Chapter 2

TRENDS, ISSUES, OPPORTUNITIES AND PLANNING STANDARDS

INTRODUCTION

Information regarding existing conditions and historic trends with respect to the demographic and economic base, the natural environment, and the man-made environment is essential to the comprehensive planning process. An extensive database has been developed by the Southeastern Wisconsin Regional Planning Commission (SEWRPC) pertaining to these and other aspects of the Southeastern Wisconsin Region, updating that database periodically. A major inventory update effort was carried out by SEWRPC in the early 2000's in support of the preparation of new land use and transportation plans and other elements of the comprehensive plan for the Region, including Waukesha County and its municipalities. This chapter presents a summary of the results of that inventory update pertaining to the population, land use, water supply, the natural resource base and the agricultural resource base.

Much of the demographic data in this chapter is from the U.S. Bureau of the Census. This data is collected every ten years and is derived from both short and long form questionnaires. The short form provides a complete count of all persons living in the United States along with over 300 tables with counts and cross tabulations of race, ethnicity, gender, and age data. The long form is sent to 1 out of every 6 households in the United States. It provides sample data for topics related to education, housing, income, and other social and economic issues.

DEMOGRAPHIC AND ECONOMIC BASE

Population Growth by County

In 1930, Dodge and Waukesha County each had approximately 52,000 residents (Table II-1). Waukesha County began to experience significant population growth in the 1950s and experienced a population boom since 1940 that resulted in population increases per decade ranging from 23,000 people to 73,000 people (Table II-1). From 1960 to 2005 the county population more than doubled increasing from 158,249 to 377,348 (Table II-1). All of the counties surrounding Waukesha experienced smaller gains in total population since 1960 with the exception of a population decline in Milwaukee County. Between 1970 and 2005, Milwaukee County declined by 115,254 people, as population, business, and industry migrated from the City of Milwaukee.

Village of Chenequa Incorporation and Population Growth Trends

The first European settlement occurred along the shores of Pine Lake in 1841. At this time, Reverend Gustaf Unonius created the first Swedish Settlement in Wisconsin. This settlement was named New Upsala. In 1858, Gustaf Unonius returned to Sweden and the settlement was never incorporated.

The area was first incorporated as a village named in 1928 for the purposes of providing police and fire protection services to a residential community. The village was named Chenequa which is a Potawatomi Indian word for white pine. The U.S. Bureau of the Census reported 339 people living in the Village of Chenequa in 1930. With the Great Depression in the 1930s and the outbreak of World War 2 in the 1940s, the population within the village declined. In 1950, U.S. Bureau of the Census statistics revealed that 270 people lived in the Village.

The population grew to 445 in 1960 and peaked at 642 in 1970. Between 1970 and 1980 the population declined to 532 (Table II-2). In 2000, the population of the village was 583 persons. The fact that growth did not keep pace with other villages in the County was by design. The Village of Chenequa early in its history developed a five acre minimum lot size for residential homes and has maintained this ordinance over the years. As a result, it has low density development and seeks to maintain a country atmosphere in the natural environment of Lake Country.

Table II-1

SELECTED COUNTY POPULATION GROWTH TRENDS: 1840-2005

Year County	Dodge County	Jefferson County	Milwaukee County	Racine County	Walworth County	Washington County	Waukesha County
1840	67	914	5,605	3,475	2,611	343	N/A
1850	19,138	15,317	31,077	14,973	17,862	19,485	19,558
1860	42,818	30,438	62,518	21,360	26,496	23,622	26,831
1870	47,035	34,050	89,936	26,742	25,992	28,274	28,258
1880	45,931	32,155	138,523	30,921	26,249	33,270	28,957
1890	44,984	33,530	236,101	36,268	27,802	35,229	33,270
1900	46,631	34,789	330,017	45,644	20,259	23,589	35,229
1910	47,436	34,606	433,187	57,424	29,614	23,784	37,100
1920	49,742	35,022	539,449	78,961	29,327	25,713	42,612
1930	52,092	36,785	725,263	90,217	31,058	26,551	52,358
1940	54,280	38,868	766,885	94,047	33,103	28,430	62,744
1950	57,611	43,069	871,047	109,585	41,584	33,902	85,901
1960	63,170	50,094	1,036,041	141,781	52,368	46,119	158,249
1970	69,004	60,060	1,054,249	170,838	63,444	63,829	231,338
1980	75,064	66,152	964,988	173,132	71,507	84,848	280,203
1990	76,559	67,783	959,275	175,034	75,000	95,328	304,715
2000	85,897	75,784	940,164	188,831	91,996	117,493	360,767
2005	88,748	79,188	938,995	193,239	98,496	125,940	377,348

Source: U. S. Bureau of the Census and the Wisconsin Department of Administration.

Waukesha County Community Population Trends

Between 1970 and 1980 the majority of the county's growth in population occurred in cities and towns. In fact, 46 percent took place in cities, 44 percent in towns, and only 10 percent in villages. Between 1990 and 2000 the growth in cities remained the same (46 percent) with a more even distribution of growth between villages (31 percent) and towns (23 percent). In 2005, an estimated 20 percent of the total county population lived in towns (75,626 people), 24 percent resided in villages (91,157 people) and 56 percent were residents of cities (210,565).

The most significant population growth in communities took place in the City of Waukesha where the population increased by 27,915 people since 1970 (Table II-2). The Village of Sussex had the greatest increase in population (7,003 people) for any village within the county from 1970 to 2005. The Town of Mukwonago experienced the largest population growth of any town gaining 5,552 people from 1970 to 2005 (Table II-2).

Components of Population Change

Population change can be attributed to natural increase and net migration. Natural increase is the balance between births and deaths in an area over a given period of time; it can be measured directly from historical records on the number of births and deaths for an area. Net migration is the balance between migration to and from an area over a given period of time; as a practical matter, net migration is often determined as a derived number, obtained by subtracting natural increase from total population change for the time period concerned. Of the total population increase of 56,052 persons in the County between 1990 and 2000, 18,582 can be attributed to natural increase; the balance of 37,470 persons can be attributed to net in-migration. Table II-2 illustrates that the level of natural increase in the County has been relatively stable since the 1970's.

Table II-2

POPULATION GROWTH BY COMMUNITY IN WAUKESHA COUNTY: 1970-2005

Community	1970	1980	1990	2000	2005
Town of Brookfield	4,303	4,364	4,232	6,390	6,379
Town of Delafield	3,750	4,597	5,735	7,820	8,286
Town of Eagle	1,250	1,758	2,028	3,117	3,492
Town of Genesee	3,172	5,126	5,986	7,284	7,542
Town of Lisbon	4,709	8,352	8,277	9,359	9,733
Town of Merton	4,424	6,025	6,430	7,988	8,347
Town of Mukwonago	1,930	4,979	5,967	6,868	7,482
Town of Oconomowoc	6,010	7,340	7,323	7,451	7,882
Town of Ottawa	1,698	2,795	2,988	3,758	3,850
Town of Summit	3,809	4,050	4,003	4,999	5,178
Town of Vernon	2,857	6,372	7,549	7,227	7,455
Town of Waukesha	4,408	6,668	7,566	8,596	8,832
Village of Big Bend	1,148	1,345	1,299	1,278	1,285
Village of Butler	2,261	2,059	2,079	1,881	1,835
Village of Chenequa	642	532	601	583	586
Village of Dousman	451	1,153	1,277	1,548	1,808
Village of Eagle	745	1,008	1,182	1,707	1,772
Village of Elm Grove	7,201	6,735	6,261	6,249	6,234
Village of Hartland	2,763	5,559	6,906	7,905	8,365
Village of Lac La Belle	227	289	258	329	333
Village of Lannon	1,056	987	924	1,009	957
Village of Menomonee Falls	31,697	27,845	26,840	32,647	33,939
Village of Merton	646	1,045	1,199	1,926	2,376
Village of Mukwonago	2,367	4,014	4,464	6,162	6,506
Village of Nashotah	410	513	567	1,266	1,372
Village of North Prairie	669	938	1,322	1,571	1,855
Village of Oconomowoc Lake	599	524	493	564	637
Village of Pewaukee	3,271	4,637	5,287	8,170	8,969
Village of Sussex	2,758	3,482	5,039	8,828	9,761
Village of Wales	691	1,992	2,471	2,523	2,567
City of Brookfield	31,761	34,035	35,184	38,649	39,797
City of Delafield	3,182	4,083	5,347	6,472	6,876
City of Muskego	11,573	15,277	16,813	21,397	22,427
City of New Berlin	26,910	30,529	33,592	38,220	38,969
City of Oconomowoc	8,741	9,909	10,993	12,382	13,459
City of Pewaukee	7,551	8,922	9,621	11,783	12,625
City of Waukesha	39,665	50,365	56,894	64,825	67,580
Waukesha County	231,335	280,203	304,715	360,767	377,348

Source: U.S. Bureau of the Census and the Wisconsin Department of Administration

Note: The Town of Pewaukee was incorporated as the City of Pewaukee in 1999.

Table II-3

OWNER VS. RENTER OCCUPIED UNITS IN WAUKESHA COUNTY MUNICIPALITIES: 2000

Community	Owner Occupied	Percent	Renter Occupied	Percent
Town of Brookfield	1,763	63.8	999	36.2
Town of Delafield	2,521	96.0	104	4.0
Town of Eagle	1,049	93.8	69	6.2
Town of Genesee	2,431	98.0	50	2.0
Town of Lisbon	3,104	96.5	114	3.5
Town of Merton	2,706	92.3	226	7.7
Town of Mukwonago	2,184	97.5	57	2.5
Town of Oconomowoc	2,765	90.8	280	9.2
Town of Ottawa	1,232	89.6	143	10.4
Town of Summit	1,747	91.8	157	8.2
Town of Vernon	2,380	99.0	25	1.0
Town of Waukesha	2,891	98.2	54	1.8
Village of Big Bend	448	98.0	9	2.0
Village of Butler	455	49.7	461	50.3
Village of Chenequa	193	86.5	30	13.5
Village of Dousman	315	54.8	260	45.2
Village of Eagle	529	89.4	63	10.6
Village of Elm Grove	2,444	95.6	112	4.4
Village of Hartland	1,746	58.2	1,256	41.8
Village of Lac La Belle	114	97.4	3	2.6
Village of Lannon	361	84.9	64	15.1
Village of Menomonee Falls	9,939	77.4	2,905	22.6
Village of Merton	558	94.4	33	5.6
Village of Mukwonago	1,516	63.4	876	36.6
Village of Nashotah	427	96.0	18	4.0
Village of North Prairie	455	85.7	76	14.3
Village of Oconomowoc Lake	185	88.9	23	11.1
Village of Pewaukee	2,330	64.1	1,305	35.9
Village of Sussex	2,179	65.8	1,131	34.2
Village of Wales	722	85.3	124	14.7
City of Brookfield	12,482	89.9	1,409	10.1
City of Delafield	1,694	66.4	859	33.6
City of Muskego	6,228	82.7	1,305	17.3
City of New Berlin	11,778	81.3	2,717	18.7
City of Oconomowoc	3,102	62.4	1,866	37.6
City of Pewaukee	3,826	84.0	727	16.0
City of Waukesha	14,508	56.5	11,155	43.5
Waukesha County Total	**103,373**	**76.4**	**31,856**	**23.6**

Source: U.S. Bureau of the Census

Racial Composition

According to the 2000 U.S. Census, almost 96 percent of residents in Waukesha County were Caucasian in 2000. However, the population of Waukesha County continues to grow more diverse. Between 1990 and 2000 the Hispanic population in the County nearly doubled from 5,448 to 9,503. The City of Waukesha experienced the largest growth in the number of Hispanics. Several neighborhood block groups within the City of Waukesha recorded populations that were over 25 percent Hispanic. Asians made up the third largest racial group within Waukesha County with nearly 5,400 people.

Household Trends

In addition to population, the number of households, or occupied housing units, is of importance in land use and public facility planning. Households directly influence the demand for urban land as well as the demand for transportation and other public facilities and services. A household includes all persons who occupy a housing unit-defined by the Census Bureau as a house, an apartment, a mobile home, a group of rooms, or a single-room that is occupied, or intended for occupancy, as separate living quarters.

The number of households in the County increased by 29,239 households, or 28 percent, from 105,990 households in 1990 to 135,229 households in 2000. This follows increases of 17,438 households during the 1980s, 26,617 households during the 1970s, 19,541 households during the 1960s, and 18,795 households during the 1950s. In 2000, slightly over 76 percent (103,373) of the total housing units were owner occupied in Waukesha County. This figure is consistent with neighboring counties with the exception of Milwaukee County which had 52 percent owner occupied homes in 2000. In Waukesha County municipalities, owner occupied housing ranges from 56.5 percent of total housing stock in the City of Waukesha to 99 percent in the Town of Vernon (Table II-3).

Household Size

In 2000, the average household size ranged from 2.05 in the Village of Butler to 3.26 in the Village of Merton (Table II-4). The average household size in the Village of Chenequa was 2.61 in Waukesha County which was very close to the County average. Household size continues to decline slightly in Waukesha County communities. From 1990 to 2000, the average household size declined in Waukesha County from 2.83 to 2.63. This trend is occurring on a regional, state, and national scale as families continue to become smaller. A growing population with a decreasing household size has implications for development of housing stock, demand for future water and sanitary sewer capacity, land use, and other utilities and community facilities. This trend is examined in more detail in the Housing and Utilities and Community Facilities chapters of this report.

Table II-4

AVERAGE HOUSEHOLD SIZE IN WAUKESHA COUNTY: 2000

Community	Average Household Size	Community	Average Household Size	Community	Average Household Size
Town of Brookfield	2.29	Village of Big Bend	2.85	City of Brookfield	2.74
Town of Delafield	2.93	Village of Butler	2.05	City of Delafield	2.52
Town of Eagle	2.97	Village of Chenequa	2.61	City of Muskego	2.80
Town of Genesee	3.00	Village of Dousman	2.58	City of New Berlin	2.62
Town of Lisbon	2.90	Village of Eagle	2.88	City of Oconomowoc	2.40
Town of Merton	2.95	Village of Elm Grove	2.49	City of Pewaukee	2.57
Town of Mukwonago	3.14	Village of Hartland	2.63	City of Waukesha	2.43
Town of Oconomowoc	2.69	Village of Lac La Belle	2.81	Waukesha County	2.63
Town of Ottawa	2.73	Village of Lannon	2.37		
Town of Summit	2.76	Village of Menomonee Falls	2.52		
Town of Vernon	3.00	Village of Merton	3.26		
Town of Waukesha	2.97	Village of Mukwonago	2.54		
		Village of Nashotah	2.84		
		Village of North Prairie	2.96		
		Village of Oconomowoc Lake	2.71		
		Village of Pewaukee	2.19		
		Village of Sussex	2.67		
		Village of Wales	2.98		

Source: U.S. Bureau of the Census

Median Age

Waukesha County's median age is increasing. The median age in 1970 for the county was 27. The median age increased to 34 in 1990 and in 2000 reached 38.1. The City of Waukesha and villages of Hartland and Sussex had median ages well below the county's median age in 2000 (Table II-5). The towns of Brookfield, Ottawa, the

villages of Chenequa, Elm Grove, Lac La Belle, and Oconomowoc Lake and the City of Brookfield were well above the county's median age. The Village of Chenequa at 47.6 had the highest median age of any community in Waukesha County.

