IMPACT FEE STUDY

DRAFT

Prepared for

Town of Erie, Colorado

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TischlerBise
FISCAL | ECONOMIC | PLANNING

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Executive Summary

OVERVIEW

The Town of Erie, Colorado, has retained TischlerBise to determine growth-related infrastructure needs and calculate development impact fees for the following infrastructure categories:

- Parks
- Police and Courts
- Public Facilities
- Transportation
- Storm Drainage

Impact fees are one-time payments used to construct system improvements needed to accommodate development. Impact fees for Erie are proportionate and reasonably related to the capital facility service demands of new development. Impact fees are necessary to achieve an equitable allocation of capital costs, in comparison to past and future benefits. Erie has complied with all requirements of Colorado's Impact Fees Act.

After discussions with Town staff, TischlerBise determined demand indicators for each type of public facility and calculated residential and nonresidential proportionate share factors. These factors are used to allocate costs by type of development. The formulas used to calculate the impact fees for the Town of Erie are diagrammed in a flow chart for each type of public facility in the respective chapter of this report. Also contained in this report are summary tables indicating the specific level of service (LOS) or infrastructure standards used to derive the impact fees.

IMPACT FEE METHODOLOGIES

There are three basic methods used to calculate the impact fees. The **incremental expansion** method documents the current LOS for each type of public facility in both quantitative and qualitative measures. This method is best suited for public facilities that will be expanded incrementally in the future, with LOS standards based on current conditions in the community. The **plan-based** method is best suited for public facilities that have adopted plans or commonly accepted engineering standards to identify the need for capital projects. A **cost recovery** method may be used for facilities that have been oversized to accommodate future development. The rationale for the cost recovery approach is that new development is paying for its share of the useful life or remaining capacity of the existing facility. To the extent that new growth and development is served by the previously constructed improvements, Colorado's Impact Fee Act allows the Town to be reimbursed for the previously incurred public facility costs.

Another general requirement that is common to impact fee methodologies is the evaluation of credits. Past and future revenue credits have been evaluated to avoid potential double payment situations arising

from the payment of a one-time impact fee and then subsequent payments of other revenues that may also fund growth-related capital improvements. General Fund revenues, such as property taxes, being used for parks and public safety improvements have been accounted for in credits for future principal payments.

SUMMARY OF CURRENT AND PROPOSED IMPACT FEES

For comparison purposes, Erie's current impact fees are shown in Figure 1.

Figure 1. Current Impact Fees

Residential (per housing unit)	Parks	Street Tree*	Public Facilities	Transportation Improvement	Storm Drainage**	Total
Single Family	$2,165	$300	$1,808	$1,678	$1,300	$7,251
Multifamily	$2,165	$300	$1,559	$1,163	$1,300	$6,487
Nonresidential (per 1,000 Sq. Ft.)#						**Total**
Commercial	-	-	$1,382-$2,302	$1,113-$4,192	$5,440	$7935-$11,934
Office	-	-	$2,316-$3,036	$1,729-$3,465	$5,440	$9,485-$11,941
Industrial	-	-	$884-$2,185	$584-$1,953	$5,440	$6,908-$9,578

**Not analyzed in this study*
#Vary by use and size
***Per acre*

Figure 2 shows the method used to derive each type of fee in Erie, plus each component that contributes to the impact fee.

Figure 2. Proposed Impact Fees: Methods and Cost Components

Type of Fee	*Cost Recovery (past)*	*Incremental Expansion (present)*	*Plan-Based (future)*	*Cost Allocation*
1. Parks		Community Park Land Acquisition and Development, Trails, and Park Buildings		***Population***
2. Public Facilities		Public Facility Space		***Population and Jobs***
3. Transportation			System Improvements	***Average Weekday Vehicle Trips***
4. Storm Drainage			System Improvements	***Acreage***

Figure 3 provides a summary schedule of the proposed development impact fees for Erie. Fees for residential development are per housing unit and fees for nonresidential development use a 1,000 square feet of floor area basis.

Figure 3. Proposed Impact Fees

Residential (per housing unit)	**Parks**	**Street Tree***	**Public Facilities**	**Transportation**	**Storm Drainage**	**Total**
Single Family	$3,889	$300	$1,821	$5,908	$1,543	$13,461
Multifamily	$2,826	$300	$1,323	$4,763	$856	$10,068
Nonresidential (per 1,000 Sq. Ft.)						
Commercial	-	-	$424	$7,129	$1,342	$8,895
Office	-	-	$699	$3,086	$1,202	$4,987
Industrial	-	-	$381	$1,068	$1,202	$2,651

**Not analyzed in this study*

A note on rounding: Calculations throughout this report are based on an analysis conducted using Excel software. Results are discussed in the report using one-and two-digit places (in most cases), which represent rounded or truncated figures. However, in some instances the analysis itself uses figures carried to their ultimate decimal places (e.g., for level of service standards); therefore the sums and products generated in the analysis may not equal the sum or product if the reader replicates the calculation with the factors shown in the report (due to the rounding of figures shown).

General Impact Fee Requirements

Impact fees are one-time payments used to fund capital improvements necessitated by new growth. Impact fees have been utilized by local governments in various forms for at least 50 years. Impact fees do have limitations, and should not be regarded as the total solution for infrastructure financing needs. Rather, they should be considered one component of a comprehensive portfolio to ensure adequate provision of public facilities with the goal of maintaining current levels of service in a community. Any community considering impact fees should note the following limitations:

- Impact fees can only be used to finance capital infrastructure and cannot be used to finance ongoing operations and/or maintenance and rehabilitation costs;
- Impact fees cannot be deposited in the local government's General Fund—the funds must be accounted for separately in individual accounts and earmarked for the capital expenses for which they were collected; and
- Impact fees cannot be used to correct existing infrastructure deficiencies unless there is a funding plan in place to correct the deficiency for all current residents and businesses in the community.

LEGAL FRAMEWORK

U.S. Constitution. Like all land use regulations, development exactions—including impact fees—are subject to the Fifth Amendment prohibition on taking of private property for public use without just compensation. 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. 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 in the protection of public health, safety, and welfare by ensuring that development is not detrimental to the quality of essential public services.

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. Town of Tigard, OR,* 1994), the Court ruled that an exaction also must be "roughly proportional" to the burden created by development. However, the *Dolan* decision appeared to set a higher standard of review for mandatory dedications of land than for monetary exactions such as development impact fees.

REQUIRED FINDINGS

There are three reasonable relationship requirements for 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 impact fees under the U.S. Constitution, we prefer a more rigorous formulation that recognizes three elements: "impact or 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. The reasonable relationship language of the statute is considered less strict than the rational nexus standard used by many courts. Individual elements of the nexus standard are discussed further in the following paragraphs.

Demonstrating an Impact. All new development in a community creates additional demands on some, or all, public facilities provided by local government. If the supply of facilities is not increased to satisfy that additional demand, the quality or availability of public services for the entire community will deteriorate. Impact fees may be used to recover 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 clearly applies to impact fees. In this study, the impact of development on improvement 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.

Demonstrating a Benefit. A sufficient benefit relationship requires that fee revenues be segregated from other funds and expended only on the facilities for which the fees were charged. Fees must be expended in a timely manner and the facilities funded by the fees must serve the development paying the fees. Procedures for the earmarking and expenditure of fee revenues are typically mandated by the state enabling act, as are procedures to ensure that the fees are expended expeditiously or refunded. All of these requirements are intended to ensure that developments benefit from the fees they are required to pay. Thus, an adequate showing of benefit must address procedural as well as substantive issues.

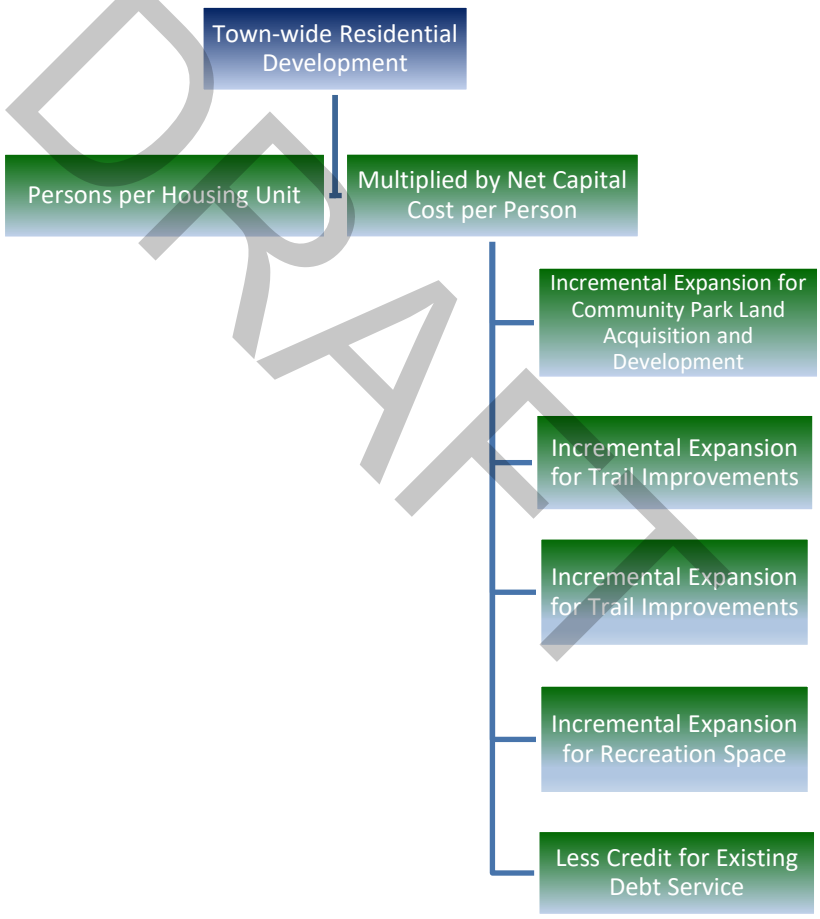
Demonstrating Proportionality. The requirement that exactions be proportional to the impacts of development was clearly stated by the U.S. Supreme Court in the *Dolan* case (although the relevance of that decision to impact fees has been debated) and is logically necessary to establish a proper nexus. 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. For example, the need for school improvements is measured by the number of public school-age children generated by development.

Parks

METHODOLOGY

The Parks impact fee is derived using an incremental expansion methodology. Town officials will focus future land acquisition and development efforts on community parks that serve the Town's entire resident population. Therefore, this impact fee includes a components for acquiring land for and developing community parks to serve future growth. Additionally, the Town will continue to develop both concrete and crusher fines trails and recreation space, discussed below. The methodology for the Parks impact fee is diagrammed in Figure 4. All cost components are allocated 100% to residential development.

Figure 4. Parks Impact Fee Methodology



COMMUNITY PARKS LEVEL OF SERVICE STANDARDS AND COST FACTORS

The Town of Erie is focused on continuing to expand its community park inventory. Community parks are designed to serve the Town's entire population. Figure 5 shows the Town's current inventory of community parks, which only consists of one: Erie Community Park (41 acres). TischlerBise estimates the

Town's 2015 (base year) population totaled 21,571 people. Therefore, the current LOS for community parks in Erie is 1.9 acres per 1,000 residents. This calculation is shown below in Figure 5.

Figure 5. Community Park Inventory

Community Parks	*Acres*
Erie Community Park	41.00
Total	*41.00*
2015 Erie Population	21,571
LOS: Acres per 1,000 Persons	**1.90**

Source: Town of Erie Parks and Recreation Department

To determine the cost of maintaining this LOS for new development, TischlerBise first calculated the cost per acre of community park land in Erie, as shown in Figure 6. Using the appraised values of parcels from recent fee-in-lieu of land dedications, TischlerBise determined that the cost of community park land in Erie is $48,404. Using this cost per acre and the LOS calculations for community parks described above, the community park land acquisition cost per person is $92.00 ((1.90 community park acres per 1,000 persons / 1,000 persons) X $48,404 land cost per acre).

Figure 6. Community Park Land Costs

Parcel	Year	Cost per Acre
Flatiron Meadows #1	2012	$35,049
Flatiron Meadows #2	2016	$53,750
Rex Ranch #1	2013	$38,977
Rex Ranch #2	2015	$42,889
Rex Ranch #3	2015	$44,996
Compass #1	2014	$45,999
Compass #2	2016	$77,168
	Average	*$48,404*

LOS: Acres per 1,000 Persons	1.90
Cost per Person	**$92.00**

Source: Town of Erie Community Development Department

Figure 7 presents the Town's estimate of the cost to develop one acre of community park land. Erie Parks and Recreation Department staff estimate the average development cost per acre is $144,000. Additionally, developing a park acre requires the acquisition of water rights, an important cost component for park development in Colorado and other western states. The Department of Public Works estimates the average cost of water rights for one non-potable acre-foot of water is $15,300 and that 2.88 acre-feet of water are required to establish one acre of planted vegetation. Therefore, the community park development water rights cost per acre totals $44,064 ($15,300 x 2.88 = $44,064). This cost, combined

with the development cost, totals $188,064, representing the total cost to develop an acre of community parkland in Erie.

