0	160
8:15 AM	56	48	0	0	19	0	51	0	0	32	24	0	0	0	0	0	230
8:30 AM	81	51	0	0	30	0	79	0	0	34	34	0	0	0	0	0	289
8:45 AM	7	35	0	0	4	0	5	0	0	50	0	0	0	0	0	0	101
9:00 AM	5	40	0	0	2	0	2	0	0	37	1	0	0	0	0	0	87
9:15 AM	3	43	0	0	0	0	4	0	0	50	1	0	0	0	0	0	101
9:30 AM	5	41	0	0	2	0	0	0	0	34	2	0	0	0	0	0	84
9:45 AM	1	27	0	0	2	0	2	0	0	36	1	0	0	0	0	0	69
AM PEAK HOUR	210	186	0	0	67	0	179	0	0	166	88	0	0	0	0	0	896
PEAK HOUR FACTOR																	0.78

Begin Time	Southbound Windermere Rd				Westbound School Entrance				Northbound Windermere Rd				Eastbound School Entrance				RAW TOTAL
	LT	T	RT	RTOR	LT	T	RT	RTOR	LT	T	RT	RTOR	LT	T	RT	RTOR	
12:00 PM	8	18	0	0	0	0	4	0	0	35	0	0	0	0	0	0	65
12:15 PM	3	34	0	0	3	0	2	0	0	33	1	0	0	0	0	0	76
12:30 PM	3	35	0	0	0	0	4	0	0	39	0	0	0	0	0	0	81
12:45 PM	1	32	0	0	0	0	3	0	0	40	0	0	0	0	0	0	76
MID PEAK HOUR	15	119	0	0	3	0	13	0	0	147	1	0	0	0	0	0	298
PEAK HOUR FACTOR																	0.92

Begin Time	Southbound Windermere Rd				Westbound School Entrance				Northbound Windermere Rd				Eastbound School Entrance				RAW TOTAL
	LT	T	RT	RTOR	LT	T	RT	RTOR	LT	T	RT	RTOR	LT	T	RT	RTOR	
2:00 PM	5	35	0	0	1	0	0	0	0	38	2	0	0	0	0	0	81
2:15 PM	17	34	0	0	1	0	5	0	0	33	6	0	0	0	0	0	96
2:30 PM	23	48	0	0	1	0	2	0	0	37	7	0	0	0	0	0	118
2:45 PM	18	41	0	0	6	0	6	0	0	28	16	0	0	0	0	0	115
3:00 PM	39	44	0	0	24	0	69	0	0	27	15	0	0	0	0	0	218
3:15 PM	5	46	0	0	13	0	50	0	0	36	6	0	0	0	0	0	156
3:30 PM	4	40	0	0	2	0	19	0	0	38	0	0	0	0	0	0	103
3:45 PM	1	48	0	0	5	0	12	0	0	43	0	0	0	0	0	0	109
4:00 PM	1	58	0	0	1	0	6	0	0	51	1	0	0	0	0	0	120
4:15 PM	8	45	0	0	3	0	8	0	0	54	2	0	0	0	0	0	120
4:30 PM	8	50	0	0	5	0	16	0	0	54	3	0	0	0	0	0	136
4:45 PM	7	58	0	0	3	0	14	0	0	61	4	0	0	0	0	0	147
5:00 PM	9	68	0	0	7	0	14	0	0	59	7	0	0	0	0	0	164
5:15 PM	8	87	0	0	2	0	8	0	0	63	3	0	0	0	0	0	171
5:30 PM	8	87	0	0	2	0	9	0	0	75	4	0	0	0	0	0	165
5:45 PM	26	84	0	0	0	0	3	0	0	58	8	0	0	0	0	0	179
PM PEAK HOUR	51	306	0	0	11	0	34	0	0	255	22	0	0	0	0	0	679
PEAK HOUR FACTOR																	0.78

Cars & Light Trucks

Intersection: Windermere Rd & Maguire Rd

Site ID 4

Date: March 28, 2019

Source:

Begin Time	Southbound Maguire Rd				Westbound Windermere Rd				Northbound Maguire Rd				Eastbound Windermere Rd				RAW TOTAL
	LT	T	RT	RTOR	LT	T	RT	RTOR	LT	T	RT	RTOR	LT	T	RT	RTOR	
7:00 AM	0	104	5	0	1	0	1	0	4	79	0	0	9	0	20	0	223
7:15 AM	0	99	6	0	0	0	1	0	5	93	0	0	11	0	39	0	254
7:30 AM	1	104	5	0	0	0	1	0	8	75	1	0	11	0	35	0	241
7:45 AM	1	99	13	0	4	0	1	0	11	84	0	0	18	1	33	0	265
8:00 AM	0	102	10	0	0	0	0	0	12	83	0	0	23	0	41	0	271
8:15 AM	0	111	12	0	1	0	0	0	10	88	0	0	25	0	44	0	291
8:30 AM	0	106	14	0	2	1	2	0	19	105	1	0	31	1	38	0	320
8:45 AM	1	100	10	0	1	1	1	0	18	96	0	0	30	0	40	0	298
9:00 AM	0	96	6	0	0	0	1	0	14	105	0	0	20	0	23	0	265
9:15 AM	1	90	8	0	1	0	1	0	10	91	1	0	18	1	18	0	240
9:30 AM	0	88	5	0	0	1	1	0	12	89	1	0	12	0	20	0	229
9:45 AM	1	95	8	0	1	0	2	0	10	84	0	0	15	0	17	0	233
AM PEAK HOUR	1	419	46	0	4	2	3	0	59	372	1	0	109	1	163	0	1180
PEAK HOUR FACTOR																	0.92

Begin Time	Southbound Maguire Rd				Westbound Windermere Rd				Northbound Maguire Rd				Eastbound Windermere Rd				RAW TOTAL
	LT	T	RT	RTOR	LT	T	RT	RTOR	LT	T	RT	RTOR	LT	T	RT	RTOR	
12:00 PM	2	85	11	0	1	0	0	0	17	98	0	0	6	1	13	0	234
12:15 PM	0	91	10	0	0	0	1	0	17	89	1	0	6	0	13	0	228
12:30 PM	0	84	8	0	1	0	2	0	18	78	0	0	10	0	13	0	214
12:45 PM	0	76	4	0	1	2	1	0	8	59	2	0	3	1	12	0	169
MID PEAK HOUR	2	336	33	0	3	2	4	0	60	324	3	0	25	2	51	0	845
PEAK HOUR FACTOR																	0.90

