NORTH FRONT RANGE LAND USE ALLOCATION MODEL

Technical Documentation

prepared for

the North Front Range MPO

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1.0 INTRODUCTION

The population of the North Font Range (including the expanded modeling area) is expected to nearly double from 488,000 residents to 896,000 by the year 2040. To better understand the impacts of this growth and to aid in planning for the future, the North Front Range Metropolitan Organization (NFRMPO) maintains a land use allocation model to generate land use and socioeconomic data forecasts. This land use model forecasts the location and timing of development and the resulting employment and household growth. Socioeconomic data resulting from the land use model serves as an input to the NFR Regional Travel Demand Model, which provides travel forecasts including roadway volumes and transit ridership.

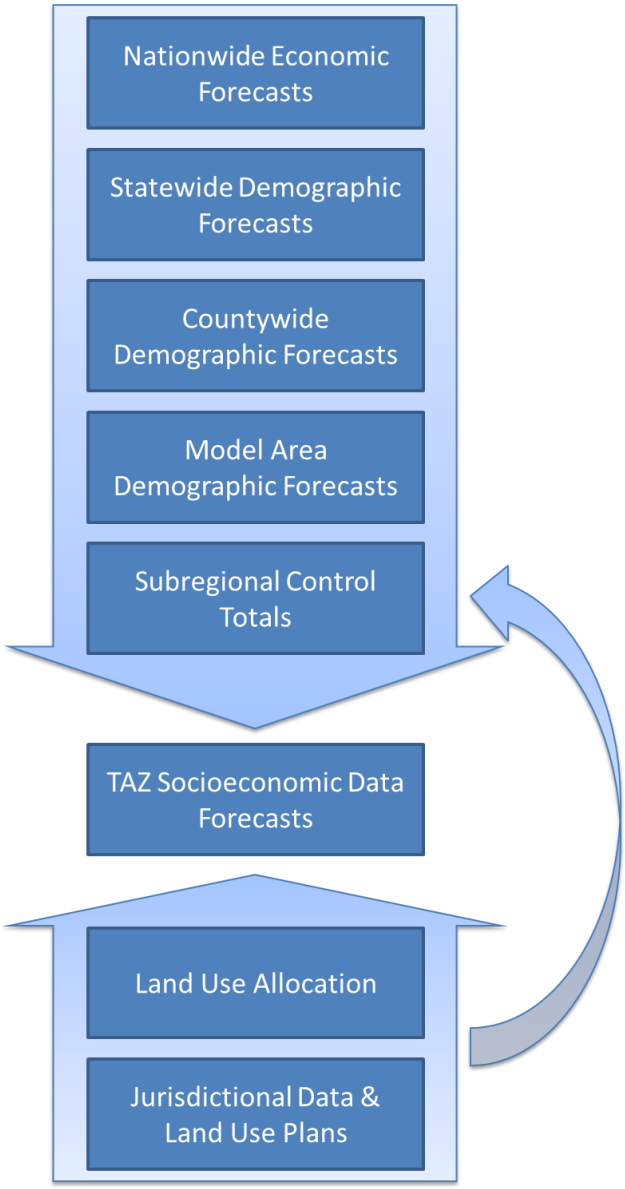
A group of representatives from local jurisdictions contributed to land use model development and reviewed land use model inputs and results. This group became the Model Development Team (MDT), which oversaw development of the land use model, 2040 forecasts, and the travel model. The MDT was comprised of transportation and land use planners from jurisdictions covered by the model boundary.

1.1 Demographic and Socioeconomic Forecasting Framework

The land use model fits into a lager forecasting process starting at the national level. National growth forecasts inform statewide and county level forecasts produced by the Colorado State Demographer. County level forecasts have been adapted to produce growth forecasts for the NFRMPO and expanded modeling area, which covers portions of Larimer and Weld Counties. Regional forecasts are broken out by subregion from state forecasts through a demographic modeling process that considers regional and local land use trends. The resulting subregional forecasts serve as control totals maintained by the land use model.

The land use model incorporates municipal and county land use and comprehensive plans, zoning, assessor's data, and numerous other GIS datasets. These plans and datasets provide information at the local level and facilitate allocation of forecast growth to individual parcels. Growth is allocated at the parcel scale and is aggregated to subregion scale. Total growth is constrained by subregional control totals to be consistent with county and state forecasts. The relationship between the different datasets and processes is shown in **Figure 1.1**.

Figure 1.1: Demographic and Socioeconomic Forecasting Framework



1.2 Forecasting Geography

Land use and socioeconomic forecasting have been performed at several different scales. These scales include the modeling area, subregions, traffic analysis zones (TAZs), census tracts, census blocks, and parcels. Furthermore, there are different jurisdictional boundaries such as growth management areas, city limits, and counties all helping to determine potential growth within the modeling area.

Control totals are first defined for the modeling region, which includes the NFRMPO as well as an extended area. The extended area is included to facilitate ozone conformity analysis for the non-

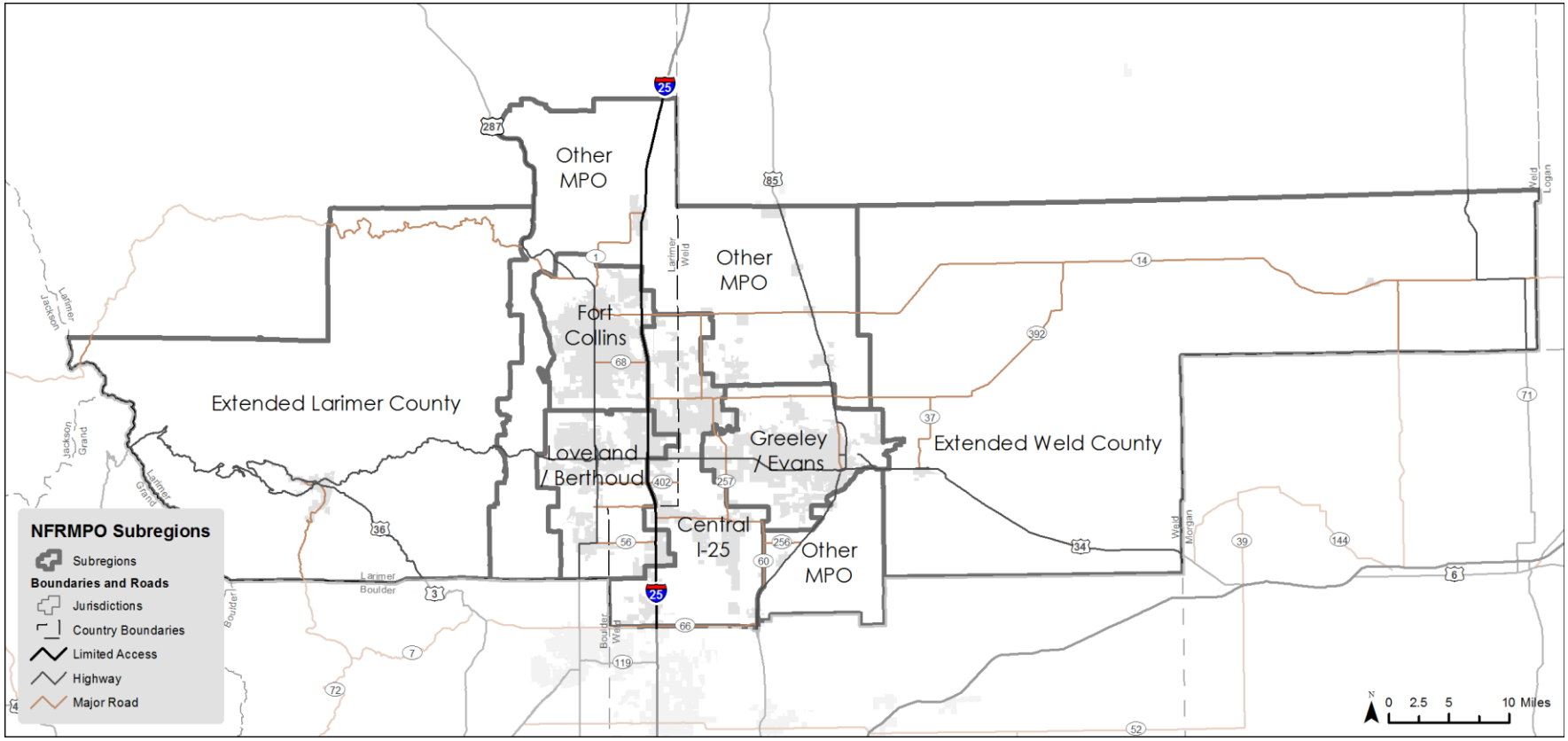
attainment area extending beyond the MPO boundary. The modeling area has seven subregions which represent distinct communities or growth areas within the region. The land use model allows different parameters for each subregion, allowing for more accurate control totals. The modeling area, MPO boundary, and subregions are shown in **Figure 1.2**.

Land use model results are typically reviewed and analyzed by Transportation Analysis Zones (TAZ). TAZs are small areas defined for use in travel modeling. They are typically bordered by roadways or geographic features that limit direct travel between TAZs. They are often, but not always, made up of homogenous activity (i.e., all residential activity, all commercial activity, etc.). There are 1,032 traffic analysis zones in the modeling area.

Existing household and population information was obtained at Census tract and block level. These geographies, defined by the US Census Bureau, represent the level at which Census and American Community Survey (ACS) data are available. Basic data such as total households and population were available at the Census block level, with more detailed information such as income, commute patterns, and worker status available at the tract level.

Land use modeling was performed using parcel data obtained from Larimer and Weld Counties. Parcels larger than five acres in size were subdivided using a five acre grid. The resulting polygons form the foundation for the land use modeling process. Throughout this document, the term "parcel" is used to refer to the parcel layer broken up by the five acre grid. The modeling area contains over 500,000 developable parcels.

Figure 1.2: Modeling Area and Subregion Boundaries



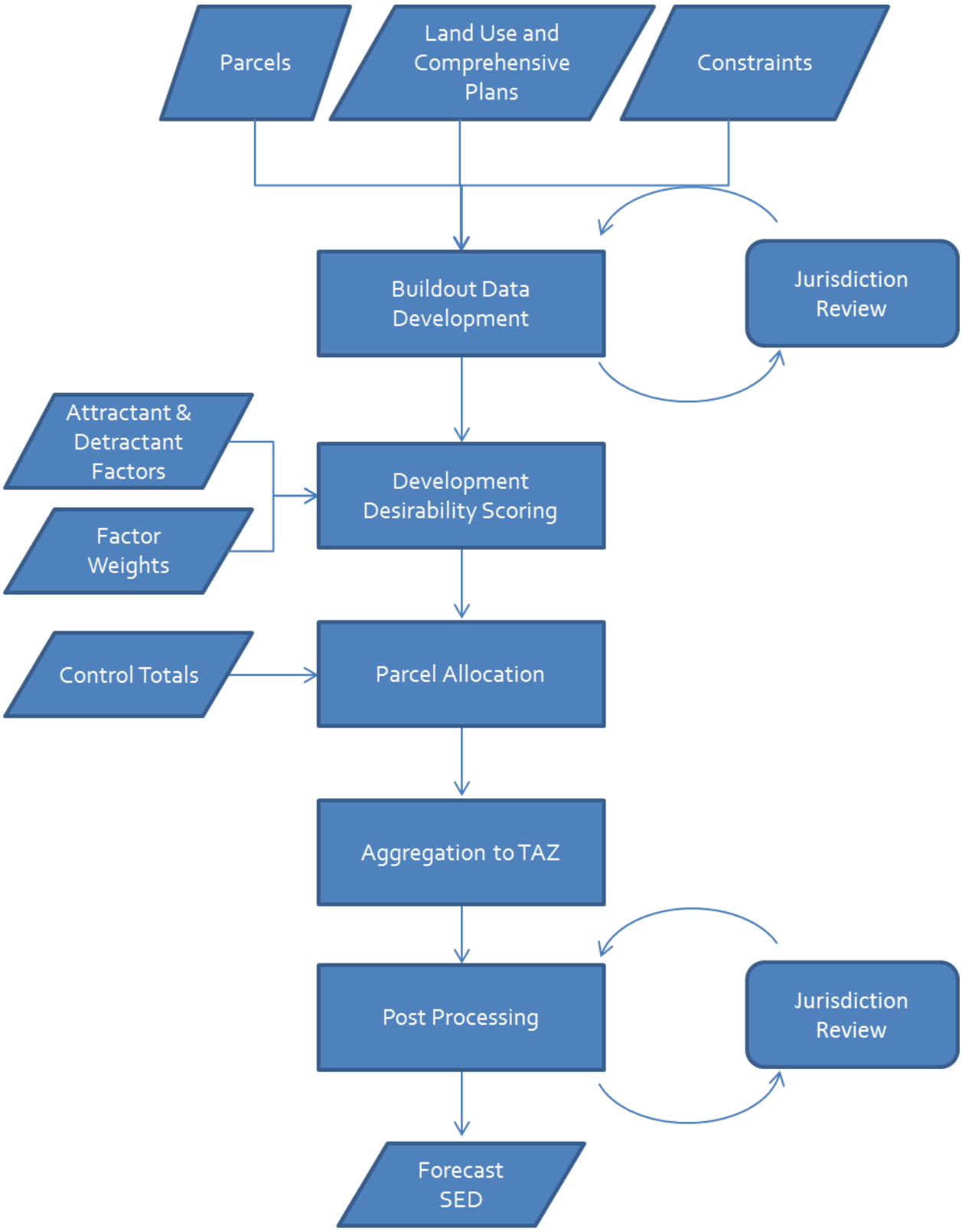
1.3 Allocation Process Overview

The land use allocation process, shown in **Figure 1.3**, illustrates the use of various data to determine the order parcels will develop over time. Parcels already developed or that lie in an area that cannot be developed are marked as undevelopable, with remaining parcels marked as developable. In addition, some areas are identified for redevelopment or infill, allowing additional development to occur in areas already developed. Land use information associated with each parcel is converted to a number of households and/or employees, which can be summed to compute a maximum or buildout number of households and employees for each subregion as a whole. Buildout household and employment numbers were reviewed by local jurisdictions refining the maximum number of households and employees available for each parcel.

The model computes development desirability scores for each developable parcel using a set of attractant and detractant factors defined through coordination with local jurisdictions. In separate processes, household and employment growth is allocated to parcels with the highest desirability. The allocation process stops when the total number of allocated households or employees meet the previously defined control total for each subregion. Results are aggregated to the TAZ and reviewed by local jurisdictions. Comments made regarding household and employment totals are accommodated through post processing of the land use model results.

