

## Chapter 4

# PROJECTED TRANSPORTATION DEMAND

Transportation demand was estimated for the 2030 Transportation Plan base year of 2002 and for immediate years to 2030. Transportation demand was estimated and assigned to the Kalamazoo Area Transportation Study (KATS) transportation network of federal aid eligible roads using TransCAD software. The TransCAD software uses a gravity modeling process to estimate demand and assign those trips to the network. The Michigan Department of Transportation maintains and runs the model for the Kalamazoo Area Transportation Study using data inputs determined locally. Demographic data was used as one of the components in the development of the KATS modeling process.

Transportation travel demand models are driven, in part, by the relationship of land use activities to the transportation network. Specific inputs of the modeling process are land use activity, including the number of households, vehicles, and employment (Retail, Service and Other) located in a given traffic zone. The modeling process translates this data into vehicle trips on the modeled transportation network. Sets of demographic data were developed to establish the 2002 base year transportation model, the 2030 forecast year travel demand model, and intermediate target year models for 2011, 2018, and 2025. A further discussion of the modeling process is provided in the Travel Demand Model chapter.

KATS, in cooperation with the Michigan Department of Transportation and local agencies, developed the demographic factors used to develop the 2002 base model and the forecast year 2030 model and the intermediate target years. The following is a summary of the procedures used to establish the 2002 base demographic information and the procedures used to forecast and distribute the 2030 data. Intermediate target year data was developed in the same way as the method for the 2030 model.

### **METHODOLOGY FOR DETERMINING 2002 BASE DATA**

2002 Basic Data Sources Used:

- 1990 and 2000 U.S. Census for Kalamazoo County (population, household, and vehicles);
- Kalamazoo Area Transportation Study 2025 Transportation Plan;
- Population and employment projections obtained from the Michigan Department of Transportation Statewide Planning Division;
- 2002 Michigan Employment Security Commission (MESCC) employment data;
- Kalamazoo Area Telephone directory; and
- REMI Control Totals for Kalamazoo County.

2002 population, household, and vehicle census block group data was initially allocated to the 375 traffic zones in the modeling area by the MDOT GIS system. It was necessary to adjust the data from multi-jurisdiction zones and zones where boundary lines had changed since the Census information was collected. Consultation with local planning staffs and township supervisors assisted in allocating population and households to particular traffic analysis zones based on local knowledge. Comparison between the traffic analysis zone data for the Kalamazoo Area Transportation Study 2025 Transportation Plan and the 2002 data allowed comparison of the data sets to determine zonal growth or other changes between the 1998 and 2002 census periods.

The variability of the Western Michigan University population between fall and winter terms and summer resulted in final base year population to be slightly higher than the 2002 control totals.

**2002 Employment Data:** Establishing employment totals for the county and the study area presented a challenge because of the lack of reliable and complete data sources for employment locations.

Retail, Service and Other employment data from the 2002 MESC file was first allocated to traffic zones based on employment address location. It became apparent that no single source completely accounted for the total employment in the county. Additional employment data was collected from telephone book listings and contact with multiple location employers, and aggregated to the appropriate traffic zones. Employment totals by Retail, Service, and Other categories were compared to control totals provided by the Michigan Department of Transportation Statewide Planning Division and the REMI control totals for Kalamazoo County. Consultation with local municipal planning staff and township supervisors helped allocate employment in each municipality. In order to distribute the remaining unidentified employment, the totals of the identified Retail, Service, and Other employment were subtracted from the REMI countywide control totals for Retail, Service, and Other. The remaining unidentified employment was distributed to the traffic zones based on the ratio of each zone's identified employment to the county total of identified employment.

## METHODOLOGY FOR DETERMINING 2030 FORECAST DATA

2030 Basic Data Sources Used:

- Michigan REMI 2030 Socio-Economic Forecast for Kalamazoo County;
- Kalamazoo County Planning Department;
- 2000, 2010, 2020, and 2030 Population Forecasts; and
- Projections received from the Michigan Department of Transportation Statewide Planning Division.