The estimated land development cost for a community park is $357.45 per person. This cost is derived by multiplying the total cost of development per acre ($188,064) by the LOS of 1.90 acres per 1,000 persons and dividing by 1,000 persons (Figure 7)

Figure 7. Cost of Park Development

Average Development Cost per Acre*	$144,000
Average Water Rights Cost per Acre**	$44,064
Total Cost per Acre	$188,064
LOS: Acres per 1,000 Persons	1.90
Land Development Cost per Person	***$357.45***

**Provided by Town of Erie Parks and Recreation Department*
*** Calculated by multiplying cost of water rights for 1 non-potable acre foot ($15,300) by the needed acre feet of water per acre of seeded area (2.88) (provided by Town of Erie Public Works)*

TRAILS LEVEL OF SERVICE AND COST FACTORS

Figures 8 and 9 provide Town of Erie's current inventory of hard (concrete) and soft surface (crusher fines) trails, respectively. These figures delineate trails by linear feet and using the Town's trail hierarchy of spine and local trails (the two levels of trails that provide a community-wide benefit to all residents). The Town currently owns 149,702 linear feet of concrete trails and 49,513 of crusher fines trails. These linear feet totals are divided by the 2015 Erie population of 21,571 people, yielding a LOS of 6.94 linear feet of hard surface trails and 2.30 linear feet of soft surface trails per person.

The Parks and Recreation Department estimates that the cost per linear foot of concrete trail is $40. The cost per linear foot for crusher fines is less, estimated at $8. These costs are multiplied by the LOS standards described above to yield a capital cost per person total. For example, 6.94 linear feet of hard surface trails per person is multiplied by the cost per linear feet of concrete trails ($40), resulting in a capital cost per person for hard surface trails of $277.60 (Figure 8). Using the same process for soft surface trails yields a capital cost per person of $18.36 (Figure 9).

Figure 8. Concrete Trails Level of Service and Cost Factors

Level of Service (LOS) Standards: Hard Surface - Concrete Trails	
Spine Trail Linear Feet	65,936
Local Trail Linear Feet	83,766
Total Linear Feet	149,702
2015 Erie Population	21,571
LOS: Linear Feet per Person	***6.94***
Cost Analysis: Concrete Trails	
LOS : Linear Feet per Person	6.94
Cost per Linear Foot	$40
Concrete Trails Cost per Person	***$277.60***

Source: Town of Erie Parks and Recreation Department

Figure 9. Crusher Fines Trails Level of Service and Cost Factors

Level of Service (LOS) Standards: Soft Surface - Crusher Fines Trails	
Spine Trail Linear Feet	18,326
Local Trail Linear Feet	31,187
Total Linear Feet	49,513
2015 Erie Population	21,571
LOS: Linear Feet per Person	***2.30***
Cost Analysis: Soft Surface - Crusher Fines Trails	
LOS : Linear Feet per Person	2.30
Cost per Linear Foot	$8
Crusher Fines Trails per Person	***$18.36***

Source: Town of Erie Parks and Recreation Department

PARK BUILDINGS

Figure 10 provides Town of Erie's current inventory of park-related buildings. These include the existing Community Center and approximately one-third of the Leon Wurl Service Center, for a total of 83,764 square feet. The park-related square footage of 83,764 square feet is divided by the 2015 Erie population of 21,571 people, yielding a LOS of 3.88 square feet per person.

Town staff indicate the estimated cost to replace these structures is $240 per square foot. This cost factor is multiplied by the LOS standard described above to yield a capital cost per person of $931.97 (Figure 10).

Figure 10. Park Buildings LOS and Cost Factors

Building	Square Feet	Cost	
Community Center	63,764	$15,303,360	
Leon Wurl Service Center*	20,000	$4,800,000	***Cost/SF****
Total	83,764	$20,103,360	**$240**

**1/3 devoted to Parks and Recreation*

***Provided by Town Staff*

Level of Service (LOS) Standards	
Total Square Feet	83,764
2015 Erie Population	21,571
LOS: Square Feet per Person	***3.88***

Cost Analysis	
LOS : Square Feet per Person	3.88
Cost per Square Foot*	$240
Cost per Person	***$931.97***

DEBT SERVICE CREDIT

In 2006 and 2014, the Village issued debt to build and then expand the Community Center. The remaining principal of these bonds totals $11,970,000. To derive the credit amount for residential development, annual principal payments are divided by the projected population. For example, in 2017 the principal to be paid for parks and recreation of $885,000 is divided by the projected population of 24,279 for a payment of $36.45 per person. To account for the time value of money, annual payments per person are discounted using a net present value formula based on a current interest rate of 3.75 percent. The total net present value of future principal payments per person is $331.65 (Figure 11). This amount is subtracted from the gross capital cost per demand unit amount to derive a net capital cost per demand unit for park facilities.

Figure 11. Debt Service Credit

Year	Principal Payments*	Projected Population	Principal Payment Credit Per Person
2016	$ 840,000	22,925	$36.64
2017	$ 885,000	24,279	$36.45
2018	$ 920,000	25,633	$35.89
2019	$ 1,525,000	26,986	$56.51
2020	$ 1,000,000	28,340	$35.29
2021	$ 1,025,000	29,597	$34.63
2022	$ 1,070,000	30,854	$34.68
2023	$ 1,110,000	32,111	$34.57
2024	$ 1,155,000	33,368	$34.61
2025	$ 1,200,000	34,624	$34.66
2026	$ 1,240,000	35,881	$34.56
Total	$ 11,970,000		$408.49
		Discount Rate	*3.75%*
		Present Value	**$331.65**

*2006A and 2014 General Obligation Bonds for Community Center

PROJECTED NEED FOR PARK FACILITIES

The need for additional parks and recreation infrastructure, based on projected population growth over the next ten years (Appendix A) and LOS standards as discussed above, is shown below in Figure 12. In addition, Figure 12 shows community park and trail LOS standards and development costs.

Over the next ten years, it is projected that Erie will need to spend approximately $5.9 million to acquire and develop community park land in order to maintain the current LOS. Similarly, the Town will need to spend $3.9 million to develop new trails and $12.2 million to construct new recreation square footage.

Figure 12. Projected Growth Needs

Developed Parks LOS	1.90	per 1,000 residents
Average Acquisition Cost per Acre	$48,404	per acre
Total Development Cost per Acre	$188,064	per acre
Concrete Trails LOS	6.94	linear feet per person
Concrete Trails Cost	$40	per linear foot
Crusher Fines LOS	2.30	linear feet per person
Crusher Fines Cost	$8	per linear foot
Building LOS	3.88	square feet per person
Building Cost per square foot	$240	per square foot

			Infrastructure Needed				
	Year	*Erie Population*	*Acquired Park Acres*	*Developed Park Acres*	*Linear Feet of Concrete Trails*	*Linear Feet of Crusher Fines Trails*	*Square Feet of Park Buildings*
Base	2015	21,571	41.00	41.00	149,702	49,513	83,764
1	2016	22,925	43.57	43.57	159,098	52,621	89,021
2	2017	24,279	46.15	46.15	168,494	55,728	94,279
3	2018	25,633	48.72	48.72	177,890	58,836	99,536
4	2019	26,986	51.29	51.29	187,286	61,944	104,794
5	2020	28,340	53.87	53.87	196,682	65,051	110,051
6	2021	29,597	56.26	56.26	205,404	67,936	114,931
7	2022	30,854	58.64	58.64	214,126	70,821	119,812
8	2023	32,111	61.03	61.03	222,848	73,706	124,692
9	2024	33,368	63.42	63.42	231,571	76,590	129,573
10	2025	34,624	65.81	65.81	240,293	79,475	134,453
Ten-Yr Increase		13,053	24.81	24.81	90,591	29,962	50,689
Cost of Park Land Acquisition							**$1,200,903**
Cost of Park Land Development							**$4,665,868**
Cost of Concrete Trails							**$3,623,640**
Cost of Crusher Fines Trails							**$239,696**
Cost of Park Buildings							**$12,165,350**
Total Cost of Parks and Trails Improvements							**$21,895,457**

PROPOSED IMPACT FEES FOR PARKS

Infrastructure costs per person used in the Parks impact fee calculations are listed at the top of Figure 13. The net capital cost for parks is $1,345.73 for each resident. Impact fees per unit are derived by multiplying persons per housing unit by the total infrastructure cost per person. Therefore, the impact fee for a multifamily unit is $2,826 (2.89 persons per housing unit X $1,345.73 infrastructure cost per person = $2,826 [truncated]). The impact fee for a single family unit is $3,889.

Figure 13. Proposed Park Impact Fees

Infrastructure Costs per Person	
Community Park Land Acquisition	$92.00
Community Park Land Development	$357.45
Concrete Trails	$277.60
Crusher Fines Trails	$18.36
Planned Recreation Center	$931.97
Debt Service Credit	($331.65)
Total Capital Cost per Person	**$1,345.73**

Unit Type	*Persons per Housing Unit*	*Proposed Fee*	*Current Fee*	*Increase/ (Decrease)*
Single Family	2.89	**$3,889**	$2,165	$1,724
Multifamily	2.10	**$2,826**	$2,165	$661

CASH FLOW ANALYSIS

The cash flow summary for community park and trail development shown in Figure 14 indicates impact fee revenue and expenditures necessary to meet the demand for growth-related parks facilities. Parks impact fees are projected to yield a revenue stream that averages $1.8 million per year. Deficits are present due to the inclusion of a debt service credit. To the extent the rate of development either accelerates or slows down, there will be a corresponding change in the impact fee revenue and capital costs.

Figure 14. Cash Flow Analysis

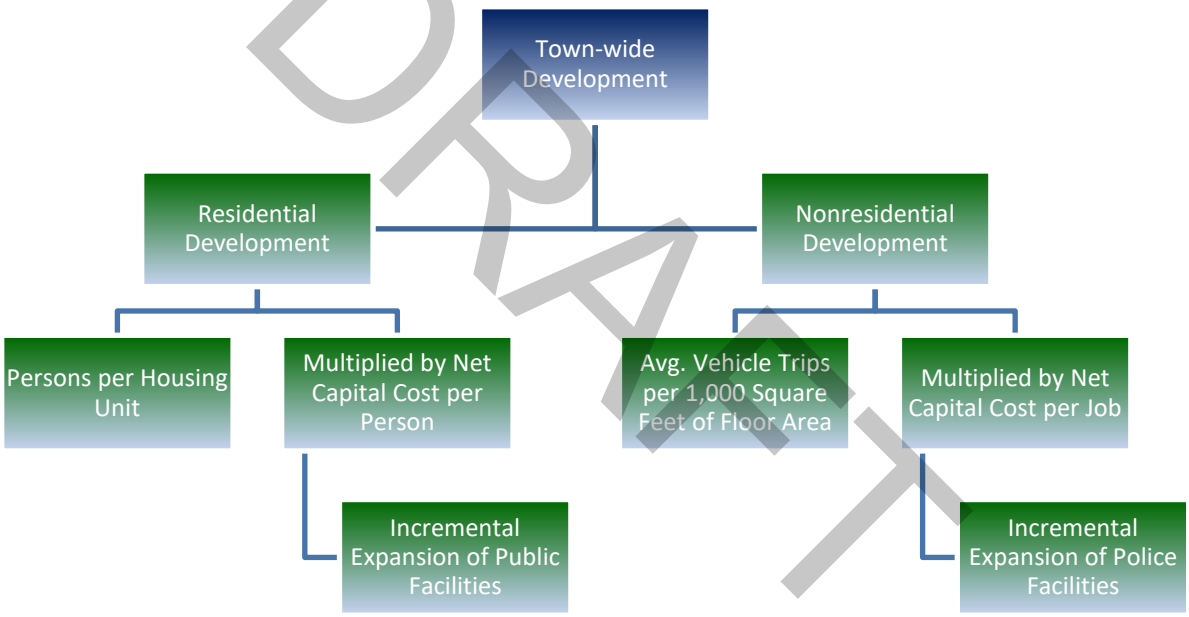
	Year =>	1	2	3	4	5	6	7	8	9	10	*Cumulative*	*Average*
(2015$ in '000s)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	*Total*	*Annual*
REVENUES													
Parks Fee - SF		$1,556	$1,556	$1,556	$1,556	$1,556	$1,556	$1,556	$1,556	$1,556	$1,556	$15,556	$1,556
Parks Fee - MF		$266	$266	$266	$266	$266	$136	$136	$136	$136	$136	$2,010	$201
Parks Impact Fees		*$1,822*	*$1,822*	*$1,822*	*$1,822*	*$1,822*	*$1,691*	*$1,691*	*$1,691*	*$1,691*	*$1,691*	$17,566	*$1,757*
CAPITAL COSTS													
Community Parks		$608	$610	$608	$608	$610	$565	$563	$563	$565	$565	$5,864	$586
Concrete Trails		$376	$376	$376	$376	$376	$349	$349	$349	$349	$349	$3,624	$362
Crusher Fines Trails		$25	$25	$25	$25	$25	$23	$23	$23	$23	$23	$240	$24
Park Buildings		$1,262	$1,262	$1,262	$1,262	$1,262	$1,171	$1,171	$1,171	$1,171	$1,171	$12,165	
Total Parks Capital Costs		*$2,270*	*$2,273*	*$2,270*	*$2,270*	*$2,273*	*$2,108*	*$2,106*	*$2,106*	*$2,108*	*$2,108*	$21,893	*$2,189*
Net Cap. Facilities Cash Flow - Parks		($448)	($451)	($448)	($448)	($451)	($417)	($415)	($415)	($417)	($417)	($4,327)	($433)
		($448)	($899)	($1,347)	($1,796)	($2,246)	($2,663)	($3,078)	($3,493)	($3,910)	($4,327)		

Public Facilities

METHODOLOGY

The Public Facilities impact fee for Erie utilizes an incremental expansion approach, with infrastructure costs allocated to residential and nonresidential development based on a functional population analysis (Figure 16). The formula for the Public Facilities impact fee is diagrammed in Figure 15. For residential development, Public Facilities impact fees are a function of population growth. Public Facilities impact fees for nonresidential development are based on the estimated number of employees per 1,000 square feet of floor area.