Table II-5

WAUKESHA COUNTY COMMUNITIES:
POPULATION BY AGE GROUP AND MEDIAN AGE: 2000

	Under 5	5 to 14	15 to 24	25 to 44	45 to 64	65 and Over	Median Age
Town of Brookfield	368	815	494	1,582	1,551	1,580	44.4
Town of Delafield	488	1,347	1,136	1,933	2,403	513	38.6
Town of Eagle	226	532	326	1,030	799	204	36.9
Town of Genesee	437	1,289	865	2,101	2,121	471	38.7
Town of Lisbon	620	1,542	994	2,716	2,515	982	38.6
Town of Merton	483	1,553	828	2,279	2,159	686	38.3
Town of Mukwonago	426	1,316	856	2,128	1,839	303	36.7
Town of Oconomowoc	402	1,136	817	2,188	2,175	733	39.7
Town of Ottawa	206	596	409	999	1,118	430	41.1
Town of Summit	286	762	569	1,411	1,421	532	39.6
Town of Vernon	346	1,206	1,353	864	2,360	412	39.4
Town of Waukesha	488	1,555	1,020	2,415	2,405	713	38.8
Village of Big Bend	76	236	147	384	320	105	36.8
Village of Butler	82	214	186	580	377	442	40.9
Village of Chenequa	25	69	66	111	217	95	47.6
Village of Dousman	106	262	191	514	268	243	35.4
Village of Eagle	164	306	175	649	301	112	32.8
Village of Elm Grove	320	950	516	1,266	1,789	1,408	45.7
Village of Hartland	550	1,353	1,062	2,647	1,703	590	34.1
Village of Lac La Belle	22	44	24	81	122	36	43.9
Village of Lannon	52	125	114	301	281	136	39.8
Village of Menomonee Falls	2,161	4,709	3,053	9,950	7,650	5,124	39.2
Village of Merton	140	441	213	634	423	75	34.5
Village of Mukwonago	434	864	882	1,980	1,328	674	33.9
Village of Nashotah	91	233	126	366	337	113	37.8
Village of North Prairie	98	296	188	515	392	92	36.3
Village of Oconomowoc Lake	21	92	53	122	216	64	44.5
Village of Pewaukee	578	981	829	3,048	1,742	992	35.5
Village of Sussex	799	1,413	988	3,202	1,695	731	34.1
Village of Wales	151	443	356	732	736	105	37.3
City of Brookfield	2,072	6,311	3,740	8,957	10,760	6,808	42.5
City of Delafield	430	991	669	1,931	1,752	699	38.7
City of Muskego	1,431	1,482	2,232	6,737	5,332	1,781	37.5
City of New Berlin	2,275	5,425	4,222	11,083	10,372	4,843	39.8
City of Oconomowoc	781	1,716	1,757	2,253	2,686	2,092	38.0
City of Pewaukee	669	1,566	1,169	3,482	3,628	1,269	40.4
City of Waukesha	4,792	8,634	9,574	21,813	13,118	6,894	33.4
Waukesha County	23,096	54,805	41,587	107,439	90,406	43,434	38.1

Source: U.S. Bureau of the Census

Age Composition

The 45 to 64 and 65 and over age groups will continue to grow in number reflecting the aging of the "baby boomers" (people born between 1946 and 1964). Thirty-seven percent of the Village of Chenequa's population in 2000 was between the age of 45 and 64. The population aged 25 to 44 will begin to decrease as "baby boomers" grow older and fewer numbers of persons born in the 1970s move into this age group. This change in age composition will have implications for school districts, housing, labor, and transportation.

Table II-6

MEDIAN HOUSEHOLD INCOME BY SELECTED COUNTIES: 1999

County	Median Household Income
Milwaukee County	$38,100
Dodge County	$45,190
Walworth County	$46,274
Jefferson County	$46,901
Racine County	$48,059
Washington County	$57,033
Waukesha County	$62,839

Source: U.S. Bureau of the Census

Table II-7

MEDIAN HOUSEHOLD INCOME BY WAUKESHA COUNTY COMMUNITIES: 1999

Community	Median Household Income
Town of Brookfield	$55,417
Town of Delafield	$98,779
Town of Eagle	$69,071
Town of Genesee	$78,740
Town of Lisbon	$69,012
Town of Merton	$78,937
Town of Mukwonago	$75,067
Town of Oconomowoc	$68,676
Town of Ottawa	$69,493
Town of Summit	$76,859
Town of Vernon	$71,366
Town of Waukesha	$73,984
Village of Big Bend	$61,771
Village of Butler	$38,333
Village of Chenequa	$163,428
Village of Dousman	$53,409
Village of Elm Grove	$86,212
Village of Hartland	$58,359
Village of Lac La Belle	$100,000
Village of Lannon	$44,375
Village of Menomonee Falls	$57,952
Village of Merton	$75,000
Village of Mukwonago	$56,250
Village of Nashotah	$82,949
Village of North Prairie	$70,781
Village of Oconomowoc Lake	$112,760
Village of Pewaukee	$53,874
Village of Sussex	$76,859
Village of Wales	$75,000
City of Brookfield	$76,225
City of Delafield	$71,995
City of Muskego	$64,247
City of New Berlin	$67,576
City of Oconomowoc	$51,250
City of Pewaukee	$75,589
City of Waukesha	$50,084
Waukesha County	$62,839

Source: U.S. Bureau of the Census

Household Income
Waukesha County has a substantially higher median household income than adjacent counties. The median household income was $62,839 in 2000 for Waukesha County (Table II-6). This figure was over 60 percent higher than the median household income in Milwaukee County. The median household income in Waukesha County communities (Table II-7) ranged from $33,883 in the Village of Butler to over $160,000 in the Village of Chenequa.

Household Income
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Employment Trends
Waukesha County has continued to enhance its economy through new job creation. Waukesha County experienced a 43 percent growth in employment from 1990 to 2000 resulting in a net addition of 81,100 jobs. (Table II-8). Ozaukee County also recorded impressive employment growth during this period. Although, Milwaukee County has nearly three times as many jobs as Waukesha, it recorded only a 2 percent increase in jobs during the 1990's.

Table II-8

TOTAL EMPLOYMENT TRENDS BY SELECTED COUNTIES: 1990-2000

County	1990	2000	Number Increase In Employment 1990-2000	Percent Increase In Employment 1990-2000
Waukesha County	189,700	270,800	81,100	43%
Milwaukee County	609,800	624,600	14,800	2%
Ozaukee County	35,300	50,800	15,500	44%
Racine County	89,600	94,400	4,800	5%
Washington County	46,100	61,700	15,600	34%
Walworth County	39,900	51,800	11,900	30%

Source: U.S. Bureau of Economic Analysis and SEWRPC

Waukesha County like the rest of Wisconsin has experienced a decline in manufacturing as a percent of total employment. Despite this fact, Waukesha County is still above the national average in manufacturing employment. Approximately 21 percent of all jobs in Waukesha County are in manufacturing. Nationally, only about 12 percent of all jobs are in manufacturing. Service employment has increased significantly over the last decade and now is the most important sector for jobs in the county accounting for 28 percent of all jobs within Waukesha County (Table II-9).

Waukesha County has the third highest percentage of people with associate, bachelors, graduate, and professional degrees in Wisconsin (Table II-10). Over 41 percent of people 25 years of age and older have an associate, bachelors, graduate, or professional degree within Waukesha County. Only Dane with 49.5 percent and Ozaukee at 45.6 percent have higher percentages in Wisconsin. In the State of Wisconsin, 31 percent of residents age 25 and over have earned an associate, bachelors, graduate, or professional degree. Within Waukesha County municipalities, this figure ranges from 18 percent in the Village of Butler to 70 percent in the Village of Chenequa (Table II-11). The relatively high household income in the Village of Chenequa reflects the high level of educational attainment of village residents, and the fact that many are professionals and heads of businesses in the Southeastern Wisconsin Region.

Table II-9

WAUKESHA COUNTY EMPLOYMENT INDUSTRY TRENDS: 1990-2000

Waukesha County	1990	2000	1990-2000 Number Change in Employment	2000 Percent of Total Employment
Agriculture	1,191	1,011	-180	1%
Construction	12,679	18,462	5,783	7%
Manufacturing	44,871	56,754	11,883	21%
Transportation, Communication and Utilities	8,185	9,516	2,434	4%
Wholesale Trade	16,128	22,508	6,380	8%
Retail Trade	31,054	43,132	12,078	16%
Finance, Insurance and Real Estate	13,131	22,340	9,209	8%
Services	46,293	76,265	29,979	28%
Government and Government Enterprises	13,994	17,059	3,065	7%
Other	2,135	3,749	1,614	1%

Source: U.S Bureau of Economic Analysis and SEWRPC

Notes: Services include Business, Repair, Personal, Entertainment, Recreation, Health, Education, Accommodation and Food, Social, and Professional services. Government and Government Enterprises includes all non-military government agencies and enterprises, regardless of SIC code. Other includes agricultural services, forestry, commercial fishing, mining, and unclassified jobs.

Table II-10

WAUKESHA COUNTY EDUCATIONAL ATTAINMENT FOR PERSONS 25 AND OVER: 2000

Educational Attainment Level	Number	Percent
Less than 9th Grade	5,537	2.3
High School, No Diploma	14,873	5.7
High School Graduate	66,651	27.6
Some College (No Degree)	54,483	22.6
Associate Degree	18,492	7.7
Bachelor's Degree	57,050	23.6
Graduate /Professional Degree	25,213	10.4
Total	**241,299**	**100**

Source: U.S. Bureau of the Census

LAND USE

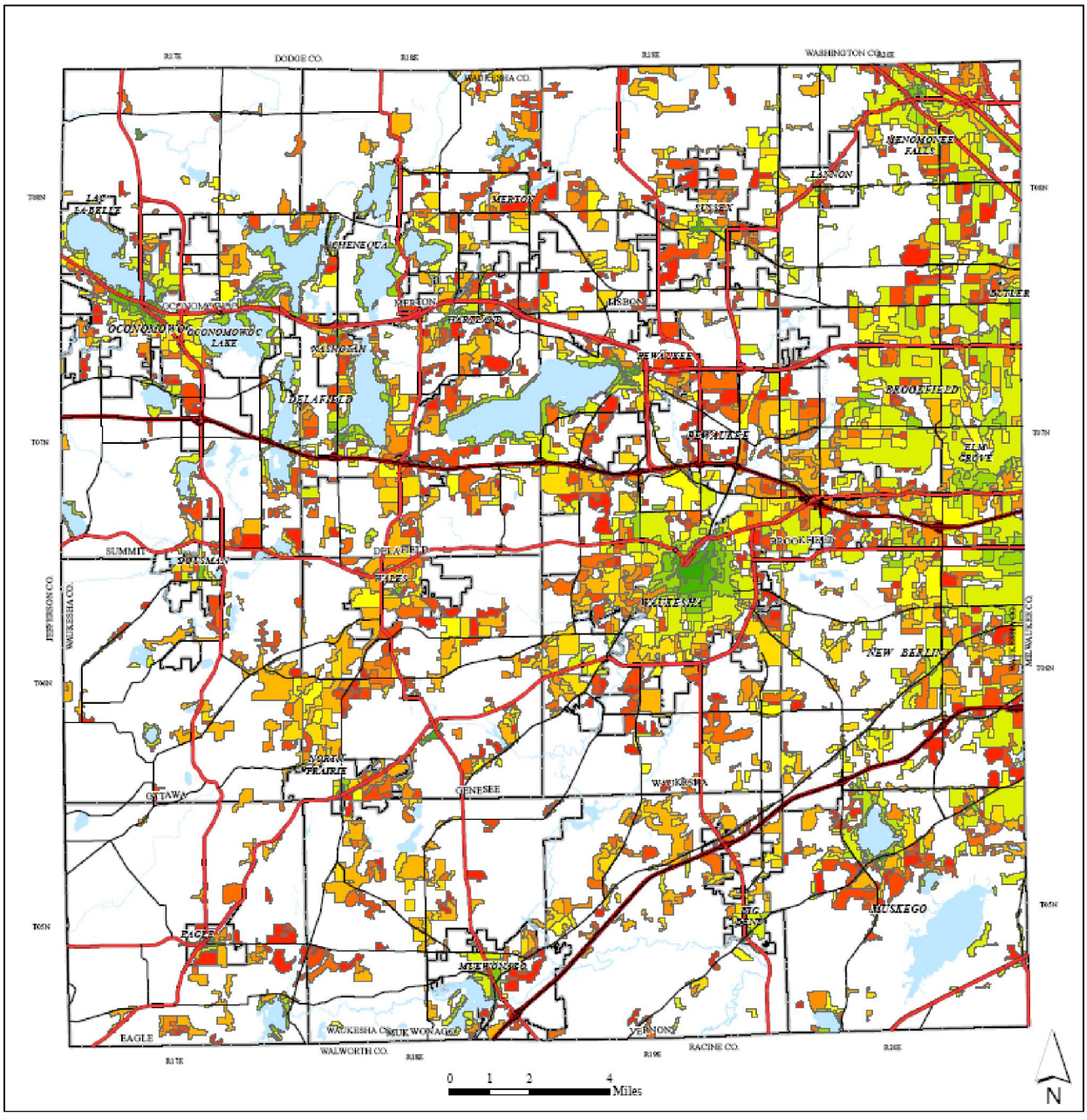
SEWRPC relies on two types of inventories and analyses in order to monitor urban growth and development in Southeastern Wisconsin—an urban growth ring analysis and a land use inventory. The urban growth ring analysis delineates the outer limits of concentrations of urban development and depicts the urbanization over the past 150 years. When related to urban population levels, the urban growth ring analysis provides a good basis for calculating urban population and household densities. By contrast, SEWRPC's land use inventory is a more detailed inventory that places all land and water areas into one of 66 discrete land use categories, providing a basis for analyzing specific urban and non-urban land uses. Both the urban growth ring analysis and the land use inventory have been updated to the year 2000 under the continuing regional planning program, therefore serve as the basis for the land use trends present in this Plan.

Urban Growth Ring Analysis

The urban growth ring analysis shows the historical pattern of urban settlement, growth, and development since 1850 for selected points in time. Areas identified as urban under this time series analysis include areas where residential structures or other buildings have been constructed in relatively compact groups, thereby indicating a concentration of residential, commercial, industrial, governmental, institutional, or other urban land uses. In addition, the identified urban areas encompass certain open space lands such as urban parks and small areas being preserved for resource conservation purposes within the urban areas.

