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From: SRF Consulting Group, Inc.

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Subject: 2045 Population and Employment Projections

This document describes the methodology and results of the development of job and household projections developed for the East Grand Forks 2045 Land Use Plan. These projections will be used to inform the amount of each land use needed to support East Grand Forks’ projected population in 2045. Throughout this narrative, we’ll discuss existing conditions, methodology used, and the outcomes of the analysis.

Existing Conditions

From 2000-2010, the population of East Grand Forks rose from 7,501 to 8,604. The average annual rate of increase was 1.4 percent. This increase was preceded by a decrease in population from 1990 to 2000 of approximately 1.4 per year, on average, following the flood of 1997. The decrease and subsequent increase recorded during the last two decennial censuses does not provide a reliable trend to project future population from. Therefore, a review of population estimates following the 2010 census were warranted. A population estimate for 2014 of 8,731 was developed by the Grand Forks-East Grand Fork MPO using a combination of Minnesota State Demographer data and 2013 ACS estimates. This estimated reveals a population that has remained fairly stable, suggesting an annual growth rate of 0.4% from 2010 to 2014. Based on the review of available population estimates for East Grand Forks, it was determined that the 2010 census data was preferred to more recent ACS data because it represents the results of a comprehensive survey of the total population of East Grand Forks. Data from 2010 is used to derive all forecasts included in this memorandum.

Local jobs and commuting trends

East Grand Forks exhibits characteristics of a “bedroom community”. Government economic data from the website On the Map (onthemap.ces.census.gov) shows that approximately 4,543 of the 8,604 people in East Grand Forks are currently in the workforce. However, 3,546 jobs were located in the City. The On the Map data showed that approximately 77 percent of the population of East Grand Forks worked outside the city in 2010. Meanwhile, 70 percent of the local jobs are filled by residents who commute to East Grand Forks from outside the city. This information will help to inform the employment estimates needed to support the future population of East Grand Forks.

Existing land use

Existing land use information was provided by the Grand Forks-East Grand Forks MPO for the City of East Grand Forks. This data is used as the baseline for future land use planning efforts. The existing data included one stratification for residential land uses. Using satellite imagery and Google Street View, the residential land uses were stratified into low-density and medium/high-density residential. This analysis suggests that approximately 95 percent of residential parcels are low-density (single or two-family units), and that the remaining 5 percent are medium/high-density (multi-family). The stratification of residential land uses will allow for the addition of compact, vertical growth into the future land use plan.

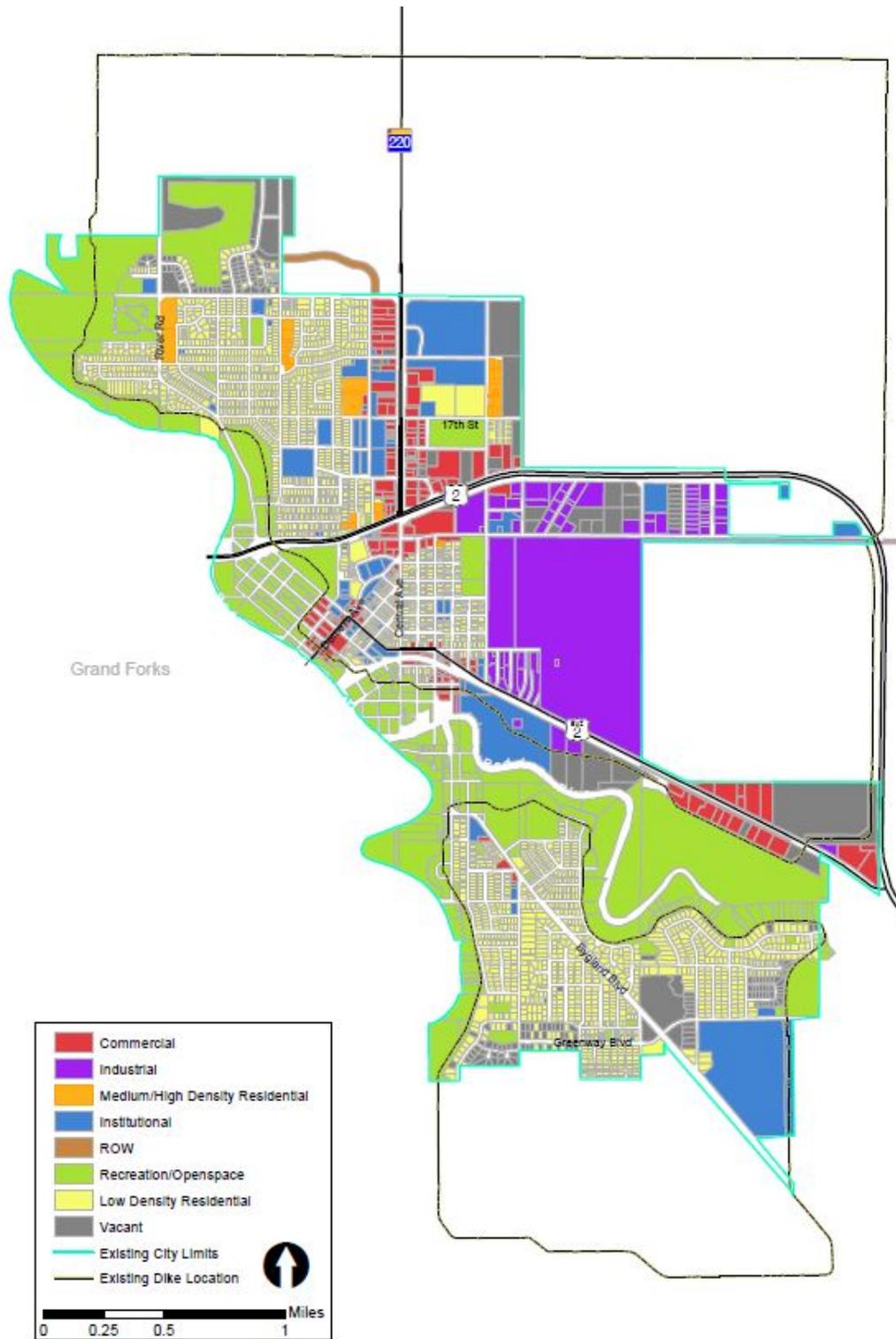
Additionally, satellite imagery was also used to update the map to reflect the location of known vacant parcels. Many vacancies are located in new residential developments; thus, they are likely in the process of being constructed and cannot be considered as potential infill sites. Other vacancies, however, are located in older neighborhoods, which suggests they have could be candidates for infill housing development.

