



MEMORANDUM

TO: Genesee County Local Units of Government

FROM: Jason Nordberg, Principal Planner
Genesee County Metropolitan Planning Commission

DATE: October 3, 2013

SUBJECT: **Draft Genesee County Population Projections for the 2040 Long Range Transportation Plan**

One of the key elements to the development of a Long Range Transportation Plan (LRTP) is the development of population projections out to the horizon year of the plan, in this case out to 2040. The base data for previous GCMPC population projections has been building permit and demolition data gathered from local units of government. The crash of the housing market and the national recession of the late 2000's have halted much of the new construction in the county and we have also seen an increase in vacancy and reduction in housing values. While we are starting to see new residential construction and vacant houses being occupied throughout the county the amount and short timeframe of recovery leading up to the 2040 projections does not provide a firm foundation to build projections from.

Staff developed projections for the City of Flint separately from local units of government outside the City of Flint. This is primarily due to the amount and duration of population loss in the City of Flint, which averaged a loss of 19,000 people per decade since 1980 even with significant residential investments over the past decade. Staff made the assumption that at some point the population loss in the City will level off. Historic Census rates of loss for the City were used to gradually reduce the percent loss over time.

For the local units of government outside of the City of Flint staff made two primary assumptions, local units of government will get back to the level of residential construction realized in the early 2000's and they will get back to vacancy rates of the 2000 Census. Each community will recover at different

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rates so to address this staff developed Recovery Rates for each Community. The recovery rates are based on 2010 and historic Census data and were applied to growth factors from the 2035 projections to gradually build up to the level of growth realized in the first half of the 2000's and to vacant housing in each community to help recover vacancy to 2000 Census levels.

The Methodology Report for the Draft 2040 LRTP Population Projections has been included with this agenda and provides further details on the development of the population projections. Please review the projections and the methodology. The projections were submitted to the Long Range Transportation Steering Committee in September for initial review and will be discussed at the October 3, 2013 Technical Advisory Committee (TAC) meeting at 1:30 p.m. in Room 223 of the Genesee County Administration Building located at 1101 Beach Street Flint, MI 48502. We are giving communities until Friday, October 11, 2013 to comment on the projections. This will give staff opportunity to gather comments before taking the projections to the Long Range Transportation Steering Committee for a second time on October 16, 2013.

Please feel free to contact me by phone (810)766-6543 or email jnordberg@co.genesee.mi.us by October 11, 2013 with any questions or comments related to the Genesee County 2040 LRTP Population Projections.

Draft Genesee County 2040 Long Range Transportation Plan Population Projections

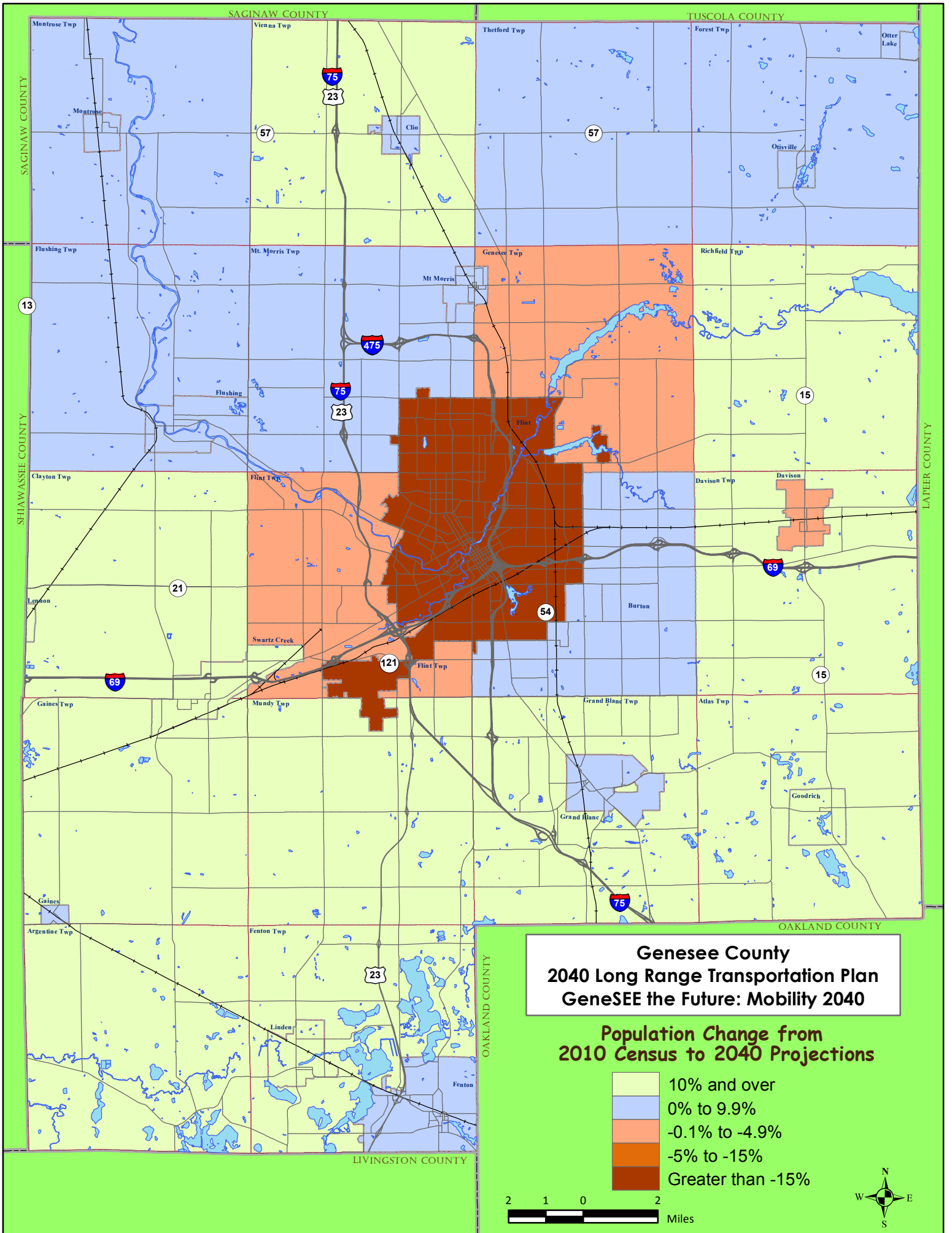
LUG	Pop 2005	Pop 2010	Pop 2012	Pop 2015	Pop 2020	Pop 2025	Pop 2030	Pop 2035	Pop 2040	2010 to 2040 Change	2010 to 2040 % Change
Argentine Twp	6,943	6,913	6,903	6,926	7,069	7,236	7,425	7,638	7,886	973	14.1%
Atlas Twp	6,215	6,133	6,102	6,085	6,139	6,267	6,412	6,576	6,768	635	10.4%
Burton City	31,305	29,999	29,874	29,742	29,700	30,065	30,473	31,068	31,821	1,822	6.1%
Clayton Twp	7,700	7,611	7,591	7,602	7,730	7,901	8,096	8,319	8,581	970	12.7%
Clio City	2,586	2,646	2,628	2,605	2,584	2,602	2,626	2,661	2,711	65	2.5%
Davison City	5,529	5,173	5,136	5,083	5,008	4,988	4,973	4,989	5,046	-127	-2.5%
Davison Twp	19,180	19,575	19,512	19,551	19,986	20,606	21,292	22,055	22,932	3,357	17.1%
Fenton City	11,625	11,746	11,771	11,878	12,201	12,344	12,466	12,628	12,861	1,115	9.5%
Fenton Twp	14,665	15,552	15,554	15,689	16,274	16,953	17,647	18,331	19,020	3,468	22.3%
Flint City	120,283	102,486	99,416	93,009	82,543	77,343	72,527	69,646	67,133	-35,353	-34.5%
Flint Twp	33,720	31,890	31,739	31,526	31,251	31,281	31,203	31,310	31,646	-244	-0.8%
Flushing City	8,464	8,389	8,352	8,306	8,268	8,332	8,364	8,429	8,541	152	1.8%
Flushing Twp	10,596	10,640	10,604	10,585	10,661	10,779	10,931	11,120	11,363	723	6.8%
Forest Twp	3,931	3,838	3,820	3,800	3,789	3,829	3,868	3,921	3,993	155	4.0%
Gaines Twp	6,420	6,442	6,436	6,460	6,592	6,736	6,900	7,086	7,305	863	13.4%
Gaines Village	450	380	379	378	377	375	375	377	380	0	0.0%
Genesee Twp	23,981	21,595	21,513	21,395	21,237	21,259	21,159	21,164	21,300	-295	-1.4%
Goodrich Village	1,566	1,860	1,855	1,868	1,940	2,045	2,155	2,271	2,396	536	28.8%
Grand Blanc City	8,078	8,276	8,227	8,181	8,187	8,257	8,358	8,492	8,674	398	4.8%
Grand Blanc Twp	35,075	37,500	37,527	37,878	39,312	40,903	42,421	43,970	45,734	8,234	22.0%
Linden City	3,603	3,991	3,997	4,029	4,142	4,239	4,342	4,417	4,514	523	13.1%
Montrose City	1,552	1,657	1,648	1,639	1,635	1,656	1,679	1,707	1,745	88	5.3%
Montrose Twp	6,496	6,224	6,203	6,180	6,172	6,232	6,290	6,380	6,499	275	4.4%
Mt Morris City	3,448	3,127	3,119	3,111	3,118	3,168	3,209	3,282	3,393	266	8.5%
Mt Morris Twp	23,795	21,460	21,421	21,370	21,331	21,477	21,422	21,482	21,684	224	1.0%
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	449,150	425,790	421,919	415,657	409,210	410,384	411,749	416,286	423,030	-2,760	-0.6%

