



2016 Transportation Capital Expansion Fee Study

**Prepared for:
City of Fort Collins, Colorado**

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EXECUTIVE SUMMARY

The City of Fort Collins currently collects Street Oversizing Capital Expansion Fees based on staff study completed in 2000. Although Colorado is a “home-rule” state and home-rule municipalities were already collecting “impact fees” under their home-rule authority granted in the Colorado Constitution, the Colorado Legislature passed enabling legislation in 2001, as discussed further below.

COLORADO IMPACT FEE ENABLING LEGISLATION

For local governments, the first step in evaluating funding options for transportation improvements is to determine basic options and requirements established by state law. Some states have more conservative legal parameters that basically restrict local government to specifically authorized actions. In contrast, “home-rule” states grant local governments broader powers that may or may not be precluded or preempted by state statutes depending on the circumstances and on the state’s particular laws. Home rule municipalities in Colorado, like Fort Collins, have the authority to impose impact fees based on both their home rule power granted in the Colorado Constitution and the impact fee enabling legislation enacted in 2001 by the Colorado General Assembly.

Impact fees are one-time payments imposed on new development that must be used solely to fund growth-related capital projects, typically called “system improvements”. An impact fee represents new growth’s proportionate share of capital facility needs. In contrast to project-level improvements, impact fees fund infrastructure that will benefit multiple development projects, or even the entire service area, as long as there is a reasonable relationship between the new development and the need for the growth-related infrastructure. Project-level improvements, typically specified in a development agreement, are usually limited to transportation improvements near a proposed development, such as ingress/egress lanes.

According to Colorado Revised Statute Section 29-20-104.5, impact fees must be legislatively adopted at a level no greater than necessary to defray impacts generally applicable to a broad class of property. The purpose of impact fees is to defray capital costs directly related to proposed development. The statutes of other states allow impact fee schedules to include administrative costs related to impact fees and the preparation of capital improvement plans, but this is not specifically authorized in Colorado’s statute. Impact fees do have limitations, and should not be regarded as the total solution for infrastructure funding. Rather, they are one component of a comprehensive portfolio to ensure adequate provision of public facilities. Because system improvements are larger and more costly, they may require bond financing and/or funding from other revenue sources. To be funded by impact fees, Section 29-20-104.5 requires that the capital improvements must have a useful life of at least five years. By law, impact fees can only be used for capital improvements, not operating or maintenance costs. Also, development impact fees cannot be used to repair or correct existing deficiencies in existing infrastructure.

ADDITIONAL LEGAL GUIDELINES

Both state and federal courts have recognized the imposition of impact fees on development as a legitimate form of land use regulation, provided the fees meet standards intended to protect against regulatory takings. Land use regulations, development exactions, and impact fees are subject to the Fifth Amendment prohibition on taking of private property for public use without just compensation. To comply with the Fifth Amendment, development regulations must be shown to substantially advance a legitimate governmental interest. In the case of impact fees, that interest is the protection of public health, safety, and welfare by ensuring development is not detrimental to the quality of essential public services. The means to this end are also important, requiring both procedural and substantive due process. The process followed to receive community input (i.e. stakeholder meetings, work sessions, and public hearings) provides opportunities for comments and refinements to the impact fees.

There is little federal case law specifically dealing with impact fees, although other rulings on other types of exactions (e.g., land dedication requirements) are relevant. In one of the most important exaction cases, the U. S. Supreme Court found that a government agency imposing exactions on development must demonstrate an “essential nexus” between the exaction and the interest being protected (see *Nollan v. California Coastal Commission*, 1987). In a more recent case (*Dolan v. City of Tigard, OR*, 1994), the Court ruled that an exaction also must be “roughly proportional” to the burden created by development.

There are three reasonable relationship requirements for development impact fees that are closely related to “rational nexus” or “reasonable relationship” requirements enunciated by a number of state courts. Although the term “dual rational nexus” is often used to characterize the standard by which courts evaluate the validity of development impact fees under the U.S. Constitution, TischlerBise prefers a more rigorous formulation that recognizes three elements: “need,” “benefit,” and “proportionality.” The dual rational nexus test explicitly addresses only the first two, although proportionality is reasonably implied, and was specifically mentioned by the U.S. Supreme Court in the *Dolan* case. Individual elements of the nexus standard are discussed further in the following paragraphs.

All new development in a community creates additional demands on some, or all, public facilities provided by local government. If the capacity of facilities is not increased to satisfy that additional demand, the quality or availability of public services for the entire community will deteriorate. Development impact fees may be used to cover the cost of development-related facilities, but only to the extent that the need for facilities is a consequence of development that is subject to the fees. The *Nollan* decision reinforced the principle that development exactions may be used only to mitigate conditions created by the developments upon which they are imposed. That principle likely applies to impact fees. In this study, the impact of development on infrastructure needs is analyzed in terms of quantifiable relationships between various types of development and the demand for specific facilities, based on applicable level-of-service standards.

The requirement that exactions be proportional to the impacts of development was clearly stated by the U.S. Supreme Court in the Dolan case and is logically necessary to establish a proper nexus.

Proportionality is established through the procedures used to identify development-related facility costs, and in the methods used to calculate impact fees for various types of facilities and categories of development. The demand for facilities is measured in terms of relevant and measurable attributes of development (e.g. a typical housing unit's average weekday vehicle trips).

A sufficient benefit relationship requires that impact fee revenues be segregated from other funds and expended only on the facilities for which the fees were charged. The calculation of impact fees should also assume that they will be expended in a timely manner and the facilities funded by the fees must serve the development paying the fees. However, nothing in the U.S. Constitution or the state enabling legislation requires that facilities funded with fee revenues be available exclusively to development paying the fees. In other words, benefit may extend to a general area including multiple real estate developments. Procedures for the earmarking and expenditure of fee revenues are discussed near the end of this study. All of these procedural as well as substantive issues are intended to ensure that new development benefits from the impact fees they are required to pay. The authority and procedures to implement impact fees is separate from and complementary to the authority to require improvements as part of subdivision or zoning review.

Impact fees must increase the carrying capacity of the transportation system. Capacity projects include, but are not limited to the addition of travel lanes, intersection improvements (i.e., turning lanes, signalization or roundabouts) and widening roads (e.g. adding travel lanes, paved shoulders, and bike lanes). Whenever improvements are made to existing roads, non-impact fee funding is typically required to help pay a portion of the cost.

CURRENT STREET OVERSIZING FEE

Figure 1 lists Street Oversizing Capital Expansion Fees currently collected in Fort Collins. For residential development, fees are imposed according to 11 different types of housing. For nonresidential development, fees are imposed according to size thresholds and 38 different categories.

Figure 1: 2015 Fee Schedule

2015 Street Oversizing Capital Expansion Fee					
Residential			Non Residential		
SF Detached	\$3,112	per D.U	Comm/Shopping Center		
MF and Other Housing	\$2,143	per D.U	1000K GLA	\$6.08	Per Sq. Ft.
Hotel/Motel	\$2,931	per Room	500K GLA	\$7.32	Per Sq. Ft.
Apartment	\$2,162	per D.U	200K GLA	\$10.32	Per Sq. Ft.
Retirement Community	\$914	per D.U	50K GLA	\$11.93	Per Sq. Ft.
Assisted Living	\$1,470	per D.U	Movie Theater	\$14.78	Per Sq. Ft.
Congregate Care Facility	\$657	per D.U	Fitness/Racquet Club	\$2.86	Per Sq. Ft.
Residential Condominium	\$1,889	per D.U	Day Care	\$6.30	Per Sq. Ft.
Duplex	\$2,335	per D.U	Government Office	\$14.04	Per Sq. Ft.
Townhome	\$1,905	per D.U	Building Materials/Lumber	\$8.55	Per Sq. Ft.
Mobile Home	\$1,623	per D.U	Specialty Retail	\$8.39	Per Sq. Ft.
			Discount Superstore	\$10.06	Per Sq. Ft.
			Nursery(Garden Center)	\$7.35	Per Sq. Ft.
			Sit Down Restaurant	\$16.55	Per Sq. Ft.
			Fast Food Restaurant w/ Driveup	\$39.46	Per Sq. Ft.
			Car Sales	\$6.79	Per Sq. Ft.
			Service Station	\$13,407.17	Per Pump
			Wholesale Tire Store	\$4.15	Per Sq. Ft.
			Self Service Car Wash	\$460.53	Per Stall
			Supermarket	\$13.31	Per Sq. Ft.
			Convenience Market w/Gas	\$43.16	Per Sq. Ft.
			Pharmacy/Drugstore	\$7.01	Per Sq. Ft.
			Furniture Store	\$1.61	Per Sq. Ft.
			Bank	\$5.98	Per Sq. Ft.
			Drive-In Bank	\$11.78	Per Sq. Ft.
			Insurance Building	\$2.33	Per Sq. Ft.
			Manufacturing	\$1.22	Per Sq. Ft.
			Warehousing	\$1.13	Per Sq. Ft.
			Light Industrial	\$2.22	Per Sq. Ft.
			Mini-Warehouse	\$0.80	Per Sq. Ft.
			Business Park	\$4.06	Per Sq. Ft.
			General Office		
			200K GFA	\$3.67	Per Sq. Ft.
			50K GFA	\$5.19	Per Sq. Ft.
			10K GFA	\$7.76	Per Sq. Ft.
			Recreational	\$1,158.09	Per Acre
			City Park	\$1,164.46	Per Acre
			Golf Course	\$1,603.52	Per Acre
			Elementary School	\$410.42	Per Student
			Private School (K-8)	\$789.03	Per Student
			Church/Synagogue	\$2.90	Per Sq. Ft.
			Library	\$4.47	Per Sq. Ft.
			Hospital	\$5.25	Per Sq. Ft.
			Nursing Home	\$754.03	Per Bed
			Medical Clinic	\$10.01	Per Sq. Ft.

