Memorandum

GEWALT HAMILTON ASSOCIATES, INC.
CONSULTING ENGINEERS
625 Forest Edge Drive, Vernon Hills, IL 60061
TEL 847.478.9700 ■ FAX 847.478.9701
www.gha-engineers.com

To: Ms. Kellie McIvor
Redwood Apartment Neighborhoods

Copy: Mr. Kevin Serafin
CEMCON, Ltd.

From: Dan Brinkman, PE, PTOE
Assistant Director of Transportation Services

Date: December 21, 2021

Subject: Proposed Residential PUD
IL Rte 22
Fox River Grove, IL

Per your request, Gewalt Hamilton Associates, Inc. (GHA) has prepared a preliminary Traffic Summary for the proposed Redwood Apartment development to be located on the south side of IL Rte 22 between US Rte 14 and Kelsey Road in Fox River Grove, Illinois.

Per the December 16, 2021 Site Plan prepared by CEMCON, Ltd, Redwood proposes to construct a total of 110 rental residential units on the approximately 21.3-acre subject site. A single access is proposed to serve the site that will be aligned with the existing Bridle Path Lane on the northside of IL Rte 22.

The following summarizes our preliminary findings:

Area Land Uses

- The site currently an agricultural use.
- Adjacent land uses include multi-tenant office complex to the west, single family residential to the north and southeast, and commercial to the south along US Rte 14.

Roadway Network

IL Rte 22 is an east-west, Principal Arterial under the jurisdiction of the Illinois Department of Transportation (IDOT). In the vicinity of the site, IL Rte 22 is classified as a Strategic Regional Arterial (SRA) Route. IL Rte 22 generally provides a single travel lane in each direction. IL Rte 22 widens from the east and an eastbound left turn lane is provided at Bridle Path Ln. Along the subject site IL Rte 22 narrows back to a two lane section. The three lane section extends west from Bridle Path Ln to US Rte 14. Per data published by IDOT on its website www.gettingaroundillinois.com, IL Rte 22 carried approximately 12,300 vehicles per day in 2019 along the subject frontage. The posted speed limit on IL Rte 22 changes from 50-mph to 45-mph as one heads west across the site frontage.

Exhibit 1 provides a site context aerial photo of the site and surrounding development.

Proposed Development Characteristics

- The development will consist of 110 units in 19 buildings ranging from 3 to 8-units per building.
- Each unit has a its own driveway and garage and several locations for off-street guest parking are provided throughout the development.
- As previously noted, a single, full movement access drive is proposed to IL Rte 22.
- The site access will provide a boulevard style landscaped median.
- Two exit lanes are proposed, to be marked as shared through-left turn lane and a separate right turn lane.
- Exiting traffic will be under Stop Sign Control.

The CEMCON, Ltd Site Plan is attached as *Exhibit 2*

Trip Generation

- Institute of Transportation Engineers (ITE): Trip generation rates published by ITE in the 11th Edition of the Manual *Trip Generation* were used to determine the anticipated traffic from the proposed residential use. The number of vehicle trips anticipated during the weekday morning, weekday evening as well as on a weekday daily basis are summarized in *Table 1*.

- Redwood Community Data. Redwood has also commissioned several studies of their communities to determine trip generation rates for their specific product type. The most recent summary from 2020 (utilizing pre-pandemic 2019 data) indicates that the proposed development can be expected to generate between 35 and 50 trips (combined inbound and outbound) during the Morning and Evening Peak Hour respectively. As can be seen this is between 25 and 40 percent less than the data published by the ITE would suggest. *Note Redwood did not collect daily 24-hour volumes.*

Table 1: Estimated Trip Generation

Land Use	Size	ITE Code	Weekday Peak Hours						Daily		
			Morning			Evening					
			In	Out	Sum	In	Out	Sum	In	Out	Sum
Redwood Community											
Residential	110 DU	220	14	43	57	43	25	68	390	390	780
Redwood Data	110 DU	USER	6	29	35	35	21	56	n/a	n/a	n/a

Sources ITE Trip Generation Manual, 11th Edition - See Appendix A

CESO July 22, 2020 Memorandum - See Appendix B

Traffic Impacts

- *Exhibit 3* illustrates the Morning and Evening Peak Hour traffic volumes in the site vicinity from the June 2019 IDOT traffic data.
- The total peak hour volumes expected to be generated by the development represent a less than 6 percent increase in the volumes already travelling along IL Rte 22 in the site vicinity. Accordingly, the additional traffic generated by the development is expected to have minimal effects on the operations of the external street network.

Conclusions and Recommendations

A preliminary traffic assessment was performed for the proposed rental residential development. As currently proposed, it is anticipated that IDOT will require IL Rte 22 to be improved to provide a westbound left turn lane and taper per the design speed on IL Rte 22 at the access location opposite Bridle Path Lane. Overall, the development is anticipated to have a minimal effect on the existing traffic operations of the area roadway network.

Technical Addendum

The following *Exhibits* and *Appendices* were previously referenced. They provide technical support for our observations, findings and recommendations discussed in the text.

Exhibits

1. Site Context
2. Site Plan
3. 2019 Traffic

Appendices

A. ITE Trip Generation Excerpt
B. CESO – Redwood Development Trip Generation Memo
C. IDOT historical Traffic Data

5885.900 Redwood FRG - TPM 122121.docx

TECHNICAL ADDENDUM

GHA GEWALT HAMILTON ASSOCIATES, INC.