Map II-1

HISTORIC GROWTH RING ANALYSIS IN WAUKESHA COUNTY: 1850-2000
HISTORIC URBAN GROWTH IN WAUKESHA COUNTY: 1850-2000



Legend

- *Civil Division Boundary*
- *Interstate*
- *US*
- *State*
- *County*

Historic Urban Growth

Year

- *1850*
- *1880*
- *1900*
- *1920*
- *1940*
- *1950*
- *1963*
- *1970*
- *1975*
- *1980*
- *1985*
- *1990*
- *1995*
- *2000*

Source: SEWRPC and Waukesha County
Civil Divisions as of 5/31/08
Prepared by Waukesha Co.
Dept. of Parks and Land Use

Table II-11

RESIDENTS OF AGE 25 AND OVER WITH ASSOCIATES, BACHELOR'S, GRADUATE, OR PROFESSIONAL DEGREES BY COMMUNITY IN WAUKESHA COUNTY: 2000

Community	Number	Percent
Town of Brookfield	2,026	45.6
Town of Eagle	673	34.2
Town of Delafield	2,802	57.5
Town of Genesee	2,100	45.5
Town of Lisbon	2,149	28.3
Town of Merton	2,282	44.9
Town of Mukwonago	1,757	42.3
Town of Oconomowoc	1,957	38.8
Town of Ottawa	959	37.5
Town of Summit	1,355	40.2
Town of Vernon	1,428	30.1
Town of Waukesha	2,247	40.8
Village of Big Bend	228	28.1
Village of Butler	257	18.4
Village of Chenequa	291	70.4
Village of Dousman	287	27.2
Village of Eagle	309	26.9
Village of Elm Grove	3,058	69.1
Village of Hartland	2,028	40.9
Village of Lac La Belle	139	58.5
Village of Lannon	111	15.7
Village of Menomonee Falls	8,566	37.6
Village of Merton	451	37.4
Village of Mukwonago	1,381	35.0
Village of Nashotah	436	53.7
Village of North Prairie	370	36.6
Village of Oconomowoc Lake	244	61.6
Village of Pewaukee	2,227	38.3
Village of Sussex	2,012	36.2
Village of Wales	761	49.3
City of Brookfield	14,727	55.3
City of Delafield	2,002	45.1
City of Muskego	4,699	33.1
City of New Berlin	11,562	44.0
City of Oconomowoc	3,221	38.5
City of Pewaukee	3,927	46.0
City of Waukesha	3,927	37.6

Source: U.S. Bureau of the Census

As part of the urban growth ring analysis, urban growth for the years prior to 1940 was identified using a variety of sources, including the records of local historical societies, land subdivision plat records, farm plat maps, U. S Geological Survey maps, and Wisconsin Geological and Natural History Survey records. Urban growth for the years 1940, 1950, 1963, 1970, 1980, 1990, and 2000 was identified using aerial photographs. Because of limitations inherent in the source materials, information presented for the years prior to 1940 represents the extent of urban development at approximately those points in time, whereas the information presented for later years can be considered precisely representative of those respective points in time. The urban growth ring analysis, updated through 2000, is presented graphically on Map II-1.

Population Projections

Projections are estimates of the population for future dates. They illustrate plausible courses of future population change based on assumptions about future births, deaths, international migration, and domestic migration.

While projections and estimates may appear similar, there are some distinct differences between the two measures. Estimates are for the past, while projections are based on assumptions about future demographic trends. Estimates generally use existing data collected from various sources, while projections must assume what demographic trends will be in the future.

Table II-12

POPULATION PROJECTIONS BY COMMUNITY IN WAUKESHA COUNTY: 2010-2035

Community	2010	2015	2020	2025	2030	2035
Town of Brookfield	6,957	7,212	7,468	7,782	8,055	8,349
Town of Delafield	9,120	9,712	10,295	10,949	11,603	12,313
Town of Eagle	3,817	4,138	4,451	4,793	5,156	5,554
Town of Genesee	7,970	8,281	8,593	8,971	9,305	9,664
Town of Lisbon	9,751	9,926	10,110	10,378	10,565	10,770
Town of Merton	8,729	9,062	9,397	9,804	10,162	10,546
Town of Mukwonago	7,631	7,989	8,346	8,765	9,153	9,571
Town of Oconomowoc	7,400	7,370	7,354	7,404	7,384	7,374
Town of Ottawa	4,057	4,191	4,327	4,497	4,641	4,795
Town of Summit	5,308	5,479	5,653	5,870	6,053	6,250
Town of Vernon	7,209	7,192	7,189	7,250	7,243	7,245
Town of Waukesha	8,873	9,001	9,139	9,354	9,493	9,646
Village of Big Bend	1,202	1,165	1,132	1,110	1,078	1,048
Village of Butler	1,769	1,714	1,666	1,634	1,587	1,543
Village of Chenequa	573	568	564	566	562	559
Village of Dousman	1,721	1,781	1,842	1,917	1,981	2,051
Village of Eagle	1,912	2,005	2,097	2,205	2,306	2,414
Village of Elm Grove	5,948	5,802	5,672	5,597	5,469	5,351
Village of Hartland	8,828	9,247	9,662	10,149	10,601	11,088
Village of Lac La Belle	358	372	385	401	415	431
Village of Lannon	958	933	911	898	876	856
Village of Menomonee Falls	34,668	35,565	36,483	37,696	38,651	39,684
Village of Merton	2,238	2,378	2,517	2,672	2,826	2,994
Village of Mukwonago	6,839	7,131	7,422	7,770	8,084	8,423
Village of Nashotah	1,548	1,677	1,803	1,941	2,087	2,247
Village of North Prairie	1,900	2,048	2,193	2,353	2,520	2,702
Village of Oconomowoc Lake	651	660	670	686	696	707
Village of Pewaukee	9,299	9,813	10,320	10,902	11,462	12,068
Village of Sussex	10,745	11,620	12,475	13,412	14,399	15,480
Village of Wales	2,537	2,540	2,548	2,578	2,584	2,594
City of Brookfield	39,577	39,959	40,396	41,179	41,607	42,096
City of Delafield	7,322	7,707	8,089	8,530	8,950	9,402
City of Muskego	23,183	23,984	24,791	25,792	26,648	27,570
City of New Berlin	40,333	41,265	42,228	43,535	44,529	45,607
City of Oconomowoc	13,190	13,542	13,902	14,375	14,751	15,158
City of Pewaukee	13,434	14,227	15,009	15,898	16,768	17,708
City of Waukesha	68,905	70,666	72,471	74,859	76,734	78,762
Waukesha County	**386,460**	**397,922**	**409,570**	**424,472**	**436,986**	**450,620**

Source: Wisconsin Department of Administration

Note: The projections for years 2030 and 2035 were made with simple trend extrapolation techniques by the University of Wisconsin Applied Population Laboratory. These projections are built upon the Wisconsin Department of Administration's Demographic Services Center's population projections for municipalities (through 2025) and for counties (through 2030).

In the report, *The Population of Southeastern Wisconsin*, SEWRPC projected a range of future population and household levels – using high, intermediate, and low growth scenarios for Waukesha County. The analysis uses the cohort-component projection model that projects population based on births, deaths, and migration rates. (Previously said fertility, survival, and migration rates). After analyzing the data, the intermediate growth projection was used for land use planning purposes. The intermediate population projection predicts a modest increase in birth rates, a slight improvement in death rates, and a relatively stable migration pattern through 2035. The intermediate projection of growth for Waukesha County is slightly higher than projections developed by the Wisconsin Department of Administration (Tables II-13 and II-14). SEWPRC in their study did not attempt to create projections for individual communities in Waukesha County. The Wisconsin Department of Administration developed projections through 2025 for communities within the County (Table II-12). The University of Wisconsin Applied Population Laboratory made the projections for years 2030 and 2035 with simple trend extrapolation techniques. These projections are built upon the Wisconsin Department of Administration's Demographic Services Center's population projections for municipalities (through 2025) and for counties (through 2030). At the community level it is more difficult to project future population growth. There is greater uncertainty with making demographic trend assumptions at the community level. For example, fertility is influenced by many factors including age of residents, income, educational attainment, race, and percentage of married couple families. Domestic migration or movement from one community to another is also difficult to project at a local community level. This variable is influenced by age, marriage, income, housing availability, and percentage of renters vs. homeowners. Between 1995 and 2000 over 66,000 Waukesha County residents moved to different houses within communities in the County. As a result, the projections for communities are a best projection guess, but may end up being quite different at the community level 30 years into the future.

Table II-13

PROJECTED POPULATION IN WAUKESHA COUNTY: 2010-2035
(INTERMEDIATE PROJECTION)

	2010	2015	2020	2025	2030	2035
Waukesha County	391,499	404,086	417,362	429,635	440,289	446,768

Source: SEWRPC

Table II-14

ACTUAL AND PROJECTED HOUSEHOLDS IN WAUKESHA COUNTY: 2000-2035
(INTERMEDIATE PROJECTION)

		Change from Preceding Year	
Year	**Households**	**Absolute**	**Percent**
Actual Households:			
2000	135,200	--	--
Projected Households:			
2005	144,300	9,100	6.7
2010	150,800	6,500	4.5
2015	156,700	5,900	3.9
2020	162,300	5,600	3.6
2025	167,400	5,100	3.1
2030	171,900	4,500	2.7
2035	174,100	2,200	1.3
Change: 2000-2035	**--**	**38,900**	**28.8**

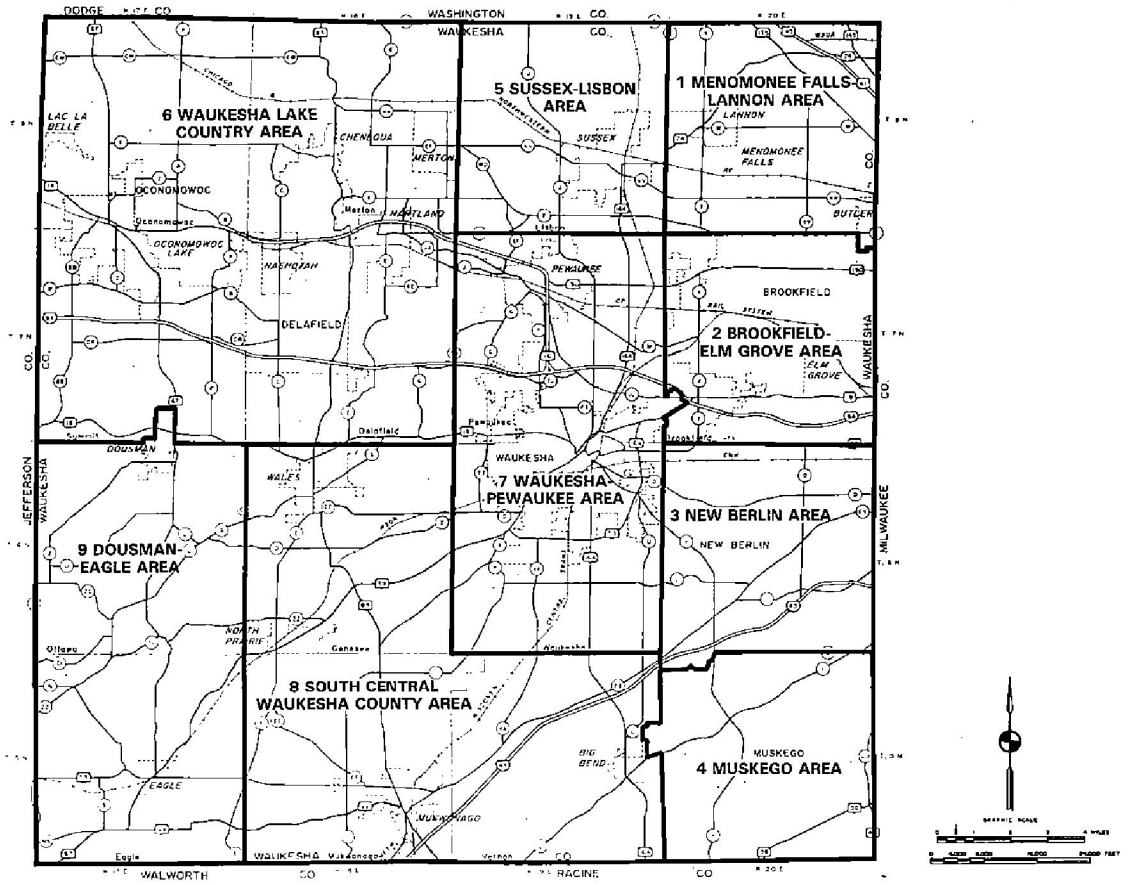
Source: U.S. Bureau of the Census and SEWRPC.

Household Projections

Based upon the intermediate projection, SEWRPC estimates that Waukesha County will gain an additional 38,900 households by 2035 (Table II-14). The SEWRPC intermediate population growth projection for the County in 2035 is 446,768. This projected trend would result in a continued decline in household size to 2.50 persons.

Map II-2

WAUKESHA COUNTY PLANNING ANALYSIS AREAS



Source: SEWRPC.

Table II-15

EXISTING 2000 AND PLANNED 2035 POPULATION, HOUSEHOLDS AND EMPLOYMENT BY PLANNING ANALYSIS AREA

County and Planning Analysis Area (See Map II-2)	Population				Households				Jobs			
	Existing 2000	Planned Increment: 2000 - 2035		Total 2035	Existing 2000	Planned Increment: 2000 – 2035		Total 2035	Existing 2000	Planned Increment: 2000 - 2035		Total 2035
		Number	Percent			Number	Percent			Number	Percent	
Waukesha												
1	35,500	9,200	25.9	44,700	14,200	4,300	30.3	18,500	43,800	9,800	22.4	53,600
2	50,900	6,300	12.4	57,200	19,000	3,200	16.8	22,200	58,500	6,500	11.1	65,000
3	38,200	7,200	18.8	45,400	14,500	3,400	23.4	17,900	27,000	7,400	27.4	34,400
4	21,400	9,400	43.9	30,800	7,500	3,800	50.7	11,300	7,400	1,300	17.6	8,700
5	18,400	7,200	39.1	25,600	6,600	3,100	47.0	9,700	9,300	4,300	46.2	13,600
6	59,400	16,300	27.4	75,700	21,800	7,100	32.6	28,900	31,500	13,400	42.5	44,900
7	93,800	20,500	21.9	114,300	36,800	9,600	26.1	46,400	78,900	10,400	13.2	89,300
8	32,900	7,300	22.2	40,200	11,200	3,200	28.6	14,400	11,500	7,800	67.8	19,300
9	10,300	2,600	25.2	12,900	3,600	1,200	33.3	4,800	2,900	2,000	69.0	4,900
Total	360,800	86,000	23.8	446,800	135,200	38,900	28.8	174,100	270,800	62,900	23.2	333,700

Source: SEWRPC.