* Note: Rate based on the product of Weekday Trips, Trip Adjustment Factor, and Cost Per Trip.

BOOKEND TRANSPORTATION CAPITAL EXPANSION FEES

Because impact fees for transportation facilities in Fort Collins are used for more than street oversizing, the 2016 study recommends a name change to Transportation Capital Expansion Fee (TCEF). As documented in this report, the City of Fort Collins has complied with applicable legal precedents and Colorado's Impact Fee enabling legislation (discussed above). The 2016 TCEF schedule is proportionate and reasonably related to the cost of capital improvements needed to accommodate new development.

Specific costs have been identified using local data and current dollars. With input from City staff, TischlerBise determined demand indicators for transportation capacity and calculated proportionate share factors to allocate costs by type of development. The TCEF methodology also identifies the extent to which new development is entitled to various types of credits to avoid potential double payment of growth-related capital costs.

High-range fees shown below would yield approximately a 24% increase in TCEF funding over the next ten years compared to the current street oversizing fees. The low-range range alternative would yield approximately the same level of TCEF funding over the next ten years as the 2015 street oversizing fees. However, the proportionate share paid by residential versus nonresidential development, as summarized in the table below, would shift due to a change in cost allocation from a simple vehicle trip methodology to vehicle miles of travel. Because the demand for transportation infrastructure is not simply a function of the number of trips, but must also consider trip lengths, the proposed methodology is more proportionate to the actual demand for capital facilities.

<i>Proportionate Share of Projected Revenue Over Ten Years</i>	<i>Residential Development</i>	<i>Nonresidential Development</i>
Current Fees	36%	64%
Proposed Fees	60%	40%

Figure 2 shows the high-range and low-range 2016 TCEF schedules, along with current fees. For residential development, updated amounts are based on square feet of finished living space. Garages, porches and patios are excluded from the TCEF assessment. Fees by dwelling size rather than type simplifies administration, improves proportionality, and is consistent with the way other Capital Expansion Fees are collected in Fort Collins.

For nonresidential development, TCEFs are stated per thousand square feet of floor area, using three broad categories. This change also makes the fees easier to administer and eliminating size thresholds helps small businesses that tend to be locally owned and managed. The recommended change is consistent with Colorado’s enabling legislation and the current approach used to collect other Capital Expansion Fees in Fort Collins. The TCEF schedule for nonresidential development is designed to provide a reasonable fee amount for general types of development. For unique developments, the City may allow or require an independent assessment.

Figure 2: Draft High-Range and Low-Range TCEF Schedules

Residential (per dwelling unit)						
Square Feet of Finished Living Space	Avg Wkdy Veh Trip Ends	Trip Rate Adjustment	Trip Length Adjustment	High-Range TCEF	Current Fees	Increase or Decrease
up to 700	3.70	50%	110%	\$2,205	\$1,905	\$300
701 to 1200	6.87	50%	110%	\$4,095	\$2,143	\$1,952
1201 to 1700	8.92	50%	110%	\$5,317	\$3,112	\$2,205
1701 to 2200	10.43	50%	110%	\$6,217	\$3,112	\$3,105
over 2200	11.18	50%	110%	\$6,664	\$3,112	\$3,552
Nonresidential (per 1,000 square feet of floor area)						
Development Type	Avg Wkdy Veh Trip Ends	Trip Rate Adjustment	Trip Length Adjustment	High-Range TCEF	Current Fees	Increase or Decrease
Commercial	34.37	33%	66%	\$8,113	\$11,930	-\$3,817
Office & Other Services	11.03	50%	100%	\$5,977	\$7,760	-\$1,783
Industrial	3.56	50%	100%	\$1,929	\$1,130	\$799

Residential (per dwelling unit)						
Square Feet of Finished Living Space	Avg Wkdy Veh Trip Ends	Trip Rate Adjustment	Trip Length Adjustment	Low-Range TCEF	Current Fees	Increase or Decrease
up to 700	3.70	50%	110%	\$1,827	\$1,905	-\$78
701 to 1200	6.87	50%	110%	\$3,392	\$2,143	\$1,249
1201 to 1700	8.92	50%	110%	\$4,404	\$3,112	\$1,292
1701 to 2200	10.43	50%	110%	\$5,150	\$3,112	\$2,038
over 2200	11.18	50%	110%	\$5,520	\$3,112	\$2,408
Nonresidential (per 1,000 square feet of floor area)						
Development Type	Avg Wkdy Veh Trip Ends	Trip Rate Adjustment	Trip Length Adjustment	Low-Range TCEF	Current Fees	Increase or Decrease
Commercial	34.37	33%	66%	\$6,721	\$11,930	-\$5,209
Office & Other Services	11.03	50%	100%	\$4,951	\$7,760	-\$2,809
Industrial	3.56	50%	100%	\$1,598	\$1,130	\$468

TRANSPORTATION CAPITAL EXPANSION FEE

In contrast to project-level improvements, impact fees fund growth-related infrastructure that will benefit multiple development projects, or the entire jurisdiction (referred to as system improvements). There are three general methods for calculating one-time charges for public facilities needed to accommodate new development. The choice of a particular method depends primarily on the timing of infrastructure construction (past, concurrent, or future) and service characteristics of the facility type being addressed. Each method has advantages and disadvantages in a particular situation, and can be used simultaneously for different cost components.

Reduced to its simplest terms, the process of calculating infrastructure costs for new development involves two main steps: (1) determining the cost of development-related capital improvements and (2) allocating those costs equitably to various types of development. In practice, TCEF calculations can become quite complicated because of many variables involved in defining the relationship between development and the need for facilities within the designated service area. The following sections discuss three basic methods and how those methods can be applied in Fort Collins.

Cost Recovery (past improvements)

The rationale for recoupment, often called cost recovery, is that new development is paying for its share of the useful life and remaining capacity of facilities already built, or land already purchased, from which new growth will benefit. This methodology is often used for utility systems that must provide adequate capacity before new development can take place.

Incremental Expansion (concurrent improvements)

The incremental expansion method documents current level-of-service (LOS) standards for each type of public facility, using both quantitative and qualitative measures. New development is only paying its proportionate share for growth-related infrastructure needed to maintain current standards. Revenue will be used to expand or provide additional facilities, as needed to keep pace with new development.

Plan-Based (future improvements)

The plan-based method allocates costs for a specified set of improvements to a specified amount of development. Improvements are typically identified in a capital improvements plan and development potential is identified by land use assumptions. There are two options for determining the cost per service unit: 1) total cost of a public facility can be divided by total service units (average cost), or 2) the growth-share of the capital facility cost can be divided by the net increase in service units over the planning timeframe (marginal cost). Option 2 is used in the 2016 TCEF study.

Credits

Regardless of the methodology, a consideration of “credits” is integral to a legally defensible impact fee study. There are two types of “credits” with specific characteristics, both of which should be addressed in studies and ordinances.

- First, a revenue credit might be necessary if there is a double payment situation and other revenues are contributing to the capital costs of infrastructure to be funded by TCEF revenue. This type of credit is integrated into the TCEF calculation, thus reducing the gross amount. In contrast to some studies that only provide general costs, with credits at the back-end of the analysis, Fort Collins’s 2016 transportation TCEF update uses growth shares to provide an up-front reduction in total costs. Also, the 2016 update provides TCEF revenue projections to verify that new development will fully fund the growth cost of future infrastructure (i.e., only TCEF revenue will pay for growth costs).
- Second, a site-specific credit or developer reimbursement might be necessary for dedication of land or construction of system improvements to be funded by TCEF revenue. This type of credit is addressed in the administration and implementation of the TCEF program.

The 2016 TCEF study uses a combination of incremental expansion and plan-based methodologies to provide improvements for all modes of travel. Figure T1 provides an overview of the methodology and cost components used in the Fort Collins study.

Figure T1: 2016 TCEF Methods and Cost Components

<i>Type of Improvements</i>	<i>Cost Allocation</i>	<i>Service Area</i>	<i>Incremental Expansion (current)</i>	<i>Plan-Based (future)</i>
<i>Lane Miles</i>	Vehicle Miles of Travel	Citywide	Complete Streets	
<i>Multimodal</i>	Vehicle Miles of Travel	Citywide		Sidewalks, Bike Lanes, Bus Stops/Pullouts
<i>Intersections</i>	Vehicle Miles of Travel	Citywide		Turn Lanes, Signals/Timing, Roundabouts

CAPITAL IMPROVEMENTS PLAN FOR TRANSPORTATION FACILITIES

In 2012, Fort Collins produced a Capital Improvement Plan (CIP) for transportation that included both short range (six year) and long-range projects (through 2035). For the purpose of the TCEF study, TischlerBise recommends a ten-year planning horizon, with the understanding that impact fee studies should be updated every 5-10 years due to changes in demographics, capital costs, and infrastructure plans. Transportation improvements for the 2016 TCEF update are summarized in Figure T2. The need

for additional lane miles of complete streets is based on an incremental expansion method, as describe further below. The 2016 TCEF study assumes a cost factor of \$1.4 million per lane mile, derived by City engineering staff from a comprehensive analysis of actual street oversizing projects in Fort Collins over the last five years. Multimodal projects and intersection improvements are based on the Fort Collins transportation CIP.