Historic patterns of growth in employment and population were assumed to continue to occur. The projections were made before the price of fuel fluctuated dramatically and before the Kalamazoo Promise program that provides state university and college tuition for graduates of the Kalamazoo Public School system was announced. Since the effects of these unanticipated changes are not known at this time, the next transportation plan or update will incorporate any observed changes in growth patterns.

The 2030 population, household, and vehicle forecast was developed using a multi-step process. A countywide 2030 population control total was developed from a comparison of the REMI 2030 Population Forecast and the population forecasts developed by the Kalamazoo County Planning Department and KATS. The REMI figure appeared to be too low compared to actual historic countywide growth trends. The 2030 countywide population total was derived by using the population per dwelling unit change over time and projected to 2030. Because of the addition of students to the 2002 base year population, the 2030 county population similarly exceeded the REMI control total. The resulting population projection compared well with the projections made by the Kalamazoo County Planning Department. The 2030 countywide population control total projected is 275,468.

Each local unit of government in the modeling area provided specific data on new residential (number of dwelling units) by location. This data was added to the appropriate traffic zones. Figures for new dwelling units were converted to population using the projected 2030 population/household figures

for each zone. The resulting population and employment figures were then subtracted from the difference between the 2002 and the 2030 population control totals, which provided the remaining population to be distributed for the 2030 forecast.

The potential growth for each traffic zone was based on a review of zoning, current and future land use, build out capacity, attractiveness for future development, water and sewer availability, local agency staff input, and increasing, decreasing, or stable growth trends. These inputs were then used to make an initial distribution of the remaining 2002 - 2030 population figures. 2030 estimates of the number of households and vehicles per zone were calculated using the projected population per household and vehicles per household figures for each zone.

Countywide employment control totals were based on REMI control totals for 2002 and 2030. The Plan totals were slightly higher than the published REMI totals because of the higher population due to university student counts.

The 2002 employment for each REMI employment category was adjusted to come up with individual 2030 employment category control totals for the county. A portion of the change was uniformly applied across all traffic zones. The remainder of the change was manually assigned to zones where staff, in consultation with local planning staff and township supervisors, determined the additional changes would most likely occur. Factors such as zoning, land use, available space for expansion, growth trends, local knowledge, and individual agency input were used in land assignments of the employment projections.

The final step was to aggregate the individual REMI employment categories into the three broader categories used as input to the model. These three broad categories are Retail, Service, and Other. The aggregation was done for 2002 and for 2030 by traffic zones.

Local government planners and officials reviewed the initial 2030 data distributed by traffic zone. Final adjustments in the distribution of the 2030 socio-economic data were based on these local reviews. Local agency staff will monitor their socio-economic changes to assist in the preparation of the next transportation plan.

## **METHODOLOGY FOR DETERMINING INTERMEDIATE TARGET YEAR FORECAST DATA**

Intermediate target year socio-economic data was projected using the same procedures as noted above for the 2002 base year and the 2030 horizon year of the plan. In general the projected numbers for population, households, vehicles per household, and employment was made from straight line projections of REMI control totals that were provided to the Kalamazoo Area Transportation Study. These projections were modified based on consultation with local planning staffs and township supervisor knowledge that suggested that an employer or developer was planning on specific developments or changes in employment. Where these specific changes were known or reasonably expected, they were reflected in the target year period and traffic analysis zones as appropriate.

The following table shows a comparison of the 2002 and 2030 demographic data for the KATS transportation modeling study area.

### 2002 AND 2030 DEMOGRAPHIC DATA COMPARISON

	2002 Base	2030 Forecast	Percent Change
Population	241,381	282,274	+17
Households	98,276	123,501	+26
Vehicles	153,943	193,585	+26
Retail Employment	26,537	25,383	-4
Service Employment	64,420	87,814	+36
Other Employment	64,488	56,713	-12

The REMI projections show a steady increase in the older population. This illustrates the trend of increasing age of drivers as a proportion of the population. Future efforts should look at how to meet special needs of older drivers in the transportation system. Such items could include increased letter sizes and more legible fonts traffic in signs (already being done in the Kalamazoo area on street name and other signs), better retro reflective signs, markings, illumination and traffic signal timing changes.