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1 inch = 400 Feet

Exhibit 1 - Site Context

Proposed Redwood Development
IL Rte 22; Fox River Grove, IL

Map Center: -88.19634 42.19203

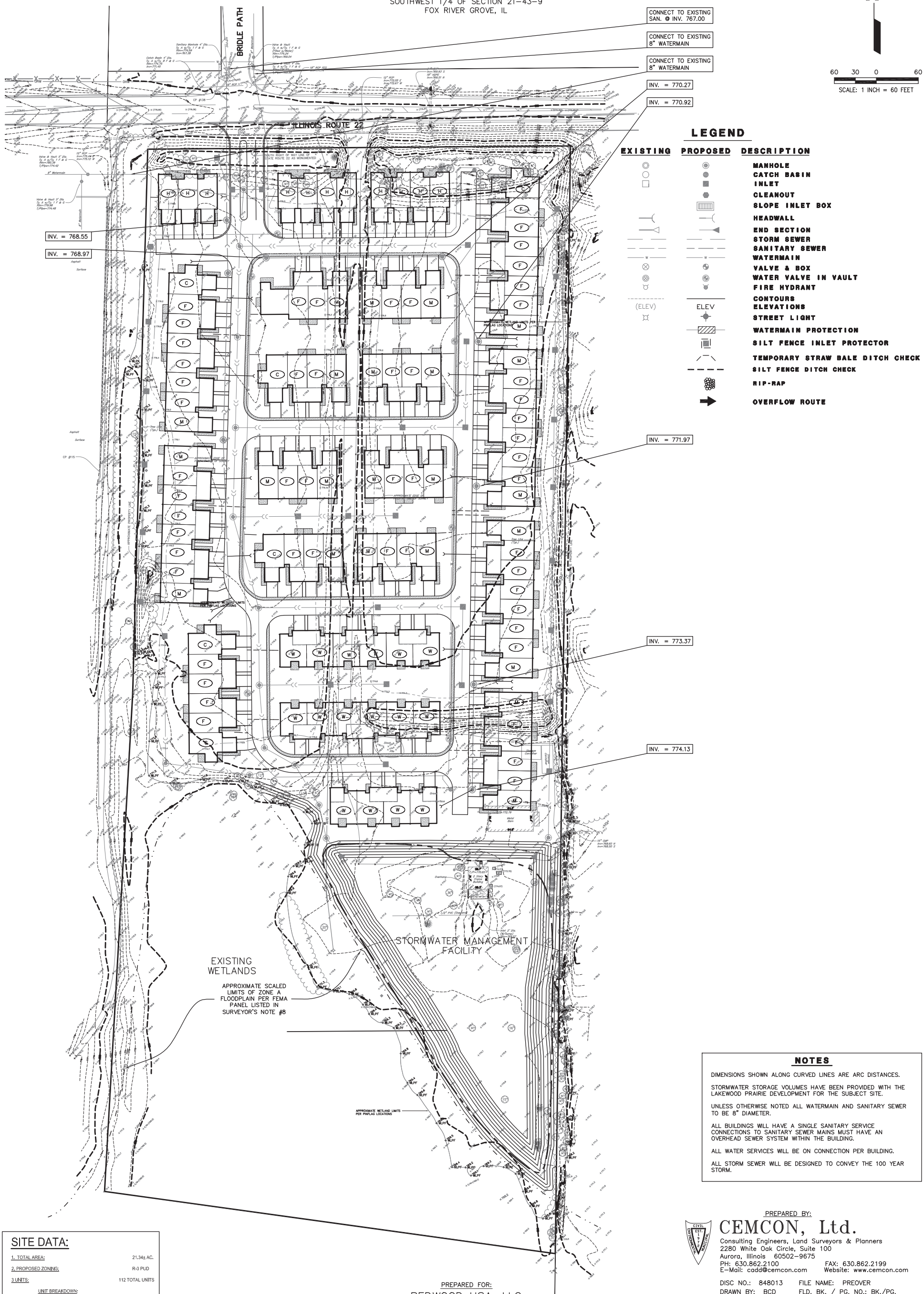
Date: 12/16/2021 Project:

PRELIMINARY ENGINEERING PLAN

FOR

FOX RIVER GROVE PARCEL

PART OF THE WEST 1/2 OF THE NORTHWEST 1/4 AND PART OF THE WEST 1/2 OF THE SOUTHWEST 1/4 OF SECTION 21-43-9
FOX RIVER GROVE, IL



LEGEND

EXISTING	PROPOSED	DESCRIPTION
		MANHOLE
		CATCH BASIN
		INLET
		CLEANOUT
		SLOPE INLET BOX
		HEADWALL
		END SECTION
		STORM SEWER
		SANITARY SEWER
		WATERMAIN
		VALVE & BOX
		WATER VALVE IN VAULT
		FIRE HYDRANT
		CONTOURS
(ELEV)	ELEV	ELEVATIONS
		STREET LIGHT
		WATERMAIN PROTECTION
		SILT FENCE INLET PROTECTOR
		TEMPORARY STRAW BALE DITCH CHECK
		SILT FENCE DITCH CHECK
		RIP-RAP
		OVERFLOW ROUTE

SITE DATA:

1. TOTAL AREA:	21.34± AC.
2. PROPOSED ZONING:	R-3 PUD
3 UNITS:	112 TOTAL UNITS
UNIT BREAKDOWN:	
56 - FORESTWOOD UNITS	(50.00%)
23 - MEADWOOD UNITS	(20.54%)
6 - CAPEWOOD UNITS	(5.36%)
16 - WILLOWOOD UNITS	(14.29%)
11 - HAYDENWOOD UNITS	(9.81%)
4. GROSSS DENSITY:	5.25 DU/AC.

NOTES

DIMENSIONS SHOWN ALONG CURVED LINES ARE ARC DISTANCES.

