

CHAPTER 10 - Appendix

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APPENDIX A: HOUSING, HOUSEHOLD SIZE AND STUDENTS

The Elkhorn Area School District serves the City of Elkhorn and the surrounding area. The district is currently divided into two elementary schools, the Elkhorn Area Middle School, and the Elkhorn Area High School. In addition, there are two small alternative schools serving approximately 60 students. Enrollment in the Elkhorn Area School District rose from 1,996 students in the 1994-1995 school year to 2,437 five years later. In 2003, enrollment grew to 2,607 or about a 7% increase from 2000.

Elkhorn Area School District (2002-2003)		
Public Schools	Grades	Enrollment
Tibbits Elementary (Sugar Creek)	K-4	441
West Side Elementary	K-4	498
Elkhorn Area Middle School	5-8	817
Elkhorn High School	9-12	791
Lakeland Elem/Secondary*	PreK-12	30
Walworth County Alternative**	9-12	30
Total		2607
Private Schools		
1st Evangelical Lutheran	PreK-8	34
St. Patricks Parish	K-8	172
Total		206
<i>*Special Needs School, **Public Charter School</i>		

We analyzed Elkhorn housing data to identify any relationship between the number of school children generated and type of housing unit (i.e. two, three, four, and five bedroom unit) and the assessed value of the units. The data is based on 256 total units across four developments: Harvest Pointe, The Pines, Elkhorn West, and Jackson Creek.² The tables below and at right indicate how the types of housing units are distributed to each category. The data included in this analysis is based on a sample of existing single-family units within Elkhorn. School-aged children are grouped by grades K-5, 6-8, 9-12, and the combined 6-12 classification.

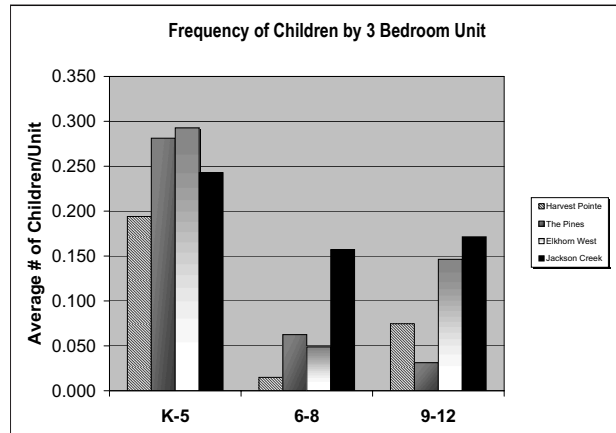
Total Number of children by Type of Unit:				
Single Family Units	School Population			
	K-5	6-8	9-12	6-12
2 Bedrooms	4	0	0	0
3 Bedrooms	51	16	24	40
4 Bedrooms	15	8	6	14
5 Bedroom	1	2	2	4
Total by Grade	71	26	32	58
Total (K-12)			129	
Number of Units in All Developments by Assessed Value				
\$100,000-\$150,000				43
\$150,000 to 200,000				179
\$200,000 +				34
Sum				256

A breakdown of the sample data illustrates that 82% of the housing units are three bedroom homes and 70% have assessed values between \$150,000 and \$200,000. When compared with 2000 Census data, these characteristics are not entirely consistent with the typical housing unit in Elkhorn. As reported in the 2000 Census sample, 48% of units in Elkhorn are 2-bedroom homes and 30% are three-bedroom units. Further, the mean housing value of owner-occupied housing reported in the 2000 Census is \$114,600³. Given the minimal number of two-bedroom and five-bedroom units in the sample, those averages have not been included in the following analysis.

Number of Units by Type of Unit:	
2 Bedrooms	10
3 Bedrooms	210
4 Bedrooms	35
5 Bedroom	1
Total # of Units	256

SINGLE-FAMILY THREE-BEDROOM UNITS

The majority of units in the sample data (82%) fall into the three-bedroom category. Based on the data from Harvest Pointe, The Pines, Elkhorn West, and Jackson Creek, three-bedroom homes in Elkhorn generate between 0.194 and 0.293 children in grades K-5 per unit. At the time of the analysis, the majority of children fell into the K-5 age group. In addition to children in grades K-5, three-bedroom units contribute between 0.015 and 0.157 children to grades six through eight. Each



unit additionally generates between 0.075 and 0.171 high-school aged children. Overall, the sample three-bedroom units contribute on average 0.43 school-aged children per unit or a little less than one child per two housing units.