For the high-range alternative, TischlerBise included the cost of Bicycle, Pedestrian, and Transit improvements in the cost of multimodal projects. According to the long-term CIP, Fort Collins intends to spend \$254.8 million on multimodal projects over 23 years, or \$110.8 million over ten years. As shown in Figure T5, 12% of this capital cost is attributable to new development based on the projected increase in Vehicle Miles of Travel (VMT), which equates to a TCEF share of \$13.3 million over ten years. The cost of intersection improvements includes Advanced Traffic Management Systems (ATMS). The short-term CIP indicates expenditure of \$28.5 million over six years, or \$47.5 million over ten years. Applying the 12% growth share to intersection improvements yields a TCEF share of \$5.7 million over ten years for intersection improvements. For all three cost components (i.e. complete streets, multimodal projects and intersections) the high-range TCEF will provide approximately \$76 million for transportation facilities.

The low-range alternative shown at the bottom of Figure T2 assumes 100% TCEF funding for complete streets, but only 31% TCEF funding for multimodal projects and intersection improvements. Reducing TCEF funding for these improvements makes the low-range TCEF fees yield similar revenue as the 2015 fee schedule.

Figure T2: Growth Cost of Transportation Improvements

High-Range Cost of Transportation Improvements Over Ten Years

	Total Cost	Other Revenues	TCEF Share
Complete Streets	\$57,400,000	\$0	\$57,400,000
Multimodal Projects*	\$110,800,000	\$97,500,000	\$13,300,000
Intersections**	\$47,500,000	\$41,800,000	\$5,700,000
TOTAL =>	\$215,700,000	\$139,300,000	\$76,400,000

* Bicycle, Pedestrian, and Transit projects.

** Includes turn lanes, signals/timing/ATMS, and/or roundabouts.

Low-Range Cost of Transportation Improvements Over Ten Years

TCEF Percent of High-Range		Total Cost	Other Revenues	TCEF Share
100%	Complete Streets	\$57,400,000	\$0	\$57,400,000
31%	Multimodal Projects*	\$110,800,000	\$106,677,000	\$4,123,000
31%	Intersections**	\$47,500,000	\$45,733,000	\$1,767,000
	TOTAL =>	\$215,700,000	\$152,410,000	\$63,290,000

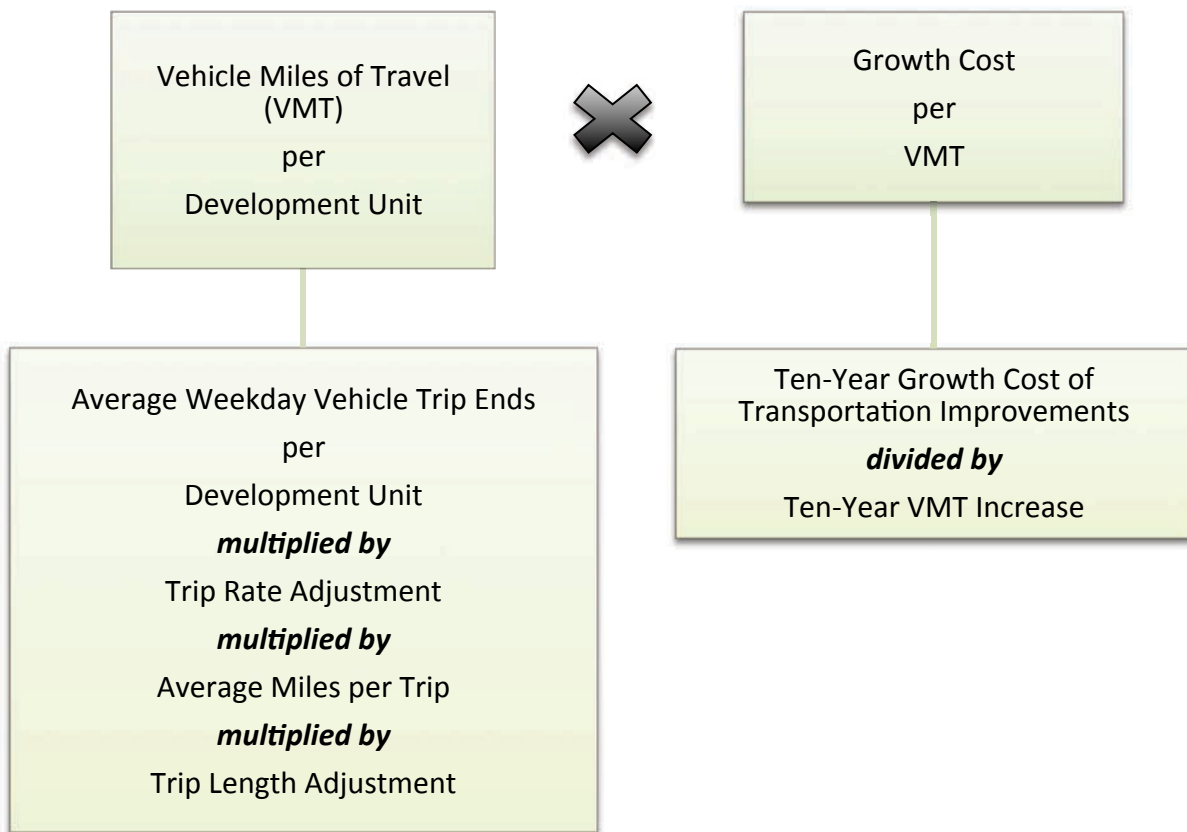
* Bicycle, Pedestrian, and Transit projects.

** Includes turn lanes, signals/timing/ATMS, and/or roundabouts.

VEHICLE MILES OF TRAVEL

Transportation improvements that provide additional vehicular capacity, account for approximately 91% of the growth cost for the low-range alternative and 75% of the growth cost for the high-range alternative. The TCEF is derived from custom trip generation rates (see Appendix A), trip rate adjustment factors, and the capital cost per Vehicle Mile of Travel (VMT). The latter is a function of average trip length, trip-length weighting factor by type of development, and the growth cost of transportation improvements. A TCEF calculation flow chart is shown in Figure T3, with the lower boxes “drilling down” to show the formula details.

Figure T3: TCEF Calculation Flow Chart



VMT is a measurement unit equal to one vehicle traveling one mile¹. In the aggregate, VMT is the product of vehicle trips multiplied by the average trip length. For the 2016 TCEF update, the average trip length is calibrated to lane miles of existing City arterials within Fort Collins.

Vehicular Trip Generation Rates

The 2016 TCEF update is based on Average Weekday Vehicle Trip Ends (AWVTE). For residential development, trip rates are customized using demographic data for Fort Collins, as documented in Appendix A. For nonresidential development, trip generation rates are from the reference book Trip Generation published by the Institute of Transportation Engineers (ITE 9th Edition 2012). A vehicle trip end represents a vehicle either entering or exiting a development (as if a traffic counter were placed across a driveway). To calculate transportation fees, trip generation rates require an adjustment factor to avoid double counting each trip at both the origin and destination points. Therefore, the basic trip adjustment factor is 50%. As discussed further below, the TCEF methodology includes additional adjustments to make the fees proportionate to the infrastructure demand for particular types of development.

Adjustment for Pass-By Trips

For commercial development, the trip adjustment factor is less than 50% because retail development and some services, like schools and daycare facilities, attract vehicles as they pass by on arterial and collector roads. For example, when someone stops at a convenience store on the way home from work, the convenience store is not the primary destination. For the average shopping center, ITE indicates that 34% of the vehicles that enter are passing by on their way to some other primary destination. The remaining 66% of attraction trips have the commercial site as their primary destination. Because attraction trips are half of all trips, the trip adjustment factor is 66% multiplied by 50%, or approximately 33% of the trip ends.

Trip Length Weighting Factor by Type of Land Use

The transportation fee methodology includes a percentage adjustment, or weighting factor, to account for trip length variation by type of land use. TischlerBise derived the weighting factors using household survey results provided by North Front Range Metropolitan Planning Organization (NRFMPO 2010). As shown in Figure T4, trips associated with residential development are approximately 110% of the average trip length. Conversely, trips associated with commercial development (i.e. retail and

¹ Typical VMT calculations for development-specific traffic studies, along with most transportation models of an entire urban area, are derived from traffic counts on particular road segments multiplied by the length of that road segment. For the purpose of the TCEF study, VMT calculations are based on attraction (inbound) trips to development located in the service area, with trip length limited to the road network considered to be system improvements (arterials and collectors). This refinement eliminates pass-through or external-external trips, and travel on roads that are not system improvements (e.g. state highways).

restaurants) are approximately 66% of the average trip length while other nonresidential development typically accounts for trips that are 100% of the average for all trips.

