

**SOCIOECONOMIC PROJECTIONS AND LAND USE ALLOCATION
REPORT**

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SOCIOECONOMIC PROJECTIONS AND LAND USE ALLOCATION REPORT

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INTRODUCTION

Project Background

RGS is currently contracted by the Anchorage Metropolitan Area Transportation Solutions (AMATS) to develop a new Transportation Demand Model (TDM) for the Anchorage region, which includes the Municipality of Anchorage and a portion of the Matanuska-Susitna Borough (MSB). The AMATS transportation demand model is a computer program designed to simulate future travel by comparing the demand for transportation (the need to travel generally expressed in terms of travel generation and attraction) to the supply (the available transportation network).

The primary use of the TDM is for the development of the Metropolitan Transportation Plan (MTP). The MTP is the document used to identify short and long-term transportation projects needed to meet future transportation demand. Transportation demand models are the traditional tool used to evaluate and distinguish between various transportation plan alternatives.

Use of Household, Population and Employment Data in Transportation Demand Models

The places where the population lives and works and the locations of major destinations, both for individual and commercial needs, play an important role in determining travel demand. As a result, one of the most critical inputs into the AMATS Transportation Demand Model involves forecasts of the geographic distribution of socio-economic factors, such as household and employment data.

Horizon Year

The Federal Highway Administration (FHWA) guides the development of the MTP for each of the designated Metropolitan Planning Organization, including AMATS. In order to meet the FHWA 20-year MTP planning requirement, AMATS has set 2040 as the planning horizon year for the next MTP update. Therefore, the population, household and employment forecast used in the AMATS Transportation Demand Model will utilize 2040 as the horizon year. In order to provide AMATS with the capability of analyzing and evaluating short versus long-term transportation projects in the MTP, AMATS staff identified 2028 as an intermediate forecast year.

Purpose of this Report

The purpose of this report is to document the methodology used to estimate the amount and geographic distribution of future land use activities used as input into the AMATS Transportation Demand Model, which then translates the resulting land use pattern into future travel and determines how potential transportation system improvements will perform.

Organization of the Report

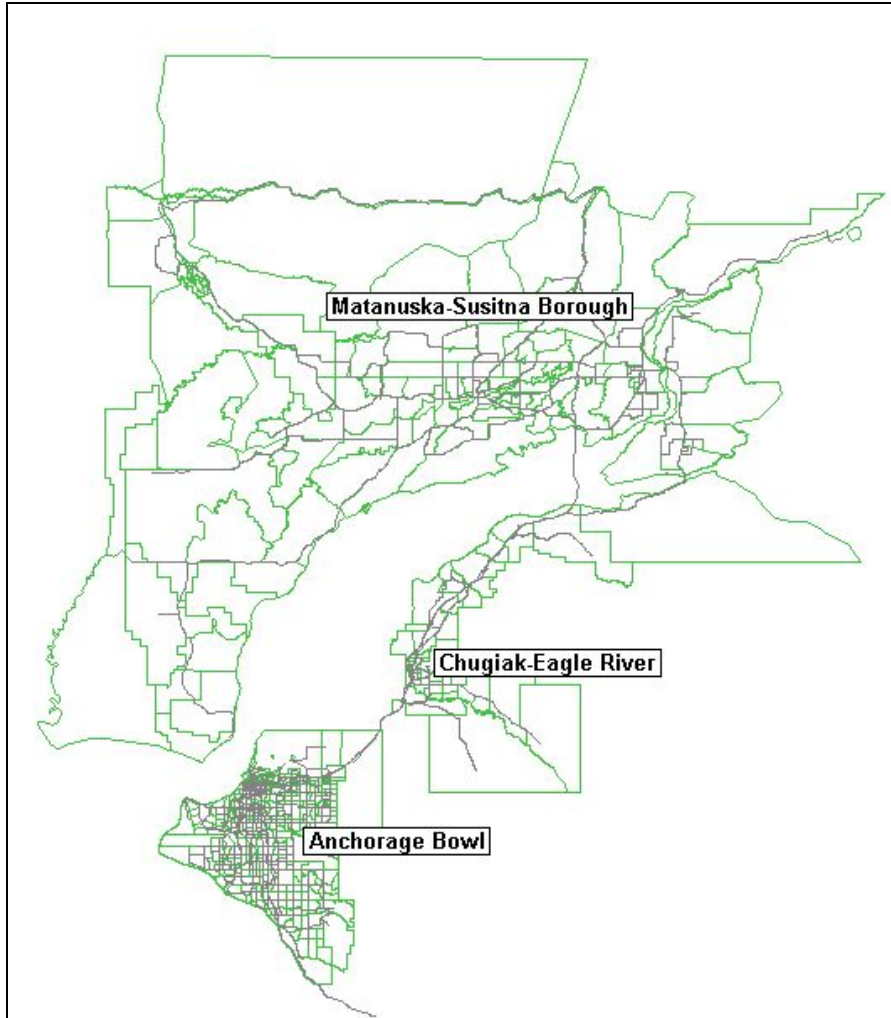
The forecast and allocation of the 2028 and 2040 population, household and employment involves three distinct steps; first, the creation of a 2013 base year population, household and employment estimate is undertaken. The figures developed for the base year utilizes the best available existing data to allocate the data by Traffic Analysis Zones (TAZs). This includes U.S. Census Bureau socio-economic data, Municipality of Anchorage building permit and the computer-assisted mass appraisal (CAMA) tax assessment data, Alaska Department of Labor and Work Development (ADOLWD) employment data, and

McDowell Group data on self-proprietors derived from the Bureau of Economic Analysis (BEA). Second, the establishment of 2028 and 2040 regional population, household and employment control totals for the MSB and the Municipality of Anchorage are completed. This part includes the additional breakdown of the regional control totals from ADOLWD and BEA into geographical subareas. Since not all of the MSB is within the TDM study area (see Figure 1), it is necessary to develop a MSB population, household and employment projection that reflects the study boundaries. This process is performed in collaboration with MSB staff. The population, household and employment projections for the Municipality of Anchorage also have to be broken down into subareas. The TDM study area for the MOA does not include the Turnagain Arm communities of Girdwood, Bird and Indian and therefore are excluded from the MOA projection. Since the Anchorage Bowl and Chugiak-Eagle River (CER) have separate comprehensive plans that guide the land use of their respective communities, separate projections are developed for these subareas. Finally, the third step involves the disaggregation of the subareas totals into the Traffic Analysis Zones, which are the geographical areas used by the transportation demand model for the actual calculation of travel generation and attraction. The organization of this report is based on these three steps in the land use allocation process.

GEOGRAPHICAL BOUNDARIES OF THE REGIONAL TRANSPORTATION DEMAND MODEL

The AMATS model includes both the area within the AMATS boundary (extending from Eklutna to Potter Marsh) and some of the Matanuska-Susitna Borough. The MSB portion of the model includes only the most heavily populated areas of the borough, an area that incorporates about 93 percent of the total Mat-Su Borough population. Figure 1 shows the extent of the AMATS model boundaries.

FIGURE 1: REGIONAL TRANSPORTATION DEMAND MODEL BOUNDARIES



BASE YEAR (2013) POPULATION, HOUSEHOLD, AND EMPLOYMENT ALLOCATION

Household and Population

As a rule, Transportation Demand Models are typically updated after the decennial census is completed and the results are made available. This is because the household and population data can be updated with the highest degree of accuracy since it is the only 100 percent census conducted in the United States. The U.S. Census data is available by census block. While an attempt to create TAZ boundaries that match the census block boundaries is undertaken, this is not always possible to do. As a result, some census blocks are split in order to divide the households and population contained in the blocks between their respective TAZs. This is primarily done with the use of aerial photos. The MSB has developed their own model assumptions and supplied AMATS with a copy of their 2010 socio-economic data files.

Selected as the model base year, 2013 acts as the starting point to determine future growth. As a result, the 2010 U.S. Census data needed updated to take into account population and household growth that occurred between 2010 and 2013. For the Municipality of Anchorage, this analysis included and used Municipal permit data. Although not all building permits result in development the year issued, in general most building permits eventually result in development because of the cost of obtaining a building permit. Research by the Municipality of Anchorage staff suggested that the majority of building permits issued between 2005 and 2010 have resulted in residential development. Between 2010 and the end of 2013 a total of 1,018 residential building permits were issued, 901 of which were located in the Anchorage Bowl and 117 in CER. Single-family permits (840) by far outnumbered multi-family permits (178). The MOA permit database contains tax code numbers, which link to the MOA parcel database, which in turn are overlaid by the AMATS TAZ layer. Thus, it is possible to tag each MOA building permit with the TAZ in which it lies. This permitted the TDM team to determine where the household growth occurred between 2010 and 2013 (see Figure 2 and Figure 33).¹

The allocation of population and household(s) for the MSB portion of the model is allocated somewhat differently and relied on data provided by the MSB.² The MSB allocated future households was based on the results of a charrette convened for that specific purpose, along with consideration of land suitability and related factors. The employment and household distributions were reviewed and approved by MSB Planning and Public Works staff. AMATS obtained two socio-economic files from the MSB (2010 and 2035) containing population and household data by TAZ. In order to obtain an estimate of the 2013 households by TAZ, the percentage of the overall growth captured by each TAZ (between 2010 and 2035) was calculated. This percentage was then multiplied by the total household growth between 2010 and 2013 and the result was added to the 2010 figure.

Employment

The development of 2013 employment data by TAZ required detailed information regarding the location, number of employees, and employment category of each employee in the Municipality of Anchorage. The AMATS TDM development team created new employment categories for this version of the model. The new categories should provide a better representation of the trip generation characteristics of different employment types, which should lead to a better estimate of trip attractions. A comparison between the old employment categories used in the previous model and the new categories are presented in Table 1. Each employment category is associated with one or more North American Industrial Classification

1 The Municipality of Anchorage CAMA tax assessment database is an alternative source for obtaining information on new development activities. However, one advantage of using the permit database is that it contains information on additions to existing structures which is helpful when estimating employment. The TDM consultant team recommends using the CAMA database as a check for the permit database in future updates to the land use allocation model, especially with respect to new housing construction. In any case, use of the permit data for the identification of new development has been determined by the MOA Planning Department to provide an acceptable level of accuracy.

2 Murph O'Brien, HDR Project Manager to Mat-Su Borough LRTP Technical Advisory Committee, memorandum, June 27, 2014, "Travel Demand Model Calibration Results."

System (NAICS) categories, which is the standard employment classification system developed by and used by the U.S. Department of Labor. The employment categories used in the new model with their associated NAICS codes are listed in Table 2.