The resulting household and employee totals form the foundation of the socioeconomic data (SED) and serve as the end result of the forecasting process. In addition to employment and household totals, SED includes information about employment type, household size, number of resident workers, and household income. This more detailed information is developed using a combination of the GIS data present in the land use model and a post processing procedure ensuring consistency with subregional control totals.

Figure 1.3: Land Use Allocation Process



2.0 HOUSEHOLD AND EMPLOYMENT CONTROL TOTALS

In 2012, the NFRMPO conducted an economic and demographic study[1] resulting in a set of control totals for future year household and employment growth. This study, adopted by the NFRMPO Council in 2013, contains 2040 control totals for regional and subregional household and employment growth. These control totals form the foundation for development of SED estimates at the TAZ level.

Employment control totals are broken down into four categories: retail, service, basic, and medical. These categories are useful in travel modeling, as each type of employment has been shown to generate different types of travel. The four categories are defined by the National Industrial Classification System (NAICS) codes, shown in **Table 2.1**.

While reviewing base year employment data obtained from the Quarterly Census of Employment and Wages (QCEW), the employment type definitions from the demographic forecast report were slightly different than those required for travel modeling. This required adjustment of the control totals to support the regional travel model. The resulting control totals still maintain overall subregional totals included in the demographic forecast report, but adjust the individual control totals by employment type. The resulting 2040 employment control totals are shown in **Table 2.2.**

The demographic forecast report also includes forecast control totals in five year increments, from 2015 to 2035. Adjusted interim year forecasts are shown in **Table 2.2** through **Table 2.7**. These control totals are used to allocate interim year TAZ-level SED forecasts.

[1] Steve Fisher, Phyllis Resnick. 2040 Economic and Demographic Forecast, North Front Range Metropolitan Planning Organization. 2012-2013.

Table 2.1: Employment Type Definitions

Employment Type	Description	NAICS Codes
Retail	Retail stores, food service establishments, and the US postal service	44, 45, 491, 722
Service	Employment providing a service, including finance, insurance information, real estate, professional and scientific services, management, educational services, arts and entertainment, accommodations, and public administration.	51-61, 65-71, 721, 81, 92
Basic	Production and distribution employment including manufacturing, wholesale trade, mining, agriculture, utilities, and transportation.	11-42, 48, 492, 493,
Medical	Health care and social assistance	62

Table 2.2: Adjusted 2040 Socioeconomic Control Totals

Subregion		Households	Employment	Retail Employment	Service Employment	Basic Employment	Medical Employment
1	Other MPO	35,728	20,007	2,081	10,147	7,058	721
2	Greeley / Evans	86,680	115,060	14,330	61,075	19,223	20,433
3	Fort Collins	99,959	146,458	24,507	84,560	17,219	20,172
4	Loveland / Berthoud	59,451	78,269	12,854	41,658	12,544	11,214
5	Extended Larimer	15,703	9,571	1,780	5,968	627	1,197
6	Extended Weld	5,795	3,859	178	1,191	2,420	71
7	Central I-25	47,861	55,375	5,360	33,386	13,206	3,422
Regional Total		**351,177**	**428,599**	**61,089**	**237,984**	**72,296**	**57,230**

Table 2.3: Adjusted 2015 Interim Year Socioeconomic Control Totals

Subregion		Households	Employment	Retail Employment	Service Employment	Basic Employment	Medical Employment
1	Other MPO	21,243	12,608	1,317	6,276	4,640	375
2	Greeley / Evans	48,503	74,862	9,686	40,334	13,490	11,352
3	Fort Collins	70,857	105,794	18,312	61,733	13,359	12,391
4	Loveland / Berthoud	35,170	51,129	8,670	27,456	8,786	6,218
5	Extended Larimer	8,521	6,178	1,190	3,896	435	658
6	Extended Weld	3,330	2,487	113	740	1,597	37
7	Central I-25	20,328	27,146	2,669	16,247	6,829	1,401
Regional Total		**207,952**	**280,204**	**41,957**	**156,681**	**49,135**	**32,431**

Table 2.4: Adjusted 2020 Interim Year Socioeconomic Control Totals

Subregion		Households	Employment	Retail Employment	Service Employment	Basic Employment	Medical Employment
1	Other MPO	25,376	14,210	1,472	7,134	5,156	449
2	Greeley / Evans	54,667	84,111	10,677	45,242	14,793	13,399
3	Fort Collins	76,481	116,103	19,744	67,728	14,328	14,304
4	Loveland / Berthoud	39,639	57,448	9,578	30,861	9,655	7,354
5	Extended Larimer	10,179	6,942	1,312	4,376	477	777
6	Extended Weld	3,754	2,794	126	844	1,779	44
7	Central I-25	24,283	33,220	3,226	19,974	8,208	1,812
Regional Total		**234,379**	**314,828**	**46,135**	**176,158**	**54,396**	**38,138**

Table 2.5: Adjusted 2025 Interim Year Socioeconomic Control Totals

Subregion		Households	Employment	Retail Employment	Service Employment	Basic Employment	Medical Employment
1	Other MPO	27,212	15,239	1,576	7,699	5,458	505
2	Greeley / Evans	63,882	91,956	11,551	49,335	15,821	15,249
3	Fort Collins	79,824	121,179	20,410	70,573	14,642	15,555
4	Loveland / Berthoud	44,892	63,732	10,531	34,202	10,493	8,506
5	Extended Larimer	11,319	7,418	1,389	4,665	499	865
6	Extended Weld	4,177	2,989	136	914	1,890	50
7	Central I-25	33,114	40,305	3,895	24,311	9,797	2,302
Regional Total		**264,420**	**342,818**	**49,486**	**191,698**	**58,601**	**43,033**

Table 2.6: Adjusted 2030 Interim Year Socioeconomic Control Totals

Subregion		Households	Employment	Retail Employment	Service Employment	Basic Employment	Medical Employment
1	Other MPO	30,245	16,937	1,761	8,556	6,043	578
2	Greeley / Evans	71,002	98,991	12,446	52,854	16,888	16,803
3	Fort Collins	88,721	129,915	21,915	75,345	15,575	17,080
4	Loveland / Berthoud	49,896	68,607	11,353	36,667	11,209	9,378
5	Extended Larimer	12,581	7,987	1,498	5,002	533	954
6	Extended Weld	4,643	3,217	147	985	2,030	56
7	Central I-25	36,804	43,387	4,211	26,135	10,495	2,545
Regional Total		**293,892**	**369,041**	**53,331**	**205,544**	**62,773**	**47,393**

Table 2.7: Adjusted 2035 Interim Year Socioeconomic Control Totals

Subregion		Households	Employment	Retail Employment	Service Employment	Basic Employment	Medical Employment
1	Other MPO	32,865	18,403	1,924	9,286	6,556	637
2	Greeley / Evans	79,733	107,113	13,506	56,992	18,206	18,410
3	Fort Collins	91,948	136,564	23,110	78,952	16,317	18,185
4	Loveland / Berthoud	54,687	72,862	12,096	38,815	11,863	10,088
5	Extended Larimer	14,444	8,912	1,676	5,565	593	1,078
6	Extended Weld	5,331	3,593	165	1,099	2,266	63
7	Central I-25	44,025	51,549	5,028	31,005	12,448	3,069
Regional Total		**323,033**	**398,996**	**57,504**	**221,713**	**68,249**	**51,530**

3.0 BASE YEAR SOCIOECONOMIC DATA

The base year SED represents existing conditions in 2012. This dataset includes information at TAZ level and is consistent with the control totals discussed in Chapter 2. Base year SED serves as input to the base year travel model and as a baseline to which future growth is added. Sources used to create the base year dataset include 2010 US Census data, 2008-2012 ACS estimates, building permits, parcel data, and QCEW data.

3.1 Base Year Household Data

Base year household data by TAZ was developed using 2010 Census data, ACS data, and building permits. NFRMPO staff developed base year household totals beginning with 2010 Census block data. Block data was adjusted to account for two years of growth between 2010 and 2012 using building permit data obtained from Larimer and Weld Counties. The building permit data provided information about the location of new housing development since 2010. Accompanying occupancy and mailing address information helped identify households built and occupied, as issuance of a permit does not necessarily indicate completion of construction. Resulting totals were aggregated to Census tract and adjustment factors were applied to match totals obtained from the 2008-2012 five year ACS household estimates.

Adjusted Census block data representing 2012 conditions was allocated to TAZs using a series of GIS procedures. First, all parcels containing at least one dwelling unit were converted to centroid points, the point indicating the location of the dwelling unit. MPO staff performed a visual review of large parcels and parcels near TAZ boundaries, moving centroid points to better reflect actual dwelling unit locations. After dwelling unit locations had been identified, each record was assigned a scaling factor based on the Census block containing the dwelling unit. These scaling factors were defined so the sum of all scaled dwelling units in each Census block was equal to the number of adjusted 2012 households in the Census block. Finally, each dwelling unit record was assigned to a TAZ and totals were aggregated to TAZ level.

Household Size

To support the travel model, it was necessary to obtain average household size in each TAZ, as well as distribution of households by size (i.e., 1, 2, 3, 4, and 5+ person households). For this exercise, population was based on the "Population in Households" variable provided in the 2010 Census. This variable excludes population in group quarters (dorms, nursing homes, etc.), which should not be considered when analyzing household size. Household size information was obtained from the 2010 Census rather than the more recent ACS estimates because Census data was available at block level, while ACS estimates were only available by tract level.

Average household size was computed by multiplying scaled dwelling unit records by average household size obtained from the 2010 Census. Resulting population values were aggregated to the TAZ level. Average household size was computed at the TAZ level as the total population divided by the total number of households in each TAZ.

Household size distributions from the 2010 Census were applied to 2012 household estimates at the Census block level, resulting in the number of households in each size group. Resulting households by size group were then aggregated to TAZ level using the same procedure for total households. The resulting distributions of households by size are consistent with 2012 household and population totals, but based on 2010 distributions of households by size. Household size distributions were required to develop household disaggregation models described in the travel model documentation, but are not required in forecast year datasets.

Resident Workers

Travel model development also required the average number of resident workers per household at the TAZ level, along with a distribution of households by number of workers (0, 1, 2, and 3+). Total workers and distribution of households by number of workers were obtained from the 2008-2012 5-year ACS estimates at the Census tract level, since this information was not available at the block or block group level. Total number of workers, as well as, households by worker group were applied to Census blocks and aggregated to TAZs using a process similar to those described for households and population.

Median Income

As with resident worker information, household income data is only available at the Census tract level. To support travel model development, median income and share of households by income group were obtained from the 2008-2012 5-year ACS estimates. In most cases, individual TAZs fell entirely within a single Census tract, making identification of median income straightforward. In cases where TAZs span multiple tracts, TAZ median income was calculated as a weighted average of the median income from relevant tracts.

Distributions of households into income groups are listed in **Table 3.1.** This was conducted using a process similar to that used to determine household size and worker distributions.

Table 3.1: Income Group Definitions

Income Group	Income Range
Low	$19,999 and lower
Medium	$20,000 - $74,999
High	$75,000 and higher

3.2 Base Year Employment

Base year employment data was obtained from QCEW for the second quarter of 2012. The QCEW dataset, provided by the Colorado Department of Labor, contains individual records with business location (i.e., latitude and longitude) and number of employees at each site. Because QCEW data was not designed for use in detailed identification of employment activity, NFRMPO staff performed an extensive review of employment data. Employment data cleanup activities included:

- Identification of central office records to represent employment at multiple locations throughout the region (e.g., school district head offices);
- Identification of records located at city center or zip code rather than an actual address; and
- Review of major employers to ensure records were placed in the appropriate zone rather than an adjacent zone.

After completing this review, each record was assigned an employment type based on the NAICS code list in **Table 2.1.** Records were aggregated to TAZs for use in further modeling and analysis.

The total employment represented by QCEW data is considerably lower than the total employment identified in the demographic forecast report. The demographic forecast report includes contract workers and sole proprietors in the overall employment count, while QCEW data does not. According to the demographic forecast report, contract workers and sole proprietors represent approximately 18 percent of employment in the NFR region. Therefore, it was necessary to expand TAZ level employment data for consistency with regional control totals.

The demographic report includes employment estimates for 2010 and 2015, but not for 2012.To expand the TAZ employment data for consistency with control totals, it was necessary to develop 2012 control totals. The 2012 control totals shown in **Table 3.2** were developed using a compound annual growth rate between 2010 and 2015. Employment by TAZ was scaled by

employment type and subarea to match 2012 totals. Resulting 2012 employment data was reviewed by local jurisdictions and confirmed or adjusted at TAZ level.

Table 3.2: Adjusted 2012Base Year Socioeconomic Control Totals

	Subregion	2010 Employment	2015 Employment	2012 Employment
1	Other MPO	11,288	12,608	9,124
2	Greeley / Evans	58,263	74,862	71,050
3	Fort Collins	101,158	105,794	101,729
4	Loveland / Berthoud	40,763	51,129	51,365
5	Extended Larimer	5,397	6,178	5,859
6	Extended Weld	2,173	2,487	2,359
7	Central I-25	18,574	27,146	24,859
Regional Total		**237,616**	**280,440**	**266,345**

Note: The 2012 employment total for the Loveland / Berthoud area was adjusted by local jurisdictions to exceed the 2015 control total by 236 employees. No new growth is allocated to this subarea in the 2015 interim year.

4.0 BUILDOUT DATA DEVELOPMENT

The first step in the land use and socioeconomic forecasting process was development of a buildout socioeconomic dataset. The buildout dataset serves as a maximum number of households and employment that can be allocated to any individual parcel. Buildout represents a combination of all land use plans extracted from comprehensive plans maintained by local jurisdictions within the modeling area and assumes all land uses identified in these plans are built.

The buildout dataset implies a maximum total number of households and employment in the region. However, the combined land use and comprehensive plans allow for considerably more growth than expected by 2040. This means while buildout data can be informative, it must be used with caution. It is possible land use plans will change in the long term, allowing the region to grow beyond current buildout totals. The total number of buildout households and employees are shown in **Table 4.1** along with 2012 and 2040 data for context.

Table 4.1: Base year, 2040, and buildout SED totals

Variable	2012 Total	2040 Total	Buildout Total	2040 % of Buildout
Households	192,786	351,177	627,757	56%
Employment	266,345	428,599	822,731	52%

Note: Buildout totals reflect adjustments made by local jurisdictions.

4.1 Data Collection and Parcel Processing

Development of a buildout dataset required an extensive data gathering effort. It was necessary to obtain planning information from each MPO member jurisdiction, information about the built environment, and information about natural features and other constraints prevent development. NFRMPO and consultant staff coordinated with member jurisdictions to obtain the most current information required to support development of the buildout dataset.