As shown in the graph at right three-bedroom units in each of the developments create a greater number of children in grades K-5, than in the middle or high school grade levels. However, when grades 6-12 are combined, the difference between younger and older

Mean number of Children by 3-Bedroom Unit (Single-Family Housing Type in Elkhorn, Wisconsin)					
	K-5	6-8	9-12	6-12	Total Children per unit
Harvest Pointe	0.194	0.015	0.075	.090	0.284
The Pines	0.281	0.063	0.031	.094	0.375
Elkhorn West	0.293	0.049	0.146	.195	0.488
Jackson Creek	0.243	0.157	0.171	.329	0.571
Mean across developments	0.24	0.08	0.11	0.19	0.43
Comparison (Ehlers Associates)	0.369	0.173	0.184	NA	0.57

children is less noticeable (see summary table below). Because the Elkhorn Area School District is divided by elementary, middle, and high school, this analysis contributes to separate grades 6-12 into 6-8 and 9-12.

The number of high-school aged children generated by three-bedroom units is slightly higher than the number of middle school aged children. Table 5 on the following page details the average number of children associated with three-bedroom homes and the total number generated by each housing unit. For comparison, we included estimated ultimate population per dwelling units data derived from Ehlers Associates, Inc. (1996). The Elkhorn mean for children living in three-bedroom units, across grade levels, is consistently lower than the generally accepted Ehlers Associates standard. The total number of children per unit in Elkhorn is 0.43 per three-bedroom unit or about 25% less than the Ehlers standard.

SINGLE-FAMILY FOUR-BEDROOM UNITS

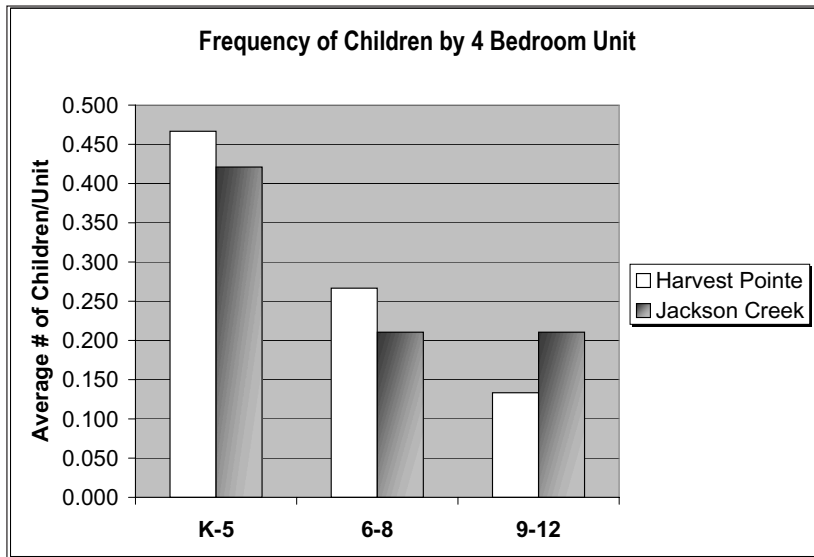
Of the four developments included in the sample data, only Jackson Creek and Harvest Pointe offer data associated with four-bedroom units. Not surprisingly, the four-bedroom units included in the sample generate a greater number of children per unit than three bedrooms overall. Consistent with three-bedroom units, the greatest number of children per unit falls within the K-5 range (0.421-0.467). The mean for middle school and high school children is about half of the K-5 group, (0.211-0.267) and (0.133 – 0.211) respectively. However, the combined total for grades 6-12 shows there is virtually no difference between the number of younger children (K-5) and older children (6-12) in this category. Table 6 summarizes the mean for each development and the total number of children generated per unit. Again, for comparison, Ehlers Associates data summarizing the estimated ultimate children per four-bedroom dwelling is included. Consistent with the three-bedroom data, the average number of children per unit is slightly lower than the general standard. Approximately 0.83 children are contributed by each four-bedroom unit. This total is about 30% less than the Ehlers Associates standard. Further, the sample illustrates that four bedroom units in Elkhorn produce an average of 0.83 children per unit or about two times as many children as three-bedroom units.