ADOLWD collects data on the number of establishments, monthly employment and quarterly wages, by NAICS industry, by county and by ownership sector through their Quarterly Census of Employment and Wages (QCEW) reports. The QCEW program produces a comprehensive tabulation of employment and wage information for workers covered by State unemployment insurance (UI) laws and Federal workers covered by the Unemployment Compensation for Federal Employees (UCFE) program. AMATS requested and the ADOLWD provided the QCEW data for the fourth quarter of 2009. Yet, in some cases, business location is only identifiable with a PO Box address and not by the street address. In other cases, only a single business location is reported; yet in reality they (businesses) were scattered in multiple locations throughout the city. As a result, in order to ensure that the employees were allocated in the correct TAZs a substantial amount of research was required to identify the actual location of business employment.

FIGURE 2: ANCHORAGE BOWL RESIDENTIAL BUILDING PERMITS(2010 -2013)

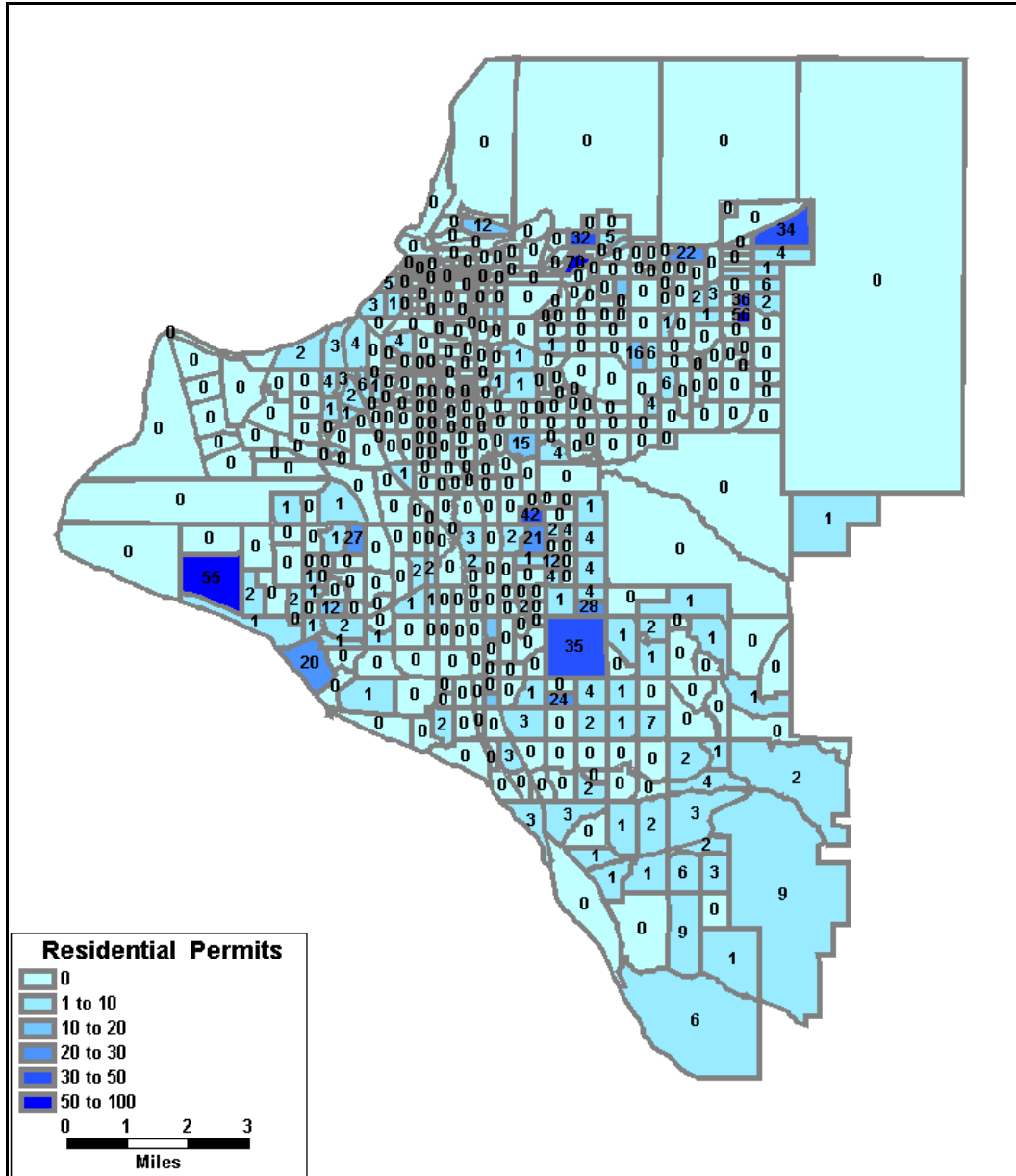
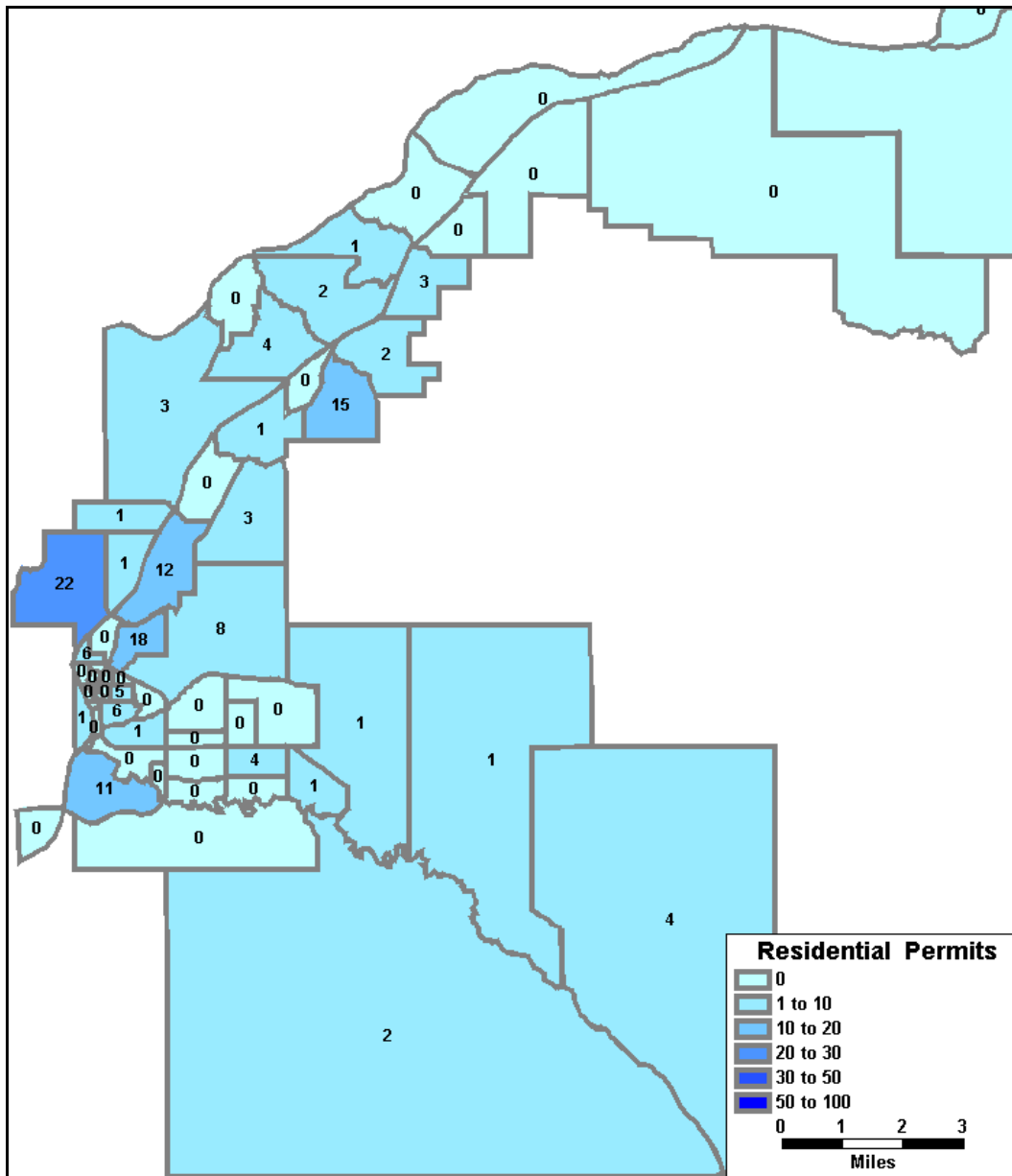


FIGURE 3: CHUGIAK-EAGLE RIVER RESIDENTIAL BUILDING PERMITS(2010 -2013)



As with the population and household data, the Municipality of Anchorage permit database is used to determine where employment growth occurred between 2010 and 2013 and what employment category to select to assign the growth. Unfortunately, the Anchorage permit database does not contain information on the number of employees that the business is expected to employ. As a result, it is necessary to estimate the number of employees based on the square footage of the structure and the nature of the business. Table 3 shows the assumptions that are used to calculate the employees associated with each of the commercial building permits. In some unique instances, the number of employees per 1,000 square feet was estimated using the QCEW data combined with the MOA assessors file, which provided information on the square footage of the business.

TABLE 1: EMPLOYMENT CATEGORY CONVERSION (OLD MODEL TO NEW)

Old AMATS Employment Category	Old AMATS Employment Category Description	New AMATS Employment Category
AEMP	Agriculture, forestry and Fisheries	Category 1
BEMP	Mining	Category 1
CEMP	Construction	Category 3
DEMP	Manufacturing	Category 2
EEMP	Transportation, Communications & Utilities	Category 5
FEMP	Wholesale	Category 2
GEMP	Retail	Category 4
HEMP	FIRE	Category 6
IEMP	Services, except Health Services	Category 9
JEMP	Government except schools, university and Hospitals	Category 10
SEMP	Schools	Category 10
UEMP	Universities	Category 10
XEMP	Health Services	Category 8

Source: Spring Planning Services

As a result, of these calculations, a total of 3,193 employees were added to the 2009 QCEW employment totals. The majority were by far, allocated to Anchorage Bowl TAZs (only 20 employees were allocated to CER due to the lack of commercial building permit activity in this subarea).