The existing breakdown of existing land use types with the modifications to the land use categories as described, are provided in Table 1. The location of these land uses are shown in Figure 1.

Table 1. Existing Land Use Breakdown

Land Use	Acreage	Percent Total
Commercial	200	6.8%
Industrial	410	14.0%
Low-Density Residential	688	23.5%
Med/High-Density Res.	37	1.3%
Recreation/Open Space	933	31.9%
Public/Semi-public	312	10.6%
Vacant	351	12.0%

Figure 1. Existing Land Uses



Population Growth Estimates

General Considerations

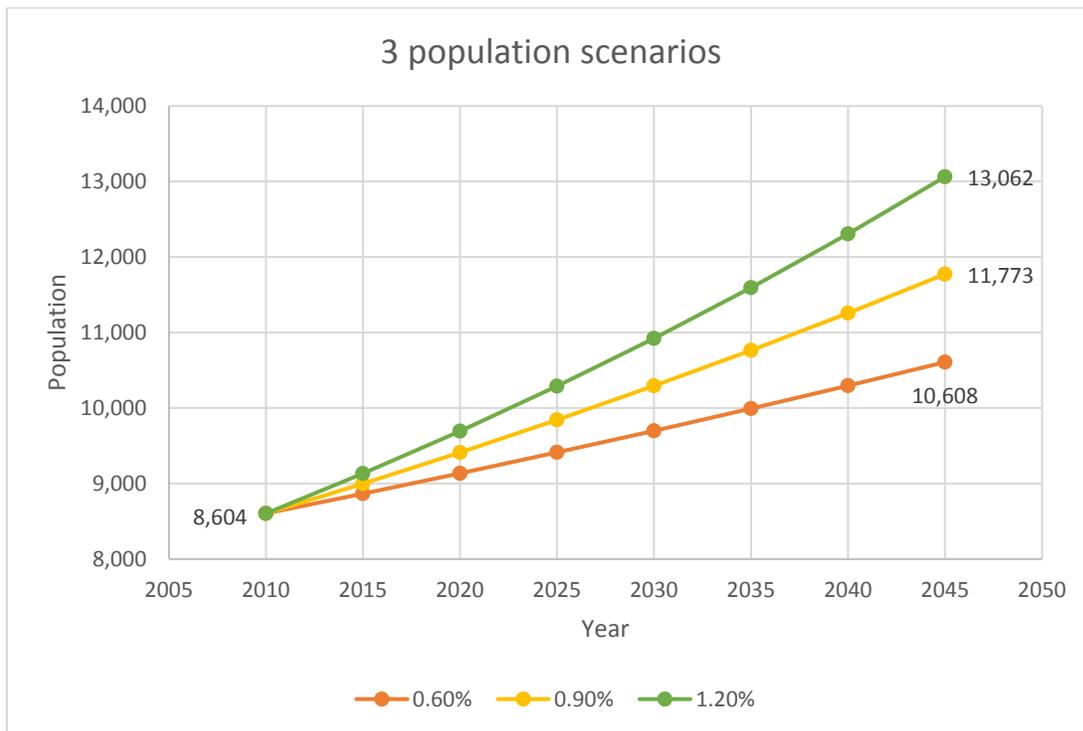
In 2010, the population of East Grand Forks was 8,604, according to the U.S. Census. Historically, the population of East Grand Forks has grown slowly but steadily. In the last 50 years, the annual rate of population growth for East Grand Forks ranged from 0.1 to 1.4 percent, excluding a brief period of decline that is attributed to the displacement of residents after the 1997 flood. The lack of reliable trend information in the last 20 years as a result of the flood requires the examination of potential growth scenarios to inform population projections.

