Impact Fee Study

Prepared for:

Town of Erie, Colorado

November 22, 2021

Prepared by:

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IMPACT FEE STUDY

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Executive Summary

Impact fees are one-time payments for new development's proportionate share of the capital cost of infrastructure. The following study addresses the Town of Erie's Municipal Facilities, Transportation, Police, and Parks & Recreation facilities. Impact fees do have limitations and should not be regarded as the total solution for infrastructure funding. Rather, they are one component of a comprehensive funding strategy to ensure provision of adequate public facilities. Impact fees may only be used for capital improvements or debt service for growth-related infrastructure. They may not be used for operations, maintenance, replacement of infrastructure, or correcting existing deficiencies. Although Colorado is a "home-rule" state and home-rule municipalities were already collecting "impact fees" under their home-rule authority granted in the Colorado Constitution, the Colorado Legislature passed enabling legislation in 2001, as discussed further below.

Colorado Impact Fee Enabling Legislation

Impact fees are one-time payments imposed on new development that must be used solely to fund growth-related capital projects, typically called "system improvements". An impact fee represents new growth's proportionate share of capital facility needs. In contrast to project-level improvements, impact fees fund infrastructure that will benefit multiple development projects, or even the entire service area, as long as there is a reasonable relationship between the new development and the need for the growth-related infrastructure.

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

Additional Legal Guidelines

Both state and federal courts have recognized the imposition of impact fees on development as a legitimate form of land use regulation, provided the fees meet standards intended to protect against regulatory takings. Land use regulations, development exactions, and impact fees are subject to the Fifth Amendment prohibition on taking of private property for public use without just compensation. To comply with the Fifth Amendment, development regulations must be shown to substantially advance a legitimate

governmental interest. In the case of impact fees, that interest is the protection of public health, safety, and welfare by ensuring development is not detrimental to the quality of essential public services. The means to this end is also important, requiring both procedural and substantive due process. The process followed to receive community input (i.e., stakeholder meetings, work sessions, and public hearings) provides opportunities for comments and refinements to the impact fees.

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

There are three reasonable relationship requirements for 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, TischlerBise prefers a more rigorous formulation that recognizes three elements: "need," "benefit," and "proportionality." The dual rational nexus test explicitly addresses only the first two, although proportionality is reasonably implied, and was specifically mentioned by the U.S. Supreme Court in the Dolan case. Individual elements of the nexus standard are discussed further in the following paragraphs.

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

The requirement that exactions be proportional to the impacts of development was clearly stated by the U.S. Supreme Court in the Dolan case and is logically necessary to establish a proper nexus. Proportionality is established through the procedures used to identify development-related facility costs, and in the methods used to calculate impact fees for various types of facilities and categories of development. The demand for facilities is measured in terms of relevant and measurable attributes of development (e.g., persons per household).

A sufficient benefit relationship requires that impact fee revenues be segregated from other funds and expended only on the facilities for which the fees were charged. The calculation of impact fees should also assume that they will be expended in a timely manner and the facilities funded by the fees must serve the development paying the fees. However, nothing in the U.S. Constitution or the state enabling legislation

requires that facilities funded with fee revenues be available exclusively to development paying the fees. In other words, benefit may extend to a general area including multiple real estate developments. Procedures for the earmarking and expenditure of fee revenues are discussed near the end of this study. All of these procedural as well as substantive issues are intended to ensure that new development benefits from the impact fees they are required to pay. The authority and procedures to implement impact fees is separate from and complementary to the authority to require improvements.

Proposed Maximum Supportable Impact Fee

The impact fees are based on the actual level of service for Public Facilities, Police, Transportation, and Parks & Recreation. The Parks & Recreation Impact Fee is only calculated for residential development while the fees for Public Facilities, Transportation and Police are allocated to nonresidential development as well. A summary of methodologies used in the analysis is provided in Figure 1.

Figure 1: Summary of Town of Erie Impact Fees

Type of Fee	*Cost Recovery (past)*	*Incremental Expansion (present)*	*Plan-Based (future)*	*Cost Allocation*
Parks and Recreation	N/A	Community and Neighbrhood Park Development	N/A	***Population***
Public Facilities	N/A	Public Facility Space	N/A	***Population and Jobs***
Transportation	N/A	N/A	Capcity and Intersection Improvements	***Average Weekday Vehicle Trips***
Police	N/A	Police and Court Space	N/A	***Population and Nonresidential Vehicle Trips***

Maximum Supportable Impact Fees

Figure 2 provides a schedule of the maximum supportable impact fee for Public Facilities, Transportation, Police, and Parks & Recreation. The fees represent the highest amount supportable for each type of residential and nonresidential unit, which represents new growth's fair share of the cost for capital facilities. The Town may adopt fees that are less than the amounts shown. However, a reduction in impact fee revenue will necessitate an increase in other revenues, a decrease in planned capital expenditures, and/or a decrease in levels of service.

Figure 2: Maximum Supportable Impact Fees

Residential (Per Unit)

Type	*Parks and Recreation*	*Public Facilities*	*Police*	*Transportation*	*Maximum Supportable Fee*	*Current Fee*	*Difference*
Single-Family	$2,451	$3,739	$686	$5,598	**$12,474**	**$12,340**	$134
Multi-Family	$1,339	$2,042	$375	$3,449	**$7,205**	**$9,264**	($2,059)

Nonresidential (Per 1,000 square feet)

Type	*Parks and Recreation*	*Public Facilities*	*Police*	*Transportation*	*Maximum Supportable Fee*	*Current Fee*	*Difference*
Commercial	$0	$2,317	$824	$4,973	**$8,114**	**$8,026**	$88
Office & Institutional	$0	$2,941	$322	$1,895	**$5,158**	**$4,039**	$1,119
Industrial	$0	$1,945	$130	$765	**$2,840**	**$1,550**	$1,290

General Methods for Impact Fees

There are three general methods for calculating impact fees. The choice of a particular method depends primarily on the timing of infrastructure construction (past, concurrent, or future) and service characteristics of the facility type being addressed. Each method has advantages and disadvantages in a particular situation and can be used simultaneously for different cost components.

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

Cost Recovery Method (past improvements)

The Town of Erie impact fees use the cost recovery method to address existing excess capacity provided at the Public Safety Building (police headquarters). The rationale for recoupment, or cost recovery, is that new development is paying for its share of the useful life and remaining capacity of facilities already built, or land already purchased, from which new growth will benefit. This methodology is often used for utility systems that must provide adequate capacity before new development can take place.