Table II-16

POPULATION IN THE REGION BY SEWER SERVICE AREA: EXISTING 2000 AND 2035 RECOMMENDED PLAN

County and Sewer Service Area Name	Existing Population: 2000			Sewered Population: 2035 Recommended Plan		
					Change	
	Sewered	Unsewered[a]	Total	2035	Number	Percent
Waukesha County						
Big Bend	-	1,860	1,860	1,930	1,930	-
Brookfield East[i]	18,430	-	18,430	20,380	1,950	10.6
Brookfield West[ii]	27,740	360	28,100	32,580	4,840	17.4
Butler	1,840	-	1,840	1,880	40	2.2
Delafield[iii]	5,940	4,680	10,620	12,800	6,860	115.5
Dousman[iv]	1,960	1,690	3,650	4,960	3,000	153.1
Eagle Spring Lake/ Mukwonago Park/ Rainbow Springs	-	460	460	450	450	-
Elm Grove	5,570	-	5,570	5,770	200	3.6
Golden Lake	-	180	180	190	190	-
Hartland	8,770	260	9,030	11,310	2,540	29.0
Lake Country[v]	1,280	11,110	12,390	14,080	12,800	>300.0
Lannon	1,210	80	1,290	1,900	690	57.0
Menomonee Falls East[vi]	28,740	840	29,580	34,410	5,670	19.7
Menomonee Falls West[vii]	480	1,040	1,520	4,910	4,430	>300.0
Mukwonago (part)	6,260	1,090	7,350	11,260	5,000	79.9
Muskego[viii]	19,090	350	19,440	28,610	9,520	49.9
Muskego South[ix]	1,090	40	1,130	1,240	150	13.8
New Berlin[x]	31,970	2,500	34,470	41,190	9,220	28.8
Oconomowoc[xi]	13,750	1,810	15,560	21,380	7,630	55.5
Pewaukee[xii]	20,560	1,900	22,460	32,140	11,580	56.3
Sussex/Lisbon	10,270	1,660	11,930	17,770	7,500	73.0
Wales	-	1,600	1,600	1,950	1,950	-
Waukesha	67,300	8,410	75,710	88,440	21,140	31.4

Source: SEWRPC

[i] Includes area of the City of Brookfield tributary to the Milwaukee Metropolitan Sewerage District

[ii] Includes area of the City of Brookfield tributary to the Fox River Water Pollution Control Commission sewage treatment plant, along with small areas of the Village of Menomonee Falls and the City of New Berlin tributary to that treatment plant

[iii] Includes Village of Nashotah and Nemahbin Lakes Sewer Service Area

[iv] Includes Lower Genesee Lake, Pretty Lake, and School Section Lake Sewer Service Areas

[v] Includes the following sewer service areas located generally east of the City of Oconomowoc: Ashippun Lake, Beaver Lake, Lake Keesus, North Lake, Oconomowoc Lake, Okauchee Lake, Pine Lake, and the Village of Merton

[vi] Includes area of the Village of Menomonee Falls tributary to the Milwaukee Metropolitan Sewerage District

[vii] Includes area of the Village of Menomonee Falls tributary to the Sussex sewage treatment plant

[viii] Includes area of the City of Muskego tributary to the Milwaukee Metropolitan Sewerage District

[ix] Includes area of the City of Muskego tributary to the Town of Norway Sanitary District No. 1 sewage treatment plant

[x] Includes area of the City of New Berlin tributary to the Milwaukee Metropolitan Sewerage District

[xi] Includes the Village of Lac la Belle Sewer Service Area

[xii] Includes the City and Village of Pewaukee and Pewaukee Lake Sewer Service Areas

Population Projections for the Planning Area and Southeastern Wisconsin

The projected population for the Waukesha County planning analysis areas (presented in Map II-2) in 2035 is 446,768 persons. This is a projected increase of 86,000 persons, or about 23.8 percent, over the 2000 population level of 360,800. Existing and projected population, households and job totals for planning analysis areas are set forth in Table II-15. More detailed discussion regarding employment and other economic trends are presented in Chapter 6.

Planned urban service areas generally include the corporate boundaries of cities and villages and additional contiguous lands needed to accommodate anticipated urban development. The 2000 population in each urban service area shown on Table II-16 is therefore greater than the 2000 population in the corresponding city or village corporate boundaries because the planned urban service area includes lands that are now in the towns. Although most cities and villages require land to be annexed before providing sewer, this plan does not assume that annexation is a prerequisite to providing public sewer. Cities and villages may enter into boundary or cooperative agreements that could provide for the extension of sewer and other services without annexation, subject to conditions negotiated between the city or village and the adjacent town as part of an agreement.

Population Projections for the Village of Chenequa

The population projections for the Village of Chenequa show that the population of the Village will remain about the same through 2035. The Village is a residential community with the stated objective of maintaining its open space and rural character and therefore has little room for increased development. As a result, the population will remain stable through 2035 (Table II-12)

Table II-17

CHANGE IN LAND USE ACRES IN WAUKESHA COUNTY: 1963-2000

Land Use Category[a]	1963	1970	1980	1990	2000
Urban					
Residential	28,148	35,476	50,745	59,247	75,221
Commercial	1,197	1,831	2,754	3,827	5,351
Industrial	924	1,758	2,747	3,802	5,525
Transportation, Communication, and Utilities	16,079	18,545	21,867	22,805	30,001
Governmental and Institutional	2,550	3,587	4,037	4,215	4,887
Recreational	3,311	4,605	5,756	6,465	8,253
Unused Urban Land	8,509	8,516	8,017	7,025	7,806
Subtotal Urban	**60,718**	**74,318**	**95,923**	**107,386**	**137,044**
Non-urban					
Natural Areas					
Surface Water	16,076	16,461	16,753	16,878	16,891
Wetlands	52,588	51,660	51,233	51,978	52,661
Woodlands	31,181	30,818	29,472	29,584	28,931
Subtotal Natural Areas	**99,845**	**98,939**	**97,458**	**98,440**	**98,483**
Agricultural	200,241	184,390	161,558	142,428	112,611
Unused Rural and Other Open Lands	10,786	13,943	16,651	23,336	23,397
Subtotal Nonurban	**310,872**	**297,272**	**275,667**	**264,204**	**234,491**
Total	371,590	371,590	371,590	371,590	371,535

Note: As part of the regional land use inventory for the year 2000, the delineation of existing land use was referenced to real property boundary information not available for the 1990 and prior inventories. This change increases the precision of the land use inventory and makes it more useable to public agencies and private interests throughout the Region. As a result of the change, however, year 2000 land use inventory data are not strictly comparable with data from the 1990 and prior inventories. At the county and regional level, the most significant effect of the change is to increase the transportation, communication, and utilities category—the result of the use of actual street and highway rights-of-way as part of the 2000 land use inventory, as opposed to the use of narrower estimated rights-of-way in prior inventories. This treatment of streets and highways generally diminishes the area of adjacent land uses traversed by those streets and highways in the 2000 land use inventory relative to prior inventories.

Land Use Inventory

SEWRPC land use inventory is intended to serve as a relatively precise record of land use at selected points in time. The land use classification system used in the inventory consists of nine major categories which are divisible into 66 sub-categories, making the inventory suitable for both land use and transportation planning, adaptable to storm water drainage, public utility, and community facility planning, and compatible with other land

use classification systems. Aerial photographs serve as the primary basis for identifying existing land use, augmented by field surveys as appropriate.

The first regional land use inventory was prepared by SEWRPC in 1963 and has been updated periodically following the preparation of new aerial photography, with the most recent inventory prepared using aerial photographs taken in spring of 2000. As part of the year 2000 land use inventory, the delineation of existing land use was referenced to real property boundary information not available in prior inventories. This change increases the precision of the land use inventory and makes it more useable to public agencies and private interests. As a result of this change, however, year 2000 land use inventory data are not strictly comparable with data from the 1990 and prior inventories. The data remains suitable for denoting general land use trends. The results of the year 2000 land use inventory are presented along with the results of prior land use inventories in Table II-17.

Land Use Change: 1963-2000

Residential development was responsible for the most significant land use change within Waukesha County since 1963. Over 47,000 acres of land was converted to residential use as the county gained over 100,000 households between 1960 and 2000. Agricultural lands experienced the greatest loss of any land use within the county between 1963 and 2000. Nearly 88,000 acres of agricultural lands were converted to other land uses.

NATURAL RESOURCES

Groundwater Supply

The importance of groundwater as a source of water supply in Waukesha County and Southeastern Wisconsin can be shown by analyzing water-use data. According to estimates by the U.S. Geological Survey, water users in the Southeastern Wisconsin Region used about 324 million gallons per day (mgd) of water from surface and groundwater sources in 2000, not including water used for thermoelectric-power production. From this amount, 228 mgd, or about 70 percent, was withdrawn from surface water sources, primarily Lake Michigan; and 96 mgd, or about 30 percent, from groundwater (see Table II-18). In Waukesha County, nearly all of the water supply has historically been obtained from the groundwater system. This has recently changed somewhat with the conversion of the eastern portion of the Village of Menomonee Falls, the Village of Butler, and the eastern portion of the City of New Berlin to Lake Michigan water over the period of 1999 to 2005. Groundwater use and total water use in Waukesha County have risen steadily since 1985, increasing by about 36 percent over the period 1985 to 2000.

Table II-18

TRENDS IN REPORTED SURFACE (SW) AND GROUNDWATER (GW) USE IN SOUTHEASTERN WISCONSIN: 1979-2000
(IN MILLION GALLONS PER DAY)

County Name	1979			1985			1990			2000		
	SW	GW	Total	SW	GW	Total	SW	GW	Total	SW	GW	Total
Kenosha	17.81	3.42	21.23	17.87	2.54	20.41	20.41	2.56	22.97	16.04	2.69	18.73
Milwaukee	172.47	10.18	182.65	213.26	9.91	223.17	184.96	6.17	191.13	183.22	6.32	189.54
Ozaukee	1.19	6.66	7.85	1.15	6.33	7.48	1.43	6.66	8.09	1.52	7.80	9.32
Racine	22.55	7.69	30.24	22.55	7.28	29.83	29.32	8.85	38.17	26.24	13.63	39.87
Walworth	0.14	9.89	10.03	1.16	9.14	10.30	0.08	16.07	16.15	0.07	14.95	15.02
Washington	0.15	10.11	10.26	0.06	9.37	9.43	0.08	9.76	9.84	0.08	13.30	13.38
Waukesha	0.02	33.37	33.39	0.12	27.84	27.96	0.04	30.78	30.82	0.35	37.56	37.91
Total	**214.33**	**81.32**	**295.65**	**256.17**	**72.41**	**328.58**	**236.32**	**80.85**	**317.17**	**227.52**	**96.25**	**323.77**
Percent of Total	72.5	27.5	100.0	78.0	22.0	100.0	74.5	25.5	100.0	70.3	29.7	100.0

Source: SEWRPC and U. S. Geological Survey, 2000.

Note: The trends are based on currently available data, but the sources of information and accuracy of data may vary from one reporting period to another. The USGS obtains most of water-use data from files of state agencies, and makes estimates for categories for which data are not reported (private domestic and agricultural uses). Water used for thermoelectric power is not included.

GW: Groundwater; SW: Surface Water

Recharge to groundwater is derived almost entirely from precipitation. Much of the groundwater in shallow aquifers originates from precipitation that has fallen and infiltrated within a radius of about 20 or more miles from where it is found. The bedrock formations underlying the unconsolidated surficial deposits of Waukesha County consist of Precambrian crystalline rocks; Cambrian sandstone; Ordovician dolomite, sandstone, and shale; and Silurian dolomite. The uppermost bedrock unit throughout most of the county is pervious Silurian dolomite, primarily Niagara dolomite, underlaid by a relatively impervious layer of Maquoketa shale. In some of the pre-Pleistocene valleys in the southwestern and central portions of the county, however, the Niagara dolomite is absent and the uppermost bedrock unit is the Maquoketa shale.

The deeper sandstone aquifers are recharged by downward leakage of water through the Maquoketa Formation from the overlying aquifers or by infiltration of precipitation in western Waukesha County where the sandstone aquifer is not overlain by the Maquoketa Formation and is unconfined. On the average, precipitation annually brings about 32 inches of water to the surface area of the county. It is estimated that approximately 80 percent of that total is lost by evapotranspiration. Of the remaining water, part runs off in streams and part becomes groundwater. It is likely that the average annual groundwater recharge to shallow aquifers is 10 to 15 percent of annual precipitation.

To document the utilization of the shallow aquifers in the county, it may be assumed, for example, that, on the average, 10 percent of the annual precipitation reaches groundwater. Then, the average groundwater recharge in the County would be about 88 mgd. As previously noted, the estimated daily use of groundwater in 2000 was about 38 mgd, which is about 43 percent of the total amount of groundwater assumed to be recharged in a given year. This indicates that there is an adequate annual groundwater recharge to satisfy water demands on the shallow aquifer system in Waukesha County on a countywide basis. However, the availability on a localized area basis will vary depending upon usage, pumping system configuration, and groundwater flow patterns. The Village of Chenequa will periodically monitor shallow aquifer levels within its boundaries to determine if groundwater recharge is keeping pace with increased usage from neighboring high capacity wells installed since 2000.

The situation is different for the deep aquifers where withdrawals of groundwater cause supply/demand imbalance in areas of concentrated use of groundwater, which has resulted in the declining potentiometric surface and mining of groundwater. For example, Professor Douglas Cherkauer of the University of Wisconsin-Milwaukee, estimated that the demand on groundwater from the deep sandstone aquifer in Waukesha County is greater than the available supply (see Table II-19).

Table II-19

ESTIMATES OF AVAILABLE GROUNDWATER IN WAUKESHA COUNTY, 1999

Aquifer	Recharge Area (square miles)	Estimated Recharge Rate (inches per year)	Average Daily Recharge (mgd)	Average Daily Demand (mgd)
Shallow	400	3.1	59	3.5
Deep	100	3.1	14.8	31.5

Source: D.S. Cherkauer, 1999
Note: mgd: million gallons per day

The imbalanced withdrawal of groundwater has shifted the major pumping center in Southeastern Wisconsin from the City of Milwaukee in the early 1900's to eastern Waukesha County in 2005. As a result of the groundwater use trend, the center of the "cone of depression", a term used to describe the deepest part of the pumping drawdown, has shifted westward about eight miles from Milwaukee to near eastern Waukesha County. Groundwater levels in the "cone of depression" have dropped about 500 feet since the onset of groundwater pumping. Figure II-1 shows how groundwater flows have been influenced as a result of groundwater pumping.