Three future growth scenarios were explored that fall within the historical growth range: 0.6 percent, 0.9 percent, and 1.2 percent annual growth (compound annual growth, as shown in Table 2). This alternate series of forecasts represents a range of possibilities. Because each scenario uses a flat growth rate over the 30-year planning horizon, it implies that the net effect of births, deaths, and migration is stable for the duration of the period. Although this assumption is simplistic, the forecast of continued, steady growth is appropriate for a community such as East Grand Forks, which has exhibited steady growth trends over the past 50 years, and for which no major economic change has been projected. Figure 2 demonstrates how the population projection varies under the three scenarios.

Table 2. Population Projections

	0.60% Annual Growth	0.90% Annual Growth	1.20% Annual Growth
2010	8,604	8,604	8,604
2015	8,865	8,998	9,133
2025	9,134	9,410	9,694
2025	9,412	9,842	10,290
2030	9,698	10,293	10,922
2035	9,992	10,764	11,593
2040	10,295	11,257	12,306
2045	10,608	11,773	13,062

Figure 2. Three Population Scenarios



Growth Timeframes/Application to Future Land Use Plan

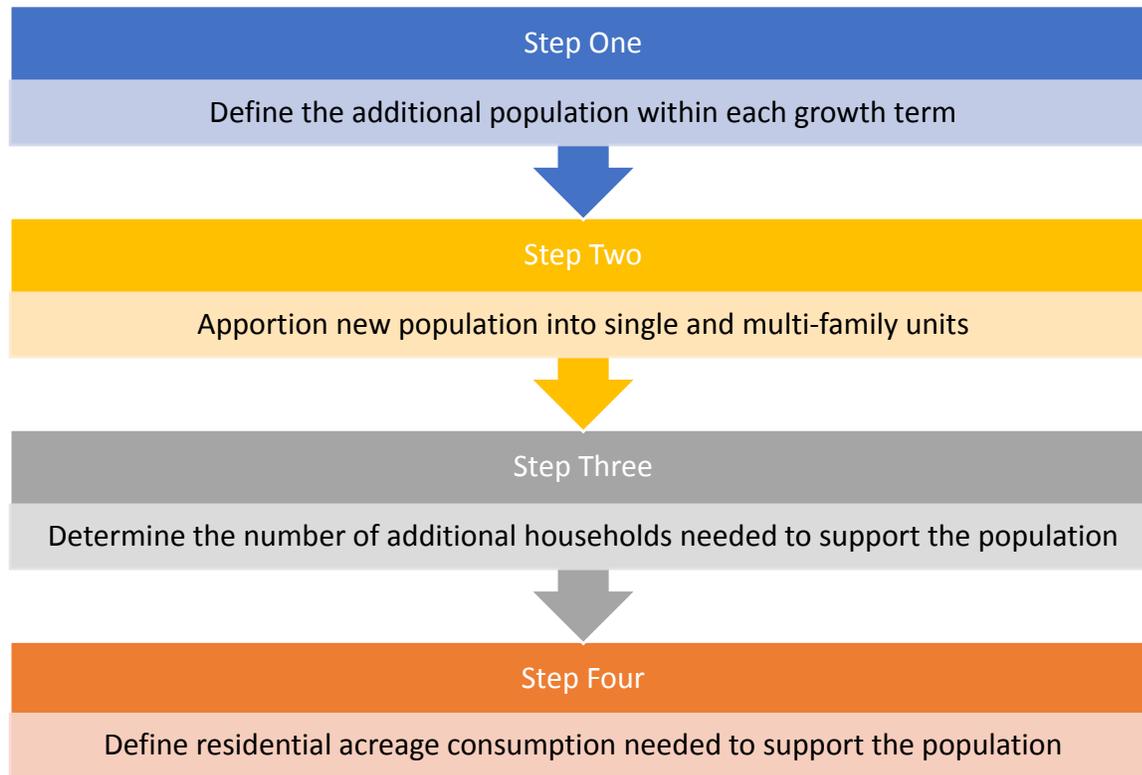
The projected population for 2045 is an important piece of the future land use plan, as it sets an estimate of the number of households and jobs that need to be created to support the additional population within the community. The future land use plan will serve as a tool for East Grand Forks staff, elected and appointed officials, and residents as future development plans are considered or pursued. For this purpose, the future land use plan is intended to include the designation of future land uses beyond the projected need based on the population estimates. However, these estimates become a pivotal element of the growth assumptions. Growth timeframes are developed within the future land use plan that determine the acreage needed within each timeframe to support growth. Though the 2010 Census population is used as a baseline for population projections, the growth between 2010 and 2015 is assumed to have already occurred and is not factored into the acreage consumption estimates. To inform each timeframe, the projected need for residential, commercial and industrial acreage needs to be defined. Three timeframes will be used within the 2045 Land Use Plan:

- Near Term – 2015 to 2025
- Mid Term – 2025 to 2035
- Long Term – 2035 to 2045

Calculating Residential Land Use Needs (Households)

The simplest method for forecasting future land use consumption for residential needs is to estimate the current distribution of housing types and project a similar housing mix in the future. For example, if the fraction of the population living in single-family homes is expected to stay the same, we can apply that same fraction to the projected population of each growth term. Using this method implies that the City will maintain current density standards, as well as the same mix of housing types through 2045. With any community, a host of variable conditions to shift the housing mix in future years, affecting future land use planning. Nonetheless, the 2045 Land Use Plan is intended to be utilized as a general guide, and these projections are a reasonable starting point.

The following steps outline the process used to develop residential land consumption within the 30-year planning horizon for the East Grand Forks 2045 Land Use Plan.



Step 1 - Define the Additional Population

Defining the additional population added within each growth term is the first step of this process. This defines the number of additional people that need to be accounted for. Table 2 provides the additional population under each growth scenario.

$$\text{Additional Population} = \text{Future Population} - \text{Baseline}$$

Table 3. Population Growth by Timeframe (people)

	0.6% Annual Growth	0.9% Annual Growth	1.2% Annual Growth
<i>Assumed Growth (2010 – 2015)</i>	<i>261 people</i>	<i>394 people</i>	<i>529 people</i>
Near Term (2015-2025)	547 people	844 people	1,157 people
Mid Term (2025-2035)	580 people	922 people	1,303 people
Long Term (2035-2045)	616 people	1,009 people	1,469 people
Total Additional Population	1,743 people	2,775 people	3,929 people

Step 2 – Apportion new population into single-family units and multi-family units

The 2010 Census provides a breakdown of total households by the number of housing units in each structure. From this data, it was determined that approximately 71.5 percent of the population in East Grand Forks live in single-family housing units. This figure includes attached homes, detached homes, twin homes, and mobile homes. The remaining 28.5 percent of the population are classified as living in multi-family units. This breakdown can be used to apportion the additional population into single-family and multi-family units, as shown in Table 3.

Population in Single-Family Units = Additional Population * 71.5%

Population in Multi-Family Units = Additional Population * 28.5%

Table 4. Additional population forecast by housing type people)

	0.6% Annual Growth		0.9% Annual Growth		1.2% Annual Growth	
	Single-Family (71.5%)	Multi-Family (28.5%)	Single-Family (71.5%)	Multi-Family (28.5%)	Single-Family (71.5%)	Multi-Family (28.5%)
Near Term (2015-2025)	391	156	603	241	827	330
Mid Term (2025-2035)	415	165	659	263	932	371
Long Term (2035-2045)	440	176	751	288	1,050	419
Additional Population by Unit Type	1,246 people	497 people	2,013 people	792 people	2,809 people	1,120 people

Step 3 – Determine the number of additional households needed to support this population

The third step of this process is to determine the number of households needed to support the new population growth within each growth term. The number of households is calculated using an average number of people per household for each residential land use type. The current 2040 Land Use Plan forecasts an average household size of 2.6 persons on average for single-family units and 1.8 persons for multi-family units. These numbers will be used to estimate the number of units need to support the additional population.