Figure 15. Public Facilities Impact Fee Methodology



PROPORTIONATE SHARE ANALYSIS

The Public Facilities impact fee uses functional population to determine the proportionate cost share for residential and nonresidential development. For residential development, the proportionate share factor is based on estimated person hours of non-working residents, plus the non-working hours of resident workers. Based on 2013 U.S. Census Bureau data, approximately 42% of Erie's population worked in 2013. For resident workers, two thirds of a day (i.e., annualized average of 16 hours per day) was allocated to residential demand. Time spent at work (i.e., annualized average of 8 hours per day) was allocated to nonresidential development. In 2013, the U.S. Census Bureau's OnTheMap web application indicated that 399 Town residents also worked in Erie, but 95% of workers commuted to out-of-town jobs. Total jobs

located in Erie are 2,023. Based on estimated person hours, the cost allocation for residential development is 96.2% while nonresidential development accounts for 3.8% of the demand for infrastructure. This analysis is shown in Figure 16.

Figure 16. Town of Erie Functional Population

			Demand	Person	Proportionate
Residential		*Demand Units in 2013*	*Hours/Day*	*Hours*	*Share*
	Estimated Residents	19,749			
58%	Residents Not Working	11,515	24	276,360	
42%	Workers Living in Town	8,234			
5%	City Residents Working in Town	399	16	6,384	
95%	City Residents Working outside of Town	7,835	16	125,360	
		Residential Subtotal		408,104	**96.2%**
Nonresidential					
	Jobs Located in Town	2,023			
	City Residents Working in Town	399	8	3,192	
	Non-Resident Workers	1,624	8	12,992	
		Nonresidential Subtotal		16,184	**3.8%**
			TOTAL	424,288	**100%**

Source: US Census, OnTheMap Application and LEHD Origin-Destination Employment Statistics

PUBLIC FACILITY LEVELS OF SERVICE STANDARDS AND COST FACTORS

As shown in Figure 17, the Town of Erie Public Facilities fee is based on two facilities: Town Hall and the Leon Wurl Service Center (two-thirds of which is devoted to general government uses according to staff). The general government-related square footage of these two structures totals 58,907 square feet. Town staff estimate structures of these type could be replaced at a cost of $240 per square foot.

Figure 17: Public Facility LOS and Cost Factors

Building	*Square Footage*	*Replacement Cost*	
Town Hall	18,907	$4,537,680	
Leon A. Wurl Service Center*	40,000	$9,600,000	Cost/SF
Total	**58,907**	***$14,137,680***	**$240**

**Staff indicate 2/3 of this structure is devoted to general government uses*

Figure 18 indicates current population and employment bases, residential/nonresidential proportionate share factors, current LOS standards, and cost per demand unit. The current residential LOS is derived by

multiplying total public facility square footage by the proportionate share determined in the functional population analysis (Figure 16) and dividing by the 2015 population (58,907 sq. ft. X 96.2% proportionate share / 21,571 persons), resulting in a 2.63 sq. ft. per person LOS. Similarly, nonresidential LOS is derived by multiplying total square footage by the proportionate share and dividing by total jobs (58,907 sq. ft. X 3.8% proportionate share / 2,543 jobs), resulting in a LOS of 0.88 sq. ft. per job.

The cost per demand unit is derived by multiplying total development cost per square foot ($240) by the existing LOS standards discussed above. For residential development the cost per person is $630.41 (2.63 square feet per person X $240 cost per square foot). The cost per demand unit for nonresidential development is $212.10 per job (derived in the same fashion).

Figure 18. Current Level of Service and Cost Factors for Public Facilities

Development Type	*Proportionate Share*	*2015 Demand Units*	*Sq. Ft. per Demand Unit*	*Cost per Demand Unit*
Residential	96.2%	21,571 Population	2.63	**$630.41**
Nonresidential	3.8%	2,543 Jobs	0.88	**$212.10**

PROJECTED NEED FOR PUBLIC FACILITY SPACE

Figure 19 depicts projected demand for Public Facility space over the next ten years. Demand from population and nonresidential growth will require 35,778 square feet (34,287 sq. ft. demand by residential + 1,490 sq. ft. demand by nonresidential) of new public facility space for a total cost of $8,586,609 (35,778 sq. ft. x $240) over the next ten years.

Figure 19. Public Facility Needs Analysis

Public Building Level of Service (LOS) Standards

Residential LOS	2.63	per person
Nonresidential LOS	0.88	per job
Public Building Cost	$240	per square foot

				Infrastructure Needed	
	Year	*Erie Population*	*Erie Jobs*	*Residential*	*Nonresidential*
Base	2015	21,571	2,543	56,660	2,247
1	2016	22,925	2,956	60,216	2,612
2	2017	24,279	3,169	63,773	2,801
3	2018	25,633	3,382	67,329	2,989
4	2019	26,986	3,595	70,885	3,177
5	2020	28,340	3,701	74,441	3,271
6	2021	29,597	3,807	77,742	3,364
7	2022	30,854	3,912	81,044	3,457
8	2023	32,111	4,018	84,345	3,551
9	2024	33,368	4,123	87,646	3,644
10	2025	34,624	4,229	90,947	3,737
Ten-Yr Increase		13,053	1,686	34,287	1,490
Residential Cost of Public Building Improvements					**$8,228,946**
Nonresidential Cost of Public Building Improvements					**$357,663**
Total Cost of Public Building Improvements					**$8,586,609**

PUBLIC FACILITY IMPACT FEE CALCULATIONS

Proposed Public Facility impact fees are shown in Figure 20. For residential development, Public Facility impact fees are based on unit type and persons per housing unit. For example, the proposed Public Facility fee for multifamily housing units is $1,323 per unit (2.10 persons per housing unit x $630.41 net cost per person = $1,323 [truncated]).

For nonresidential development, the fees are expressed per thousand square feet (KSF) of floor area. Therefore, an office building with 10,000 square feet of floor area would pay a Public Facility fee of $6,990 (i.e., 3.30 jobs per KSF X 10 KSF X $212.10 net cost per job (truncated)).

Figure 20. Proposed Public Facility Impact Fees

Residential

Level of Service	Per Person
Public Buildings	$630.41
Total Net Cost per Person	**$630.41**

Residential Impact Fees per Person

Unit Type	Persons per Housing Unit	Proposed Fee	Current Fee	Increase/ (Decrease)
Single Family	2.89	**$1,821**	$1,808	$13
Multifamily	2.10	**$1,323**	$1,559	($236)

Nonresidential

Level of Service	Per Job
Public Buildings	$212.10
Net Cost Per Demand Unit	**$212.10**

Nonresidential Impact Fees per 1,000 Square Feet of Floor Area

Development Type	Jobs/1,000 SF	Proposed Fee	Current Fee#
Commercial	2.00	***$424***	$1382-$2302*
Office	3.30	***$699***	$2316-$3036*
Industrial	1.80	***$381***	$884-$1,597**

**Range based on size*

***Range based on use*

#Other uses not included in proposed schedule are Business Park and Private School; current fee includes all public facilities, whereas proposed fee breaks out law enforcement facility

CASH FLOW ANALYSIS

The cash flow summary for public facility improvements shown in Figure 21 indicates impact fee revenue and expenditures necessary to meet the demand for growth-related public facilities. As indicated in Figure 21, Public Facility impact fees are projected to yield a revenue stream that averages $858,000 per year. To the extent the rate of development either accelerates or slows down, there will be a corresponding change in the impact fee revenue and capital costs.

Figure 21. Cash Flow Analysis

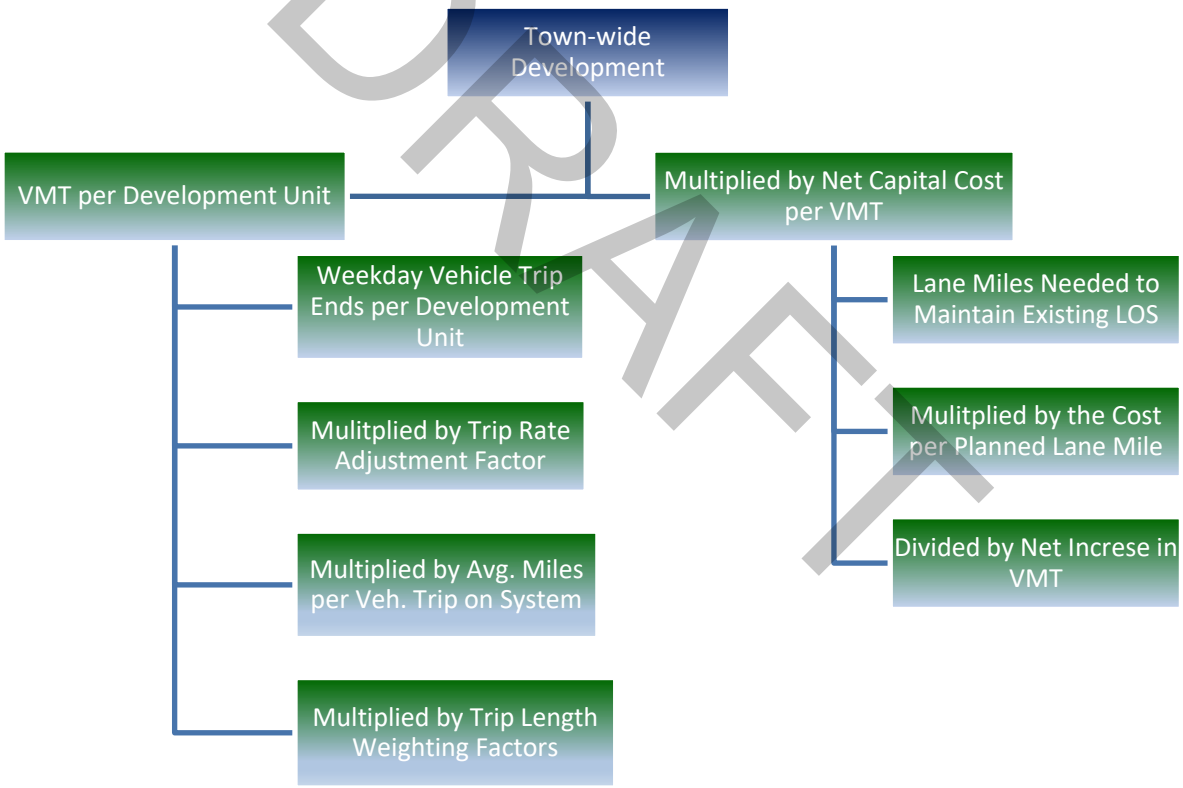
	Year =>	1	2	3	4	5	6	7	8	9	10	*Cumulative*	*Average*
(2015$ in '000s)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	*Total*	*Annual*
REVENUES													
Public Facility Fees -SF		$728	$728	$728	$728	$728	$728	$728	$728	$728	$728	$7,284	$728
Public Facility Fees -MF		$125	$125	$125	$125	$125	$64	$64	$64	$64	$64	$941	$94
Public Facility Fees-Commercial		$81	$38	$38	$38	$17	$17	$17	$17	$17	$17	$297	$30
Public Facility Fees-Office		$7	$7	$7	$7	$3	$3	$3	$3	$3	$3	$49	$5
Public Facility Fees-Industrial		$0	$0	$0	$0	$2	$2	$2	$2	$2	$2	$11	$1
Public Facility Impact Fees		*$941*	*$898*	*$898*	*$898*	*$875*	*$814*	*$814*	*$814*	*$814*	*$814*	*$8,582*	*$858*
CAPITAL COSTS													
Public Facility Costs		$941	$899	$899	$899	$876	$815	$815	$815	$815	$815	$8,587	$859
Net Cap. Facilities Cash Flow:													
Public Facilities		($1)	($1)	($1)	($1)	($0)	($0)	($0)	($0)	($0)	($0)	($5)	($0)
		($1)	($1)	($2)	($2)	($2)	($3)	($3)	($4)	($4)	($5)		

Transportation

METHODOLOGY

The Town of Erie Transportation impact fees are calculated using a plan-based approach for minor arterial improvements. As shown in Figure 22, trip generation rates and other factors are used to determine vehicle miles traveled (VMT) by type of development, which is then multiplied by the total capital cost per VMT to yield the impact fees. The incremental portion of the approach involves developing a transportation demand model to determine how new development increases vehicle miles traveled (VMT) and lane miles needed to maintain existing levels of service (LOS) for minor arterials. The plan-based portion of the methodology for road improvements in Erie uses those planned minor arterial improvements that will increase system-wide capacity to develop a true cost per lane mile.