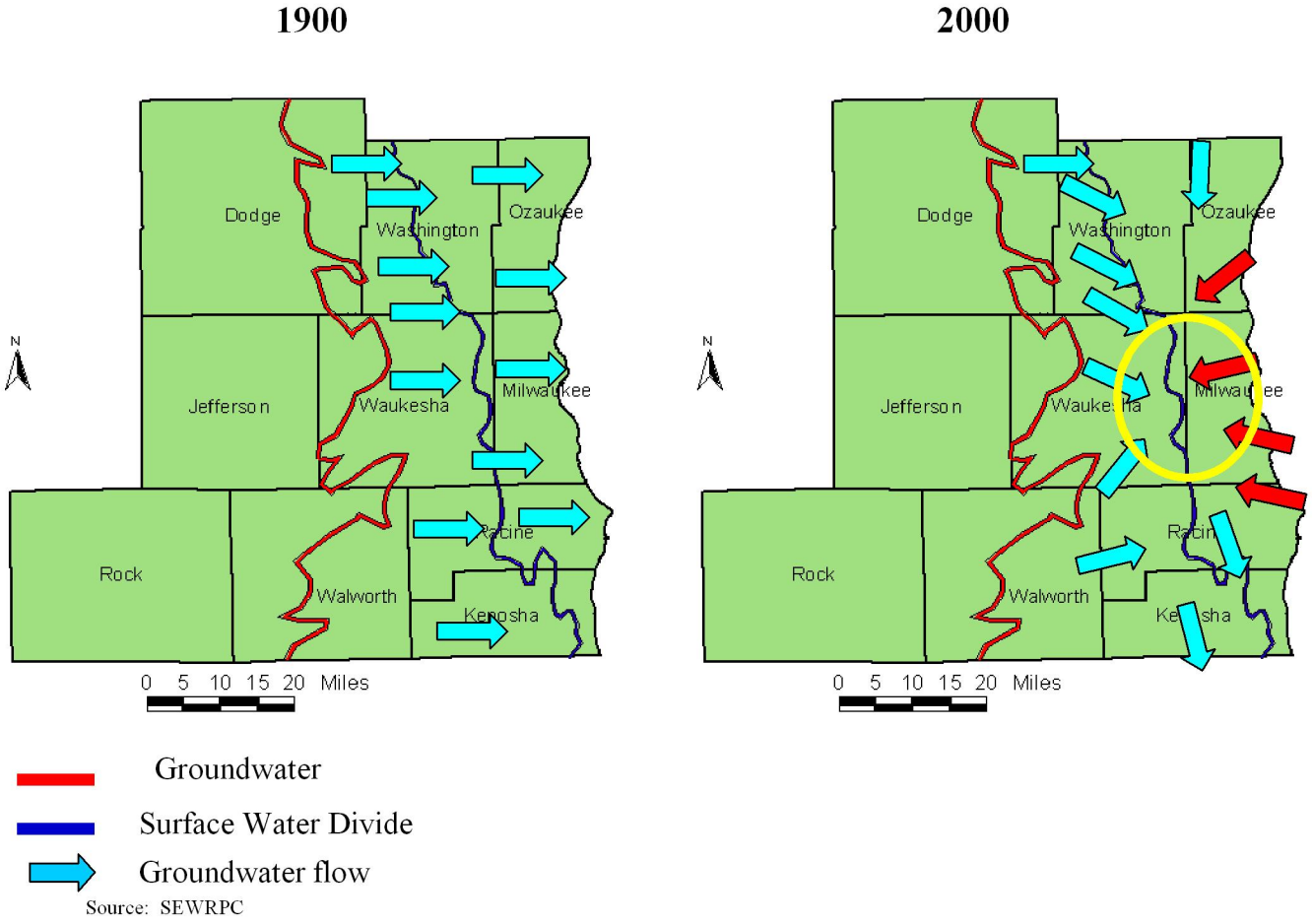
Surface Water Resources

Waukesha County has or contains portions of 33 lakes that comprise approximately 14,000 acres or almost 4 percent of the total area of the county. Surface water drains into the Fox, Rock, Root, and Menomonee River

watersheds. The Menomonee and Root River watersheds lie east of the subcontinental divide and drain into the Great Lakes basin. The Fox and Rock Watersheds are west of the subcontinental divide and drain west into the Mississippi River basin.

Figure II-1

SIMULATED GROUNDWATER FLOW DIRECTION ALTERATION FROM GROUNDWATER PUMPING



Source: SEWRPC

FORMULATION OF OBJECTIVES

Planning may be described as a rational process for formulating and achieving objectives. The formulation of objectives is an essential task to be undertaken before plans can be prepared. This chapter presents a set of objectives along with supporting principles and related standards recommended by the Comprehensive Development Plan Advisory Committee as a basis for the preparation of a Comprehensive Development Plan for Waukesha County. The objectives are derived from the objectives contained in the year 2035 Regional Land Use Plan for Southeastern Wisconsin.

The key steps in the comprehensive planning process are 1) formulation of objectives, principles and standards, 2) inventory, 3) analyses and forecasts, 4) plan design, 5) plan evaluation, and 6) plan refinement and plan adoption. Plan implementation, although a step beyond the planning process, is considered throughout the process so that realization of the plan may be achieved.

The terms "objective," "principle," "standard," "plan," "policy," and "program" are subject to a range of interpretations. Although this chapter deals with only the first three of these terms, an understanding of the

interrelationship between the foregoing terms and the basic concepts which they represent is essential to any consideration of objectives, principles, and standards. Under the regional planning program, these terms have been defined as follows:

1. Objective: a goal or end toward the attainment of which plans and policies are directed.
2. Principle: a fundamental, primary, or generally accepted tenet used to support objectives and prepare standards and plans.
3. Standard: a criterion used as a basis of comparison to determine the adequacy of plan proposals to attain objectives.
4. Plan: a design that seeks to achieve agreed-upon objectives.
5. Policy: a rule or course of action used to ensure plan implementation.
6. Program: a coordinated series of policies and actions to carry out a plan.

GENERAL DEVELOPMENT OBJECTIVES

The following general development objectives, presented as part of the year 2035 regional land use plan, have been reaffirmed by the Comprehensive Development Plan Advisory Committee for use in the preparation of the Comprehensive Development Plan for Waukesha County; no ranking is implied by the order in which these objectives are listed:

1. Economic growth at a rate consistent with county resources, including land, water, labor, and capital, and primary dependence on free enterprise in order to provide needed employment opportunities for the expanding labor force.
2. A wide range of employment opportunities through a broad diversified economic base.
3. Preservation and protection of desirable existing residential, commercial, industrial, and agricultural development in order to maintain desirable social and economic values and renewal of obsolete and deteriorating areas in both urban and rural areas; and prevention of slums and blight.
4. A broad range of choice among housing designs, sizes, types, and costs, recognizing changing trends in age group composition, income, and family living habits.
5. An adequate, flexible, and balanced level of community services and facilities.
6. An efficient and equitable allocation of fiscal resources within the public sector of the economy.
7. An attractive and healthful physical and social environment with ample opportunities for high-quality education, cultural activities, and outdoor recreation.
8. Protection, sound use, and enhancement of the natural resource base.
9. Development of communities having distinctive individual character, based on physical conditions, historical factors, and local desires.

SPECIFIC DEVELOPMENT OBJECTIVES

Within the framework established by the general development objectives, a secondary set of more specific objectives, which are directly relatable to physical development plans, and which can be at least crudely quantified has been developed. The specific development objectives are concerned primarily with spatial allocation to, and distribution of, the various land uses; land use compatibility; resource protection; and accessibility.

The following specific development objectives have been formulated by the Comprehensive Development Plan Advisory Committee. No ranking is implied by the order in which these objectives are listed:

1. A balanced allocation of space to the various land use categories, which meets the social, physical, and economic needs of the county population.
2. A spatial distribution of the various land uses that will result in a convenient and compatible arrangement of land uses.

3. A spatial distribution of the various land uses which maintains biodiversity and which will result in the preservation and sustainable management of the natural resources of the County.
4. A spatial distribution of the various land uses which is properly related to the supporting transportation, utility, and public facility systems in order to assure the economical provision of transportation, utility, and public facility services.
5. The availability of a broad range of choice among housing designs, sizes, types, and costs, recognizing changing trends in age group composition, income, and family living habits.
6. The development and preservation of residential areas within a physical environment that is healthy, safe, convenient, and attractive.
7. The preservation, development, and redevelopment of a variety of suitable industrial and commercial sites both in terms of physical characteristics and location.
8. The conservation, renewal, and full use of existing urban service areas of the Region and the County.
9. The preservation of productive agricultural lands.
10. The preservation and provision of open space to enhance the total quality of the environment, maximize essential natural resource availability, give form and structure to urban development, and provide opportunities for a full range of outdoor recreational activities.

FORMULATION OF STANDARDS

Complementing each of the foregoing specific development objectives is a set of planning standards. Each set of standards is directly related to the objective. The standards facilitate application of the objectives in plan design and evaluation. The standards related to the ten specific objectives were developed by the subcommittee addressing the particular planning element. The following objective and standards serve as an example for industrial and commercial sites.

Objective
The preservation, development, and redevelopment of a variety of suitable industrial and commercial sites both in terms of physical characteristics and location.

Standards
1. Industrial, retail, and office uses should meet the following standards:

    a. Available adequate water supply, sanitary sewer service, storm water drainage facilities, and power supply.
    b. Ready access to the arterial street and highway system.
    c. Adequate off-street parking (may not be directly on-site) and loading areas.
    d. Provision of properly located points of ingress and egress appropriately controlled to prevent congestion on adjacent arterial streets.
    e. Site design appropriately integrating the site with adjacent land uses.
    f. Served by local transit service.

BALANCING OF PLANNING STANDARDS

In applying the planning standards and preparing the Comprehensive Development Plan for Waukesha County, it should be recognized that it is unlikely that the Plan can meet all of the standards completely. It should also be recognized that some objectives are complementary, with the achievement of one objective supporting the achievement of others. Conversely, some objectives may be conflicting, requiring reconciliation through consensus building and/or compromise.

For example, as part of the planning process, the objectives of preserving agricultural and other open space lands, must be balanced with the need to convert certain lands to urban use in support of the orderly growth and development of the County.

Most of the development objectives, principles, and standards were incorporated without significant change from the set of planning objectives, principles, and standards included in the adopted design year 2035 Regional Land Use Plan.

PLANNING OBJECTIVES AND STANDARDS

Agricultural, Natural and Cultural Resources Objective No. 1

A spatial distribution of the various land uses which maintains biodiversity and which will result in the preservation and sustainable use of the natural resources of the County.

Environmental Corridors and Isolated Natural Resource Areas

Principle

The preservation of environmental corridors and isolated natural resource areas in essentially natural, open use yields many benefits, including recharge and discharge of groundwater; maintenance of surface water and groundwater quality; attenuation of flood flows and flood stages; maintenance of base flows of streams and watercourses; reduction of soil erosion; abatement of air and noise pollution; provision of wildlife habitat; protection of plant and animal diversity; protection of rare and endangered species; maintenance of scenic beauty; and provision of opportunities for recreational, educational, and scientific pursuits. Conversely, since some environmental corridors and isolated natural resource areas are poorly suited for urban development, their preservation can help avoid serious and costly development problems while protecting the County's most valuable natural resources. Due to the minimum lot size requirements, the Village of Chenequa has a significant number of isolated natural resource areas which make it particularly valuable in terms of the long term preservation of Waukesha County's natural resources. To this end, the State of Wisconsin Department of Natural Resources, through previous agreements with the Village, has agreed not to pursue further development of boat access sites within the Village of Chenequa borders.

Notes: Environmental corridors are elongated areas in the landscape which contain concentrations of natural resource features (lakes, rivers, streams, and their associated shorelands and floodlands; wetlands; woodlands; prairies; wildlife habitat areas; wet, poorly drained, and organic soils; and rugged terrain and high-relief topography) and natural resource-related features (existing park and open space sites; potential park and open space sites; historic sites; scenic areas and vistas; and natural areas and critical species habitat sites). Primary environmental corridors include a variety of these features and are at least 400 acres in size, two miles long, and 200 feet in width. Secondary environmental corridors also contain a variety of these features and are at least 100 acres in size and one mile in length. Isolated natural resource areas are smaller concentrations of natural resource features that are physically separated from the environmental corridors by intensive urban or agricultural uses; by definition, such areas are at least five acres in size and 200 feet in width.

Standards

a. Primary environmental corridors should be preserved in natural, open uses.
b. Secondary environmental corridors and isolated natural resource areas should be preserved in essentially natural, open uses to the extent practicable, as determined in county and local plans.

Uses considered compatible with both planning standards relating to the preservation of environmental corridors and isolated natural resource areas are indicated in Table II-20.

Table II-20

GUIDELINES FOR DEVELOPMENT CONSIDERED COMPATIBLE WITH ENVIRONMENTAL CORRIDORS

Component Natural Resource and Related Features within Environmental Corridors[a]	Permitted Development															
	Transportation and Utility Facilities (see General Development Guidelines below)				Recreational Facilities (see General Development Guidelines below)											Rural Density Residential Development (see General Development Guidelines below)
	Streets and Highways	Utility Lines and Related Facilities	Engineered Stormwater Management Facilities	Engineered Flood Control Facilities[b]	Trails[c]	Picnic Areas	Family Camping[d]	Swimming Beaches	Boat Access	Ski Hills	Golf	Playfields	Hard-Surface Courts	Parking	Buildings	
Lakes, Rivers, and Streams	--[e]	--[f,g]	--	--[h]	--[i]	--	--	X	X	--	--	--	--	--	--	--
Shoreland	X	X	X	X	X	X	--	X	X	--	X	--	--	X	X[j]	--
Floodplain	--[k]	X		X	X	X	--	X	X	--	X	X	--	X	X[l]	--
Wetland[m]	--[k]	X	--	--	X[n]	--	--	--	X	--	--[o]	--	--	--	--	--
Wet Soils	X	X	X	X	X	--	--	X	X	--	X	--	--	X	--	--
Woodland	X	X	Xp	--	X	X	X	--	X	X	Xp	Xp	Xp	Xp	X[p]	X
Wildlife Habitat	X	X	X	--	X	X	X	--	X	X	X	X	X	X	X	X
Steep Slope	X	X	--	--	--[q]	--	--	--	--	X[r]	X	--	--	--	--	--
Prairie	--	--[g]	--	--	--[q]	--	--	--	--	--	--	--	--	--	--	--
Park	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	--
Historic Site	--	--[g]	--	--	--[q]	--	--	--	--	--	--	--	--	X	--	--
Scenic Viewpoint	X	X	--	--	X	X	X	--	X	X	X	--	--	X	X	X
Natural Area or Critical Species Habitat Site	--	--	--	--	--[q]	--	--	--	--	--	--	--	--	--	--	--

Source: SEWRPC and Waukesha County

NOTE: An "X" indicates that facility development is permitted within the specified natural resource feature. In those portions of the environmental corridors having more than one of the listed natural resource features, the natural resource feature with the most restrictive development limitation should take precedence.

Footnotes to Table II-20:

[a]*The natural resource and related features are defined as follows:*

Lakes, Rivers, and Streams: Includes all lakes greater than five acres in area and all perennial and intermittent streams as shown on U. S. Geological Survey quadrangle maps.
Shoreland: Includes a band 50 feet in depth along both sides of intermittent streams; a band 75 feet in depth along both sides of perennial streams.
Floodplain: Includes areas, excluding stream channels and lake beds, subject to inundation by the 100-year recurrence interval flood event.
Wetlands: Includes areas that are inundated or saturated by surface water or groundwater at a frequency, and with a duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.
Wet Soils: Includes areas covered by wet, poorly drained, and organic soils.
Woodlands: Includes areas one acre or more in size having 17 or more deciduous trees per acre with at least a 50 percent canopy cover as well as coniferous tree plantations and reforestation projects; excludes lowland woodlands, such as tamarack swamps, which are classified as wetlands.
Wildlife Habitat: Includes areas devoted to natural open uses of a size and with a vegetative cover capable of supporting a balanced diversity of wildlife.
Steep Slope: Includes areas with land slopes of 12 percent or greater.
Prairies: Includes open, generally treeless areas which are dominated by native grasses; also includes savannas.
Park: Includes public and nonpublic park and open space sites.
Historic Site: Includes sites listed on the National Register of Historic Places. Most historic sites located within environmental corridors are archeological features such as American Indian settlements and effigy mounds and cultural features such as small, old cemeteries. On a limited basis, small historic buildings may also be encompassed within delineated corridors.
Scenic Viewpoint: Includes vantage points from which a diversity of natural features such as surface waters, wetlands, woodlands, and agricultural lands can be observed.
Natural Area and Critical Species Habitat Sites: Includes natural areas and critical species habitat sites as identified in the regional natural areas and critical species habitat protection and management plan.