STORMWATER STORAGE VOLUMES HAVE BEEN PROVIDED WITH THE LAKEWOOD PRAIRIE DEVELOPMENT FOR THE SUBJECT SITE.

UNLESS OTHERWISE NOTED ALL WATERMAIN AND SANITARY SEWER TO BE 8" DIAMETER.

ALL BUILDINGS WILL HAVE A SINGLE SANITARY SERVICE CONNECTIONS TO SANITARY SEWER MAINS MUST HAVE AN OVERHEAD SEWER SYSTEM WITHIN THE BUILDING.

ALL WATER SERVICES WILL BE ON CONNECTION PER BUILDING.

ALL STORM SEWER WILL BE DESIGNED TO CONVEY THE 100 YEAR STORM.

PREPARED FOR:
REDWOOD USA, LLC
7510 EAST PLEASANT VALLEY ROAD
INDEPENDENCE, OH 44131
(216) 254-8425

PREPARED BY:
CEMCON, Ltd.
Consulting Engineers, Land Surveyors & Planners
2280 White Oak Circle, Suite 100
Aurora, Illinois 60502-9675
PH: 630.862.2100 FAX: 630.862.2199
E-Mail: cadd@cemcon.com Website: www.cemcon.com

DISC NO.: 848013 FILE NAME: PREOVER
DRAWN BY: BCD FLD. BK. / PG. NO.: BK./PG.
COMPLETION DATE: 12-16-2021 JOB NO.: 848.013
REVISION DATE: PROJECT MANAGER : KTS

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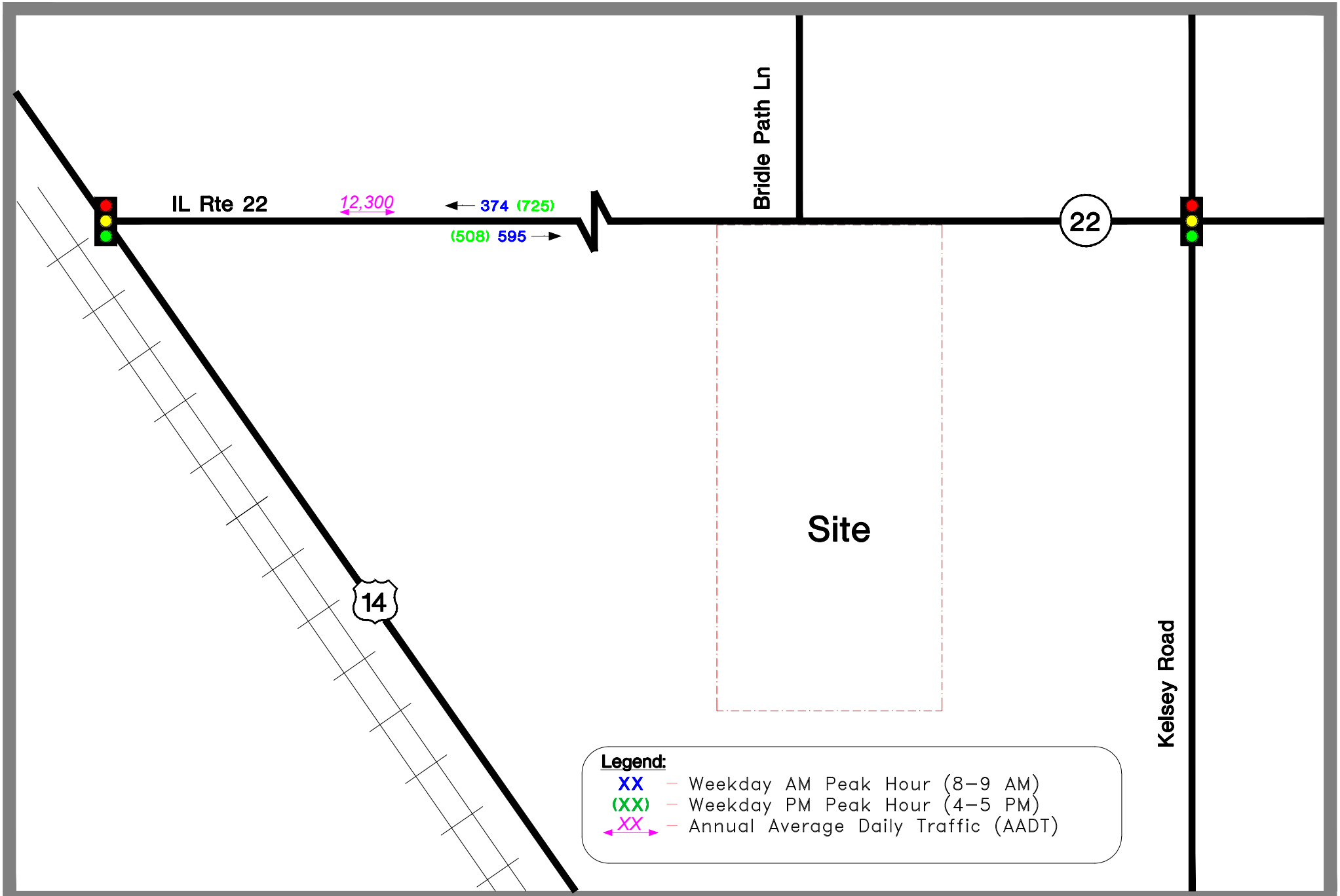

GEWALT HAMILTON ASSOCIATES, INC.