Woods and Poole	2005	2010	2012	2015	2020	2025	2030	2035	2040	2010 to 2040 Change	2010 to 2040 % Change
	442,508	425,790	421,827	421,531	421,711	422,231	422,645	422,895	423,226	-2,564	-0.6%

REMI	2005	2010	2012	2015	2020	2025	2030	2035	2040	2010 to 2040 Change	2010 to 2040 % Change
	442,382	425,790	422,722	418,132	411,712	407,617	404,881	403,049	401,784	-24,006	-5.6%

GCMPC 2035	2005	2010	2012	2015	2020	2025	2030	2035	2040	2010 to 2040 Change	2010 to 2040 % Change
	449,150	451,954	452,486	455,624	457,680	461,835	465,879	469,895	473,883	21,929	4.9%

Census Estimates	2005	2010	2012
	442,508	425,790	418,408



Draft

2005 Base Year Population Data 2040 Population Projections Methodology Report



September 2013



Genesee County
2040 Long Range Transportation Plan
GeneSEE the Future: Mobility 2040

Prepared by the Genesee County
Metropolitan Planning Commission



Genesee County Population Projections Methodology Report

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Methodology Examples

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Recovery Factors and Supporting Census Data

Genesee County 2040 Population Projections Methodology

2005 and 2010 Years of the 2040 Population Projections

TAZ Level Data

The population projections for Genesee County were produced on a traffic analysis zone (TAZ) level where growth/decline was calculated for each TAZ which can then be aggregated up to the municipality level for all cities and townships and some villages. The 2005 base year projections are based on 2000 census data derived from the 2000 Census transportation Planning Package (CTPP) which provided household data information to the TAZ level. The 2005 projections were originally developed for 467 TAZ that represented Genesee County. When the transportation model for the 2035 Long Range Transportation Plan (LRTP) was updated the TAZ layer in the model was modified to 639 TAZ and data was migrated to the new zones.

Building Permits and Demolitions

In the development of the 2035 projections, which includes the 2005 base year of the 2040 projections, staff used building permit data (new builds and demolitions) to depict the areas of growth/decline in Genesee County. Building permit data was collected from every municipality, geo-located and aggregated to the TAZ level. Building permits include single-family residential, multi-family residential, and mobile homes all weighted equally per housing unit. Data was used from the years 2000 through 2006. Comparing the 1990 and 2000 Census and Genesee County building permit data for the same time period it was decided that a reduction factor of .42 would be used to compensate for building permits issued but not completed and vacancy rates. The factored net change was then averaged out from the seven years of data into an average yearly growth/decline factor that will be identified from this point on as the 2035 Annual TAZ Household Growth Factors. This factor was used to project the 2005 base year data from 2000 Census data.

2010 TAZ level data was validated using 2010 Census data. The remaining year projections for the 2040 Population Projections are explained in further detail in the following sections of this report.

Methodology for Projections Beyond 2010

All local units of Government in Genesee County (including the City of Flint) were projected using the same methodology for the 2035 LRTP Population Projections. The 2040 projections use different methodology for the City of Flint than what is used for all other local units of government in Genesee County. The primary reason for this separation is that the City of Flint is a unique case as it has lost on average 19,000 people per decade since 1980. No other local unit of government in Genesee County has a fraction of the continued loss realized in the City of Flint. The following sections of this report describe the methodology used for areas outside the City of Flint and for the City of Flint itself.

Methodology for the Local Units of Government outside the City of Flint

A. New Construction

In the late 2000's much of the growth realized earlier in the decade was halted with the crash of the housing market and the beginning of the national recession. These conditions resulted in the following:

- An uncharacteristic number of foreclosures
- An uncharacteristic number of short sales
- An uncharacteristic number of abandoned homes
- An uncharacteristic drop in housing values

These conditions made it a lot cheaper and attractive to buy an existing home rather than building a new one. Many older homes were abandoned as homeowners were able to buy newer and larger homes for relatively the same monthly payment of their existing home. Residential development basically halted in the late 2000's. In 2012/2013 the housing market began to stabilize and new residential development was starting throughout Genesee County. While seeing positive growth, the amount and the short timeframe of the recovery leading up to the 2040 population projections did not give a firm foundation to build growth factors from. As a result the main assumption that staff made moving forward is that Genesee County communities will eventually get back to levels of growth realized in the first half of the 2000's. A large amount of infrastructure was put in place in the early 2000's as seen in partially finished subdivisions throughout the County. It is assumed that factors such as infrastructure that made areas in the County attractive for growth before the housing market crash and the national recession will continue to attract growth as the recovery continues. To determine how a community may recover staff used Census data, specifically 2010 vacancy rates, percent change in population from the 2000 to 2010 Census, and a general trend in Census population numbers from 1980 to 2010 to develop a recovery factor for each community. Charts and maps of Census data used to create the Recovery Factors and of the Recovery Factors themselves can be found in Appendix B. The recovery factors were applied to 2035 Annual TAZ HH Growth Factors creating the 2040 Annual TAZ HH Growth Factors. This allows each community to recover at its own pace until it reaches annual growth realized in the early 2000's. This growth/decline is represented as an annual change in households each year at the TAZ level. An example of how this is calculated is provided in Example 1 of Appendix A.

B. Vacancy

Every community in Genesee County had a higher 2010 Census vacancy rate as compared to the 2000 Census vacancy rate. Another assumption made by staff is that the same factors that have affected new construction have also affected vacancy and that in most communities many of the houses that were vacant in 2010 will be occupied returning the community to 2000 vacancy levels. A vacancy rate is hard to project into the future as demolitions and new construction each affect the rate. At this time the Genesee County population

projections do not project vacant housing units into the future and thus a vacancy rate is not projected. To compensate for this staff identified a target number of houses in each community that will move from vacant to occupied in the future. The target was calculated by first applying the 2000 vacancy rate to the 2010 housing units. The difference in comparing the 2010 vacant units to the factored 2010 vacant units using the 2000 vacancy rate is the target. As with new construction each community will recover vacancy at a different rate so the target number of housing units is divided by the Recovery Factor to get an annual number of housing units that will move from vacant to occupied each year until the target number of units is reached. This is represented as an annual change in households each year at the TAZ level. An example of how this is calculated is provided in Example 2 of Appendix A.

C. Total Households

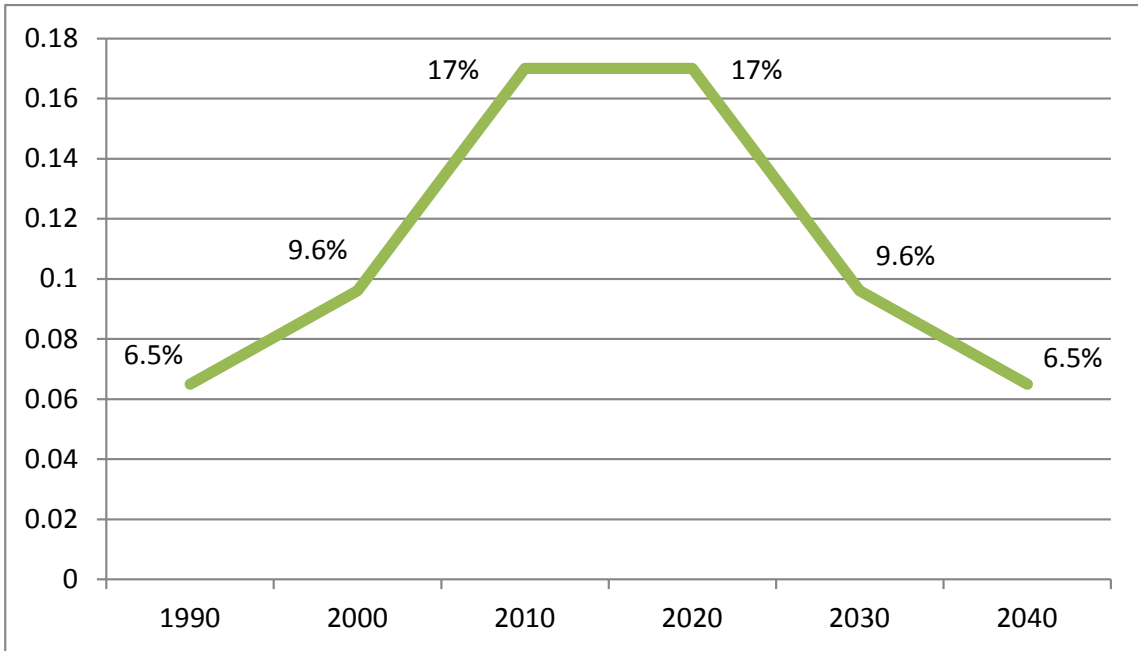
The combination of new construction households and households recovered from vacancy represents the growth in households for a TAZ for a given year. The households in a TAZ for a given year are multiplied by the projected persons per household for the TAZ for the representative year to calculate population. An example of how this is calculated is provided in Example 3 of Appendix A.