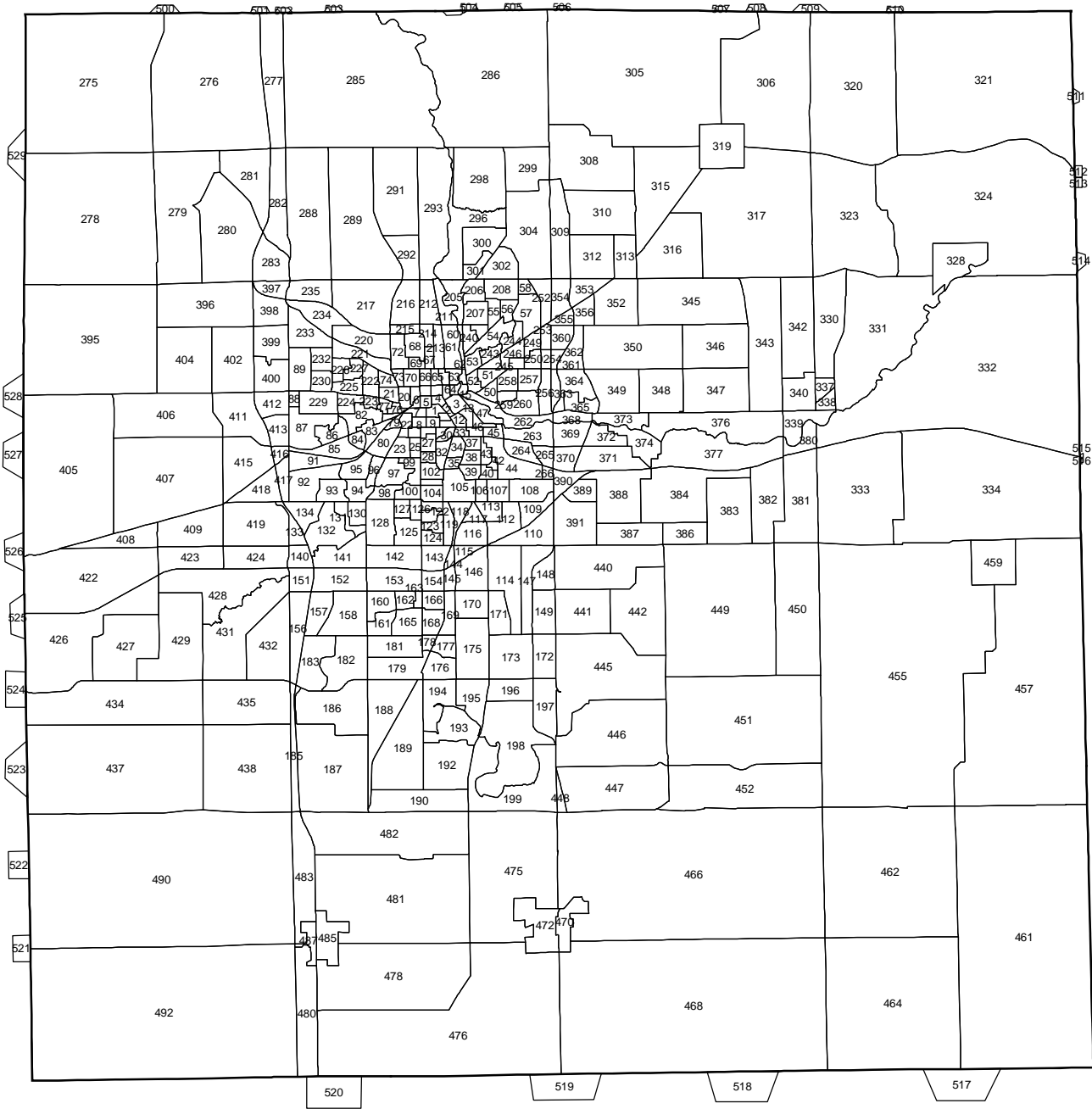
### STATEMENTS OF ERROR IN THE FORECASTING PROCESS

The forecasting and distribution of future households and employment data cannot be made with pin point accuracy due to the nature of the data sources, changes in development plans, unforeseen economic or population factors, and the limits imposed by time and financial resources. Although efforts were made to allocate the data as accurately as possible, in a few instances, due to minor errors in address coding or unidentifiable employer names or addresses, some of the employment data allocated to one zone may actually belong in an adjacent zone. This does not change the overall effect of travel demand on the model because travel activity would be loaded onto the same adjacent network corridor. Therefore, household and employment data for individual zones should be considered as an estimate to be used as a guideline and not an exact total.