MEAN NUMBER OF SCHOOL CHILDREN BY ASSESSED VALUE

The second portion of the single-family housing analysis is based on determining if a relationship exists between number of school children generated by unit and the assessed value of the housing units in the sample. We divided the assessed values into the following three categories: \$100,000 - \$150,000; \$150,000 - \$200,000, and \$200,000 or more. As illustrated in Table 7 below, the majority of homes within the study sample are similar in value and fall within the \$150,000 to \$200,000 assessment range.

Mean number of Children by 4-Bedroom Unit (Single-Family Housing Type)					
	K-5	6-8	9-12	6-12	Total Children per unit
Harvest Pointe	0.467	0.267	0.133	0.40	0.867
Jackson Creek	0.421	0.211	0.211	0.421	0.842
Mean across developments	0.43	0.23	0.17	0.40	0.83
<i>Comparison (Ehlers Associates)</i>	<i>0.530</i>	<i>0.248</i>	<i>0.360</i>	<i>NA</i>	<i>1.19</i>

The following graphs and tables illustrate the relationship between number of children per unit and assessed value of unit. Overall, there appears to be a slightly higher number of children in the 6-8 and 9-12 age categories for the highest level assessments. However, the highest average of children is produced in the \$100,000 to 150,000 K-5 Classification.



Therefore, there does not appear to be a strong relationship between number of children per unit and assessed value of unit.

	\$100-150,000	\$150-200,000	\$200,000+
<i>Harvest Point</i>	2	65	17
<i>The Pines</i>	15	18	0
<i>Elkhorn West</i>	21	24	2
<i>Jackson Creek</i>	5	72	15
Sum	43	179	34

In the \$100,000 and \$150,000 category, as well as across developments, Elkhorn West contributes a high number of younger children per unit (0.524 per unit). Jackson Creek, however, contributes a consistent 0.2 across grade levels. In the \$150,000 to \$200,000 category, the average number of children per unit ranges between 0.050 and 0.3

This table (above) shows the breakdown of homes in the three assessed value categories. Of the total units, 16% fall into the \$100-150,000 AV category, 70% fall into the \$150-200,000 group, and 13% are in the \$200,000+ assessed value category.

per unit. This range is generally lower than the number of children contributed by the previous category. Excluding Elkhorn West (there are only 2 units in this category), the range of children is between 0.07 and 0.4 per unit per age group.

Table 8 below and the following graph (Illustration #) illustrate the average number of children across developments broken into the three assessed value categories. There does not appear to be a strong relationship between value of unit and number of school children per unit.

MULTI-FAMILY HOMES

The following tables are based on sample multi-family data in Elkhorn. The multi-family data is based on 898 housing units in 101 multi-family buildings. The buildings each have between five and sixteen units and represent a wide variety of developments within Elkhorn. According to the 2000 Census, about 48% of Elkhorn’s housing units are renter-occupied. Of those 1,400+ units, 72% are two-bedroom units, 18% are one-bedroom units, and 7% have three-bedrooms. The following Table 9 illustrates the average number of children per housing unit and the two, three, and four bedroom Ehlers Associates comparison. Although

the sample data does not detail number of bedrooms per unit, given that 72% of rental units are two-bedrooms, the most important comparison is between the Elkhorn data and the two bedroom Ehlers Associates data.

If we assume that the majority of multi-family units have one or two bedrooms, the Elkhorn data shows a higher contribution of children per unit overall than the standard Ehlers Associates data. It is important to note, however, that the three bedroom estimates are significantly higher than both the Elkhorn data and the estimates for one and two-bedroom units.

	K-5	6-8	9-12	6-12	Total
<i>\$100,000-\$150,000</i>	0.40	0.05	0.09	0.14	0.53
<i>\$150,000 to 200,000</i>	0.25	0.11	0.10	0.21	0.46
<i>\$200,000 +</i>	0.29	0.12	0.29	0.41	0.71

	K-5	6-8	9-12	Total Children per Unit
All Developments	0.136	0.069	0.055	0.259
Ehlers Associates (1 bedroom)	0.002	0.001	0.001	0.004
Ehlers Associates (2 bedroom)	0.086	0.042	0.046	0.174
Ehlers Associates (3 bedroom)	0.234	0.123	0.118	0.475

SUMMARY

Overall, a comparison between the Elkhorn data and the Ehlers Associates data shows that single family homes in the sample contribute fewer children than the standard estimates suggest. Consistent with the standard, the Elkhorn data shows four-bedroom units contributing more children per unit than three-bedroom units. The same analysis of multi-family homes illustrates a higher average of children per unit in Elkhorn. In the Future Land Use section of the Comprehensive Plan, population projections are based on the Ehlers Associates standard data for estimated persons per unit. Future school projections, however, utilize the existing Elkhorn data in addition to the existing school age population.