Incremental Expansion Method (concurrent improvements)

The Town of Erie impact fees use the incremental expansion method to document current level-of-service (LOS) standards for the infrastructure types included in the study, using both quantitative and qualitative measures. This approach assumes there are no existing infrastructure deficiencies or surplus capacity. New development is only paying its proportionate share for growth-related infrastructure. Revenue will be used to expand or provide additional facilities, as needed, to accommodate new development. An incremental expansion cost method is best suited for public facilities that will be expanded in regular increments to keep pace with development. The incremental expansion methodology is used for four infrastructure categories included in the study. This is a conservative approach, which limits the Town's General Fund exposure. If a plan-based approach were utilized, reliance on long-range growth projections would be likely, which could force the Town to spend more General Fund dollars to implement the plan if growth does not occur as projected.

Plan-Based Method (future improvements)

Although not used in Town of Erie, the plan-based method allocates costs for a specified set of improvements to a specified amount of development. Improvements are typically identified in a long-range facility plan and development potential is identified by a land use plan. There are two basic options for determining the cost per demand unit: 1) total cost of a public facility can be divided by total service units (average cost), or 2) the growth-share of the public facility cost can be divided by the net increase in service units over the planning timeframe (marginal cost).

Evaluation of Possible Credits

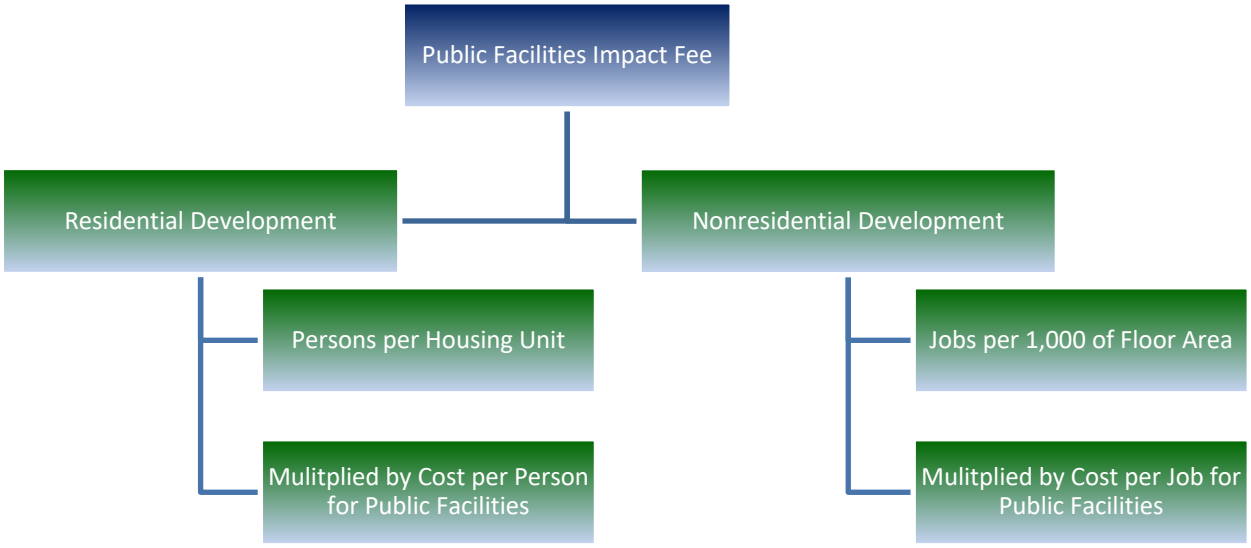
Regardless of the methodology, a consideration of "credits" is integral to the development of a legally defensible impact fee methodology. There are two types of "credits" with specific characteristics, both of which should be addressed in impact fee studies and ordinances. The first is a revenue credit due to possible double payment situations, which could occur when other revenues may contribute to the capital costs of infrastructure covered by the impact fee. This type of credit is integrated into the Police impact fee calculation, thus reducing the fee amount. The second is a site-specific credit or developer reimbursement for construction of system improvements. This type of credit is addressed in the administration and implementation of the development impact fee program.

Please note, calculations throughout this report are based on an analysis conducted using MS Excel software. Results are discussed in the report using one- and two-digit places (in most cases). Figures are typically either truncated or rounded. In some instances, the analysis itself uses figures carried to their ultimate decimal places; 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, not in the analysis).

Public Facilities Impact Fee

The Public Facilities Impact Fee is calculated on a per capita basis for residential development and a per employee basis for nonresidential development. Figure PF1 illustrates the methodology used to determine the development fee. It is intended to read like an outline, with lower levels providing a more detailed breakdown of the components. The residential portion is derived from the product of persons per housing unit (by type) multiplied by the net cost per person. The nonresidential portion is derived from the product of employees per 1,000 square feet of nonresidential space multiplied by the net cost per employee (job).

Figure PF1: Public Facilities Impact Fee Methodology Chart



Public Facilities Proportionate Share Factors

Both residential and nonresidential developments increase the demand on Public Facilities infrastructure. To calculate the proportional share between residential and nonresidential demand on Public Facilities infrastructure, a functional population approach is used. The functional population approach allocates the cost of the facilities to residential and nonresidential development based on the activity of residents and workers in the Town through the 24 hours in a day.

Residents that do not work are assigned 20 hours per day to residential development and four hours per day to nonresidential development (annualized averages). Residents that work in Erie are assigned 16 hours to residential development and 8 hours to nonresidential development. Residents that work outside

Erie are assigned 14 hours to residential development. Inflow commuters are assigned 10 hours to nonresidential development. Based on 2018 functional population data for Erie, the cost allocation for residential development is 92.7 percent while nonresidential development accounts for 7.3 percent of the demand for municipal facilities, see Figure PF2.

