



4701 SANGAMORE ROAD | SUITE S240 | BETHESDA | MD 20816
T: 800.424.4318 | F: 301.320.4860

300 UNO LAGO DRIVE | SUITE 405 | NORTH PALM BEACH | FL 33408
T: 800.424.4318 | F: 301.320.4860

WWW.TISCHLERBISE.COM

To: Chris Meschuk, AICP
Senior Planner, Department of Community Planning & Sustainability
City of Boulder

From: Dwayne Guthrie, Ph.D., AICP, and Julie Herlands, AICP
TischlerBise

Date: January 27, 2016

RE: **DRAFT #3** Land Use Assumptions for Impact Fee/Excise Tax Studies

Attached please find Draft Land Use Assumptions for the Impact Fee/Excise Tax Studies. This document will become an Appendix to the final report(s) developed for this assignment.

Please let us know if there are any comments or questions. Thank you.

Appendix A: Demographic Data

The population, housing unit, and job projections contained in this document provide the foundation for the Impact Fee/Excise Tax update for the City of Boulder. To evaluate the demand for growth-related infrastructure from various types of development, TischlerBise prepared documentation on population, housing units, jobs, nonresidential floor area, Average Weekday Vehicle Trip Ends (AWVTE), and demand indicators by type and size of dwelling. These metrics (explained further below) are the service units and demand indicators that will be used in the impact fee update.

Impact fees are based on the need for growth-related improvements and they must be proportionate by type of land use. Demographic data and development projections will be used to demonstrate proportionality and anticipate the need for future infrastructure. All land use assumptions and projected growth rates are consistent with socioeconomic data from the 2015 Boulder Valley Comprehensive Plan Trends Report. In contrast to the Comprehensive Plan, that has a long-range horizon, impact fees/excise taxes require a quantitative analysis with a shorter focus. Typically, impact fee studies look out five to ten years, with the expectation that fees will be periodically updated (e.g., every 5 years). Infrastructure standards are calibrated using Fiscal Year 2015 data, with FY16 being the first projection year. In the City of Boulder, the fiscal year begins on January 1st.

Impact Fee/Excise Tax Service Area

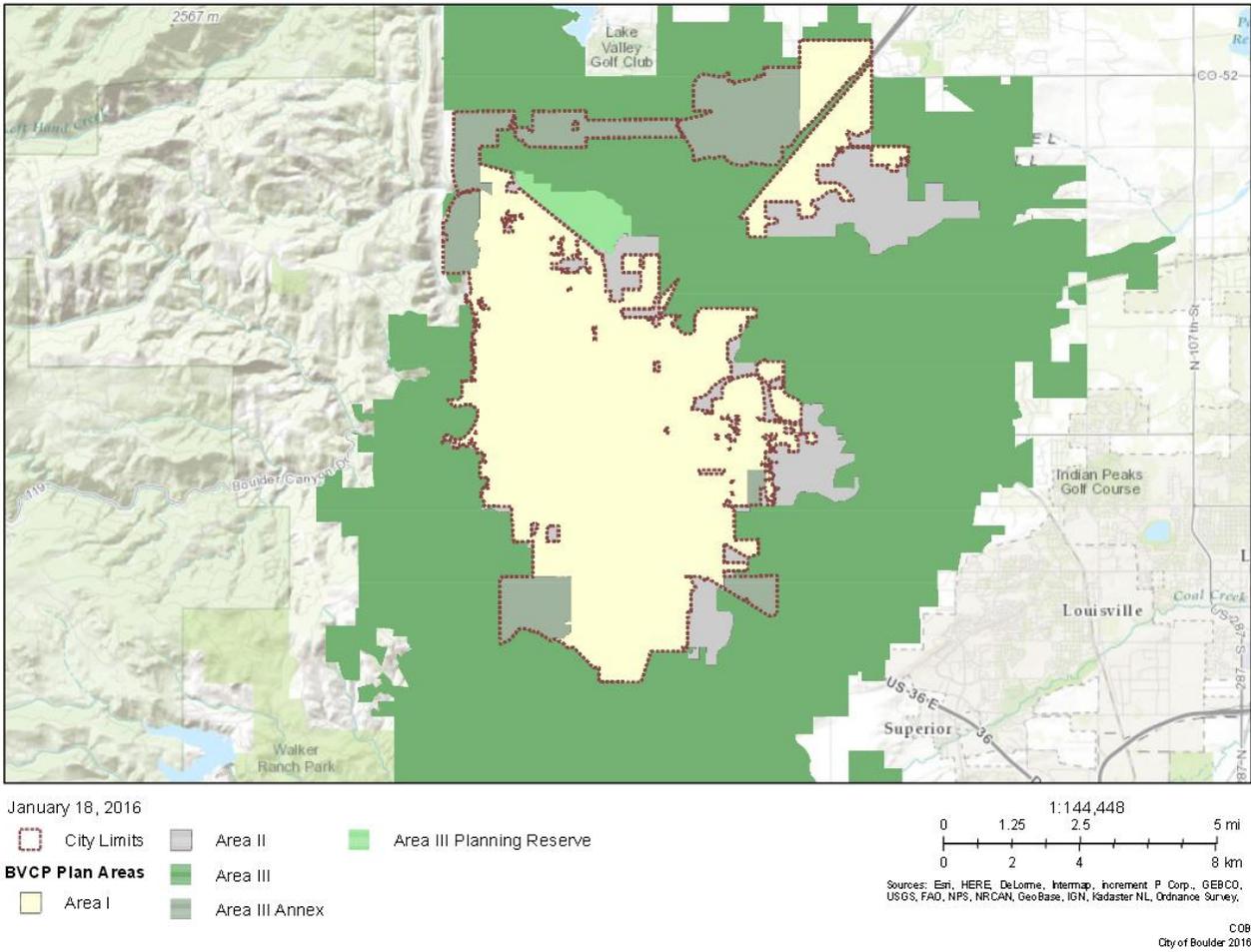
The City of Boulder is part of the Boulder Valley planning area, which is comprised of three areas:

- Area I is the urbanized area of the city.
- Area II is under county jurisdiction but where annexation to the city can be considered and where new urban development may occur coincident with adequate facilities and services.
- Area III is the remaining area in the Boulder Valley, generally under county jurisdiction and where the city and county intend to preserve existing rural land uses and character.¹

The service area for the Impact Fee/Excise Tax study is the city limits. City estimates for 2015 and projections for 2015 to 2040 from the *2015 Boulder Valley Comprehensive Plan (BVCP) Trends Report* are used in this analysis and reflect development within Boulder City limits as defined in the BVCP. **For growth projections, city limits includes future development in both Area I and annexed portions of Area III.**

¹ 2015 BVCP Trends Report.

Figure A1: City of Boulder Planning Areas



Summary of Growth Indicators

Key development projections for the City of Boulder Impact Fee/Excise Tax study are housing units and nonresidential floor area, as shown in Figure A2. These projections will be used to estimate impact fee/excise tax revenue and to indicate the anticipated need for growth-related infrastructure. The goal is to have reasonable projections without being overly concerned with precision. Because impact fee methods are designed to reduce sensitivity to development projections in the determination of the proportionate-share fee amounts, if actual development is slower than projected, fee revenue will decline, but so will the need for growth-related infrastructure. In contrast, if development is faster than anticipated, the City will receive an increase in fee revenue, but will also need to accelerate infrastructure improvements to keep pace with the actual rate of development.

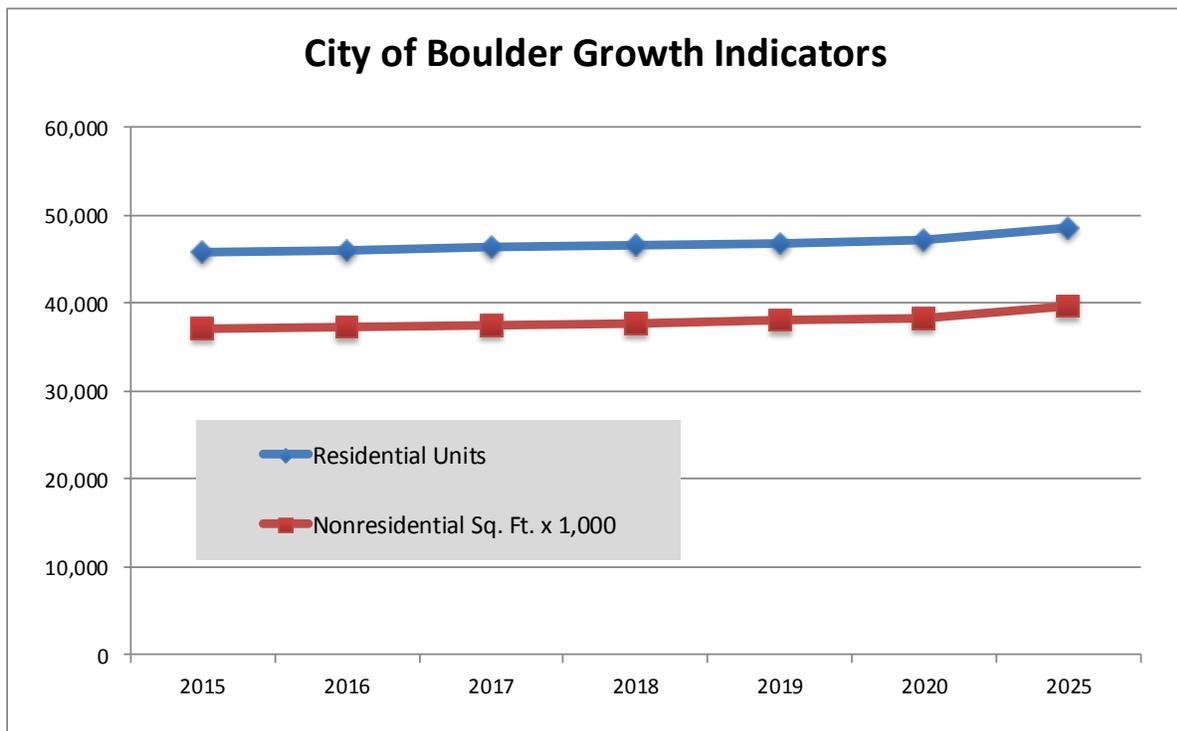
During the next five years, the 2015-2016 impact fee update expects an average increase of 282 housing units per year in the City. In comparison, 365 housing units on average were added per year from 2010 to 2014 and 387 units per year on average from 2004 to 2014.²