(Notes)

¹ Source: GreatSchools.net; National Center for Education Statistics (NCES) 2002-2003

² Note: Harvest Point North, Harvest Pointe Condos and the Hearthstone are not included due to incomplete data

³ The Mean Housing Value defined in the census is the respondent's estimate of how much the property (house and lot, mobile home and lot, or condominium unit) would sell for if it were for sale.

APPENDIX B. FUTURE LAND USE POPULATION METHODOLOGY

Calculations for Elkhorn’s future growth in population and area were determined in five year periods through the year 2030. The following sections explain the methodology used to determine future development and population. We determined population by starting with Elkhorn’s existing 2004 population (8,191) and estimated developed land area using GIS and aerial photographs (1730 acres). We then added population and land area in five year increments to these base numbers. Population was determined by:

Residential Acreage (Less ROW and Utilities) x Average Density = Average Dwelling Units

We calculated average net densities based on several examples of residential development existing in the City. We determined the average percent of land dedicated to streets and then subtracted streets from the total area to determine density. Existing density is calculated by taking the residential area of a development and dividing by the total number of units. In other words, we measured the number of units per acre on land devoted to residential land use. While it includes driveways and sidewalks, the number of dwelling units per acre, does not include public right of ways or parkland.

Average Residential Densities of Sample Developed Areas In Elkhorn			
	LDR	MDR	HDR*
Average Density (Residential Area Only DU/Acre) ¹	3.8	6.21	9.58
Average Lot Size (sq ft)	11,463	7,014	N/A
Average % of Total Area dedicated to ROWs	24.8%	27.4%	11%
Average % of Total Area dedicated to ROWs (Used in Projection Totals)	25%	25%	15%
*HDR does not account for any private or interior ROWs not shown on Future Land Use Map			

The sample density calculations that the existing average Elkhorn densities are based on are included at the end of this explanation. Using these average densities, we calculated future population and required park acreage based on the residential area shown on the Future Land Use Map. The average proportion of residential area dedicated to roads ranges between 11% for higher-density development to 25-28% for medium and lower-density in Elkhorn. To determine future low and medium-density development, we first subtracted 25% from the total residential area to account for public ROW and utilities. From the higher-density area, we subtracted 15% for ROW and utilities. In general, 20-25% of residential area is afforded for public ROW use.

Given Elkhorn’s desire to plan for traditional, compact development, a slightly lesser percentage of land area may be demanded for roadways in the future in the lower and medium density neighborhoods. However, by subtracting 25% of the residential area for ROW/utilities, we are not only adhering to actual trends of development in Elkhorn and

assuring adequate land area is assumed for roadways, we are creating a cushion to allow a percentage of that residential land area to develop as uses other than dwelling units, including churches, schools, neighborhood centers, etc. that are at too small of a scale to be built into the Future Land Use Map.

Population per dwelling unit was determined based on the Ehlers Associates Table of Ultimate Population per Dwelling Units. The average population per dwelling unit used in the calculation is 3.1 persons for low-density, 2.1 persons for medium density, and 1.9 persons for higher density. The estimates are intended to be on the higher end of the spectrum so that the City can conservatively plan for resources and facilities that will be necessary over the planning period. The number of children per household is also based on Ehlers Associates data for child per dwelling unit for grades K-5; 6-8; and 9-12.

Population = Total Dwelling Units x 3.1 persons for low-density; 2.1 persons for medium density; 1.9 persons for higher density

Future park space is estimated based on national parks standards requiring 10 acres/1000 persons. Using future population estimates, we generated the number of acres required for park space. Need for elementary schools are also calculated based on one school for approximately 600 children. A portion of those required park areas and schools will be located in “residential areas” and are subtracted from the “developable acres” total, decreasing the total number of dwelling units and ultimate population by a small percentage. The Future Land Use and Phasing chapters summarize ultimate future development in terms of acreage, population, park space, and schools in 2030. Also included are projections of population in five phases, allowing flexibility for timing of growth. The phases are guidelines for development and should not be assumed to be definitive population/land area projections. Both the phasing and ultimate populations assume that Elkhorn will continue to develop and annex areas outside of its existing (2005) municipal boundary. There are, of course, unknown factors associated with where and when development will occur. The Future Land Use and Phasing Plans should be reevaluated over time as outlined in Chapter 9 - Implementation to ensure that future conditions are taken into account.