Figure 22: Transportation Impact Fee Methodology Chart



EXISTING LEVELS OF SERVICE FOR TRANSPORTATION

As shown in Figure 23, The Town currently maintains 35.94 lane miles of minor arterial roadways.

Figure 23: Town of Erie Transportation System Inventory

Existing Roadways	Lanes	Miles	Lane Miles
Major Collectors	2.00	11.19	22.39
Minor Arterials	4.00	8.99	35.94
TOTAL	*6.00*	*20.18*	*58.33*

Source: Town of Erie GIS

The steps to calculate a current LOS for the Town's street network involve calibrating existing development to the system network. To do so, development units by type are multiplied by adjusted vehicle trip ends per development unit. The factors used to calculate the current LOS, expressed in VMT, are discussed below and shown in Figure 27 after the discussion.

Trip Generation Rates

Trip generation rates are from the reference book *Trip Generation* (Institute of Transportation Engineers, 2012). Town of Erie Transportation impact fees are based on average weekday vehicle trip ends. 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 the impact fees, trip generation rates are adjusted to avoid double counting each trip at both the origin and destination points. Therefore, the basic trip adjustment factor is 50 percent. As discussed below, the impact fee methodology includes additional adjustments to make the fees proportionate to the infrastructure demand for particular types of development.

Residential Vehicle Trip Ends

As an alternative to simply using the national average trip generation rate for residential development, the Institute of Transportation Engineers (ITE) publishes regression curve formulas that may be used to derive custom trip generation rates using local demographic data. Key independent variables needed for the analysis (i.e., vehicles available, housing units, households, and persons) are only available from the American Community Survey (ACS) estimates for Erie. These data were used to derive custom average weekday vehicle trip ends by type of housing, as shown in Figure 24.

Figure 24: Average Weekday Vehicle Trip Ends by Housing Type

Town of Erie, CO	Vehicles Available (1)	Households (2) Single Family Units (3)	Households (2) Multifamily Units	Households (2) Total	Vehicles per Household by Tenure
Owner-occupied	11,577	5,140	144	5,284	2.19
Renter-occupied	2,146	931	183	1,114	1.93
TOTAL	13,723	6,071	327	6,398	2.14
Housing Units (6) =>		6,209	336	6,545	

	Persons (4)	Trip Ends (5)	Vehicles by Type of Housing	Trip Ends (6)	Average Trip Ends	Trip Ends per Housing Unit
Single Family Units	17,962	46,457	13,055	75,483	60,970	**9.8**
Multifamily Units	707	2,389	668	2,926	2,657	**7.9**
TOTAL	18,669	48,846	13,723	78,409	63,628	**9.7**

(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) Single Family units include detached homes, attached homes and mobile homes.
(4) Persons by units in structure from Table B25033, American Community Survey, 2013.
(5) Vehicle trips ends based on persons using formulas from Trip Generation (ITE 2012). For single family housing (ITE 210), the fitted curve equation is EXP(0.91*LN(persons)+1.52). To approximate the average population of the ITE studies, persons were divided by 32 and the equation result multiplied by 32. For multifamily housing (ITE 220), the fitted curve equation is (3.47*persons)-64.48.
(6) Vehicle trip ends based on vehicles available using formulas from Trip Generation (ITE 2012). For single family housing (ITE 210), the fitted curve equation is EXP(0.99*LN(vehicles)+1.81). To approximate the average number of vehicles in the ITE studies, vehicles available were divided by 52 and the equation result multiplied by 52. For multifamily housing (ITE 220), the fitted curve equation is (3.94*vehicles)+293.58.

Nonresidential Vehicle Trip Ends

Vehicle trip ends for nonresidential development are from the reference book, *Trip Generation* (Institute of Transportation Engineers, 2012). The shaded categories in Figure 25 represent the proxy categories for use in determining existing and projected trips from nonresidential development in Erie.

Figure 25: The Institute of Transportation Engineers, Nonresidential Trip Ends, 2012

ITE Code	Land Use / Size	Demand Unit	Wkdy Trip Ends Per Dmd Unit*	Wkdy Trip Ends Per Employee*	Emp Per Dmd Unit	Sq Ft Per Emp
110	Light Industrial	1,000 Sq Ft	6.97	3.02	2.31	433
130	Industrial Park	1,000 Sq Ft	6.83	3.34	2.04	489
140	Manufacturing	1,000 Sq Ft	3.82	2.13	1.79	558
150	Warehousing	1,000 Sq Ft	3.56	3.89	0.92	1,093
254	Assisted Living	bed	2.66	3.93	0.68	na
320	Motel	room	5.63	12.81	0.44	na
520	Elementary School	1,000 Sq Ft	15.43	15.71	0.98	1,018
530	High School	1,000 Sq Ft	12.89	19.74	0.65	1,531
540	Community College	student	1.23	15.55	0.08	na
550	University/College	student	1.71	8.96	0.19	na
565	Day Care	student	4.38	26.73	0.16	na
610	Hospital	1,000 Sq Ft	13.22	4.50	2.94	340
620	Nursing Home	1,000 Sq Ft	7.60	3.26	2.33	429
710	General Office (avg size)	1,000 Sq Ft	11.03	3.32	3.32	301
760	Research & Dev Center	1,000 Sq Ft	8.11	2.77	2.93	342
770	Business Park	1,000 Sq Ft	12.44	4.04	3.08	325
820	Shopping Center (avg size)	1,000 Sq Ft	42.70	na	2.00	500

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

Adjustment for Journey-To-Work Commuting

Residential development in the Town of Erie has a larger trip adjustment factor of 65 percent to account for commuters leaving Erie for work. According to the National Household Travel Survey (2009), home-based work trips are typically 31 percent of "production" trips, also known as out-bound trips (which are 50 percent of all trip ends). Data from the U.S. Census Bureau's OnTheMap web application for 2013 indicate that 95 percent of Erie's employed residents travel outside the Town for work. In combination, these factors (0.31 x 0.50 x 0.95 = 0.15) account for 15 percent (rounded) of additional production trips. The total adjustment factor for residential includes attraction trips (50% of trip ends) plus the journey-to-work commuting adjustment for a total of 65 percent.

Figure 26: Adjustment for Journey-to-Work Commuting

Trip Adjustment Factor for Commuters

Employed Erie Residents (2013)	8,234
Erie Residents Working in City (2013)	399
Erie Residents Commuting Outside City for Work	7,835
Percent Commuting out of the City	**95%**
Additional Production Trips	15%
Residential Trip Adjustment Factor	***65%***

Source: U.S. Census, OnTheMap Application
Longitudinal-Employer Household Dynamics (LEHD) Program; ITE

Adjustment for Pass-By Trips

For commercial development, the trip adjustment factor is less than 50 percent because these land uses attract vehicles as they pass by. 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, the ITE data indicate that 34 percent of the vehicles that enter are passing-by on their way to some other primary destination. The remaining 66 percent 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 percent multiplied by 50 percent, or approximately 33 percent of the trip ends. These factors are shown to derive inbound vehicle trips for each type of nonresidential land use.

Trip Length Weighting Factor by Type of Land Use

The Transportation impact fees methodology includes a percentage adjustment, or weighting factor, to account for trip length variation by type of land use. As documented in Table 6 of the 2009 National Household Travel Survey, vehicle trips from residential development are approximately 121 percent of the average trip length. The residential trip length adjustment factor includes data on home-base work trips, social, and recreational purposes. Conversely, shopping trips associated with commercial development are roughly 66 percent of the average trip length while other nonresidential development typically accounts for trips that are 73 percent of the average for all trips.

Lane Capacity

Transportation impact fees are based on established daily per-lane capacities for each classification of roadways. According to the 2008 Town of Erie Transportation Master Plan completed for the Town by LSA, the daily per-lane capacity of minor arterials in Erie is 9,000 (36,000 for a four-lane arterial).

Summary of Demand Model Inputs

Figure 27 shows the calibration of existing development to the Town's minor arterial network. Knowing the current lane miles of minor arterial streets (35.94), TischlerBise determined a weighted-average trip length of five miles on the current system using a series of spreadsheet iterations. As shown in Figure 27 below, based on the trip generation, trip adjustment, and trip length factors discussed above, existing development within Erie attracted an estimated 221,344 Vehicle Miles of Travel (VMT) in 2015. A VMT is a measurement unit equal to one vehicle traveling one mile. In the aggregate, VMT is the product of vehicle trips multiplied by the average trip length.[1] The current infrastructure standard is 1.62 lane miles per 10,000 vehicle miles of travel (i.e., 35.94 lane miles divided by 221,344 VMT expressed in ten-thousands).

[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 impact fees, VMT calculations are based on attraction (inbound) trips to development located in the service area, with the trip lengths calibrated to the road network considered to be system improvements. This refinement eliminates pass-through or external- external trips, and travel on roads that are not system improvements (e.g. interstate highways).

Figure 27: Existing Level of Service on the Minor Arterial Street Network

Development Type [1]	Dev. Unit	[A] Avg Wkdy Veh Trip Ends per Dev. Unit [2]	[B] Trip Adjustment Factors [3]	[A]X[B]=[C] Trip Length	X[D] Trip Length Weighting Factor [4]
RESIDENTIAL					
Single Units	HU	9.80	65%	6.37	121%
2+ Units	HU	7.90	65%	5.14	121%
NONRESIDENTIAL					
Commercial	KSF	42.70	33%	14.09	66%
Office/ Other	KSF	11.03	50%	5.52	73%
Industrial	KSF	3.82	50%	1.91	73%

Average Trip Length (Miles) [5]	3.50
Capacity per Lane	9,000

	Base Year 2015
Development Unit	
Single Units	7,335
2+ Units	471
Commercial KSF	137
Office/ Other KSF	511
Industrial KSF	318
Vehicle Trips	
Single Units	46,727
2+ Units	2,418
Commercial KSF	1,932
Office KSF	2,819
Industrial KSF	608
TOTAL Trips	54,503
Vehicle Miles of Travel (VMT)	221,344
Total Lane Miles	35.94
Lane Miles per 10,000 VMT	1.62

[1] KSF = square feet of floor area in thousands.
[2] Residential: TischlerBise Impact Fee Land Use Assumptions; Nonresidential: Trip Generation, Institute of Transportation Engineers, 2012.
[3] On an average weekday, half of all trip ends are inbound. Retail and institutional include 34% pass-by adjustment (i.e. 66% are primary trips) half of which are trip ends. The residential adjustment factor accounts for 65% of employed residents commuting to jobs outside the Community.
[4] Table 6, National Household Travel Survey, 2009.
[5] TischlerBise

PROJECTED TRAVEL DEMAND

The projected need for system lane miles is a function of the ten-year development forecast (see Appendix A) and the existing infrastructure standards discussed above. 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. For the purpose of impact fees, this progression of travel up and down the functional classification chain narrows the average trip length determination to the following question, "what is the average vehicle trip length on Transportation impact fee system improvements (i.e., the same type of streets used to document current infrastructure standards)?"

As shown in Figure 28 below, new development increases vehicle miles of travel from 211,348 in 2015 to 368,640 in 2025, for a net increase of 147,292 VMT. When VMT is compared to the current infrastructure (existing LOS) standards discussed previously, new development generates the need for an additional 16.37 lane miles of Town-maintained arterial roads in the next 10 years in order to maintain the current LOS.