City of Flint Population Projection Methodology

The City of Flint has continued to see a steady loss in population over the past several decades averaging a loss of 19,000 persons per decade since 1980. At some point in the future this rate of loss should level out, however, this is hard to estimate given the consistency of population loss in the City even with significant investments made in the community over the past decade.

Genesee County population projections are driven by changes to households. Staff used historic percent changes to households in the City of Flint to project future percent changes to households. The percent change in households increased each decade since 1980 leading up to the 2010 Census and the future projection reverse the pattern decreasing the percent change in households for the decades out to 2040. This approach tappers back the percent household reduction in the future and resembles a bell curve pattern as seen in the chart on the next page.

This graph illustrates a bell curve pattern for existing and projected Percent Reduction in households for the City of Flint.



Staff used information in the Draft City of Flint Master Plan to identify areas and levels of growth and decline. This information was coded into the TAZ representing the City of Flint and used to distribute annual HH reductions. The projections also recognized areas of growth in the City such as Smith Village, student housing, and the Durant that were not accounted for or at least not fully accounted for in the 2010 Census. The projected households for each City of Flint TAZ are multiplied by the persons per household projections for each TAZ for the representative year. An example of how the City of Flint Population Projections are calculated is provided in Example 5 (a) and 5 (b) of Appendix A.

Other Factors

A. Availability for growth

In high growth TAZs, availability of land was looked at to determine the number of housing units a TAZ can actually hold. Aerial imagery was used to determine available land and zoning ordinances were used to determine the number of units available in that area. These were applied to the high growth TAZ in the same method that was used in the previous two projections.

B. Household Size

Up to this point we are working with households not persons in our population forecasting. For each TAZ a person per household factor is derived from 2010 Census data. We know that the average household size is decreasing and that it is projected to continue to decrease in the future. The University of Michigan Institute for Research on Labor, Employment, and the Economy used Regional Economic Models Inc (REMI) 2040 population projection data as their base to

develop household projections for Genesee County out to the year 2040. This data is provided in five year increments and was developed for the Michigan Department of Transportation (MDOT). The information derived from this dataset for the Genesee County population projections is an annual projected change in household size. Persons per household (PPHH) is easily calculated from the UM/REMI projections by dividing the population by the number of households for each five year increment. This represents the projected UM/REMI average PPHH for Genesee County for each five year increment. The annual change in household size for years between each five year increment is calculated by dividing the difference in PPHH for two sequential five year increments by five. From this calculation each five year period is represented by an annual PPHH reduction factor that will be applied to each TAZ to project TAZ level reductions in annual household size. An example of how PPHH Reduction Factors are used at the TAZ level to project PPHH is provided in Example 4 of Appendix A.

Comparison to other data sources

As stated earlier the population projections are calculated at the TAZ level and then aggregated by local unit of government. The local unit of government data is further aggregated to County level projections. The County level projections are compared to and validate against other population projections such as the 2035 Genesee County LRTP Population Projections, 2040 Regional Economic Models Inc. (REMI) projections, and 2040 Woods and Poole projections.

	<u>2040</u>
2035 Genesee County LRTP Population Projections:	473,883
2040 Woods and Poole:	423,226
2040 REMI:	401,784
2040 year of 2040 LRTP Population Projections:	423,030

A 2040 year was estimated for the 2035 Genesee County LRTP Population Projections for comparison to other projections.

Population Projection Assumptions

- Data from the 2000 Census Transportation Planning Package for Genesee County is accurate for each traffic analysis zone.
- Data from the 2010 Census is accurate for each traffic analysis zone.
- Locations of building permits from 2000-2006 will represent the areas of future growth out to 2040.
- Locations of demolitions from 2000-2006 will represent areas of future decline out to 2040.
- All new building permits do not equal new housing units. The number of new housing units is a factor based on the difference between the number of new building permits between 1990 and 2000 compared to the number of new households reported by the Census during that same time period.

- Density patterns of single-family residential will continue at the current densities now present in the local unit of governments' master plan and zoning ordinances.
- Household size will continue to decline at the rates suggested in the 2040 University of Michigan Institute for Research on Labor, Employment, and the Economy/Regional Economic Models Inc (REMI) data.
- Interpolation of the five-year increments of household size in the 2040 University of Michigan Institute for Research on Labor, Employment, and the Economy/Regional Economic Models Inc (REMI) data can be analyzed to show household size changes for any given year out to 2040.
- Local planning knowledge of future development in Genesee County is a factor that is considered when applying statewide and national data to the local area and adjustments are made where known development is occurring that is not represented in the statewide and national datasets.
- Genesee County Local Units of Government will eventually get back to the levels of growth realized in the first half of the 2000's.
- Genesee County Local Units of Government will eventually get back to the levels of vacancy realized in the first half of the 2000's.
- Recovery Factors can be assigned to a community based on current and historic Census vacancy and population data and used to factor future construction and vacancy recovery.