TABLE 2: EMPLOYMENT CATEGORY BY NAICS TWO-DIGIT CODE

Category Number	Category Name	NAICS Code
1	Natural Resources	11, 21
2	Wholesale Trade, Manufacturing and Utilities	22, 31, 32, 33, 42
3	Construction	23
4	Retail Trade	44, 45
5	Transportation & Warehousing	48, 49
6	FIRE, Professional Services and Other	51, 52, 53, 54, 55, 56, 81
7	Educational Services	61
8	Health Care & Social Assistance	62
9	Accommodation, Food Services, & Entertainment	71, 72
10	Government	92

Source: RSG AMATS TDM Consultant Team

TABLE 3: EMPLOYEES PER 1,000 SQUARE FEET

Use Type	Employees per 1000 square feet
Retail	1.8
Bank	2.1
Restaurant	7.5
General offices	3.4
Medical offices	4.8

Source: Institute of Transportation Engineers

The final step in the development of the 2013 employment estimates was to expand the employment totals to include the McDowell Group estimate of self -proprietors. It is important to note that the QCEW employment estimates do not include members of the armed forces, the self-employed, proprietors, domestic workers, unpaid family workers and railroad workers covered by the railroad unemployment insurance system. There are, of course, a large number of self-employed persons who remain uncovered

by this program and are therefore not included in the QCEW database. The McDowell Group determined that there were approximately 30,000 self -proprietors working in the Municipality of Anchorage in 2013 (this figure is calculated using the Bureau of Economic Analysis 2012 estimate of employment by sector and subtracting it from the state of Alaska 2012 aggregate QCEW employment estimates). The TDM model relies on algorithms, which estimate attractions and productions. Employment is an important source for the attractions portion of the equation. If the total employment is underreported, then the algorithms may not work properly. As a result, the employees by TAZ must be revised to incorporate the large number of self-employed persons. Since there is no way of telling where these employees are located, it was assumed that they are located where the existing QCEW employees are located. Thus, the number of employees by TAZ was revised upwards in proportion to the percentage to the total QCEW workforce that is located in each TAZ³.

The 2013 MSB employment data was estimated in much the same manner used to create the population and households calculations. However, additional steps to convert the MSB employment categories into the new employment categories was developed for the updated AMATS TDM (see Table 1 [The MSB TDM currently uses the old employment categories that were developed for the previous AMATS TDM]). Conversion of both the 2010 and 2035 MSB socio-economic files to the new employment categories and 2013 MSB employment was calculated using the percentage of growth methodology described in the population and household section.

REGIONAL AND SUBAREA POPULATION, HOUSEHOLD, AND EMPLOYMENT ALLOCATION

Population

ADOLWD's Alaska Population Projections 2012 to 2042 provides the foundation for all socio-economic projections addressed in this report. The ADOLWD projections include population by age cohort and gender for the Anchorage Municipality and MSB in five-year increments. The following narrative, extracted from page five of the ADOLWD report, summarizes the projection methodology:

To create this set of projections, ADOLWD used a "cohort component" technique, separating the population of each sex into age groups and aging them forward in time, then adding projected births and in-migrants and subtracting projected deaths and out-migrants.

Based on recent data and knowledge of the specific populations, ADOLWD assigned each borough/census its own unique mortality, fertility and migration rates.

In consultation with Alaska state demographers, study area population projections for the horizon years 2028 and 2040 were linearly extrapolated from the ADOLWD projections for the years 2027, 2032, 2037 and 2042.

It is important to note the ADOLWD population projections do not consider the population effects of potential structural changes to the economy, such as those that might occur with transportation infrastructure development or with large-scale industrial development. For example, the socio-economic

³ New employees in TAZ = existing employees in TAZ/total existing employees * total self-proprietors

impacts of a Knik Arm crossing or gas line development are not explicitly reflected in the population projections.

Rates of population growth evident in the ADOLWD projections are slower than recent historical growth rates. Anchorage’s population grew at an average annual rate of 1.13 percent between 2000 and 2013 and the MSB has been averaging 3.78 percent (see Table 4). The growth rates for both the Municipality of Anchorage and the Matanuska-Susitna Borough have been slowing down even more over the past few years (see Table 5). Since 2010, the growth rate of the MOA has been generally under 1 percent per-year and the MSB has been under 3 percent. ADOLWD’s forecast is consistent with these slower growth rates projecting annual growth rates for the Municipality of Anchorage of 0.82 percent for the 2013 to 2028 period and 0.51 percent for the 2028 to 2040 period. ADOLWD projections are also in line with the slower MSB growth rates projecting rates of 2.18 percent and 1.66 percent for the 2013 to 2028 and 2028 to 2040 periods, respectively.

Figure 4 shows the ADOLWD population forecast compared to the historic population growth for the combined MOA and MOB. The forecast is a continuation of the historic trendline.

The published ADOLWD projections are at the borough/municipality level. To develop population projections for the geographic sub-areas defined in the AMATS study, the study team used 2010 Census data at Census Tract, Census Designated Place (CDP), and Census Block Group levels--plus TAZ population data prepared by HDR for the MSB--to allocate the borough/municipal populations to the sub-areas, including the Anchorage Bowl, CER and the MSB. The following discusses how these subarea allocations were developed.

TABLE 4: PAST AND PROJECTED POPULATION ANNUAL GROWTH RATES

	2000 - 2013	2013 - 2028	2028 - 2040	2013 - 2040
Anchorage Municipality	1.13%	0.82%	0.51%	0.68%
Mat-Su Borough	3.78%	2.18%	1.66%	1.94%
Total	1.69%	1.17%	0.85%	1.03%

Source: ADOLWD Alaska Population Projection 2012 to 2042.

TABLE 5: HISTORIC POPULATION GROWTH RATE

Year	Municipality of Anchorage	Mat-Su Borough
2000	0.3%	6.5%
2001	1.7%	4.4%
2002	1.0%	4.4%
2003	1.9%	5.1%
2004	1.7%	4.5%
2005	0.1%	5.4%
2006	1.7%	4.5%
2007	-0.2%	3.6%
2008	0.6%	3.3%
2009	2.2%	2.8%
2010	0.9%	3.4%
2011	1.5%	3.2%
2012	0.8%	2.2%
2013	0.9%	2.4%
2014	-0.08	2.1%

Source: ADOLWD and ISER

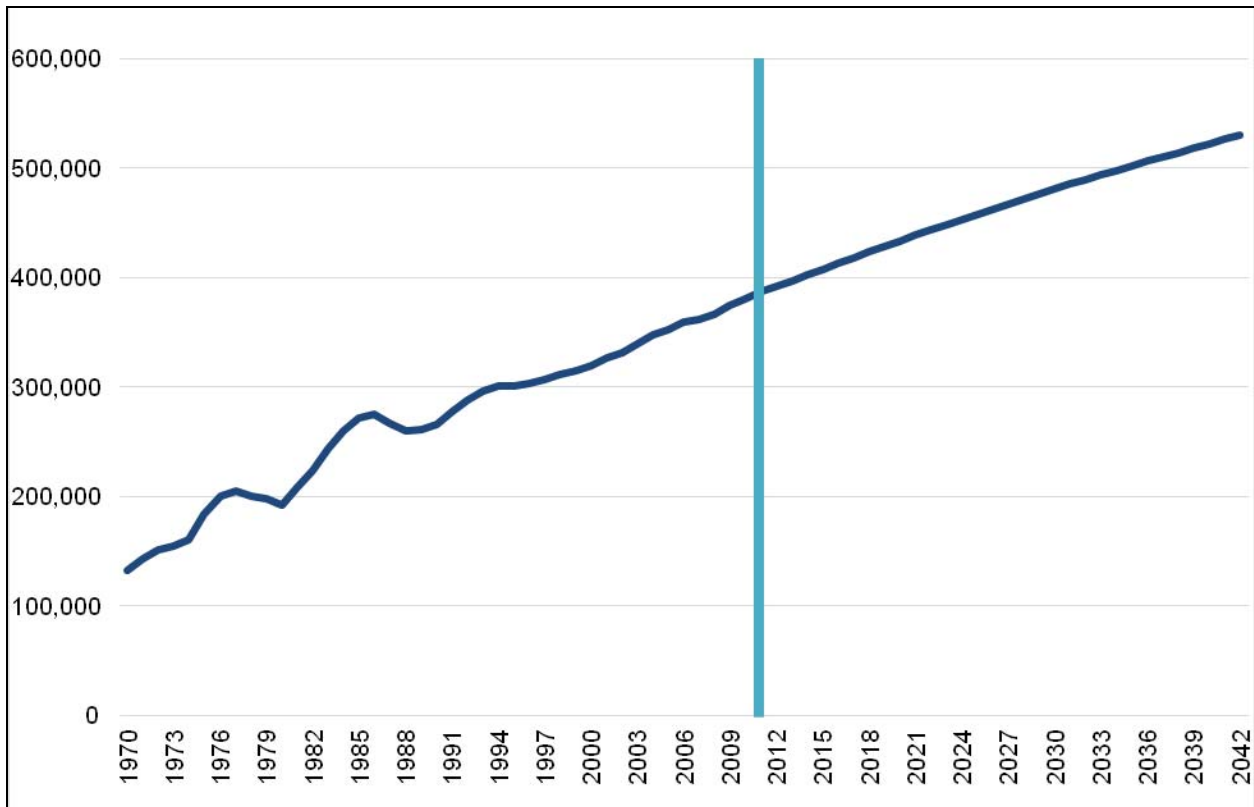
There are 55 Census Tracts in the Municipality of Anchorage (see Figure A-1 in Appendix): 48 in the Anchorage Bowl, six in the Chugiak-EagleRiver area, and one for Girdwood-Turnagain Arm (which is outside the study area). Table 6 lists the Census Tracts for CER.

The distribution of the population between the Anchorage Bowl and CER has changed over time. In 1970, CER accounted for 4.6 percent of the Municipality of Anchorage population, including Girdwood-Turnagain Arm. This increased to 11.2 percent in 1990, 11.49 percent in 2000, and 12.03 percent in 2011. The most recent estimates for 2013 show a slight decline in the Chugiak-Eagle River to 11.98 percent.

As previously mentioned, the CER area has its own Comprehensive Plan, which guides development in this subarea of the Municipality of Anchorage. The Plan provides an estimate of the future growth of the

area, which is expressed as a percentage of the total future MOA population. The Plan estimates that the CER population will continue to grow at a faster rate than the Anchorage Bowl and that it will represent 15 percent of the total MOA population by 2025 (the planning horizon year for the last adopted CER Comprehensive Plan). Since the 2025 population forecast used by the CER Comprehensive Plan (351,300) is close to the population forecast used in new 2040 forecast developed by ADOLWD (358,363) it seems reasonable to retain the use of the 15 percent CER Comprehensive Plan estimate in this allocation report.

FIGURE 4: POPULATION, ANCHORAGE MUNICIPALITY AND MAT-SU BOROUGH, 1970 - 2042



Source: ADOLWD Population Estimates (1970-2013) and Projects (2012-2042). Population projections adjusted to match 2013 population estimates.