For nonresidential development, over the next five years, the City of Boulder expects an average increase of 264,000 square feet of nonresidential floor area per year. Current estimates of floor area by type of nonresidential development are discussed below (see Figure A10 and related text).

² Because approximately 80 percent of recent housing development in the City is multifamily units, development activity is relatively “lumpy,” with yearly increases and decreases reflecting completion of multifamily buildings with multiple buildings coming online as opposed to single units.

Figure A2: Summary of Development Projections and Growth Rates

| City of Boulder | 10-Year Projection Period | | | | | | | | Increase | Compound Growth Rate | |
|--------------------------------|---------------------------|--------|--------|--------|--------|-----------------|--------|-----------------------------|----------|----------------------|--|
| | One-Year Intervals | | | | | 5-Year Interval | | 2015 to 2025 Average Annual | | | |
| | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2025 | | | | |
| Residential Units | 45,740 | 46,012 | 46,288 | 46,566 | 46,846 | 47,127 | 48,557 | 282 | 0.62% | | |
| Nonresidential Sq. Ft. x 1,000 | 36,991 | 37,245 | 37,503 | 37,762 | 38,023 | 38,286 | 39,627 | 264 | 0.71% | | |



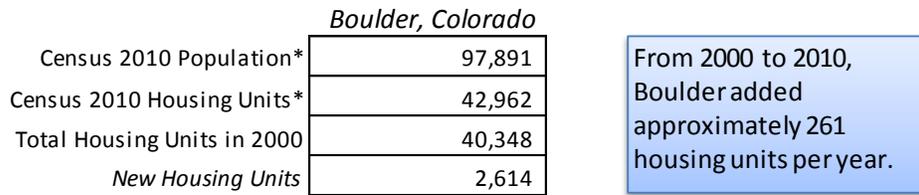
Sources: Figure A12: Population and Housing Unit Projections; Figure A13: Projected Jobs and Nonresidential Floor Area

Residential Construction

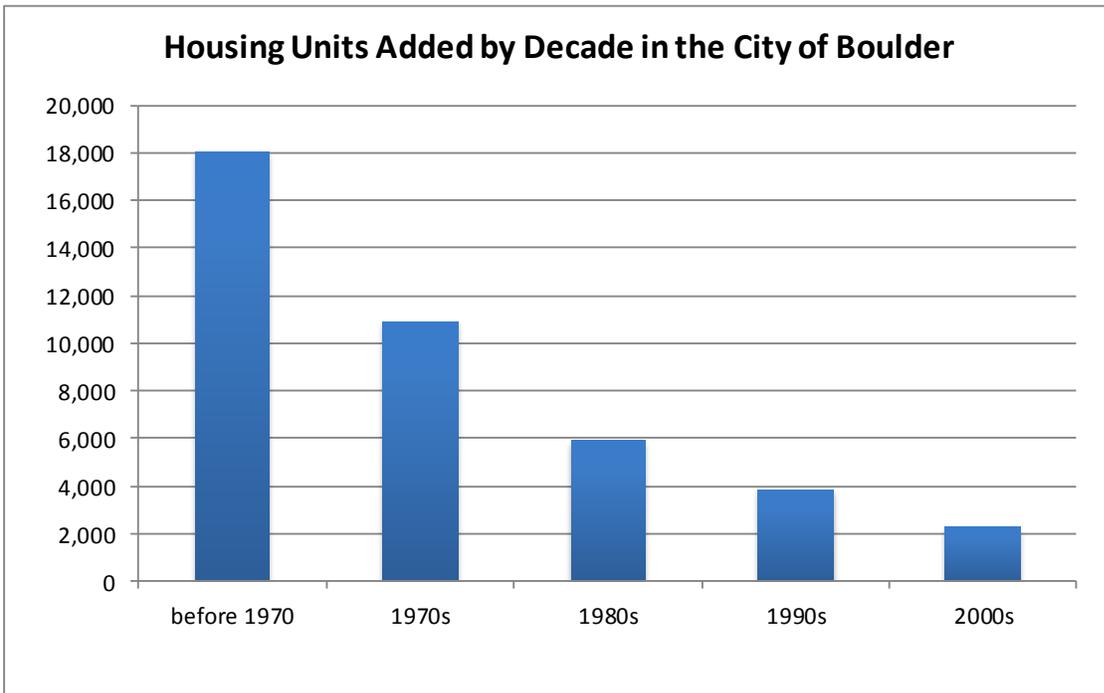
From 2000 to 2010, the City of Boulder increased by an average of 261 housing units per year. Figure A3 indicates citywide housing units added by decade in the city, according to data obtained from the U.S. Census Bureau and the 2015 BVCP Trends Report. Consistent with the nationwide decline in development activity during the Great Recession, residential construction slowed significantly from 2008 to 2010, thus decreasing the number of units added during the past decade. However, development

activity has increased in recent years, and the City of Boulder estimates that over the last five years (2010 through 2014), approximately 365 units have been built per year.