[b]*Includes such improvements as stream channel modifications and such facilities as dams.*

[c]*Includes trails for such activities as hiking, bicycling, cross-country skiing, nature study, and horseback riding, and excludes all motorized trail activities. It should be recognized that trails for motorized activities such as snowmobiling that are located outside the environmental corridors may of necessity have to cross environmental corridor lands. Proposals for such crossings should be evaluated on a case-by-case basis, and if it is determined that they are necessary, such trail crossings should be designed to ensure minimum disturbance of the natural resources.*

[d]*Includes areas intended to accommodate camping in tents, trailers, or recreational vehicles, which remain at the site for short periods of time, typically ranging from an overnight stay to a two-week stay.*

[e]*Certain transportation facilities such as bridges may be constructed over such resources.*

[f]*Utility facilities such as sanitary sewers may be located in or under such resources.*

[g]*Electric power transmission lines and similar lines may be suspended over such resources.*

[h]*Certain flood control facilities such as dams and channel modifications may need to be provided in such resources to reduce or eliminate flood damage to existing development.*

[i]*Bridges for trail facilities may be constructed over such resources.*

[j]*Consistent with Chapter NR 115 of the* Wisconsin Administrative Code.

[k]*Streets and highways may cross such resources. Where this occurs, there should be no net loss of flood storage capacity or wetlands. Guidelines for mitigation of impacts on wetlands by Wisconsin Department of Transportation facility projects are set forth in Chapter Trans 400 of the* Wisconsin Administrative Code.

[l]*Consistent with Chapter NR 116 of the* Wisconsin Administrative Code.

[m]*Any development affecting wetlands must adhere to the water quality standards for wetlands established under Chapter NR 103 of the* Wisconsin Administrative Code.

[n]*Only an appropriately designed boardwalk/trail should be permitted.*

[o]*Wetlands may be incorporated as part of a golf course, provided there is no disturbance of the wetlands.*

[p]*Only if no alternative is available.*

[q]*Only appropriately designed and located hiking and cross-country ski trails should be permitted.*

[r]*Only an appropriately designed, vegetated, and maintained ski hill should be permitted.*

GENERAL DEVELOPMENT GUIDELINES

- Transportation and Utility Facilities: All transportation and utility facilities proposed to be located within the important natural resources should be evaluated on a case-by-case basis to consider alternative locations for such facilities. If it is determined that such facilities should be located within natural resources, development activities should be sensitive to, and minimize disturbance of, these resources, and, to the extent possible following construction, such resources should be restored to preconstruction conditions.

  The above table presents development guidelines for major transportation and utility facilities. These guidelines may be extended to other similar facilities not specifically listed in the table.

- Recreational Facilities: In general, no more than 20 percent of the total environmental corridor area should be developed for recreational facilities. Furthermore, no more than 20 percent of the environmental corridor area consisting of upland wildlife habitat and woodlands should be developed for recreational facilities. It is recognized, however, that in certain cases these percentages may be exceeded in efforts to accommodate needed public recreational and game and fish management facilities within appropriate natural settings.

  The above table presents development guidelines for major recreational facilities. These guidelines may be extended to other similar facilities not specifically listed in the table.

- Residential Development: Limited residential development may be accommodated in upland environmental corridors, provided that buildings are kept off steep slopes. The maximum number of housing units accommodated at a proposed development site within the environmental corridor should be limited to the number determined by dividing the total corridor acreage within the site, less the acreage covered by surface water, floodplains and wetlands, by five. The permitted housing units may be in single-family or multi-family structures. When rural residential development is accommodated, conservation subdivision designs are strongly encouraged to locate development outside the corridor while maintaining an overall development density of no more than one dwelling per five acres.

  Single-family development on existing lots of record should be permitted as provided for under county or local zoning at the time of adoption of the land use plan.

- Other Development: In lieu of recreational or rural density residential development, up to 10 percent of the upland corridor area in a parcel may be disturbed in order to accommodate urban residential, commercial, or other urban development under the following conditions: 1) the area to be disturbed is compact rather than scattered in nature; 2) the disturbance is located on the edge of a corridor or on marginal resources within a corridor; 3) the development does not threaten the integrity of the remaining corridor; 4) the development does not result in significant adverse water quality impacts; and 5) development of the remaining corridor lands is prohibited by a conservation easement or deed restriction. Each such proposal must be reviewed on a site-by-site basis.

  Under this arrangement, while the developed area would no longer be part of the environmental corridor, the entirety of the remaining corridor would be permanently preserved from disturbance. From a resource protection point of view, preserving a minimum of 90 percent of the environmental corridor in this manner may be preferable to accommodating scattered homesites and attendant access roads at an overall density of one dwelling per five acres throughout the upland corridor areas.

- Pre-Existing Lots: Single-family development on existing lots of record should be permitted as provided for under county or local zoning at the time of adoption of the Comprehensive Development Plan or on lands with the Primary Environmental Corridor amended through adopted sewer service plans.

- All permitted development presumes that sound land and water management practices are utilized.

OTHER ENVIRONMENTALLY SENSITIVE AREAS

Principle
Care in locating urban and rural development in relation to other environmentally sensitive areas can help to maintain the overall environmental quality of the County and to avoid developmental problems.

Standards
a. Small wetlands, woodlands, and prairies not identified as part of an environmental corridor or isolated natural resource area should be preserved to the extent possible, as determined in county and local plans.
b. All natural areas and critical species habitat sites identified for preservation in the Regional Natural Areas and Critical Species Habitat Protection and Management Plan should be preserved.
c. One hundred-year recurrence interval floodlands should not be allocated to any development, which would cause or be subject to flood damage; and no unauthorized structure should be allowed to encroach upon and obstruct the flow of water in perennial stream channels and floodways.
d. Urban and rural development should be directed away from areas with steep slopes (12% or greater) or with seasonally high groundwater one foot or less from the surface.
e. Land use patterns should be designed to discourage development of below grade structures on soils with seasonally high groundwater less than 3 feet from the surface. The intent is to allow development on these marginal soils, providing below grade structures (including basements) maintain a minimum of one foot separation from the seasonally high groundwater level.

RESTORATION/ENHANCEMENT OF NATURAL CONDITIONS

Principle
The restoration of unused farmland and other open space land to more natural conditions, resulting in the re-establishment or enhancement of wetlands, woodlands, prairies, grasslands, and forest interiors, can increase biodiversity and contribute to the overall environmental quality of the County by providing additional functional values as set forth in Objective No. 1 above.

Standard
a. Carefully planned efforts to restore unused farmland and other open space land to more natural conditions should be encouraged.

Agricultural, Natural and Cultural Resources Objective No. 2
The preservation of productive agricultural land.

Principle
The preservation of productive agricultural land is important for meeting future needs for food and fiber. Agricultural areas, in addition to providing food and fiber, can provide wildlife habitat and contribute to the maintenance of an ecological balance between plants and animals. Moreover, the preservation of agricultural areas also contributes immeasurably to the maintenance of the scenic beauty and cultural heritage of the County. Maintaining agricultural lands near urban areas can facilitate desirable and efficient production-distribution relationships, including community-supported agriculture operations.

The preservation of agricultural lands can maximize return on investments in agricultural soil and water conservation practices; and minimizes conflicts between farming operations and urban land uses.

Standard
Prime agricultural lands in Waukesha County includes those lands that meet all the following: 1) Land use is agricultural, unused/open (rural), primary/secondary environmental corridor or isolated natural areas, using SEWRPC definitions; 2) The stated land use makes up at least 5 square miles of "contiguous" lands, meaning all connecting lands are at least 1000 lineal feet in width - including adjacent communities, and excluding transportation corridors; 3) 75% of the land ownership parcels within the contiguous area are 35 acres or more; 4)

Every parcel is outside of a planned sewer service area boundary; 5) 75% of every parcel is agricultural or open/unused (rural) land uses by SEWRPC definitions; and 6) 50% of the soils for every parcel are Land Capability Class I or II by NRCS definitions.

This standard is a modification of the standard used to prepare the Development Plan for Waukesha County in 1996. The standard in the 1997 Development Plan read "Prime agricultural lands in Waukesha County includes those lands in agricultural use which meet the following criteria: 1) the farm unit must be at least 35 acres in area; 2) at least 50 percent of the farm unit must be covered by soils which meet Natural Resources Conservation Service standards for National prime farmland; and 3) the farm unit must be located within a block of farmland at least five square miles in size". The definition used in 1997 became difficult to map using land information system technology. As a result, the Agriculture, Natural and Cultural Resources Element Subcommittee of the Comprehensive Development Plan Advisory Committee at their August 3, 2005 meeting approved the modification of the standards used for the delineation of prime agricultural lands. The modified standards can be mapped using land information system technology. In general, the modified standards produced the same map results used in the 1997 Development Plan.

The standard utilized in the identification of prime agricultural lands in the design year 2010 regional land use plan, including the criterion indicating that the farm unit be located within a block of farmland at least 100 acres in size, and the criterion indicating that at least 50 percent of the farm unit must be covered by Class I, Class II, or Class III soils was, to a large extent, based upon criteria utilized in the identification of farmland preservation areas in county farmland preservation plans completed within the Region in the early 1980s, including the Waukesha County Agricultural Land Preservation Plan. The 100-acre minimum combined farmland area was chosen for such plans because it was consistent with the State's minimum acreage planning criterion for farmland preservation areas under Wisconsin's Farmland Preservation Program. This relatively small area would enable the largest number of farmers to qualify for tax credits under the State Farmland Preservation Program.

While the recognition in a land use plan of smaller blocks of farmland may enable a larger number of farmers to qualify for tax credits, the maintenance of long-term agricultural use within such smaller blocks in an urbanizing region such as Southeastern Wisconsin has proven to be very difficult. Among those reasons frequently cited to explain that difficulty is the following:

1. Relatively large blocks of farmland are necessary to support such agriculture-related businesses as distributors of farm machinery and parts and farm supplies. Scattered, relatively smaller blocks of farmland do not provide the critical mass necessary for such agribusiness support enterprises. Consequently, farmers remaining in such smaller blocks must travel ever-increasing distances for support services.

2. In many cases, smaller blocks of farmland are merely remnants of formerly larger blocks which have been subject to intrusion by urban residential development. This intrusion has resulted in significant urban-rural conflicts, including problems associated with the objection by residents of urban-type land subdivision developments to odors associated with farming operations; to the use of fertilizers, herbicides and pesticides, and other agriculturally related chemicals; to the noise associated with the operation of farm machinery during the early and late hours of the day; and to the movement of large farm machinery on rural roads being used increasingly for urban commuting.

3. For most farming enterprises, the economies of scale require relatively large tracts of land, frequently involving many hundreds of acres. The breakup of large blocks of farmland by urban intrusion makes it more difficult for farmers to assemble such larger tracts either through ownership or rental arrangements. Tract assembly is thus complicated by scattered field locations, resulting in costly and inconvenient related travel distances and, therefore, in unproductive time and higher fuel consumption.

4. In agricultural communities on the fringe of urbanizing areas, there is often a declining interest among the next generation of farmers to continue farm operations. This is particularly true where alternative land uses are perceived to be available. This phenomenon is reinforced by the rigors of day-to-day farm life when compared with urban lifestyles.

The criterion specifying that prime agricultural lands include those areas where 50 percent or more of the farm unit is covered by soils meeting U. S. Natural Resources Conservation Service standards for National prime farmland or farmland of Statewide importance was valid when the first county farmland preservation plans were prepared in the early 1980's. Inclusion of soils of statewide importance, or Class III soils, in the standard was appropriate even though such soils may have had marginal crop production value because a high proportion of the farms within the County then were dairy operations. Dairy operations can be viable even though a relatively large portion of the farm unit may be covered by Class III soils because such soils are suitable for grazing, production of animal feed crops, and the use of cover crops related to the dairy operations. However, increased specialization of farm operations, and loss of smaller "family" farms and dairy farms in Waukesha County has now raised questions concerning continued utilization of farmland of statewide importance, or Class III soils, as a criterion in the identification of prime agricultural lands within Waukesha County.

Local public officials, farmers, landowners, and soil scientists stated, at meetings held to review the preliminary 1997 Development Plan for Waukesha County land use plan, that lands covered by Class III soils should not be considered as prime farmland. It was noted that such soils in Waukesha County, being excessively wet, droughty or steep, rendering them unsuitable for the production of cash grain crops such as corn or soybeans. Because Class III soils are not as well-suited for intensive cash grain farming as Class I and Class II soils, and because of the significant loss of dairy farm operations within Waukesha County over the past three decades, lands covered by Class III soils no longer have the same inherent value as an agricultural resource as when dairy farms were prevalent. The criterion for the five square mile farmland block size is not a new criterion. Indeed, the Southeastern Wisconsin Regional Planning Commission utilized the five-square-mile-block criterion in the identification of prime agricultural land under the first-generation, design year 1990, regional land use plan adopted by the Commission in 1966. This criterion was established with direct input from, and utilizing the collective judgment of, University of Wisconsin-Extension agricultural agents working in the Region at that time.

As a practical matter, the application of the "block" standard would involve the delineation of gross areas of at least five square miles containing concentrations of farmland meeting the three criteria cited above. At least 75 percent of the gross area should be comprised of such farmland including adjacent associated environmental corridor lands, that occur within the blocks of such farmland.

In 2005, the Agriculture, Natural and Cultural Resources Subcommittee of the Comprehensive Development Plan Advisory Committee reaffirmed the concerns over the inclusion of Class III soils and using a farmland block size smaller than five square miles in the standards for prime agricultural lands.

Notes: National prime farmland consists of agricultural lands covered by U. S. Natural Resources Conservation Service-designated Class I and Class II soils. Class I soils are deep, well drained, and moderately well drained, nearly level soils with no serious limitation that restrict their use for cultivated crops. Class II soils are generally deep and well drained but may have some limitations that reduce the choice of plants that can be economically produced or require some conservation practices.

Farmland of Statewide importance consists of agricultural lands covered by U. S. Natural Resources Conservation Service-designated Class III soils. Class III soils have moderate limitations due to wetness, steepness or drought conditions that restrict the choice of plants or require special conservation practices or both.

Agricultural, Natural and Cultural Resources Objective No. 3

The preservation and provision of open space to enhance the total quality of the County environment, maximize essential natural resource availability, give form and structure to urban development, and provide opportunities for a full range of outdoor recreational activities.

Principle

Open space is the fundamental element required for the preservation and sustainable use of such natural resources as soil, water, woodlands, wetlands, native vegetation, and wildlife; it provides the opportunity to add to the

physical, intellectual, and spiritual growth of the population; it enhances the economic and aesthetic value of certain types of development; and it is essential to outdoor recreational pursuits.