TABLE 6: 2010 CENSUS TRACTS DEFINING THE CHUGIAK-EAGLE RIVER REGION

Census Tract Code	Census Tract Name
1.01	Peters Creek/Eklutna
1.02	Chugiak
2.01	DowntownEagleRiver
2.02	EagleRiver
2.03	LowerEagleRiverValley
2.04	UpperEagleRiverValley

THE 2010 CENSUS DEFINES 24 CENSUS TRACTS FOR THE MSB (SEE FIGURE A-2 IN APPENDIX). MOST (19) OF THESE CENSUS TRACTS ARE WITHIN THE MAT-SU VALLEY. TWO CENSUS TRACTS ARE OUTSIDE THE VALLEY AND THEREFORE EXCLUDED FROM THE ANALYSIS. THE AMATS MODEL SPACE OUTER BOUNDARY CROSSES THE REMAINING THREE CENSUS TRACTS. UTILIZING 2010 CENSUS BLOCK GROUP PLUS TAZ POPULATION DATA PRODUCED BY HDR FOR THE MSB PORTION OF THE ADOT&PF “HIGHWAY 2 HIGHWAY” PROJECT, THE TOTAL POPULATION OF THE THREE PARTIALLY INCLUDED CENSUS TRACTS THAT WERE ADJUSTED PROPORTIONALLY TO COMPUTE THEIR POPULATION CONTRIBUTIONS WITHIN THE MODEL SPACE. ALL POINTS NORTH ALONG THE PARKS HIGHWAY BEGINNING WITH CASWELL LAKES AND ALL POINTS EAST ALONG THE GLENN HIGHWAY BEGINNING WITH CHICKALOON WERE EXCLUDED.

Table 7 lists the Census Tracts that were fully or partially excluded from the Mat-Su Valley sub-area analysis.

TABLE 7: 2010 CENSUS TRACTS EXCLUDED FROM MAT-SU VALLEY REGION

2010 Census Tract Code	Description	Population Percentage Excluded From Study Area
1.01	Western Mat-Su	100
1.02	Talkeetna	100
2	MatanuskaRiver	87
3	Fishhook	16
4.02	Willow	27

Based on ADOLWD projections, the combined Anchorage Bowl, Chugiak-Eagle River and Mat-Su Valley population(s) will likely grow by approximately 121,000 residents, or 31 percent, between 2013 and 2040 (see Table 8). This includes a 19 percent overall growth between 2013 and 2028, and 10 percent overall growth between 2028 and 2040. Uneven future regional growth and distribution is expected. Following historic trends, the fastest growing area of the region in terms of populations probably the MSB. The MSB population (within the study area) is projected to grow by 61,000 between 2013 and 2040, a 68 percent increase. This growth rate is substantially greater than the 41,900 increase in population or 16 percent that the Anchorage Bowl is forecasted to experience between 2013 and 2040. An additional 18,000 persons are projected to live in CER in 2040, a 50 percent increase.

TABLE 8: TOTAL POPULATION, 2013 ESTIMATES, 2028 AND 2040 PROJECTIONS

	2013	2028	2040	% Growth 2013 - 2028	% Growth 2028 - 2040	% Growth 2013 - 2040
Anchorage Bowl	262,679	290,155	304,609	10%	5%	16%
Chugiak–Eagle River	35,761	46,960	53,754	31%	14%	50%
Mat–Su Valley	89,916	124,188	151,241	38%	22%	68%
Total Study Area	388,356	461,303	509,604	19%	10%	31%

Source: ADOLWD Alaska Population Projection 2012 to 2042, and McDowell Group estimates.

Total Number of Households and Average Household Size

Projections of the number of households in the study area are tied to the overall population projections and estimated household size. The population estimates are based on the 2014 ADOLWD “Alaska Population Projections 2012 to 2042”. Likewise, household size is anticipated to decrease over time. Census 2010 household size estimates are 2.62 in Anchorage Bowl, 2.83 in Chugiak-Eagle River, and 2.79 in Mat-Su Valley. Household size is assumed to decrease in size at the same rate the population to household ratio decreases in the ISER 2009 forecast⁴ or approximately 2.9 percent. As a result, household size in the Anchorage Bowl is forecasted to be 2.54 and 2.74 in CER by 2040. The number of households in each of the MOA Traffic Analysis Zones is then adjusted by subtracting the population living in group quarters⁵, mainly prisoners, military, students and those in long-term care from the population totals in each TAZ. It is assumed that the group quarter population will remain constant at 2013 proportions and thus will total approximately 10,740 by 2040.

4 Institute of Social and Economic Research, “Economic and Demographic Projections for Alaska and Greater Anchorage”, December 2009.

5 Group Quarters (GQ) are places where people live or stay, in a group living arrangement, which is owned or managed by an entity or organization providing housing and/or services for the residents.

The number of households in the Anchorage Bowl is projected to increase by 19,081 by 2040 bringing the total to 116,437. CER is forecasted to add 6,363 households, and MSB is expected to add about 23,300 households (see Table 9).

TABLE 9: NUMBER OF HOUSEHOLDS, 2013 ESTIMATES, 2028 AND 2040 PROJECTIONS

	2013	2028	2040	Growth 2013 - 2028	Growth 2028 - 2040	Growth 2013 - 2040
Anchorage Bowl	97,356	109,387	116,437	12%	6%	20%
Chugiak-Eagle River	12,474	16,422	18,837	32%	15%	52%
Mat-Su Valley	32,950	46,344	56,260	41%	21%	71%
Total Study Area	142,701	172,154	191,428	21%	11%	34%

Source: U.S. Census 2000 and 2010; ACS 2008-2012, and McDowell Group estimates.

Total Labor Force and Labor Force Participation Rates

Labor force is defined as the resident population over 16 years of age that is either employed or seeking employment. The Labor Force Participation Rate (LFPR) is typically defined as the labor force divided by the total population age 16 and above.

While labor force is measured by place of residence, published employment data is evaluated by location of employment. As a result, the number employed in a region may exceed its labor force due to commuters from outside the community or from seasonal non-resident employment. Indeed, this is the case in the Anchorage Municipality where total employment in 2013 was 47,000 greater than the resident labor force.

ADOLWD reports labor force counts are available at <http://live.laborstats.alaska.gov/labforce/> In order to produce a baseline LFPR, these data are coupled with ADOLWD population estimates.

Moreover, labor force and population data together indicate the LFPR in both Anchorage and Mat-Su is at or near 25-year lows. The LFPR in Anchorage in 2013 was 66.8%, well below the 10-year average of 69.4 percent. Mat-Su’s LFPR in 2013 was 60.7 percent, also below the 10-year average of 64.5 percent. LFPRs have been declining in recent year(s) largely due to an aging population. Although ADOLWD research indicates the LFPR in older cohorts is increasing it is not enough to offset the declining LFPR due to fewer workers in the prime working years.

To project the size of the labor force, the 2013 LFPRs for Anchorage Municipality and Mat-Su Borough are applied to projected sub-area populations of residents 16 and over in 2028 and 2040 (see Table 10). While the LFPR has been on a downward trend in recent years (it may continue to decline in the near

term as the population continues to age), the 2013 rate is a reasonable estimate for purposes of calculating the 2028 and 2040 labor force projections.

TABLE 10: TOTAL LABOR FORCE, 2013 ESTIMATES, 2028 AND 2040 PROJECTIONS

	2013	2028	2040	Growth 2013 - 2028	Growth 2028 - 2040	Growth 2013 - 2040
Anchorage Bowl	135,926	153,437	165,551	13%	8%	22%
Chugiak- EagleRiver	18,199	20,544	22,166	13%	8%	22%
Mat-SuValley	40,370	56,045	68,501	39%	22%	70%
Total	194,496	230,026	256,218	18%	11%	32%

Source: ADOLWD Unemployment Statistics, and McDowell Group estimates.

Total Employment and Employment by Sector

In Anchorage and MSB, employment and labor force have had a very strong correlation over the past decade. Because of this correlation, labor force trends guide employment projections. The baseline ratio of employment to labor force in the Municipality of Anchorage, excluding the Turnagain Arm (128 percent) and MSB model area (76 percent) holds constant for the projection period and then is multiplied by the labor force; which in turn, gives the total employment projections for 2028 and 2040.

In addition to labor force projections, data from ADOLWD and the federal Bureau of Economic Analysis (BEA) allow TDM staff to calculate the total sub-area employment projections and employment in 10 different industrial sectors.

In addition, military and proprietor employment data (the military and sole proprietorships are not included in ADOLWD’s employment data) from BEA supplements ADOLWD data.

Overall, employment is projected to grow at an annual rate of 0.871 percent in the Anchorage Municipality for the 2013 to 2028 period (a rate consistent with the past decade). Applying this rate to Anchorage Bowl employment indicates total employment of approximately 217,000 in 2028 and 233,000 in 2040.

A certain percentage of the Municipality of Anchorage employment growth is expected to occur in CER. Table 11 shows that 2.58 percent of the Anchorage Municipality employment was located in Chugiak-Eagle River in 2013. Available data suggests that employment has been growing at a faster rate in CER than in the Anchorage Bowl.⁶ As such, the proportion of total Anchorage employment in the CER would

⁶ McDowell Group, “Technical Memorandum #6, AMATS Travel Model Update: Socioeconomic Projections”, prepared for Anchorage Metropolitan Transportation Solutions, 2015.

increase from 2.58 percent to 2.75 percent by 2028 is assumed. This proportion is also maintained for the 2040 employment allocation.

Based on the 2009 ADOLWD employer list for MSB, 95.4 percent of borough employment is located in the Mat-Su Valley sub-area (slightly higher than the population proportion of 93.6 percent). For the base year of 2013, total employment in the Mat-Su Borough is estimated at 33,000, with employment in the Mat-Su Valley sub-area (model area) estimated at 31,700. For 2028, employment in Mat-Su Valley is projected to be 44,000 and by 2040, 54,000.

Overall employment in the study area is projected to grow 28 percent to an annual average of approximately 295,000 in 2040, approximately 64,000 jobs above the current level (see Table 11).

TABLE 11: STUDY AREA EMPLOYMENT, 2013 ESTIMATES, 2028 AND 2040 PROJECTIONS

	2013	2028	2040	Growth 2013 - 2028	Growth 2028 - 2040	Growth 2013 - 2040
Anchorage Bowl	192,958	217,481	232,948	13%	7%	21%
Chugiak–Eagle River	5,100	6,092	6,593	19%	8%	29%
Mat–SuValley	31,711	44,023	53,808	39%	22%	70%
Total	229,769	267,596	293,349	16%	11%	28%

Source: ADOLWD Quarterly Census of Employment and Wages, BEA, and McDowell Group estimates.

In addition to overall (total) sub-area employment projections, employment in ten sectors was projected for each sub-area. The distribution of employment across each sector of the economy changes over time as an economy matures. The ADOLWD periodically forecasts employment growth by sector, the latest published in October 2014. This forecast predicts that the health services industry will be the fastest growing sector followed by professional & business services with government employment growing the slowest. The breakdown of employment by category for the Anchorage Bowl, Table 12 and for CER, Table 13 is substantially based on this forecast. Table 14 provides the employment by industrial sector forecast for the MSB based on projections provided by the MSB.