Figure PF2: Town of Erie Functional Population

Proportionate Share

		Demand Units in 2018		*Demand Hours/Day*	*Person Hours*	*Proportionate Share*
Residential						
	Estimated Residents	22,930				
49%	Residents Not Working		11,243	20	224,860	
51%	Workers Living in Town		11,687			
4%	Town Residents Working in Town		511	16	8,176	
96%	Town Residents Working outside of Town		11,176	14	156,464	
			Residential Subtotal		389,500	**92.7%**
Nonresidential						
	Non-worker Residents	11,243		4		
	Jobs Located in Town	3,162				
	Town Residents Working in Town		511	8	4,088	
	Non-Resident Workers		2,651	10	26,510	
			Nonresidential Subtotal		30,598	**7.3%**
				Total	420,098	**100%**

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

Public Facilities Level of Service and Capital Costs

The Public Facilities Impact Fee is based on two primary facilities serving the public, and their associated replacement costs. The use of existing standards means there are no existing infrastructure deficiencies. New development is only paying its proportionate share for growth-related infrastructure. The floor area has been provided by the Town of Erie staff.

The buildings included in the Public Facilities impact fee calculation are listed in Figure PF3. In total, there is 80,520 square feet of general government municipal floor area in the Town.

The functional population split for the Town of Erie found in Figure PF2 is used to allocate the square footage and corresponding replacement cost of Public Facilities infrastructure in Figure PF3. Of the 80,520

square feet of applicable general government facilities, 92.7 percent is allocated to residential growth (74,642 square feet) and 7.3 percent (5,878 square feet) is allocated to nonresidential growth. The 2021 population or job totals divide the floor area allocations to find the residential and nonresidential level of service standard. For example, the residential level of service is 2.48 square feet per person (74,642 square feet 30,149 residents = 2.48 square feet per person).

To estimate the replacement cost of the facilities, the average cost of $500 per square foot is used. As a result, the replacement cost of Town Facilities is $40,260,000. To find the cost per person, the level of service standards is applied to the average replacement cost. For example, the residential cost per person is $1,238.11 (2.48 square feet person x $500 per square foot = $1,238.11 per person).

Figure PF3: Public Facilities Level of Service and Cost Factors

Building	*Square Footage*	*Replacement Cost*	
Town Hall	20,520	$10,260,000	
Leon A. Wurl Service Center	60,000	$30,000,000	Cost/SF
Total	**80,520**	***$40,260,000***	**$500**

Source: Town of Erie

Development Type	*Proportionate Share*	*2021 Demand Units*	*Sq. Ft. per Demand Unit*	*Cost per Demand Unit*
Residential	92.7%	30,149 Population	2.48	**$1,238.11**
Nonresidential	7.3%	2,961 Jobs	1.98	**$990.25**

Projection of Growth-Related Municipal Facilities Facility Needs

To estimate the 10-year growth needs for Public Facilities infrastructure, the current level of service (2.48 square feet per person and 1.98 square feet per job) is applied to the residential and nonresidential growth projected for the Town of Erie. The Town is projected to increase by 16,102 residents and 987 jobs over the next ten years (see Appendix A). Figure PF4 indicates that the Town will need to construct 41,826 square feet of additional space to maintain current levels of service for Public Facilities. By applying the average cost of a building ($500 per square feet), the estimated growth-related cost for Public Facilities is approximately $20.9 million.

Figure PF4: 10-Year Public Facilities Infrastructure Needs to Accommodate Growth

Residential LOS	2.48	per person
Nonresidential LOS	1.98	per job
Public Building Cost	$500	per square foot

				Infrastructure Needed	
	Year	*Population*	*Jobs*	*Residential*	*Nonresidential*
Base	2021	30,149	2,961	74,655	5,865
1	2022	31,759	3,050	78,643	6,041
2	2023	33,369	3,142	82,630	6,222
3	2024	34,980	3,236	86,617	6,408
4	2025	36,590	3,333	90,604	6,601
5	2026	38,200	3,433	94,591	6,799
6	2027	39,810	3,536	98,579	7,002
7	2028	41,420	3,642	102,566	7,212
8	2029	43,031	3,751	106,553	7,429
9	2030	44,641	3,863	110,540	7,652
10	2031	46,251	3,948	114,528	7,819
Ten-Yr Increase		16,102	987	39,872	1,954

Residential Cost of Public Building Improvements	$19,936,106
Nonresidential Cost of Public Building Improvements	$977,008
Total Cost of Public Building Improvements	**$20,913,115**

Maximum Supportable Public Facilities Impact Fee

Figure PF5 shows the maximum supportable Public Facilities Impact Fee. Impact fees for Public Facilities are based on persons per housing unit for residential development and employees per 1,000 square feet for nonresidential development. For residential development, the total cost per person is multiplied by the persons per housing unit to calculate the proposed fee. For nonresidential development, the total cost per job is multiplied by the jobs per 1,000 square feet to calculate the proposed fee. The fees represent the highest amount supportable for each type of development, which represents new growth's fair share of the cost for capital facilities. The Town may adopt fees that are less than the amounts shown. However, a reduction in impact fee revenue will necessitate an increase in other revenues, a decrease in planned capital expenditures, and/or a decrease in levels of service.

Figure PF5: Maximum Supportable Public Facilities Impact Fee

	Residential	***Nonresidential***
Cost per Demand Unit	Per Person	Per Job
Building Cost Component	$1,238.11	$990.25

Residential Impact Fees per Person

Unit Type	*Persons per Housing Unit*	*Proposed Fee*	*Current Fee*	*Difference*
Single Family	3.02	**$3,739**	**$2,009**	**$1,730**
Multifamily	1.65	**$2,042**	**$1,260**	**$782**

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

Development Type	*Jobs/1,000 SF*	*Proposed Fee*	*Current Fee*	*Difference*
Commercial	2.34	**$2,317**	**$466**	**$1,851**
Office & Institutional	2.97	**$2,941**	**$767**	**$2,174**
Industrial	1.97	**$1,945**	**$418**	**$1,527**

Revenue from Public Facilities Impact Fee

Revenue from the Public Facilities Impact Fee is estimated in Figure PF6. There is projected to be 5,533 new housing units and 404,916 square feet of nonresidential development in Erie by 2031. To determine the revenue from each development type, the fee is multiplied by the growth. Overall, the revenue from the impact fee covers 99.7 percent of the capital costs generated by projected growth in the Town of Erie.