### FUTURE UPDATES

Development of future socio-economic updates for the Transportation Plan, on a four-year basis, may require modifications in the research approach and the type of data resources used. In particular, the availability of accurate employment data needs to be improved for both employment address locations and employer business names.

The following traffic zone maps show the location and boundaries of each traffic zone. A summary table provides a breakdown of the 2002 and 2030 demographic data by jurisdiction, with the Study Area Demographics for Kalamazoo County by traffic analysis zone located in the appendices.

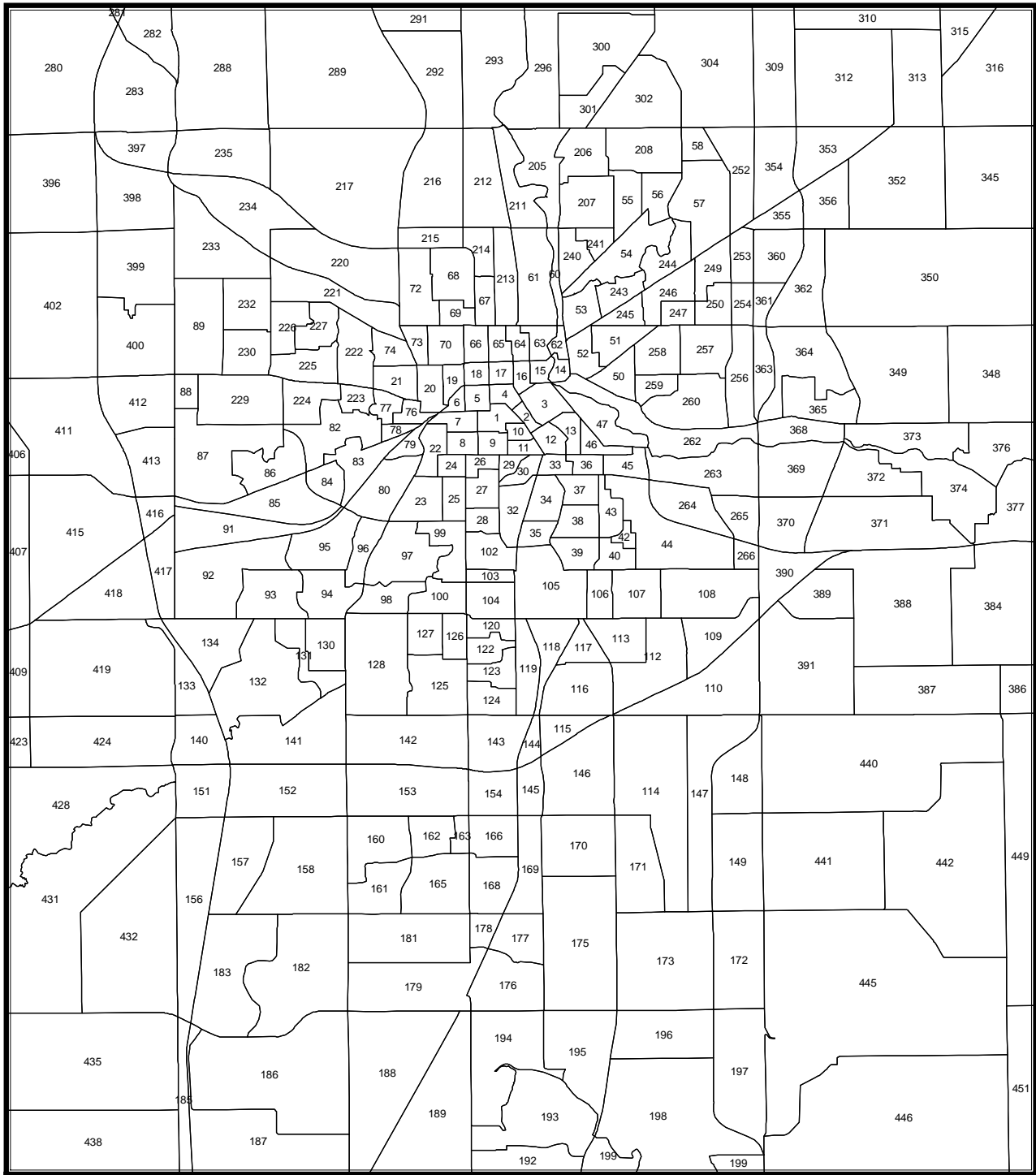


# Traffic Analysis Zones for Kalamazoo County



**KALAMAZOO AREA TRANSPORTATION STUDY**  
3801 East Kilgore Road • Kalamazoo, MI 49001-5534 • (269) 343-0766 • Fax (269) 381-1760

Data Source: MCGI, KATS



# Traffic Analysis Zones for Kalamazoo County Metropolitan Area



**SUMMARY OF DEMOGRAPHICS**

Jurisdiction	POPULATION										
	2000	2002	2005	2006	2009	2010	2015	2020	2025	2030	
City of Kalamazoo	74,324	75,609	74,016	73,651	72,389	71,938	72,742	72,539	72,602	72,587	
City of Portage	45,248	45,769	46,563	46,687	47,165	47,331	49,012	51,133	53,453	55,737	
City of Galesburg	1,988	1,986	1,984	1,982	1,976	1,974	2,000	2,043	2,093	2,142	
City of Parchment	2,523	2,476	2,404	2,404	3,627	3,627	3,675	3,746	3,835	3,925	
Village of Augusta	899	903	909	911	927	939	986	1,042	1,103	1,163	
Village of Climax	791	794	801	803	815	818	851	894	940	986	
Village of Richland	593	593	593	604	635	646	710	781	855	929	