Begin Time	Southbound Maguire Rd				Westbound Windermere Rd				Northbound Maguire Rd				Eastbound Windermere Rd				RAW TOTAL
	LT	T	RT	RTOR	LT	T	RT	RTOR	LT	T	RT	RTOR	LT	T	RT	RTOR	
2:00 PM	2	96	16	0	0	3	0	0	20	82	0	0	16	1	13	0	249
2:15 PM	1	94	12	0	0	2	1	0	22	85	0	0	14	2	15	0	248
2:30 PM	2	101	15	0	0	1	1	0	19	88	0	0	17	0	18	0	262
2:45 PM	0	82	15	0	0	1	3	0	12	71	0	0	14	0	20	0	218
3:00 PM	0	88	17	0	0	2	1	0	15	80	1	0	15	1	22	0	242
3:15 PM	0	101	22	0	0	1	0	0	26	97	0	0	11	0	23	0	281
3:30 PM	1	94	20	0	1	1	1	0	25	100	0	0	14	2	20	0	279
3:45 PM	1	102	21	0	1	0	1	0	26	98	1	0	16	1	19	0	287
4:00 PM	0	101	17	0	1	1	1	0	21	116	0	0	10	0	17	0	285
4:15 PM	1	108	13	0	1	0	2	0	15	88	0	0	11	0	18	0	257
4:30 PM	2	119	18	0	2	0	2	0	9	99	0	0	8	0	16	0	273
4:45 PM	3	115	15	0	2	0	1	0	17	86	1	0	10	1	22	0	273
5:00 PM	4	117	20	0	2	1	2	0	11	90	0	0	11	0	20	0	278
5:15 PM	1	111	18	0	1	1	1	0	24	104	0	0	9	0	27	0	297
5:30 PM	2	128	10	0	1	1	1	0	21	112	2	0	15	0	22	0	315
5:45 PM	3	116	15	0	0	1	2	0	18	103	0	0	12	2	18	0	290
PM PEAK HOUR	10	472	63	0	4	4	6	0	74	409	2	0	47	2	87	0	1180
PEAK HOUR FACTOR																	0.94

Cars & Light Trucks

Intersection: Windermere Rd & McKinnon Rd

Site ID 4

Date: March 28, 2019

Source:

Begin Time	Southbound Windermere Rd				Westbound McKinnon Rd				Northbound Windermere Rd				Eastbound McKinnon Rd				RAW TOTAL
	LT	T	RT	RTOR	LT	T	RT	RTOR	LT	T	RT	RTOR	LT	T	RT	RTOR	
7:00 AM	0	23	12	0	0	0	0	0	3	5	0	0	20	0	3	0	66
7:15 AM	0	27	20	0	0	0	0	0	5	5	0	0	17	0	11	0	85
7:30 AM	0	26	11	0	0	0	0	0	7	13	0	0	31	0	11	0	99
7:45 AM	0	28	20	0	0	0	0	0	5	18	0	0	51	0	18	0	140
8:00 AM	0	27	30	0	0	0	0	0	10	17	0	0	24	0	16	0	124
8:15 AM	0	35	21	0	0	0	0	0	6	19	0	0	28	0	17	0	126
8:30 AM	0	29	42	0	0	0	0	0	11	16	0	0	27	0	24	0	149
8:45 AM	0	24	14	0	0	0	0	0	7	16	0	0	28	0	14	0	103
9:00 AM	0	22	21	0	0	0	0	0	7	15	0	0	23	0	17	0	105
9:15 AM	0	34	8	0	0	0	0	0	5	28	0	0	17	0	10	0	102
9:30 AM	0	19	12	0	0	0	0	0	6	12	0	0	17	1	10	0	77
9:45 AM	0	26	8	0	0	0	0	0	9	9	0	0	22	0	7	0	81
AM PEAK HOUR	0	119	113	0	0	0	0	0	32	70	0	0	130	0	75	0	539
PEAK HOUR FACTOR																	0.90

Begin Time	Southbound Windermere Rd				Westbound McKinnon Rd				Northbound Windermere Rd				Eastbound McKinnon Rd				RAW TOTAL
	LT	T	RT	RTOR	LT	T	RT	RTOR	LT	T	RT	RTOR	LT	T	RT	RTOR	
12:00 PM	0	8	8	0	0	0	0	0	9	18	0	0	11	0	7	0	61
12:15 PM	0	15	18	0	0	0	0	0	13	12	0	0	12	0	3	0	73
12:30 PM	0	17	9	0	0	0	0	0	5	16	0	0	19	0	8	0	72
12:45 PM	0	14	19	0	0	0	0	0	4	9	0	0	19	0	2	0	67
MID PEAK HOUR	0	54	54	0	0	0	0	0	31	55	0	0	61	0	18	0	273
PEAK HOUR FACTOR																	0.93