Future Single-Family Units Needed = Population in Single-Family / 2.6
 Future Multi-Family Units Needed = Population in Multi-Family / 1.8

Table 5. Additional housing needs (units)

	0.6% Annual Growth		0.9% Annual Growth		1.2% Annual Growth	
	Single-Family Units	Multi-Family Units	Single-Family Units	Multi-Family Units	Single-Family Units	Multi-Family Units
Near Term (2015-2025)	150 units	84 units	232 units	130 units	318 units	178 units
Mid Term (2025-2035)	160 units	89 units	254 units	142 units	358 units	201 units
Long Term (2035-2045)	169 units	95 units	277 units	155 units	404 units	226 units
Total Additional Units Needed	479 units	268 units	763 units	427 units	1,080 units	605 units

Step 4 – Define residential acreage consumption needed to support the population

The fourth step of the process is needed to define the additional acreage of each land uses needed to support the number of units determined in Step 3. This is done by dividing the number of additional units by a density (units/acre) for each residential land use type. The 2040 Land Use Plan assumed a density of 3.65 units/acre for single-family development. This average density accounts for a variety of existing development styles within the community. An average density was not provided within the 2040 plan for multi-family housing. Using existing multi-family developments within the community, an average density of 12 units/acre was calculated. This density will be used

within this effort to determine the acreage consumption for multi-family units. These densities were assumed to include public infrastructure (i.e. roads) into their calculation.

To calculate the acreage needed for each residential land use type, the number of additional units needed to support the population was divided by the average density.

$$\text{Single-Family Residential Land Use Acreage} = \text{Future Single-Family Units} / 3.65$$

$$\text{Multi-Family Residential Land Use Acreage} = \text{Future Multi-Family Units} / 12$$

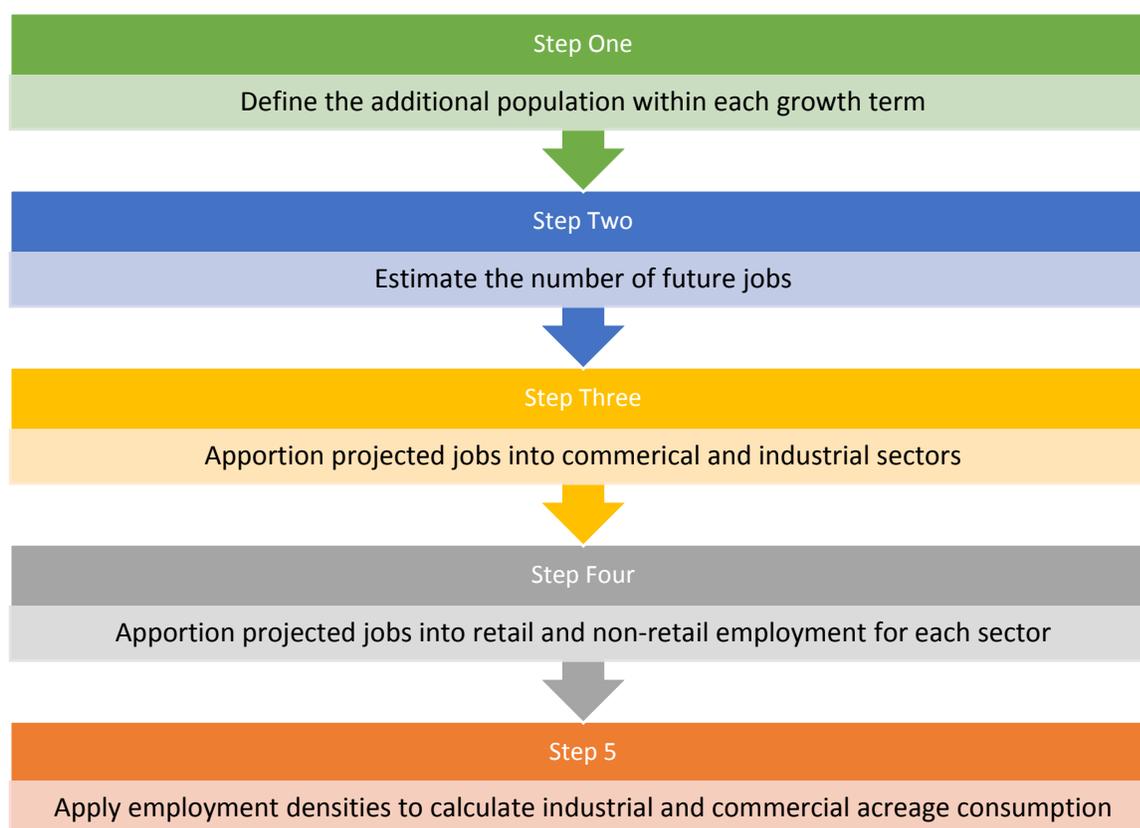
Table 6. Residential Land Use Consumption (acres)