TABLE 12: EMPLOYMENT BY INDUSTRIAL SECTOR, ANCHORAGE BOWL, 2013 ESTIMATES, 2028 AND 2040 PROJECTIONS

Sector	2013	2028	2040
Natural Resources	4,619	4,954	5,147
Wholesale Trade, Manufacturing and Utilities	8,295	9,508	10,281
Construction	12,930	13,750	14,205
Retail Trade	22,226	25,118	26,939
Transportation & Warehousing	12,872	14,186	14,987
FIRE, Professional Services and Other	59,709	66,618	70,907
Educational Services	2,735	3,532	4,064
Health Care & Social Assistance	25,424	31,614	35,708
Accommodation, Food Services, & Entertainment	19,553	23,351	25,829
Government	24,588	24,850	24,811
Total	192,958	217,481	232,948

Source: Anchorage Industrial Land Assessment Update: Volume 1-Employment Land Need & Policy Recommendation, prepared by Cardno for the Municipality of Anchorage, May 14, 2015.

TABLE 13: EMPLOYMENT BY INDUSTRIAL SECTOR, CHUGIAK-EAGLE RIVER, 2013 ESTIMATES, 2028 AND 2040 PROJECTIONS

Sector	2013	2028	2040
Natural Resources	32	33	35
Wholesale Trade, Manufacturing and Utilities	120	142	153
Construction	376	471	518
Retail Trade	1,089	1317	1,433
Transportation & Warehousing	111	144	159
FIRE, Professional Services and Other	1,305	1534	1,655
Educational Services	49	53	57
Health Care & Social Assistance	504	632	693
Accommodation, Food Services, & Entertainment	510	724	818
Government	1011	1042	1079
Total	5100	6092	6,593

Source: ADOLWD Quarterly Census of Employment and Wages, BEA, and McDowell Group estimates

TABLE 14: EMPLOYMENT BY INDUSTRIAL SECTOR, MAT-SU VALLEY, 2013 ESTIMATES, 2028 AND 2040 PROJECTIONS

Sector	2013	2028	2040
Natural Resources	230	290	356
Wholesale Trade, Manufacturing and Utilities	604	2,197	2,915
Construction	2,747	3,220	3,838
Retail Trade	6,000	7,230	8,670
Transportation & Warehousing	2,291	3,135	3,830
FIRE, Professional Services and Other	1,093	1,659	2,043
Educational Services	0	0	0
Health Care & Social Assistance	5,281	8,017	9,888
Accommodation, Food Services, & Entertainment	6,582	8,755	10,642
Government	6,883	9,520	11,626
Total	31,711	44,023	53,808

Source: ADOLWD Quarterly Census of Employment and Wages, BEA, and McDowell Group estimates.

TRAFFIC ANALYSIS ZONE ALLOCATION

Introduction

The last step in the household, population and employment allocation process involves disaggregating the Anchorage Bowl, CER and MSB subarea control totals to the TAZ level. The allocation process within the AMATS boundary primarily relies on a 2015 buildable lands inventory and capacity analysis prepared by the Municipality of Anchorage Public Works Geographic Information System (GIS) section (see MOA_Transportation_Planning_Land_Use_parcel_9_21_2015.shp file). This database, in essence, includes information on both the potential number of residential units that potentially can be built on each individual parcel in the Municipality of Anchorage. The capacity is ultimately aggregated to the TAZ level. Residential capacity was calculated by adding following:

Infill Capacity – Platted subdivisions have a known number of lots each of which can be developed with a single-family unit. Instead of estimating the number of units that can be built on the vacant land in the subdivision using average density by zoning type, a value of one unit is assigned to each lot (one unit per parcel, based on single-family units).

Pipeline Capacity – Pipeline developments include, approved site plans, approved master planned communities, or large undeveloped parcels where the residential development potential can be reasonably estimated. The 2015 buildable lands inventory identified a total of 4,708 residential pipeline units the majority of them located in CER (3,564). Two developments owned by Eklutna, Inc. in CER

account for over two-thirds of the total. The largest is the Powder Reserve Master Planned development in Eagle River, which has 1,615 residential units planned.

Partially Vacant Land Capacity – These lots are partially developed but have a capacity for additional development. The zoning density is multiplied by the size of the parcel and the existing units, if there are any, are subtracted to obtain the total development capacity. The potential development capacity of partially vacant units was calculated to be 1,278.

Vacant Land Capacity – Vacant lands have no structure associated with it. They do not include lands that are committed, a pipeline project, infill lots, conservation easements, unsuitable fill lots and Eagle River transportation constrained lots. The number of potential units was calculated by multiplying the historic developed density by zoning district by the size of the parcel after taking into account environmental factors such as wetlands, slopes and floodplains. The total capacity of vacant land was calculated to be 15,110 with 6,441 of this total located in CER.

Redevelopable Mobile Home Park Capacity – These parcels include all of the remaining mobile home sites in the Municipality of Anchorage. The potential residential development capacity was calculated by multiplying the zoning density by the lot size and subtracting the existing number of mobile homes. A total of 2,462 units could be developed on existing mobile home sites all of which are in the Anchorage Bowl.

Downtown Residential Capacity – Downtown Anchorage boundaries used in this study are the same as those shown on page 47 of the Anchorage Downtown Comprehensive Plan and are generally described as being south of Ship Creek, west of Gambell St, north of 9th Ave. and east of the Bootlegger Cove bluff. The Anchorage Downtown Comprehensive Plan (2007) divides the Downtown into several districts including a core district (Downtown Core) and five periphery districts surrounding the core. The MOA GIS database does not indicate that any vacant land exists in the Downtown Core. However, the adopted Downtown Comprehensive Plan (2007) calls for 2,000 residential units in the downtown area by 2025. While this development has not occurred to date, this allocation study assumes that there is a potential capacity of 2,000 residential units in the downtown and has added this to the overall residential capacity total. In order to allocate these units to the TAZ level, additional assumptions are required regarding where these units are most likely to be located. Utilizing the densities provided by the Downtown Comprehensive Plan, a potential capacity for each downtown TAZ was estimated and then was multiplied by the final DU/A shown in Table 15. The calculated TAZ housing capacity as a proportion of the total downtown capacity was then multiplied by the downtown housing control total (2027) to arrive at the estimated housing growth for each TAZ.

The Midtown Employment District does not have the advantage of an adopted plan. While completed in 2007, the Public Hearing Draft of the Midtown District Plan was never adopted by the MOA. The public hearing draft does, however, contain a housing market study, which states that the Midtown District should attempt to retain its current 5 percent share of the MOA housing market. The draft Midtown Plan also identified specific areas, which might be suitable for new residential development, most notably the areas east of the Denali Street and south of 36th Avenue. The majority of the future residential growth in Midtown was allocated to the TAZs in this area.

TABLE 15: DOWNTOWN RESIDENTIAL SUBDISTRICT DENSITIES

Sector	Range DU/A	Midpoint DU/A	Final DU/A*
Barrow St	15 to 30	22.5	22.5
Pioneer Slope	15 to 30	22.5	22.5
Park Strip North	20 to 50	35	35
East Avenues	20 to 60	40	20
Legal/Office	20 to 60	40	20

* East Avenues and Legal Districts are not in DT-3 District. Therefore, residential bonus incentives will not apply. Development potential was therefore reduced by half.

Other Redevelopable Residential Capacity – This category includes redevelopable land outside of downtown, midtown and the mobile home parks, which are potentially considered redevelopable. Residential parcels, which had a lot to building value, as determined by the MOA CAMA database, of more than 1.5 to 1 was also assumed redevelopable. This criteria was only applied to multi-family zoned parcels. The existing units were subtracted from the potential capacity to derive the net residential capacity. A potential residential capacity of 4,593 units were calculated to be available through this type of redevelopment (see Table 16).

TABLE 16: EXISTING (2015) RESIDENTIAL CAPACITY

Development Potential Category	No. of Units
Infill Capacity	2,359
Pipeline Capacity	3,564
Partially Vacant Land Capacity	1,278
Vacant Land Capacity	15,114
Redevelopable Mobile Home Park Capacity	2,462
Downtown Residential Capacity	2,000
Midtown Residential Capacity	1,088
Other Redevelopable Residential Capacity	4,593

Source: MOA GIS

The other component of residential capacity involves density. Density necessarily varies with the zoning district. Although zoning districts determine the highest density allowed, it is seldom the case that those densities are achieved. Thus, in order to determine what densities to use an historic analysis of residential density by zoning district was conducted by the Municipality of Anchorage Planning Department.

Municipality of Anchorage Household and Population TAZ Allocation

The starting point for the Municipality of Anchorage (including Chugiak-Eagle River) allocation is the year 2013. Obviously, development did not stop between 2013 and 2015 (the date that this update was completed). As a result, it was necessary to fill in this two-year gap with information regarding recent development activity. Municipality of Anchorage permit data provided the number and location of new housing units during that period (see 2014-2015 residential permit file). Each new permit was geocoded in order to assign it to the proper TAZ and was added to the 2013 database to produce an updated 2015 estimated number of households by TAZ. A total of 1,333 housing permits were issued during that time within the AMATS planning boundary. (Note: It is assumed that all of the household permits issued during that timeframe were built.)

Once the households were updated to 2015 and the household capacity and subarea control totals were set (see above), the allocation of households to individual TAZs is simply a matter of distributing the subarea control totals (described above) to individual TAZs based on the TAZ's percentage of the total residential capacity. In other words, if TAZ 100 has 1 percent of the MOA's total residential capacity and the future household growth is expected to be 10,000, then 100 housing units will be assigned to TAZ 100 (see MOA residential growth 2015-2040.xls file). The resulting household growth allocation by TAZ is shown in Figure 5, Figure 6, and Figure 7 below.

Population by TAZ is derived from the household estimate and is calculated by multiplying the number of households by the average household size (AHHS). The resulting population estimate is then adjusted to the overall population control total (see Table 10).