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Not to Scale

Exhibit 3
Existing Traffic
Sources: 1) IDOT AADT 2019

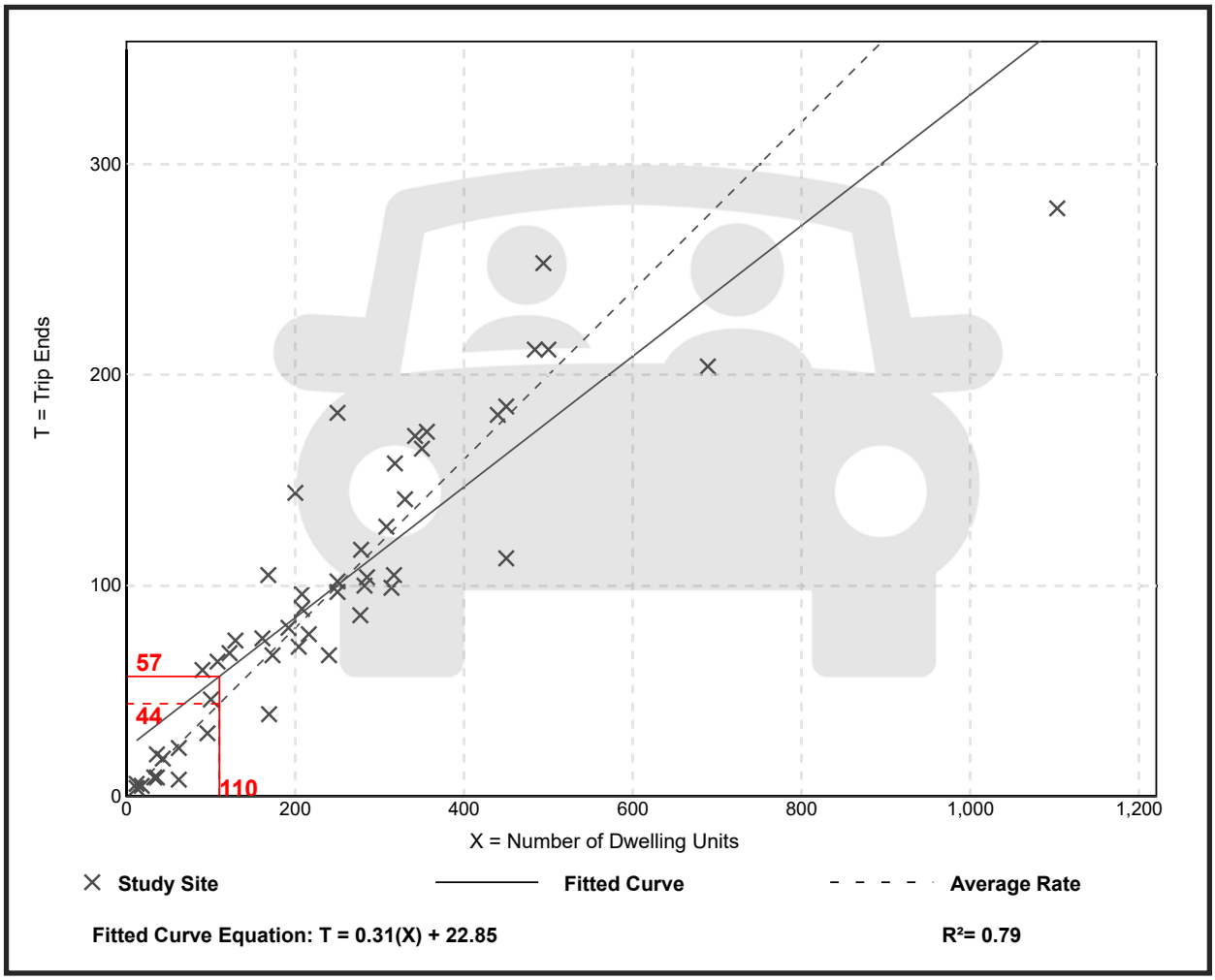
Multifamily Housing (Low-Rise)
Not Close to Rail Transit (220)

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:	49
Avg. Num. of Dwelling Units:	249
Directional Distribution:	24% entering, 76% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.40	0.13 - 0.73	0.12