Sample Densities Existing In Elkhorn

(Source: Teska Associates Estimates, City of Elkhorn and Future Land Use Plan)

A. LDR (County Hwy ‘H’ and MacClean Rd)

	Acres	Percent
Low Density Res (Ex. A)		
a. Low-Density Residential (Yellow)	50.87	80%
b. ROWs (White)	12.61	20%
c. Total Area (residential and ROW)	63.48	
d. Total Number of Units	95	(assumes 1 unit/lot)
e. Total Number of Units/Residential Acre (d/a)	1.87	
(Average Lot Size)	23,294.1	sq ft

B. LDR (South of Market, West of Rte 12)

	<u>Acres</u>	<u>Percent</u>
<u>Low Density Residential (Ex B)</u>		
a. Low-Density Residential (Yellow)	22.71	73%
b. ROWs (White)	8.47	27%
c. Total Area (residential and ROW)	31.17	
d. Total Number of Units	90	(assumes 1 unit/lot)
e. Total Number of Units/Residential Acre (d/a)	3.96	
(Average Lot Size)	10,421.1	sq ft

C. LDR (South Lincoln and Remer Rd)

	<u>Acres</u>	<u>Percent</u>
<u>Low Density Residential (Ex C)</u>		
a. Low-Density Residential (Yellow)	35.97	73%
b. ROWs (White)	13.50	27%
c. Total Area (residential and ROW)	49.46	
d. Total Number of Units	122	
e. Total Number of Units/Residential Acre (d/a)	3.392	(Assumes 1 unit/lot)
(Average Lot Size)	12,842.0	

D. HDR (Market and Church) Meadow Blossum Apts

<u>Higher Density Area</u>		
a. Low-Density Residential (Yellow)	12.63	72%
b. ROWs (White)	4.94	28%
c. Total Area (residential and ROW)	17.57	
d. Total Number of Units	112	*Based on MFU Population Sheet
e. Total Number of Units/Residential Acre (d/a)	8.866	

E. HDR (South Side of Market and Church) Market Street Ventures

<u>Higher Density Area</u>		
a. Higher Density Residential (Yellow)	5.07	86%
b. ROWs (White)	0.85	14%
c. Total Area (residential and ROW)	5.92	
d. Total Number of Units	48	*Based on MFU Population Sheet
e. Total Number of Units/Residential Acre (d/a)	9.471	

F. HDR (N Sandy and Patricia) Fairfield Heights and Fieldview Apts

	<u>Higher Density Area</u>		
a.	Higher Density Residential (Yellow)	10.00	93%
b.	ROWs (White)	0.71	7%
c.	Total Area (residential and ROW)	10.71	
d.	Total Number of Units	104	*Based on MFU Population Sheet
e.	Total Number of Units/Residential Acre (d/a)	10.404	(does not include private interior row)
	<u>G. MDR (N Sandy and Third St)</u>		
	<u>Medium Density Area</u>		
a.	Medium Density Residential (Yellow)	2.486	74%
b.	ROWs (White)	0.878	26%
c.	Total Area (residential and ROW)	3.364	
d.	Total Number of Units	18	*Based on Aerial Photo Estimation
e.	Total Number of Units/Residential Acre (d/a)	7.241	
	(Average Lot Size)	6,016	
	<u>H. MDR (CTHWY 'H' & Sporleader Rd)</u>		
	<u>Medium Density Area</u>		
a.	Medium Density Residential (Yellow)	13.530	71%
b.	ROWs (White)	5.422	29%
c.	Total Area (residential and ROW)	18.952	
d.	Total Number of Units	70	
e.	Total Number of Units/Residential Acre (d/a)	5.174	
	(Average Lot Size)	8,419	

(Footnotes)

¹ The sample average density was adjusted from 3.01 to 3.8 du/acre to account for trends toward recent low-density areas developing at about 4 du/acre.