Figure A3: Housing Units by Decade



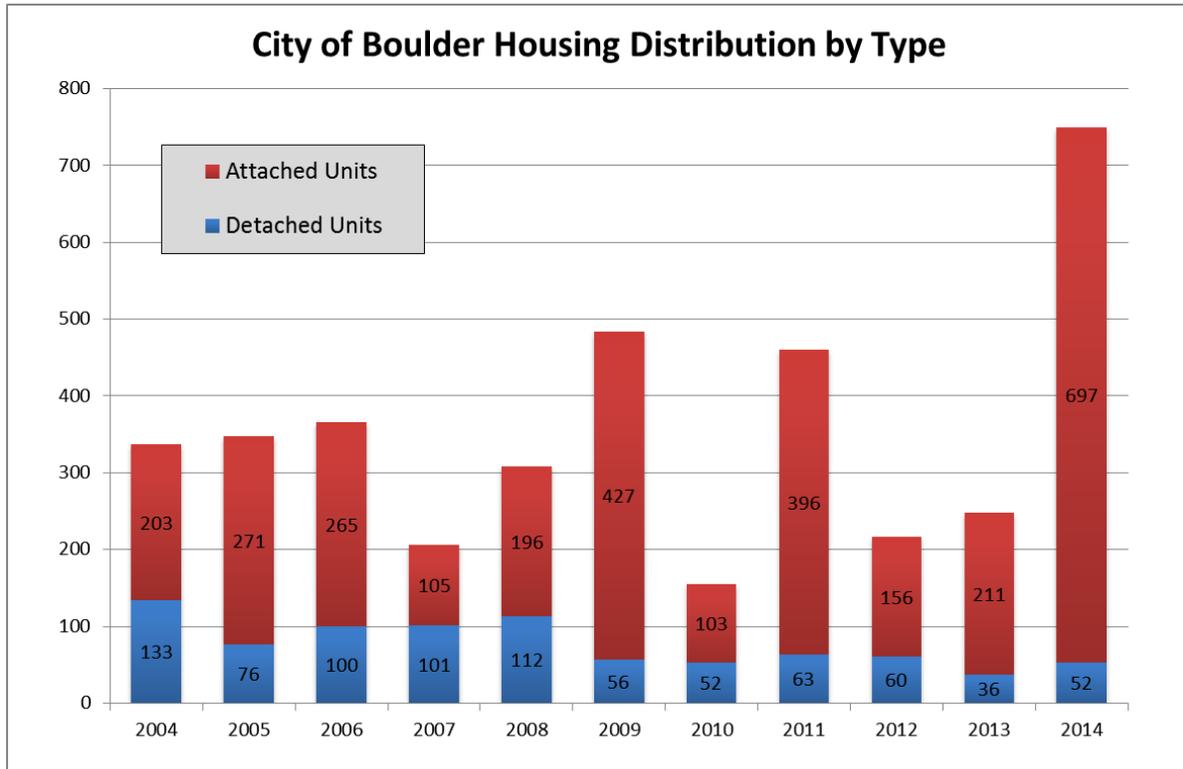
* From City of Boulder, 2015 BVCP Trends Report.



Sources: City of Boulder, 2015 BVCP Trends Report; US Census American Community Survey

Furthermore, recent residential development in the City has been in multifamily structures rather than detached, single family homes. Figure A4 provides detail on residential construction over the last ten years illustrating the recent demand and absorption of multifamily units at a recent trend of approximately 80 percent multifamily attached and 20 percent single family detached, which is consistent with the distribution assumed in the BVCP projections

Figure A4: City of Boulder Housing Unit Distribution Trends by Type



Source: 2015 BVCP Trends Report

Figure A5: City of Boulder Housing Unit 10-Year and 5-Year Trends by Type

| | 10-Yr Trend | 5-Yr Trend |
|---------------------------|--------------|--------------|
| Detached Units | 708 | 263 |
| Attached Units | 2,827 | 1,563 |
| Total Net Increase | 3,535 | 1,826 |
| <i>Average Annual</i> | 354 | 365 |
| Detached % | 20% | 14% |
| Attached % | 80% | 86% |

Source: 2015 BVCP Trends Report

Residential Demand Factors

The 2010 Census did not obtain detailed information using a “long-form” questionnaire. Instead, the U.S. Census Bureau has switched to a continuous monthly mailing of surveys, known as the American Community Survey (ACS), which is limited by sample-size constraints. For example, data on detached housing units are now combined with attached single units (commonly known as townhouses). Part of the rationale for deriving fees by bedroom range, as discussed further below, is to address this ACS data limitation. Because townhouses generally have fewer bedrooms and less living space than detached units, fees by house size ensure proportionality and facilitate construction of affordable units.