Data Plot and Equation



Fitted Curve Equation: T = 0.31(X) + 22.85

R^2= 0.79

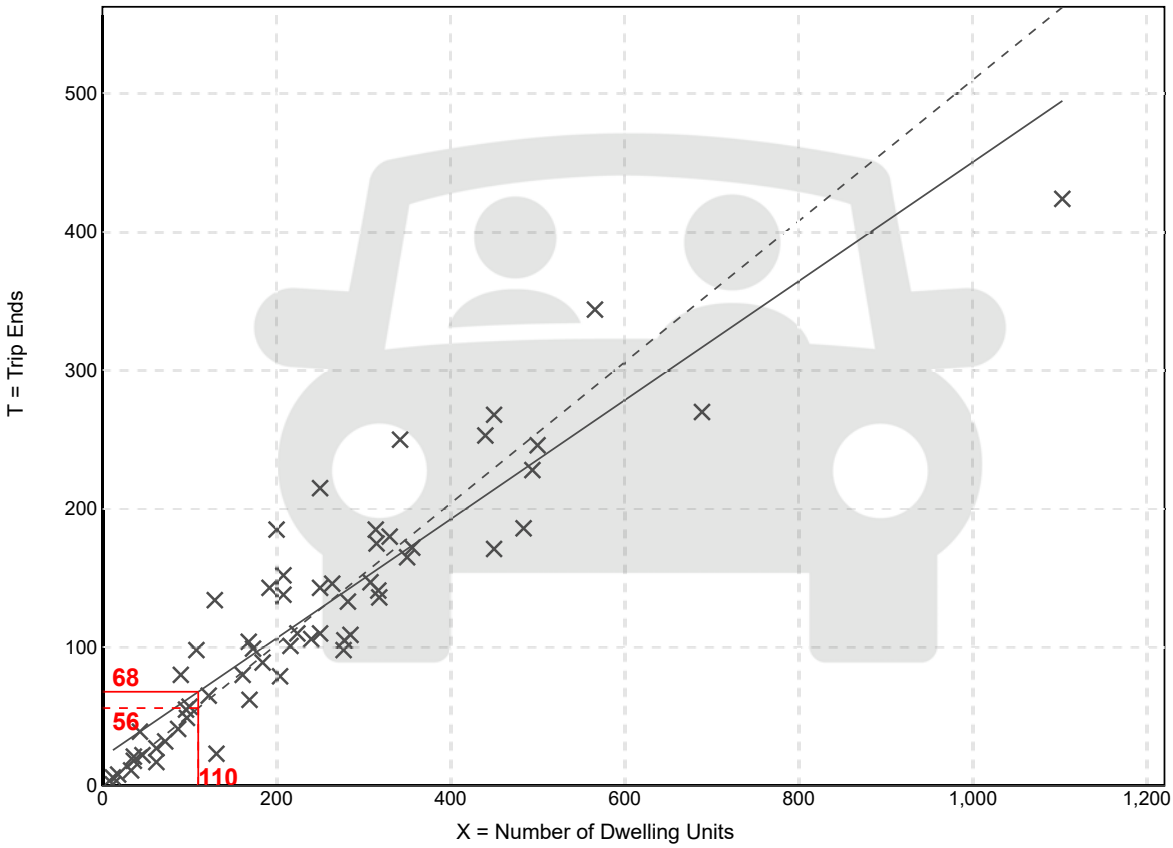
Multifamily Housing (Low-Rise)
Not Close to Rail Transit (220)

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:	59
Avg. Num. of Dwelling Units:	241
Directional Distribution:	63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.51	0.08 - 1.04	0.15

Data Plot and Equation



Fitted Curve Equation: T = 0.43(X) + 20.55

R^2= 0.84

Multifamily Housing (Low-Rise)
Not Close to Rail Transit (220)

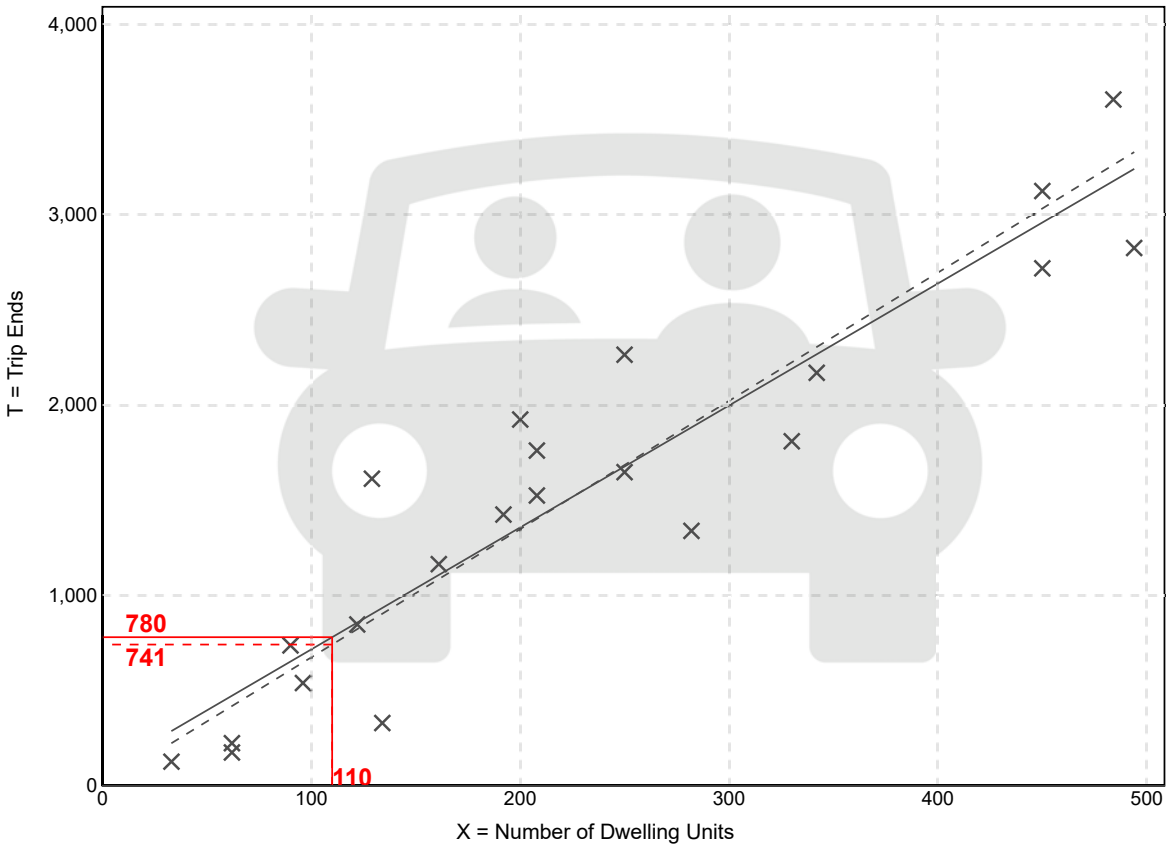
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 22
Avg. Num. of Dwelling Units: 229
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
6.74	2.46 - 12.50	1.79

Data Plot and Equation



Fitted Curve Equation: T = 6.41(X) + 75.31

R^2= 0.86

13060 S. US Hwy 27, Suite D
DeWitt, MI 48820
(517) 622-3000
www.cesoinc.com

July 22, 2020

Kellie McIvor, VP of Acquisitions
Redwood USA, LLC.
7510 East Pleasant Valley Road
Independence, OH 44131

RE: Trip Generation Summary and Comparison for Existing Redwood Neighborhoods

Dear Ms. McIvor:

As requested, CESO, Inc. has prepared the following trip generation summary and comparison for existing Redwood Neighborhoods.