Figure PF6: Estimated Revenue from Public Facilities Impact Fee

		Single Family	*Multifamily*	*Commercial*	*Office*	*Industrial*
		$3,739 per unit	*$2,042 per unit*	*$2,317 per 1,000 Sq. Ft.*	*$2,941 per 1,000 Sq. Ft.*	*$1,945 per 1,000 Sq. Ft.*
Year		Housing Units		1,000 Square Feet		
Base	2021	8,930	1,928	343	560	312
Year 1	2022	9,439	1,972	354	576	322
Year 2	2023	9,948	2,016	364	594	331
Year 3	2024	10,457	2,060	375	611	341
Year 4	2025	10,966	2,105	387	630	351
Year 5	2026	11,475	2,149	398	649	362
Year 6	2027	11,984	2,193	410	668	373
Year 7	2028	12,493	2,237	422	688	384
Year 8	2029	13,002	2,282	435	709	396
Year 9	2030	13,511	2,326	448	730	407
Year 10	2031	14,020	2,370	458	746	416
Ten Year Increase		5,090	443	114	186	104
Projected Revenue		$19,031,510	$903,807	$265,168	$548,285	$202,364

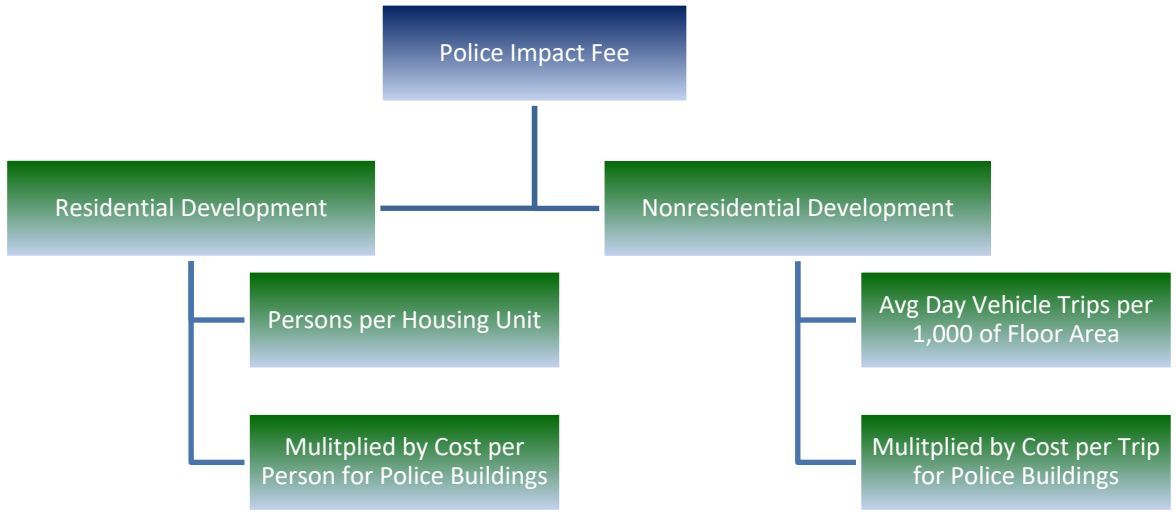
Pojected Revenue:	$20,951,134
Total Expenditures:	$20,913,115
General Fund Share:	($38,019)

Police Impact Fee

The Police Impact Fee is calculated on a per capita basis for residential development and a per vehicle trip basis for nonresidential development. Figure P1 illustrates the methodology used to determine the impact fee. It is intended to read like an outline, with lower levels providing a more detailed breakdown of the components. The residential portion is derived from the product of persons per housing unit (by type) multiplied by the net cost per person. The nonresidential portion is derived from the product of vehicle trips generated per 1,000 square feet of nonresidential space multiplied by the net cost per vehicle trip.

The residential police impact fees are calculated per housing unit. TischlerBise recommends using nonresidential vehicle trips as the best demand indicator for police facilities. Trip generation rates are used for nonresidential development because vehicle trips are highest for commercial/retail developments, such as shopping centers, and lowest for industrial development. Office and institutional trip rates fall between the other two categories. This ranking of trip rates is consistent with the relative demand for police services and facilities from nonresidential development. Other possible nonresidential demand indicators, such as employment or floor area, will not accurately reflect the demand for service. For example, if employees per thousand square feet were used as the demand indicator, police impact fees would be too high for office and institutional development because offices typically have more employees per 1,000 square feet than retail uses.

Figure P1: Police Impact Fee Methodology Chart



Police Proportionate Share Factors

Both residential and nonresidential developments increase the demand on Police facilities. To calculate the proportional share between residential and nonresidential demand on Police facilities, a functional population approach is used. The functional population approach allocates the cost of the facilities to residential and nonresidential development based on the activity of residents and workers in the Town through the 24 hours in a day.

Residents that do not work are assigned 20 hours per day to residential development and four hours per day to nonresidential development (annualized averages). Residents that work in Erie are assigned 16 hours to residential development and 8 hours to nonresidential development. Residents that work outside Erie are assigned 14 hours to residential development. Inflow commuters are assigned 10 hours to nonresidential development. Based on 2018 functional population data for Erie, the cost allocation for residential development is 92.7 percent while nonresidential development accounts for 7.3 percent of the demand for Police facilities, see Figure P2.

Figure P2: Town of Erie Functional Population

Proportionate Share

		Demand Units in 2018		Demand Hours/Day	Person Hours	Proportionate Share
Residential						
	Estimated Residents	22,930				
49%	Residents Not Working		11,243	20	224,860	
51%	Workers Living in Town		11,687			
4%	Town Residents Working in Town		511	16	8,176	
96%	Town Residents Working outside of Town		11,176	14	156,464	
			Residential Subtotal		389,500	**92.7%**
Nonresidential						
	Non-worker Residents		11,243	4		
	Jobs Located in Town		3,162			
	Town Residents Working in Town		511	8	4,088	
	Non-Resident Workers		2,651	10	26,510	
			Nonresidential Subtotal		30,598	**7.3%**
				Total	420,098	**100%**

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

Police Station Level of Service and Capital Costs

The first component of the Police Impact Fee is based on an inventory of existing Townwide facilities and replacement costs. The use of existing standards means there are no existing infrastructure deficiencies.

New development is only paying its proportionate share for growth-related infrastructure. The floor area has been provided by the Town of Erie staff.

The Town of Erie Police Department is housed in the Police/Courts Facility. The Police Department occupies 17,800 square feet. To determine the residential level of service, the current Police space square footage (17,800) is multiplied by the residential proportionate share factor (92.7%) and divided by the current population (30,149) for a level of service standard of 0.55 square feet per person. The nonresidential level of service standard of 0.17 square feet per nonresidential vehicle trip was determined by multiplying the current facility square footage (17,800) by the nonresidential proportionate share factor (7.3%) and divided by the current average daily nonresidential vehicle trips (7,618).