According to the U.S. Census Bureau, a household is a housing unit that is occupied by year-round residents. Impact fees often use per capita standards and persons per housing unit, or persons per household, to derive proportionate-share fee amounts. TischlerBise recommends that fees for residential development in Boulder be imposed according to the number of year-round residents per housing unit. Figure A6 indicates the average number of year-round residents per housing unit.

Figure A6: Year-Round Persons per Unit by Type of Housing

2013 Summary by Two House Types: City of Boulder

| <i>Units in Structure</i> | <i>Persons</i> | <i>House-holds</i> | <i>Persons per Household</i> | <i>Housing Units</i> | <i>Persons per Housing Unit</i> | <i>Housing Mix</i> | <i>Vacancy Rate</i> |
|---------------------------|----------------|--------------------|------------------------------|----------------------|--|--------------------|---------------------|
| Single Unit* | 57,742 | 22,479 | 2.57 | 23,284 | 2.48 | 52.9% | 3% |
| All Other | 36,747 | 19,828 | 1.85 | 20,767 | 1.77 | 47.1% | 5% |
| Subtotal | 94,489 | 42,307 | 2.23 | 44,051 | 2.14 | | 4% |
| Group Quarters | <u>8,674</u> | | | | | | |
| TOTAL | <u>103,163</u> | | | | | | |

* Single unit includes detached and attached (e.g. townhouse).

Source: Tables B25024, B25032, B25033, and B26001.

2013 American Community Survey 1-Year Estimates, U.S. Census Bureau.

Demand Indicators by Dwelling Size

Custom tabulations of demographic data by bedroom range can be created from individual survey responses provided by the U.S. Census Bureau, in files known as Public Use Micro-data Samples (PUMS). PUMS files are available for areas of roughly 100,000 persons, and the City of Boulder is wholly contained in Public Use Micro-data Areas (PUMA) 803. At the top of Figure A7, in the cells with yellow shading, are the survey results for the City of Boulder. Unadjusted persons per dwelling, derived from PUMS data, were adjusted upward to match the control totals for the City of Boulder, as documented above in Figure A6.

Figure A7: Average Number of Persons by Bedroom Range (All Housing Types)

City of Boulder 2013 Data

| Bedroom Range | Persons (1) | Vehicles Available (1) | Housing Units (1) | Boulder Hsg Mix | Unadjusted Persons/HU | Adjusted Persons/HU (2) |
|---------------|-------------|------------------------|-------------------|-----------------|-----------------------|-------------------------|
| 0-1 | 114 | 89 | 89 | 19% | 1.28 | 1.31 |
| 2 | 220 | 162 | 121 | 25% | 1.82 | 1.86 |
| 3 | 296 | 236 | 134 | 28% | 2.21 | 2.26 |
| 4+ | 372 | 300 | 135 | 28% | 2.76 | 2.83 |
| Total | 1,002 | 787 | 479 | | 2.09 | 2.14 |

(1) American Community Survey, Public Use Microdata Sample for CO PUMA 803 (2013 One-Year unweighted data).

(2) Adjusted multipliers are scaled to make the average PUMS values match control totals based on American Community Survey 2013 1-year data for the City of Boulder.

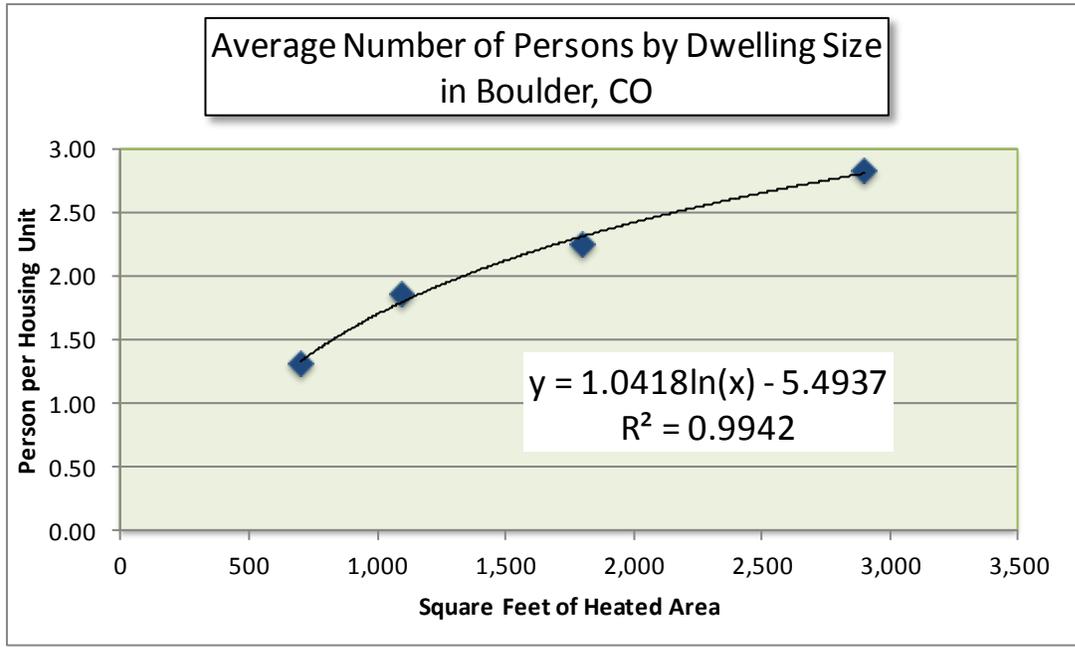
Average Number of Persons by Dwelling Size