Village of Schoolcraft	1,587	1,561	1,524	1,524	1,524	1,524	1,559	1,606	1,660	1,712	
Village of Vicksburg	2,055	2,016	1,953	1,953	1,953	1,954	1,999	2,064	2,135	2,206	
Alamo Township	3,836	3,926	4,070	4,090	4,166	4,193	4,395	4,638	4,897	5,154	
Brady Township	3,587	3,583	3,577	3,603	3,710	3,746	3,982	4,254	4,542	4,829	
Charleston Township	1,828	1,882	1,965	1,965	1,965	1,965	2,008	2,067	2,132	2,197	
Climax Township	1,621	1,624	1,634	1,634	1,661	1,664	1,730	1,811	1,902	1,992	
Comstock Township	13,851	14,568	15,640	15,732	16,016	16,109	16,878	17,798	18,776	19,747	
Cooper Township	8,738	9,234	9,940	11,324	12,755	13,030	14,181	14,156	14,212	14,268	
Kalamazoo Township	23,561	23,597	24,002	24,219	24,256	24,489	24,642	24,969	26,976	27,378	
Oshtemo Township	17,058	18,543	19,559	21,611	23,158	23,250	23,937	24,763	25,661	26,552	
Pavilion Township	5,829	5,839	6,274	6,469	6,784	7,317	7,525	7,775	8,072	8,378	
Prairie Ronde Township	2,086	2,094	2,111	2,178	2,364	2,433	2,793	3,179	3,582	3,985	
Richland Township	5,898	5,899	5,939	6,223	6,895	7,100	8,065	8,805	9,580	10,383	
Ross Township	4,133	4,169	4,231	4,419	4,673	4,729	5,046	5,393	5,788	6,157	
Schoolcraft Township	4,296	4,296	4,296	4,454	5,045	5,084	5,266	5,508	5,778	6,044	
Texas Township	10,861	11,511	12,446	12,641	13,251	13,453	14,651	15,938	17,278	18,620	
Wakeshma Township	1,414	1,445	1,492	1,492	1,497	1,499	1,539	1,589	1,645	1,700	
<b>TOTAL COUNTY</b>	<b>238,605</b>	<b>243,917</b>	<b>247,923</b>	<b>252,573</b>	<b>259,208</b>	<b>260,812</b>	<b>270,173</b>	<b>278,492</b>	<b>289,496</b>	<b>298,771</b>	