FIGURE 5: ANCHORAGE BOWL HOUSEHOLD GROWTH(2013 – 2040)

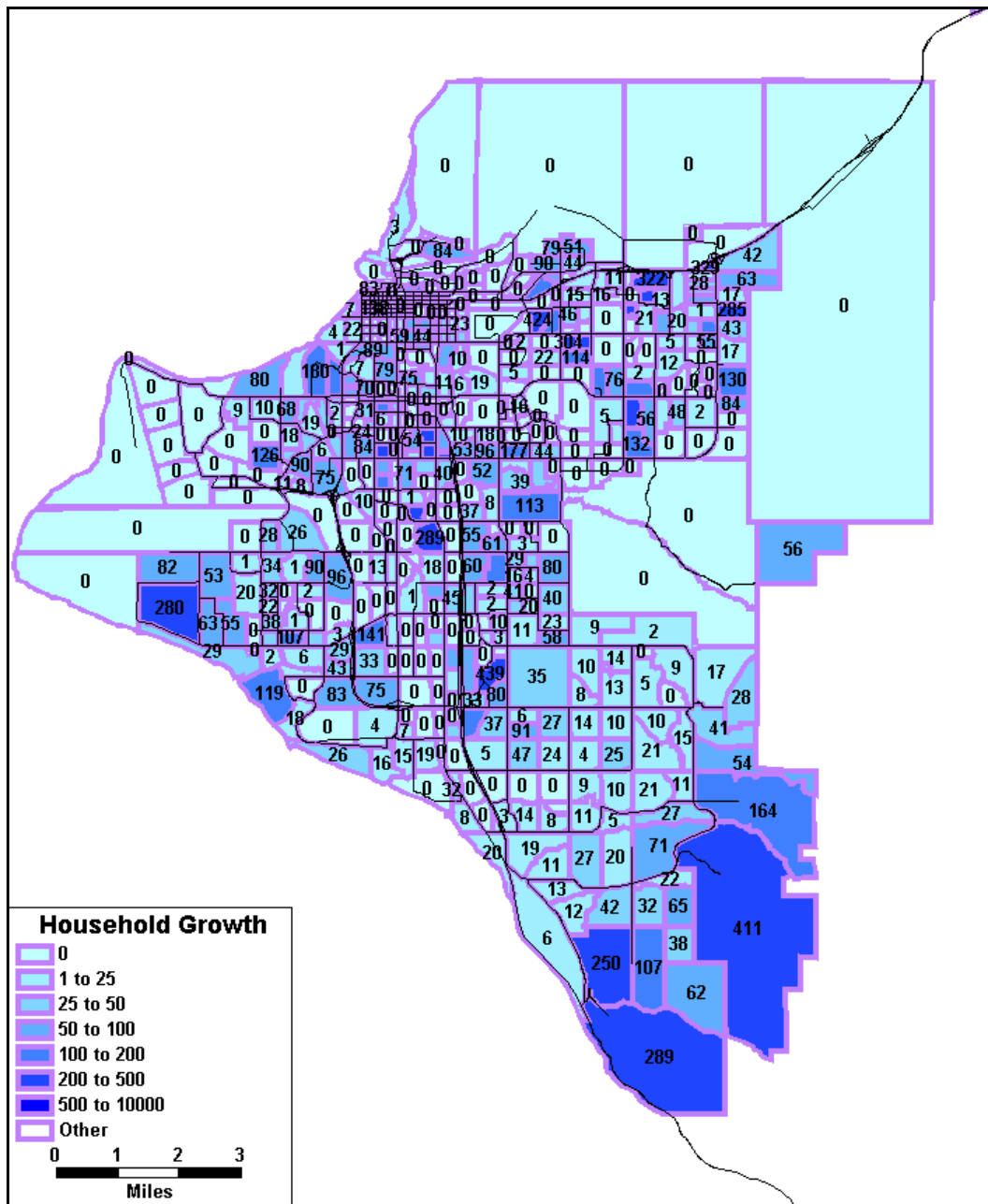


FIGURE 6: CHUGIAK-EAGLE RIVER HOUSEHOLD GROWTH(2013 – 2040)

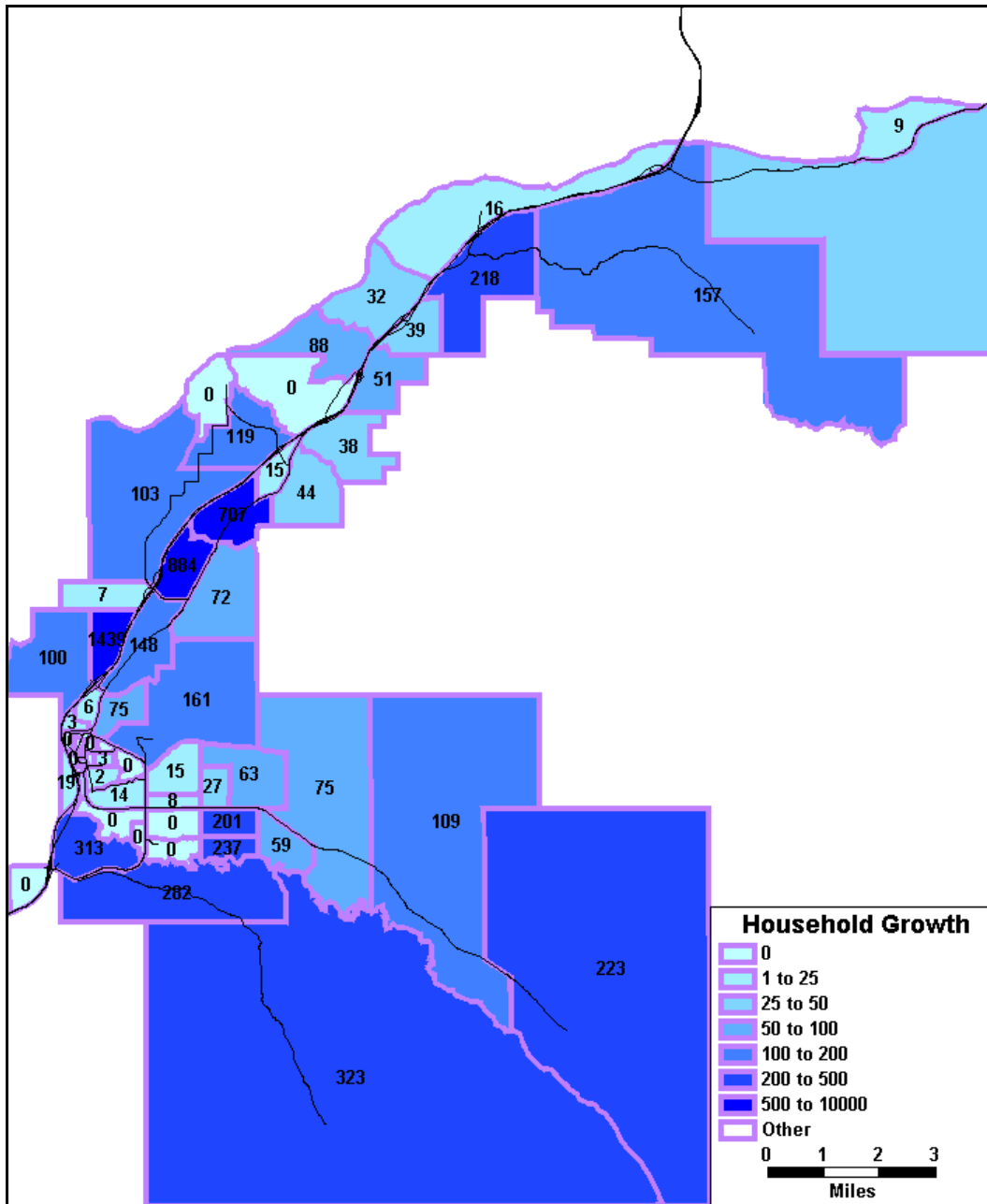
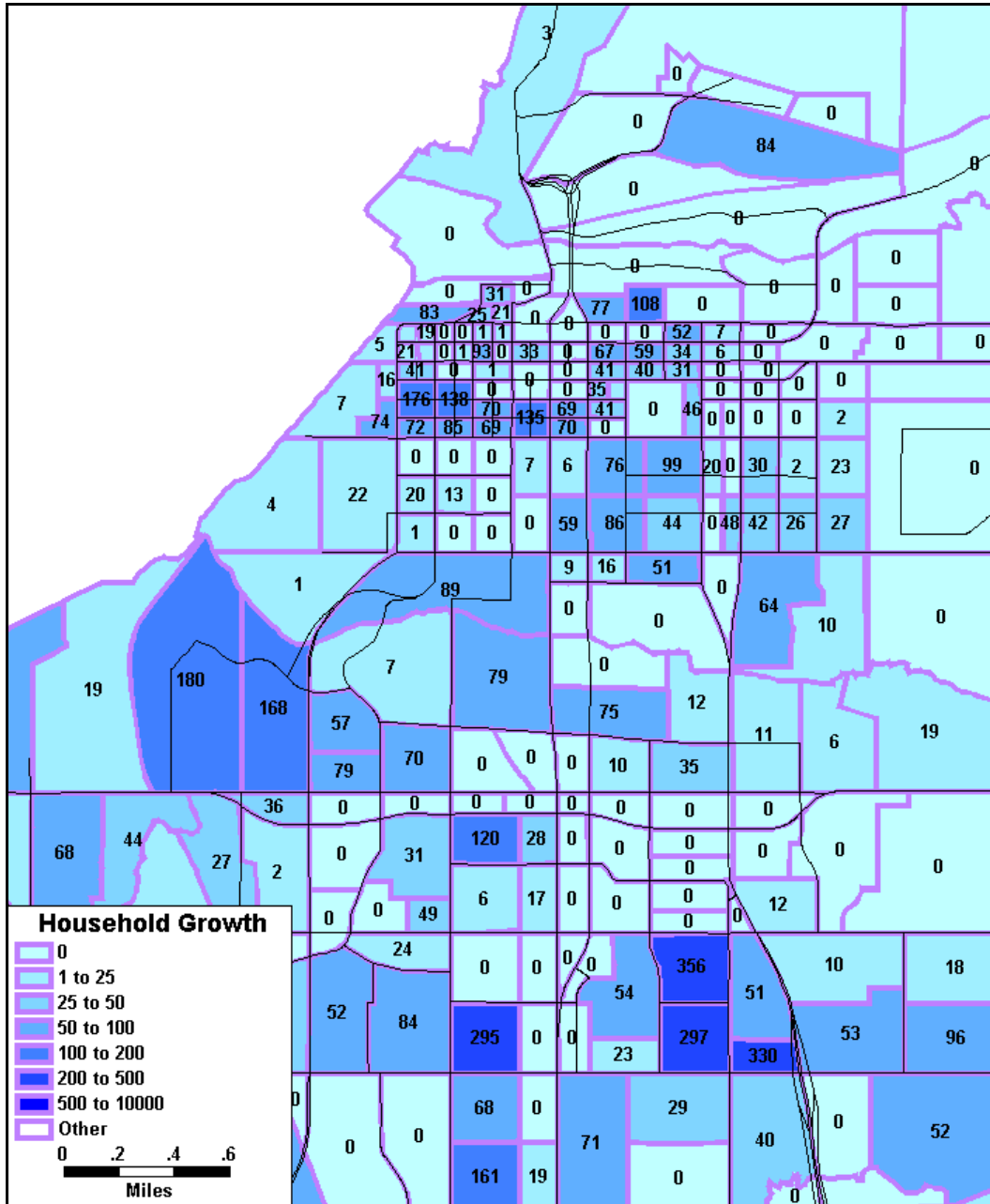


FIGURE 7: DOWNTOWN/MIDTOWN HOUSEHOLD GROWTH(2013 – 2040)



MSB Household and Population TAZ Allocation

As previously mentioned, AMATS obtained two socioeconomic files from the MSB (2010 and 2035) containing the population and household data by TAZ. In order to obtain an estimate of the 2040 households by TAZ, the percentage of the overall growth captured by each TAZ (between 2010 and 2035) was calculated. This percentage was then multiplied by the total household growth between 2010 and 2040, and then added to the 2010 household estimate for each TAZ.