CESO completed a trip generation analysis dated May 2019 for four (4) sites located in the state of Michigan. In addition, prior counts were conducted in 2010 by Redwood for three (3) sites located in the state of Ohio. These locations were then compared and summarized providing the average trip rate for each analysis and an overall trip combined trip rate. The following is a summary of the analysis:

CESO MAY 2019 TRIP GENERATION SUMMARY

CESO conducted a trip generation analysis for the following four (4) existing Redwood Neighborhoods located in the state of Michigan:

- Red Hawk Landing Redwood Development located in Brownstown Township - 115 dwelling units
- Enclave at Brownstown Redwood Development located in Canton - 93 dwelling units
- Four Seasons Redwood Development located in Commerce Chart Township - 98 units
- River Birch Bend Redwood Development located in Shelby Charter Township -140 dwelling units

Traffic counts (turning movement) were collected by Miovision for all four (4) sites during Midweek (Tuesday, Wednesday, or Thursday) AM, Mid-Day, and PM Peak Hour time frames (7:00 AM – 9:00 AM, 11:00 AM – 1:00 PM, and 4:00 PM – 6:00 PM). Note: Only the AM and PM Peak Hour time frames are compared and summarized.

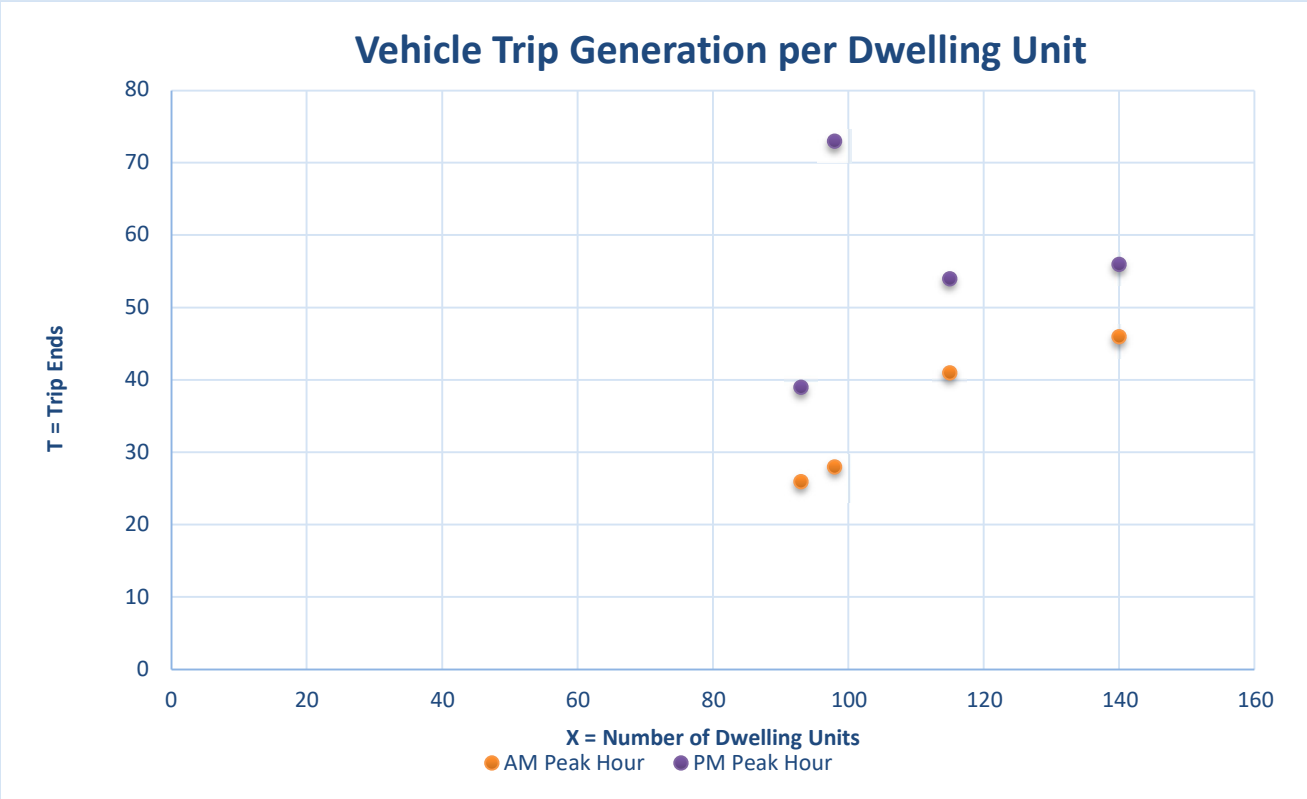
CESO calculated the average rate for each development and then averaged the four (4) locations resulting in a multiplier. Table 1 summarizes the total vehicles collected for the AM and PM Peak Hours for each of the four (4) developments and the calculated trip generation rates.