Begin Time	Southbound Windermere Rd				Westbound McKinnon Rd				Northbound Windermere Rd				Eastbound McKinnon Rd				RAW TOTAL
	LT	T	RT	RTOR	LT	T	RT	RTOR	LT	T	RT	RTOR	LT	T	RT	RTOR	
2:00 PM	0	15	17	0	0	0	0	0	10	17	0	0	14	0	5	0	78
2:15 PM	0	12	15	0	0	0	0	0	11	15	0	0	13	0	7	0	73
2:30 PM	0	15	25	0	0	0	0	0	8	18	0	0	15	0	10	0	91
2:45 PM	0	21	21	0	0	0	0	0	11	15	0	0	18	0	11	0	97
3:00 PM	0	26	26	0	0	0	0	0	15	18	0	0	15	0	4	0	104
3:15 PM	0	25	32	0	0	0	0	0	11	27	0	0	16	0	6	0	117
3:30 PM	0	29	30	0	0	0	0	0	12	25	0	0	18	0	7	0	121
3:45 PM	0	22	26	0	0	0	0	0	15	24	0	0	20	0	9	0	116
4:00 PM	0	15	22	0	0	0	0	0	9	21	0	0	32	0	7	0	106
4:15 PM	0	26	22	0	0	0	0	0	8	17	0	0	27	0	5	0	105
4:30 PM	0	20	20	0	0	0	0	0	10	19	0	0	29	0	8	0	106
4:45 PM	0	18	29	0	0	0	0	0	8	21	0	0	43	0	8	0	127
5:00 PM	0	21	33	0	0	0	0	0	11	28	0	0	40	0	10	0	143
5:15 PM	0	34	48	0	0	0	0	0	10	36	0	0	33	0	12	0	173
5:30 PM	0	36	51	0	0	0	0	0	8	24	0	0	34	0	13	0	166
5:45 PM	0	30	51	0	0	0	0	0	6	16	0	0	48	0	8	0	159
PM PEAK HOUR	0	121	183	0	0	0	0	0	35	104	0	0	155	0	43	0	641
PEAK HOUR FACTOR																	0.93

Cars & Light Trucks

Intersection: Windermere Rd & Roberson Rd

Site ID 4

Date: March 28, 2019

Source:

Begin Time	Southbound Windermere Rd				Westbound Roberson Rd				Northbound Windermere Rd				Eastbound Roberson Rd				RAW TOTAL
	LT	T	RT	RTOR	LT	T	RT	RTOR	LT	T	RT	RTOR	LT	T	RT	RTOR	
7:00 AM	8	17	21	0	8	41	29	0	10	46	8	0	26	58	24	0	296
7:15 AM	10	21	25	0	11	44	25	0	10	51	9	0	29	66	26	0	327
7:30 AM	15	25	27	0	10	48	27	0	12	60	10	0	25	54	25	0	338
7:45 AM	18	26	36	0	15	59	25	0	15	55	10	0	36	65	30	0	390
8:00 AM	25	35	42	0	11	73	22	0	15	33	11	0	40	81	31	0	419
8:15 AM	22	40	39	0	18	80	27	0	17	40	12	0	42	95	27	0	459
8:30 AM	24	33	40	0	20	69	29	0	14	41	14	0	39	102	29	0	454
8:45 AM	20	24	33	0	17	78	22	0	12	52	10	0	41	98	31	0	438
9:00 AM	18	20	30	0	10	66	20	0	10	48	9	0	35	100	28	0	394
9:15 AM	11	20	25	0	11	54	24	0	14	42	12	0	30	89	20	0	352
9:30 AM	15	21	19	0	8	50	20	0	12	39	7	0	26	77	24	0	318
9:45 AM	10	17	18	0	9	47	17	0	9	40	9	0	20	63	21	0	280
AM PEAK HOUR	84	117	142	0	65	293	98	0	53	181	45	0	157	395	115	0	1745
PEAK HOUR FACTOR																	0.95

Begin Time	Southbound Windermere Rd				Westbound Roberson Rd				Northbound Windermere Rd				Eastbound Roberson Rd				RAW TOTAL
	LT	T	RT	RTOR	LT	T	RT	RTOR	LT	T	RT	RTOR	LT	T	RT	RTOR	
12:00 PM	4	11	29	0	7	98	8	0	14	15	12	0	15	75	9	0	297
12:15 PM	5	15	33	0	11	90	8	0	11	20	10	0	12	89	10	0	292
12:30 PM	4	10	30	0	9	85	5	0	15	17	9	0	17	70	12	0	283
12:45 PM	12	16	38	0	6	87	16	0	12	20	8	0	12	63	10	0	302
MID PEAK HOUR	25	52	130	0	33	360	37	0	52	72	39	0	56	277	41	0	1174
PEAK HOUR FACTOR																	0.99

Begin Time	Southbound Windermere Rd				Westbound Roberson Rd				Northbound Windermere Rd				Eastbound Roberson Rd				RAW TOTAL
	LT	T	RT	RTOR	LT	T	RT	RTOR	LT	T	RT	RTOR	LT	T	RT	RTOR	
2:00 PM	10	15	35	0	4	96	4	0	10	18	9	0	10	84	4	0	299
2:15 PM	13	21	43	0	6	88	6	0	10	21	16	0	15	80	7	0	326
2:30 PM	12	24	39	0	8	100	9	0	11	19	16	0	17	77	10	0	342
2:45 PM	15	31	41	0	11	96	12	0	12	22	18	0	15	63	11	0	347
3:00 PM	10	40	44	0	9	87	12	0	45	44	21	0	14	80	15	0	421
3:15 PM	18	28	27	0	11	95	15	0	23	39	11	0	16	69	18	0	370
3:30 PM	18	33	50	0	15	103	9	0	20	36	14	0	18	74	11	0	401
3:45 PM	20	44	44	0	11	110	10	0	24	30	10	0	15	90	12	0	420
4:00 PM	22	62	42	0	10	121	14	0	22	28	20	0	20	111	14	0	486
4:15 PM	30	57	36	0	12	116	17	0	14	29	18	0	17	99	18	0	461
4:30 PM	26	59	45	0	10	129	24	0	22	33	15	0	25	89	20	0	497
4:45 PM	30	54	47	0	13	115	20	0	16	30	12	0	20	101	14	0	472
5:00 PM	41	63	40	0	10	130	23	0	20	28	15	0	18	87	17	0	492
5:15 PM	39	57	38	0	9	118	20	0	14	30	11	0	18	74	10	0	438
5:30 PM	40	66	40	0	8	120	18	0	15	24	10	0	13	80	12	0	446
5:45 PM	35	54	35	0	10	101	12	0	12	26	11	0	10	78	10	0	392
PM PEAK HOUR	127	233	168	0	45	490	84	0	72	120	58	0	80	376	69	0	1922
PEAK HOUR FACTOR																	0.97

Intersection	
Intersection Delay, s/veh	16.4
Intersection LOS	C

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	785	536	328	404
Demand Flow Rate, veh/h	801	547	334	412
Vehicles Circulating, veh/h	320	469	764	493
Vehicles Exiting, veh/h	585	629	357	523
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	20.9	14.8	14.7	11.1
Approach LOS	C	B	B	B