As shown in Figure P3, the estimated replacement cost is $575 per square foot. When the residential (0.55 per person) and nonresidential (0.17 per vehicle trip) per square foot level of service standards are multiplied by the cost per square foot ($575), the resulting cost per demand units are $314.75 per person and $97.86 per vehicle trip.

Figure P3: Police Station Level of Service and Cost Factors

Building	*Square Footage*	*Cost per SF*	*Replacement Cost*
Police /Courts Facility	17,800	$575.00	$10,235,000

Source: Town of Erie

Development Type	*Proportionate Share*	*2021 Demand Units*	*Sq. Ft. per Demand Unit*	*Cost per Demand Unit*
Residential	92.7%	30,149 Population	0.55	**$314.75**
Nonresidential	7.3%	7,618 Nonres. Vehicle Trips	0.17	**$97.86**

Projection of Growth-Related Police Facility Needs

To estimate the 10-year growth needs for Police space, the current level of service (.55 square feet per person and 0.17 square feet per nonresidential vehicle trip) is applied to the residential and nonresidential growth projected for the Town of Erie. The Town is projected to increase by 16,102 residents and 2,538 nonresidential vehicle trips over the next ten years (see Appendix A). Listed in Figure P4, there is projected need for 9,246 square feet of growth-related Police space to accommodate new development in the Town at the present level of service. By applying the average cost per square foot ($575), the total projected growth-related building space expenditure is approximately $5.3 million.

Figure P4: 10-Year Police Space Needs to Accommodate Growth

Residential LOS	0.55	per person
Nonresidential LOS	0.17	per vehicle trip
Police Building Cost	$575	per square foot

				Infrastructure Needed	
	Year	*Population*	*Nonresidential Vehicle Trips*	*Residential*	*Nonresidential*
Base	2021	30,149	7,618	16,504	1,296
1	2022	31,759	7,846	17,385	1,335
2	2023	33,369	8,081	18,266	1,375
3	2024	34,980	8,324	19,148	1,417
4	2025	36,590	8,573	20,029	1,459
5	2026	38,200	8,831	20,911	1,503
6	2027	39,810	9,095	21,792	1,548
7	2028	41,420	9,368	22,674	1,594
8	2029	43,031	9,649	23,555	1,642
9	2030	44,641	9,939	24,436	1,691
10	2031	46,251	10,156	25,318	1,728
Ten-Yr Increase		16,102	2,538	8,814	432
Residential Cost of Police Building Improvements					$5,068,208
Nonresidential Cost of Building Improvements					$248,378
Total Cost of Police Building Improvements					**$5,316,585**

Police Debt Service Credit

The Town of Erie has existing debt obligations for the construction of the present Public Safety Building. Figure P5 lists the remaining principal payment schedule for the bonds, which is totals $6.2 million.

The total remaining annual principal payment schedule is distributed to the equivalent residential and nonresidential share, Town's population and vehicle trip ends, to find the debt cost per attributed user. To account for the time value of money, annual payments are discounted using a net present value formula based on the applicable discount (3.75%) rate. This results in a credit of $87.34 per person, and $31.64 per nonresidential vehicle trip.

Figure P5: Police Debt Principal Payment Credit

Year	*2014 Bond Principal Payments*	*Projected Population**	*Projected Nonresidential Vehicle Trips*	*Principal Payment*	
				Residential Credit (per Person)	*Nonresidential Credit (per Vehicle Trip)*
				92.7%	*7.3%*
2021	$0	30,149	7,618	$0.00	$0.00
2022	$0	31,759	7,846	$0.00	$0.00
2023	$0	33,369	8,081	$0.00	$0.00
2024	$0	34,980	8,324	$0.00	$0.00
2025	$0	36,590	8,573	$0.00	$0.00
2026	$0	38,200	8,831	$0.00	$0.00
2027	$800,000	39,810	9,095	$18.63	$6.41
2028	$825,000	41,420	9,368	$18.47	$6.41
2029	$855,000	44,641	9,649	$17.76	$6.45
2030	$880,000	46,251	9,939	$17.64	$6.45
2031	$915,000	47,861	10,156	$17.73	$6.56
2032	$945,000	49,472	10,377	$17.71	$6.63
2033	$980,000	51,082	10,604	$17.79	$6.73
Total	$6,200,000			$125.72	$45.65
		Discount Rate		*3.75%*	*3.75%*
		Present Value		**$87.34**	**$31.64**

Maximum Supportable Police Impact Fee

Figure P6 shows the maximum supportable Police Impact Fee. Impact fees for Police are based on persons per housing unit for residential development and vehicle trips per 1,000 square feet for nonresidential development. For residential development, the total cost per person is multiplied by the housing unit size to calculate the proposed fee. For nonresidential development, the total cost per vehicle trip is multiplied by the trips per 1,000 square feet to calculate the proposed fee.

The fees represent the highest amount supportable for each type of development, which represents new growth's fair share of the cost for capital facilities. The Town may adopt fees that are less than the amounts shown. However, a reduction in impact fee revenue will necessitate an increase in other revenues, a decrease in planned capital expenditures, and/or a decrease in levels of service.

Figure P6: Maximum Supportable Police Impact Fee

Cost per Demand Unit	Per Person	Per Vehicle Trip
Building Cost Component	$314.75	$97.86
Principal Payment Credit	($87.34)	($31.64)
Total Net Cost per Demand Unit	**$227.41**	**$66.22**

Residential Impact Fees per Person

Unit Type	*Persons per Housing Unit*	*Proposed Fee*	*Current Fee*	*Difference Difference*
Single Family	3.02	**$686**	**$0**	**$686**
Multifamily	1.65	**$375**	**$0**	**$375**

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

Development Type	*Vehicle Trips/1,000 SF*	*Proposed Fee*	*Current Fee*	*Difference*
Commercial	12.46	**$824**	**$0**	**$824**
Office & Institutional	4.87	**$322**	**$0**	**$322**
Industrial	1.97	**$130**	**$0**	**$130**

Revenue from Police Impact Fee

Revenue from the Police Impact Fee is estimated in Figure P7. There is projected to be 5,533 new housing units and 404,916 square feet of nonresidential development in Erie by 2031. To find the revenue from each development type, the fee is multiplied by the growth for each land use. Overall, the projected revenue from the Police impact fee totals approximately $3.8 million. Impact fee revenue is less than the projected expenditures due to the required debt credit.