Figure T4: Average Trip Length by Trip Purpose in North Front Range

Type of Development	Trip Purpose	Trips	Average Miles Per Trip	Weighting Factor	
1-Residential	All other at home activities	4,920	5.30	3.469	
1-Residential	Dropped off passenger	566	4.36	0.328	
1-Residential	Picked up passenger	557	3.47	0.257	
1-Residential	Indoor recreation/entertainment	516	4.80	0.330	
1-Residential	Change transportation mode	354	9.37	0.441	
1-Residential	Outdoor recreation/entertainment	254	6.60	0.223	
1-Residential	Service private vehicle	160	5.44	0.116	
1-Residential	Working at home	127	4.06	0.069	
1-Residential	Loop Trip and Other travel related	55	2.71	0.020	
1-Residential	School at home	7	2.03	0.002	
1-Residential Total		7,516		5.255	1.10
2-Retail/Restaurant	Routine shopping	1,236	2.76	1.571	
2-Retail/Restaurant	Eat meal outside home	577	3.10	0.824	
2-Retail/Restaurant	Other	180	5.37	0.445	
2-Retail/Restaurant	Major purchase / specialty item	91	6.15	0.258	
2-Retail/Restaurant	Drive through	88	1.80	0.073	
2-Retail/Restaurant Total		2,172		3.170	0.66
3-Other Nonresidential	Attend a class	790	2.59	0.756	
3-Other Nonresidential	Work/business related	618	8.48	1.937	
3-Other Nonresidential	Errands (bank, dry cleaning, etc.)	475	2.34	0.411	
3-Other Nonresidential	Personal business (attorney, accountant)	241	5.50	0.490	
3-Other Nonresidential	Health care	224	6.39	0.529	
3-Other Nonresidential	Civic/religious	196	5.13	0.372	
3-Other Nonresidential	Other activities at school	92	3.72	0.126	
3-Other Nonresidential	All other activities at work	70	5.82	0.151	
3-Other Nonresidential Total		2,706		4.771	1.00
TOTAL		12,394	4.784		

Data Source: Table R-27, NFRMPO Household Survey, 2010. Analysis excludes "Visit friends/relatives" because the average distance of 22.43 miles traveled is an outlier, approximately four times the overall average. "Work/job" travel was also excluded because trip origins and destinations can not be allocated between residential and type of nonresidential development.

DEVELOPMENT PROTOTYPES AND PROJECTED VMT

The relationship between the amount of development within Fort Collins and Vehicle Miles of Travel (VMT) is documented in Figure T5. In the table below DU means dwelling unit, KSF means square feet of

nonresidential development, in thousands; Institute of Transportation Engineers is abbreviated ITE, and VTE means vehicle trip ends. Trip generation rates by bedroom range are documented in Appendix A.

A typical vehicle trip, such as a person leaving their home and traveling to work, generally begins on a local street that connects to a collector street, which connects to an arterial road and eventually to a state or interstate highway. This progression of travel up and down the functional classification chain limits the average trip length determination, for the purpose of impact fees, to the following question, "What is the average vehicle trip length on impact fee system improvements?" The TCEF analysis for Fort Collins excludes travel on state highways and I-25.

According to City staff, there are 295 lane miles of arterial streets within Fort Collins. With 295 lane miles and a lane capacity standard of 7,700 vehicles per lane², the existing network has approximately 2.27 million vehicle miles of capacity (i.e., 7,700 vehicles per lane multiplied by 295 lane miles). To derive the average utilization (i.e., average trip length expressed in miles) of the arterial network, divide vehicle miles of capacity by the vehicle trips attracted to development in Fort Collins. As shown in the bottom-left corner of the table below, existing development attracts 510,140 average weekday vehicle trips. Dividing 2,271,500 vehicle miles of capacity by inbound average weekday vehicle trips yields an un-weighted average trip length of approximately 4.45 miles. However, the calibration of average trip length includes the same adjustment factors used in the fee calculations (i.e., commercial pass-by adjustment and average trip length adjustment by type of land use). With these adjustments, TischlerBise determined the weighted-average trip length to be 4.50 miles.

Projected development over the next ten years and the corresponding need for additional lane miles is shown in the lower section of Figure T5. Fort Collins has a current infrastructure standard of 1.3 arterial lane miles per 10,000 VMT. To accommodate projected development over the next ten years, Fort Collins will need 41 additional lane miles of complete streets.

² Provided by staff, assuming 12 feet travel lanes, with no additional shoulder width, in an urban area.

Figure T5: Projected VMT Increase to Development within Fort Collins

<i>Development Type</i>	<i>Weekday VTE</i>	<i>Development Unit</i>	<i>Primary Trip Adjustment</i>	<i>Trip Length Wtg Factor</i>			
Residential 0-1 Bedroom	3.86	DU	50%	1.10	R1		
Residential 2 Bedrooms	6.53	DU	50%	1.10	R2		
Residential 3 Bedrooms	9.01	DU	50%	1.10	R3		
Residential 4+ Bedrooms	11.26	DU	50%	1.10	R4		
Commercial	34.37	KSF	33%	0.66	NR1		
Office & Other Services	11.03	KSF	50%	1.00	NR2		
Industrial	3.56	KSF	50%	1.00	NR3		
Avg Trip Length (miles)	4.50						
Vehicle Capacity Per Lane	7,700						
Year->	Base	1	2	3	4	10	10-Year Increase
Fort Collins Travel Model	2015	2016	2017	2018	2019	2025	
Residential 0-1 Bedroom	6,088	6,168	6,246	6,326	6,406	6,911	823
Residential 2 Bedrooms	15,904	16,113	16,318	16,526	16,736	18,055	2,151
Residential 3 Bedrooms	23,133	23,437	23,736	24,038	24,343	26,261	3,128
Residential 4+ Bedrooms	20,394	20,662	20,925	21,191	21,461	23,151	2,757
Commercial KSF	8,894	8,995	9,097	9,200	9,304	9,954	1,060
Office & Other Services KSF	19,833	20,148	20,468	20,793	21,123	23,215	3,382
Industrial KSF	9,649	9,748	9,848	9,950	10,053	10,692	1,043
<i>0-1 Bedroom Trips</i>	11,750	11,904	12,055	12,209	12,364	13,338	
<i>2 Bedroom Trips</i>	51,927	52,609	53,278	53,957	54,643	58,950	
<i>3 Bedroom Trips</i>	104,214	105,584	106,931	108,291	109,665	118,306	
<i>4+ Bedroom Trips</i>	114,818	116,327	117,808	119,305	120,825	130,340	
<i>Commercial Trips</i>	100,877	102,022	103,179	104,347	105,527	112,899	
<i>Office & Other Services Trips</i>	109,379	111,116	112,881	114,673	116,493	128,031	
<i>Industrial Trips</i>	17,175	17,351	17,529	17,711	17,894	19,032	
<i>Total Inbound Vehicle Trips</i>	510,140	516,914	523,661	530,495	537,412	580,895	70,756
<i>Vehicle Miles of Travel (VMT)</i>	2,268,506	2,298,909	2,329,143	2,359,769	2,390,771	2,585,714	317,208
LANE MILES	295	299	302	306	310	336	41
Ten-Year VMT Increase =>							12%

REVENUE CREDIT EVALUATION

A credit for other revenues is only necessary if there is potential double payment for system improvements. In Fort Collins, Road & Bridge Fund property taxes and gas tax revenue will be used for maintenance of existing facilities, correcting existing deficiencies, and for capital projects that are not TCEF system improvements. As shown below in the Figure T7, cumulative TCEF revenue over the next ten years roughly matches the growth cost of system improvements. There is no potential double payment from other revenues if elected officials make a legislative policy decision to use TCEF revenue to fund the growth cost of system improvements in Fort Collins.

COST ALLOCATION FOR TRANSPORTATION IMPROVEMENTS

Input variables for the 2016 TCEF schedule are shown in the upper portion of Figure T6. Inbound VMT by type of development, multiplied by the growth cost per VMT, yields the transportation fee. For example, an industrial building generates approximately 8.01 VMT per KSF (i.e. $3.56 \times 0.50 \times 4.50 \times 1.00$), multiplied by the capital cost of \$240.85 per VMT (high-range alternative), yields a fee of \$1,929 per KSF (truncated) for the high-range TCEF.

The text below from Trip Generation (ITE 2012) supports the consultant's recommendation to use ITE 820 Shopping Center as a reasonable proxy for all commercial development (i.e. retail and restaurants). The shopping center trip generation rates are based on 302 studies with an r-squared value of 0.79. The latter is a goodness-of-fit indicator with values ranging from 0 to 1. Higher values indicate the independent variable (floor area) provides a better prediction of the dependent variable (average weekday vehicle trip ends). If the r-squared value is less than 0.50, ITE does not publish the value because factors other than floor area provide a better prediction of trip rates.

"A shopping center is an integrated group of commercial establishments. Shopping centers, including neighborhood, community, regional, and super regional centers, were surveyed for this land use. Some of these centers contained non-merchandising facilities, such as office buildings, movie theaters, restaurants, post offices, banks, and health clubs. Many shopping centers, in addition to the integrated unit of shops in one building or enclosed around a mall, include out parcels (peripheral buildings or pads located on the perimeter of the center adjacent to the streets and major access points). These buildings are typically drive-in banks, retail stores, restaurants, or small offices. Although the data herein do not indicate which of the centers studied include peripheral buildings, it can be assumed that some of the data show their effect."