Draft Genesee County 2040 Long Range Transportation Plan Population Projections

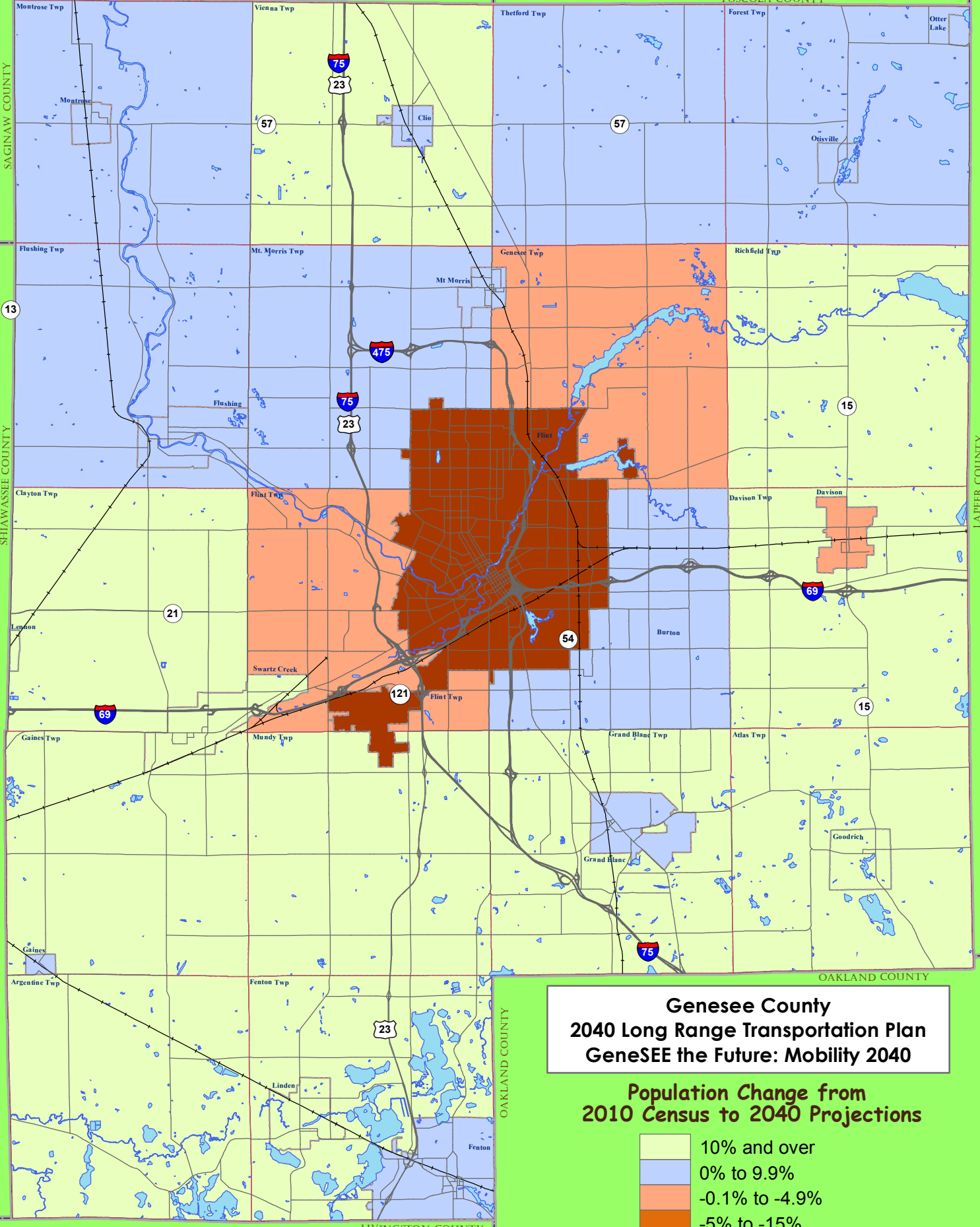
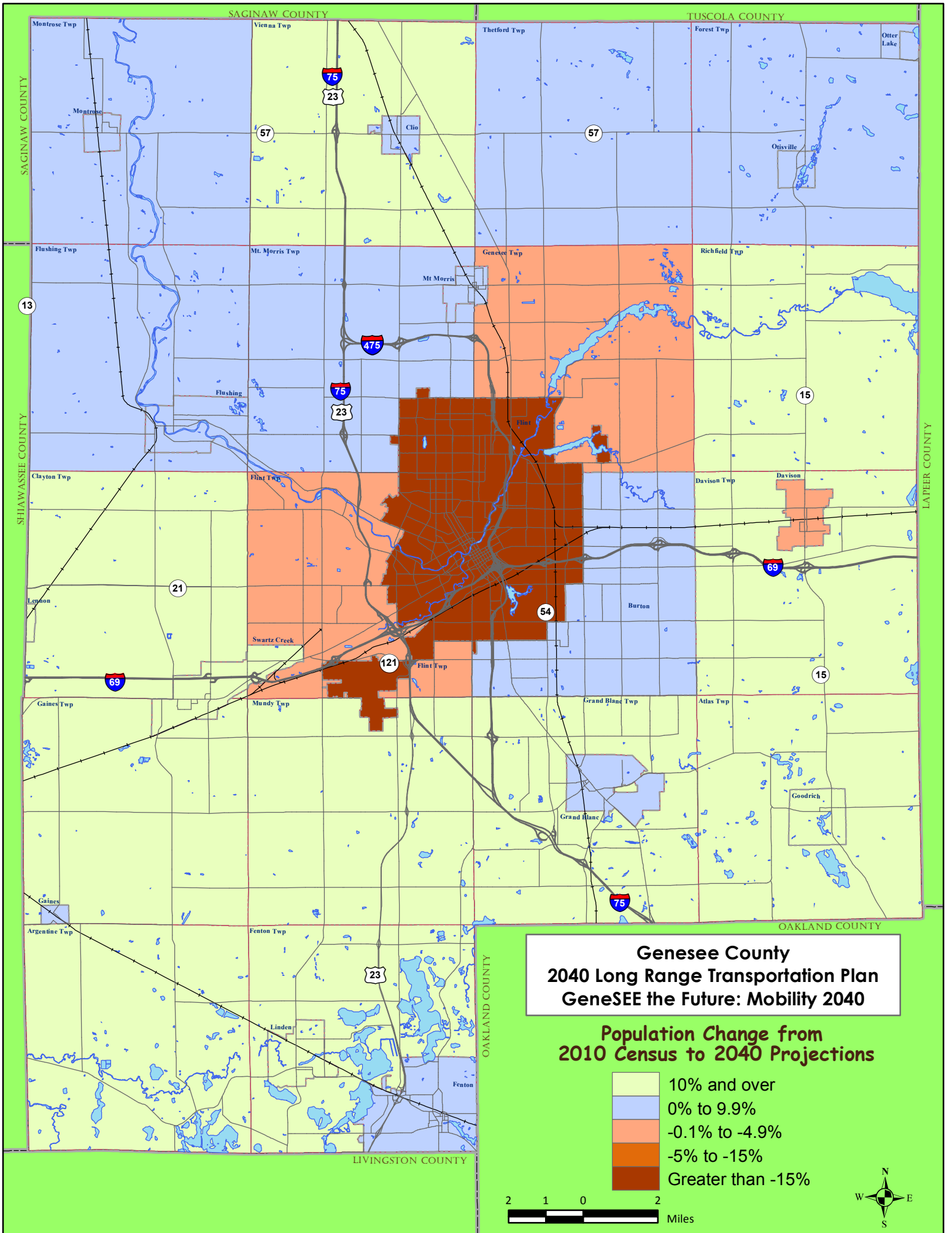
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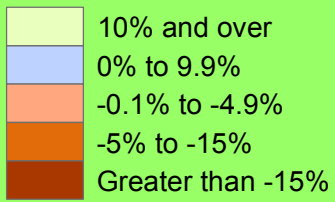
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Census Estimates	2005	2010	2012
	442,508	425,790	418,408



**Genesee County
2040 Long Range Transportation Plan
GeneSEE the Future: Mobility 2040**

**Population Change from
2010 Census to 2040 Projections**



Appendix A

Methodology Examples

**1. Example Calculation for Annual Household (HH) Growth Factor
for Areas outside the City of Flint**

Annual Distribution of Target

	2035 Annual HH Growth Factor for TAZ		Recovery Factor for Community 1		2040 Annual Recovery Factor for TAZ
Community 1 TAZ 1	10	÷	5	=	2.00
Community 1 TAZ 2	5	÷	5	=	1.00
Community 1 TAZ 3	14	÷	5	=	2.80
Community 1 Total	29	÷	5	=	5.80

2040 Annual HH Growth Factor Recovery

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Community 1 TAZ 1	2.00	4.00	6.00	8.00	10.00	10.00	10.00
Community 1 TAZ 2	1.00	2.00	3.00	4.00	5.00	5.00	5.00
Community 1 TAZ 3	2.80	5.60	8.40	11.20	14.00	14.00	14.00
Community 1 Total	5.80	11.60	17.40	23.20	29.00	29.00	29.00

2040 Annual Recovery Factors for each TAZ are compounded each year until the 2035 Annual HH Growth Factor is reached.

2040 HH Projection For Community 1 Using Only 2040 Annual HH Growth Factor (no Recovered Vacancy included)

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Community 1 TAZ 1	902.00	906.00	912.00	920.00	930.00	940.00	950.00
Community 1 TAZ 2	555.00	557.00	560.00	564.00	569.00	574.00	579.00
Community 1 TAZ 3	528.80	534.40	542.80	554.00	568.00	582.00	596.00
Community 1 Total	1,986	1,997	2,015	2,038	2,067	2,096	2,125
Community 1 HH Growth	5.80	11.60	17.40	23.20	29.00	29.00	29.00

New households are added to existing households for each TAZ.

2. Example Calculation for Recovered Vacancy for Areas Outside the City of Flint

Community 1 Information

2010 Vacant Houses	220
2010 Households	1,980
2010 Housing Units	2,200
2000 Vacancy Rate	6%

2010 Factored Vacant Houses Using Census 200 Vacancy Rate	132	2,200 x 6%=132
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Difference = Target	220	-	132	=	88
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The Target represents the number of housing units that will be moved from vacant to occupied through the timeframe of the projections. The rate at which this happens depends on the Recover Factor for the community the TAZ represents.

Annual Distribution of Target

	Vacant Houses	Percent of Vacant Houses this TAZ represents for the community	Distribution of Target	Recovery Factor	Annual Recovery Factor
Community 1 TAZ 1	100	45.5%	40.00	5	8.00
Community 1 TAZ 2	71	32.3%	28.40	5	5.68
Community 1 TAZ 3	49	22.3%	19.60	5	3.92
Community 1 Total	220	100.0%	88		17.60

The Target is distributed based on the Percentage of Vacant Houses the TAZ represents for the community and is then divided by the Recovery Factor to get an Annual Recovery Factor for each TAZ.

2040 Annual Vacancy Recovery

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Community 1 TAZ 1	8.00	8.00	8.00	8.00	8.00	0	0
Community 1 TAZ 2	5.68	5.68	5.68	5.68	5.68	0	0
Community 1 TAZ 3	3.92	3.92	3.92	3.92	3.92	0	0
Community 1 Total	17.60	17.60	17.60	17.60	17.60	0	0
					88		

The Annual Recovery Factor is applied to each year until the Target of housing units is reached for the TAZ.