	0.6% Annual Growth		0.9% Annual Growth		1.2% Annual Growth	
	Single-Family Acres	Multi-Family Acres	Single-Family Acres	Multi-Family Acres	Single-Family Acres	Multi-Family Acres
Near Term (2015-2025)	41 acres	7 acres	64 acres	11 acres	87 acres	15 acres
Mid Term (2025-2035)	44 acres	7 acres	69 acres	12 acres	98 acres	17 acres
Long Term (2035-2045)	46 acres	8 acres	76 acres	13 acres	111 acres	19 acres
Total Acreage	131 acres	22 acres	209 acres	36 acres	296 acres	51 acres

Calculating Commercial and Industrial Land Use Needs (Jobs)

Forecasts for industrial and commercial land use consumption are tied to projected job growth within a community. Additional jobs, in turn, are associated with the population growth projects established in the first section of this report. Therefore, the general framework for projecting commercial and industrial land uses needs will use the population projections to inform the number of jobs, which will inform the future land use consumption.

Employment forecasts will be separated into two sectors, commercial and industrial, to inform future land use needs. These sectors directly translate into land use categories that are used within existing land use planning efforts for the City of East Grand Forks. The following steps outline the process of forecasting commercial and industrial land use consumption.



Step 1 - Define the additional population

Defining the additional population added within each growth term is the first step of this process. This allows defines the number of additional people that need to be accounted for. Table 6 provides the additional population under each growth scenario.

$$\text{Additional Population} = \text{Future Population} - \text{Baseline}$$

Table 7. Population Growth by Term (people)

	0.6% Annual Growth	0.9% Annual Growth	1.2% Annual Growth
<i>Assumed Growth (2010 – 2015)</i>	<i>261 people</i>	<i>394 people</i>	<i>529 people</i>
Near Term (2015-2025)	547 people	844 people	1,157 people
Mid Term (2025-2035)	580 people	922 people	1,303 people
Long Term (2035-2045)	616 people	1,009 people	1,469 people
Total Additional Population	1,743 people	2,775 people	3,929 people

Step 2 – Estimate the number of future jobs

The assumption could be made that the number of employees within a community could be easily equated as the population between the ages of 15 and 64. This assumption reflects the percent of the population that may currently be in the workforce, but does not account for those that commute outside of the community for work. For the purposes of calculating the future acreage needs, the total number of employees within the City of East Grand Forks needs to be estimated. To account for the effects of in-commuting and out-commuting, current and forecasted jobs located in East Grand Forks are described as a fraction of total population.

According to On the Map (<http://onthemap.ces.census.gov/>), 4,543 residents of the total 8,406 were employed in 2010, resulting in approximately 54 percent of the population in the workforce. This data noted that 1,060 of these employees remain in East Grand Forks for work, while the remaining 3,483 employees commute outside of the community for work. However, this data also noted that 2,486 employees commute to East Grand Forks for work, equating to a total of 3,546 jobs within the community in 2010. Using this information, the total number of employees can be calculated for each growth term, using the following process.

Step 2a – Calculate the Jobs in East Grand Forks Held by Residents

The first step of the process will define the total employable population within East Grand Forks. Based on the data collected from On the Map, 54 percent of the population is in the workforce. However, only 23 percent of that workforce stays in East Grand Forks to work.

$\text{EGF Workforce} = \text{Future Population} * 54\%$ $\text{EGF Jobs held by Residents} = \text{EGF Workforce} * 23.3\%$
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Table 8. Jobs in East Grand Forks held by Residents (jobs)

	0.6% Annual Growth	0.9% Annual Growth	1.2% Annual Growth
Near Term (2015-2025)	67 jobs	104 jobs	142 jobs
Mid Term (2025-2035)	71 jobs	113 jobs	160 jobs
Long Term (2035-2045)	76 jobs	124 jobs	181 jobs
Total Additional Population	214 jobs	341 jobs	483 jobs

Step 2b – Calculate the Employees Commuting into East Grand Forks

The next step of the process is to estimate the number of employees commuting into East Grand Forks for work. According to the *On the Map* data, 70 percent of the jobs within East Grand Forks are employed by people living outside of the community. Therefore, the jobs calculated in Step 2a only account for 30 percent of the total jobs. With this information, we can assumed that commuters hold 3.34 times the jobs in East Grand Forks compared to residents within the community.

Table 9. Jobs held by Employees commuting into EGF (jobs)

	0.6% Annual Growth	0.9% Annual Growth	1.2% Annual Growth
Near Term (2015-2025)	225 jobs	347 jobs	476 jobs
Mid Term (2025-2035)	239 jobs	379 jobs	536 jobs
Long Term (2035-2045)	253 jobs	415 jobs	604 jobs
Total Commuting Jobs	717 jobs	1,141 jobs	1,616 jobs

Step 2c – Calculate the Total Jobs in East Grand Forks

Finally, a total number of jobs located in East Grand Forks by combining the jobs calculated in Steps 2a and 2b.