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	801	547	334	412
Entry HV Adj Factor	0.980	0.980	0.981	0.981
Flow Entry, veh/h	785	536	328	404
Cap Entry, veh/h	975	838	621	819
Control Delay, s/veh	20.9	14.8	14.7	11.1
LOS	C	B	B	B
95th %tile Queue, veh	9	5	3	3

Intersection	
Intersection Delay, s/veh	9.2
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	440	477	296	388
Demand Flow Rate, veh/h	449	486	302	396
Vehicles Circulating, veh/h	286	289	466	494
Vehicles Exiting, veh/h	602	479	271	281
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	8.5	9.1	8.3	10.7
Approach LOS	A	A	A	B

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	449	486	302	396
Cap Entry Lane, veh/h	1029	1028	858	834
Entry HV Adj Factor	0.981	0.982	0.980	0.980
Flow Entry, veh/h	440	477	296	388
Cap Entry, veh/h	1009	1009	841	817
V/C Ratio	0.436	0.473	0.352	0.475
Control Delay, s/veh	8.5	9.1	8.3	10.7
95th %tile Queue, veh	2	3	2	3

Intersection	
Intersection Delay, s/veh	27.1
Intersection LOS	D

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	617	728	294	621
Demand Flow Rate, veh/h	630	743	300	633
Vehicles Circulating, veh/h	485	327	699	729
Vehicles Exiting, veh/h	877	672	416	341
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	19.9	17.8	11.9	52.4
Approach LOS	C	C	B	F

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	630	743	300	633
Entry HV Adj Factor	0.980	0.980	0.981	0.980
Flow Entry, veh/h	617	728	294	621
Cap Entry, veh/h	824	969	663	643
V/C Ratio	0.749	0.752	0.444	0.965
Control Delay, s/veh	19.9	17.8	11.9	52.4
LOS	C	C	B	F
95th %tile Queue, veh	7	7	2	14

Intersection	
Int Delay, s/veh	6.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	67	179	166	88	210	186
Future Vol, veh/h	67	179	166	88	210	186
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	300	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	79	211	195	104	247	219

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	960	247	0	0	299	0
Stage 1	247	-	-	-	-	-
Stage 2	713	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	285	792	-	-	1262	-
Stage 1	794	-	-	-	-	-
Stage 2	486	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	229	792	-	-	1262	-
Mov Cap-2 Maneuver	229	-	-	-	-	-
Stage 1	794	-	-	-	-	-
Stage 2	391	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16	0	4.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	229	792	1262	-
HCM Lane V/C Ratio	-	-	0.344	0.266	0.196	-
HCM Control Delay (s)	-	-	28.8	11.2	8.5	-
HCM Lane LOS	-	-	D	B	A	-
HCM 95th %tile Q(veh)	-	-	1.5	1.1	0.7	-

Intersection	
Int Delay, s/veh	4.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	44	127	128	44	85	179
Future Vol, veh/h	44	127	128	44	85	179
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	300	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	52	149	151	52	100	211

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	588	177	0	0	203	0
Stage 1	177	-	-	-	-	-
Stage 2	411	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	471	866	-	-	1369	-
Stage 1	854	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	437	866	-	-	1369	-
Mov Cap-2 Maneuver	437	-	-	-	-	-
Stage 1	854	-	-	-	-	-
Stage 2	620	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.1	0	2.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	437	866	1369	-
HCM Lane V/C Ratio	-	-	0.118	0.173	0.073	-
HCM Control Delay (s)	-	-	14.3	10	7.8	-
HCM Lane LOS	-	-	B	B	A	-
HCM 95th %tile Q(veh)	-	-	0.4	0.6	0.2	-

Intersection	
Int Delay, s/veh	1.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	11	34	255	22	51	306
Future Vol, veh/h	11	34	255	22	51	306
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	300	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	40	300	26	60	360

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	793	313	0	0	326	0
Stage 1	313	-	-	-	-	-
Stage 2	480	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	358	727	-	-	1234	-
Stage 1	741	-	-	-	-	-
Stage 2	622	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	340	727	-	-	1234	-
Mov Cap-2 Maneuver	340	-	-	-	-	-
Stage 1	741	-	-	-	-	-
Stage 2	592	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.6	0	1.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	340	727	1234	-
HCM Lane V/C Ratio	-	-	0.038	0.055	0.049	-
HCM Control Delay (s)	-	-	16	10.2	8.1	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0.2	0.2	-

Intersection	
Int Delay, s/veh	2.3

Movement	WBL	WBR	NBT	NBL	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	31	47	200	35	52	232
Future Vol, veh/h	31	47	200	35	52	232
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	36	55	235	41	61	273

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	651	256	0	0	276	0
Stage 1	256	-	-	-	-	-
Stage 2	395	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	433	783	-	-	1287	-
Stage 1	787	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	409	783	-	-	1287	-
Mov Cap-2 Maneuver	409	-	-	-	-	-
Stage 1	787	-	-	-	-	-
Stage 2	643	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.8	0	1.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	409	783	1287	-
HCM Lane V/C Ratio	-	-	0.089	0.071	0.048	-
HCM Control Delay (s)	-	-	14.7	9.9	7.9	0
HCM Lane LOS	-	-	B	A	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.2	0.1	-

Int Delay, s/veh	2.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	38	56	142	33	50	191
Future Vol, veh/h	38	56	142	33	50	191
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	45	66	167	39	59	225

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	530	187	0	0	206	0
Stage 1	187	-	-	-	-	-
Stage 2	343	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	510	855	-	-	1365	-
Stage 1	845	-	-	-	-	-
Stage 2	719	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	485	855	-	-	1365	-
Mov Cap-2 Maneuver	485	-	-	-	-	-
Stage 1	845	-	-	-	-	-
Stage 2	684	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.1	0	1.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	485	855	1365	-
HCM Lane V/C Ratio	-	-	0.092	0.077	0.043	-
HCM Control Delay (s)	-	-	13.2	9.6	7.8	0
HCM Lane LOS	-	-	B	A	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.2	0.1	-