Figure 28: Transportation Demand Model

	Base Yr	*1*	*2*	*3*	*4*	*5*	*10*
Year->	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2025**
DEMAND DATA							
SINGLE UNIT	7,335	7,735	8,135	8,535	8,935	9,335	11,335
2+ UNIT	471	565	659	754	848	942	1,182
SINGLE UNIT TRIPS	46,727	49,275	51,823	54,371	56,919	59,467	72,207
2+ UNIT TRIPS	2,418	2,902	3,386	3,869	4,353	4,837	6,070
RES TRIPS	**49,145**	**52,177**	**55,209**	**58,240**	**61,272**	**64,304**	**78,277**
COMMERCIAL KSF	137	327	417	507	597	637	837
OFFICE KSF	511	521	531	541	551	556	581
INDUSTRIAL KSF	318	318	318	318	318	323	348
COMMERCIAL TRIPS	1,932	4,609	5,877	7,146	8,414	8,977	11,796
OFFICE TRIPS	2,819	2,874	2,929	2,984	3,040	3,067	3,205
INDUSTRIAL TRIPS	608	608	608	608	608	617	665
NONRES TRIPS	**5,359**	**8,091**	**9,414**	**10,738**	**12,062**	**12,661**	**15,666**
Total VMT on Planned Improv.	**221,348**	**240,513**	**256,423**	**272,331**	**288,244**	**302,477**	**368,640**
Lane Miles	24.59	26.72	28.49	30.26	32.03	33.61	40.96
Annual Lane Mile Increase		2.13	1.77	1.77	1.77	1.58	1.47
Cumulative Lane Miles		2.13	3.90	5.66	7.43	9.01	**16.37**

Source: TischlerBise

COST PER LANE MILE AND POTENTIAL IMPACT FEE ELIGIBLE PROJECTS

Figure 29 summarizes a list of potential transportation system improvement projects the Town will fund through impact fees. This list of projects is used to determine the cost per lane mile factor used in the impact fee calculation. Potential impact fee funded projects total approximately $32.1 million. When this total is compared to the increase in lane miles (16.3), the cost per lane mile $1,971,226.99.

Figure 29: Summary of Growth-Related Transportation Projects (10-Year Plan)

Year	Future Capacity Projects	Length	Lanes	Lane Miles	Estimated Cost
FY2016	Erie Parkway 111th to Meadow View	0.8	2	1.5	$1,500,000
FY2017	CLR- Telleen to Cheesman	0.5	2	1	$1,450,000
FY2018	CLR - Bonnell to Telleen	1.2	4	4.8	$7,500,000
TBD	Nine Mile internal roads	0.5	2	1	$2,409,000
TBD	Erie Parkway WCR 5- I25	2.0	4	8	$19,272,000
Total		**5.0**	**14**	**16.3**	**$32,131,000**
		Cost per Lane Mile			***$1,971,226.99***

TRANSPORTATION INPUT VARIABLES AND IMPACT FEES

Figure 30 provides a summary of the input variables (described in the chapter sections above) used to calculate the net capital cost per vehicle mile of travel for transportation improvements.

The residential Transportation impact fees are the product of adjusted residential VMT multiplied by the total net capital cost per VMT ($219.03). Also shown is a comparison with the City's current fees. For example, the net capital cost per VMT ($219.03) multiplied by the single unit VMT factor (26.98) results in a Transportation impact fee of $5,908 per housing unit. The nonresidential Transportation impact fees are calculated in the same way. TischlerBise used 2012 weekday vehicle trip ends factors published by The Institute of Transportation Engineers in Trip Generation, 9th Edition for the Weekday Vehicle Trip Ends factors by land use.

Figure 30: Transportation Input Variables and Maximum Allowable Impact Fees

Street Level Of Service and Capital Costs

Lane Miles Needed to Maintain LOS	16.37
Cost Per Lane Mile	$1,971,227
Total Cost of System Improvements	$32,260,603
Net Increase in VMT	147,292
NET CAPITAL COST PER VMT	**$219.03**

Residential Schedule

	[A]	*[B]*	*[C]*	*[D]*	*VMT = [A] x [B] x [C] x [D]*			
	Weekday Vehicle Trip Ends	***Trip Rate Adjustment Factors***	***Avg Miles per Veh. Trip on System***	***Trip Length Weighting Factors***	***VMT***	***Proposed Impact Fee***	***Current Fee***	***Increase (Decrease)***
Unit Type					*per unit*	***(Per Housing Unit)***		
Single Unit	9.80	65%	3.50	121%	26.98	$5,908	$1,678	$4,230.00
2+ Unit	7.90	65%	3.50	121%	21.75	$4,763	$1,163	$3,600.00

Nonresidential Schedule

		[A]	*[B]*	*[C]*	*[D]*	*VMT = [A] x [B] x [C] x [D]*			
Land Use/ Size	***Demand Unit***	***Weekday Vehicle Trip Ends***	***Trip Rate Adjustment Factors***	***Avg Miles per Veh. Trip on System***	***Trip Length Weighting Factors***	***VMT***	***Proposed Impact Fee***	***Current Fee***	***Increase (Decrease)***
Light Industrial	1,000 Sq Ft	6.97	50%	3.50	73%	8.90	$1,950	$1,067	$883
Industrial Park	1,000 Sq Ft	6.83	50%	3.50	73%	8.73	$1,911	-	-
Manufacturing	1,000 Sq Ft	3.82	50%	3.50	73%	4.88	$1,068	$584	$484
Warehousing	1,000 Sq Ft	3.56	50%	3.50	73%	4.55	$996	$759	$237
Assisted Living	bed	2.66	50%	3.50	73%	3.40	$744	-	-
Motel	room	5.63	50%	3.50	73%	7.19	$1,575	-	-
Elementary School	1,000 Sq Ft	15.43	50%	3.50	73%	19.71	$4,317	-	-
High School	1,000 Sq Ft	12.89	50%	3.50	73%	16.47	$3,606	-	-
Community College	student	1.23	50%	3.50	73%	1.57	$344	-	-
University/College	student	1.71	50%	3.50	73%	2.18	$478	-	-
Day Care	student	4.38	50%	3.50	73%	5.60	$1,225	-	-
Hospital	1,000 Sq Ft	13.22	50%	3.50	73%	16.89	$3,699	-	-
Nursing Home	1,000 Sq Ft	7.60	50%	3.50	73%	9.71	$2,126	-	-
General Office (avg size)	1,000 Sq Ft	11.03	50%	3.50	73%	14.09	$3,086	$1,729-$3,465	-
Research & Dev Center	1,000 Sq Ft	8.11	50%	3.50	73%	10.36	$2,269	-	-
Business Park	1,000 Sq Ft	12.44	50%	3.50	73%	15.89	$3,480	$1,953	$1,527
Shopping Center (avg size)	1,000 Sq Ft	42.70	33%	3.50	66%	32.55	$7,129	$1,113-$4,192	-

CASH FLOW PROJECTIONS

This section summarizes the potential cash flow to the Town of Erie if the Transportation impact fees are implemented at the maximum allowable amounts. The cash flow projections are based on the assumptions detailed in this chapter. To the extent the rate of development either accelerates or slows down from those detailed in Appendix A, there will be a corresponding change in the impact fee revenue available for the prioritized projects.

The cash flow summary provides an indication of the impact fee revenue generated by new development over the next ten years, and capital expenditures necessary to meet existing and new demand for new Transportation system improvements.

Figure 31: Cash Flow Summary for Transportation

Ten-Year Growth-Related Costs for Road Facilities

Total Cost of System Improvements	$32,260,603

		per Housing Unit		*Per Square KSF of Floor Area*		
		Single Unit **$5,908**	***2+ Units*** **$4,763**	***Commercial*** **$7,129**	***Office/Inst.*** **$3,086**	***Industrial*** **$1,068**
	Year	***Housing Units Added***		***Square Feet Added (1,000)***		
Base	2015					
Year 1	2016	400	94	190	10	0
Year 2	2017	400	94	90	10	0
Year 3	2018	400	94	90	10	0
Year 4	2019	400	94	90	10	0
Year 5	2020	400	94	40	5	5
Year 6	2021	400	48	40	5	5
Year 7	2022	400	48	40	5	5
Year 8	2023	400	48	40	5	5
Year 9	2024	400	48	40	5	5
Year 10	2023	400	48	40	5	5
Ten-Yr Increase		4,000	711	700	70	30
Projected Fees (Rounded)=>		$23,632,000	$3,387,216	$4,990,300	$216,020	$32,040

Total Projected Revenues	**$32,257,576**
Cumulative Net Surplus/(Deficit)	($3,027)

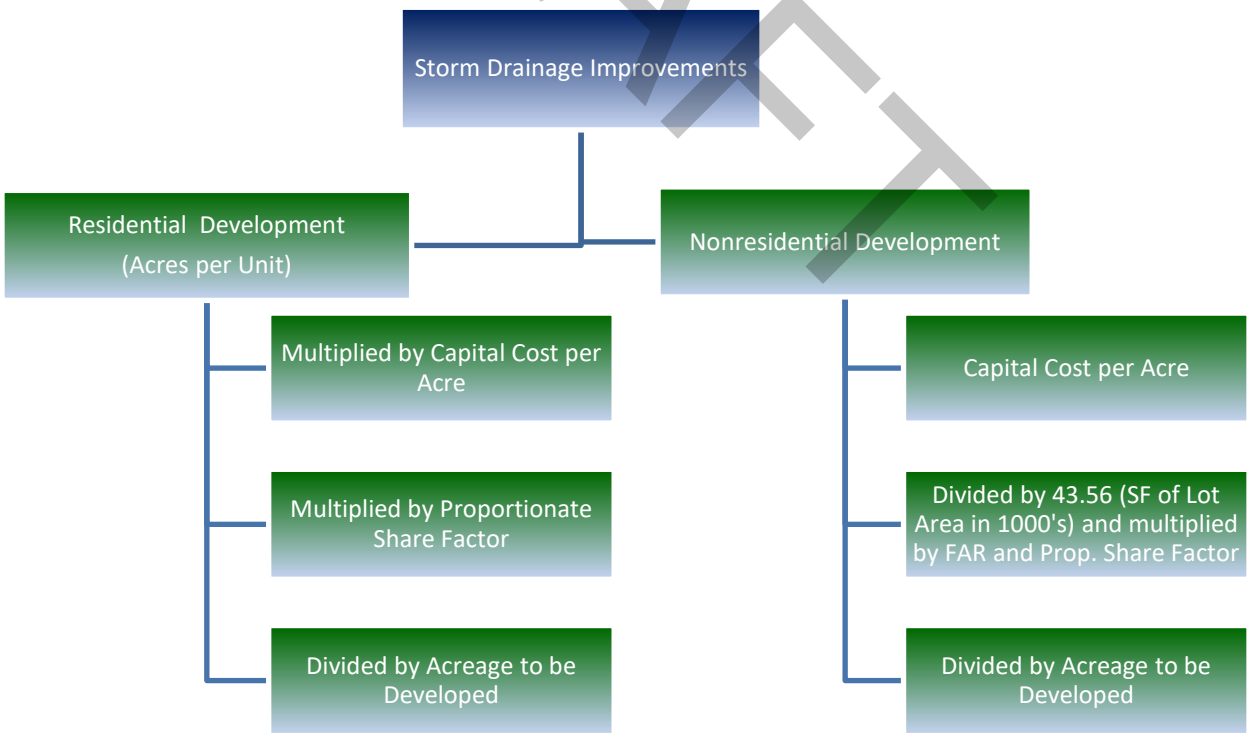
Storm Drainage

METHODOLOGY

The Storm Drainage impact fees are derived using a plan-based methodology. The Town's Storm Drainage Capital Improvement Plan (CIP) identifies improvements that will be necessary to implement over the next ten years. Because some of these improvements correct existing deficiencies, TischlerBise used development projections (Appendix A) to determine future growth's share of storm drainage demand (detailed later in Figure 34).

As shown in Figure 32, the capital cost of storm drainage improvements is multiplied by proportionate share factors for each type of land use, and then divided by the amount of land area by type of land use. Residential fees per housing unit are based on a gross density of 4 units per acre for single family-detached units and 13.5 units per acre of all other residential housing types. The capital cost per acre for nonresidential land uses was converted to a fee per 1,000 square feet (KSF) using an average floor area ratio (FAR) of 0.25. These figures were all based on discussions with Town staff and the Town of Erie Universal Development Ordinance. It is preferable to base the nonresidential fees on floor area rather than on a per acre basis because the fee will increase or decrease according to the intensity of an individual project.

Figure 32: Storm Drainage Impact Fee Methodology



GROWTH-RELATED STORM DRAINAGE IMPROVEMENTS

As noted above, the Town's Storm Drainage CIP includes projects that both accommodate demand from future growth and partially correct existing deficiencies in the system. To guard against charging new development for existing deficiencies, TischlerBise conducted a growth share analysis using development projections (Appendix A) for residential and nonresidential over the next 10 years. Figure 33 shows existing and future developed units and acreage by land use category. Expected development over the next 10 years will account for 58 percent of the developed acreage in Erie (1,127.1 developed acres in 2025 / 1,957.5 developed acreage in 2015 x 100).

Figure 33. Growth Share Analysis

Residential (Units)	2015 Units	2015 Acreage	10-year Growth (Units/Ac.)	10-Year Growth Acreage
Single Family	7,335	1,833.9	4,000	1,000.0
Multifamily	471	34.9	711	53.0
Nonresidential (KSF)				
Industrial	318,156	29.2	30,000	3.0
Retail	137,103	12.6	700,000	64.5
Office	511,151	46.9	70,000	6.6
Total		**1,957.5**		**1,127.1**
			Growth Share	**58%**

This growth share factor is multiplied by the total cost of the improvements identified in the Storm Drainage CIP, shown in Figure 34. The total cost of projects identified in the CIP is $14,654,248 (adjusted to 2015 dollars). To prevent double counting, TischlerBise credits the existing Storm Drainage impact fee fund balance of $1,015,368 against these costs, resulting in a new subtotal of $13,638,880, which is then multiplied by the growth share of 58 percent to yield an impact fee-eligible total of $7,853,068.53.