Employment

The employment allocation process is similar to the residential allocation process in that it substantially relies on the 2015 buildable lands inventory and capacity analysis prepared by the Municipality of Anchorage Public Works GIS section (see MOA_Transportation_Planning_Land_Use_parcel_9_21_2015.shp file). This database includes information on the square footage of commercial space that can be built on each individual parcel in the Municipality of Anchorage. The capacity is ultimately aggregated to the TAZ level. Commercial capacity includes the following:

Vacant Commercial Capacity – All parcels listed in the MOA GIS database under the development status field as vacant, partially vacant, marginally vacant, and redevelopable were included in the land use allocation model database as vacant commercial parcels (4,226 acres). Parcels with 2014-2015 commercial permits (totaling 41.7 acres) were then deducted from the total vacant acreage in order to calculate the remaining vacant commercial capacity.

Office capacity was treated somewhat differently given that office uses are typically multi-story and are generally constructed at higher densities than other uses such as retail (see Table 17 for a list of employment categories included in office uses). Thus, in order to estimate the real capacity of parcels that are expected to be developed as commercial office space it was necessary to estimate the average Floor Area Ratio (FAR) for each TAZ (see FAR by activity by TAZ.xls file). The FAR used in the allocation model was calculated from the MOA CAMA database, which contains information on the square footage of existing buildings and the square footage of the lot itself. The average FAR for each TAZ was calculated and the FAR was multiplied by the total vacant land in the TAZ (see above) to derive the relative development potential. In this way, it was possible to add more capacity in areas with historically higher development densities such as downtown and midtown.

Downtown Commercial Capacity – There is very little vacant land available for development in the downtown area. Since the adopted Downtown Comprehensive Plan calls for a substantial amount of future commercial development, it is assumed that the majority of future downtown development will occur due to redevelopment. The MOA GIS database included an existing land activity field. All parcels which contained the 5230 activity code (commercial parking lots), were included in the list of redevelopable properties along with a handful of other lots which have been the subject of redevelopment proposals (4th Ave. theater) and marginal existing development.

Midtown Commercial Capacity – Midtown has been one of the fastest growing office districts in the MOA for the past few decades and has surpassed the downtown as the largest employment center some time ago. However, the amount of vacant land available to support new office development is limited. As a result, it was necessary to assume that at least some of the new office development would occur on

underdeveloped parcels. The majority of the underdeveloped property in midtown lies in the northern portion of the district between Northern Lights Blvd. and Fireweed Lane. A total of 20 acres of redevelopable commercial parcels was identified in this area.

TABLE 17: OFFICE USE EMPLOYMENT CATEGORIES

Category Number	Category Description
1	Natural Resources
6	FIRE, Professional Services and Other
7	Educational Services
8	Health Care & Social Assistance
10	Government

Employment allocation was calculated separately for the Anchorage Bowl, CER and the MSB since the employment category distribution as well as the total employment growth differs significantly. CER employment was allocated in two steps. The first step was to determine where the retail (category 4), FIRE, Professional Services and Other (category 6), Health Services (category 8), and Accommodation, Food Services, & Entertainment (category 9) were most likely to be located using the 2006 Chugiak-Eagle River Comprehensive Plan Land Use Map Commercial Designation as a guide. The remaining employment categories were distributed in commercial zones outside of the commercial land use designated areas (see 2040 CER employment by TAZ.xls and CER employment growth 2015 to 2040.xls files).

Attempting to forecast where employment growth might occur for each employment category in the Anchorage Bowl proves more difficult. It was decided to use historic employment patterns as a guide to the allocation of future employment by category. In other words, if a specific TAZ in the Anchorage Bowl currently contains 100 percent retail employment, then only retail employment will be allocated to that TAZ (assuming it has some remaining developable land capacity).

With respect to the MSB, the employment allocation process relied on previous work conducted by HDR for the MSB Transportation Demand Model. As previously mentioned, it was first necessary to convert the old employment categories (10) used in the MSB TDM into the new employment categories (13) used in the updated AMATS TDM. The final step involved simply multiplying the ratio of the 2040 McDowell/ADOLWD total employment projection (53,808) and 2035 HDR/MSB Total Employment (43,543) by the employment by category in each TAZ. In this way, the integrity of the assumptions regarding employment growth used by the MSB was maintained.

Figure 8, Figure 9 and Figure 10 shows the areas of projected employment growth between 2013 and 2040 within the AMATS boundary. While the existing downtown and midtown employment centers are expected to continue to expand their employment base, future employment growth is expected to shift somewhat further south due to the existence of more readily available vacant commercial land. The UMED district is also expected to attract an increasing share of future employment growth due to the availability of around 60 acres of Alaska Pacific University endowment land, which is expected to be primarily developed as medical offices.

FIGURE 8: ANCHORAGE BOWL EMPLOYMENT GROWTH(2013 – 2040)

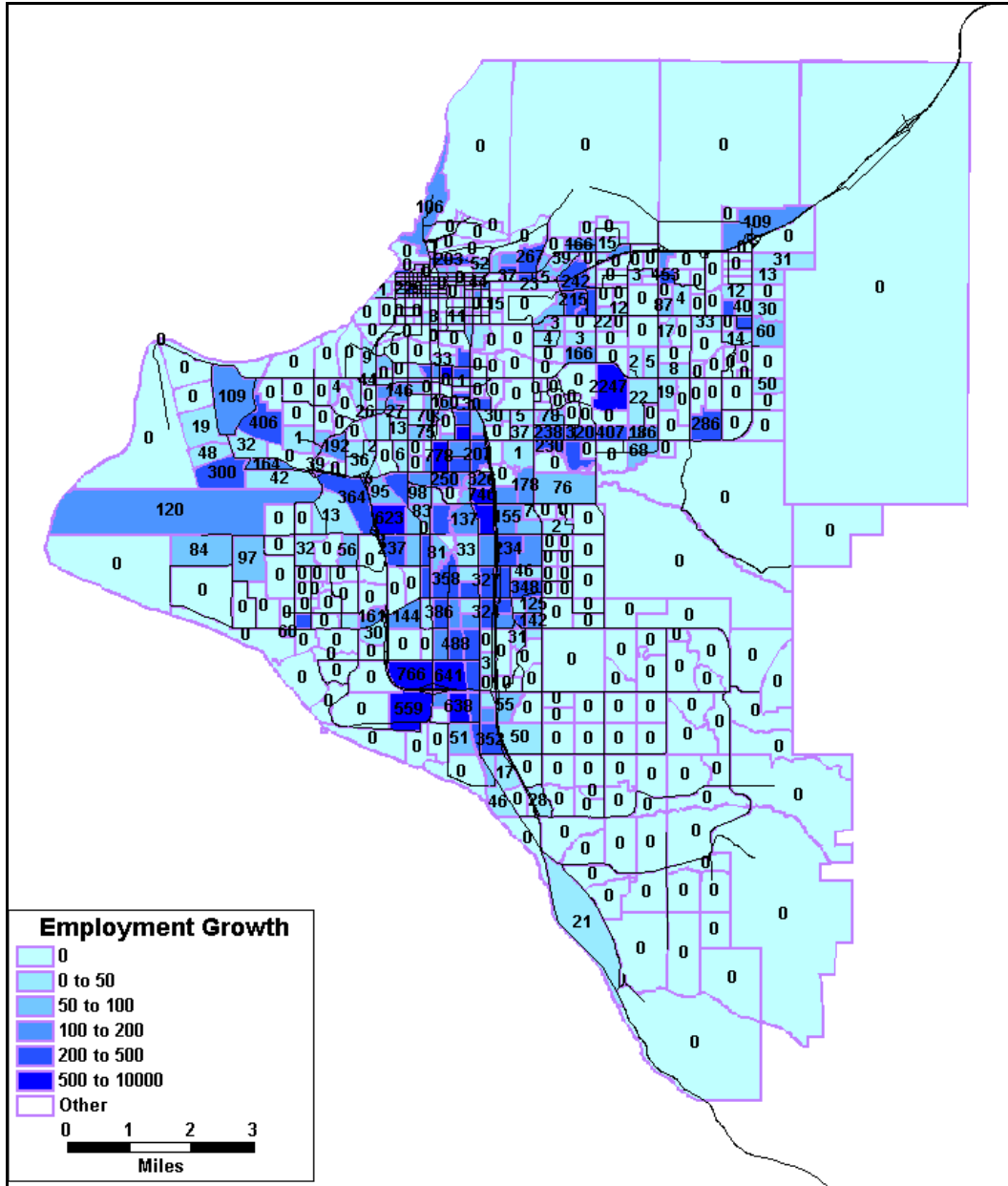
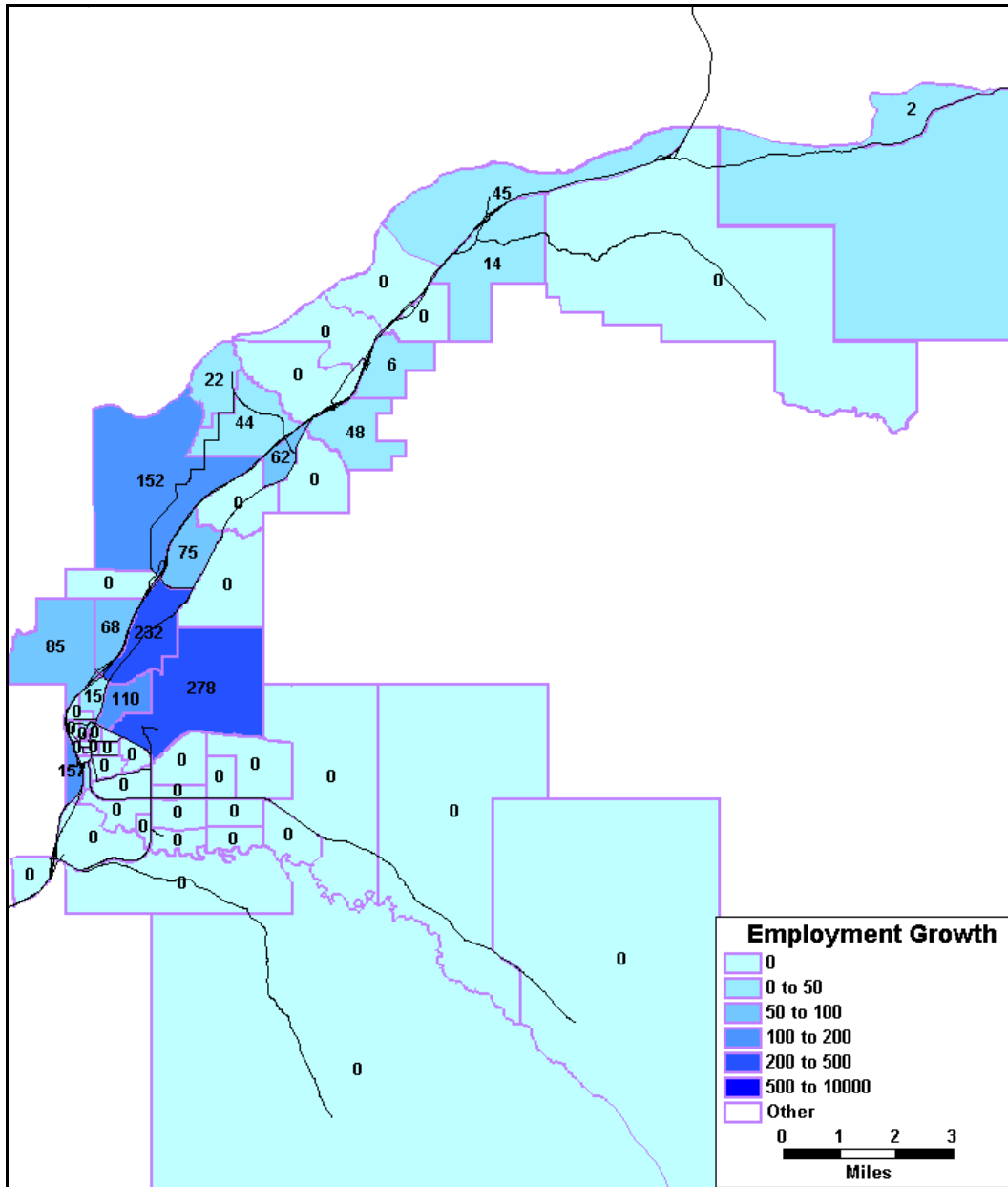
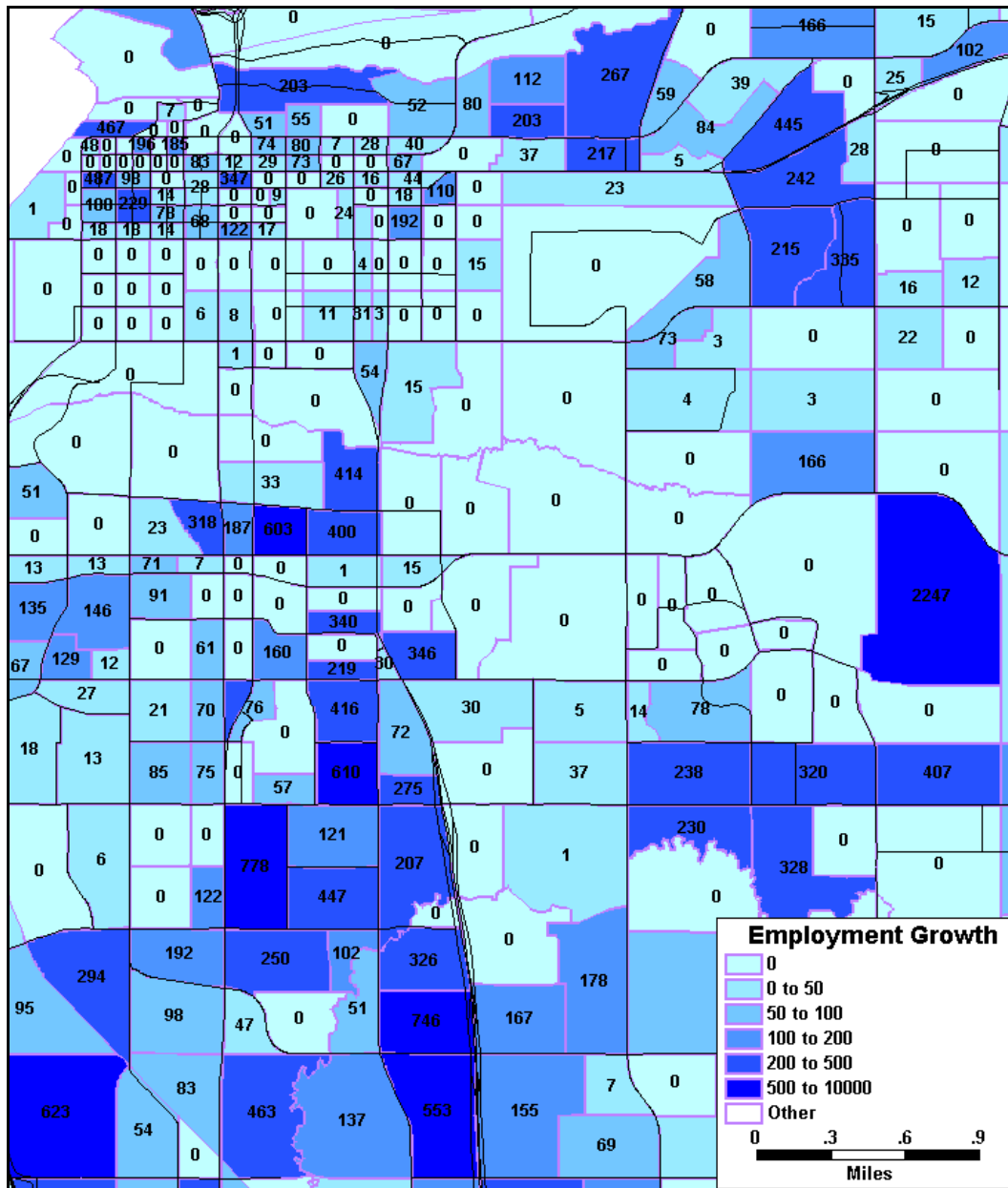