Intersection	
Int Delay, s/veh	2.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	36	53	259	31	47	304
Future Vol, veh/h	36	53	259	31	47	304
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	42	62	305	36	55	358

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	791	323	0	0	341	0
Stage 1	323	-	-	-	-	-
Stage 2	468	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	358	718	-	-	1218	-
Stage 1	734	-	-	-	-	-
Stage 2	630	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	338	718	-	-	1218	-
Mov Cap-2 Maneuver	338	-	-	-	-	-
Stage 1	734	-	-	-	-	-
Stage 2	595	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.2	0	1.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	338	718	1218	-
HCM Lane V/C Ratio	-	-	0.125	0.087	0.045	-
HCM Control Delay (s)	-	-	17.2	10.5	8.1	0
HCM Lane LOS	-	-	C	B	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0.3	0.1	-

Int Delay, s/veh	5.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	130	75	32	70	119	113
Future Vol, veh/h	130	75	32	70	119	113
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	153	88	38	82	140	133

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	365	207	273	0	-	0
Stage 1	207	-	-	-	-	-
Stage 2	158	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	635	833	1290	-	-	-
Stage 1	828	-	-	-	-	-
Stage 2	871	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	615	833	1290	-	-	-
Mov Cap-2 Maneuver	615	-	-	-	-	-
Stage 1	802	-	-	-	-	-
Stage 2	871	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.2	2.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1290	-	680	-	-
HCM Lane V/C Ratio	0.029	-	0.355	-	-
HCM Control Delay (s)	7.9	0	13.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	1.6	-	-

Int Delay, s/veh 3.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	64	31	45	78	87	104
Future Vol, veh/h	64	31	45	78	87	104
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	75	36	53	92	102	122

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	361	163	224	0	-	0
Stage 1	163	-	-	-	-	-
Stage 2	198	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	638	882	1345	-	-	-
Stage 1	866	-	-	-	-	-
Stage 2	835	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	611	882	1345	-	-	-
Mov Cap-2 Maneuver	611	-	-	-	-	-
Stage 1	830	-	-	-	-	-
Stage 2	835	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.3	2.8	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1345	-	679	-	-
HCM Lane V/C Ratio	0.039	-	0.165	-	-
HCM Control Delay (s)	7.8	0	11.3	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.6	-	-

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	43	155	35	104	121	183
Future Vol, veh/h	43	155	35	104	121	183
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	51	182	41	122	142	215

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	454	250	357	0	-	0
Stage 1	250	-	-	-	-	-
Stage 2	204	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	564	789	1202	-	-	-
Stage 1	792	-	-	-	-	-
Stage 2	830	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	543	789	1202	-	-	-
Mov Cap-2 Maneuver	543	-	-	-	-	-
Stage 1	763	-	-	-	-	-
Stage 2	830	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.4	2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1202	-	718	-	-
HCM Lane V/C Ratio	0.034	-	0.324	-	-
HCM Control Delay (s)	8.1	0	12.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	1.4	-	-

Intersection	
Intersection Delay, s/veh	34.5
Intersection LOS	D

Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	109	1	163	4	2	3	59	372	1	1	419	46
Future Vol, veh/h	109	1	163	4	2	3	59	372	1	1	419	46
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
										1	493	54
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	18.7	11.3	36.3	42.6
HCM LOS	C	B	E	E

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	14%	40%	44%	0%
Vol Right, %	0%	60%	33%	10%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	432	273	9	466
Through Vol	372	1	2	419
RT Vol	1	163	3	46
Lane Flow Rate	508	321	11	548
Geometry Grp	1	1	1	1
Degree of Util (X)	0.864	0.588	0.024	0.911
Departure Headway (Hd)	6.117	6.59	8.044	5.98
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	590	546	442	603
Service Time	4.166	4.641	6.143	4.027
HCM Lane V/C Ratio	0.861	0.588	0.025	0.909
HCM Control Delay	36.3	18.7	11.3	42.6
HCM 95th-tile Q	9.7	3.8	0.1	11.3

HCM 6th AWSC
4: Maguire Blvd & Windermere Rd

Intersection	
Intersection Delay, s/veh	18.9
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	57	1	83	0	5	5	72	336	1	2	372	69
Future Vol, veh/h	57	1	83	0	5	5	72	336	1	2	372	69
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	67	1	98	0	6	6	85	395	1	2	438	81
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	11.5	9.8	19.6	20.8
HCM LOS	B	A	C	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	18%	40%	0%	0%
Vol Thru, %	82%	1%	50%	84%
Vol Right, %	0%	59%	50%	16%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	409	141	10	443
LT Vol	72	57	0	2
Through Vol	336	1	5	372
Lane Flow Rate	481	166	12	521
Geometry Grp	1	1	1	1
Degree of Util (X)	0.699	0.281	0.021	0.734
Departure Headway (Hd)	5.233	6.099	6.561	5.072
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	688	587	543	714
Service Time	3.269	4.151	4.629	3.107
HCM Lane V/C Ratio	0.699	0.283	0.022	0.73
HCM Control Delay	19.6	11.5	9.8	20.8
HCM 95th-tile Q	5.7	1.1	0.1	6.5

Intersection	
Intersection Delay, s/veh	36.1
Intersection LOS	E

Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	47	2	87	4	4	6	74	409	2	10	472	63
Future Vol, veh/h	47	2	87	4	4	6	74	409	2	10	472	63
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	12.4	10.7	33.7	44.9
HCM LOS	B	B	D	E

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	15%	35%	29%	2%
Vol Right, %	0%	64%	43%	12%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	485	136	14	545
LT Vol	74	47	4	10
Through Vol	409	2	4	472
Lane Flow Rate	571	160	16	641
Geometry Grp	1	1	1	1
Degree of Util (X)	0.866	0.293	0.034	0.943
Departure Headway (Hd)	5.485	6.59	7.415	5.297
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	662	542	486	680
Service Time	3.526	4.675	5.415	3.355
HCM Lane V/C Ratio	0.863	0.295	0.033	0.943
HCM Control Delay	33.7	12.4	10.7	44.9
HCM 95th-tile Q	10.1	1.2	0.1	13.2