Table 1
CESO 2019 Trip Generation Results

Location	Size	Unit	Total Generated Trips							
			Weekday AM Peak Hour				Weekday PM Peak Hour			
			Trips				Trips			
			Tot	In	Out	Rate	Tot	In	Out	Rate
Brownstown Township, MI	115	Dwelling Units	41	9	32	0.36	54	34	20	0.47
Entering (%)/Exiting (%)			*100%*	*22%*	*78%*	---	*100%*	*63%*	*37%*	---

Canton, MI	93	Dwelling Units	26	4	22	0.28	39	29	10	0.42
Entering (%)/Exiting (%)			*100%*	*15%*	*85%*	---	*100%*	*74%*	*26%*	---
Commerce Charter Township, MI	98	Dwelling Units	28	8	20	0.29	73	49	24	0.74
Entering (%)/Exiting (%)			*100%*	*29%*	*71%*	---	*100%*	*67%*	*33%*	---
Shelby Charter Township, MI	140	Dwelling Units	46	8	38	0.33	56	35	21	0.40
Entering (%)/Exiting (%)			*100%*	*17%*	*83%*	---	*100%*	*63%*	*37%*	---
Total Average Rate			**AM Peak Hour**			**0.32**	**PM Peak Hour**			**0.51**

The total generated trips were plotted in a chart against the number of dwelling units to mimic the charts found in the Institute of Transportation Engineers Trip Generation Manual (ITE). Refer to the results below.



The CESO May 2019 Trip Generation Study is included in Attachment A.

2010 REDWOOD COLLECTED DATA SUMMARY

Redwood collected traffic count data in 2010 at the following three (3) existing Redwood Neighborhoods located in the state of Ohio:

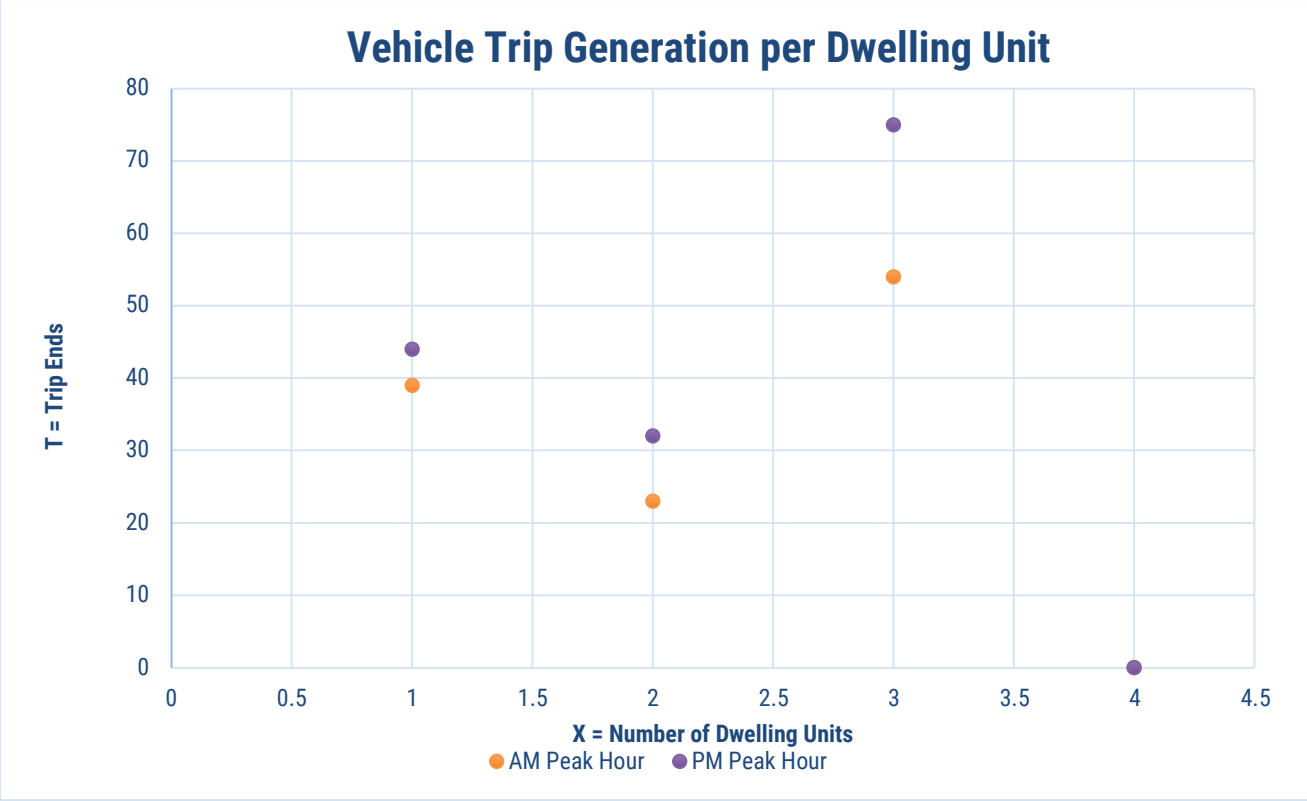
- Hunters Crossing Redwood Development located in Findlay - 84 dwelling units
- Village of Northampton Redwood Development located in Akron - 95 dwelling units
- Milltown Point Redwood Development located in Wooster – 158 units

Table 2 summarizes the total vehicles collected for the AM and PM Peak Hours for each of the three (3) developments and the calculated trip generation rates