2040 HH Projection For Community 1 Using Only Recovered Vacancy (no New Build Housing included)

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Community 1 TAZ 1	908.00	916.00	924.00	932.00	940.00	940.00	940.00
Community 1 TAZ 2	559.68	565.36	571.04	576.72	582.40	582.40	582.40
Community 1 TAZ 3	529.92	533.84	537.76	541.68	545.60	545.60	545.60
Community 1 Total	1,998	2,015	2,033	2,050	2,068	2,068	2,068
					88		

The housing units that are newly occupied from vacant houses in a given year are added to the existing households in each TAZ

**3. Example Calculation Combining Recovered Vacancy and Household Growth Factor
for Areas Outside the City of Flint**

2040 Annual Vacancy Recovery

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Community 1 TAZ 1	8.00	8.00	8.00	8.00	8.00	0.00	0.00
Community 1 TAZ 2	5.68	5.68	5.68	5.68	5.68	0.00	0.00
Community 1 TAZ 3	3.92	3.92	3.92	3.92	3.92	0.00	0.00
Community 1 Total	17.60	17.60	17.60	17.60	17.60	0.00	0.00

2040 Annual HH Growth Factor Recovery

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Community 1 TAZ 1	2.00	4.00	6.00	8.00	10.00	10.00	10.00
Community 1 TAZ 2	1.00	2.00	3.00	4.00	5.00	5.00	5.00
Community 1 TAZ 3	2.80	5.60	8.40	11.20	14.00	14.00	14.00
Community 1 Total	5.80	11.60	17.40	23.20	29.00	29.00	29.00

2040 Combined Annual Vacancy Recovery and Annual HH Growth Factor Recovery

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Community 1 TAZ 1	10.00	12.00	14.00	16.00	18.00	10.00	10.00
Community 1 TAZ 2	6.68	7.68	8.68	9.68	10.68	5.00	5.00
Community 1 TAZ 3	6.72	9.52	12.32	15.12	17.92	14.00	14.00
Community 1 Total	23.40	29.20	35.00	40.80	46.60	29.00	29.00

Projected Households for Community 1

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Community 1 TAZ 1	910.00	922.00	936.00	952.00	970.00	980.00	990.00
Community 1 TAZ 2	560.68	568.36	577.04	586.72	597.40	602.40	607.40
Community 1 TAZ 3	532.72	542.24	554.56	569.68	587.60	601.60	615.60
Community 1 Total	2,003	2,033	2,068	2,108	2,155	2,184	2,213

New households from recovered vacancy and new builds are added to existing households.

**4. Example Population Projections Combining All Factors
for Areas Outside the City of Flint**

Projected Households (HH) for Community 1

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Community 1 TAZ 1 HH	910.00	922.00	936.00	952.00	970.00	980.00	990.00
Community 1 TAZ 2 HH	560.68	568.36	577.04	586.72	597.40	602.40	607.40
Community 1 TAZ 3 HH	532.72	542.24	554.56	569.68	587.60	601.60	615.60
Community 1 Total HH	2,003.40	2,032.60	2,067.60	2,108.40	2,155.00	2,184.00	2,213.00

Projected Persons Per Household (PPHH)

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
PPHH Reduction Factors	-0.01056	-0.01056	-0.01056	-0.01056	-0.01056	-0.00992	-0.00992
Projected PPHH Comm 1 TAZ 1	2.489436	2.478873	2.468309	2.457745	2.447182	2.437263	2.427345
Projected PPHH Comm 1 TAZ 2	2.589436	2.578873	2.568309	2.557745	2.547182	2.537263	2.527345
Projected PPHH Comm 1 TAZ 3	2.289436	2.278873	2.268309	2.257745	2.247182	2.237263	2.227345

The PPHH Reduction Factor for the County for a given year is subtracted from the previous years PPHH calculation for the TAZ. This is repeated each year for each TAZ.

Projected Population for Community 1

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Community 1 TAZ 1 Pop	2265.387	2285.521	2310.337	2339.774	2373.766	2388.518	2403.072
Community 1 TAZ 2 Pop	1451.845	1465.728	1482.017	1500.68	1521.686	1528.447	1535.109
Community 1 TAZ 3 Pop	1219.629	1235.696	1257.913	1286.192	1320.444	1345.938	1371.154
Community 1 Total Pop	4936.861	4986.945	5050.268	5126.646	5215.897	5262.903	5309.334

Population = Persons Per Household x Households.

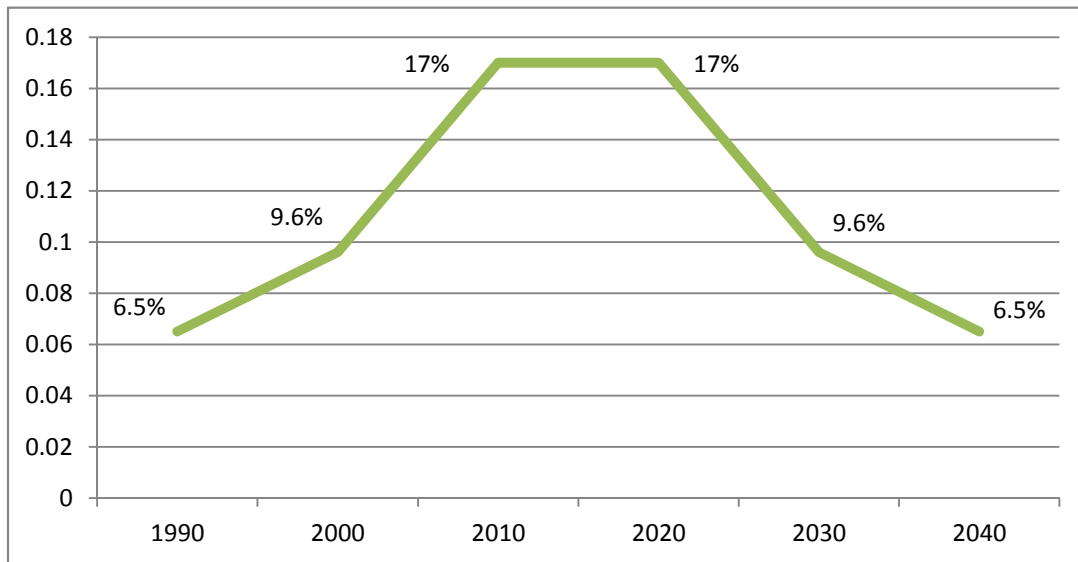
5 (a). Factors for City of Flint Household (HH) Reduction

Projected Percent Reduction in Households (HH) between the years:		
2011 to 2020	2021 to 2030	2031 to 2040
17%	9.60%	6.50%
2010 Flint HH	2020 Flint HH (Projected)	2030 Flint HH(Projected)
40,497	34,809	31,467
2011 to 2020	2021 to 2030	2031 to 2040
HH Reduction	HH Reduction	HH Reduction
6,884	3,342	2,045

For each period the City of Flint combined households are multiplied by the Percent Reduction in Households to calculate the HH Reduction for the represented decade.

2011 to 2020	2021 to 2030	2031 to 2040
HH Reduction Per Year	HH Reduction Per Year	HH Reduction Per Year
688.45	334.16	204.53

The Household Reduction for the represented decade is divided by 10 to get an Annual Reduction Per Year.



This graph illustrates a bell curve pattern for existing and projected Percent Reduction in households for the City of Flint.

5 (b).Example of How Household (HH) Reduction Factors for the City of Flint Change HHs at the TAZ Level

	Percent of HH Change This TAZ Represents	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12
Example Flint TAZ 1	20%	137.69	137.69	137.69	137.69	137.69	137.69	137.69	137.69	137.69	137.69	66.83	66.83
Example Flint TAZ 2	30%	206.53	206.53	206.53	206.53	206.53	206.53	206.53	206.53	206.53	206.53	100.25	100.25
Example Flint TAZ 3	40%	275.38	275.38	275.38	275.38	275.38	275.38	275.38	275.38	275.38	275.38	133.66	133.66
Example Flint TAZ 4	10%	68.84	68.84	68.84	68.84	68.84	68.84	68.84	68.84	68.84	68.84	33.42	33.42
	100%	688.45	688.45	688.45	688.45	688.45	688.45	688.45	688.45	688.45	688.45	334.16	334.16

In the chart above the *HH Reduction Per Year* for the City of Flint from 5 (a) is multiplied by the *Percent of HH Change the TAZ Represents* to get HH reduction per year per TAZ

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12
Example Flint TAZ 1	7961.7102	7824.02	7686.33	7548.64	7410.95	7273.26	7135.57	6997.88	6860.19	6722.50	6655.67	6588.84
Example Flint TAZ 2	11942.5653	11736.03	11529.50	11322.96	11116.43	10909.89	10703.36	10496.82	10290.29	10083.75	9983.50	9883.26
Example Flint TAZ 3	15923.4204	15648.04	15372.66	15097.28	14821.90	14546.52	14271.14	13995.76	13720.38	13445.00	13311.34	13177.67
Example Flint TAZ 4	3980.8551	3912.01	3843.17	3774.32	3705.48	3636.63	3567.79	3498.94	3430.10	3361.25	3327.83	3294.42
	39,809	39,120	38,432	37,743	37,055	36,366	35,678	34,989	34,301	33,613	33,278	32,944