Table 10. Projected Jobs located in East Grand Forks (jobs)

	0.6% Annual Growth	0.9% Annual Growth	1.2% Annual Growth
Near Term (2015-2025)	292 jobs	451 jobs	618 jobs
Mid Term (2025-2035)	310 jobs	493 jobs	696 jobs
Long Term (2035-2045)	329 jobs	539 jobs	785 jobs
Total Additional Jobs	931 jobs	1,483 jobs	2,099 jobs

Step 3 – Apportion projected jobs into commercial and industrial sectors

The next step of the process will apportion the projected jobs within East Grand Forks into commercial and industrial sectors. Additional jobs must be apportioned to the industrial and commercial sectors, because these uses employ different densities of workers/acre on average. Public input gathered through the early stages of the planning process revealed the community’s desire to maintain its current balance of manufacturing/industrial jobs to retail sales and services jobs. The Bureau of Labor Statistics divides the total jobs of a region into various industries. Using this information, 40 percent of the jobs are assumed within the industrial industries, and the remaining 60 percent in commercial industries. This information was used to apportion the projected jobs within each growth term, as shown in Table 10.

<p>Commercial Jobs = Total Jobs * 60%</p> <p>Industrial Jobs = Total Jobs * 40%</p>

Table 11. Commercial and Industrial Job Growth (jobs)

	0.6% Annual Growth		0.9% Annual Growth		1.2% Annual Growth	
	Industrial Jobs	Commercial Jobs	Industrial Jobs	Commercial Jobs	Industrial Jobs	Commercial Jobs
Near Term (2015-2025)	117 jobs	175 jobs	180 jobs	271 jobs	247 jobs	371 jobs
Mid Term (2025-2035)	124 jobs	186 jobs	197 jobs	296 jobs	279 jobs	418 jobs
Long Term (2035-2045)	132 jobs	197 jobs	216 jobs	324 jobs	314 jobs	471 jobs
Total Jobs by Sector	393 jobs	558 jobs	593 jobs	891 jobs	840 jobs	1,260 jobs

Step 4 – Apportion projected jobs into retail and non-retail employment for each sector

Jobs within the commercial and industrial sectors can be further aggregated into retail and non-retail employees. This split is required to apply appropriate employment densities used to calculate acreage consumption. The sector splits used within the 2040 plan will be carried into this step. Therefore, the industrial jobs will be broken into 10 percent retail and 90 percent non-retail. The commercial jobs will be split into 70 percent retail and 30 percent non-retail, as shown in Table 11.

Table 12. Retail/Non-Retail Breakdown of Industrial and Commercial Jobs (jobs)

	0.6% Annual Growth			
	Industrial Jobs		Commercial Jobs	
	Retail	Non-Retail	Retail	Non-Retail
Near Term (2015-2025)	12 jobs	105 jobs	123 jobs	53 jobs
Mid Term (2025-2035)	12 jobs	112 jobs	130 jobs	56 jobs
Long Term (2035-2045)	13 jobs	119 jobs	138 jobs	59 jobs
Total Jobs	37 jobs	336 jobs	391 jobs	168 jobs

0.9% Annual Growth				
	Industrial Jobs		Commercial Jobs	
	Retail	Non-Retail	Retail	Non-Retail
Near Term (2015-2025)	18 jobs	162 jobs	189 jobs	81 jobs
Mid Term (2025-2035)	20 jobs	177 jobs	207 jobs	89 jobs
Long Term (2035-2045)	22 jobs	195 jobs	226 jobs	97 jobs
Total Jobs	60 jobs	534 jobs	622 jobs	267 jobs
1.2% Annual Growth				
	Industrial Jobs		Commercial Jobs	
	Retail	Non-Retail	Retail	Non-Retail
Near Term (2015-2025)	25 jobs	223 jobs	260 jobs	111 jobs
Mid Term (2025-2035)	28 jobs	251 jobs	292 jobs	125 jobs
Long Term (2035-2045)	31 jobs	283 jobs	330 jobs	141 Jobs
Total Jobs	84 jobs	757 jobs	882 jobs	377 jobs

Step 5 – Apply employment densities to calculate industrial and commercial acreage consumption

The final step uses employment densities from the 2040 land use plan to calculate industrial and commercial acreage consumption needed to support the population growth within each growth term. The 2040 Plan provides values of worker density for industrial-retail, industrial non-retail, commercial-retail, and commercial-non-retail land uses. Public infrastructure (i.e. roads) was assumed to be factored into these densities. Those densities are:

- Industrial Retail = 1.10 workers/acre
- Industrial Non-Retail = 6.62 workers/acre
- Commercial Retail = 10.26 workers/acre
- Commercial Non-Retail = 10.36 workers/acre.