Table 2
2010 Redwood Trip Generation Summary

Location	Size	Unit	Total Generated Trips							
			Weekday AM Peak Hour				Weekday PM Peak Hour			
			Trips				Trips			
			Tot	In	Out	Rate	Tot	In	Out	Rate
Findlay, OH	84	Dwelling Units	39	6	33	0.46	44	31	13	0.52
Entering (%)/Exiting (%)			*100%*	*15%*	*85%*	---	*100%*	*70%*	*30%*	---
Akron, OH	95	Dwelling Units	23	4	19	0.24	32	22	10	0.34
Entering (%)/Exiting (%)			*100%*	*17%*	*83%*	---	*100%*	*69%*	*31%*	---
Wooster, OH	158	Dwelling Units	54	11	43	0.34	75	50	25	0.47
Entering (%)/Exiting (%)			*100%*	*20%*	*80%*	---	*100%*	*67%*	*33%*	---
Total Average Rate			**AM Peak Hour**			**0.34**	**PM Peak Hour**			**0.45**

The total generated trips were plotted in a chart against the number of dwelling units to mimic the charts found in the Institute of Transportation Engineers Trip Generation Manual (ITE). Refer to the results below.



The 2010 Redwood Collected Data is included in Attachment B.

COMPARISON

Comparing the CESO May 2019 trip generation data with the Redwood 2010 data yields very similar results in terms of the average trip generation rate. Table 3 provides a summary of the comparison:

Table 3
CESO May 2019 Trip Generation Summary and Redwood 2010 Trip Generation Summary Comparison

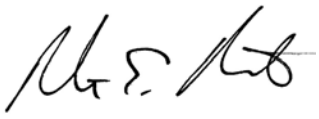
Study	Weekday AM Peak Hour of Adjacent Street	Weekday PM Peak Hour of Adjacent Street
CESO May 2019 Trip Generation Study	0.32	0.51
Redwood 2010 Analysis	0.34	0.45
Difference 2019 vs 2010	**-0.02**	**+0.06**
Average of CESO May 2019 Trip Generation Study and Redwood 2010 Analysis	**0.33**	**0.48**

CONCLUSIONS

By evaluating the information herein, this summary concludes that that Redwood Neighborhoods generate consistent traffic impacts that are lower than traditional multifamily neighborhoods. Taken nine (9) years apart in a randomized study, the trip rates from the CESO May 2019 Trip Generation Study and the Redwood 2010 Analysis are very similar. In fact, Table 3 shows that the difference in average trip rate is less than -0.02 during the Weekday AM peak hour and +0.06 during the Weekday PM peak hour. In comparison to the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition, Redwood Neighborhoods generate lower trips in comparison to the average site surveyed in the ITE 220 study. Redwood Neighborhoods as summarized in Table 3 generate 0.33 trips per dwelling unit during existing AM Peak Hour (ITE average is 0.46), and 0.48 trips per dwelling unit during existing PM Peak Hour (ITE average is 0.56).

Please review the above calculations and call or email me directly should you have any comments or questions regarding the above summary.

Sincerely,



Robert E. Matko, P.E., P.S., PTOE
Engineering Manager
(517) 212-4188
matko@cesoinc.com

Location Info	
Location ID	049 0286_EB
Type	LINK
Functional Class	3
Located On	IL-22
Between	IL-22 AND Kelsey Rd
Direction	EB
Community	FOX RIVER GROVE
MPO_ID	
HPMS ID	
Agency	Illinois DOT

Count Data Info	
Start Date	6/5/2019
End Date	6/6/2019
Start Time	9:00 AM
End Time	9:00 AM
Direction	EB
Notes	
Source	IL22
File Name	D1Submittal10d-049.mdb
Weather	
Study	
Owner	idotco
QC Status	Accepted

Interval: 60 mins	
Time	**Hourly Count**
00:00 - 01:00	17
01:00 - 02:00	14
02:00 - 03:00	18
03:00 - 04:00	27
04:00 - 05:00	93
05:00 - 06:00	294
06:00 - 07:00	600
07:00 - 08:00	626
08:00 - 09:00	595
09:00 - 10:00	467
10:00 - 11:00	453
11:00 - 12:00	463
12:00 - 13:00	507
13:00 - 14:00	482
14:00 - 15:00	467
15:00 - 16:00	415
16:00 - 17:00	508
17:00 - 18:00	464
18:00 - 19:00	366
19:00 - 20:00	240
20:00 - 21:00	220
21:00 - 22:00	149
22:00 - 23:00	85
23:00 - 24:00	42
TOTAL	7612

Location Info	
Location ID	049 0286_WB
Type	LINK
Functional Class	3
Located On	IL-22
Between	IL-22 AND Kelsey Rd
Direction	WB
Community	FOX RIVER GROVE
MPO_ID	
HPMS ID	
Agency	Illinois DOT

Count Data Info	
Start Date	6/5/2019
End Date	6/6/2019
Start Time	9:00 AM
End Time	9:00 AM
Direction	WB
Notes	
Source	IL22
File Name	D1Submittal10d-049.mdb
Weather	
Study	
Owner	idotco
QC Status	Accepted

Interval: 60 mins	
Time	**Hourly Count**
00:00 - 01:00	36
01:00 - 02:00	32
02:00 - 03:00	16
03:00 - 04:00	12
04:00 - 05:00	29
05:00 - 06:00	56
06:00 - 07:00	199
07:00 - 08:00	332
08:00 - 09:00	374
09:00 - 10:00	385
10:00 - 11:00	401
11:00 - 12:00	467
12:00 - 13:00	465
13:00 - 14:00	480
14:00 - 15:00	502
15:00 - 16:00	660
16:00 - 17:00	725
17:00 - 18:00	725
18:00 - 19:00	552
19:00 - 20:00	370
20:00 - 21:00	255
21:00 - 22:00	244
22:00 - 23:00	123
23:00 - 24:00	92
TOTAL	7532