Figure P7: Estimated Revenue from Police Impact Fee

		Single Family	*Multifamily*	*Commercial*	*Office*	*Industrial*
		$686 per unit	*$375 per unit*	*$824 per 1,000 Sq. Ft.*	*$322 per 1,000 Sq. Ft.*	*$130 per 1,000 Sq. Ft.*
Year		Housing Units		1,000 Square Feet		
Base	2021	8,930	1,928	343	560	312
Year 1	2022	9,439	1,972	354	576	322
Year 2	2023	9,948	2,016	364	594	331
Year 3	2024	10,457	2,060	375	611	341
Year 4	2025	10,966	2,105	387	630	351
Year 5	2026	11,475	2,149	398	649	362
Year 6	2027	11,984	2,193	410	668	373
Year 7	2028	12,493	2,237	422	688	384
Year 8	2029	13,002	2,282	435	709	396
Year 9	2030	13,511	2,326	448	730	407
Year 10	2031	14,020	2,370	458	746	416
Ten Year Increase		5,090	443	114	186	104
Projected Revenue		$3,491,740	$165,978	$94,302	$60,030	$13,526

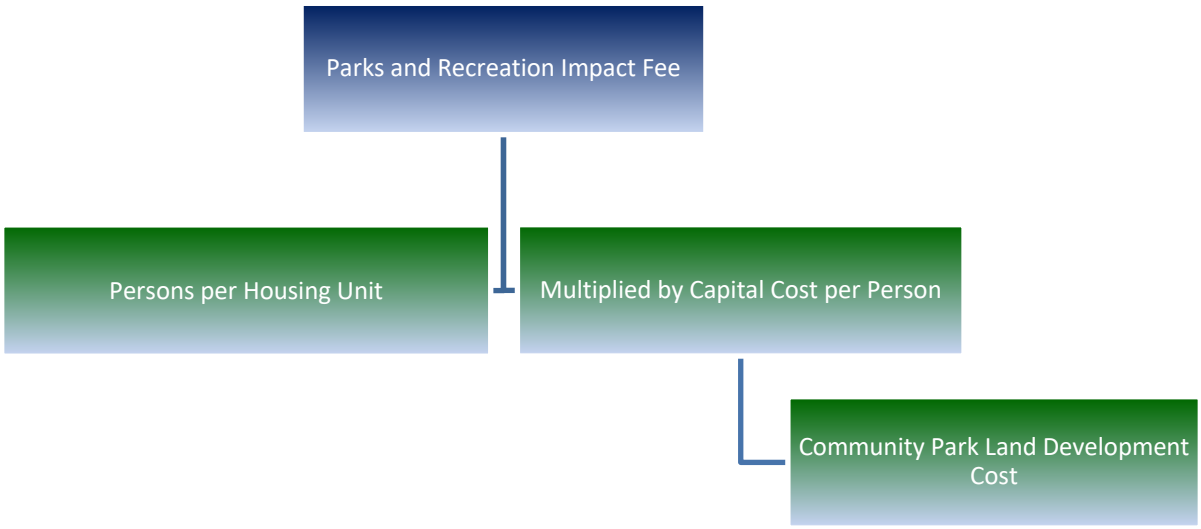
Pojected Revenue:	$3,825,576
Total Expenditures:	$5,316,585
General Fund Share:	$1,491,009

Parks & Recreation Impact Fee

The Parks & Recreation Impact Fee is based on the incremental expansion methodology. The impact fee methodology assumes the Town will construct additional recreation improvements through the development of existing and future community park land to serve future growth to maintain current levels of service incrementally over time. The study includes only the development costs for community park land, land acquisition is not included. However, the Town will still maintain its current park land dedication requirement.

Figure PR1 diagrams the general methodology used to calculate the Parks & Recreation impact fee. It is intended to read like an outline, with lower levels providing a more detailed breakdown of the impact fee components. The Parks and Recreation impact fee is derived from the product of persons per housing unit (by type of unit) multiplied by the net capital cost per person. The boxes in the next level down indicate detail on the components included in the fee.

Figure PR1. Parks & Recreation Impact Fee Methodology



Parks Land Level of Service Factors

Although the Town of Erie has over approximately 1,500 acres of parks and open space, the focus of the impact calculation is developing future community parks. The impact fee does not include a land purchase component as the Town will obtain future land through its current park land dedication requirement. Community parks are designed to serve the Town's entire population. As indicated in Figure PR2, the Town currently has one developed community park. Land for a second park was recently acquired, but it has not yet been developed. Erie Community Park is 41 acres in size. When community park land (41 acres) is compared to the Town's current population (30,149), the level of service for community parks is .0014 acres per person.

Figure PR2: Community Park Inventory

Park Site	*Acres*
Erie Community Park	41.00
TOTAL	*41.00*

Level of Service (LOS) Standards	
Community Park Acres	41.00
2021 Erie Population	30,149
Community Park LOS: Acres per Person	**0.0014**

Source: Town of Erie Parks, Recreation, Open Space, and Trails Master Plan

Community Park Development Cost

The cost to develop an acre of community park land in Erie is shown below in Figure PR3. This is based on recent development costs incurred by the Town. As shown in Figure PR3, the Town developed 12 acres at a cost of $6,633,580. This equates to a cost per acre of $552,798, plus a water rights cost per acre of $44,064, for a total cost of $596,862 per acre. When this cost per acre is compared to the existing level of service for community park land, the development cost per person is $811.68.