## SUMMARY OF DEMOGRAPHICS

Jurisdiction	DWELLING UNITS									
	2000	2002	2005	2006	2009	2010	2015	2020	2025	2030
City of Kalamazoo	31,752	32,915	32,942	32,951	32,951	32,879	34,162	34,725	35,166	35,496
City of Portage	18,283	18,838	19,127	19,221	19,686	19,836	21,001	22,284	23,492	24,622
City of Galesburg	765	765	767	767	767	765	777	796	808	818
City of Parchment	1,057	1,058	1,058	1,058	1,608	1,608	1,628	1,654	1,675	1,693
Village of Augusta	368	372	377	378	381	385	399	418	437	451
Village of Climax	279	285	292	293	299	302	319	338	355	372
Village of Richland	258	275	282	287	300	305	335	367	397	427
Village of Schoolcraft	615	616	617	617	617	618	634	658	676	692
Village of Vicksburg	788	789	791	791	792	792	806	828	843	856
Alamo Township	1,383	1,443	1,470	1,478	1,533	1,551	1,663	1,785	1,901	2,012
Brady Township	1,301	1,352	1,381	1,387	1,437	1,450	1,547	1,656	1,759	1,855
Charleston Township	686	696	709	710	719	725	764	805	844	883
Climax Township	606	621	631	631	648	656	689	724	757	790
Comstock Township	5,368	5,596	5,721	5,769	5,964	6,029	6,491	6,991	7,475	7,931
Cooper Township	3,182	3,258	3,297	3,771	4,360	4,487	5,090	5,270	5,434	5,579
Kalamazoo Township	9,913	9,944	10,094	10,219	10,449	10,451	10,656	10,902	11,715	11,893
Oshtemo Township	7,568	7,272	8,141	8,930	9,779	9,865	10,367	10,902	11,386	11,823
Pavilion Township	2,114	2,165	2,344	2,424	2,575	2,799	2,923	3,064	3,194	3,314
Prairie Ronde Township	707	783	828	844	912	941	1,068	1,201	1,331	1,459
Richland Township	2,136	2,271	2,358	2,458	2,726	2,809	3,185	3,458	3,723	3,984
Ross Township	1,656	1,681	1,703	1,776	1,883	1,907	2,049	2,195	2,348	2,482
Schoolcraft Township	1,632	1,684	1,712	1,772	2,026	2,048	2,145	2,259	2,366	2,470
Texas Township	3,861	4,174	4,322	4,395	4,666	4,803	5,356	5,975	6,566	7,132
Wakeshma Township	486	492	499	499	505	510	534	558	582	606
<b>TOTAL COUNTY</b>	<b>96,764</b>	<b>99,345</b>	<b>101,464</b>	<b>103,426</b>	<b>107,582</b>	<b>108,521</b>	<b>114,588</b>	<b>119,813</b>	<b>125,230</b>	<b>129,640</b>