Standards

a. Major park and recreation sites providing opportunities for a variety of natural resource-oriented, self actualized outdoor recreational activities should be provided by the County within a 4-mile service radius of every dwelling unit in the County, and should have a minimum gross site area of 250 acres. Examples of such uses include: camp site, swimming beach, picnic area, golf course, ski hill, hiking and cross country ski trails, horseback riding, boat launch, nature study area, and play field area.
b. Other park and recreation sites should be provided within a maximum service radius of one mile of every dwelling unit in an urban area, and should have a minimum gross site area of five acres. (S*tandard to be refined through working with municipalities; SEWRPC standard for neighborhood parks, include a standard for one community park with a min. site area of 25 acres in each Town.*) *Suggested text from SEWRPC "In rural areas, a minimum of one community park having a minimum gross site area of 25 acres should be provided by each Town."*
c. Typically local municipalities provide outdoor recreation facilities to afford the resident population of the opportunities to participate in intensive nonresource-oriented outdoor recreation activities. These types of facilities are activity specific such as tennis, baseball, basketball, soccer, skate parks and playgrounds.
d. Areas having unique scientific, cultural, scenic, or educational value should not be allocated to any urban or agricultural land uses; adjacent surrounding areas should be retained in open space use, such as agricultural or limited recreational uses.
e. The County should acquire or otherwise protect land and establish Greenways along the following waterways: the Ashippun, Bark, Fox, Mukwonago, Oconomowoc and Pewaukee Rivers and Mill, Pebble, Scuppernong, and Spring Creeks and Pebble Brook. For the purposes of this plan, greenways are located along a stream or river and are intended to provide aesthetic and natural resource continuity and often serve as ideal locations for trail facilities.
f. Where open space is mentioned as part of a conservation design residential planned unit development, said open space shall be protected as green or natural open space and no more than five (5) percent of said open space area shall be allowed to have impervious surfaces.

Agricultural, Natural and Cultural Resources Objective No. 4

A spatial distribution of land uses and specific site development designs which protects or enhances the surface and ground water resources of the County.

Principle

Information regarding existing and potential surface and ground water quality and quantity conditions is essential to any comprehensive land use and natural resource planning program. The existing quality condition of the surface and ground water resource provides important baseline data. The potential condition becomes the goal upon which planners and resource managers target their land use efforts.

Standards

a. Potentially contaminating land uses should not be located in areas where the potential for groundwater contamination is the highest.
b. Storm water management planning should seek to meet the potential biological use objectives of the streams in the County (presented in Chapter 3 of this Plan).

Notes: The Wisconsin Department of Natural Resources (DNR) is required, under Wisconsin Statutes and the State Water Resources Act of 1965, to establish a set of water use objectives and supporting water quality standards applicable to all surface waters of the state. The type of aquatic community a particular surface water resource is capable of supporting is represented by the biological use objectives. The potential biological use of streams indicates the biological use or trout stream class a stream could achieve if it was well managed and pollution sources were controlled.

The Wisconsin Department of Natural Resources (DNR) has established Administrative Code NR 140 to establish groundwater quality standards for substances detected in or having a reasonable probability of entering the groundwater resources of the state; to specify scientifically valid procedures for determining if a numerical standard has been attained or exceeded; to specify procedures for establishing points of standards application, and for evaluating groundwater monitoring data; to establish ranges of responses the department may require if a groundwater standard is attained or exceeded; and to provide for exemptions for facilities, practices and activities regulated by the department.

c. Land use development patterns and practices should be designed to preserve important groundwater recharge areas and should support maintaining the natural surface and groundwater hydrology to the extent possible.
d. Storm water management planning should seek to encourage ground water recharge to maintain the natural groundwater hydrology.

Notes: As of the writing of this Plan, the Southeastern Wisconsin Regional Planning Commission is engaged in the preparation of a Regional Water Supply Plan. The recommendations contained in the plan will be incorporated into future amendments to this Comprehensive Development Plan for Waukesha County.

Agricultural, Natural and Cultural Resources Objective No. 5

A spatial distribution of the various land uses which maintains biodiversity and clean air and will result in the protection and wise use of the natural resources of the County, including its soils, nonmetallic minerals, inland lakes and streams, groundwater, wetlands, woodlands, prairies, and wildlife.

Principle

The proper allocation of uses to land can assist in maintaining an ecological balance between the activities of man and the natural environment.

1. Soils

Principle

The proper relation of urban and rural land use development to soil types and distribution can serve to avoid many environmental problems, aid in the establishment of better regional settlement patterns, and promote the wise use of an irreplaceable resource.

Standards

1. Sewered urban development, particularly for residential use, should not be located in areas covered by soils identified in the detailed operational soil survey as having severe limitations for such development.
2. Unsewered suburban residential development should not be located in areas covered by soils identified in the detailed operational soil survey as unsuitable for such development.
3. Rural development, including agricultural and rural residential development, should not be located in areas covered by soils identified in the detailed operational soil survey as unsuitable for such uses.
4. Urban and rural development should be directed away from areas, with steep slopes (12% or greater) or with seasonally high groundwater one foot or less from the surface.
5. Land use patterns should be designed to discourage development of below grade structures on soils with seasonally high groundwater less than 3 feet from the surface. The intent is to allow development on these marginal soils, providing below grade structures (including basements) maintain a minimum of one foot separation from the seasonally high groundwater level.

2. Nonmetallic Minerals

Principle

Nonmetallic minerals, including sand and gravel, dimensional building stone, and organic materials, have significant commercial value and are an important economical supply of the construction materials needed for the continued development of Waukesha County and the Region and for the maintenance of the existing

infrastructure. Urban development of lands overlying these resources and urban development located in close proximity to these resources may make it impossible to economically utilize these resources in the future and thus may result in shortages and concomitant increases in the costs of those materials, which would ultimately be reflected in both consumer prices and in the community tax structure.

Standard
All known economically viable nonmetallic mineral deposits should be protected and preserved for future mining.

3. Clean Air

Principle
Air is a particularly important determinant of the quality of the environment for life, providing the vital blend of oxygen and other gases needed to support healthy plant and animal life. Air, however, contains pollutants contributed by both natural and human sources which may be harmful to plant and animal life, that may injure or destroy such life, and that may severely damage personal and real property.

Standards
1. Encourage a centralized land use development pattern to minimize automobile travel and related air pollutant emissions.
2. Encourage protection of existing woodlands, wetlands, and prairies to enhance atmospheric oxygen supply levels.

Land Use Development Objective No. 1
A balanced allocation of space to the various land use categories which meets the social, physical, and economic needs of the County population with the Village of Chenequa retaining its rural-density area as explained throughout the scope and length of this plan.

Principle
The planned supply of urban land use should approximate the known and anticipated demand for that use.

Standards
a. For each additional 100 dwelling units to be accommodated within the County at each urban residential density, the following amounts of residential and related land should be allocated:

Residential Density	Residential Area (Net Area)		Residential Area Plus Supporting Land Uses (Gross Area)	
	Acres Per 100 Dwelling Units	Dwelling Units Per Acre	Acres Per 100 Dwelling Units	Dwelling Units Per Acre
High-Density Urban	8	12.5	13	7.7
Medium-Density Urban	23	4.3	32	3.1
Low-Density Urban	83	1.2	109	0.9
Suburban-Density	167	0.6	204	0.5
Rural-Density	500	0.2	588	0.17

b. For each additional 1,000 persons to be accommodated within the County, at least 5 acres of land should be set aside in major public parks of at least 250 acres in size, and at least 9 acres should be set aside in other public parks.

c. For each additional 1,000 persons to be accommodated within the County, approximately 12 acres of governmental and institutional land should be allocated.[1]
d. For each additional 100 industrial employees to be accommodated within the County, approximately 12 acres of industrial land should be allocated.[2]
e. For each additional 100 commercial employees to be accommodated in retail and service settings within the County, approximately 6 acres of retail and service land should be allocated.[2]
f. For each additional 100 commercial employees to be accommodated in office settings within the County, approximately 2.5 acres of commercial office land should be allocated.[3]

Land Use Development Objective No. 2

A spatial distribution of the various land uses which will result in a convenient and compatible arrangement of land uses.

Principle

The proper allocation of uses to land can avoid or minimize hazards and dangers to health, safety, and welfare and maximize amenity and convenience in terms of accessibility to supporting land uses.

Standards

1. Urban high-, medium-, and low-density residential uses should be located within neighborhood and other planning units which are served with centralized public sanitary sewerage and water supply facilities and contain, within a reasonable walking and bicycling distance necessary supporting local service uses, such as park, commercial, and elementary-school facilities.
2. Mixed-use development designs should be used, as appropriate, to accommodate urban land uses that are compatible and complimentary in the vicinity of each other. Mixed-use development may consist of residential and compatible business uses together.
3. To the extent practicable, residential and employment-generating land uses should be located so as to provide opportunities for living in proximity to work.
4. When accommodated, rural residential development should be located in such a way as to minimize conflicts attendant to dust, odors, and noise associated with farming activity that may arise when residences are located in the vicinity of agricultural operations. Rural residential development should also be located in such a way as to minimize impacts on the natural resource base including wildlife habitat.

Land Use Development Objective No. 3

A spatial distribution of the various land uses which is properly related to the supporting transportation, utility, and public facility systems in order to assure the economical provision of transportation, utility, and public facility services.

Principle

The transportation and public utility facilities and the land use pattern which these facilities serve and support are mutually interdependent in that the land use pattern determines the demand for, and loading upon, transportation

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[1] *Commercial, industrial, and governmental and institutional area includes the area devoted to the given use, consisting of the ground floor site area occupied by any building, required yards and open space, and parking and loading areas.*

[2] *The industrial standard is intended to be representative of typical new single-story industrial development. It should be recognized that the number of industrial employees per acre can vary considerably from site to site, depending upon the nature of the manufacturing activity, the level of automation, the extent to which warehousing or office functions are located at the site, and other factors.*

[3] *The office standard is equivalent to a floor area ratio of 30 percent and a gross building area of about 325 square feet per employee.*

and utility facilities; and these facilities, in turn, are essential to, and form a basic framework for, land use development.

Standards

1. Urban development should be located and designed so as to maximize the use of existing transportation and utility systems.
2. The transportation system should be located and designed to serve not only all land presently devoted to urban development but to land planned to be used for such urban development.
3. The transportation system should be located and designed to minimize the penetration of existing and planned residential neighborhood units by through traffic.
4. Transportation terminal facilities, such as off-street parking, off-street truck loading, and public transit stops, should be located in proximity to the principal land uses to which they are accessory.
5. Land developed or planned to be developed for urban high-, medium-, and low-density residential use should be located in areas serviceable by an existing or planned public sanitary sewerage system and preferably within the gravity drainage area tributary to such a system.
6. Land developed or planned to be developed for urban high-, medium-, and low-density residential use should be located in areas serviceable by an existing or planned public water supply system.
7. Land developed or planned to be developed for urban high, medium- density residential and commercial use should be located in areas serviceable by existing or planned public transit facilities.
8. Mixed use development should be encouraged to accommodate multi-purpose trips, including pedestrian trips, as a matter of convenience and efficiency.
9. In the absence of public sanitary sewer service, onsite sewage disposal systems should be utilized only in accordance with the following:
    a. Onsite soil absorption sewage disposal systems should be sited and designed in accordance with Chapter Comm 83 of the *Wisconsin Administrative Code.*
    b. The use of onsite sewage disposal systems should be limited to the following types of development:
        - Rural density residential development.
        - Suburban density residential development, limited, however, to areas already committed to such use through subdivision plats or certified surveys.
        - Urban land uses, which may be, required in unsewered areas limited to agriculture businesses, communication facilities, utility installations, public institutional uses and park and recreation sites.
    c. New urban development served by onsite sewage disposal systems in areas planned to receive sanitary sewer service is discouraged. Where such development is permitted, it should be designed so that the public and private costs of conversion to public sanitary sewer service are minimized.
    d. For a private sewage system serving multiple buildings located on a separate property and owned by multiple owners, the private sewage system must be owned and maintained by a governmental entity or agency. For condominium private sewage systems serving multiple units/buildings, owned by multiple owners and located on the same property as the unit/building, the owner/association must accept responsibility for the operation and maintenance of the private sewage system and have the local municipality provide written acceptance of this responsibility should the owner/association fail to do so.

Land Use Development Objective No. 4

The development and preservation of residential areas within a physical environment that is healthy, safe, convenient, and attractive.[4]

Principle A

Residential development in the form of planned residential neighborhoods can provide a desirable environment for families as well as other household types; can provide efficiency in the provision of neighborhood services and facilities; and can foster safety and convenience.

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[4] *This objective does not address suburban density residential development (between 0.2 and 0.6 dwelling units per acre) since new suburban density residential development would be limited to that which is already committed in subdivision plats and certified surveys.*

Standards

a. Urban high-, medium-, and low-density residential neighborhoods should be designed as cohesive units properly related to the larger community of which they are a part. Such neighborhoods should be physically self-contained within clearly defined and relatively permanent recognizable boundaries, such as arterial streets and highways, major park and open space reservations, or significant natural features, such as rivers, streams, or hills. Desirably, the neighborhoods should contain enough area to provide the following: housing for the population served by one elementary school and one neighborhood park; an interconnected internal street, bicycle-way, and pedestrian system which provides multiple opportunities for access and circulation; and those community and commercial facilities necessary to meet the day-to-day living requirements.[5]
b. Desirably, urban residential neighborhoods should accommodate a mix of housing sizes, structure types, and lot sizes, resulting in an overall density that is within the planned density range for each neighborhood.
c. Conservation subdivision design concepts should be incorporated into high-, medium-, and low-density neighborhoods, as appropriate.[6]

To the extent possible, efforts directed at the conservation and renewal of existing residential areas should be undertaken on a neighborhood basis and should seek to preserve those cultural features which contribute to the promotion of neighborhood identity within the larger urban complex. To meet the foregoing standards, land should typically be allocated as follows:

Land Use Category	Percent of Area in Land Development Category					
	Urban High-Density (7.0-17.9 dwelling units per net residential acre)	Urban Medium-Density (2.3-6.9 dwelling units per net residential acre)	Urban Low-Density (0.7-2.2 dwelling units per net residential acre)	Suburban-Density (0.2-0.6 dwelling units per net residential acre)	Rural-Density (0.1-0.2 dwelling units per net residential acre)	Agricultural (less than 0.2 dwelling units per net residential acre)
Residential	66.0	71.0	76.5	82.0	85.0	6.0
Streets and Utilities	25.0	23.0	20.0	18.0	15.0	4.0
Parks and Playgrounds	3.5	2.5	1.5	- -	- -	- -
Public Elementary Schools	2.5	1.5	0.5	- -	- -	- -
Other Governmental and Institutional	1.5	1.0	1.0	- -	- -	- -
Retail and Service	1.5	1.0	0.5	- -	- -	- -
Nonurban	- -	- -	- -	- -	- -	90.0
Total	100.0	100.0	100.0	100.0	100.0	100.0

Principle B

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[5] *Neighborhood sizes envisioned under these standards are as follows: high-density—160 acres; medium-density—640 acres; and low-density—2,560 acres. As a practical matter, smaller household sizes and the attendant lower neighborhood population levels often require that an elementary school or retail and service area be provided to serve two or more contiguous neighborhoods, rather than a single neighborhood.*

[6] *Conservation subdivision designs generally involve locating dwelling units in clusters surrounded by open space, thereby achieving the desired density for the site on an overall basis. The layout of individual lots and supporting streets is done in a manner that preserves the most significant existing natural resource features to the extent possible. In a rural setting, conservation subdivisions can include agricultural lands as part of the open space area that is planned to be preserved.*

Residential development in mixed-use settings can provide a desirable environment for a variety of household types seeking the benefits of proximity to places of employment as well as civic, cultural, commercial, and other urban amenities. Examples of mixed use settings include dwellings above the ground floor of commercial uses and residential structures intermixed with, or located adjacent to, compatible commercial, institutional, or civic uses.