Figure PR3: Community Park Development Costs

Item	Cost for 12 acre site
General Sitework	$46,748
Earthwork	$487,813
Utilities - Water, Sanitary Sewer, Storm Drainage	$380,537
Erosion Control	$91,164
Site Electrical Service	$787,524
Parking	$281,885
Hardscape/Trails - Flatwork Concrete	$637,258
Hardscape/Trails - Structural Concrete	$492,182
Landscaping (includes native)	$554,912
Playground	$562,055
Irrigation	$507,533
Site Funishings	$322,785
Pavilion(s)/Shelter(s) - EA	$55,000
Primary Archtectural (Primary Building)	$661,427
Mobilization/GC	$764,756
Total	**$6,633,580**

Level of Service (LOS) Standards	
Average Development Cost per Acre	$552,798
Average Water Rights Cost per Acre	$44,064
Total Development Cost per Acre	**$596,862**
LOS: Acres per Person	0.0014
Community Park LOS: Development Cost per Person	***$811.68***

Source: Town of Erie

Projection of Growth-Related Park Development Needs

To estimate the 10-year growth needs for community and neighborhood park development, the current levels of service for community park acres (0.0014 acres person) is applied to the projected population growth. The Town is projected to increase by 16,102 residents over the next ten years (see Appendix A). Listed in Figure PR4, there is projected need for an additional 21.90 acres of developed community park land to accommodate new residential development in the Town at the present level of service. The total projected growth-related park development expenditure is approximately $13 million.

Figure PR4. 10-Year Park Development Needs to Accommodate Growth

Park Level of Service (LOS) Standards				
Developed Community Parks LOS			0.0014	per Person
Community Development Cost per Acre			$596,862	per acre
			Infrastructure Needed	
	Year	*Erie Population*	*Community Park Acres*	*Community Park Development Cost*
Base	2021	30,149	41.00	
1	2022	31,759	43.19	$1,306,976
2	2023	33,369	45.38	$1,306,976
3	2024	34,980	47.57	$1,306,976
4	2025	36,590	49.76	$1,306,976
5	2026	38,200	51.95	$1,306,976
6	2027	39,810	54.14	$1,306,976
7	2028	41,420	56.33	$1,306,976
8	2029	43,031	58.52	$1,306,976
9	2030	44,641	60.71	$1,306,976
10	2031	46,251	62.90	$1,306,976
Ten-Yr Increase		16,102	21.90	$13,069,763
Cost of Community Park Land Development				$13,069,763
Total Cost of Park Development				**$13,069,763**

Parks & Recreation Impact Fee

Figure PR5 shows the cost factors for each component of the Town of Erie's Parks and Recreation Impact Fee. Impact fees for parks and recreation are based on persons per housing unit and are only assessed against residential development. The fees for park improvements are calculated per person, so by multiplying the total cost per person by the housing unit size calculates the maximum supportable fee.

The fees represent the highest amount supportable for each type of housing unit, which represents new growth's fair share of the cost for capital facilities. The Town may adopt fees that are less than the amounts shown. However, a reduction in impact fee revenue will necessitate an increase in other revenues, a decrease in planned capital expenditures, and/or a decrease in levels of service.

Figure PR5. Maximum Supportable Park & Recreation Impact Fee

Infrastructure Costs per Person	
Community Park Development	$811.68
Total Capital Cost per Person	**$811.68**

Unit Type	*Persons per Housing Unit*	*Proposed Fee*	*Current Fee*	*Increase/ (Decrease)*
Single Family	3.02	**$2,451**	$4,100	($1,649)
Multifamily	1.65	**$1,339**	$2,980	($1,641)

Revenue from Parks & Recreation Impact Fee

Revenue from the Town's Parks & Recreation Impact Fee is estimated in Figure PR6. There is projected to be 5,533 new housing units in Erie by 2031. To find the revenue from each development type, the fee is multiplied by the growth for each land use. Overall, the projected revenue from the Parks and Recreation impact fee totals approximately $13 million.

Figure PR6. Estimated Revenue from Parks & Recreation Impact Fee

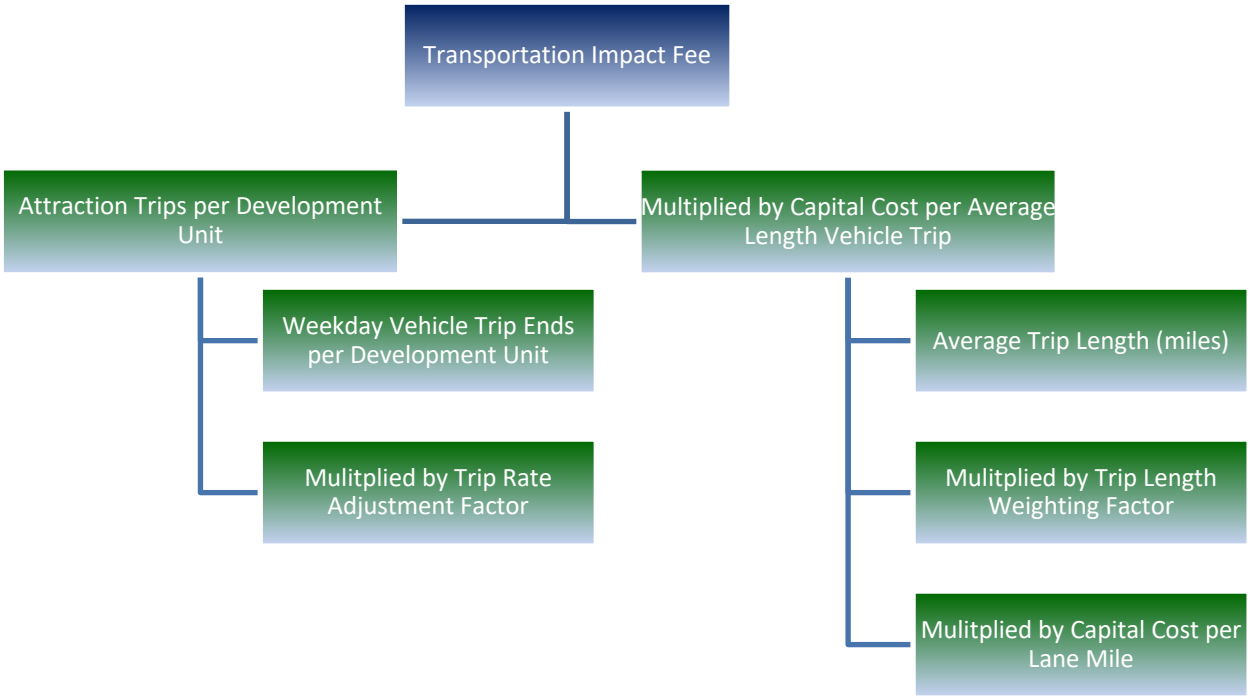
		Single Family	*Multifamily*
		$2,531 per unit	***$1,399 per unit***
Year		Housing Units	
Base	2021	8,930	1,928
Year 1	2022	9,439	1,972
Year 2	2023	9,948	2,016
Year 3	2024	10,457	2,060
Year 4	2025	10,966	2,105
Year 5	2026	11,475	2,149
Year 6	2027	11,984	2,193
Year 7	2028	12,493	2,237
Year 8	2029	13,002	2,282
Year 9	2030	13,511	2,326
Year 10	2031	14,020	2,370
Ten Year Increase		5,090	443
Projected Revenue		$12,475,590	$592,653
		Pojected Revenue:	$13,068,243
		Total Expenditures:	$13,069,763
		General Fund Share:	$1,520