Figure 34. Storm Drainage Capital Improvement Plan

Timing	*Location*	*Total Cost**
2016	Reimbursable Capital Projects - Colliers Hill	$2,114,000
2016-2017	Prince Lake #2 Improvements	$660,625
2016	Prince Tributary Drainage Improvement	$105,700
2016-2024	Coal Creek Improvements	$7,742,525
2017	Coal Creek - County Line to Kenosha	$1,057,000
2019	Reach 120 Sierra Vista Outfall	$687,050
2021	Doniphan Reach 5	$264,250
2022	Doniphan Reach 6	$169,120
2021	Reach CC100 Sunset Outfall	$1,853,978
	Subtotal	*$14,654,248*
	Storm Drainage Impact Fee Fund Balance	*$1,015,368*
	Adjusted Subtotal	*$13,638,880*
	New Growth Share	58%
	Impact Fee-Eligible Total	**$7,853,068.53**

**Costs from 2013 CIP are adjusted for inflation using Engineering News-Record's November 2015 Construction Cost Index*

PROPORTIONATE SHARE FACTORS

The capital costs for the storm drainage system are allocated to the land area served by the improvements. In order to determine the land area served by the storm drainage system, TischlerBise has applied average residential density and nonresidential FAR factors to projected development through the year 2025 to determine the amount of developed acreage by land use, as shown in Figure 35.

Figure 35. Projected Increase in Acreage by Land Use to 2016

	Net Increase in Residential and Nonresidential Acre (10-Year Projection)											10-Year
	Units	***2016***	***2017***	***2018***	***2019***	***2020***	***2021***	***2022***	***2023***	***2024***	***2025***	**Net Increase**
	Single Family	400	400	400	400	400	400	400	400	400	400	**4,000**
	Multifamily	94	94	94	94	94	48	48	48	48	48	**711**
	NET INCREASE	**494**	**494**	**494**	**494**	**494**	**448**	**448**	**448**	**448**	**448**	**4,711**
	Residential Acreage											
4 DU/Ac*	Single Family Acres	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	**1,000.0**
13.5 DU/Ac*	Multifamily Acres	7.0	7.0	7.0	7.0	7.0	3.6	3.6	3.6	3.6	3.6	**53.0**
	NET INCREASE	**107.0**	**107.0**	**107.0**	**107.0**	**107.0**	**103.6**	**103.6**	**103.6**	**103.6**	**103.6**	**1,053.0**
	Nonresidential Square Footage											
0.25 FAR*	Retail	190,000	90,000	90,000	90,000	40,000	40,000	40,000	40,000	40,000	40,000	**700,000**
0.25 FAR*	Office	10,000	10,000	10,000	10,000	5,000	5,000	5,000	5,000	5,000	5,000	**70,000**
0.25 FAR*	Industrial	0	0	0	0	5,000	5,000	5,000	5,000	5,000	5,000	**30,000**
	NET INCREASE	**200,000**	**100,000**	**100,000**	**100,000**	**50,000**	**50,000**	**45,000**	**45,000**	**45,000**	**45,000**	**800,000**
	Nonresidential Acreage											
	Retail Acres	17.4	8.3	8.3	8.3	3.7	3.7	3.7	3.7	3.7	3.7	**64.5**
	Office Acres	0.9	0.9	0.9	0.9	0.5	0.5	0.5	0.5	0.5	0.5	**6.6**
	Industrial Acres	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.5	0.5	0.5	**3.0**
	NET INCREASE	**18.3**	**9.2**	**9.2**	**9.2**	**4.7**	**4.7**	**4.2**	**4.2**	**4.2**	**4.2**	**74.1**
	TOTAL NET INCREASE ACRES	**125.3**	**116.2**	**116.2**	**116.2**	**111.7**	**108.3**	**107.8**	**107.8**	**107.8**	**107.8**	**1,127.1**

**Source: Town staff estimates and Town of Erie Universal Development Ordinance*

Based on the projected increase in acreage by land use shown in the figure above, TischlerBise can determine proportionate share factors by land use by using weighting factors, representing the percentage of impervious surface area. For example, there are 1,000 acres of land projected for single family housing units, based on an average density of four dwellings per acre. The percent impervious surface is estimated at 40 percent, based on data contained in the Denver metropolitan area's Urban Drainage and Flood Control District's *Urban Storm Drainage Criteria Manual* (2001, updated in 2008), resulting in 400 impervious acres. Based on projected development town-wide, this represents 78.6 percent of the net increase in impervious acreage over the next ten years. This calculation is shown in Figure 36.

Figure 36. Proportionate Share and Capital Cost per Acre

Storm Drainage System Improvements				
Growth-Related Capital Costs				**$7,853,069**
Proportionate Share	*Projected Land Use Acreage (10-year)**	*Percent Impervious***	*Impervious Acreage*	*Proportionate Share*
Single Family Residential	1,000.0	40%	400.0	78.6%
Multifamily Residential	53.0	75%	39.8	7.8%
Retail/Commercial	64.5	95%	61.3	12.0%
Office	6.6	85%	5.6	1.1%
Industrial	3.0	80%	2.4	0.5%
TOTAL	1,127.1		509.1	100.0%
*Capital Cost per Acre****				
Single Family Residential	$6,173			
Multifamily Residential	$11,557			
Retail/Commercial	$14,610			
Office	$13,088			
Industrial	$13,088			

** Land use area calculated by TischlerBise using average density and floor area ratios.*
*** Impervious factors from Urban Storm Drainage Criteria Manual (2001; updated 2008). Single Family Residential percent impervious derived from 3,000 square foot , two-story structure on 3 acre lot, the average modelled home size. Multifamily Residential percent impervious derived using Multi-unit (attached) data. Retail percent impervious is from Business - Commercial data, and Office is from Business - Neighborhood data.*
**** For each type of development, the level of service standard (expressed in terms of capital cost per acre) is equal to the capital cost multiplied by the proportionate share factor, divided by the acreage to be developed.*

Capital Cost per Acre			
Single Family Residential	$6,173	=	($7,853,069 x 78.6%) / 1,000 acres
Multifamily Residential	$11,557	=	($7,853,069 x 7.8%) / 53 acres
Retail	$14,610	=	($7,853,069 x 12.0%) / 64.5 acres
Office	$13,088	=	($7,853,069 x 1.1%) / 6.6 acres
Industrial	$13,088	=	($7,853,069 x 0.5%) / 3.0 acres

STORM DRAINAGE IMPACT FEES

Input variables for the Storm Drainage impact fees are shown in the upper section of Figure 37. Fees are derived using the LOS standards shown in the middle of Figure 36 (capital cost per acre). For purposes of the cash flow analysis shown in Figure 38, the capital cost per acre is converted to a "prototype" amount per housing unit and an amount per 1,000 square feet of floor area for nonresidential development. These conversions are based on the average density and floor area ratio assumptions shown in the top of Figure 37.

Figure 37. Storm Drainage Impact Fees

Level Of Service

		Standards:
Gross Acreage per Housing Unit		
	Single Family	0.250
	Multifamily	0.074
Nonresidential Floor Area Ratio		
	Commercial	0.25
	Office	0.25
	Industrial	0.25
Maximum Supportable Impact Fee Per Acre		
	Capital Cost Per Acre	
	Single Family	**$6,173**
	Multifamily	**$11,557**
	Commercial	**$14,610**
	Office	**$13,088**
	Industrial	**$13,088**

STORM DRAINAGE IMPACT FEES		
	Land Use	***Proposed Fee per Acre***
Single Family Residential		**$6,173**
Multifamily Residential		**$11,557**
Retail/Commercial		**$14,610**
Office		**$13,088**
Industrial		**$13,088**

Prototype Impact Fee for Use in Cash Flow Analysis

Residential

Unit Type	***Prototype Fee (Per Unit)***	***Current Fee***	***Increase/ (Decrease)***
Single Family	$1,543	$1,300	$243
Multifamily	$856	$1,300	($444)

Nonresidential

Development Type	***Prototype Fee (Per 1,000 Sq. Ft.)***	***Prototype Fee (per acre)***	***Current Fee (per acre)***	***Increase/ (Decrease)***
Commercial	$1,342	$14,610	$5,440	$9,170
Office	$1,202	$13,088	$5,440	$7,648
Industrial	$1,202	$13,088	$5,440	$7,648

CASH FLOW ANALYSIS

The cash flow summary for storm drainage improvements shown in Figure 38 indicates impact fee revenue and expenditures necessary to meet the demand for growth-related storm drainage facilities. Storm Drainage impact fees are projected to yield a revenue stream that averages $784,000 per year. To the extent the rate of development either accelerates or slows down, there will be a corresponding change in the impact fee revenue and capital costs.

Figure 38. Cash Flow Analysis

Ten-Year Growth-Related Costs for Storm Drainage Facilities

Growth-Related Storm Drainage Projects	$7,982,689

		per Housing Unit		*Per Square KSF of Floor Area*		
		Single Unit	***2+ Units***	***Commercial***	***Office/Inst.***	***Industrial***
		$1,543	**$856**	**$1,341.63**	**$1,201.88**	**$1,201.88**
	Year	***Housing Units Added***		***Square Feet Added (1,000)***		
Base	2015					
Year 1	2016	400	94	190	10	0
Year 2	2017	400	94	90	10	0
Year 3	2018	400	94	90	10	0
Year 4	2019	400	94	90	10	0
Year 5	2020	400	94	40	5	5
Year 6	2021	400	48	40	5	5
Year 7	2022	400	48	40	5	5
Year 8	2023	400	48	40	5	5
Year 9	2024	400	48	40	5	5
Year 10	2023	400	48	40	5	5
Ten-Yr Increase		4,000	711	700	70	30
Projected Fees (Rounded)=>		$6,172,512	$608,817	$939,142	$84,131	$36,056

Total Projected Revenues	**$7,840,658**
Cumulative Net Surplus/(Deficit)	($142,031)

Appendix A – Demographic Data

POPULATION AND HOUSING CHARACTERISTICS

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. When persons per housing unit is used in the fee calculations, infrastructure standards are derived using year-round population. When persons per household is used in the fee calculations, the impact fee methodology assumes all housing units will be occupied, thus requiring seasonal or peak population to be used when deriving infrastructure standards. TischlerBise recommends that impact fees for residential development in the Town of Erie be imposed according to the number of year-round residents per housing unit.

As shown in the bottom portion of Figure A1, in 2013, dwellings with a single unit per structure (detached, attached, and mobile homes) averaged 2.89 persons per unit. Dwellings in structures with multiple units averaged 2.10 year-round residents per unit.

Figure A1. Town of Erie Persons per Housing Unit

Erie, CO Population and Housing Characteristics in 2013

Units in Structure	*Renter & Owner* Persons	Households		*Housing Units*	*Persons Per Hsg Unit*	*Vacancy Rate*
Single Family	17,844	6,016	2.97	6,154	2.90	2.2%
Mobile Homes	118	55	2.15	55	2.15	0.0%
2+ Units	707	327	2.16	336	2.10	2.7%
Total	18,669	6,398	2.92	6,545		
			Vacant/Seasonal HU	147		

2013 Summary by Type of Housing	*Persons*	*House-holds*	*Persons per Household*	*Housing Units*	*Persons Per Hsg Unit*	*Housing Mix*
Single Family	17,962	6,071	2.96	6,209	**2.89**	95%
Multifamily	707	327	2.16	336	**2.10**	5%
Subtotal	18,669	6,398	2.92	6,545	**2.85**	*Vacancy Rate*
Group Quarters	3.00					
TOTAL	18,672	6,398		6,545		2.2%

Source: 2009-2013 American Community Survey 5-year Estimates, U.S. Census Bureau

RECENT RESIDENTIAL CONSTRUCTION

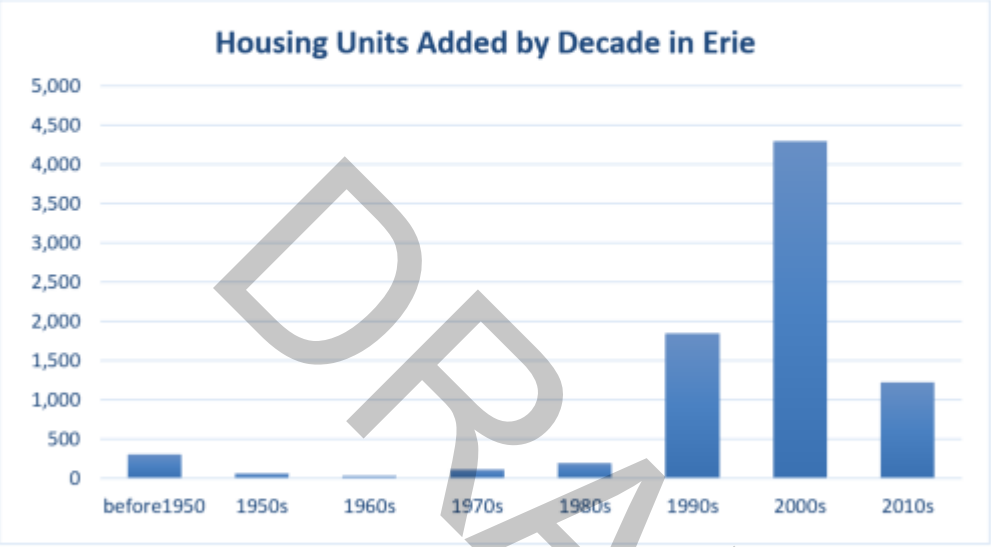
From 2000 to 2010, Erie's housing stock increased by an average of 430 housing units per year. The chart at the bottom of Figure A2 indicates the estimated number of housing units added by decade in Erie. Housing units constructed per decade peaked in the 2000s and may be slowing in the 2010s following the Great Recession. In fact, from 2010 to 2015 Erie added an average of only 218 housing units per year (Figure A3). However, since 2013 Erie has averaged 317 units per year (an average of 288 of which were single family units), suggesting the Town's housing market may be recovering from the recession.