Table 13. Industrial and Commercial Land Consumption (acres)

0.6% Annual Growth				
	Industrial		Commercial	
	Retail	Non-Retail	Retail	Non-Retail
Near Term (2015-2025)	11 acres	16 acres	12 acres	7 acres
Mid Term (2025-2035)	11 acres	17 acres	13 acres	7 acres
Long Term (2035-2045)	12 acres	18 acres	13 acres	8 acres
Total Acres	34 acres	51 acres	38 acres	22 acres
	85 acres		60 acres	
0.9% Annual Growth				
	Industrial Jobs		Commercial Jobs	
	Retail	Non-Retail	Retail	Non-Retail
Near Term (2015-2025)	16 acres	25 acres	18 acres	10 acres
Mid Term (2025-2035)	18 acres	27 acres	20 acres	11 acres
Long Term (2035-2045)	20 acres	29 acres	22 acres	12 acres
Total Acres	54 acres	81 acres	60 acres	33 acres
	135 acres		93 acres	
1.2% Annual Growth				
	Industrial Jobs		Commercial Jobs	
	Retail	Non-Retail	Retail	Non-Retail
Near Term (2015-2025)	22 acres	34 acres	25 acres	14 acres
Mid Term (2025-2035)	25 acres	38 acres	28 acres	16 acres
Long Term (2035-2045)	28 acres	43 acres	32 acres	18 acres
Total Acres	75 acres	115 acres	85 acres	48 acres
	190 acres		133 acres	

Calculating Other Land Use Needs

There are other land uses that occur within a community that can be difficult to project into growth scenarios. Within the city of East Grand Forks, the future needs for park/open space and public/institutional land uses are difficult to predict. The community currently contains a large amount of park and open space as a result of flood control efforts. Additionally, public and institutional spaces used for education and civic spaces are well established. It is difficult to project future needs for these land uses based on population projections, as the size and location of future areas are highly dependent on decisions made by the school board and city council. Therefore, projects for these land uses will not be made with this effort.

Mixed-Use Land Use Category

A mixed-use land use category will be introduced into the 2045 future land use plan. This land use was not factored into the land use consumptions described within the memo, as the land use is location specific. However, methodology has been developed for assigning household and job growth to the land use for the development of the growth terms. A majority of mixed-use land use is comprised of a single structure with commercial land uses on the ground floor and multi-family development on the upper floors. With this understanding, 2/3 of the acreage will utilize the multi-family density to calculate households and the remaining 1/3 of the acreage will utilize the commercial densities for job calculations.

Conclusions

The processes described within this memo provide future land use consumptions for residential, commercial and industrial land uses to support the projected 2045 population. Three growth scenarios were provided by the MPO for consideration in this planning process, and land use consumption projections were calculated for each, see Table 13.

Table 14. 2045 Land Use Consumption

	Single-Family Residential	Multi-Family Residential	Commercial	Industrial	Total
0.60% Growth Rate	131 acres	22 acres	60 acres	85 acres	298 acres
0.90% Growth Rate	209 acres	36 acres	93 acres	135 acres	473 acres
1.2% Growth Rate	296 acres	50 acres	133 acres	190 acres	669 acres

Based on this analysis and the review of historic population trends, a growth rate of 0.9 percent is recommended for use within the planning efforts for the 2045 Land Use Plan.

Comparisons to 2040 Land Use Plan Projections

The current 2040 Land Use Plan utilized an annual growth rate of 1.2 percent for future population projections into 2040. This resulted in a future population of 12,088, a growth of 3,484 from 2010. Based on the calculations and estimates used to inform the planning process, 310 acres of residential land use and 49.5 acres of commercial/industrial land use were projected for consumption by 2040 to support this growth. A comparison between the consumption calculations for the 2040 and 2045 plans is needed to ensure that major discrepancies are accounted for, see Table 14. For the purposes of an even comparison, the estimates based on a 1.2 percent annual growth rate were used for the 2045.

Table 15. Land Use Consumption Comparison between 2040 and 2045

	2040 Plan (1.2% Annual Growth)	2045 Plan Estimates (1.2% Annual Growth)
Residential Land Use	310 acres	346 acres
Commercial/Industrial Land Use	49.5 acres	323 acres
Total	359.5 acres	669 acres

Based on this comparison, the 2045 estimates for residential land use consumption is aligned with the assumptions made within the 2040 plan. However, there is a large discrepancy between the commercial/industrial land use consumptions of the 2040 plan and 2045 plan estimates. This discrepancy is likely a result of varied methodology used to develop the 2045 estimates, additional factors such as the commuting population and sector splits likely influenced the increase in projected consumption.