Figure T6: High-Range and Low-Range Growth Cost Allocated by VMT

High-Range Input Variables for 2016 TCEF						
Average Miles per Trip		4.50	* Total cost per additional lane mile includes both multimodal and intersection improvements. The average cost for complete streets is approximately \$1.4 million per lane mile.			
Additional Lane Miles over Ten Years		41.0				
Total Cost per Additional Lane Mile*		\$1,863,000				
Ten-Year Growth Cost		\$76,400,000				
VMT Increase Over Ten Years		317,208				
Growth Cost per VMT		\$240.85				
Residential (per dwelling unit)						
Square Feet of Finished Living Space	Avg Wkdy Veh Trip Ends	Trip Rate Adjustment	Trip Length Adjustment	High-Range TCEF	Current Fees	Increase or Decrease
up to 700	3.70	50%	110%	\$2,205	\$1,905	\$300
701 to 1200	6.87	50%	110%	\$4,095	\$2,143	\$1,952
1201 to 1700	8.92	50%	110%	\$5,317	\$3,112	\$2,205
1701 to 2200	10.43	50%	110%	\$6,217	\$3,112	\$3,105
over 2200	11.18	50%	110%	\$6,664	\$3,112	\$3,552
Nonresidential (per 1,000 square feet of floor area)						
Development Type	Avg Wkdy Veh Trip Ends	Trip Rate Adjustment	Trip Length Adjustment	High-Range TCEF	Current Fees	Increase or Decrease
Commercial	34.37	33%	66%	\$8,113	\$11,930	-\$3,817
Office & Other Services	11.03	50%	100%	\$5,977	\$7,760	-\$1,783
Industrial	3.56	50%	100%	\$1,929	\$1,130	\$799
Low-Range Input Variables for 2016 TCEF						
Average Miles per Trip		4.50	* Total cost per additional lane mile includes both multimodal and intersection improvements. The average cost for complete streets is approximately \$1.4 million per lane mile.			
Additional Lane Miles over Ten Years		41.0				
Total Cost per Additional Lane Mile*		\$1,544,000				
Ten-Year Growth Cost		\$63,290,000				
VMT Increase Over Ten Years		317,208				
Growth Cost per VMT		\$199.52				
Residential (per dwelling unit)						
Square Feet of Finished Living Space	Avg Wkdy Veh Trip Ends	Trip Rate Adjustment	Trip Length Adjustment	Low-Range TCEF	Current Fees	Increase or Decrease
up to 700	3.70	50%	110%	\$1,827	\$1,905	-\$78
701 to 1200	6.87	50%	110%	\$3,392	\$2,143	\$1,249
1201 to 1700	8.92	50%	110%	\$4,404	\$3,112	\$1,292
1701 to 2200	10.43	50%	110%	\$5,150	\$3,112	\$2,038
over 2200	11.18	50%	110%	\$5,520	\$3,112	\$2,408
Nonresidential (per 1,000 square feet of floor area)						
Development Type	Avg Wkdy Veh Trip Ends	Trip Rate Adjustment	Trip Length Adjustment	Low-Range TCEF	Current Fees	Increase or Decrease
Commercial	34.37	33%	66%	\$6,721	\$11,930	-\$5,209
Office & Other Services	11.03	50%	100%	\$4,951	\$7,760	-\$2,809
Industrial	3.56	50%	100%	\$1,598	\$1,130	\$468

FUNDING STRATEGY FOR TRANSPORTATION IMPROVEMENTS

The revenue projections shown in Figure T7 assume implementation of the proposed 2016 TCEF schedule (high or low range) and the development projections described in the land use assumptions (see Appendix A). To the extent the rate of development either accelerates or slows down, there will be a corresponding change in TCEF revenue and the timing of capital improvements. Based on the draft 2016 TCEF methodology, residential development will pay approximately 60% of the growth cost for transportation system improvements, with nonresidential development covering the remaining 40%.

The high-range revenue projection shown in the upper portion of Figure T7 will provide additional revenue for multimodal projects and intersection improvements. The low-range alternative shown in the lower portion of the Figure T7 yields projected revenue similar to 2015 street oversizing fees.

Figure T7: Projected TCEF Revenue for High-Range and Low-Range Alternatives

Ten-Year Revenue Projection Based on High-Range TCEF Schedule

		Average-Size Residential \$5,317 per housing unit	Commercial \$8,113 per 1000 Sq Ft	Office & Other Services \$5,977 per 1000 Sq Ft	Industrial \$1,929 per 1000 Sq Ft
	Year	Hsg Units	KSF	KSF	KSF
Base	2015	65,518	8,894	19,833	9,649
Year 1	2016	66,380	8,995	20,148	9,748
Year 2	2017	67,225	9,097	20,468	9,848
Year 3	2018	68,080	9,200	20,793	9,950
Year 4	2019	68,946	9,304	21,123	10,053
Year 5	2020	69,823	9,409	21,458	10,157
Year 10	2025	74,378	9,954	23,215	10,692
Ten-Yr Increase =>		8,860	1,060	3,382	1,043
Projected Revenue =>		\$47,109,000	\$8,600,000	\$20,214,000	\$2,012,000
Total TCEF Revenue =>					\$77,935,000
Residential Share =>		60%	40%	<= Nonresidential Share	

Ten-Year Revenue Projection Based on Low-Range 2016 TCEF Schedule

		Average-Size Residential \$4,404 per housing unit	Commercial \$6,721 per 1000 Sq Ft	Office & Other Services \$4,951 per 1000 Sq Ft	Industrial \$1,598 per 1000 Sq Ft
	Year	Hsg Units	KSF	KSF	KSF
Base	2015	65,518	8,894	19,833	9,649
Year 1	2016	66,380	8,995	20,148	9,748
Year 2	2017	67,225	9,097	20,468	9,848
Year 3	2018	68,080	9,200	20,793	9,950
Year 4	2019	68,946	9,304	21,123	10,053
Year 5	2020	69,823	9,409	21,458	10,157
Year 10	2025	74,378	9,954	23,215	10,692
Ten-Yr Increase =>		8,860	1,060	3,382	1,043
Projected Revenue =>		\$39,019,000	\$7,124,000	\$16,744,000	\$1,667,000
Total TCEF Revenue =>					\$64,554,000
Residential Share =>		60%	40%	<= Nonresidential Share	

IMPLEMENTATION AND ADMINISTRATION

Development impact fees should be periodically evaluated and updated to reflect recent data. One approach is to adjust for inflation using the Engineering News Record (ENR) Construction Cost Index published by McGraw-Hill Companies. This index could be applied to the adopted TCEF schedule. If cost estimates or demand indicators change significantly, the City should redo the fee calculations.

Colorado's enabling legislation allows local governments to "waive an impact fee or other similar development charge on the development of low or moderate income housing, or affordable employee housing, as defined by the local government."

CREDITS AND REIMBURSEMENTS

A general requirement that is common to impact fee methodologies is the evaluation of credits. A revenue credit may be necessary to avoid potential double payment situations arising from one-time impact fees plus on-going payment of other revenues that may also fund growth-related capital improvements. The determination of revenue credits is dependent upon the impact fee methodology used in the cost analysis and local government policies.

Policies and procedures related to site-specific credits should be addressed in the resolution or ordinance that establishes the impact fees. Project-level improvements, required as part of the development approval process, are not eligible for credits against impact fees. If a developer constructs a system improvement included in the fee calculations, it will be necessary to either reimburse the developer or provide a credit against the fees due from that particular development. The latter option is more difficult to administer because it creates unique fees for specific geographic areas.

Based on national experience, TischlerBise typically recommends reimbursement agreements with developers that construct system improvements. The reimbursement agreement should be limited to a payback period of no more than ten years and the City should not pay interest on the outstanding balance. The developer must provide sufficient documentation of the actual cost incurred for the system improvement. The City should only agree to pay the lesser of the actual construction cost or the estimated cost used in the impact fee analysis. If the City pays more than the cost used in the fee analysis, there will be insufficient fee revenue for other capital improvements. Reimbursement agreements should only obligate the City to reimburse developers annually according to actual fee collections from the applicable Benefit District.

CITYWIDE SERVICE AREA

The TCEF service area is defined as the entire incorporated area within Fort Collins. Given Colorado's direct benefit requirement, separate Urban versus Suburban Benefit Districts could be used to track

transportation fee revenues and expenditures. Fee expenditures would be limited to the Benefit District that generated the fee revenue.

EXPENDITURE GUIDELINES

Fort Collins will distinguish system improvements (funded by transportation fees) from project-level improvements, such as local streets within a residential subdivision. TischlerBise recommends limiting transportation fee expenditures to arterials and collectors. System improvements that are eligible for transportation fee funding include:

- Constructing an arterial or collector street.
- A carrying-capacity enhancement to existing arterials or collectors, such reconstruction to add greater street depth and width, including additional vehicular travel lanes, bike lanes, and/or shoulders.
- Adding turn lanes, traffic signals, or roundabouts at the intersection of a State Highway with a City arterial or collector, or a City arterial with another City arterial or collector.

DEVELOPMENT CATEGORIES

Proposed transportation fees for residential development are by square feet of finished living space, excluding unfinished basement, attic, and garage floor area. Appendix A provides further documentation of demographic data by size threshold.