Figure A2. Housing Units by Decade

Town of Erie, Colorado	
US Census Bureau Population in 2010*	18,135
Housing Units in 2010*	6,581
Total Housing Units in 2000	2,282
New Housing Units	4,299

**2010 Census Summary*
Table H1 from 2000 Census 100% Count data

From 2000 to 2010, Erie added an average of 430 housing units per year. From 2010 to 2015, the Town added an average of 218 units per year.



Source for 1990s and earlier is Table B25034, American Community Survey, 2013.
Source for 2000s is U.S. Census Bureau
Source for 2010s is Department of Community Development permitting data

Figure A3. Residential Permitting from 2005-2015

Year	Single Family	Multifamily	Total
2005	735	68	803
2006	319	191	510
2007	167	83	250
2008	130	39	169
2009	89	14	103
2010	103	16	119
2011	101	8	109
2012	123	27	150
2013	208	39	247
2014	246	40	286
2015	337	3	340
Total	2,558	528	3,086

Source: Department of Comm. Dev., Building Div., Town of Erie, CO

From 2005 to 2010, Erie added an average of 257 single-family units and 69 multifamily housing units per year according to Town building permit data.

From 2011 to September 2015, Erie added an average of 214 single-family units and 25 multifamily housing units per year according to Town building permit data.

Current Estimate of Housing Units and Households

There were 6,581 housing units in Erie in April 2010. Using permit information for residential development from April 2010 to September 2015, TischlerBise estimates the number of housing units for October 2015 is 7,806. This analysis is shown in Figure A4.

Figure A4. October 2015 Estimate of Housing Units

		Building Permits Issued [2]							
	April 1, 2010 Units [1]	*2010 (April 1-Dec 31)*	*2011 (Jan 1-Dec 31)*	*2012 (Jan 1-Dec 31)*	*2013 (Jan 1-Dec 31)*	*2014 (Jan 1-June 30)*	*2015 (Jan 1-Sept. 30)*	*Total Units Added*	*Estimated October 2015 Units [3]*
Single Family	6,243	77	101	123	208	246	337	1092	7,335
Multifamily	338	16	8	27	39	40	3	133	471
Totals	*6,581*	93	109	*150*	*247*	*286*	*340*	*1225*	***7,806***

[1] 2010 Decennial Census
[2] Source: Department of Comm. Dev., Building Div., Town of Erie, CO
[3] US 2010 Census units plus permitted units added.

Current Estimate of Population

TischlerBise estimates the Town's current population at 21,571. This estimate is based on the 2010 decennial census population, the number and type of residential permits issued for new construction since April 2010, and persons per housing unit by type. Detail is provided below in Figure A5.

Figure A5. October 2015 Estimate of Population

2010-2015 Housing Unit Increase

Type of Unit	*Total Units Added [1]*	*Persons Per Hsg Unit [2]*	Added Population
Single Family	1,092	2.89	3,157
Multifamily	133	2.10	279
	1,225		3,436

Current Population Estimate

April 1, 2010 Population [3]	*Estimated October 2015 Population*
18,135	**21,571**

[1] Town of Erie, Dept. of Community Development
[2] 2009-2013 American Community Survey 5-Year Estimates, U.S. Census Bureau.
[3] 2010 Decennial Census

HOUSING UNIT AND POPULATION PROJECTIONS

On the recommendation of Town staff, TischlerBise projects the construction of 400 single family homes annually over the course of the 15 year study period. This figure is well above the post-recessionary average of 288 single family units per year, but the presence of several large scale communities in development in Erie substantiates the use of a higher figure. Additionally, despite the currently small share of multifamily housing in Erie, TischlerBise projects a doubling of the multifamily housing stock over the next five years to 942 total units (approximately 94 units each year), followed by another ten years of roughly 48 additional units per year (around the ten year average permitted in Erie from 2005 through 2015). This projection yields a greater share of multifamily housing by the end of the study period (10%, as opposed to 5% in 2015). The presence of more multifamily housing is supported by the large amount

of retail square footage anticipated and concomitant increase in the retail workforce, discussed in the next section.

As a result of these housing projections, TischlerBise projects an annual net increase in population of 1,354 persons over the next five years and 1,257 the following ten. By 2030, the Town of Erie's population will increase to an estimated 40,908 residents, effectively doubling its 2015 population. Results of this analysis are shown in Figure A6.

Figure A6. Town of Erie Annual Residential Development Projections

		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2030
Cumulative		*Base Yr*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*25*
Housing Unit Projections	*PPHU*												
Single Family Units	*2.89*	7,335	7,735	8,135	8,535	8,935	9,335	9,735	10,135	10,535	10,935	11,335	13,335
Multifamily Units	*2.10*	471	565	659	754	848	942	990	1,038	1,086	1,134	1,182	1,422
Total Housing Units		7,806	8,300	8,795	9,289	9,783	10,277	10,725	11,173	11,621	12,069	12,517	14,757
Annual Net Increase in Housing Units			*494*	*494*	*494*	*494*	*494*	*448*	*448*	*448*	*448*	*448*	*448*
Population Projections													
Population		21,571	22,925	24,279	25,633	26,986	28,340	29,597	30,854	32,111	33,368	34,624	40,908
Annual Net Increase in Population			*1,354*	*1,354*	*1,354*	*1,354*	*1,354*	*1,257*	*1,257*	*1,257*	*1,257*	*1,257*	*1,257*

NONRESIDENTIAL DEVELOPMENT PROJECTIONS AND ESTIMATES

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. To convert jobs to floor area of nonresidential development, TischlerBise uses average square feet per employee multipliers, shown in Figure A7. The employee to building area ratios are derived using national data published by the Institute of Transportation Engineers (ITE) and the Urban Land Institute (ULI). In the impact fee study, vehicle trips per demand unit (i.e., one thousand square feet of floor area, beds, students, or rooms) will be used to differentiate fees by type of nonresidential development. In the table below, gray shading indicates three nonresidential development prototypes used by TischlerBise to calculate vehicle trips and potential impact fee revenue. The prototype for retail and/or general restaurant jobs is an average-size shopping center. The prototype for industrial jobs is manufacturing. For all other office uses/services, the prototype is an average sized general office building.

Figure A7. Employee and Building Area Ratios

ITE Code	Land Use / Size	Demand Unit	Wkdy Trip Ends Per Dmd Unit*	Wkdy Trip Ends Per Employee*	Emp Per Dmd Unit	Sq Ft Per Emp
110	Light Industrial	1,000 Sq Ft	6.97	3.02	2.31	433
130	Industrial Park	1,000 Sq Ft	6.83	3.34	2.04	489
140	Manufacturing	1,000 Sq Ft	3.82	2.13	1.79	558
150	Warehousing	1,000 Sq Ft	3.56	3.89	0.92	1,093
254	Assisted Living	bed	2.66	3.93	0.68	na
320	Motel	room	5.63	12.81	0.44	na
520	Elementary School	1,000 Sq Ft	15.43	15.71	0.98	1,018
530	High School	1,000 Sq Ft	12.89	19.74	0.65	1,531
540	Community College	student	1.23	15.55	0.08	na
550	University/College	student	1.71	8.96	0.19	na
565	Day Care	student	4.38	26.73	0.16	na
610	Hospital	1,000 Sq Ft	13.22	4.50	2.94	340
620	Nursing Home	1,000 Sq Ft	7.60	3.26	2.33	429
710	General Office (avg size)	1,000 Sq Ft	11.03	3.32	3.32	301
760	Research & Dev Center	1,000 Sq Ft	8.11	2.77	2.93	342
770	Business Park	1,000 Sq Ft	12.44	4.04	3.08	325
820	Shopping Center (avg size)	1,000 Sq Ft	42.70	na	2.00	500

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

Estimated Current Nonresidential Floor Area and Employment

To derive current nonresidential floor area and employment, TischlerBise used job estimates by major sector from the U.S. Census Bureau's OnTheMap web application. Each sector job total was multiplied by the ITE square footage per employee average from Figure A7 to estimate total nonresidential square footage in Erie in 2013. Next, permitted nonresidential square footage from 2014 and 2015 was added to estimate a current total for 2015 and current employment was determined using ITE square footage per employee ratios. Results are shown in Figure A8.

Figure A8. Town of Erie Estimated Nonresidential Floor Area and Employment

	2013 All Jobs [1]	2013 Breakdown	Employee and Building Area Ratios [2]	Floor Area (2013)	Floor Area (2015)[3]	2015 Jobs
Industrial/Warehousing	666	33%	558	371,628	318,156	570
Retail, Accommodation & Food Services	287	14%	500	143,500	137,103	274
All Other Services	1,070	53%	301	322,070	511,151	1,698
TOTAL	2,023	100%		837,198	966,410	2,543

[1] Source: U.S. Census Bureau, OnTheMap web application, 2013 all jobs.
[2] "Employee and Building Area Ratios" (Figure A7)
[3] Estimated using 2013 OnTheMap data and Town of Erie permitting data

Employment and Nonresidential Floor Area Projections

Given the local expectation of several large-scale retail developments in the near-term development pipeline, TischlerBise projects an increase of approximately 550,000 square feet of nonresidential square footage over the next five years, the vast majority of which will be retail space. The Town of Erie permitted an average of approximately 52,000 square feet of nonresidential construction each year since 2010

(Figure A9). The large amount of retail square footage expected in the coming years is due in part to the lack of retail constructed in the recent past, despite the residential construction and population growth needed to support it. Thus, we expect the retail construction market will rebound in the next five years. After that time, we anticipate nonresidential construction demand will slow once more to roughly 50,000 square feet annually. By 2030, retail square footage will comprise 51% of total nonresidential square footage in Erie, office uses will account for 30%, and industrial uses will use 19% of square footage. Industrial land is expected to grow very little during the study period. Employment was derived by dividing the projected nonresidential square footage by the applicable square footage per employee from Figure A7. Results are found in Figure A10.

Figure A9. Town of Erie Annual Nonresidential Development Projections

Year	Nonres. Square Footage
2010	32,535
2011	54,258
2012	51,153
2013	44,396
2014	90,481
2015*	38,731
Average	51,926

*2015 annual total extrapolated from total through July

Figure A10. Town of Erie Annual Nonresidential Development Projections

		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2030
Cumulative		*Base Yr*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*25*
Job Projections													
Total Jobs		2,543	2,956	3,169	3,382	3,595	3,701	3,807	3,912	4,018	4,123	4,229	4,757
	%												
Industrial	*33%*	570	570	570	570	570	579	588	597	606	615	624	669
Retail	*14%*	274	654	834	1,014	1,194	1,274	1,354	1,434	1,514	1,594	1,674	2,074
Office	*53%*	1,698	1,731	1,765	1,798	1,831	1,848	1,864	1,881	1,898	1,914	1,931	2,014
Annual Net Increase in Jobs			*413*	*213*	*213*	*213*	*106*	*106*	*106*	*106*	*106*	*106*	*106*
Nonresidential Square Footage (1,000 SF)													
	SF/Empl												
Industrial	*558*	318	318	318	318	318	323	328	333	338	343	348	373
Retail	*500*	137	327	417	507	597	637	677	717	757	797	837	1,037
Office	*301*	511	521	531	541	551	556	561	566	571	576	581	606
Total Nonres Sq. Ft.		966	1,166	1,266	1,366	1,466	1,516	1,566	1,616	1,666	1,716	1,766	2,016
Annual Net Increase in 1,000 SF			*200*	*100*	*100*	*100*	*50*	*50*	*50*	*50*	*50*	*50*	*50*

AVERAGED DAILY VEHICLE TRIPS

Residential Vehicle Trip Rates

As an alternative to simply using the national average trip generation rate for residential development, the Institute of Transportation Engineers (ITE) publishes regression curve formulas that may be used to derive custom trip generation rates using local demographic data. Key independent variables needed for the analysis (i.e., vehicles available, housing units, households, and persons) are available from the U.S. Census Bureau 2009-2013 American Community Survey (ACS) 5-year estimate data for the Town of Erie. This data was used to derive custom average weekday vehicle trip ends by type of housing, as shown below in Figure A11. A vehicle trip end represents a vehicle either entering or exiting development, as if a traffic counter were placed across a driveway.