NOISE STUDY

WONDERMERE GARDEN PRESCHOOL

for:

Ray Coudriet Builder, Inc.
7635 Ashley Park Cr., Suite 505
Orlando, Florida 32835

by:

RML Acoustics, LLC
14688 NW 150th Lane
Alachua, Florida 32615

March 22, 2019

I. INTRODUCTION/BACKGROUND

RML Acoustics was engaged by Ray Coudriet Builder, Inc., to conduct a study of potential noise impacts on residences in The Willows development in Windermere, Florida, from children playing on the playground of the proposed Wondermere Garden Preschool, to be located at 1841 Windermere Rd., in Windermere, Florida. The preschool is designed to house 200 students, age 18 months to 6 years old, and operate from 8 am to 6 pm on weekdays. Residents along the west side of Willow Gardens Drive in The Willows residential development have voiced concerns about noise from children playing during outdoor activities at the preschool.

Figure 1 contains a site plan of the proposed preschool showing the location of the building and proposed playground on the east side. Figure 2 contains an aerial photo showing the approximate distances between the playground and nearest homes in The Willows to the east.

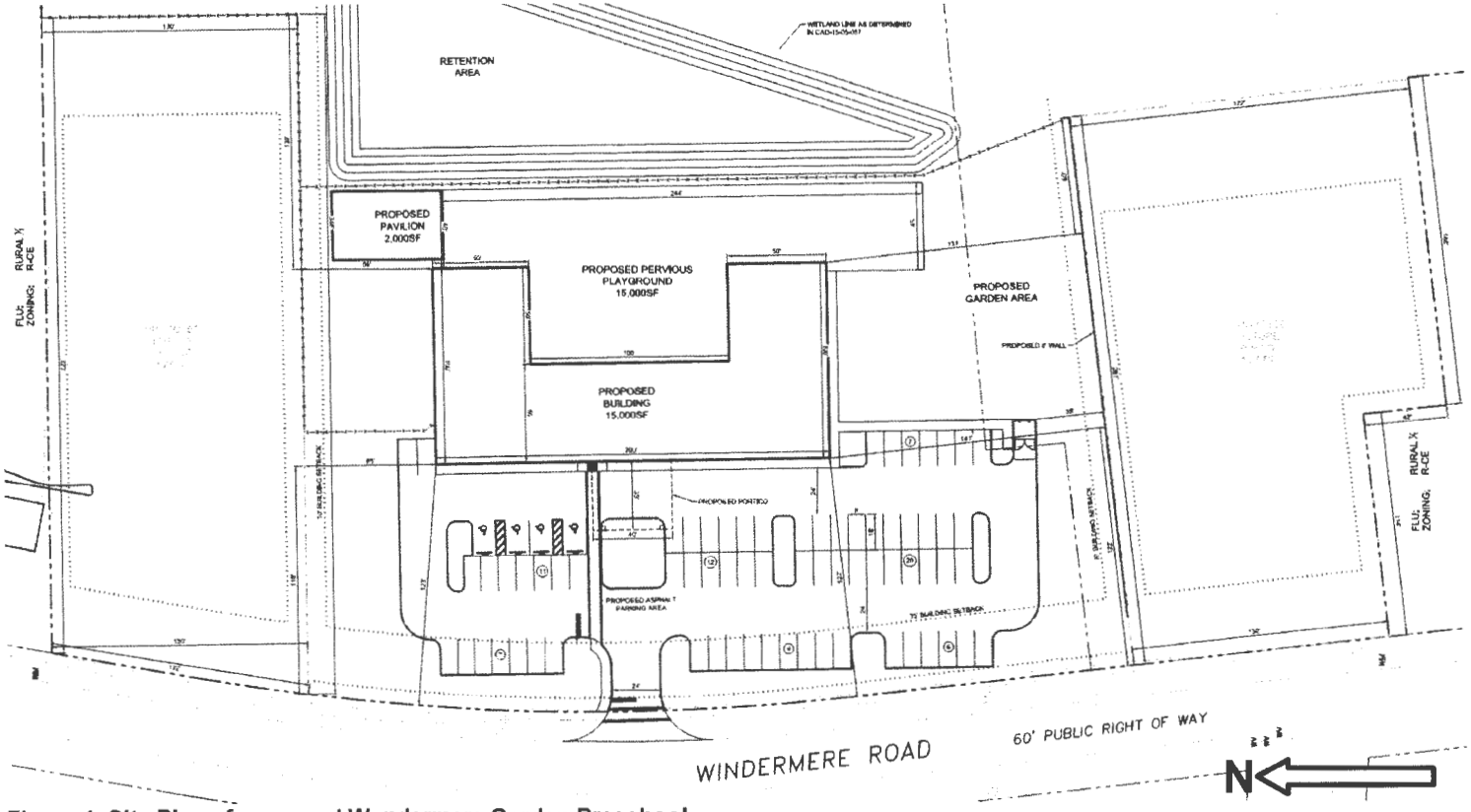


Figure 1. Site Plan of proposed Wondermere Garden Preschool.

Figure 2. Aerial showing the location of the proposed Wondermere Garden Preschool relative to homes in The Willows to the east.

II. WINDERMERE NOISE CONTROL ORDINANCE

Division 9, *Noise Control*, of Article IX, *Operational Performance Standards*, of the Town of Windermere, Florida Code of Ordinances, hereinafter referred to as the "Windermere Noise Control Ordinance," contains a table of Maximum Allowable Sound Level Limits for sound transmitted into a residential area, as well as the maximum distance at which sounds propagated from a land use category must no longer be plainly audible. The only noise source considered in this study is the unamplified voices of children playing on the playground, which, per Section 9.00.10, *Exemptions*, of the Windermere Noise Control Ordinance, is exempt. However, it is understood that for the purposes of addressing homeowner concerns regarding the sounds of children playing at the school, it is necessary to evaluate the potential noise impacts on the concerned residents regardless of the Noise Ordinance's requirements.