Average floor area and number of persons by bedroom range are plotted in Figure A8, with a logarithmic trend line derived from four actual averages in the City. Using the trend line formula shown in the chart, TischlerBise derived the estimated average number of persons, by dwelling size, using five size thresholds. For the purpose of impact fees/excise taxes, TischlerBise recommends a minimum fee based on a unit size of 800 square feet and a maximum fee for units 2201 square feet or larger. Average dwelling sizes by bedroom range in the City was derived from the Property Assessor parcel database.

Figure A8: Persons by Square Feet of Living Space (All Housing Types)

| <i>Actual Averages per Hsg Unit</i> | | | <i>Fitted-Curve Values</i> | |
|-------------------------------------|--------------------|----------------|----------------------------|----------------|
| <i>Bedrooms</i> | <i>Square Feet</i> | <i>Persons</i> | <i>Sq Ft Range</i> | <i>Persons</i> |
| 0-1 | 700 | 1.31 | 800 or less | 1.17 |
| 2 | 1,100 | 1.86 | 801 to 1200 | 1.80 |
| 3 | 1,800 | 2.26 | 1201 to 1600 | 2.19 |
| 4+ | 2,900 | 2.83 | 1601 to 2200 | 2.52 |
| | | | 2201 or more | 2.83 |

Average dwelling size by bedroom range is from Property Assessor parcel database. Average persons per housing unit by bedroom range are derived from 2013 1-Year ACS PUMS data for CO PUMA 803 (City of Boulder).



Nonresidential Development Demand Indicators

In addition to data on residential development, the calculation of impact fees requires data on nonresidential development. TischlerBise uses the term “jobs” to refer to employment by place of work.

Figure A9 indicates the key nonresidential development prototypes that will be used to derive average weekday vehicle trips and Vehicle Miles of Travel (VMT). Current floor area estimates for industrial, commercial, and office/other services, are documented in the next section.

The prototype for future commercial development (i.e., retail and eating/drinking places) is an average-size Shopping Center (ITE code 820). For office and other services, General Office (ITE 710) is the prototype for future development. For future industrial development, two prototypes are included to reflect differences between Light Industrial (ITE code 110) and Warehouse (ITE code 150). (Current industrial estimates and projections use local data.) The remaining nonresidential land use categories included below are anticipated to be included in the impact fee schedule. ITE data for nonresidential land uses are used to reflect the relative average demand on the system from different types of land uses to be used in limited parts of the Impact Fee/Excise Tax Study—Police Impact Fee update and the Multimodal Transportation Funding Study. Further adjustments are anticipated to be made regarding these assumptions particularly for the Multimodal Transportation components of the Study as it progresses.

Figure A9: Nonresidential Service Units per Development Unit

| <i>Nonres.</i> | | | | <i>ITE Trip Rate per</i> | <i>Employees per</i> | <i>Sq. Ft. per</i> |
|------------------|-----------------|--------------------------------|--------------------|--------------------------|----------------------|--------------------|
| <i>Category#</i> | <i>ITE Code</i> | <i>Nonresidential Land Use</i> | <i>Demand Unit</i> | <i>Demand Unit</i> | <i>Demand Unit*</i> | <i>Employee*</i> |
| 1 | 820 | Retail / Restaurant / Service | 1,000 Sq Ft | 42.7 | 2.51 | 399 |
| 2 | 710 | Office | 1,000 Sq Ft | 11.03 | 3.59 | 279 |
| 3 | 110 | Light Industrial | 1,000 Sq Ft | 6.97 | 2.31 | 433 |
| 4 | 150 | Warehousing | 1,000 Sq Ft | 3.56 | 0.92 | 1,087 |
| 5 | 520 | Institutional [^] | 1,000 Sq Ft | 14.03 | 0.81 | 1,235 |
| 6 | 610 | Hospital | 1,000 Sq Ft | 13.22 | 2.94 | 340 |
| 7 | 620 | Nursing Home/Assisted Living | Bed | 2.74 | 0.84 | na |
| 8 | 310 | Lodging | Room | 8.17 | 0.57 | na |

* Factors derived from ITE trip data except Retail and Office, which is derived from local data (parcel database and current jobs)

[^] Institutional = E.g., schools, churches

Sources: Trip Generation, Institute of Transportation Engineers (ITE), 9th Edition (2012);

Boulder County parcel database for City of Boulder (TischlerBise analysis); QCEW 2014 (CO Dept. of Labor and Employment)

Figure A10 provides the estimate of number and type of jobs located in the City of Boulder in 2015. The 2015 total job estimate of 98,510 is from the City of Boulder *2015 BVCP Trends Report* and reflects total of jobs of any type and any location including self-employment. To determine the estimate of jobs at nonresidential locations, TischlerBise used average annual 2014 Quarterly Census of Employment and Wages (QCEW) data for the City of Boulder and applied that distribution to the 2015 at-place estimate of 89,202.