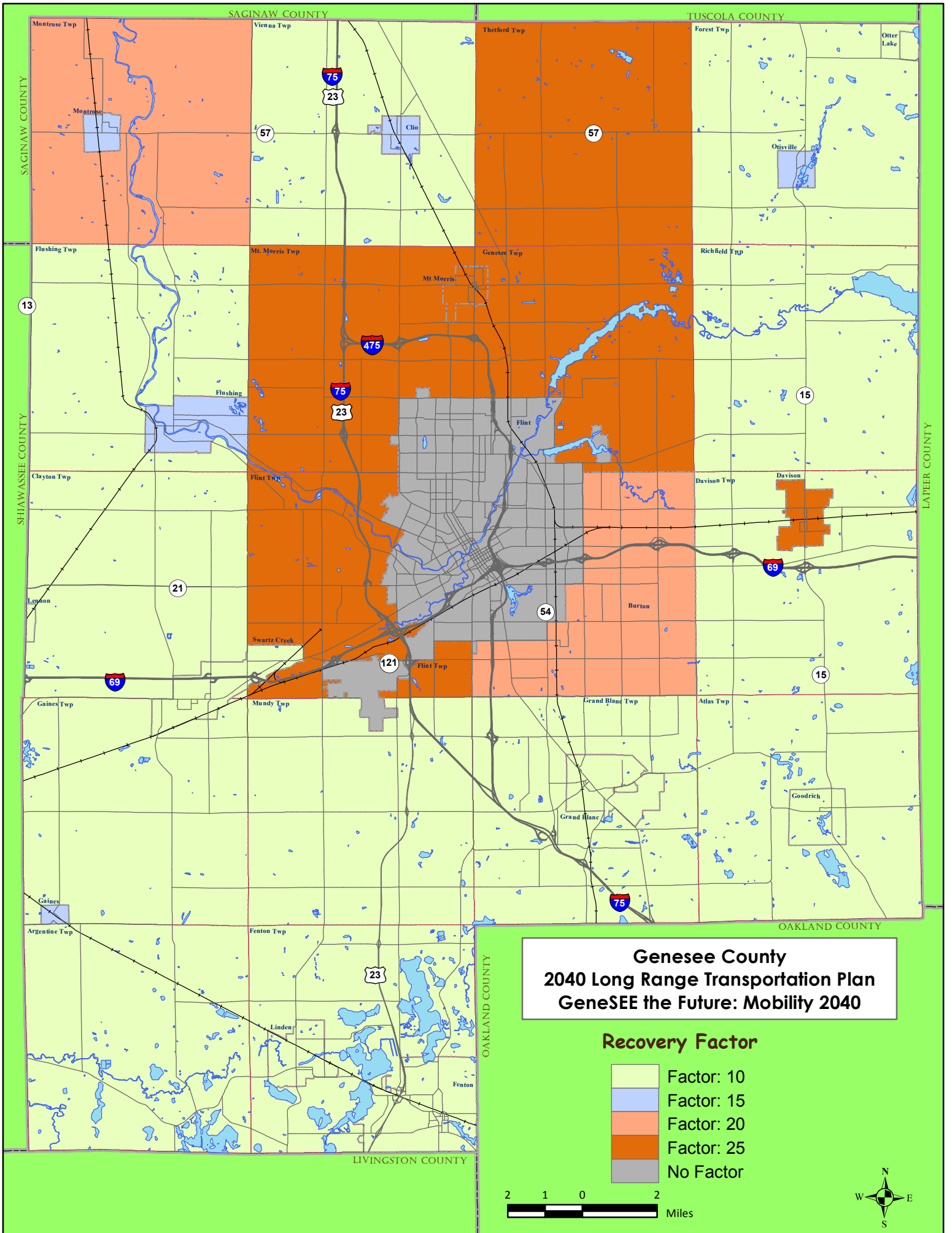
In the actual City of Flint projections new construction projects were manually added to the representing TAZ but were not included as part of this example. The City of Flint is represented by 191 TAZ in the Genesee County Transportation Model

Appendix B

**Recovery Factors
and
Supporting Census Data**

Recovery Factors for the 2040 Population Projections

Local Unit	Recovery Factor	Summary	% Vacant	Pop Change	% Pop Change
Argentine Twp	10	Med Vac and Med Growth: Pos Growth 1980	9.9%	392	6.0%
Atlas Twp	10	Low Vac and Med Growth: Pos Growth 1990	4.1%	229	3.9%
Clayton Twp	10	Med Vac and Med Growth: Pos Growth 1980	6.5%	28	0.4%
Davison Twp	10	Med Vac and High Growth: Pos Growth 1980	6.5%	1853	10.5%
Fenton City	10	Med Vac and High Growth: Pos Growth 1980	9.1%	1164	11.0%
Fenton Twp	10	Med Vac and High Growth: Pos Growth 1980	9.1%	2584	19.9%
Flushing Twp	10	Low Vac and Med Growth: Pos Growth 1990	5.7%	410	4.0%
Gaines Twp	10	Low Vac and Med Growth: Pos Growth 1990	5.0%	329	5.1%
Goodrich Village	10	Med Vac and High Growth: Pos Growth 1980	6.4%	507	37.5%
Grand Blanc City	10	Low Vac and Med Growth: Pos Growth 1980	5.8%	34	0.4%
Grand Blanc Twp	10	Med Vac and High Growth: Pos Growth 1980	8.1%	7681	25.8%
Linden City	10	Med Vac and High Growth: Pos Growth 1980	8.4%	1130	39.5%
Mundy Twp	10	Low Vac and High Growth: Pos Growth 1980	5.9%	2891	23.7%
Otisville Village	10	Med Vac and Mild Loss: Pos Growth 1980	9.8%	-18	-2.0%
Richfield Twp	10	Low Vac and Med Growth: Pos Growth 1980	5.5%	560	6.9%
Swartz Creek City	10	Med Vac and High Growth: Pos Growth 1980	7.1%	656	12.9%
Vienna Twp	10	Med Vac and Med Growth: Pos Growth 1980	7.3%	147	1.1%
Clio City	15	High Vac and Med Growth: Flat/Neg Growth 1980	10.5%	163	6.6%
Flushing City	15	Med Vac and Med Growth: Flat/Neg Growth 1980	6.3%	41	0.5%
Forest Twp	15	Low Vac and Mild loss: Flat/Pos Growth 1980	4.0%	-18	-0.5%
Gaines Village	15	Med Vac and Med Growth: Neg Growth 1980	9.9%	14	3.8%
Montrose City	15	Med Vac and Med Growth: Flat/Neg Growth 1980	8.0%	38	2.3%
Burton City	20	Med Vac and Mild Loss: Flat Growth 1980	8.5%	-347	-1.1%
Montrose Twp	20	Med Vac and Mild Loss: Pos Growth 1980	8.2%	-112	-1.8%
Davison City	25	High Vac and High Loss: Neg Growth 1980	8.6%	-363	-6.6%
Flint Twp	25	High Vac and High Loss: Neg Growth 1980: Neg Growth 1980	10.4%	-1724	-5.1%
Genesee Twp	25	High Vac and High Loss: Neg Growth 1980	12.2%	-2535	-10.5%
Mt Morris City	25	High Vac and Mild Loss: Neg Growth 1980	12.5%	-117	-3.7%
Mt Morris Twp	25	High Vac and High Loss: Neg Growth 1980	13.8%	-2224	-9.4%
Thetford Twp	25	High Vac and High Loss: Neg Growth 1980	10.8%	-1228	-14.8%