Figure A11. Average Weekday Vehicle Trip Ends by Housing Type in Town of Erie

Town of Erie, CO	Vehicles Available (1)	Households (2) Single Family Units (3)	Households (2) Multifamily Units	Households (2) Total	Vehicles per Household by Tenure
Owner-occupied	11,577	5,140	144	5,284	2.19
Renter-occupied	2,146	931	183	1,114	1.93
TOTAL	13,723	6,071	327	6,398	2.14
Housing Units (6) =>		6,209	336	6,545	

	Persons (4)	Trip Ends (5)	Vehicles by Type of Housing	Trip Ends (6)	Average Trip Ends	Trip Ends per Housing Unit
Single Family Units	17,962	46,457	13,055	75,483	60,970	**9.8**
Multifamily Units	707	2,389	668	2,926	2,657	**7.9**
TOTAL	18,669	48,846	13,723	78,409	63,628	**9.7**

(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) Single Family units include detached homes, attached homes and mobile homes.
(4) Persons by units in structure from Table B25033, American Community Survey, 2013.
(5) Vehicle trips ends based on persons using formulas from Trip Generation (ITE 2012). For single family housing (ITE 210), the fitted curve equation is EXP(0.91*LN(persons)+1.52). To approximate the average population of the ITE studies, persons were divided by 32 and the equation result multiplied by 32. For multifamily housing (ITE 220), the fitted curve equation is (3.47*persons)-64.48.
(6) Vehicle trip ends based on vehicles available using formulas from Trip Generation (ITE 2012). For single family housing (ITE 210), the fitted curve equation is EXP(0.99*LN(vehicles)+1.81). To approximate the average number of vehicles in the ITE studies, vehicles available were divided by 52 and the equation result multiplied by 52. For multifamily housing (ITE 220), the fitted curve equation is (3.94*vehicles)+293.58.

Nonresidential Vehicle Trip Rates

Vehicle trips rates for nonresidential development are from the reference book, *Trip Generation* published by the Institute of Transportation Engineers (ITE) in 2012.

Trip Rate Adjustments

Trip generation rates are adjusted to avoid double counting each trip at both the origin and destination points. Therefore, the basic trip adjustment factor is 50 percent. As discussed below, additional adjustments are made to ensure the fees are proportionate to the infrastructure demand for particular types of development.

Adjustment for Journey-To-Work Commuting

According to the National Household Travel Survey (2009), home-based work trips are typically 31 percent of "production" trips, or, in other words, out-bound trips (which are 50 percent of all trip ends). Also, Census Bureau's web application OnTheMap indicates that 95 percent of Erie's workers travel outside the Town for work. In combination, these factors (0.31 x 0.50 x 0.95 = 0.15) account for 15 percent of additional production trips. The total adjustment factor for residential includes attraction trips (50% of trip ends) plus the journey-to-work commuting adjustment (15% of production trips) for a total of 65 percent (Figure A12).

Figure A12. Adjustment for Journey-to Work Commuting

Employed Erie Residents (2013)	8,234
Erie Residents Working in City (2013)	399
Erie Residents Commuting Outside City for Work	7,835
Percent Commuting out of the City	**95%**
Additional Production Trips	15%
Residential Trip Adjustment Factor	***65%***

Source: U.S. Census, OnTheMap Application
Longitudinal-Employer Household Dynamics (LEHD) Program; ITE

Adjustment for Pass-By Trips

The basic trip adjustment factor of 50 percent is applied to the Office/Institutional and Industrial categories. The Retail category has a trip factor of less than 50 percent because this type of development attracts vehicles as they pass-by on arterial and collector roads. For an average size shopping center, the ITE manual indicates that an average size shopping center has a pass-by rate of 34 percent, yielding a trip adjustment rate of 33% (50% X (1 - 34%).

Estimated Vehicle Trips in Erie

As shown in Figure A13 there are an average of 54,503 vehicle trips generated by existing development in the Town of Erie on an average weekday. As the table indicates, residential development is estimated to generate 49,144 vehicle trips compared to 5,359 vehicle trips generated by nonresidential development. An example of the calculation is as follows for detached units: 7,335 single family units x 9.80 vehicle trips per day per unit x 65% adjustment factor = 46,727 total vehicle trips per day from single family units in the town.

Figure A13. Average Daily Trips

Residential Vehicle Trips on an Average Weekday (2015)		
Residential Units	*Assumptions*	
Single Family	7,335	
Multifamily	471	
Average Weekday Vehicle Trip Ends per Unit*	*Trip Rate*	*Trip Factor*
Single Family	9.80	65%
Multifamily	7.90	65%
Residential Vehicle Trip Ends of an Average Weekday		
Single Family	46,727	
Multifamily	2,418	*% of total*
Total Residential Trips	**49,144**	***90%***

Nonresidential Vehicle Trips on an Average Weekday (2015)		
Nonresidential Gross Floor Area (1,000 sq. ft.)	*Assumptions*	
Industrial	318	
Retail	137	
Office	511	
Average Weekday Vehicle Trips Ends per 1,000 Sq. Ft.	*Trip Rate*	*Trip Factor*
Industrial	3.82	50%
Retail	42.70	33%
Office	11.03	50%
Nonresidential Vehicle Trips on an Average Weekday		
Industrial	608	
Retail	1,932	
Office	2,819	*% of total*
Total Nonresidential Trips	**5,359**	***10%***
TOTAL TRIPS	**54,503**	***100%***

**Trip rates are customized for Town of Erie. See accompanying tables and discussion.*
***Trip rates are from the Institute of Transportation Engineers (ITE) Trip Generation Manual (2012)*

DEMAND INDICATORS BY SIZE OF HOUSING

Custom tabulations of demographic data by bedroom range were created from individual survey responses provided by the U.S. Census Bureau, in files known as Public Use Micro-data Sample (PUMS). Because PUMS files are only available for areas of roughly 100,000 persons, the Town of Erie is included with other jurisdictions. The Town is included in Public Use Micro-data Areas (PUMA) 00802. TischlerBise derived persons per housing unit and trip rates by bedroom count for both single family units and multifamily units using the data from these files.

Figure A14 is for **single family units** and shows trip generation rates and average persons per housing unit by bedroom range, from PUMS data. Recommended multipliers were scaled to make the average value for all housing units in PUMA 00802 match the average value derived from 2009-2013 American Community Survey 5-year data for the Town of Erie.

Figure A14. Single Family Trip Generation Rates and Household Sizes by Bedroom Count

Town of Erie, CO

Single Family	*Persons (1)*	*Trip Ends (2)*	*Vehicles Available (1)*	*Trip Ends (3)*	*Average Trip Ends*	*Housing Units (1)*	*Recommended Multipliers (4)* *Trip Ends per Housing Unit*	*Persons per Housing Unit*
0-3 Bedrooms	3,713	10,053	3,402	19,757	14,905	1,837	8.7	2.54
4 Bedrooms	1,714	4,975	1,412	8,272	6,624	599	11.9	3.59
5 Bedrooms	566	1,815	455	2,696	2,256	187	12.9	3.80
6+ Bedrooms	121	446	93	560	503	34	15.9	4.47
GRAND TOTAL	6,114	17,289	5,362	31,285	24,287	2,657	9.8	2.89

(1) 2009-2013 American Community Survey 5-year Estimates, Public Use Microdata Sample for CO PUMA 00802.
(2) Vehicle trips ends based on persons using formulas from Trip Generation (ITE 2012). For single family housing (ITE 210), the fitted curve equation is EXP(0.91*LN(persons)+1.52). To approximate the average population in the ITE studies, persons were divided by 11 and the equation result multiplied by 11.
(3) Vehicle trip ends based on vehicles available using formulas from Trip Generation (ITE 2012). For single family housing (ITE 210), the fitted curve equation is EXP(0.99*LN(vehicles)+1.81). To approximate the average number of vehicles in the ITE studies, vehicles available were divided by 21 and the equation result multiplied by 21.
(4) Recommended multipliers are scaled to make the average value by type and size of single family housing for PUMA 00802 match the average value derived for the Town of Erie from 2009-2013 American Community Survey 5-year data.

Figure A15 is for **multifamily units** and shows trip generation rates and average persons per housing unit by bedroom range, from PUMS data. Recommended multipliers were scaled to make the average value for all housing units in PUMA 00802 match the average value derived from 2009-2013 American Community Survey 5-year data for the Town of Erie.

Figure A15. Multifamily Trip Generation Rates and Household Sizes by Bedroom Count

Town of Erie, CO

Multifamily	*Persons (1)*	*Trip Ends (2)*	*Vehicles Available (1)*	*Trip Ends (3)*	*Average Trip Ends*	*Housing Units (1)*	*Recommended Multipliers (4)* *Trip Ends per Housing Unit*	*Persons per Housing Unit*
0-1 Bedrooms	147	446	96	672	559	111	5.6	1.38
2 Bedrooms	382	1,261	256	1,302	1,282	176	8.2	2.26
3+ Bedrooms	160	491	90	648	569	55	11.6	3.03
GRAND TOTAL	689	2,197	442	2,622	2,410	342	7.9	2.10

(1) 2009-2013 American Community Survey 5-year Estimates, Public Use Microdata Sample for CO PUMA 00802.
(2) Vehicle trips ends based on persons using formulas from Trip Generation (ITE 2012). For multifamily housing (ITE 220), the fitted curve equation is (3.47*persons)-64.48.
(3) Vehicle trip ends based on vehicles available using formulas from Trip Generation (ITE 2012). For multifamily housing (ITE 220), the fitted curve equation is (3.94*vehicles)+293.58.
(4) Recommended multipliers are scaled to make the average value by type and size of single family housing for PUMA 00802 match the average value derived for the Town of Erie from 2009-2013 American Community Survey 5-year ACS data.

DETAILED DEVELOPMENT PROJECTIONS

Demographic data shown in Figure A16 provides key inputs for updating development fees in the Town of Erie. Cumulative data are shown at the top and projected annual increases by type of development are shown at the bottom of the table. As discussed earlier, TischlerBise recommends the use of persons per housing unit to derive impact fees. Therefore, vacancy rates and number of households are not essential to the demographic analysis.

Figure A16. Annual Demographic Data

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2030	15-Year
Cumulative	*Base Yr*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*15*	**Net Increase**
Population	21,571	22,475	23,380	24,285	25,189	26,094	26,998	27,903	28,807	29,712	30,617	35,139	13,569
Jobs	2,543	2,685	2,826	2,968	3,110	3,252	3,394	3,536	3,678	3,820	3,962	4,672	2,130
Housing Units	*7,806*	*8,124*	*8,441*	*8,759*	*9,076*	*9,394*	*9,711*	*10,028*	*10,346*	*10,663*	*10,981*	*12,568*	*4,762*
Single Family Units	7,335	7,637	7,938	8,239	8,540	8,841	9,142	9,444	9,745	10,046	10,347	11,853	*4,517*
Multifamily Units	471	487	503	520	536	552	569	585	601	618	634	715	*244*
Jobs to Housing Ratio	0.33	0.33	0.33	0.34	0.34	0.35	0.35	0.35	0.36	0.36	0.36	0.37	
Nonres Sq Ft in thousands (KSF)													
Industrial	318	326	334	342	350	358	366	373	381	389	397	437	
Retail/ Restaurant	137	151	165	180	194	208	222	236	250	264	279	349	
Office/ Institutional	511	541	571	601	631	661	691	721	751	781	811	961	
Total	966	1,018	1,070	1,122	1,174	1,226	1,278	1,330	1,382	1,434	1,486	1,746	
Avg Sq Ft Per Job	380	379	379	378	378	377	377	376	376	375	375	374	
Nonres. Veh. Trips	5,359	5,738	6,118	6,497	6,877	7,257	7,636	8,016	8,396	8,775	9,155	11,053	
													2015-2030
Annual Increase		15-16	16-17	17-18	18-19	19-20	20-21	21-22	22-23	23-24	24-25	29-30	***Avg Anl***
Population		905	905	905	905	905	905	905	905	905	905	905	905
Jobs		142	142	142	142	142	142	142	142	142	142	142	142
Housing Units		317	317	317	317	317	317	317	317	317	317	317	317
Industrial (1,000 SF)		8	8	8	8	8	8	8	8	8	8	8	8
Retail/ Restaurant (1,000 SF)		14	14	14	14	14	14	14	14	14	14	14	14
Office/ Institutional (1,000 SF)		30	30	30	30	30	30	30	30	30	30	30	30
		52	52	52	52	52	52	52	52	52	52	52	52