Standards

a. Opportunities should be provided for residential dwellings—particularly in the medium- and high-density range—within a variety of mixed-use settings.
b. Residential uses should be integrated into, or located in close proximity to, major economic activity centers.

Principle C

Residential development in a rural setting can provide a desirable environment for households seeking proximity to open space.

Standards

a. The County and regional land use plans seek to maintain the rural character of lands located outside planned urban service areas.
b. Continued agricultural and other open space uses are encouraged in such areas.
c. Where residential development is to be accommodated, an overall density of no more than one dwelling unit per five acres should be maintained. The use of residential cluster designs, with homes developed in clusters surrounded by agriculture or other open space sufficient to maintain the maximum recommended density of no more than one home per five acres, is encouraged.
d. A development density of no more than one home per five acres in rural areas is recommended to help accomplish the following:
    - Minimize traffic volumes on rural highways and the need to widen highways beyond two lanes.
    - Preserve natural drainage systems insofar as possible and minimize drainage problems and the need for storm water management facilities.
    - Preserve open space and rural character, especially through the use of cluster design, to accommodate residential development while avoiding "wall to wall" residential subdivisions.
    - Minimize the risks to the groundwater supply and quality which the widespread use of onsite sewage treatment and wells at higher densities may pose in the long term.
    - Preserve, through careful design, the overall integrity of the rural landscape, including environmental corridors and wildlife habitat areas.
    - Minimize the loss of farmland covered by agricultural soils classified as Class I and Class II soils.

Land Use Development Objective No. 5

Provide for the preservation, development, and redevelopment of a variety of suitable industrial and commercial sites both in terms of physical characteristics and location.

Principle

The production and sale of goods and services are among the principal determinants of the level of economic vitality in any society; the important activities related to these functions require areas and locations suitable to their purposes.

Standards

1. Industrial, retail, and office uses should meet the following standards:
    a. Available adequate water supply, sanitary sewer service, stormwater drainage facilities, and power supply.
    b. Ready access to the arterial street and highway system.
    c. Adequate on-street and off-street parking (may not be directly on-site but within vicinity) and loading areas.
    d. Provision of properly located points of ingress and egress appropriately controlled to prevent congestion on adjacent arterial streets.

e. Site design emphasizing integrated nodes or centers, rather than linear strips.
f. Site design appropriately integrating the site with adjacent land uses.
g. Served by local transit service (applies to industrial, retail, and office uses located within, or in proximity to, medium- and high-density areas).[7]

2. In addition, major centers accommodating industrial, retail, and office development should meet the following standards:[8]
   a. Served by rapid and express transit service.
   b. Access within two miles of the freeway system.
   c. Access to a transport-corporate airport within a maximum travel time of 30 minutes (major office and industrial development).[9]
   d. Reasonable access through appropriate components of the transportation system to railway and seaport facilities, consistent with the requirements of the industries concerned (major industrial development).
   e. Residential uses appropriately integrated into, or located in proximity to, the major center.

Land Use Development Objective No. 6

The conservation, renewal, and full use of existing urban areas of the County.

Principle

The conservation and renewal, as appropriate, of existing urban areas can enhance their viability and desirability as places to live, work, recreate, and participate in cultural activities. Such efforts, along with infill development on vacant land within existing urban service areas, serves to maximize the use of existing public infrastructure and public service systems and can moderate the amount of agricultural and other open space land converted to urban use to accommodate growth in the county and regional population and economy.

Standards

1. Existing urban areas should be conserved and renewed, as appropriate.
2. To the extent possible, the additional urban land necessary to accommodate growth in the regional population and economy should be met through the renewal or redevelopment as appropriate of older, underutilized urban areas that are in need of revitalization and through the infilling of undeveloped land within existing urban service areas.

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[7] *It should be recognized that industrial, retail, and office uses located in outlying areas may not be able to be served by transit service.*

[8] *A major economic activity center is defined as a concentrated area of commercial and/or industrial land having a minimum of 3,500 total employees or 2,000 retail employees. Major economic activity centers are further classified according to the following employment levels, recognizing that a major economic activity center may meet more than one of the indicated thresholds:*

Major industrial center: A major economic activity center that accommodates at least 3,500 industrial employees.

Major office center: A major economic activity center that accommodates at least 3,500 office employees.

Major retail center: A major economic activity center that accommodates at least 2,000 retail employees.

General-purpose major center: A center that qualifies as a major economic activity center having total employment of at least 3,500, but does not meet any of the above individual thresholds for an industrial, office, or retail center.

It should be recognized that major industrial, office, and retail centers generally encompass a mix of uses. A major industrial center may accommodate offices, service operations, and research facilities in addition to manufacturing, wholesaling, and distribution facilities. A major retail center may accommodate office and service uses in addition to retail operations. The mix of uses extends to residential uses—which should be integrated into, or provided in close proximity to, major economic activity centers, as those centers develop or are re-developed.

[9] *A transport-corporate airport is defined as an airport that is intended to serve business and corporate jets as well as virtually all small single- and twin-engine general aviation aircraft. Existing and proposed transport-corporate airports in the Region are identified in the regional airport system plan, documented in SEWRPC Planning Report No. 38 (2nd Edition),* A Regional Airport System Plan for Southeastern Wisconsin: 2010, *November 1996.*

Transportation Objective No. 1

A multi-modal transportation system which, through its location, capacity, and design, will effectively serve the existing regional and County land use pattern and promote the implementation of the regional land use plan and the Comprehensive Development Plan for Waukesha County, meeting and managing the anticipated travel demand generated by the existing and proposed land uses.

Principle

An integrated multi-modal regional transportation system connects major land use activities within the Region and County, providing the accessibility essential to the support of these activities. The transportation system should provide higher accessibility to areas recommended for development and redevelopment, and lower accessibility to areas not recommended for development. The Village of Chenequa as a rural-density area filled with isolated natural resource areas, is not readily conducive to the expansion of Waukesha County's transportation system and should be avoided whenever possible as a transportation corridor between higher density areas within the County.

Standards

1. The transportation system should be consistent with and serve to support, and promote the implementation of the land use plan.
    a. Higher relative transportation accessibility should be provided to areas recommended for development than to areas not recommended for development;
    b. Improvements in accessibility should be provided to areas recommended for development rather than to areas not recommended for development.

Transportation Objective No. 2

A multi-modal transportation system which provides appropriate types of transportation needed by all residents of the County at an adequate level of service; provides choices among transportation modes; and provides inter-modal connectivity.

Principle

A multi-modal regional transportation system is necessary to provide transportation service to all segments of the population and to support and enhance the economy and quality of life. The arterial street and highway system serving personal travel by automobile and freight travel by truck is, has been, and will likely continue to be the dominant element of the transportation system carrying over 90 percent of total daily travel, and serving the overwhelming majority of the population. However, there are substantial reasons for a multi-modal regional transportation system, including public transit and bicycle-pedestrian elements. Moreover, in the most heavily traveled corridors, public transit and bicycle and pedestrian facilities can alleviate peak travel loadings on highway facilities and the demand for land for parking facilities. Also, a multi-modal transportation system can support and enhance the quality of life and economy by providing a choice of modes.

Standards

1. Arterial Street and Highway System
    a. A grid of arterial streets and highways should be provided in urban areas of the Region at intervals of no more than one-half mile in each direction in urban high-density areas, at intervals of no more than one mile in each direction in urban medium-density areas, and at intervals of no more than two miles in each direction in urban low-density and suburban-density areas. In rural areas, arterials should be provided at intervals of no less than two miles in each direction.
    b. In urban areas of the Region, the grid of arterial streets should be direct and understandable.
    c. Arterial street and highway facilities should be provided with adequate traffic-carrying capacity to minimize traffic congestion.[a]

[a] *Design capacity is the maximum level of traffic volume a facility can carry before beginning to experience morning and afternoon peak traffic hour traffic congestion, and is expressed in terms of number of vehicles per average weekday. The design capacity and level of congestion thresholds are set forth in the following table:*

Facility Type	Average Weekday Traffic Volumes (vehicles per 24 hours)			
	Design Capacity and Upper Limit of Level of Service C	Upper Limit of Moderate Congestion and Level of Service D	Upper Limit of Severe Congestion and Level of Service E	Extreme Congestion and Level of Service F
Freeway				
Four-lane	60,000	80,000	90,000	> 90,000
Six-lane	90,000	121,000	135,000	> 135,000
Eight-lane	120,000	161,000	180,000	> 180,000
Standard Arterial				
Two-lane	14,000	18,000	19,000	> 19,000
Four-lane Undivided	18,000	23,000	24,000	> 24,000
Four-lane with Two-way Left Turn Lane	21,000	29,000	31,000	> 31,000
Four-lane Divided	27,000	31,000	32,000	> 32,000
Six-lane Divided	38,000	45,000	48,000	> 48,000
Eight-lane Divided	50,000	60,000	63,000	> 63,000

The level of congestion on arterial streets and highways may summarized by the following operating conditions:

Freeway			
Level of Traffic Congestion	Level of Service	Average Speed	Operating Conditions
None	A and B	Freeway free-flow speed	No restrictions on ability to maneuver and change lanes.
None	C	Freeway free-flow speed	Some restrictions on ability to maneuver and change lanes.
Moderate	D	1 to 2 mph below free-flow speed	Substantial restrictions on ability to maneuver and change lanes.
Severe	E	Up to 10 mph below free-flow speed	Virtually no ability to maneuver and change lanes. Operation at maximum capacity. No usable gaps in the traffic stream to accommodate lane changing.
Extreme	F	Typically 20 to 30 mph or less	Breakdown in vehicular flow with stop-and-go, bumper-to-bumper traffic.

Surface Arterial			
Level of Traffic Congestion	Level of Service	Average Speed	Operating Conditions
None	A and B	70 to 100% of free-flow speed	Ability to maneuver within traffic stream is unimpeded. Control delay at signalized intersections is minimal.
None	C	50 to 100% of free-flow speed	Restricted ability to maneuver and change lanes at mid-block locations.
Moderate	D	40 to 50% of free-flow speed	Restricted ability to maneuver and change lanes. Small increases in flow lead to substantial increases in delay and decreases in travel speed.
Severe	E	33 to 40 percent of free-flow speed	Significant restrictions on lane changes. Traffic flow approaches instability.
Extreme	F	25 to 33 percent of free-flow speed	Flow at extremely low speeds. Intersection congestion with high delays, high volumes, and extensive queuing.

2. Public Transit
   a. The public transit system should serve and connect medium and high density areas of the Region and the Region's major activity centers that currently generate, or have the potential to generate, ridership. The public transit services provided should include rapid, express, local, shuttle, and paratransit services. The detailed planning objectives, principles and standards for the public transit system are documented in SEWRPC Planning Report No. 49, A Regional Transportation System Plan for Southeastern Wisconsin: 2035.

3. Bicycle and Pedestrian Facilities
   a. All arterial streets and highways (including their bridge and underpass facilities) except freeways should provide accommodation for bicyclists upon construction or reconstruction, or for arterial facilities having a rural cross section if possible, when resurfaced. Highways and arterial streets in the Village of Chenequa are encumbered by environmentally sensitive terrain and are therefore not conducive to the provision of bicycle and pedestrian lanes. Moving State Highway 83 to County Highway P would reduce traffic flow through the Village and enhance bicycle and pedestrian safety.
   b. A regional system of off-street bicycle paths should be provided in accordance with the recommendations set forth in the adopted park and open space plans. These off-street bicycle paths should provide reasonably direct connections between the urban areas and communities on safe and aesthetically attractive routes with separation from motor vehicle traffic.
   c. The detailed planning objectives, principles and standards for bicycle and pedestrian facilities are documented in SEWRPC Planning Report No. 43, A Regional Bicycle and Pedestrian Facilities System Plan for Southeastern Wisconsin: 2010, and amendments thereto.

Community Facilities Objective No. 1

To provide police, fire and other emergency service facilities necessary to maintain high-quality protection throughout the County.

Principle

The adequacy of police, fire and other emergency protection in the County is dependent upon the relationship between the distribution of land uses and the location of facilities available to serve those uses. The Village of Chenequa continues to work with neighboring communities to provide the highest level of police, fire, other emergency services and service facilities within the County while maintaining a low cost of overhead to all its residents. Mergers of departments and/or services between the Village of Chenequa and neighboring communities are possible and even likely in order to meet this principle.

Standard
The future placement and current use of emergency service facilities needs to be coordinated to optimize emergency response times and to eliminate overlap of service areas and equipment.

Housing Objective No. 1
The provision of an adequate stock of decent, safe, and sanitary housing to meet the county's total housing requirement and, as components of that requirement, the effective market demand and true housing need.

Principle
Increases in the total number of households within the County as a result of new household formations and net in-migration of additional households as well as changing size and composition of existing households require a concomitant increase in housing units. New centers of employment, which accommodate industrial, retail, service, governmental, or other uses, may also prompt the need for additional employee housing.

Standards
1. The supply of vacant and available housing units should be sufficient to maintain and facilitate ready housing consumer turnover. Rental and homeowner vacancy rates at the county level and, if possible, within local municipalities should be maintained at a minimum of 4 percent and a maximum of 6 percent for rental units and a minimum of 1 percent and a maximum of 2 percent for homeowner units over a full range of housing types, sizes, and costs.
2. The supply of sound housing units should be provided through the working of the private housing sector to the maximum extent possible, with continued assistance, incentives, and cooperation by various Federal, State, and local governmental agencies rendered as necessary.
3. A sufficient supply of new housing should be made available within reasonable proximity to new employment centers. To meet this standard, additional housing at a rate of 75 housing units per 100 new jobs should be provided within a six-mile one-way travel distance of such employment centers.

Housing Objective No. 2
The provision of adequate locational choice of housing.

Principle
The Southeastern Wisconsin Region provides a wide variety of employment, educational, cultural, and recreational facilities. Adequate choice in the size, cost, and location of housing units will facilitate the opportunity for all households to utilize and enjoy these facilities. Geographic distribution and price level variety of housing units can also assist in reducing economic and racial imbalances and equalize fiscal disparities and services differences among communities within the Region.

Standard
Communities that seek to attract jobs, as reflected in the accommodation of new commercial and industrial development, should ensure that a broad range of housing styles, types and price ranges are provided so as to provide opportunities to minimize geographic imbalances between job and residence locations. In so doing, a community should examine both its range of housing stock and its range of jobs, with a view toward ensuring that the price range of the existing and planned housing stock compares favorably with the income range of the workers in those jobs.