The three general nonresidential development categories in the proposed TCEF schedule can be used for all new construction within the Service Area. Nonresidential development categories represent general groups of land uses that share similar average weekday vehicle trip generation rates, as documented in Appendix A.

- “Industrial” includes the processing or production of goods, along with warehousing, transportation, communications, and utilities.
- “Commercial” includes retail development and eating/drinking places, along with entertainment uses often located in a shopping center (e.g. movie theater).
- “Office & Other Services” includes offices, health care and personal services, business services (e.g. banks) and lodging. Public and quasi-public buildings that provide educational, social assistance, or religious services are also included in this category.

An applicant may submit an independent study to document unique demand indicators for a particular development. The independent study must be prepared by a professional engineer or certified planner and use the same type of input variables as those in this transportation fee update. For residential development, the fees are based on average weekday vehicle trip ends per housing unit. For nonresidential development, the fees are based on average weekday vehicle trips ends per 1,000 square feet of floor area. The independent fee study will be reviewed by City staff and can be accepted as the basis for a unique fee calculation. If staff determines the independent fee study is not reasonable, the applicant may appeal the administrative decision to City elected officials for their consideration.

APPENDIX A: LAND USE ASSUMPTIONS

The population, housing unit, and job projections contained in this document provide the foundation for the capital expansion fee study. To evaluate the demand for growth-related infrastructure from various types of development, TischlerBise prepared documentation on jobs and floor area by type of nonresidential development, average weekday vehicle trip generation rates, and demand indicators by type of housing unit. These metrics (explained further below) are the service units and demand indicators that will be used in the capital expansion fee study.

Capital expansion fees are based on the need for growth-related improvements and they must be proportionate by type of land use. The demographic data and development projections will be used to demonstrate proportionality and anticipate the need for future infrastructure. Projected growth is consistent with North Front Range Metropolitan Planning Organization (NFRMPO) household and job projections in the 2040 Regional Transportation Plan. Capital expansion fee studies typically look out five to ten years, with the expectation that fees will be periodically updated (every three to five years). Infrastructure standards are calibrated using 2015 data.

SUMMARY OF GROWTH INDICATORS

Key development projections for the Fort Collins Street Oversizing Capital Expansion Fee Study are housing units and nonresidential floor area, summarized in Figure A1. These projections are used to estimate fee 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 capital expansion 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 more fee revenue, but will also need to accelerate infrastructure improvements to keep pace with the actual rate of development.

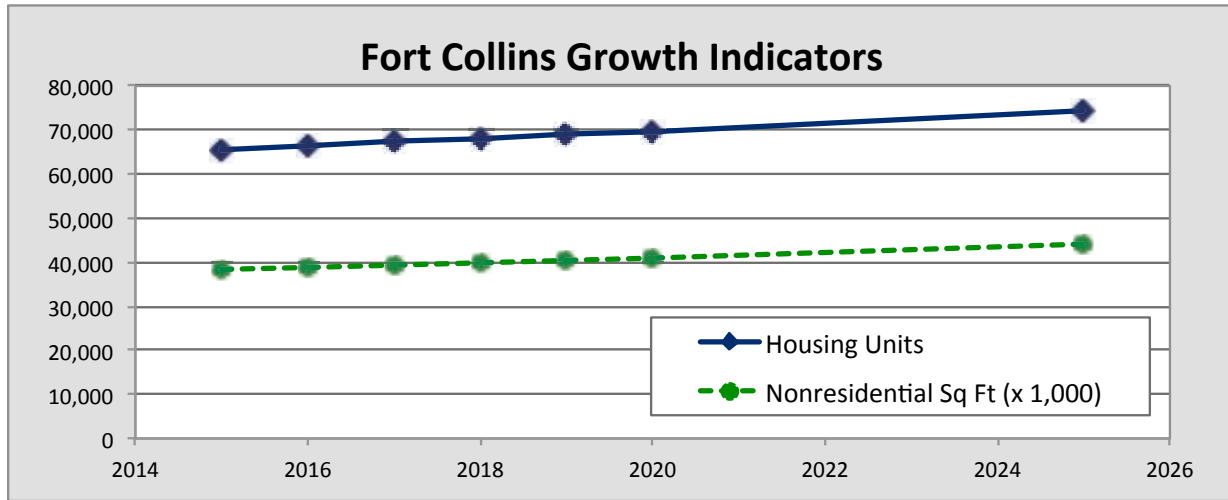
Residential development projections are consistent with NFRMPO projections. Population is based on 2015 household estimates provided by Fort Collins staff and projected household growth based on Traffic Analysis Zone (TAZ) data from NFRMPO. Because TischlerBise recommends a three to five-year update cycle for capital expansion fees, the fee study does not vary the persons per household or persons per housing unit ratio over time, and no change to the residential vacancy rate in Fort Collins is assumed. At the time of the 2013 American Community Survey (ACS) estimate, approximately 3% of the housing stock in Fort Collins was vacant or only used seasonally. During the next five years, the capital expansion fee study expects an average increase of 861 housing units per year.

Nonresidential development projections are based on jobs (i.e. employment by place of work) obtained from OnTheMap, the U.S. Census Bureau's web application, and projected NFRMPO employment growth by TAZ. According to NFRMPO job projections, which are converted to annual increases in

nonresidential floor area, Fort Collins anticipates an average increase of 530,000 square feet of nonresidential floor area per year from 2015 to 2020.

Figure A1: Summary of Development Projections and Growth Rates

	2015	2016	2017	2018	2019	2020	2025	2015 to 2020 Average Annual	
								Increase	Compound Growth Rate
Housing Units	65,518	66,380	67,225	68,080	68,946	69,823	74,378	861	1.28%
Nonresidential Sq Ft (x 1,000)	38,376	38,891	39,413	39,943	40,480	41,024	43,861	530	1.34%

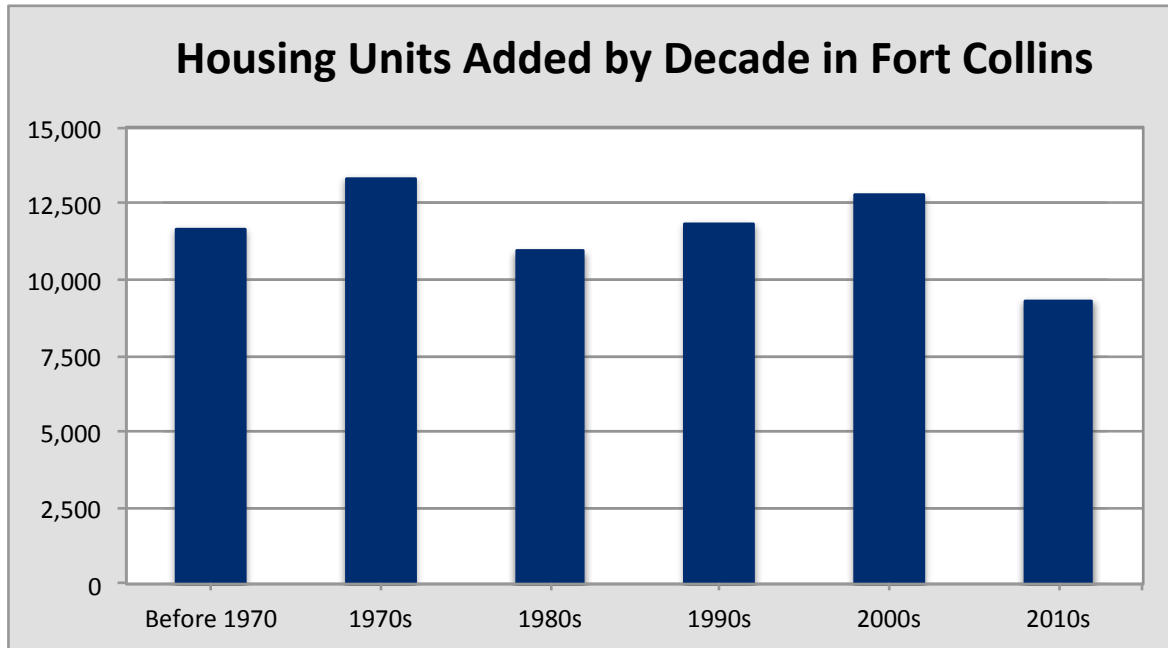


RESIDENTIAL DEVELOPMENT

Figure A2 indicates the estimated number of housing units added by decade in Fort Collins, according to data obtained from the U.S. Census Bureau. 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. From 2000 to 2010, Fort Collins grew by an average of 1,275 housing units per year. From 2010 to 2020, Fort Collins expects housing unit to increase by an average of 932 units per year.

Figure A2: Housing Units by Decade

Census 2010 Population ¹	143,986	From 2000 to 2010, Fort Collins added an average of 1,275 housing units per year. The projected increase from 2010 to 2020 is 932 units per year.
Census 2010 Housing Units ¹	60,503	
Total Housing Units in 2000 ²	47,755	
New Housing Units 2000 to 2010 ^{1,2}	12,748	



1. U.S. Census Bureau, Census 2010 Summary File 1.
 2. Census Bureau, Census 2000 Summary File 1.
 Source for 1990s and earlier is Table B25034, American Community Survey, 2010, adjusted to yield total units in 2000.