Land Use and Zoning Plans

Member jurisdictions provided future land use plans that reflect general planning concepts and include specific information about master planned developments, redevelopment areas, and protected lands. Land use and comprehensive plans used in buildout data development are listed in **Table 4.2**. As part of the data gathering process, local jurisdictions were asked to identify typical household and employment density for each land use type identified in their plans. During the model review and design process, the NFRMPO determined the buildout dataset should

reflect typical densities based on current conditions rather than maximum allowable densities. Use of maximum allowable densities would overrepresent the amount of growth likely to occur, as not all areas are built to the maximum densities allowable. Resulting densities are shown in **Appendix A**.

Each polygon in the regional parcel layer was assigned a land use type based on relevant land use or comprehensive plan data. Polygons covered by multiple land use types were separated into multiple parts for each land use designation.

Table 4.2: Land use and Comprehensive Plans

Jurisdiction	Document Name / Type	Document Date
Ault	Comprehensive Plan	2013
Berthoud	Comprehensive Plan	2007
Estes Park	Zoning	2012
Evans	Comprehensive Plan	2010
Fort Collins	Comprehensive Plan	2011
Gilcrest	Comprehensive Plan	2007
Greeley	Comprehensive Plan	2011
Larimer	Zoning	2013
Laporte	Area Plan	2004
Loveland	Comprehensive Plan	2007
Mead	Comprehensive Plan	2009
Milliken	Comprehensive Plan	2010
Nunn	Comprehensive Plan	2009
Severance	Comprehensive Plan	2011
Timnath	Comprehensive Plan	2007
Weld	Zoning	2013
Windsor	Comprehensive Plan	2006

Undevelopable Lands

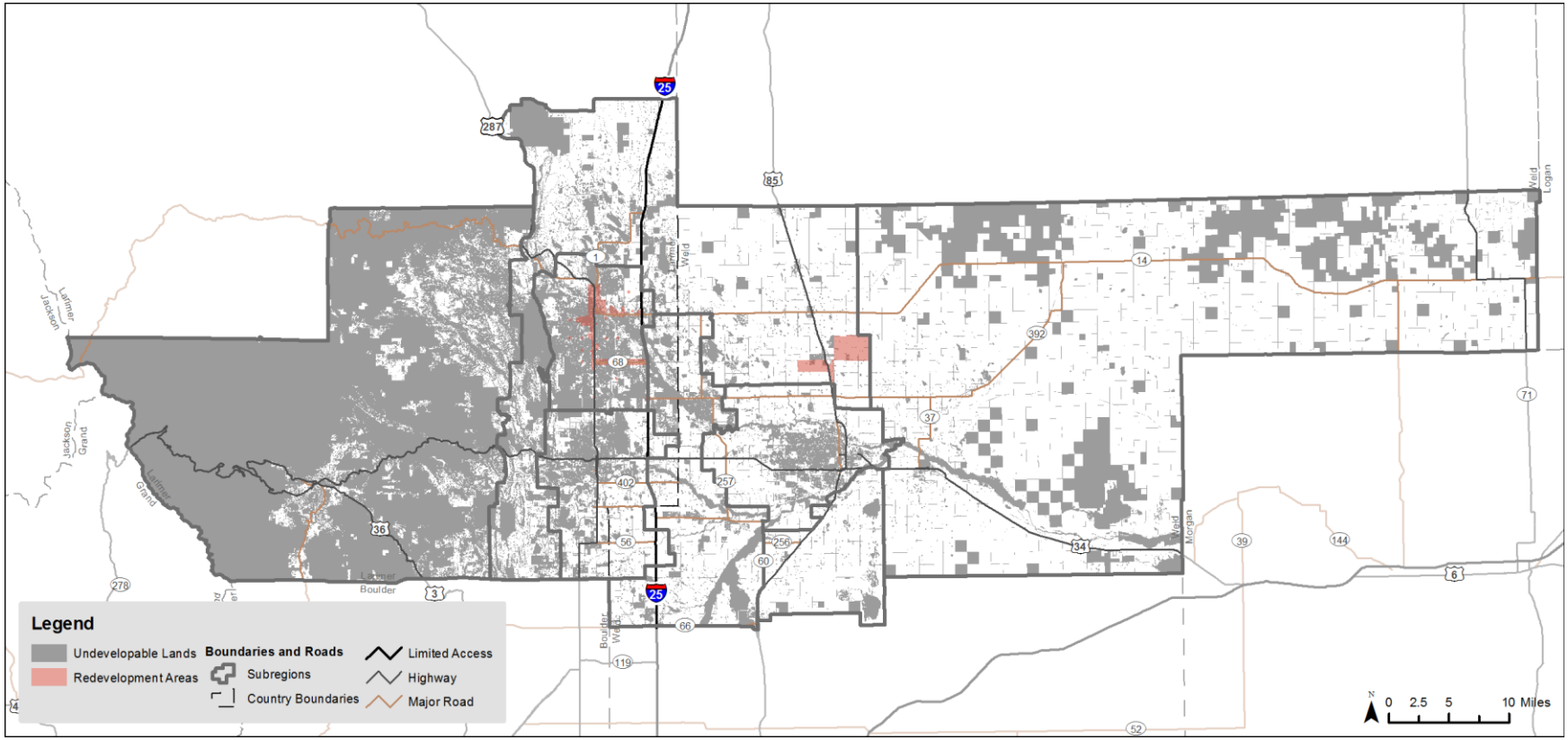
To determine the total possible growth in the region, it was necessary to identify developable and undevelopable areas. Each parcel or parcel part in the land use dataset was identified as either developable or undevelopable based on the following criteria:

1. ***Built Parcels:*** Any parcel containing a structure valued at $10,000 or more was marked as already built and therefore undevelopable. The specified value was selected after review of several randomly selected areas with low-value structures. Parcels with structures valued under the $10,000 threshold tended to contain structures such as sheds which could likely be demolished and replaced. Parcels having a value of $10,000 or more tended to contain what appeared to be viable, longer-term structures, and would not receive significant pressure for redevelopment.
2. ***Parking Lots:*** Parcels containing a parking lot were marked as undevelopable unless otherwise noted by a jurisdiction. Parking lots were identified through a manual review of potentially developable parcels in urbanized areas.
3. ***Other Developed Lands:*** Parcels identified as schools, cemeteries, and parks were marked as developed.
4. ***Open Space and Protected Lands:*** Portions of parcels overlapped by parks, open space, natural areas, or lands protected through other measures such as conservation easements were marked as undevelopable.
5. **Water Bodies:** Portions of parcels covered by bodies of water such as a lakes, ponds, rivers, and streams were marked as undevelopable.
6. ***Floodways:*** Portions of parcels located in floodways were marked as undevelopable. Floodplain restrictions vary by subregion and are discussed in the attractant/detractant factor section.
7. ***Rights of Way:*** Existing transportation and utility right-of-way were marked as undevelopable.

As a result of this process, each polygon in the regional parcel layer has been identified as either developable or undevelopable. In many cases, individual parcels and parcel parts were further split into multiple pieces, with each resulting polygon being marked as developable or undevelopable. For example, a parcel partially within a floodway would be separated into a record as undevelopable and a second record as developable. Resulting developable and undevelopable lands are shown in **Figure 4.1**.

Several areas in the region have been identified as locations where infill or redevelopment is expected to occur. These areas, shown in **Figure 4.1**, were identified by the City of Fort Collins and Town of Eaton. Parcels identified as built due to a structure or a parking lot within redevelopment areas were marked as developable and subject to additional growth beyond the existing use. In addition, other jurisdictions identified specific areas targeted for redevelopment in the TAZ-level review process. These comments were incorporated in post processing rather than marking these zones as redevelopment areas in the land use model.

Figure 4.1: Undevelopable Lands and Redevelopment Areas



4.2 Household and Employment Calculations

Buildout household and employment totals were computed for each buildable parcel. This calculation was a relatively straightforward process, densities documented in **Appendix A** were multiplied by acreage in the parcel layer.

Resulting buildout growth by parcel was aggregated to the TAZ level using a GIS overlay. Resulting growth in each zone was added to the 2012 base year household and employment totals to arrive at total buildout households and employment shown in **Table 4.3**. This table shows the ratio of total jobs to households. For the region as a whole, buildout jobs to household ratios are reasonably consistent over time. However, some subregions' land use plans allow for considerably more household growth than employment growth, or more employment growth than household growth. Use of buildout data for planning or modeling could lead to problematic assumptions about commute travel between subregions. 2040 data is constrained by control totals limiting variation of jobs to housing ratios at the subregional level.

Table 4.3: Total Buildout Households and Employment

	Subregion	2012 Households	2012 Employment	2012 Jobs / HH	Buildout Households	Buildout Employment	Buildout Jobs / HH
1	Other MPO	15,404	9,124	0.59	90,884	96,536	1.06
2	Greeley / Evans	44,793	71050	1.59	153,210	209,807	1.37
3	Fort Collins	68,862	101729	1.48	102,617	171,729	1.67
4	Loveland / Berthoud	35,780	51365	1.44	104,239	161,474	1.55
5	Extended Larimer	6,936	5859	0.84	25,229	9,712	0.38
6	Extended Weld	2,937	2359	0.80	12,601	16,458	1.31
7	Central I-25	18,074	24859	1.38	138,977	157,014	1.13
Regional Total		**192,786**	**266345**	**1.38**	**627,757**	**822,731**	**1.31**

Note: Buildout totals reflect adjustments made by local jurisdictions.

4.3 Consolidated Land Use Categories

For presentation and analysis purposes, land use information provided by local jurisdictions was simplified to 17 consolidated land use categories. Each developable parcel was assigned one simplified land use category, listed in **Table 4.4**, based on original land use categories listed in **Appendix A**. The resulting consolidated regional land use plan is shown in **Figure 4.2**. Detailed maps of subregions within the MPO are shown in **Figure 4.3** through **Figure 4.6**.

Table 4.4: Consolidated Land Use Categories

Category Description	Category ID
Commercial Retail High	RetailHigh
Commercial Retail Low	RetailLow
Industrial High	IndustryHigh
Industrial Low	IndustryLow
Office	OfficeLow
Mixed Use Commercial High	RetailMixedHigh
Mixed Use Commercial Low	RetailMixedLow
Mixed Use Commercial Medium	RetailMixedMed
Mixed Use Planned Unit Development Residential/Commercial Retail	ResRetail
Mixed Use Residential High	ResServiceHigh
Mixed Use Residential Low	ResServiceLow
Mixed Use Residential Medium	ResServiceMed
Agriculture / Residential	IndustryAG
Conservation	n/a
Open Space, Parks	n/a
Water Bodies	n/a
Campus K-12	Service1
Government Employment	Service2
Recreation Sports fields, etc.	Service3
Multi-Family Residential	n/a
Single Family Residential Low	n/a
Single Family Residential Medium	n/a
Single Family Residential Ultra Low	n/a

Note: Category IDs are present for land use categories including employment and used later to reference categories for employment type allocation.