SUMMARY OF DEMOGRAPHICS

Jurisdiction	EMPLOYMENT 2002 - 2006											
	2002			2005			2006			2006		
	Retail	Service	Other	Total	Retail	Service	Other	Total	Retail	Service	Other	Total
City of Kalamazoo	8,473	29,677	24,434	62,584	9,006	33,779	24,037	66,822	9,043	34,613	24,368	68,024
City of Portage	9,755	9,831	14,969	34,555	10,343	13,733	14,791	38,867	10,296	11,527	14,616	36,439
City of Galesburg	152	389	921	1,462	156	418	888	1,462	156	427	888	1,471
City of Parchment	219	695	1,271	2,185	228	756	1,251	2,235	228	772	1,251	2,251
Village of Augusta	35	561	38	634	37	624	38	699	37	640	38	715
Village of Climax	2	129	126	257	2	144	124	270	2	148	125	275
Village of Richland	194	416	242	852	205	462	238	905	206	474	239	919
Village of Schoolcraft	170	463	778	1,411	180	516	765	1,461	180	529	769	1,478
Village of Vicksburg	273	814	1,201	2,288	286	890	1,129	2,305	286	912	1,131	2,329
Alamo Township	226	306	907	1,439	244	346	904	1,494	246	355	910	1,511
Brady Township	45	150	404	599	48	167	389	604	48	172	390	610
Charleston Township	11	53	1,066	1,130	17	95	1,440	1,552	18	106	1,497	1,621
Climax Township	35	71	75	181	37	79	75	191	37	81	75	193
Comstock Township	1,749	1,897	5,835	9,481	1,865	2,131	6,407	10,403	1,874	2,190	7,245	11,309
Cooper Township	143	353	826	1,322	152	383	771	1,307	153	391	773	1,317
Kalamazoo Township	1,013	7,389	5,964	14,366	1,063	7,931	5,688	14,682	1,065	8,069	5,863	14,997
Oshtemo Township	3,626	3,442	2,755	9,823	4,716	3,938	2,728	11,382	4,793	3,996	2,742	11,531
Pavilion Township	69	94	1,078	1,241	73	106	1,078	1,257	73	108	1,080	1,261
Prairie Ronde Township	0	120	55	175	0	131	55	186	0	134	55	189
Richland Township	223	794	1,117	2,134	235	881	1,081	2,197	235	903	1,085	2,223
Ross Township	174	627	191	992	181	691	187	1,059	181	707	187	1,075
Schoolcraft Township	647	526	1,418	2,591	694	570	1,369	2,633	694	576	1,373	2,643
Texas Township	692	2,925	2,574	6,191	746	3,365	2,560	6,671	751	3,448	2,577	6,776
Wakeshma Township	1	1	148	150	1	1	145	147	1	1	145	147
<b>TOTAL COUNTY</b>	<b>27,927</b>	<b>61,723</b>	<b>68,393</b>	<b>158,043</b>	<b>30,515</b>	<b>72,137</b>	<b>68,138</b>	<b>170,791</b>	<b>30,603</b>	<b>71,279</b>	<b>69,422</b>	<b>171,303</b>

## SUMMARY OF DEMOGRAPHICS

Jurisdiction	EMPLOYMENT 2009 - 2015											
	2009			2010			2015			2015		
	Retail	Service	Other	Total	Retail	Service	Other	Total	Retail	Service	Other	Total
City of Kalamazoo	9,150	37,088	24,578	70,816	9,210	37,998	24,791	71,999	9,238	41,211	24,954	75,403
City of Portage	10,734	12,711	14,755	38,200	10,791	13,072	14,797	38,660	10,848	14,020	14,984	39,852
City of Galesburg	156	450	886	1,492	155	459	886	1,500	151	486	885	1,522
City of Parchment	228	820	1,255	2,303	228	834	1,255	2,317	223	890	1,261	2,374
Village of Augusta	37	687	39	763	38	703	39	780	38	763	40	841
Village of Climax	2	159	126	287	2	162	127	291	2	176	130	308
Village of Richland	208	509	242	959	208	520	243	971	207	564	248	1,019
Village of Schoolcraft	183	569	776	1,528	183	582	780	1,545	183	634	777	1,594
Village of Vicksburg	287	967	1,136	2,390	287	989	1,140	2,416	282	1,060	1,127	2,469
Alamo Township	251	386	929	1,566	253	395	937	1,585	255	435	966	1,656
Brady Township	48	184	395	627	48	189	396	633	48	206	400	654
Charleston Township	23	136	1,827	1,986	25	145	1,884	2,054	30	191	2,311	2,532
Climax Township	37	87	76	200	37	89	77	203	37	97	80	214
Comstock Township	1,904	2,364	8,934	13,202	1,914	2,422	8,944	13,280	1,923	2,651	8,978	13,552
Cooper Township	156	424	780	1,359	159	468	788	1,415	159	500	791	1,450
Kalamazoo Township	1,070	8,491	5,891	15,452	1,072	8,629	5,894	15,595	1,057	9,137	5,849	16,043
Oshtemo Township	4,857	4,324	2,786	11,967	4,886	4,434	2,802	12,122	4,980	4,862	2,858	12,700
Pavilion Township	74	118	1,089	1,281	75	122	1,096	1,293	75	134	1,111	1,320
Prairie Ronde Township	0	142	56	198	0	145	56	201	0	155	58	213
Richland Township	237	969	1,095	2,301	240	993	1,099	2,332	238	1,077	1,111	2,426
Ross Township	180	756	189	1,125	181	771	190	1,142	177	831	194	1,202
Schoolcraft Township	726	614	1,392	2,732	728	620	1,401	2,749	756	662	1,419	2,837
Texas Township	767	3,796	2,635	7,198	774	4,187	2,246	7,207	785	4,311	2,751	7,847
Wakeshma Township	1	1	145	147	1	1	147	149	1	1	153	155
<b>TOTAL COUNTY</b>	<b>31,316</b>	<b>76,752</b>	<b>72,012</b>	<b>180,079</b>	<b>31,495</b>	<b>78,929</b>	<b>72,015</b>	<b>182,439</b>	<b>31,693</b>	<b>85,054</b>	<b>73,436</b>	<b>190,183</b>