Persons per Housing Unit

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 house size, 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.

If Fort Collins’ elected officials make a legislative policy decision to not impose fees by house size, TischlerBise will recommend that fees be imposed for two residential categories. According to the U.S. Census Bureau, a household is a housing unit that is occupied by year-round residents. Capital expansion 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 Fort Collins be imposed according to the number of year-round residents per housing unit. As shown Figure A3, the U.S. Census Bureau estimates Fort Collins had 59,762 housing units in 2013. Dwellings with a single unit per structure (detached and attached) averaged 2.69 persons per housing unit. Even though townhouses are attached, each unit is usually on an individual parcel and has individual meters for water and electricity; therefore, townhouses are included with dwellings with a single unit per structure. Dwellings in structures other than single units averaged 1.92 year-round residents per unit. This category includes duplexes, which have two dwellings on a single parcel of land.

Figure A3: Year-Round Persons per Unit by Type of Housing

2010 Summary by Type of Housing

<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 Units ¹	98,418	37,821	2.60	39,090	2.52	65%	3%
All Other Units	38,483	20,008	1.92	21,413	1.80	35%	7%
Subtotal	136,901	57,829	2.37	60,503	2.26		4%
Group Quarters	7,085						
TOTAL	<u>143,986</u>						

Source: U.S. Census Bureau, 2010 Census, Table DP-1.

1. Single unit includes detached and attached (i.e. townhouse).

2013 Summary by Type of Housing

<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 Units ¹	103,920	37,873	2.74	38,611	2.69	65%	2%
All Other Units	40,634	20,035	2.03	21,151	1.92	35%	5%
Subtotal	144,554	57,908	2.50	59,762	2.42		3%
Group Quarters	7,502						
TOTAL	<u>152,056</u>						

Source: U.S. Census Bureau, 2013 American Community Survey, Tables B25024, B25032, B25033, and B26001.

1. Single unit includes detached and attached (i.e. townhouse).

Residential Estimates and Projections

Based on U.S. Census Bureau data and NFRMPO projections, Fort Collins’ population and housing inventory are expected to increase during the 10-year study period (see Figure A4). To project future residential development, NFRMPO’s average annual household growth rate was applied to the 2015 household estimate of 63,887 provided by Fort Collins. Using this growth rate, Fort Collins is projected to gain approximately 8,600 households over the next 10 years. Next, households are converted to population in households by applying the 2015 persons per household ratio of 2.37, based on estimates provided by Fort Collins staff. With a base year population in households of 151,412, this yields a population increase of 20,401 by the end of the study period. Population in Group Quarters is assumed to remain constant over the next ten years.

Figure A4: Residential Development, 2015-2025

	2015	2016	2017	2018	2019	2020	2025	10-Year Increase
Population	Base Yr	1	2	3	4	5	10	
In Households	151,412	153,338	155,289	157,264	159,264	161,290	171,813	20,401
Group Quarters	7,167	7,167	7,167	7,167	7,167	7,167	7,167	0
Total Population	158,579	160,505	162,456	164,431	166,431	168,457	178,980	20,401
Housing								
Households	63,887	64,700	65,523	66,356	67,200	68,055	72,495	8,608
PPH	2.37	2.37	2.37	2.37	2.37	2.37	2.37	
Total Housing Units	65,518	66,380	67,225	68,080	68,946	69,823	74,378	8,860
PPHU	2.31	2.31	2.31	2.31	2.31	2.31	2.31	
	2015-16	2016-17	2017-18	2018-19	2019-20	2024-25	10-Yr Avg	
	1	2	3	4	5	10	Anl Increase	
Total Population	1,926	1,950	1,975	2,000	2,026	2,158	2,040	
Housing Units	862	845	855	866	877	934	886	

NONRESIDENTIAL DEVELOPMENT

In addition to data on residential development, the calculation of capital expansion fees requires data on nonresidential development. TischlerBise uses the term “jobs” to refer to employment by place of work. In Figure A5, gray shading indicates the three nonresidential development prototypes that will be used by TischlerBise to derive average weekday vehicle trips and Vehicle Miles of Travel (VMT).

The prototype for future commercial development is an average-size shopping center (ITE code 820). Commercial development (i.e. retail and eating/drinking places) is assumed to average 500 square feet per job. For office and other services (e.g. institutional uses) general office (ITE 710) is the prototype for future development, with an average of 301 square feet per job. For future industrial development, warehousing (ITE code 150) is a reasonable proxy with an average of 1093 square feet per job.

Figure A5: Nonresidential Service Units per Development Unit

ITE Code	Land Use	Demand Unit	Weekday Trip Ends		Emp Per 1,000 Sq Ft	Sq Ft Per Emp
			Per 1,000 Sq Ft ¹	Per Employee ¹		
Commercial						
	Average	1,000 Sq Ft	42.70	na	2.00	500
820	10K gross leasable area	1,000 Sq Ft	152.03	na	3.33	300
820	25K gross leasable area	1,000 Sq Ft	110.32	na	3.03	330
820	50K gross leasable area	1,000 Sq Ft	86.56	na	2.86	350
820	100K gross leasable area	1,000 Sq Ft	67.91	na	2.50	400
820	200K gross leasable area	1,000 Sq Ft	53.28	na	2.22	450
857	Discount Club	1,000 Sq Ft	41.80	32.21	1.30	771
General Office and Other Services						
	Average	1,000 Sq Ft	11.03	3.32	3.32	301
710	10K gross floor area	1,000 Sq Ft	22.66	5.06	4.48	223
710	25K gross floor area	1,000 Sq Ft	18.35	4.43	4.14	241
710	50K gross floor area	1,000 Sq Ft	15.65	4.00	3.91	256
710	100K gross floor area	1,000 Sq Ft	13.34	3.61	3.70	271
710	200K gross floor area	1,000 Sq Ft	11.37	3.26	3.49	287
Industrial						
110	Light Industrial	1,000 Sq Ft	6.97	3.02	2.31	433
140	Manufacturing	1,000 Sq Ft	3.82	2.13	1.79	558
151	Mini-Warehouse	1,000 Sq Ft	2.50	61.90	0.04	24,760
150	Warehousing	1,000 Sq Ft	3.56	3.89	0.92	1,093
Institutional						
520	Elementary School	1,000 Sq Ft	15.43	15.71	0.98	1,018
550	University/College	student	1.71	8.96	0.19	na
530	High School	student	1.71	19.74	0.09	na
	Average School	1,000 Sq Ft	14.03	17.28	0.81	1,231
Other Nonresidential						
770	Business Park	1,000 Sq Ft	12.44	4.04	3.08	325
760	Research & Dev Center	1,000 Sq Ft	8.11	2.77	2.93	342
610	Hospital	1,000 Sq Ft	13.22	4.50	2.94	340
310	Hotel	room	8.17	14.34	0.57	na
565	Day Care	student	4.38	26.73	0.16	na

1. Trip Generation, Institute of Transportation Engineers, 9th Edition (2012).

Figure A6 indicates 2015 estimates of jobs and nonresidential floor area located in Fort Collins. To estimate 2015 jobs, average annual growth rates derived from North Front Range Metropolitan Planning Organization (NFRMPO) 2012 and 2015 job estimates are applied to 2013 estimates from OnTheMap—the U.S. Census Bureau’s web application. This yields a 2015 job estimate of 77,726 jobs.

Based on 2015 Larimer City Tax Assessor estimates, nonresidential floor area in Fort Collins totals approximately 38.4 million square feet. While similar to ITE square feet per employee estimates shown above, using Fort Collins-specific floor area ratios will better predict future nonresidential floor area.

Shown in Figure A6 below, commercial development averages 538 square feet per employee, office and other services averages 385 square feet per employee, and industrial development averages 990 square feet of floor area per job. These multipliers and the job projections described above yield projected nonresidential floor area, as discussed in the next section.

Figure A6: Jobs and Floor Area Estimates

	2015 Jobs¹	Percent of Total Jobs	Sq Ft per Job	2015 Estimated Floor Area²	Jobs per 1,000 Sq Ft
Commercial ³	16,528	21%	538	8,893,799	1.86
Office & Other Services ⁴	51,447	66%	385	19,832,649	2.59
Industrial ⁵	9,751	13%	990	9,649,235	1.01
TOTAL	77,726	100%	494	38,375,683	2.03

1. Jobs in 2015 are based on 2013 job estimates from the U.S. Census Bureau's OnTheMap web application and North Front Range Metropolitan Planning Organization (NFRMPO) growth rates derived from Fort Collins jobs in 2012 and 2015.

2. 2015 floor area based on 2015 Larimer County Tax Assessor data.

3. Major sectors are Restaurant and Retail.

4. Major sectors are Health Care and Social Assistance; Professional, Scientific, and Technical Services.

5. Major sector is Manufacturing.

Jobs and Nonresidential Projections

Over the next 10 years, continued employment growth is expected in Fort Collins. As previously discussed, the average annual employment growth rate derived from NFRMPO job projections is applied to the 2013 OnTheMap estimate. Shown in Figure A7, the base year jobs estimate is 77,726 with approximately 38.4 million square feet of nonresidential floor area. By 2025, Fort Collins is projected to have approximately 11,800 additional jobs and 5.5 million additional square feet of nonresidential floor area.