Figure 4.2: Consolidated Land Use Categories – Entire Region

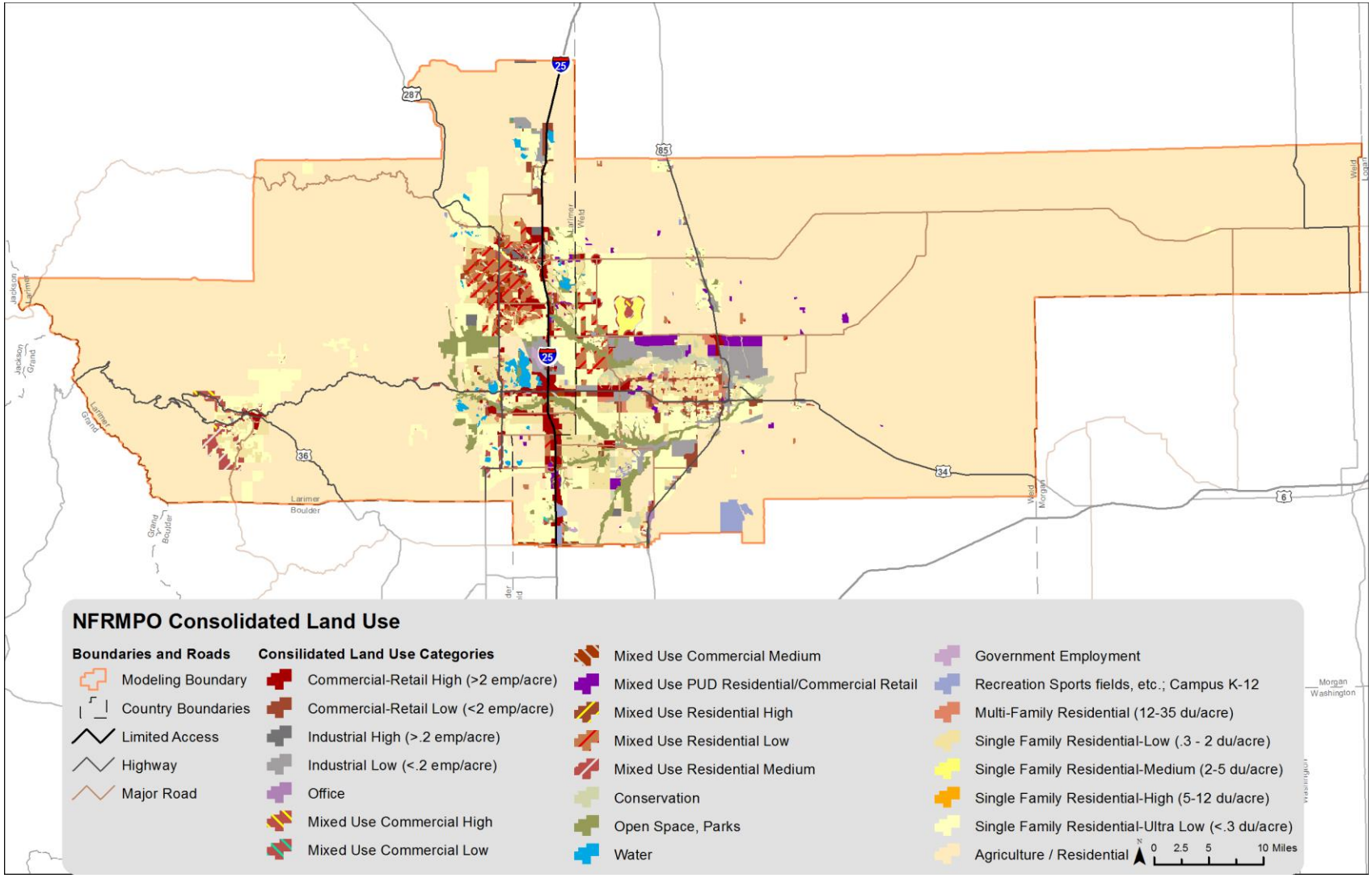


Figure 4.3: Consolidated Land Use Categories – Greeley / Evans Detail

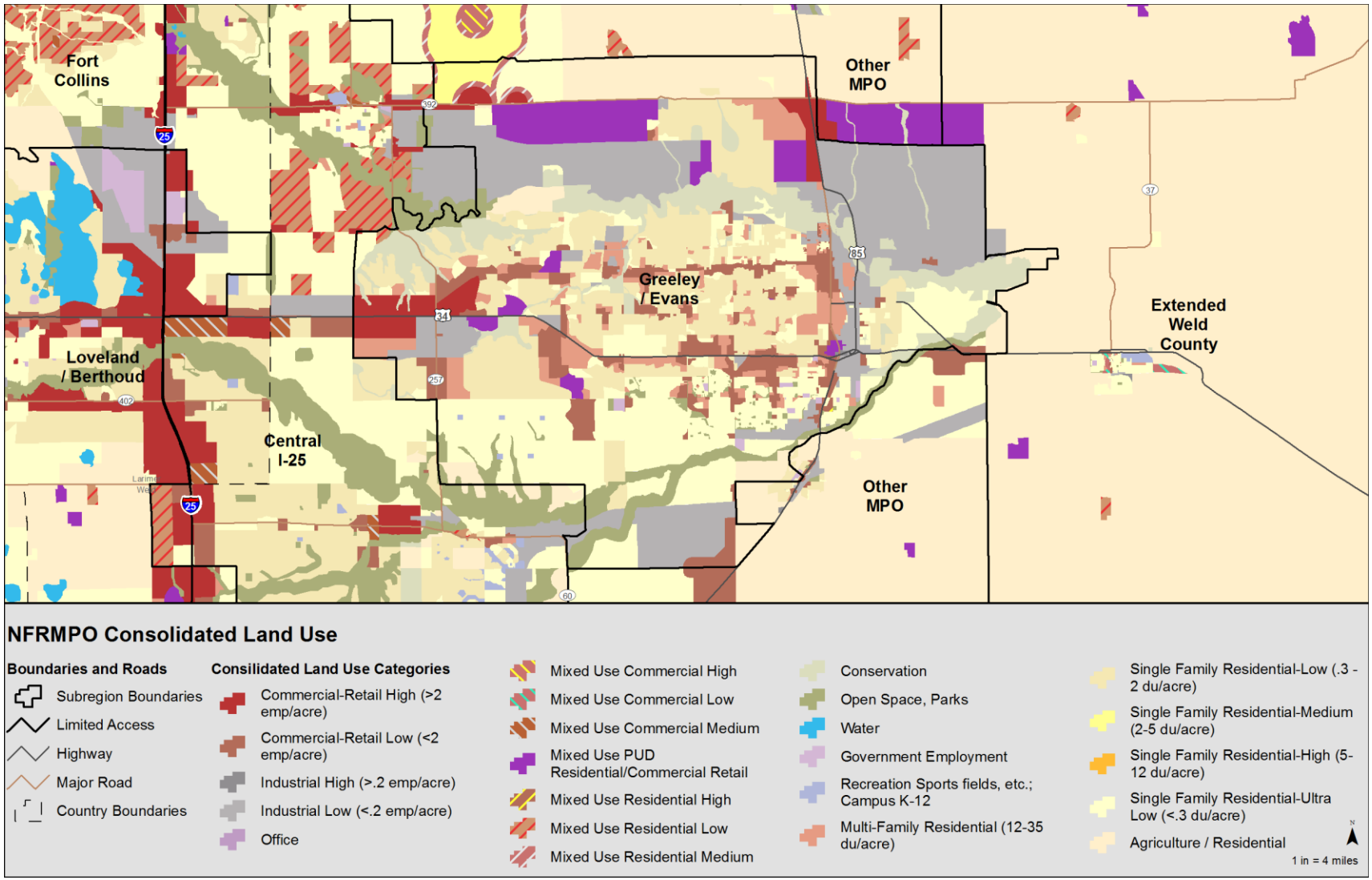


Figure 4.4: Consolidated Land Use Categories – Fort Collins Detail

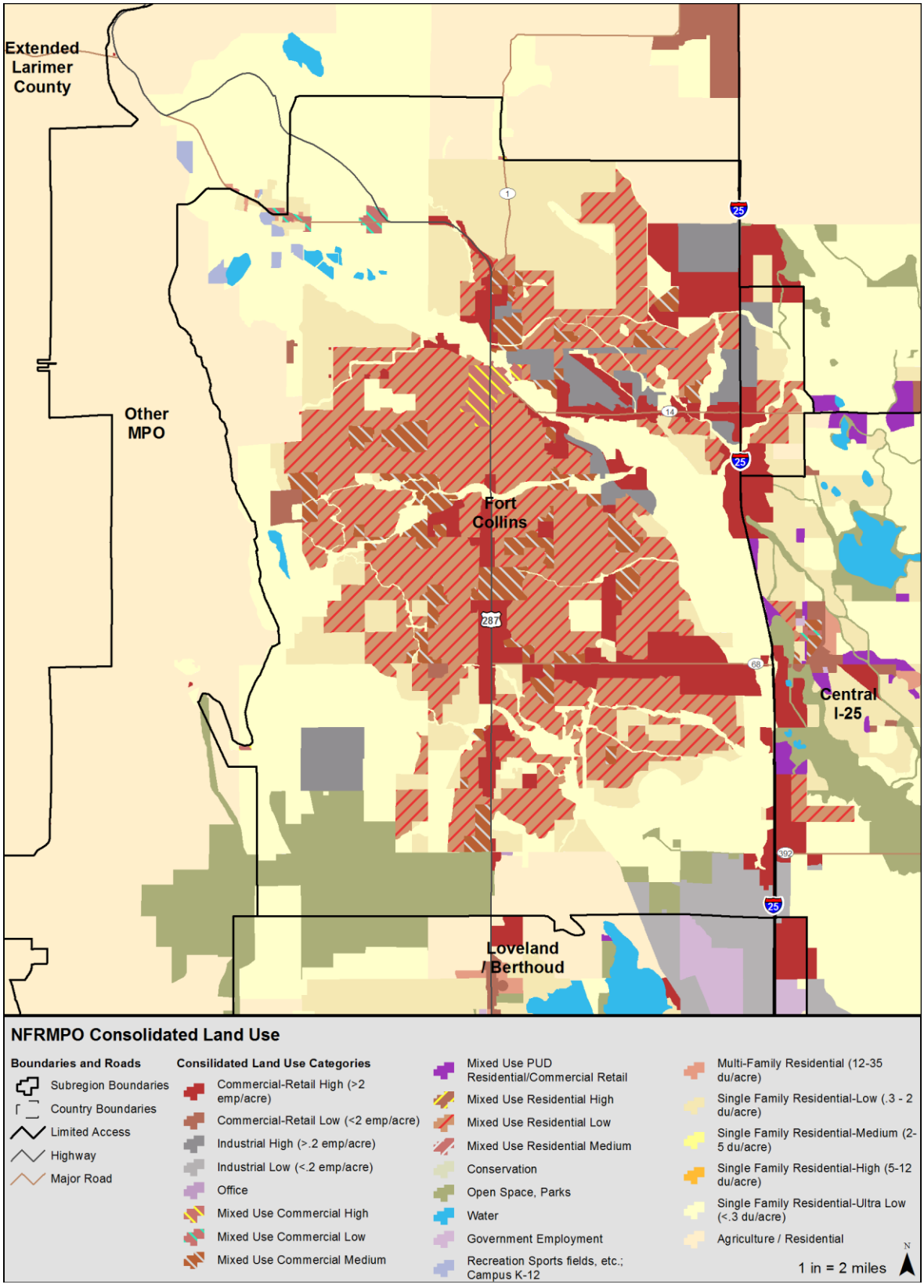


Figure 4.5: Consolidated Land Use Categories – Loveland / Berthoud Detail

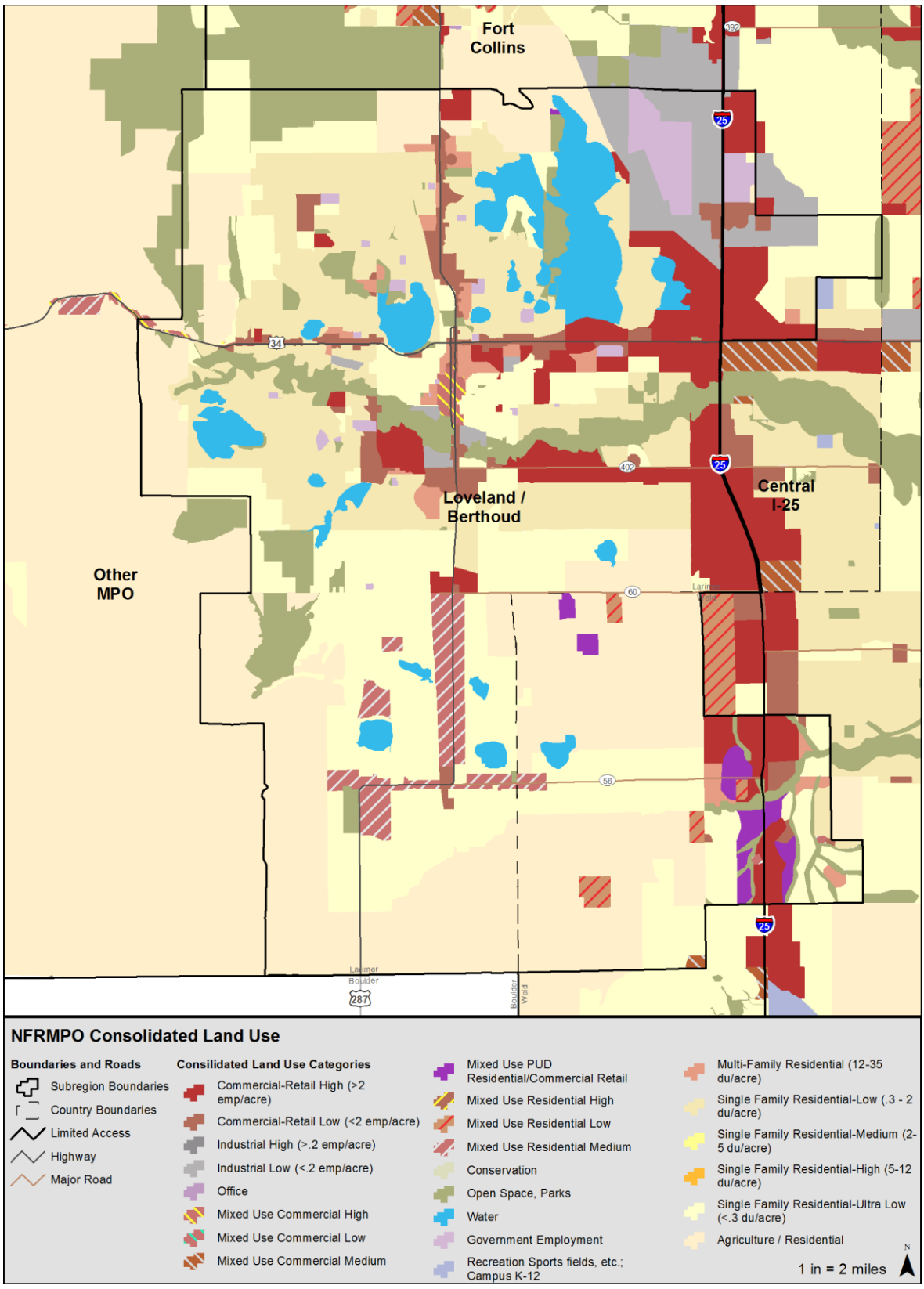
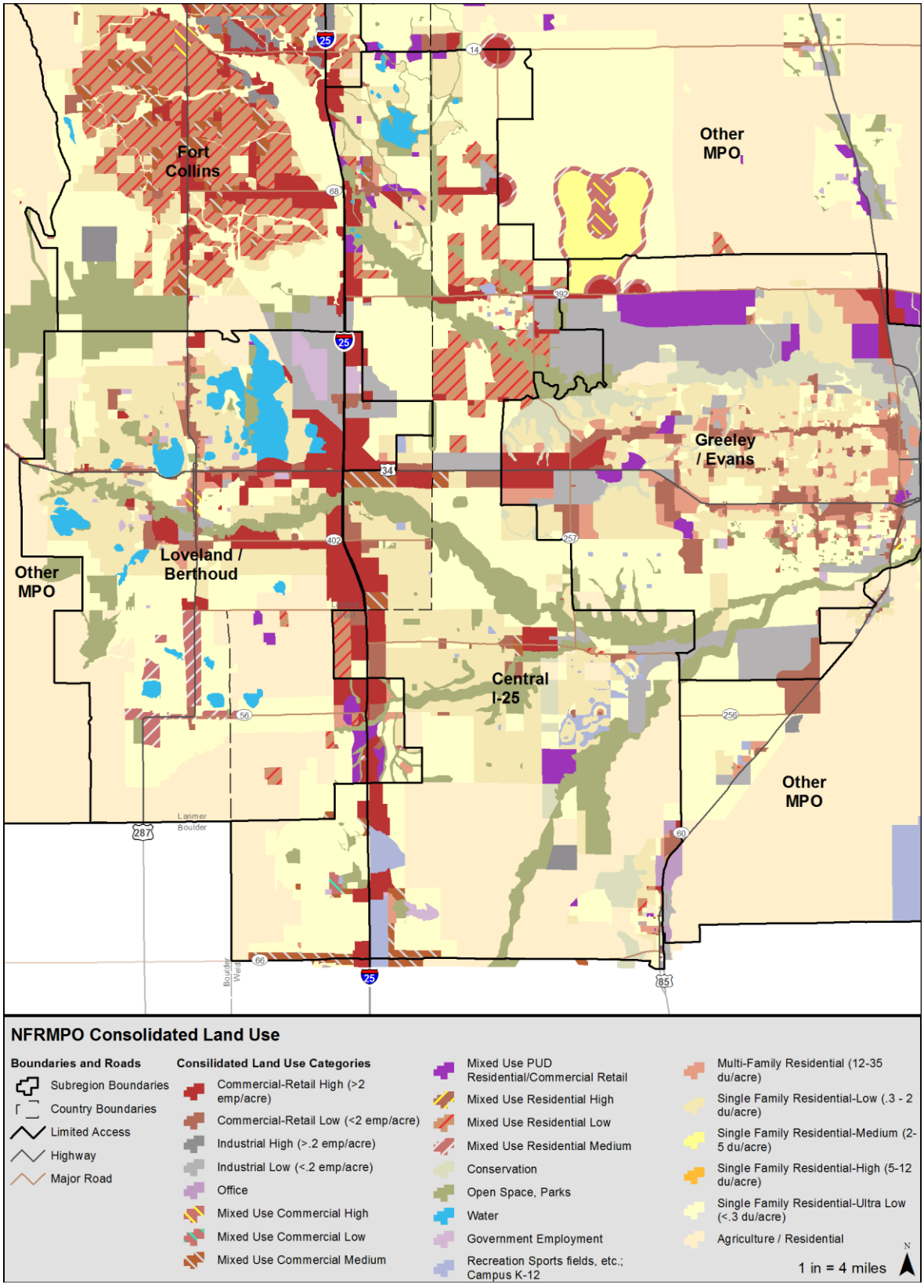


Figure 4.6: Consolidated Land Use Categories – Central I-25 Detail



4.4 Model Development Team Review

The initial buildout dataset at the TAZ level is a product of density values and land use plans provided by each local jurisdiction. These plans and densities produce a generalized picture of buildout development. Transportation and land use planners from local jurisdictions have more detailed knowledge of expected development patterns in specific areas of each city and/or county. Representatives from each jurisdiction were invited to review and comment on initial buildout household and employment data. NFRMPO staff worked to obtain comments and concurrence from all jurisdictions covered by the model boundary.