**Genesee County
2040 Long Range Transportation Plan
GeneSEE the Future: Mobility 2040**

Recovery Factor

- Factor: 10
- Factor: 15
- Factor: 20
- Factor: 25
- No Factor



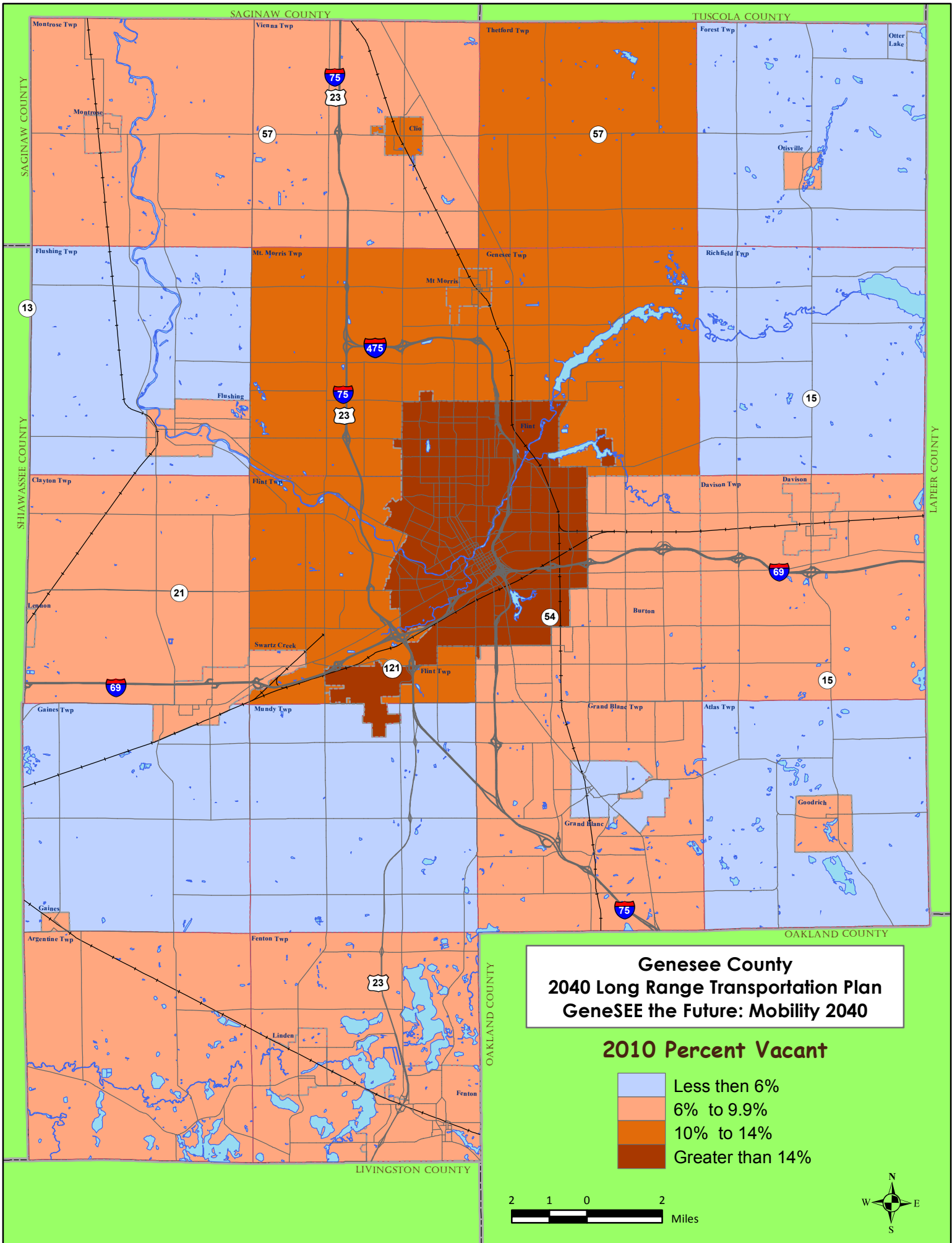
Vacancy Data for the 2000 to 2010 Census

Local Unit	Summary of 2010 Percent Vacant	2010 Percent Vacant	2000 Percent Vacant	2010 Vacant	2000 Vacant
Forest Township	Low Vacancy	4.02%	2.99%	76	42
Atlas Township	Low Vacancy	4.05%	3.95%	89	80
Gaines Township	Low Vacancy	4.67%	2.43%	115	53
Richfield Township	Low Vacancy	5.45%	5.06%	187	158
Flushing Township	Low Vacancy	5.67%	4.24%	241	165
Grand Blanc City	Low Vacancy	5.76%	4.91%	218	183
Mundy Township	Low Vacancy	5.85%	3.39%	381	171
Flushing City	Medium Vacancy	6.34%	3.46%	242	123
Goodrich Village	Medium Vacancy	6.36%	6.08%	44	32
Clayton Township	Medium Vacancy	6.46%	4.93%	200	143
Davison Township	Medium Vacancy	6.49%	5.07%	570	398
Swartz Creek City	Medium Vacancy	7.09%	5.18%	195	122
Vienna Township	Medium Vacancy	7.34%	5.25%	409	273
Montrose City	Medium Vacancy	7.99%	6.44%	58	43
Grand Blanc Township	Medium Vacancy	8.07%	5.28%	1,295	657
Montrose Township	Medium Vacancy	8.22%	5.00%	196	110
Linden City	Medium Vacancy	8.44%	4.98%	143	61
Burton City	Medium Vacancy	8.50%	5.26%	1,111	649
Davison City	Medium Vacancy	8.56%	5.88%	222	156
Fenton City	Medium Vacancy	9.07%	5.12%	505	234
Fenton Township	Medium Vacancy	9.14%	6.94%	605	364
Otisville Village	Medium Vacancy	9.76%	7.05%	37	26
Argentine Township	Medium Vacancy	9.90%	8.02%	282	200
Gaines Village	Medium Vacancy	9.94%	7.74%	17	12
Flint Township	High Vacancy	10.42%	6.00%	1,548	892
Clio City	High Vacancy	10.48%	9.29%	140	112
Thetford Township	High Vacancy	10.82%	3.16%	324	97
Genesee Township	High Vacancy	12.25%	7.38%	1,181	733
Mount Morris City	High Vacancy	12.49%	6.42%	188	90
Mount Morris Township	High Vacancy	13.77%	7.42%	1,310	706