Figure A10: Jobs Estimate by Type

| | <i>Jobs 2014*</i> | <i>% of At-Place</i> | <i>Jobs 2015^</i> | <i>% of Total Jobs</i> |
|---|-------------------|----------------------|-------------------|------------------------|
| Retail | 21,232 | 24% | 21,482 | 22% |
| Office, Institutional, and Other Services | 52,647 | 60% | 53,268 | 54% |
| Industrial | 14,283 | 16% | 14,451 | 15% |
| Total (At Place Jobs) | 88,162 | 100% | 89,202 | 91% |
| Self-Employed Estimate** | | | 9,308 | 9% |
| Total Jobs | | | 98,510 | 100% |

* Colorado Dept. of Labor and Employment, *Quarterly Census of Employment and Wages (QCEW) 2014 average annual.*

^ City of Boulder 2015 for estimate of at-place jobs and self-employed; distributed based on QCEW 2014 data.

** City of Boulder 2015 estimate.

Using the above data and nonresidential floor area from the City’s parcel database, average square feet per job (and jobs per 1,000 square feet) can be derived. The City currently has approximately 37 million square feet of nonresidential building space in 2015. Dividing floor area by jobs indicates current averages by type of development as shown in Figure A11.

Figure A11: Nonresidential Floor Area Estimates and Demand Factors

| | <i>Sq. Ft.*</i> | <i>Jobs 2015</i> | <i>% Jobs Distribution</i> | <i>Sq. Ft. per Job</i> | <i>Jobs per 1,000 Sq. Ft.</i> |
|---|-----------------|------------------|----------------------------|------------------------|-------------------------------|
| Retail | 8,565,611 | 21,482 | 24% | 399 | 2.51 |
| Office, Institutional, and Other Services | 14,848,416 | 53,268 | 60% | 279 | 3.59 |
| Industrial | 13,576,996 | 14,451 | 16% | 940 | 1.06 |
| Total Nonresidential | 36,991,023 | 89,202 | 100% | | |

* County parcel database for City of Boulder; TischlerBise analysis

Detailed Land Use Assumptions

Demographic data shown in Figure A12 will be key inputs for the City of Boulder’s impact fee/excise tax update. Cells with gray shading are from the *2015 BVCP Trends Report*. Per the City projections, it is anticipated that the City will reach residential buildout at 52,000 housing units and 123,000 residents, which occurs prior to 2040.

New housing development is assumed to be predominantly multifamily development. Using recent trends, as shown above in Figure A4 from the *2015 BVCP Trends Report*, new housing units are assumed to be 20 percent single family and 80 percent multifamily.

Figure A12: Population and Housing Unit Projections

| | 2015 | Projections ==> | | | | | | | | | 25-Year Net Increase |
|--------------------------------------|---------|-----------------|---------|---------|---------|---------|---------|---------|---------|---------|-------------------------|
| | | 2016 | 2017 | 2018 | 2019 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| | Base Yr | 1 | 2 | 3 | 4 | 5 | 10 | 15 | 20 | 25 | |
| Cumulative Population | | | | | | | | | | | |
| Population [^] | 104,808 | 105,566 | 106,324 | 107,082 | 107,840 | 108,598 | 112,388 | 116,178 | 119,968 | 123,000 | 18,192 |
| Annual Net Increase in Population | | 758 | 758 | 758 | 758 | 758 | 758 | 758 | 758 | 0 | |
| Cumulative Housing Units | | | | | | | | | | | |
| | New % | | | | | | | | | | |
| Housing Units [^] | 45,740 | 46,012 | 46,288 | 46,566 | 46,846 | 47,127 | 48,557 | 50,032 | 51,551 | 52,010 | 6,270 |
| Single Family Hsg Units | 20% | 24,242 | 24,297 | 24,352 | 24,407 | 24,463 | 24,520 | 24,806 | 25,101 | 25,404 | 1,254 |
| All Other Hsg Units | 80% | 21,498 | 21,716 | 21,937 | 22,159 | 22,382 | 22,607 | 23,752 | 24,931 | 26,146 | 5,016 |
| Annual Net Increase in Housing Units | | 272 | 276 | 278 | 279 | 281 | 290 | 298 | 307 | 0 | 6,270 |

[^] Includes Colorado University group quarters population (in dormitories) and residential units (apartments)

Source: 2015 BVCP Trends Report; TischlerBise analysis

Figure A13 provides projected jobs, by type of nonresidential floor area. Cells with gray shading are from the *2015 BVCP Trends Report*.