Once comments on the buildout dataset were received, buildout values at the parcel level were adjusted to reflect the revised numbers. In some cases, comments resulted in adjustments to density assumptions documented in **Appendix A** (values in **Appendix A** reflect these adjustments). In other cases, MDT members requested specific changes to values at the TAZ level. In these cases, all parcels contained in a TAZ were scaled to reflect the revised buildout totals. This was accomplished by adjusting household and employment growth in individual parcels using **Equation (1).**

$$SED_{Adj(parcel)} = SED_{Raw(parcel)} \cdot \frac{SED_{Adj(TAZ)}}{SED_{Raw(TAZ)}} \qquad (1)$$

Where:

$SED_{Adj(parcel)}$ = Adjusted household or employment growth at parcel level

$SED_{Raw(parcel)}$ = Unadjusted household or employment growth at parcel level

$SED_{Adj(TAZ)}$ = Adjusted household or employment growth for the TAZ containing a parcel to be adjusted, based on comments from the MDT

$SED_{Raw(TAZ)}$ = Unadjusted household or employment growth for the TAZ containing a parcel to be adjusted

The revised parcel buildout totals were again aggregated to the TAZ level and shared with member jurisdictions for review.

5.0 LAND USE ALLOCATION

Once base year (2012) and buildout datasets were finalized, forecasts and interim year datasets were generated. These datasets reflect growth likely to occur in a specified timeframe given attractant and detractant factors along with constraints inherent in the buildout dataset and regional and subregional control totals. The land use model uses a gravity based approach assuming growth will not happen uniformly across the region. Instead, the model assumes new household and employment growth will first occur in areas most attractive to development.

5.1 Attractant and Detractant Factors

The land use model makes use of attractant and detractant factors to identify the order in which parcels will develop. These factors reflect attributes describing development desirability for a parcel. The MDT designated each factor as an attractant or detractant and developed factor weights through a keypad polling workshop. The model applies the resulting weights and combines factors to compute a unique score for each parcel.

The list of factors was developed through a review of land use models used by other similarly sized MPOs across the nation. Each MPO used a different approach and different set of attributes to define development desirability. The consultant team reviewed a list of potential attributes, which included factors from the previous NFR Land Use Allocation Model and those listed by other MPOs. This review included elimination or consolidation of redundant factors and addition of new factors not previously used. This list was presented to representatives from member jurisdictions for further review and refinement. The resulting factors are:

1. Existing City Limits
2. Employment Accessibility
3. Floodplains
4. Growth Management Areas
5. Heavy Industry
6. Household Accessibility
7. Major Roads/Interchanges
8. Oil and Gas (Single Well)
9. Oil and Gas (Consolidated Site)
10. Parks and Open Space
11. Public Utilities
12. Railroads
13. Targeted Development
14. Transit Accessibility

Factor Weights

Each of the attractant and detractant factors contribute to the desirability of a parcel. The relative impact of each factor is expected to vary. Furthermore, different factors may have different roles in attracting new households or employment. For example, proximity to parks and open space may be a strong attractor for new residential development, but have a lesser impact on the desirability of a parcel for employment uses. Conversely, proximity to railroads may be a strong attractor of new non-residential development, but have a negative effect on household attractiveness.

Factor weights were defined by the MDT separately for each subregion. These weights were defined on a scale of one to 10 and indicate the relative influence of each factor in comparison to others. Due to the varying nature of communities within the NFR region, a different set of weights has been developed for each subregion.

The attractant/detractant factor workshop included a keypad polling exercise in which MDT members scored different factors for residential and non-residential attractiveness. The process began with a presentation on the concept of attractant and detractant factors and discussion about the completeness of the list. Discussions were followed by a guided exercise where each factor was individually ranked and discussed. To ensure all member jurisdictions had an opportunity to contribute, separate meetings and phone calls were conducted with jurisdictions unable to attend the group workshop.

Because many subregions include multiple jurisdictions, representatives from different jurisdictions were encouraged to collaborate and discuss rankings. Participants first ranked factors on the worksheet shown in **Figure 5.1**, allowing consideration of different factors and their relative weights. During the workshop, the group suggested changes to the initial list of factors shown. The factor list and scoring process was adjusted to accommodate these comments. After worksheets were completed, a keypad polling system was used to submit scores for each attractant. Results were displayed, prompting further discussion and debate. In some cases, this large group discussion prompted revisions to the initial scores.

Scores resulting from the polling exercise were compiled and summarized by subregion. The resulting household and employment scores, shown in **Table** 5.1**andTable** 5.2, serve as factor weights in the land use allocation process.

The MDT indicated that the Estes Park area and the remainder of the extended Larimer County subregion are very different in nature. Estes Park is an incorporated city and experiences heavy tourist activity, while the remainder of Subregion 5 is very rural in nature. Therefore, different sets of factors were defined for Estes Park and the remainder of subregion 5.

Treatment of Floodplains

Regulations regarding building within floodplains vary by jurisdiction. In some municipalities, new construction in floodplains is strictly forbidden. In other areas, new construction in floodplains is allowed, but discouraged by aspects such as increased risk and insurance costs. For the Estes park portion of subregion 5, all parcels and parcel parts in the 100 year floodplain have been marked as undevelopable. In the remaining areas, floodplains are treated as detractants where development is discouraged.

Figure 5.1: Factor Scoring Worksheet

Name: _____

Subregion: _____

Land Use Factor Ranking Worksheet

	Employment	Residential
City Limits *Is a parcel inside a city boundary?*	_____	_____
Growth Management Area *Is a parcel inside a growth management area?*	_____	_____
Public Utilities *Is a parcel currently served by a water utility?*	_____	_____
Parks and Open Space *Proximity to parks, open space, and multi-use trails*	_____	_____
Targeted Development Areas *Proximity to designated "Hot Spots"*	_____	_____
Major Roads / Interchanges *Proximity to major roads or Interchanges*	_____	_____
Railroads *Proximity to railroad facilities*	_____	_____ *
Heavy Industrial *Proximity to heavy industrial uses*	_____	_____ *
Employment Accessibility *Accessibility to regional employment*	_____	_____
Household Accessibility *Accessibility to residential areas*	_____	_____
Transit Accessibility *Accessibility to employment and households using transit*	_____	_____

* indicates a detractant (residential only)

Table 5.1: Land Use Factor Weights for Household Growth

Factor	1 – Other MPO	2 – Greeley/Evans	3 – Fort Collins	4 – Loveland/Berthoud	5a – Extended Larimer	5b – Estes Park	6 – Extended Weld	7 – Central I-25
Existing City Limits	8	2	6	6.33	1	5	1	6.67
Employment Accessibility	10	7.67	4	6	4.5	2	8	8.33
Floodplains	-10	-7.5	-9	-9	-6	-10	-5	-8.3
Growth Management Areas	9	3	4	7.33	1	1	2	7.33
Heavy Industry	-5.5	-7.67	-10	-7	-9	-9	-5	-9.33
Household Accessibility	8.5	3.67	5	6	2	4	5	6
Major Roads / Interchanges	7.5	4.33	2	4.33	4	10	10	5
Oil and Gas (Single Well)	-6.5	-4	n/a	-8.5	-5	n/a	-5	-7.5
Oil and Gas (Consolidated Site)	-7	-8.5	n/a	-9.3	-5	n/a	-5	-7.5
Parks and Open Space	6.5	6.67	9	8.67	3.5	7	2	7.33
Public Utilities	10	10	2	9.67	5	9	10	9
Railroads	-5.5	-6.33	-5	-6.33	-8.5	-1	-5	-7
Targeted Development	6.5	5.33	4	4	2	8	1	7
Transit Accessibility	5.5	5	6	4.33	1	3	1	7.33

Note: Negative values indicate detractants and positive values indicate attractants.

Table 5.2: Land Use Factor Weights for Employment Growth

Factor	1 – Other MPO	2 – Greeley/Evans	3 – Fort Collins	4 – Loveland/Berthoud	5a – Extended Larimer	5b – Estes Park	6 – Extended Weld	7 – Central I-25
Existing City Limits	7	2	8	7.33	5	7	1	7
Employment Accessibility	9.5	7	6	7	2.5	5	10	6.67
Floodplains	-10	-7.5	-4	-9	-6	-10	-5	-8.3
Growth Management Areas	9	2	6	8.33	9	1	2	7.67
Heavy Industry	6	6	1	4	2	2	8	5.67
Household Accessibility	7.5	4.67	5	6.67	2	3	8	6.33
Major Roads	9.5	9	10	10	7	10	10	8.67
Oil and Gas (Single Well)	-6.5	-4	n/a	-8.5	-5	n/a	-5	-7.5
Oil and Gas (Consolidated Site)	-7	-8.5	n/a	-9.3	-5	n/a	-5	-7.5
Parks and Open Space	3	2.67	4	3.33	2	6	2	3.33
Public Utilities	10	8.67	2	7.33	10	9	10	8.67
Railroads	-3.5	-6.67	-8	-5	-2.5	-1	-8	-6.33
Targeted Development	6	8	7	4.67	1	8	1	7.33
Transit Accessibility	3	5	8	4.33	1	4	1	6.67

Attractant and Detractant Factor Values

For each parcel, the land use model computes attractant and detractant factor values. Values for each factor range from zero to 100. Zero indicates the factor is not relevant to a particular parcel and a value of 100 indicates the factor is highly relevant. Factor values are computed independently for each developable parcel using one of the three methods described in the following sections.

All-or-Nothing Location Based Factors

Some factors are considered on a yes or no basis. For these attributes, a parcel either meets a criterion and is assigned a value of 100, or does not meet the criterion and is assigned a value of zero. Attractant factors that fall into this category are:

1. Existing City Limits;

2. Floodplains;
3. Growth Management Areas;
4. Public Utilities; and
5. Targeted Development Areas.

Proximity-Based Factors

Proximity-based factors are defined based on distance to a certain activity or land use, and vary between zero (very far from the activity) and 100 (immediately adjacent to the activity). Proximity based factors used in the NFR Land Use Model are:

1. Heavy Industry;
2. Major Roads;
3. Oil and Gas (Single Well);
4. Oil and Gas (Consolidated Site);
5. Parks and Open Space; and
6. Railroads.

Values for proximity-based factors are computed for each parcel using an invert and rank procedure defined by **Equation (2).** This approach results in any parcel is coincident with an activity (i.e., has a distance from the activity of zero) receiving a factor value of 100, with the farthest parcel from an activity receiving a value of zero. Parcels located between activity centers receive values based on proximity to the activity relative to the farthest parcel in the region.

$$A_p = \left(1 - \frac{D_p}{D_{max}}\right) \cdot 100 \qquad (2)$$

Where:

A_p = Attractants factor for parcel "p"

D_p = Distance from parcel "p" to the nearest occurrence of the relevant activity

D_{max} = Maximum distance from any parcel in the region to the nearest occurrence of the relevant activity

Accessibility Factors

Accessibility factors are based on roadway and transit network information from the travel demand model along with 2012 base year socioeconomic data at the TAZ level. Accessibility factors represent the relative proximity of each TAZ to all households or employers in the region as measured on the transportation network. By measuring proximity to nearby activities using the roadway network, the accessibility factor accounts for areas physically close to an activity, but separated due to transportation network conditions such as a limited access freeway. Accessibility factors can be applied using the roadway or transit network, and can be computed

based on proximity to households, employment, or both. The NFR Land Use Model uses the following accessibility factors:

1. Employment Accessibility;
2. Household Accessibility; and
3. Transit Accessibility.

A simplified method of creating an accessibility factor is to consider percentage of households or jobs in the region that can be reached from a TAZ within a specified amount of time. The travel time for an average trip in the North Front Range is just over 15 minutes, suggesting that a 15-minute threshold would be reasonable in computing an accessibility factor.