FIGURE 9: CHUGIAK-EAGLE RIVER EMPLOYMENT GROWTH(2013 – 2040)





SCHOOL ENROLLMENT

School enrollment by TAZ is an integral part of the AMATS TDM school submodel. Both private schools and public schools are included in the submodel. The 2013 base year school enrollment was based on

September 30, 2013 data provided by the Anchorage School District. Private school enrollment also reflects the 2013/2014 school year.

Updates to the school enrollment figures for future years (including 2040) were based on the Alaska Department of Labor and Workforce Development “2012 – 2042 Alaska Population Projections” projections of school age population. According to this report, the school age population is set to increase in the MOA by 17.4 percent between 2013 and 2040 (see 2040school age projections.xls). This growth estimate was multiplied by the 2013 base year school enrollment to arrive at an estimated student enrollment growth of 8,303.

The next step in allocating school enrollment involved allocating the additional 8,303 students to AMATS TAZs to determine where additional schools might be built in the future. Three new school sites were identified based on information provided by the Anchorage School District and the MOA Planning Department. These schools include:

- Powder Reserve Elementary School – 550 projected enrollment
- Goldenvue Drive Elementary School – 450 projected enrollment
- Sand Lake Elementary and Junior High Schools – 1,400 projected enrollment

The remaining school enrollment increase of 5,903 was then allocated to the TAZs that contain existing schools. Since the population growth rate is significantly higher in CER than it is in the Anchorage Bowl (50 percent versus 16 percent respectively), this was done separately for the Anchorage Bowl and CER. The additional increase in school enrollment was then distributed to each existing school in the Anchorage Bowl based on the existing schools enrollment as a percent of the total. In CER, however, schools vary substantially in terms of how far below or above capacity that they are. As a result, a maximum capacity was then established for each school based on information supplied by the Anchorage School District in order to ensure that school enrollment was not over or under allocated. This assumption makes sense in as far as school boundaries are not fixed and can be adjusted in order to distribute school enrollment evenly among all schools to avoid excess overcapacity (see 2040sedata_seenrolladj.xls).

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Municipality of Anchorage Planning Department, “Chugiak-Eagle River Comprehensive Plan Update”, 2006.

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McDowell Group, “Technical Memorandum #6, AMATS Travel Model Update: Socioeconomic Projections”, prepared for Anchorage Metropolitan Transportation Solutions, 2015.

Alaska Department of Labor and Workforce Development, “2012 – 2042 Alaska Population Projections”, April 2014.

Alaska Department of Labor and Workforce Development, “Alaska Industry Forecast 2012 to 2022”, Alaska Economic Trends, October 2014.

APPENDIX A

FIGURE A-1: MUNICIPALITY OF ANCHORAGE 2010 CENSUS TRACTS

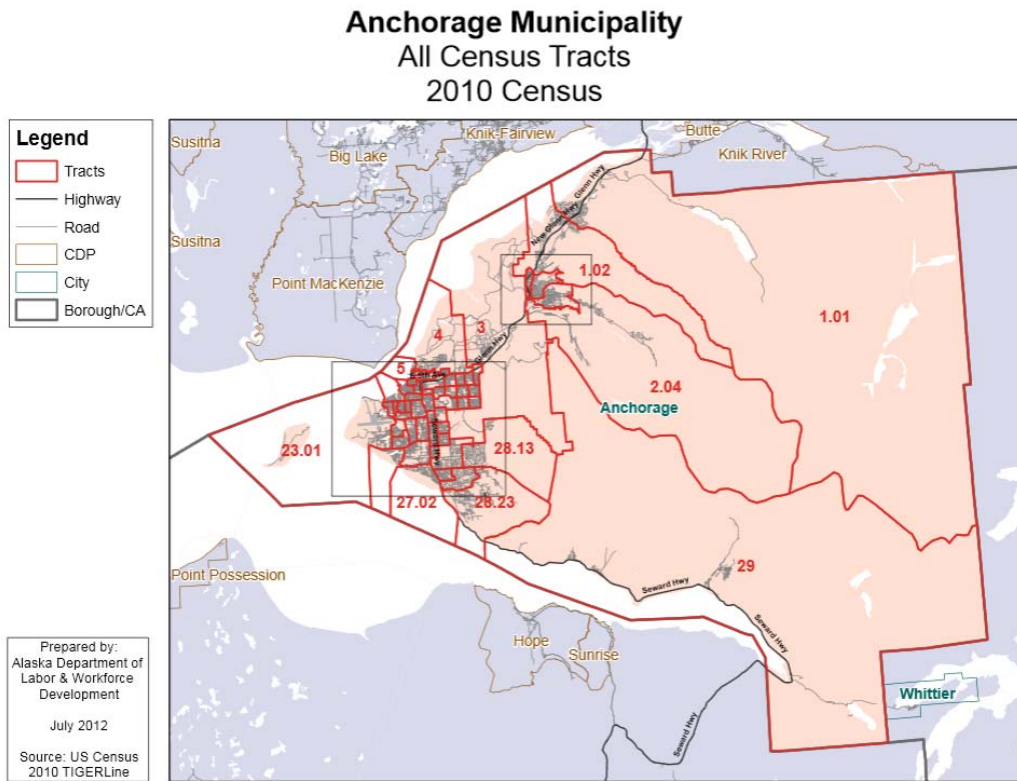


FIGURE A-2: MAT-SU 2010 CENSUS TRACTS