Projected jobs (shown at top of the figure) were converted to projections of nonresidential floor area (at the bottom of the figure) using the current multipliers listed above in Figure A9. The projected “jobs to population” ratio is shown at the bottom of the figure for informational purposes.

Figure A13: Projected Jobs and Nonresidential Floor Area

| | Projections ==> | | | | | | | | | | 25-Year Net Increase | |
|---|--------------------|---------------|---------------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|-------------------------|---------------|
| | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2025 | 2030 | 2035 | 2040 | | |
| | Base Yr | 1 | 2 | 3 | 4 | 5 | 10 | 15 | 20 | 25 | | |
| Cumulative Jobs | | | | | | | | | | | | |
| Total Employment | 98,510 | 99,187 | 99,871 | 100,561 | 101,255 | 101,954 | 105,523 | 109,219 | 113,047 | 117,010 | 18,500 | |
| Annual Net Increase in Jobs | | 677 | 685 | 689 | 694 | 699 | 724 | 750 | 776 | 804 | | |
| | <i>% of Total</i> | | | | | | | | | | | |
| Retail | 22% | 21,482 | 21,630 | 21,779 | 21,930 | 22,081 | 22,233 | 23,012 | 23,818 | 24,652 | 25,517 | 4,034 |
| Office, Institutional, and Other Services | 54% | 53,268 | 53,634 | 54,004 | 54,377 | 54,753 | 55,131 | 57,061 | 59,059 | 61,129 | 63,272 | 10,003 |
| Industrial | 15% | 14,451 | 14,551 | 14,651 | 14,752 | 14,854 | 14,957 | 15,480 | 16,022 | 16,584 | 17,165 | 2,714 |
| Total (At Place Jobs) | | 89,202 | 89,815 | 90,435 | 91,059 | 91,688 | 92,321 | 95,553 | 98,899 | 102,365 | 105,954 | 16,752 |
| Self-Employed Estimate | 9% | 9,308 | 9,372 | 9,437 | 9,502 | 9,567 | 9,633 | 9,971 | 10,320 | 10,682 | 11,056 | 1,748 |
| Total Jobs | | 98,510 | 99,187 | 99,871 | 100,561 | 101,255 | 101,954 | 105,523 | 109,219 | 113,047 | 117,010 | 18,500 |
| Annual Net Increase in Jobs^ | | | | | | | | | | | | |
| Retail | | | 148 | 149 | 150 | 151 | 152 | 158 | 163 | 169 | 175 | 4,034 |
| Office, Institutional, and Other Services | | | 366 | 370 | 373 | 375 | 378 | 391 | 405 | 420 | 435 | 10,003 |
| Industrial | | | 99 | 100 | 101 | 102 | 103 | 106 | 110 | 114 | 118 | 2,714 |
| Total (At Place Jobs) | | | 613 | 620 | 624 | 629 | 633 | 655 | 679 | 703 | 728 | 16,752 |
| Self-Employed Estimate | | | 64 | 65 | 65 | 66 | 66 | 68 | 71 | 73 | 76 | 1,748 |
| Total Jobs | | | 677 | 685 | 689 | 694 | 699 | 724 | 750 | 776 | 804 | 18,500 |
| Nonresidential Square Footage | | | | | | | | | | | | |
| | <i>Jobs/1000sf</i> | | | | | | | | | | | |
| Retail | 2.51 | 8,565,611 | 8,624,414 | 8,683,890 | 8,743,783 | 8,804,095 | 8,864,830 | 9,174,939 | 9,496,055 | 9,828,568 | 10,172,884 | 1,607,273 |
| Office, Institutional, and Other Services | 3.59 | 14,848,416 | 14,950,360 | 15,053,473 | 15,157,308 | 15,261,869 | 15,367,162 | 15,904,789 | 16,461,497 | 17,037,966 | 17,634,895 | 2,786,479 |
| Industrial | 1.06 | 13,576,996 | 13,670,663 | 13,765,405 | 13,860,809 | 13,956,881 | 14,053,626 | 14,547,603 | 15,059,113 | 15,588,778 | 16,137,243 | 2,560,247 |
| Total Nonresidential Square Footage | | 36,991,023 | 37,245,437 | 37,502,768 | 37,761,900 | 38,022,846 | 38,285,618 | 39,627,331 | 41,016,665 | 42,455,312 | 43,945,021 | 6,953,998 |
| Annual Net Increase in Nonres Sq. Ft. | | | 254,414 | 257,331 | 259,132 | 260,946 | 262,773 | 272,099 | 281,757 | 291,757 | 302,113 | |
| Population | | 104,808 | 105,566 | 106,324 | 107,082 | 107,840 | 108,598 | 112,388 | 116,178 | 119,968 | 123,000 | 18,192 |
| Jobs to Population Ratio | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.95 | 1.02 |

Source: 2015 BVCP Trends Report; TischlerBise analysis