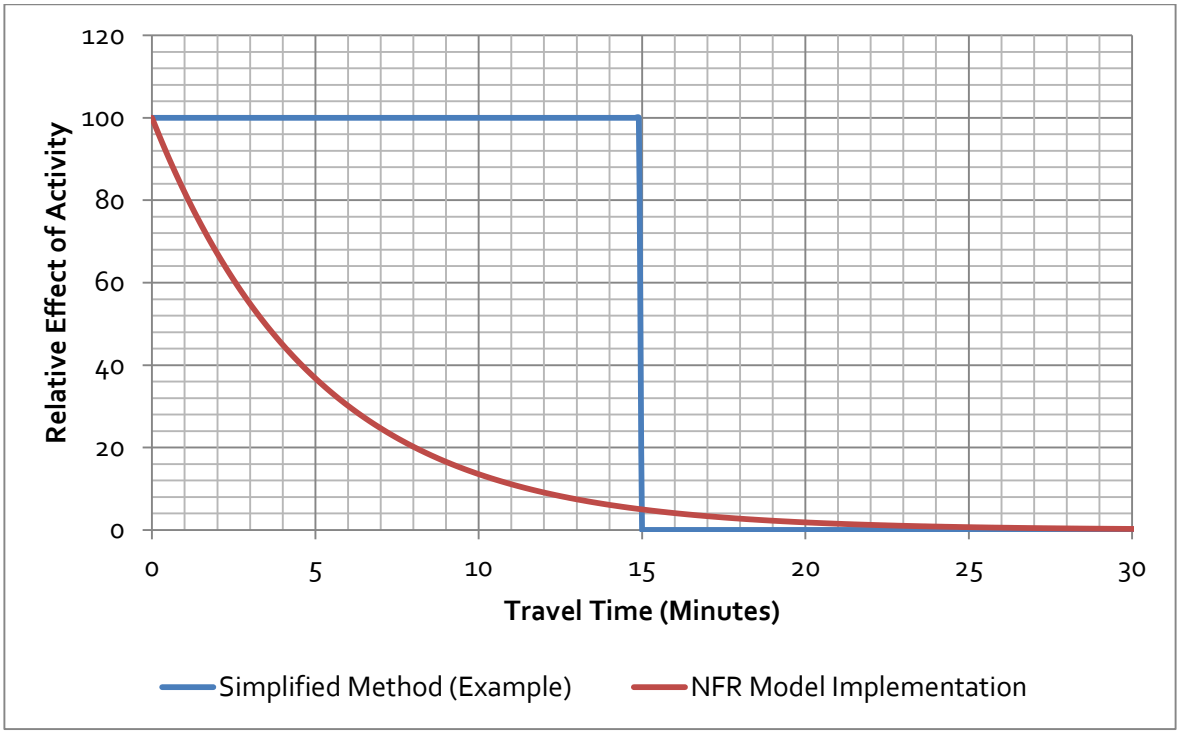
The problem with a simple percentage-based accessibility factor is a TAZ very close to a large amount of activity may not be distinguished from a TAZ only moderately close to the same area. For example, a TAZ five minutes from the Central Business District (CBD) might be ranked similarly to a TAZ that is 14 minutes from the CBD. Instead, the land use model calculates accessibility factors using **Equation (3).** The effects of activity near a specific TAZ using the simplified example and the approach used by the model are compared in **Figure 5.2.**

$$AccFac_i = \ln\left(1 + \sum_{j=1}^{n} A_j \cdot e^{-\alpha T_{ij}}\right) \cdot 100 \quad (3)$$

Where:

$AccFac_i$ = Accessibility factor for zone i
A_j = Activity (e.g., households or employment) in zone j
T_{ij} = Travel time between zones i and j
α = Calibration parameter (set to 0.2)

Figure 5.2: Relative Influence of Nearby Activity on TAZ Accessibility



For household and employment accessibility factors, travel time is based on the 2012 roadway network from the travel model and activity is represented by 2012 household and employment data at the TAZ level. As a result, all zones receive household and employment accessibility factors greater than zero.

Transit accessibility is calculated using the transit route system rather than the roadway network. Not all zones in the region are served by transit, many areas receive a transit accessibility score of zero. Additionally, the transit accessibility score is based on an activity variable combing household and employment, as defined in **Equation (4).**

$$A_i = \mathrm{HH_i} + \mathrm{EMP_i} \cdot \frac{\mathrm{RegHH}}{\mathrm{RegEmp}} \quad (4)$$

Where:

A_i = Activity variable for zone i
HH_i = Number of households in zone i
EMP_i = Number of employees in zone i
$RegHH$ = Regional number of households
$RegEmp$ = Regional number of employees

Since accessibility is computed at TAZ level and land use allocation is conducted at parcel level, accessibility factors must be disaggregated from TAZs to parcels. All parcels within a single TAZ therefore receive the same accessibility score.

5.2 Forecast Year Allocation

Attractant and detractant factor weights and values define the order parcels and parcel parts are expected to develop. The land use model uses factor weights and values along with subregional control totals to create forecast land use and socioeconomic datasets representing the 2040 forecast year as well as several interim years (i.e., 2015, 2020, 2025, 2030, and 2035). The process consists of computing scores for each parcel and allocating growth to the highest scoring parcels.

Composite Scores

The land use model computes a residential and non-residential development desirability score for each developable parcel. The composite scores are computed as the sum of the products of values and scores for each factor, as shown in **Equation (5).**

$$Score_p = \sum_{f=1}^{n} Value_{f,p} \cdot Weight_f \quad (5)$$

Where:

$Score_p$ = Development desirability score for parcel p

$Value_f$ = Computed value of factor f for parcel p

$Weight_f$ = Weight for factor f

Growth Allocation

The land use model allocates growth to parcels based on development desirability scores. This allocation is performed separately for residential and non-residential land uses, and independently by subregion. Urbanized subregions (subregions 2, 3, 4, 7, and the Estes Park portion of subregion 5) are allocated using a strict order methodology. For these subregions, the highest scoring developable parcels are incrementally marked as developed until the subregional control total is achieved. Results are consistent with the subregional household and employment totals discussed previously. Once allocation is complete, household and employment totals are aggregated to TAZs.

Probability-based Growth Allocation

For rural subregions (subregions 1, 6, and subregion 5 excluding Estes Park), growth is allocated to parcels on a probability basis. This allows development allocation to occur in a slightly more dispersed manner in these areas. For probability based allocation, desirability scores are evaluated to compute relative desirability for each parcel. This is completed by dividing the

desirability score for each parcel by the sum of desirability scores for all parcels in a subregion. The resulting relative desirability scores sum to 100 percent for all parcels.

Allocation \ proceeds the use of a probability-based approach. In this process, the probability of each parcel being allocated is equal to the relative desirability score. Once a parcel has been fully allocated, the record is removed from consideration and relative desirability scores are recalculated prior to the next allocation. This procedure continues until the subregional control total is reached.

5.3 MDT Review and Adjustment

Results of the 2040 land use and socioeconomic data allocation process were presented to the MDT for review and comment. Team members were provided with paper maps in a workshop setting, as well as PDF and GIS files for review. Due to the technical nature of the data, reviewers were given approximately two weeks after the review workshop to provide comments. These comments were considered by MPO and consultant staff and incorporated into adjusted 2040 forecasts. To ensure the final 2040 household and employment results are consistent with MDT expectations, several rounds of review were held. This allowed reviewers to see results of comments and make further suggestions as necessary.

Forecast SED Adjustment Process

Comments on the 2040 household and employment data consisted of suggested changes to the number of households or employment in a given TAZ. Rather than force the land use allocation model to show higher or lower desirability for parcels within a TAZ, land use data was post processed to reflect comments. The post processing methodology resulted in an updated dataset applying comments made by reviewers, while respecting regional and subregional control totals.

Application of MDT comments initially resulted in changes to subregional control totals. To counteract this, any overages or shortages resulting from adjustments were redistributed to other TAZs within a subregion. This approach prevented changes to specific numbers provided by reviewers, but did result in slight changes to data at the TAZ level for zones previously reviewed and approved. The post processed dataset was presented to MDT members for further review to ensure the redistribution process did not result in unreasonable values. Some reviewers provided additional comments at this stage, so the process was repeated until reviewers were comfortable with the post processed results.

In some cases, comments adjusted TAZ values to exceed the buildout values approved earlier in the process. In such cases, revised household and employment values were allowed to exceed initial TAZ buildout value. In other cases reviewers made comments such as "too high" or "too low." In these cases, the consultant team entered numeric values into the post processor. In

cases where reviewers made comments relating to a larger area (e.g., "not enough employment growth in Berthoud"), the consultant team addressed the comment by manually adjusting values based on development desirability scores. In all cases, the revised values were presented to the MDT for additional comment.

Post-Processor Methodology

Land use post processing was performed at the TAZ level and run separately by subregion and for employment and household values. If a zone had comments pertaining to the number of households, the employment total was still subject to adjustment during the reallocation process. Because the process was run by subregion, changes to a TAZ within a subregion only resulted in reallocation of data within that subregion. The land use post processor functions according to the flowchart shown in **Figure 5.3**, with reallocation performed according to **Equation (6).**

$$V_{f,i+1} = V_b + \left(1 + \frac{Control - \sum_z (V_{f,i} - V_b)}{\sum_{z_{avail}} (V_{f,i} - V_b)}\right) \cdot (V_{f,i} - V_b) \qquad (6)$$

Where:

$V_{f,i+1}$ = Forecast TAZ household or employment value for reallocation iteration $i+1$

$V_{f,i}$ = Forecast TAZ household or employment value for reallocation iteration i

V_b = Base year TAZ household or employment value

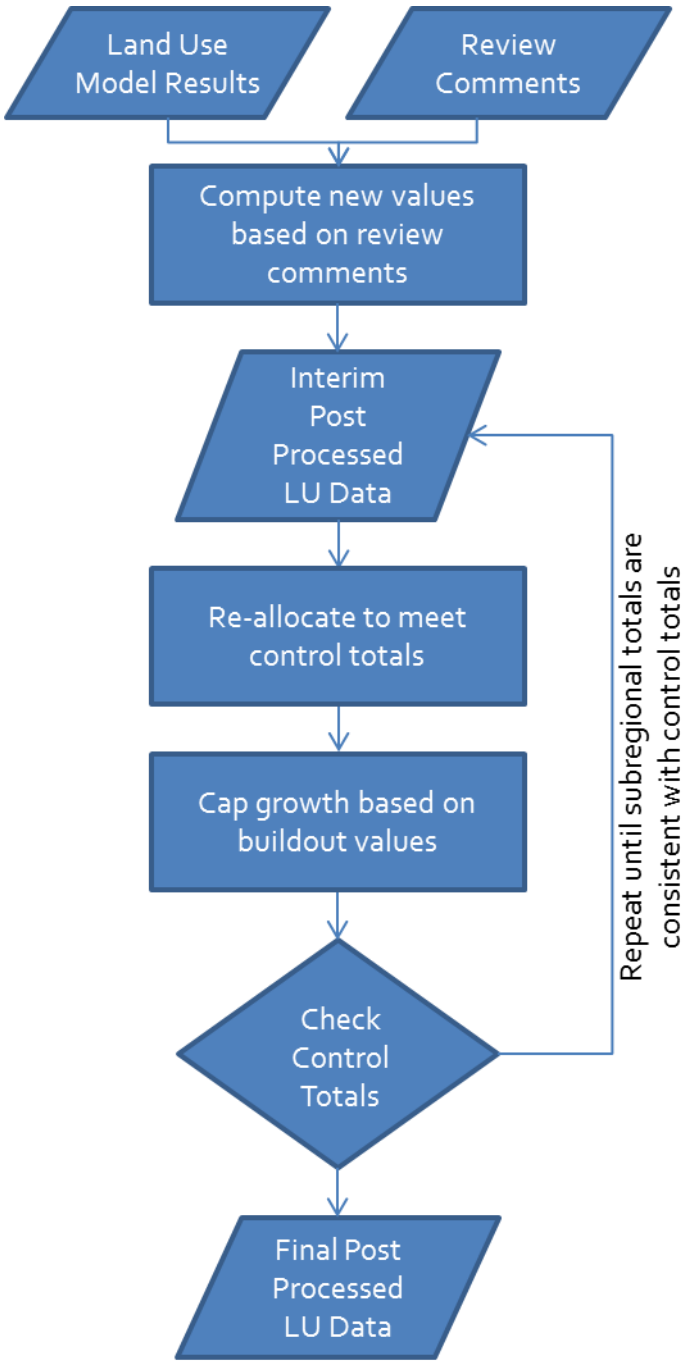
$\Delta_{control}$ = Difference between the total growth for all zones and the control total, computed separately for each subregion

z = List of all zones (by subregion)

z_{avail} = List of zones with room for growth (i.e., have growth values less than the buildout value, by subregion)

$Control$ = Growth control total (by subregion)

Figure 5.3: Land Use Post Processing Flowchart



5.4 Interim Year Allocation

Interim year land use allocation is performed using the same process described for the 2040 land use allocation. The only differences are the subregional control totals used to identify developed parcels. Employees and households are allocated until the interim year control totals are met. As

a result, the interim year land use model results are consistent with interim year control totals and are always less than or equal to forecast year totals at both the parcel and TAZ level. To ensure consistency, additional post processing is conducted. This is accomplished using a pivot approach, with values for each TAZ being computed as shown in **Equation (7).**

$$V_{i,adj} = V_b + \frac{G_{i,raw}}{G_{f,raw}} \cdot G_{f,adj} \qquad (7)$$

Where:

$V_{i,adj}$ = Interim year TAZ household or employment value, adjusted
$G_{i,raw}$ = Interim year TAZ household growth beyond base year, unadjusted
$G_{f,raw}$ = Forecast year TAZ household growth beyond base year, unadjusted
$G_{f,adj}$ = Forecast year TAZ household growth beyond base year, adjusted

Results of this adjustment for interim years are consistent with the post processed forecast year data. Values are less than or equal to post forecast year results and are proportionally lower based on results of the land use allocation process. However, this process does not ensure consistency with regional and subregional control totals. Results must be scaled for consistency with the control totals. Scaling is performed in a manner that prevents household and employment values from exceeding forecast year totals.

5.5 Employment Type

As discussed previously, the regional travel model requires employment by four distinct types: retail, service, basic, and medical. The land use model separates employment into these types based on the consolidated land use categories first discussed in **Section 4.3.** As shown in **Table 5.3,** each consolidated category is accompanied by an employment type distribution. These distributions are used to separate employment by type at the parcel level. Resulting employment totals are then aggregated to the TAZ level by type.

Table 5.3: Employment Type Splits by Land Use Category

Category ID	Retail Share	Service Share	Basic Share	Medical Share
RetailHigh	40%	30%	0%	30%
RetailLow	50%	40%	0%	10%
IndustryHigh	0%	0%	100%	0%
IndustryLow	0%	0%	100%	0%
OfficeLow	0%	40%	60%	0%
RetailMixedHigh	20%	60%	0%	20%
RetailMixedLow	20%	70%	0%	10%
RetailMixedMed	20%	60%	0%	20%
ResRetail	40%	40%	0%	20%
ResServiceHigh	10%	70%	0%	20%
ResServiceLow	10%	80%	0%	10%
ResServiceMed	10%	70%	0%	20%
IndustryAG	25%	25%	50%	0%
Service1	0%	100%	0%	0%
Service2	0%	60%	20%	20%
Service3	0%	100%	0%	0%

The land use allocation model produces employment totals consistent with subregional control totals. Employment by type resulting from the land use model is not necessarily consistent with regional control totals. This occurs because parcels with the highest desirability scores do not line up with economically constrained control totals. Combined regional land use plans include categories earmarked for retail employment at a higher rate than other types, leading to an imbalance compared to control totals.

To maintain consistency with control totals, employment type data from the land use model has been post processed. The employment type post processor maintains employment totals at the TAZ level, but adjusts the split between the four different types of employment. Employment type splits are adjusted using an iterative proportional factoring process in which data is iteratively adjusted. In this process, unadjusted land use model results serve as a seed, post processed employment totals serve as target row totals, and subregional control totals serve as target column totals[2]. The iterative process is stopped after adjusting row totals, ensuring total

[2] The regional travel model treats service and medical employment identically, so the service and medical employment control totals have been combined for this exercise.

employment by TAZ is not modified by this process. After 10 iterations, all resulting subregional totals for the 2040 forecast year dataset are within one percent of the control total values.