The Windermere Noise Control Ordinance, which includes both sound level limits and "plainly audible" distance limits, will be used to assess the potential noise impacts for this project. Table 1 contains the maximum allowable sound level limits, measured with a sound level meter, from the Windermere Noise Control Ordinance.

Table 1. Maximum permissible sound levels, land use categories, times and measurement descriptors (from Windermere Noise Control Ordinance).

Land Use Category	Measurement	Time of Day	Sound Level Limit (dBA)
Noise Sensitive Zone	Time Averaged (LEQ)	Any time	55 dB
	Impulsive	7:00 a.m.—10:00 p.m.	60 dB
	Impulsive	10:01 p.m.—6:59 a.m.	Not allowed
Residential Area	Time Averaged (LEQ)	7:00 a.m.—10:00 p.m.	60 dB
	Time Averaged (LEQ)	10:01 p.m.—6:59 a.m.	55 dB
	Impulsive	7:00 a.m.—10:00 p.m.	65 dB
	Impulsive	10:01 p.m.—6:59 a.m.	Not allowed

The Time Averaged (LEQ) sound levels limits described in table one are based on a minimum 5-minute averages of sounds. The impulsive sound category does not apply to voices, but to sources like explosions and pile drivers.

Table 2 contains the Windermere Noise Control Ordinance's maximum allowable distance at which sound must no longer be plainly audible based on the land use from which the noise emanates, which in this case does not matter, as the distance requirement of 500 ft is the same for both Residential and Nonresidential during the hours in which the preschool will operate. Since the nearest houses in The Willows are more than 500 ft away, the likelihood that sounds from children playing on the playground will be plainly audible at the residences will be evaluated at the nearest residential property lines and not at 500 ft, which would be in the middle of an unoccupied wetland area.

Table 2. Maximum permissible distance at which sound may be plainly audible (from Windermere Noise Control Ordinance).

Underlying Land Use Category (from which noise emanates)	Time of Day	Distnace
Residential Area	7:00 a.m.—10:00 p.m.	500 feet or more
	10:01 pm to 6:59 am	150 feet or more
Residential Area	7:00 a.m.—10:00 p.m.	500 feet or more
	10:01 p.m.—6:59 a.m.	300 feet or more

III. NOISE STUDY METHOD AND RESULTS

Overall Method

The overall method for the Noise Study included the following elements.

1. Measure ambient sound levels at the homes in the Willows closest to the proposed school.

2. Measure the sound levels of typical pre-school and elementary school-age children (3 to 8 years old) playing on playgrounds at distances of 75 to 100 ft to obtain source sound level data.

3. Construct a computer model to estimate the sound levels at the nearest residences to the east in the Willows from children playing on the playground, using the source sound level data obtained from an existing preschool and the effects of distance, vegetation and atmospheric conditions.

4. Compare the results of the model to ambient sound levels measured at the residences.

Sound Level Measurement Times and Locations

Ambient sound levels in The Willows were measured in the morning (approximately 9 am) and the afternoon (approximately 3:15 pm) at 11476, 11484 and 11492 Willow Gardens Drive and 2122 Willow Lauren Lane, the locations of which are shown in the aerial photograph in Figure 3.

Figure 3. Aerial photograph showing the locations of ambient sound level measurements in The Willows.

Sound levels of an existing school (O2B Kids in Alachua, Florida) where pre-school and elementary school-age children were playing on the playground were measured at distances of approximately 75 ft to 100 ft from where the children were playing (see Figure 4) on March 14, 2019 and March 21, 2019. Figure 5 contains a photograph of a jungle gym on which children were playing that was 75 ft from the measurement location. Sound level measurements were made during noon recess (3 to 4 year-old children) and afternoon recess (5 to 8 year-old children).

Figure 4. Aerial photograph of pre-school and afterschool facility where sound level measurements were made.

Figure 5. Photograph of playground where children were playing at O2B Kids in Alachua, Florida.

Sound Level Measurement Equipment

A Larson Davis 831 Sound Level Meter was used to measure sound levels at all locations. This meter meets ANSI Standard S1.4 requirements for Type 1 exponential-averaging sound level meters and ANSI Standard S1.43 requirements for Type 1 integrating-averaging sound level meters. A windscreen was affixed to the microphone for all measurements. The meter was calibrated with a Larson Davis CAL200 pistonphone before the measurements began and found to be within 0.1 dB of calibration at the completion of the measurements. Overall A-weighted

average (LAeq) and maximum (LAmax) sound levels were measured for each user-programmed time period. The average (Leq) and maximum (Lmax) octave band sound levels were also logged for each second of the measurements. The sound level data were downloaded from the meter and analyzed.

Sound Level Measurement Results

Table 3 contains a summary of the ranges of A-weighted sound levels and the overall average A-weighted sound levels measured for various noise sources and conditions at residences in The Willows development. Sound sources that were plainly audible at the residences included traffic noise on the Florida Turnpike, lawnmowing, leaf blowing, sprinklers running, pressure washing, UPS truck delivery, Fed Ex truck passing, prop planes overhead, jet planes overhead, birds chirping and wind blowing the leaves in the palm trees.

Table 4 contains a summary of the overall A-weighted average sound levels and instantaneous maximum A-weighted sound levels (Lmax) measured at O2B kids in Alachua, Florida. Sound sources included kids talking, kids crying, kids calling out names, and kids yelling.

Table 3. Summary of ambient sound levels measured in The Willows.