2010 Percent Vacant: 10% to 14%

2010 Percent Vacant: 6% to 10%

2010 Percent Vacant: Less than 6%



**Genesee County
2040 Long Range Transportation Plan
GeneSEE the Future: Mobility 2040**

2010 Percent Vacant

- Less than 6%
- 6% to 9.9%
- 10% to 14%
- Greater than 14%



Population Change from 2000 to 2010 Census

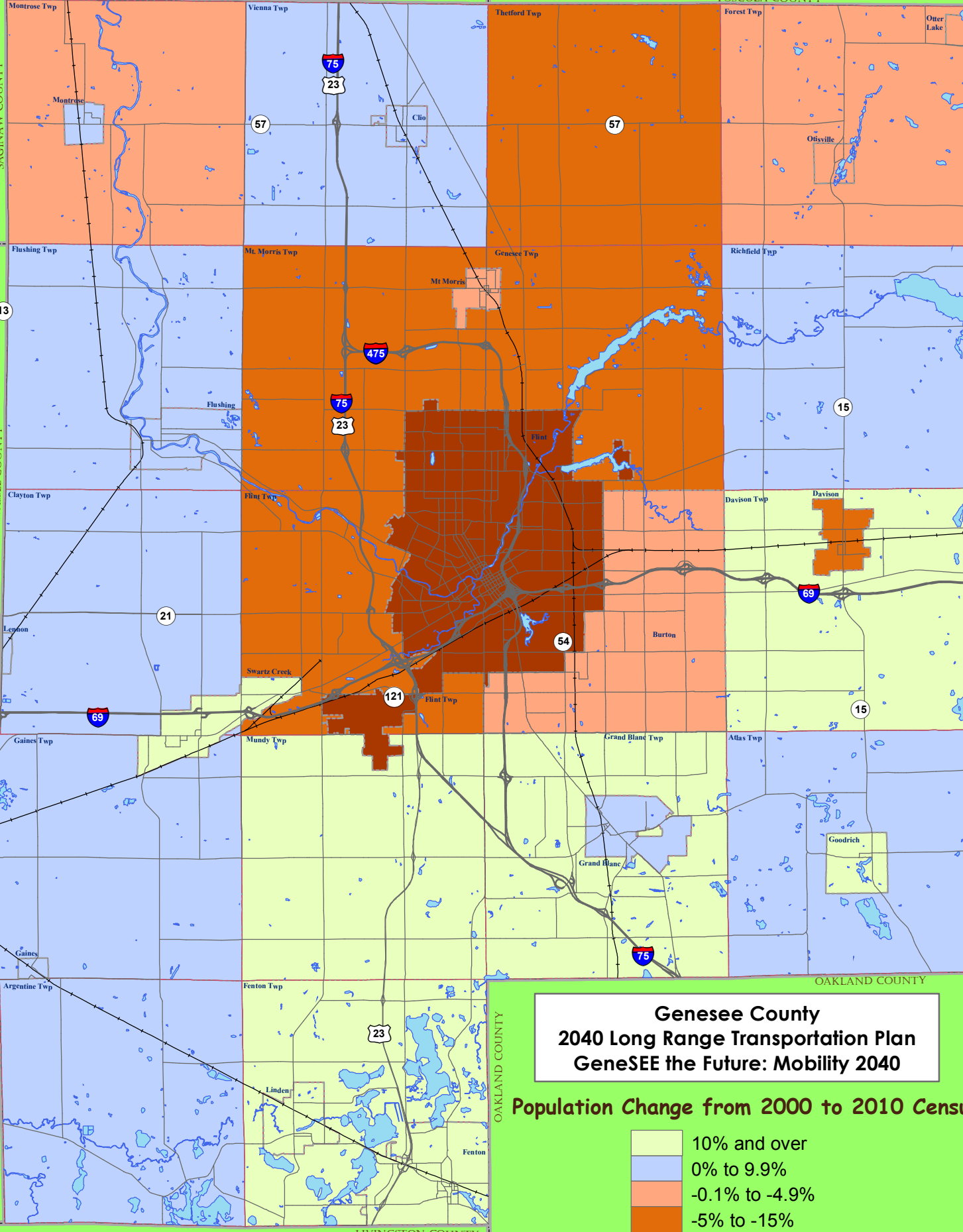
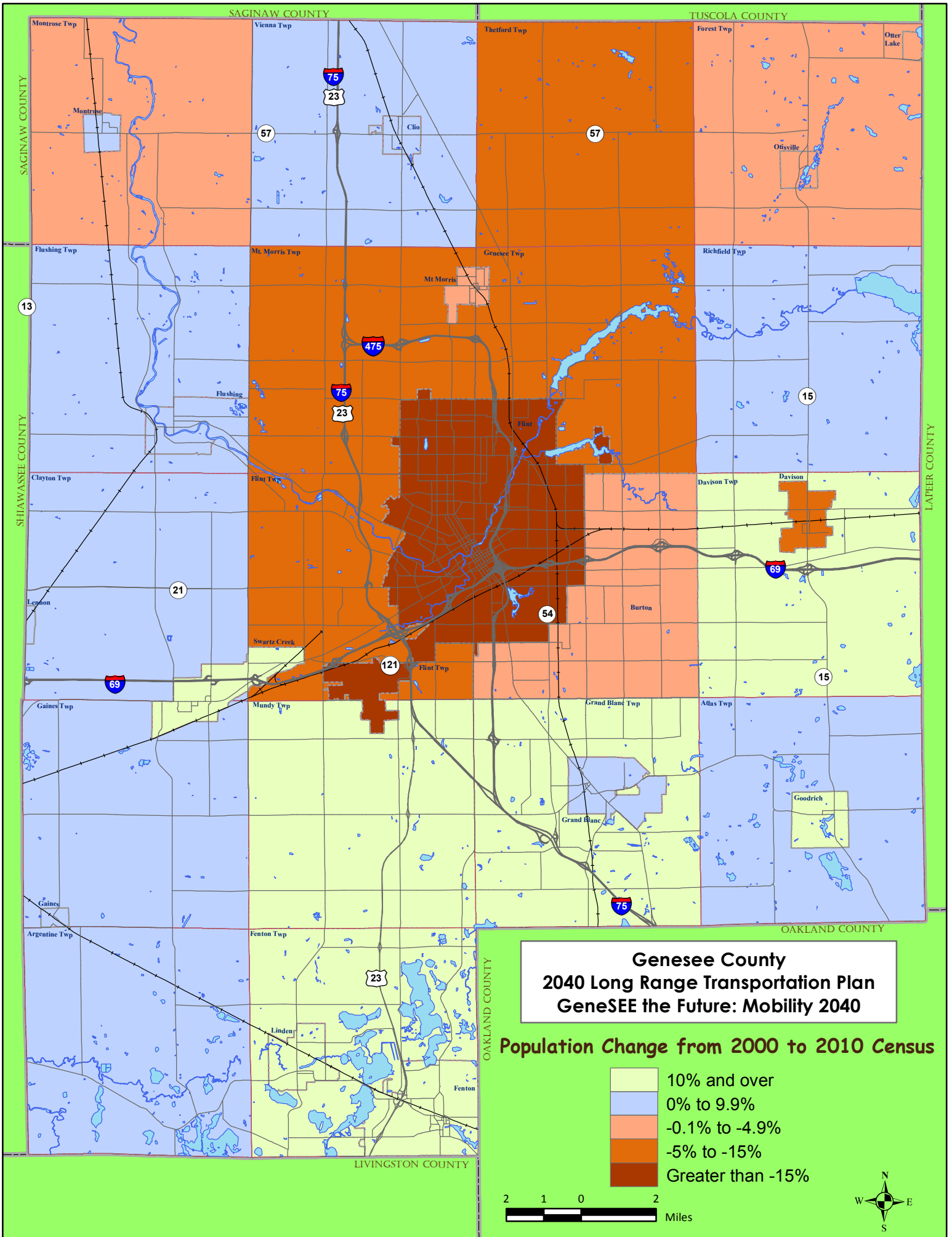
Area Name	Summary of Percent Population Change	Percent Change	Change
Linden City	High Growth	39.5%	1,130
Goodrich Village	High Growth	37.5%	507
Grand Blanc Township	High Growth	25.8%	7,681
Mundy Township	High Growth	23.7%	2,891
Fenton Township	High Growth	19.9%	2,584
Swartz Creek City	High Growth	12.9%	656
Fenton City	High Growth	11.0%	1,164
Davison Township	High Growth	10.5%	1,853
Richfield Township	Medium Growth	6.9%	560
Clio City	Medium Growth	6.6%	163
Argentine Township	Medium Growth	6.0%	392
Gaines Township	Medium Growth	5.1%	315
Flushing Township	Medium Growth	4.0%	410
Atlas Township	Medium Growth	3.9%	229
Gaines Village	Medium Growth	3.8%	14
Montrose City	Medium Growth	2.3%	38
Vienna Township	Medium Growth	1.1%	147
Flushing City	Medium Growth	0.5%	41
Grand Blanc City	Medium Growth	0.4%	34
Clayton Township	Medium Growth	0.4%	28
Forest Township	Mild Loss	-0.5%	-18
Burton City	Mild Loss	-1.1%	-347
Montrose Township	Mild Loss	-1.8%	-112
Otisville Village	Mild Loss	-2.0%	-18
Mt. Morris City	Mild Loss	-3.7%	-117
Flint Township	High Loss	-5.1%	-1,724
Davison City	High Loss	-6.6%	-363
Mt. Morris Township	High Loss	-9.4%	-2,224
Genesee Township	High Loss	-10.5%	-2,535
Thetford Township	High Loss	-14.8%	-1,228

Growth: 10% and over

Growth: 0 to 9.9%

Loss: -0.1% to -4.9%

Loss: -5% and higher loss



75
23

57

57

13

475
75
23

15

21

69

54

69

15

75

23

LIVINGSTON COUNTY

SAGINAW COUNTY

TUSCOLA COUNTY

SAGINAW COUNTY

SHEWASSEE COUNTY

LAPEER COUNTY

OAKLAND COUNTY

OAKLAND COUNTY

Historic Genesee County Census Populations

Local Unit	Summary of Population Trends Since 1980	Pop 1980	Pop 1990	Pop 2000	Pop 2010
Argentine Township	Positive Growth Since 1980	4,180	4,651	6,521	6,913
Atlas Township	Positive Growth Since 1980	4,096	4,635	5,904	6,133
Burton City	Flat Growth Since 1980	29,976	27,437	30,346	29,999
Clayton Township	Positive Growth Since 1980	7,269	7,368	7,553	7,581
Clio City	Flat/Negative Growth Since 1980	2,669	2,629	2,483	2,646
Davison City	Negative Growth Since 1980	6,087	5,693	5,536	5,173
Davison Township	Positive Growth Since 1980	13,708	14,671	17,722	19,575
Fenton Township	Positive Growth Since 1980	9,570	10,073	12,968	15,552
Fenton City	Positive Growth Since 1980	8,098	8,434	10,582	11,746
Flint Township	Negative Growth Since 1980	35,405	34,072	33,653	31,929
Flint City	Negative Growth Since 1980	159,611	140,925	124,943	102,434
Flushing Township	Positive Growth Since 1980	9,246	9,223	10,230	10,640
Flushing City	Flat/Negative Growth Since 1980	8,624	8,542	8,348	8,389
Forest Township	Flat/Positive Growth Since 1980	3,573	3,685	3,856	3,838
Gaines Township	Positive Growth Since 1980	4,769	4,964	6,125	6,440
Genesee Township	Negative Growth Since 1980	25,065	24,093	24,116	21,581
Grand Blanc Township	Positive Growth Since 1980	24,413	25,392	29,827	37,508
Grand Blanc City	Positive Growth Since 1980	6,848	7,760	8,242	8,276
Linden City	Positive Growth Since 1980	2,174	2,407	2,861	3,991
Montrose Township	Positive Growth Since 1980	6,164	6,236	6,336	6,224
Montrose City	Flat/Negative Growth Since 1980	1,706	1,811	1,619	1,657
Mount Morris City	Negative Growth Since 1980	3,246	3,292	3,203	3,086
Mount Morris Township	Negative Growth Since 1980	27,928	25,198	23,725	21,501
Mundy Township	Positive Growth Since 1980	10,786	11,536	12,191	15,082
Richfield Township	Positive Growth Since 1980	6,895	7,271	8,170	8,730
Swartz Creek City	Positive Growth Since 1980	5,013	4,851	5,102	5,758
Thetford Township	Negative Growth Since 1980	8,499	8,333	8,277	7,049
Vienna Township	Positive Growth Since 1980	12,914	13,210	13,108	13,255
Gaines Village	Negative Growth Since 1980	440	427	366	380
Goodrich Village	Positive Growth Since 1980	795	916	1,353	1,860
Otisville Village	Positive Growth Since 1980	682	724	882	864
Genesee County	Negative Growth Since 1980	450,449	430,459	436,148	425,790