Figure A7: Nonresidential Development, 2015-2025

	2015	2016	2017	2018	2019	2020	2025	10-Year
Jobs								
Commercial	16,528	16,715	16,905	17,096	17,290	17,486	18,499	1,970
Office & Other Services	51,447	52,264	53,095	53,938	54,795	55,666	60,230	8,783
Industrial	9,751	9,851	9,953	10,055	10,159	10,264	10,803	1,052
Total Jobs	77,726	78,831	79,952	81,090	82,244	83,415	89,532	11,806
Nonresidential Floor Area (x 1,000)								
Commercial	8,894	8,995	9,097	9,200	9,304	9,409	9,954	1,060
Office & Other Services	19,833	20,148	20,468	20,793	21,123	21,458	23,215	3,382
Industrial	9,649	9,748	9,848	9,950	10,053	10,157	10,692	1,043
Total KSF	38,376	38,891	39,413	39,943	40,480	41,024	43,861	5,485
	2015-16	2016-17	2017-18	2018-19	2019-20	2024-25	10-Yr Avg	
	1	2	3	4	5	10	Ann Increase	
Jobs	1,105	1,121	1,138	1,154	1,171	1,259	1,181	
Commercial KSF	101	102	103	104	105	111	106	
Office & Other Services KSF	315	320	325	330	335	363	338	
Industrial KSF	99	100	102	103	104	109	104	
Total Nonres KSF	515	522	530	537	544	583	549	

TRIP GENERATION RATES

As an alternative to simply using national average trip generation rates for residential development, published by the Institute of Transportation Engineers (ITE), TischlerBise has derived custom trip rates using demographic data for Fort Collins. Key inputs needed for the analysis (i.e. average number of persons and vehicles available per housing unit) are available from the U.S. Census Bureau's American Community Survey (ACS).

Fort Collins Control Totals

Figure A3 above indicates the average number of year-round residents per housing unit in Fort Collins. "Single Units" includes detached and attached dwellings. Duplexes, apartments, and manufactured housing are combined as "All Other Units." The average number of persons per housing unit in Fort Collins will be compared to national averages derived from traffic studies tabulated by the Institute of Transportation Engineers (ITE). In 2013, the control total for the City of Fort Collins is 2.42 persons per dwelling (i.e. weighted average for all types of housing).

Trip generation rates are also dependent upon the average number of vehicles available per dwelling. Figure A8 indicates vehicles available, by housing type, within Fort Collins. As expected, "Single Units" housing has more vehicles available per dwelling than "All Other Units" housing. In 2013, the control total for the City of Fort Collins is 1.83 vehicles available per dwelling (i.e. weighted average for all types of housing).

Figure A8: Vehicles Available per Housing Unit

Tenure	Vehicles Available ¹	Households ²			Vehicles per Household by Tenure
		Single Unit Detached or Attached	All Other	Total	
Owner-occupied	67,245	29,482	3,804	33,286	2.02
Renter-occupied	42,233	8,391	16,231	24,622	1.72
Total	109,478	37,873	20,035	57,908	1.89

Units per Structure	Vehicles Available	Housing Units ³	Vehicles per Housing Unit
Single Units	73,953	38,611	1.92
All Other Units	35,525	21,151	1.68
Total	109,478	59,762	1.83

1. Vehicles available by tenure from Table B25046, American Community Survey, 2013.
2. Households by tenure and units in structure from Table B25032, American Community Survey, 2013.
3. Housing units from Table B25024, American Community Survey, 2013.

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 Microdata Samples (PUMS). Because PUMS files are available for areas of roughly 100,000 persons, Fort Collins is included in Public Use Microdata Area (PUMA) 103 that covers the northern portion of Larimer City. At the top of Figure A9, cells with yellow shading indicate the survey results, which yield the unadjusted number of persons and vehicles available per dwelling. These multipliers are adjusted to match the control totals for Fort Collins.

The middle section of Figure A9 provides nation-wide data from the Institute of Transportation Engineers (ITE). AWWTE is the acronym for Average Weekday Vehicle Trip Ends, which measures vehicles coming and going from a development. Dividing trip ends per household by trip ends per person yields an average of 2.01 persons per occupied apartment and 3.73 persons per occupied single dwelling, based on ITE’s national survey. Applying Fort Collins’s current housing mix of 35% apartments and 65% single-unit dwellings yields a weighted average of 3.13 persons per household. In comparison to the national data, Fort Collins only has an average of 2.42 persons per housing unit.

Dividing trip ends per household by trip ends per vehicle available yields an average of 1.30 vehicles available per occupied apartment and 1.58 vehicles available per occupied single dwelling, based on ITE’s national survey. Applying Fort Collins’s current housing mix of 35% apartments and 65% single-unit dwellings yields a weighted average of 1.48 vehicles available per household. In comparison to the national data, Fort Collins has more vehicles available, with an average of 1.83 per housing unit.

Rather than rely on one methodology, the recommended trip generation rates shown in the bottom section of Figure A9 (see AWWTE per Housing Unit in bold numbers), are an average of trip rates based on persons and vehicles available, for all types of housing units by bedroom range. In the City of Fort

Collins, each housing unit is expected to yield an average of 8.63 Average Weekday Vehicle Trip Ends (AWVTE), compared to the national average of 8.52 trip ends per household.

Figure A9: Average Weekday Vehicle Trips Ends by Bedroom Range

Fort Collins 2013 Data

Bedroom Range	Persons ¹	Vehicles Available ¹	Housing Units ¹	Housing Mix	Unadjusted Persons/HU	Adjusted Persons/HU ²	Unadjusted VehAvl/HU	Adjusted VehAvl/HU ²
0-1	84	68	80	9.3%	1.05	1.10	0.85	0.81
2	353	310	209	24.3%	1.69	1.76	1.48	1.42
3	738	604	304	35.3%	2.43	2.53	1.99	1.91
4+	820	662	268	31.1%	3.06	3.19	2.47	2.37
Total	1,995	1,644	861		2.32	2.42	1.91	1.83

National Averages According to ITE

ITE Code	AWVTE per Person	AWVTE per Vehicle Available	AWVTE per Household	Housing Mix	Persons per Household	Veh Avl per Household
220 Apt	3.31	5.10	6.65	35%	2.01	1.30
210 SFD	2.55	6.02	9.52	65%	3.73	1.58
Wgtd Avg	2.82	5.70	8.52		3.13	1.48

Recommended AWVTE per Dwelling Unit by Bedroom Range

Bedroom Range	AWVTE per HU Based on Persons ³	AWVTE per HU Based on Vehicles Available ⁴	AWVTE per Housing Unit ⁵
0-1	3.10	4.62	3.86
2	4.96	8.09	6.53
3	7.13	10.89	9.01
4+	9.00	13.51	11.26
Total	6.82	10.43	8.63

1. American Community Survey, Public Use Microdata Sample for CO PUMA 00103 (2013 1-Year unweighted data).
2. Adjusted multipliers are scaled to make the average PUMS values match control totals for Fort Collins, based on American Community Survey 2013 1-year.
3. Adjusted persons per housing unit multiplied by national weighted average trip rate per person.
4. Adjusted vehicles available per housing unit multiplied by national weighted average trip rate per vehicle available.
5. Average of trip rates based on persons and vehicles available per housing unit.

AWVTE per Dwelling by House Type

ITE Code	AWVTE per HU Based on Persons ³	AWVTE per HU Based on Vehicles Available ⁴	AWVTE per Housing Unit ⁵	Fort Collins Persons/HU	Fort Collins VehAvl/HU
All Other	5.41	9.58	7.50	1.92	1.68
210 SFD	7.59	10.94	9.27	2.69	1.92
All Types	6.82	10.43	8.63	2.42	1.83

Trip Generation by Floor Area

To derive average weekday vehicle trip ends by dwelling size, TischlerBise matched trip generation rates and average floor area, by bedroom range, as shown in Figure A10. The logarithmic trend line formula, derived from the four actual averages in Fort Collins, is used to derive estimated trip ends by dwelling size, in 500 square foot intervals based on the size threshold currently used for capital expansion fees. A mid-size residential unit is estimated to range from 1,201 to 1,700 square feet of living space. A small unit of 700 square feet or less would pay 41% of the transportation capital expansion fee paid by an average size unit. A large unit over 2,200 square feet would pay 125% of the transportation capital expansion fee paid by an average size unit. If Fort Collins implements a “one-size-fits-all” approach, small units will be required to pay more than their proportionate share while large units will pay less

than their proportionate share. TischlerBise does not recommend an average fee for all house sizes, because it makes small units less affordable and essentially subsidizes larger units.

Figure A10: Vehicle Trips by Dwelling Size

Unit size ranges are based on current fee schedule and consistent with residential building permits from January 2012 through May 2015. Average weekday vehicle trip ends per housing unit are derived from 2013 ACS PUMS data for the area that includes Fort Collins.

Actual Averages per Hsg Unit			Fitted-Curve Values	
Bedrooms	Square Feet	Trip Ends	Sq Ft Range	Trip Ends
0-1	700	3.86	up to 700	3.70
2	1,200	6.53	701 to 1200	6.87
3	1,700	9.01	1201 to 1700	8.92
4+	2,500	11.26	1701 to 2200	10.43
			over 2200	11.18