Location	Approx.Time	Sound Sources	Range of Sound Levels (Leq)	Overall Average Sound Level (Leq)
11476 Willow Gardens Drive	8:51 am	Traffic on the turnpike, birds chirping	45 to 48 dBA	46 dBA
	8:53 am	Traffic on the turnpike, birds chirping	45 to 46 dBA	45 dBA
	8:54 am	Lawnmower several houses away, traffic on turnpike, birds chirping	46 to 47 dBA	46 dBA
	8:55 am	Plane overhead, lawnmower several houses away, traffic on turnpike, birds	46 to 54 dBA	50 dBA
	3:14 pm	Distant prop plane, pressure washing several houses away	47 to 51 dBA	48 dBA
	3:14 pm	Quiet ambient	41 to 44 dBA	43 dBA
	3:15 pm	Music from parked UPS truck, driver talking, truck start up and leave	42 to 66 dBA	55 dBA
	3:18 pm	Wind in palm trees, distant traffic, birds	42 to 47 dBA	45 dBA
	3:19 pm	Prop plane overhead	58 to 67 dBA	60 dBA
	3:20 pm	Wind in palm trees, distant traffic, birds	45 to 51 dBA	49 dBA
11484 Willow Gardens Drive	8:58 am	Traffic on the turnpike, distant lawnmower, distant sprinkler, birds chirping	42 to 45 dBA	44 dBA
	3:21 pm	Light breeze in palm trees, distant traffic (faint)	41 to 42 dBA	41 dBA
	3:22 pm	Fed Ex truck passing by	47 to 67 dBA	59 dBA
	3:23 pm	Wind in palm trees	42 to 45 dBA	43 dBA
	3:24 pm	Wind in palm trees	41 to 45 dBA	43 dBA
	3:25 pm	Wind in trees, distant pressure washing activity	37 to 41 dBA	39 dBA

Location	Approx.Time	Sound Sources	Range of Sound Levels (Leq)	Overall Average Sound Level (Leq)
11492 Willow Gardens Drive	9:02 am	Traffic on the turnpike, birds chirping	44 to 46 dBA	45 dBA
2122 Willow Lauren Lane	9:29 am	Distant lawnmowers and leaf blowers	45 to 48 dBA	47 dBA
	9:32 am	Plane overhead, distant leaf blower, birds	49 to 55 dBA	53 dBA

Table 4. Summary of source sound levels measured at O2B Kids Alachua at approximately 75 to 100 ft.

Sound Sources	Overall Average Sound Level (Leq)	Range of Instantaneous Maximum (Lmax) Sound Levels
Instructor's and children's voices during snack time	56 dBA	56 to 69 dBA
Children playing on a playground and running around, yelling to each other	59 dBA	57 to 67 dBA
Children playing on a playground and running around, yelling to each other	60 dBA	55 to 73 dBA
Child crying on playground	56 dBA	55 to 67 dBA
Child yelling to friends	57 dBA	55 to 63 dBA
Children playing on playground	57 dBA	55 to 67 dBA
Children playing on playground, yelling to teacher	57 dBA	55 to 70 dBA

IV. DATA ANALYSIS

The only noise sources evaluated for this study were the sounds of children playing on a playground. According to the Client, there will be no bells or PA system at the preschool. Sound source data obtained from O2B Kids in Alachua were from groups of approximately 20 children playing simultaneously. According to the Client, the typical number of children expected on the proposed playground at any one time is 40. A computer model was developed to estimate the sound levels at The Willows residences, from children playing on the proposed playground, by taking into account the effects of doubling the number of children (from 20 to 40) on the playground, sound reflections off the wall of the preschool building, distance to the residences, vegetation and atmospheric effects under standard conditions, based on ISO Standard 9613, *Attenuation of sound during propagation outdoors*. The results of the model were compared to the Windermere Noise Control Ordinance's sound level limits and to the ambient sound levels measured at the homes in The Willows to determine the potential audibility of the sounds.

Comparison to Quantitative Noise Ordinance Sound Level Limit

Average sound levels from children playing measured between 56 and 60 dBA at 75 ft to 100 ft away. At the nearest home to the east, which is approximately 1,300 ft away through approximately 1,000 ft of medium-dense woods, the overall average sound level will be below 30 dBA, and therefore well below the 60 dBA daytime sound level limit described in the Windermere Noise Ordinance.

Comparison to Ambient and Plainly Audible Standard

For a sound to be considered plainly audible, it typically needs to be at least 3 to 5 dB above the background, or ambient, sound level. Children's raised voices have most of their sound energy concentrated in the 1,000 Hz to 2,000 Hz frequency range, and very little sound energy outside that range. The greatest instantaneous maximum (Lmax) sound level measured in these frequencies was 64 dB. The lowest average (Leq) ambient sound levels measured at the homes in these frequencies were 36 to 38 at 1,000 Hz and 31 to 32 dB at 2,000 Hz at 11484 Willow Gardens Drive in the afternoon. Based on the results of the computer model study, the estimated maximum instantaneous sound level at 1,000 Hz and 2,000 Hz, due to children playing on the proposed preschool playground, will be 22 dB, which is approximately 10 or more dB below the ambient sound level. In other words, most sounds would be inaudible, and certainly not plainly audible.

V. CONCLUSIONS AND RECOMMENDATIONS

1. Average sound levels from children playing on the proposed playground will be 30 dB or more below the Windermere Noise Control Ordinance's sound level limit of 60 dBA.

2. It is very unlikely that even the loudest sounds made by children playing on a playground at the proposed Wondermere Garden Preschool will be heard during the quietest time of the day at the residences in The Willows, as calculated sound levels in the critical frequencies at which the children generate their loudest sounds were approximately 10 dB below the quietest ambient sound levels at The Willows residences. Regardless, the possibility of very faint sounds of children playing in the distance occasionally being heard would not be out of character with the typical sounds heard in a residential community.

3. During the time ambient sound levels were measured at the residences in The Willows, sounds from highway traffic, lawn maintenance, UPS and Fed Ex trucks, pressure washing, sprinklers, planes passing overhead, birds chirping and wind in the trees were all a minimum of 10 dB greater (i.e., twice as loud), with some sources as much as 35 dB greater (i.e., five to seven 7 times louder) than any sounds from children playing on the proposed preschool playground would be at The Willows residences.

4. The results of the study are based on a very conservative approach to determining the audibility of sound from the children. There is a solid, 8 foot high fence that will be constructed around the playground that was not included in the analysis and the study looked at the loudest sounds from children occurring instantaneously and compared that sound to the very quietest sound level occurring at the residences, assuming those events happen simultaneously.

5. It is our understanding that there may be occasional (three or four times a year) preschool functions that would result in a larger number of students gathering outside at one time, along with their parents. Even with the full 200 students outside, the combined sound level would only increase by 7 to 10 dB compared to 40 students being present, which will still be more than 20 dB below the Windermere Noise Control Ordinance sound level limit of 60 dBA.