SUMMARY OF DEMOGRAPHICS

Jurisdiction	EMPLOYMENT 2020 - 2030											
	2020			2025			2030			2030		
	Retail	Service	Other	Total	Retail	Service	Other	Total	Retail	Service	Other	Total
City of Kalamazoo	9,160	43,711	24,832	77,703	9,000	45,325	24,430	78,755	8,845	46,937	24,021	79,803
City of Portage	10,781	15,087	15,067	40,935	10,631	15,856	14,978	41,465	10,490	16,619	14,912	42,020
City of Galesburg	144	504	871	1,519	137	513	842	1,492	130	522	826	1,478
City of Parchment	216	930	1,256	2,402	207	952	1,243	2,402	199	975	1,234	2,408
Village of Augusta	37	809	40	886	36	839	40	915	35	869	40	944
Village of Climax	2	187	131	320	2	194	131	327	2	201	131	334
Village of Richland	204	598	249	1,051	199	620	248	1,067	194	642	248	1,084
Village of Schoolcraft	180	674	769	1,623	176	700	752	1,628	172	726	732	1,630
Village of Vicksburg	274	1,110	1,110	2,494	264	1,142	1,077	2,483	254	1,174	1,038	2,466
Alamo Township	255	468	986	1,709	253	490	994	1,737	251	512	1,007	1,770
Brady Township	47	219	401	667	46	228	399	673	45	237	396	678
Charleston Township	36	233	2,746	3,015	40	269	3,154	3,463	45	304	3,539	3,888
Climax Township	36	103	81	220	35	107	81	223	34	111	81	226
Comstock Township	1,909	2,828	8,982	13,719	1,872	2,949	8,936	13,757	1,842	3,068	8,887	13,797
Cooper Township	158	522	788	1,467	155	534	774	1,463	152	546	760	1,458
Kalamazoo Township	1,033	9,503	5,776	16,312	1,001	9,718	5,624	16,343	971	9,936	5,442	16,349
Oshtemo Township	5,074	5,199	2,886	13,159	5,067	5,447	2,877	13,391	5,019	5,672	2,875	13,566
Pavilion Township	75	143	1,117	1,335	74	149	1,117	1,340	73	155	1,120	1,348
Prairie Ronde Township	0	162	59	221	0	166	60	226	0	170	61	231
Richland Township	233	1,140	1,113	2,486	227	1,180	1,102	2,509	221	1,220	1,090	2,531
Ross Township	170	876	194	1,240	162	904	193	1,259	155	932	192	1,279
Schoolcraft Township	780	697	1,429	2,906	773	705	1,421	2,899	767	713	1,406	2,886
Texas Township	786	4,676	2,825	8,287	782	4,867	2,860	8,509	778	5,055	2,900	8,733
Wakeshma Township	1	1	156	158	1	1	158	160	1	1	160	162
<b>TOTAL COUNTY</b>	<b>31,591</b>	<b>90,380</b>	<b>73,864</b>	<b>195,834</b>	<b>31,140</b>	<b>93,855</b>	<b>73,491</b>	<b>198,486</b>	<b>30,675</b>	<b>97,297</b>	<b>73,098</b>	<b>201,069</b>

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