For interim years, employment types are computed using the same iterative proportional factoring process employed for the forecast year. However, some minor modifications became necessary. In some cases, a large number of developed parcels allow only a single employment type (e.g., only basic employment). This prevented the factoring process from reaching closure in some subregions. To address this, constraints on the process were relaxed to allow additional mixing of service and basic employment types. Resulting employment totals by type and subregion are within five percent for all cases, and are within one percent for most cases.

5.6 Household Income, Workers, and Size

In addition to total households by TAZ, the travel demand model requires information about average household size, number of workers per household, and median income[3]. For the base year, this information is based on ACS data. For forecast and interim year datasets, detailed information is not available to adjust assumptions at the parcel or TAZ level. Therefore, household income, workers, and size are computed using the assumptions shown in **Table 5.4**.

Table 5.4: Household Income, Worker, and Size adjustment

Condition	Approach
Zone has greater than 5 households in the base year, or zone has less than 10 additional households in the forecast year	Retain the income, worker, and size values from the base year
Zone has fewer than 5 households in the base year and has 10 or more additional households in the forecast year	Replace the median income, average workers per household, and average household size with regional median (for income) or average values

As a result of this process, the forecast and interim year socioeconomic datasets contain all information necessary for input to the regional travel model.

[3] Distributions by size, income, and number of workers computed for the base year are not necessary in the forecast year dataset.

Appendix A: Detailed Land Use Categories

Table A-1 lists consolidated land use categories and typical densities applied to each land use type for each jurisdiction in the region. This information was obtained from member jurisdictions and reviewed by MPO and consultant staff for consistency with generally accepted ranges. These values are input to the land use allocation model and used to calculate buildout household and employment values.

Table A-1: Base year, 2040, and buildout SED totals

Jurisdiction	Land Use / Zoning	Consolidated Land Use Category	Households per Acre	Employment per Acre
Ault	Agricultural	Agriculture / Residential	0.0	0.0
Ault	Employment Center	Industrial Low	0.0	0.2
Ault	Mixed-Use	Commercial Retail Low	0.0	2.0
Ault	Multi-Family Residential	Multi-Family Residential	20.0	0.0
Ault	Open Space/Park	Open Space, Parks	0.0	0.0
Ault	Public Facilities	Government Employment	0.0	0.0
Ault	Single Family Residential	Single Family Residential Ultra Low	5.0	0.0
Berthoud	Convenience Commercial	Commercial Retail Low	0.0	10.0
Berthoud	Employment	Commercial Retail High	0.0	10.0
Berthoud	Flex-Office/Residential	Mixed Use Planned Unit Development Residential/Commercial Retail	1.0	3.0
Berthoud	General Commercial	Commercial Retail Low	0.0	2.0
Berthoud	High Density Residential	Multi-Family Residential	20.0	0.0
Berthoud	High Density Residential/Commercial/Mixed Use -Residential (6-14 Gross DU/AC)	Mixed Use Residential High	14.0	10.0
Berthoud	Lake	Water Bodies	0.0	0.0
Berthoud	Low Density Residential	Single Family Residential Low	0.3	0.0
Berthoud	Low Density Residential (1-2 Gross DU/AC)	Single Family Residential Ultra Low	0.3	0.0
Berthoud	Medium Density Residential	Single Family Residential Ultra Low	2.0	0.0
Berthoud	Mixed Use	Mixed Use Planned Unit Development Residential/Commercial Retail	5.0	5.0
Berthoud	Moderate Density Residential (2-6 Gross DU/AC)	Single Family Residential Ultra Low	12.0	0.0

Jurisdiction	Land Use / Zoning	Consolidated Land Use Category	Households per Acre	Employment per Acre
Berthoud	Natural Preserve/Open Space	Open Space, Parks	0.0	0.0
Berthoud	Neighborhood Commercial	Commercial Retail Low	0.0	4.0
Berthoud	none	Single Family Residential Ultra Low	0.0	0.0
Berthoud	Open Space	Open Space, Parks	0.0	0.0
Berthoud	Potential	Mixed Use Residential Medium	0.0	0.0
Berthoud	Transit (Commuter Rail Station)	Commercial Retail Low	0.0	2.0
Berthoud	Very Low Density Residential/Rural Cluster	Single Family Residential Ultra Low	0.3	0.0
Eaton	Commercial/Industrial	Industrial Low	0.0	1.0
Eaton	Eaton Draw and Open Space	Open Space, Parks	0.0	0.0
Eaton	Mixed Use	Mixed Use Planned Unit Development Residential/Commercial Retail	20.0	10.0
Eaton	New Town Residential	Single Family Residential Ultra Low	5.0	0.0
Eaton	Original Town Residential	Single Family Residential Ultra Low	6.0	0.0
Eaton	Parks and Recreation	Open Space, Parks	0.0	0.0
Eaton	Schools and Public Uses	Government Employment	0.0	30.0
Eaton	Suburban Residential	Single Family Residential Ultra Low	2.0	0.0
Estes Park	Accommodations - A	Mixed Use Residential Medium	24.0	5.0
Estes Park	Accommodations - A-1	Mixed Use Residential Medium	24.0	5.0
Estes Park	Commercial Downtown	Mixed Use Residential High	0.0	10.0
Estes Park	Commercial Heavy	Commercial Retail High	0.0	10.0
Estes Park	Commercial Outlying	Commercial Retail High	0.0	10.0
Estes Park	Estate: 1 acre min.	Single Family Residential Ultra Low	1.0	0.0
Estes Park	Estate: 1/2 acre min.	Single Family Residential Ultra Low	2.0	0.0
Estes Park	Multi-Family: 3-8 du/acre	Mixed Use Residential Medium	8.0	0.0
Estes Park	Office	Employment Office Low	0.0	18.7
Estes Park	Residential: 1/4 acre min.	Single Family Residential Low	4.0	0.0
Estes Park	Residential: 5000 sqft min.	Single Family Residential Medium	8.7	0.0
Estes Park	Restricted Industrial	Industrial Low	0.0	2.0
Estes Park	Rural Estate: 10 acre min.	Single Family Residential Ultra Low	0.1	0.0
Estes Park	Rural Estate: 2 1/2 acre min.	Single Family Residential Low	0.4	0.0
Estes Park	Two Family: 27,000 sqft min.	Multi-Family Residential	1.6	0.0
Evans	Commercial	Commercial Retail Low	0.0	5.0

Jurisdiction	Land Use / Zoning	Consolidated Land Use Category	Households per Acre	Employment per Acre
Evans	Historic Mixed Use	Mixed Use Residential High	2.0	2.0
Evans	Industrial - Business Park	Industrial Low	0.0	1.0
Evans	Industrial - Energy	Industrial Low	0.0	7.0
Evans	Industrial - Rail Access	Industrial Low	0.0	7.0
Evans	Open Space	Open Space, Parks	0.0	0.0
Evans	Public Facilities	Government Employment	0.0	7.0
Evans	Residential - High Density	Multi-Family Residential	7.0	0.0
Evans	Residential - Rural Neighborhood	Single Family Residential Ultra Low	1.0	0.0
Evans	Residential - Urban Neighborhood	Single Family Residential Ultra Low	4.0	0.0
Evans	River Habitat	Open Space, Parks	0.0	0.0
Fort Collins	Campus District -- CSU	Mixed Use Residential Low	20.0	30.0
Fort Collins	Campus District -- Foothills	Commercial Retail Low	0.0	15.0
Fort Collins	Commercial Corridor District	Commercial Retail High	3.0	17.0
Fort Collins	Community Commercial Corridor District	Commercial Retail High	10.0	18.0
Fort Collins	Community Separator	Open Space, Parks	0.0	0.0
Fort Collins	Downtown District	Mixed Use Commercial High	13.0	30.0
Fort Collins	Employment	Commercial Retail High	12.0	30.0
Fort Collins	Foothills Rural Lands	Single Family Residential Ultra Low	0.4	0.0
Fort Collins	Industrial District	Employment Industrial High	0.0	15.0
Fort Collins	Low Density Mixed-Use Residential	Mixed Use Residential Low	5.0	2.0
Fort Collins	Medium Density Mixed-Use Residential	Mixed Use Commercial Medium	12.0	2.0
Fort Collins	Neighborhood Commercial District	Mixed Use Commercial Medium	0.0	20.0
Fort Collins	Other Planning Areas	Single Family Residential Ultra Low	0.0	0.0
Fort Collins	Rural Open Lands	Single Family Residential Ultra Low	0.4	0.0
Fort Collins	Rural Open Lands and Stream Corridors	Single Family Residential Ultra Low	0.0	0.0
Fort Collins	Urban Estate	Single Family Residential Low	2.0	0.0
Garden City	none	Mixed Use Planned Unit Development Residential/Commercial Retail	0.0	0.0
Gilcrest	Agriculture/Large Lot Resident	Single Family Residential Ultra Low	0.0	0.5

Jurisdiction	Land Use / Zoning	Consolidated Land Use Category	Households per Acre	Employment per Acre
Gilcrest	Commercial	Commercial Retail Low	0.0	4.0
Gilcrest	Downtown Mixed Comm/Res	Mixed Use Residential Low	14.6	3.5
Gilcrest	High Density Residential	Multi-Family Residential	20.0	0.0
Gilcrest	Industrial	Industrial Low	0.0	0.2
Gilcrest	Low Density Residential	Single Family Residential Low	4.0	0.0
Gilcrest	Medium Density Residential	Single Family Residential Ultra Low	6.0	0.0
Gilcrest	Park	Open Space, Parks	0.0	0.0
Gilcrest	School/Civic	Public / Civic Campus K-12	0.0	30.0
Greeley	Commercial High Intensity	Commercial Retail Low	0.0	30.0
Greeley	Commercial Low Intensity	Commercial Retail Low	0.0	2.0
Greeley	Conservation District	Conservation	0.0	0.0
Greeley	Employment	Commercial Retail High	0.0	15.0
Greeley	Industrial Employment	Industrial Low	0.0	9.0
Greeley	Industrial High Intensity	Industrial Low	0.0	20.0
Greeley	Industrial Low Intensity	Industrial Low	0.0	0.5
Greeley	Industrial Medium Intensity	Industrial Low	0.0	6.0
Greeley	Mixed Use	Mixed Use Planned Unit Development Residential/Commercial Retail	10.0	20.0
Greeley	Residential Estate	Single Family Residential Ultra Low	4.6	0.0
Greeley	Residential High Density	Multi-Family Residential	4.6	0.0
Greeley	Residential Low Density	Single Family Residential Ultra Low	4.6	0.0
Greeley	Residential Medium Density	Single Family Residential Ultra Low	4.6	0.0
Greeley	Residential Mobile Home	Single Family Residential Ultra Low	4.6	0.0
Johnstown	Commercial	Commercial Retail Low	0.0	8.0
Johnstown	Commercial Mixed Use	Mixed Use Commercial Medium	3.0	8.0
Johnstown	Conservation-Orented Agriculture/Large Lot Residential	Single Family Residential Ultra Low	0.5	8.0
Johnstown	Employment	Commercial Retail High	0.0	12.0
Johnstown	Greenways	Open Space, Parks	0.0	0.0
Johnstown	Low Density Residential	Single Family Residential Low	5.0	0.0
Johnstown	Medium Density Residential	Single Family Residential Ultra Low	7.0	0.0
Johnstown	Parks	Open Space, Parks	0.0	0.0
Johnstown	Public/Institutional	Public / Civic Campus K-12	0.0	10.0

Jurisdiction	Land Use / Zoning	Consolidated Land Use Category	Households per Acre	Employment per Acre
Johnstown	Residential Mixed Use	Mixed Use Residential Low	8.0	4.0
Kersey	ELEMENTARY SCHOOL/PARK/RECREATIONAL FACILITIES	Government Employment	0.0	30.0
Kersey	Existing Commercial Use	Commercial Retail Low	0.0	4.0
Kersey	Existing Industrial Use	Industrial Low	0.0	0.2
Kersey	Existing Multi-Family Residential Use	Multi-Family Residential	10.0	0.0
Kersey	Existing Open Space	Open Space, Parks	0.0	0.0
Kersey	Existing Public Use	Public / Civic Recreation Sports fields, etc.	0.0	0.0
Kersey	Existing Single Family Use	Single Family Residential Ultra Low	2.0	0.0
Kersey	INDUSTRIAL DISTRICT	Employment Industrial High	0.0	0.2
Kersey	LIGHT INDUSTRIAL/COMMERCIAL/MIXED USE	Mixed Use Commercial Low	0.0	5.0
Kersey	LOW DENSITY RESIDENTIAL	Single Family Residential Ultra Low	2.0	0.0
Kersey	MEDIUM/HIGH DENSITY RESIDENTIAL/MULTI FAMILY	Multi-Family Residential	10.0	0.0
Kersey	MEDIUM/HIGH DENSITY RESIDENTIAL/MULTIFACMILY	Multi-Family Residential	10.0	0.0
Kersey	MIXED USE - CIVIC/COMMERCIAL	Mixed Use Commercial Low	0.0	5.0
Kersey	MIXED USE - COMMERCIAL/RESIDENTIAL	Mixed Use Commercial Low	2.0	5.0
Kersey	None	Conservation	0.0	0.0
Kersey	OPEN SPACE	Open Space, Parks	0.0	0.0
Kersey	RESIDENCE DISTRICT	Single Family Residential Ultra Low	2.0	0.0
Kersey	Vacant Land	Single Family Residential Ultra Low	0.0	0.0
LaPorte	Community Business Center	Mixed Use Commercial Low	4.0	16.0
LaPorte	Lakes	Water Bodies	0.0	0.0
LaPorte	Limited Commercial	Mixed Use Commercial Low	4.0	4.0
LaPorte	Low Density Residential 2-4 Units/Acer	Single Family Residential Ultra Low	4.0	0.0
LaPorte	Medium Density Residential 4-6 Units/Acre	Single Family Residential Low	6.0	0.0
LaPorte	Multi Family	Multi-Family Residential	8.0	0.0
LaPorte	Neighborhood Business Center	Mixed Use Commercial Low	4.0	8.0

Jurisdiction	Land Use / Zoning	Consolidated Land Use Category	Households per Acre	Employment per Acre
LaPorte	Residential 1 Unit/10-35 Acres	Single Family Residential Ultra Low	0.1	0.0
LaPorte	Residential 1 Units/2+ Acres	Single Family Residential Ultra Low	0.5	0.0
LaPorte	Schools/Parks/Openspace	Public / Civic Campus K-12	0.0	0.0
Larimer	ACCOMMODATIONS, A	Mixed Use Residential Medium	1.0	6.0
Larimer	AIRPORT, AP	Industrial Low	1.0	24.0
Larimer	BUSINESS, B	Employment Office Low	0.0	24.0
Larimer	COMMERCIAL, C	Commercial Retail High	0.0	24.0
Larimer	ESTATE, E	Single Family Residential Ultra Low	0.5	0.0
Larimer	ESTATE, E1	Single Family Residential Ultra Low	1.0	0.0
Larimer	FARMING, FA	Agriculture / Residential	1.0	0.0
Larimer	FARMING, FA1	Agriculture / Residential	0.5	0.0
Larimer	FARMING, Water	Water Bodies	0.0	0.0
Larimer	FORESTRY, FO	Agriculture / Residential	0.2	0.0
Larimer	FORESTRY, FO1	Agriculture / Residential	0.1	0.0
Larimer	HEAVY INDUSTRIAL, I1	Employment Industrial High	0.0	24.0
Larimer	INDUSTRIAL, I	Employment Industrial High	0.0	24.0
Larimer	OPEN, O	Agriculture / Residential	0.1	0.0
Larimer	PLANNED DEVELOPMENT, PD	Mixed Use Planned Unit Development Residential/Commercial Retail	3.0	0.0
Larimer	RESIDENTIAL, R	Single Family Residential Ultra Low	3.0	0.0
Larimer	RESIDENTIAL, R1	Single Family Residential Ultra Low	4.0	0.0
Larimer	RESIDENTIAL, R2	Single Family Residential Ultra Low	5.0	0.0
Larimer	RURAL ESTATE, RE	Single Family Residential Ultra Low	0.1	0.0
Larimer	RURAL ESTATE, RE1	Single Family Residential Ultra Low	0.1	0.0
Larimer	TOURIST, T	Mixed Use Commercial High	0.0	8.0
LaSalle	AG	Agriculture / Residential	0.0	0.0
LaSalle	CBD	Commercial Retail Low	0.0	13.0
LaSalle	Commercial	Commercial Retail Low	0.0	13.0
LaSalle	Exempt	Conservation	0.0	0.0
LaSalle	High Density Residential	Multi-Family Residential	8.0	0.0
LaSalle	Industrial	Industrial Low	0.0	6.0
LaSalle	Low Density Residential	Single Family Residential Low	1.0	0.0
LaSalle	Medium Density Residential	Single Family Residential Ultra Low	4.0	0.0

Jurisdiction	Land Use / Zoning	Consolidated Land Use Category	Households per Acre	Employment per Acre
LaSalle	Park	Open Space, Parks	0.0	0.0
LaSalle	Public	Government Employment	0.0	9.0
LaSalle	tennis	Open Space, Parks	0.0	0.0
Loveland	Community Activity Center	Commercial Retail Low	0.0	10.0
Loveland	Corridor Commercial	Commercial Retail Low	0.0	25.0
Loveland	Development Review	Mixed Use Commercial Medium	0.0	0.0
Loveland	Downtown Activity Center	Mixed Use Commercial High	10.0	20.0
Loveland	Employment	Commercial Retail High	0.0	15.0
Loveland	Estate Residential	Single Family Residential Ultra Low	1.0	0.0
Loveland	Floodplain	Open Space, Parks	0.0	0.0
Loveland	High Density Residential	Multi-Family Residential	15.0	0.0
Loveland	Industrial	Industrial Low	0.0	20.0
Loveland	Lakes	Water Bodies	0.0	0.0
Loveland	Low Density Residential	Single Family Residential Low	3.0	0.0
Loveland	Medium Density Residential	Single Family Residential Medium	6.0	0.0
Loveland	Parks, Open Lands Cons Easement, GC, Cemetery	Open Space, Parks	0.0	0.0
Loveland	Public Schools, Hospital, Facilities	Government Employment	0.0	2.4
Loveland	Regional Activity Center	Commercial Retail High	0.0	10.0
Mead	Agriculture	Agriculture / Residential	0.0	0.0
Mead	Commercial Mixed Use	Mixed Use Commercial Medium	0.1	0.2
Mead	Downtown Mixed Use	Mixed Use Commercial Low	3.9	22.5
Mead	Large Lot Residential	Single Family Residential Ultra Low	1.0	0.0
Mead	Multi-Family Residential	Multi-Family Residential	10.0	0.0
Mead	Park/Open Space	Open Space, Parks	0.0	0.0
Mead	Planned Industrial	Public / Civic Recreation Sports fields, etc.	0.0	10.0
Mead	Public/Semi-Public	Government Employment	0.0	0.0
Mead	Regional Commercial	Commercial Retail High	0.0	3.0
Mead	Rural Residential	Single Family Residential Ultra Low	1.0	0.0
Mead	Single Family Residential	Single Family Residential Ultra Low	5.5	0.0
Milliken	Agriculture	Agriculture / Residential	0.0	0.0
Milliken	Buffer	Conservation	0.0	0.0

Jurisdiction	Land Use / Zoning	Consolidated Land Use Category	Households per Acre	Employment per Acre
Milliken	Business/Industrial	Industrial Low	0.0	0.5
Milliken	Commercial	Commercial Retail Low	0.0	4.0
Milliken	Commercial/Mixed Use	Mixed Use Planned Unit Development Residential/Commercial Retail	5.0	10.0
Milliken	Downtown	Mixed Use Residential Low	30.0	6.5
Milliken	Estate Residential	Single Family Residential Ultra Low	0.3	0.0
Milliken	Greenways	Open Space, Parks	0.0	0.0
Milliken	High Density Residential	Multi-Family Residential	20.0	0.0
Milliken	Low Density Residential	Single Family Residential Low	2.0	0.0
Milliken	Medium Density Residential	Single Family Residential Ultra Low	4.0	0.0
Milliken	Mixed Use	Mixed Use Planned Unit Development Residential/Commercial Retail	5.0	5.0
Milliken	Open Space Area (Includes Parks & Schools)	Public / Civic Recreation Sports fields, etc.	0.0	0.0
Milliken	Town Residential	Single Family Residential Ultra Low	4.0	0.0
New Raymer	Rural Town Estate	Single Family Residential Ultra Low	0.5	0.0
Nunn	AG	Agriculture / Residential	0.0	0.0
Nunn	EA	Employment Office Low	0.0	0.5
Nunn	LR	Single Family Residential Ultra Low	0.3	0.0
Nunn	MR	Single Family Residential Ultra Low	3.0	0.0
Nunn	MU	Mixed Use Commercial Low	1.0	0.2
Nunn	Park	Open Space, Parks	0.0	0.0
Nunn	Public	Government Employment	0.0	15.0
Pierce	Agricultural	Agriculture / Residential	0.0	0.0
Pierce	C1 Commercial	Commercial Retail Low	0.0	2.1
Pierce	C2 Commercial	Commercial Retail Low	0.0	2.1
Pierce	Conservation Easement	Conservation	0.0	0.0
Pierce	I1 Industrial	Employment Industrial High	3.5	2.2
Pierce	I2 Industrial	Employment Industrial High	3.5	2.2
Pierce	PUD Planned Unit Development	Public / Civic Recreation Sports fields, etc.	5.2	4.0
Pierce	R1 Single Family Residential	Single Family Residential Ultra Low	3.5	0.0
Pierce	R2 Multi-Family Residential	Multi-Family Residential	4.6	0.0
Platteville	Agricultural District	Agriculture / Residential	0.0	0.0

Jurisdiction	Land Use / Zoning	Consolidated Land Use Category	Households per Acre	Employment per Acre
Platteville	blue	Mixed Use Residential Low	0.0	0.0
Platteville	Business Park/Planned Industrial	Employment Office Low	0.0	4.0
Platteville	Central Business District	Mixed Use Commercial Medium	5.0	5.0
Platteville	Community Commercial	Commercial Retail High	0.0	4.0
Platteville	Environmentally Constrained Res & Rec	Conservation	0.0	0.0
Platteville	High Density Residential	Multi-Family Residential	8.0	0.0
Platteville	Light Industrial District	Industrial Low	0.0	0.2
Platteville	Low Density Residential	Single Family Residential Low	0.2	0.0
Platteville	Medium Density Residential	Single Family Residential Ultra Low	1.0	0.0
Platteville	Medium Density Residential	Single Family Residential Ultra Low	0.0	0.0
Platteville	Multi-Family Residential	Multi-Family Residential	10.0	0.0
Platteville	Multi-Family Residential & Mfr Home Communities	Multi-Family Residential	15.0	0.0
Platteville	P/R	Mixed Use Planned Unit Development Residential/Commercial Retail	0.0	30.0
Platteville	Planned Unit Development	Mixed Use Planned Unit Development Residential/Commercial Retail	2.0	0.0
Platteville	Regional Commercial District	Commercial Retail Low	0.0	5.0
Platteville	Rural Town Estate	Single Family Residential Ultra Low	0.5	0.1
Platteville	Single Family Residential	Single Family Residential Ultra Low	2.0	0.0
Platteville	Small Office	Employment Office Low	0.0	9.5
Platteville	Tourist Commercial District	Commercial Retail Low	0.0	2.0
Platteville	unknown	Single Family Residential Ultra Low	0.0	0.0
Platteville	Village Center Mixed Use	Mixed Use Commercial Medium	0.0	0.0
Severance	Area of Transition	Mixed Use Residential Medium	0.0	2.7
Severance	Development Node	Commercial Retail High	3.0	0.0
Severance	Rural Residential	Single Family Residential Ultra Low	0.2	0.0
Severance	Sup-Urban Perimeter	Single Family Residential Medium	1.6	4.0
Severance	Town Core	Mixed Use Commercial High	3.0	14.0
Timnath	Cnty Density Res - Agri-Business	Single Family Residential Ultra Low	0.1	0.0
Timnath	Commercial	Commercial Retail Low	0.0	4.0

Jurisdiction	Land Use / Zoning	Consolidated Land Use Category	Households per Acre	Employment per Acre
Timnath	Commercial Mixed Use	Mixed Use Commercial Medium	1.0	4.0
Timnath	Downtown Core	Mixed Use Commercial Low	3.0	8.0
Timnath	Employment	Commercial Retail High	0.0	6.0
Timnath	High Density Residential	Multi-Family Residential	8.0	0.0
Timnath	Low Density Mixed Use	Mixed Use Residential Low	3.0	0.2
Timnath	Low Density Residential	Single Family Residential Low	3.0	0.0
Timnath	Medium Density Residential	Single Family Residential Ultra Low	6.0	0.0
Timnath	Mixed Use	Mixed Use Planned Unit Development Residential/Commercial Retail	6.0	15.0
Timnath	Open Space	Open Space, Parks	0.0	1.0
Timnath	Public	Government Employment	0.0	0.0
Timnath	Regional Commercial	Commercial Retail High	0.0	4.0
Timnath	Residential Mixed Use	Mixed Use Residential Low	3.0	4.0
Timnath	Very Low Density Residential	Single Family Residential Ultra Low	1.0	0.0
Timnath	Water	Water Bodies	0.0	0.0
Weld	A	Agriculture / Residential	0.0	0.0
Weld	A, E, PUD	Mixed Use Residential Low	2.5	2.0
Weld	C-1	Commercial Retail Low	0.0	1.0
Weld	C-3	Commercial Retail High	0.0	10.0
Weld	E	Single Family Residential Ultra Low	0.5	0.0
Weld	E, PUD	Mixed Use Planned Unit Development Residential/Commercial Retail	2.5	2.0
Weld	I-3	Employment Industrial High	0.0	6.0
Weld	PUD	Mixed Use Planned Unit Development Residential/Commercial Retail	2.5	4.0
Weld	R-1	Single Family Residential Low	4.0	0.0
Weld	R-1, PUD	Public / Civic Recreation Sports fields, etc.	2.5	4.0
Wellington	Agriculture	Agriculture / Residential	0.0	0.0
Wellington	C-1 Community Commercial	Commercial Retail Low	0.0	2.0
Wellington	C-2 Downtown Commercial	Commercial Retail Low	0.0	10.0
Wellington	C-3 Highway Commercial	Commercial Retail Low	0.0	2.0
Wellington	Commercial	Commercial Retail Low	0.0	13.0

Jurisdiction	Land Use / Zoning	Consolidated Land Use Category	Households per Acre	Employment per Acre
Wellington	Future School Sites	Government Employment	0.0	30.0
Wellington	I Industrial	Industrial Low	0.0	6.0
Wellington	Lake	Water Bodies	0.0	0.0
Wellington	LI Light Industrial	Industrial Low	0.0	0.2
Wellington	Light Industrial	Industrial Low	0.0	0.2
Wellington	P Public	Public / Civic Recreation Sports fields, etc.	0.0	0.0
Wellington	Public/Parks & Open Space	Open Space, Parks	0.0	0.0
Wellington	R-1 Residential Rural	Single Family Residential Ultra Low	0.3	0.0
Wellington	R-2 Residential Medium	Single Family Residential Ultra Low	2.0	0.0
Wellington	R-4 Residential Multi-Family	Multi-Family Residential	10.0	0.0
Wellington	Reservoirs	Water Bodies	0.0	0.0
Wellington	Rural Residential	Single Family Residential Ultra Low	0.3	0.0
Wellington	TR Transitional	Single Family Residential Low	1.0	0.0
Wellington	Urban Density Residential	Single Family Residential Ultra Low	5.0	0.0
Windsor	Central Business District	Mixed Use Commercial Medium	10.0	20.0
Windsor	Community Separator	Open Space, Parks	0.2	0.0
Windsor	Employment Corridor	Industrial Low	0.0	10.0
Windsor	Heavy Industrial	Industrial Low	0.0	5.0
Windsor	High Density Estate Single Family Residential	Single Family Residential Ultra Low	1.0	0.0
Windsor	Light Industrial	Industrial Low	0.0	3.0
Windsor	Low Density Estate Single Family Residential	Single Family Residential Ultra Low	0.3	0.0
Windsor	Multi-Family Residential	Multi-Family Residential	15.0	0.0
Windsor	Neighborhood & General Commercial	Commercial Retail High	0.0	25.0
Windsor	Other Public/Semi-Private	Government Employment	0.0	0.0
Windsor	Parks, Open Space, Mineral Extraction & Flood Plain	Open Space, Parks	0.0	0.0
Windsor	Residential Mixed Use	Mixed Use Residential Low	6.0	0.0
Windsor	Schools	Public / Civic Campus K-12	0.0	25.0
Windsor	Single Family Residential	Single Family Residential Ultra Low	4.0	0.0