Transportation Impact Fee

Methodology

The Town of Erie Transportation impact fees are calculated using an incremental expansion/plan-based hybrid approach for system improvements, including arterial roads, and intersections. As shown in Figure T1, the transportation impact fee is derived from trip generation rates, trip rate adjustment factors, average trip length by land use type, and the net capacity cost per average length vehicle trip. The cost per vehicle trip is a function of the average trip length, trip-length weighting factor, costs per lane mile, and lane capacity.

Figure T1: Transportation Impact Fee Methodology



Demand Indicators

The appropriate demand indicator to measure demand for transportation improvements is Vehicle Miles Travelled (VMT), which creates a link between the supply of the roadways (capacity) and demand (traffic generated by new development). A baseline VMT per land use is based on an analysis of land use-specific trip rates and trip lengths and serves as the basis for measuring growth in demand for streets based on the development projections for the next 10 years.

Residential Trip Generation Rates

A customized trip rate is calculated for the single family and multifamily units in the Town of Erie. In Figure T2, the most recent data from the US Census American Community Survey is inputted into equations provided by the ITE to calculate the trip ends per housing unit factor. A single family unit is estimated to generate 11.20 trip ends on an average weekday and a multifamily unit is estimated to generate 6.90 trip ends on an average weekday.

Figure T2. Residential Average Daily Vehicle Trip Rates

		Households (2)			
Town of Erie, CO	*Vehicles Available (1)*	*Single Family Units (3)*	*Multifamily Units*	*Total*	*Vehicles per Household*
Owner-occupied	15,373	6,472	280	6,752	2.28
Renter-occupied	1,925	685	335	1,020	1.89
Total	17,298	7,157	615	7,772	2.23
	Housing Units =>	7,254	642	7,896	

(1) Vehicles available by tenure from Table B25046, American Community Survey, 2018.

(2) Households by tenure and units in structure from Table B25032, American Community Survey, 2018.

(3) From Table B25032, ACS 2013-2018 5 year estimates

Town of Erie, CO	*Persons (1)*	*Trip Ends (2)*	*Vehicles by Type of Housing*	*Trip Ends (3)*	*Average Trip Ends*	*Trip Ends per Housing unit*
Single Family Units	21,871	58,468	16,028	104,182	81,325	**11.20**
Multifamily Units	1,059	3,610	1,270	5,296	4,453	**6.90**
Total	22,930	62,078	17,298	109,478	85,778	**10.90**

(1) Persons by units in structure from Table B25033, American Community Survey, 2018.
(2) Vehicle trips ends based on persons using formulas from Trip Generation (ITE 2017). For single family housing (ITE 210), the fitted curve equation is EXP(0.89*LN(persons)+1.72). To approximate the average population of the ITE studies, persons were divided by 27 and the equation result multiplied by 27. For multifamily housing (ITE 220), the fitted curve equation is (7.56*persons)-40.86.
(3) Vehicle trip ends based on vehicles available using formulas from Trip Generation (ITE 2017). For single family housing (ITE 210), the fitted curve equation is EXP(0.99*LN(vehicles)+1.93). To approximate the average number of vehicles in the ITE studies, vehicles available were divided by 47.5 and the equation result multiplied by 47.5. For multifamily housing (ITE 220), the fitted curve equation is (3.94*vehicles)+293.58.

Residential Vehicle Trips Adjustment Factors

A vehicle trip end is the out-bound or in-bound leg of a vehicle trip. As a result, so to not double count trips, a standard 50 percent adjustment is applied to trip ends to calculate a vehicle trip. For example, the out-bound trip from a person's home to work is attributed to the housing unit and the trip from work back home is attributed to the employer.

However, an additional adjustment is necessary to capture Town residents' work bound trips that are outside of Erie. The trip adjustment factor includes two components. According to the National Household Travel Survey (2009), home-based work trips are typically 31 percent of out-bound trips (which are 50 percent of all trip ends). Also, utilizing the most recent data from the Census Bureau's web application

"OnTheMap", 95.6% of Erie workers travel outside the Town for work. In combination, these factors account for 15% of additional production trips.

Figure T3. Trip Adjustment Factor for Commuters

Trip Adjustment Factor for Commuters	
Employed Erie Residents	11,687
Erie Residents Working in Town	511
Erie Residents Commuting Outside Town for Work	11,176
Percent Commuting out of the Town	**95.6%**
Additional Production Trips	15%
Residential Trip Adjustment Factor	**65%**

Source: U.S. Census, OnTheMap Application Longitudinal-Employer Household Dynamics

Nonresidential Trip Generation Rates

The trip generation rates for nonresidential development are obtained from the 10th edition of the reference book 'Trip Generation' published by the Institute of Transportation Engineers (2017), shown in Figure T4. A vehicle trip end represents a vehicle either entering or exiting a development (as if a traffic counter were placed across a driveway). The prototype for industrial/warehouse development is Manufacturing (ITE 140) which generates 3.93 average weekday vehicle trip ends per 1,000 square feet of floor area. For office and institutional development, the proxy is General Office (ITE 710); it generates 9.74 average weekday vehicle trip ends per 1,000 square feet of floor area. The prototype for retail/commercial development is Shopping Center (ITE 820) which generates 37.75 average weekday vehicle trips per 1,000 square feet of floor area.

Figure T4. Nonresidential Average Daily Vehicle Trip Rates

ITE Code	Land Use / Size	Demand Unit	Wkdy Trip Ends Per Dmd Unit[1]	Wkdy Trip Ends Per Employee[1]	Employees Per Dmd Unit	Sq Ft Per Employee
110	Light Industrial	1,000 Sq Ft	4.96	3.05	1.63	613
130	Industrial Park	1,000 Sq Ft	3.37	2.91	1.16	862
140	Manufacturing	1,000 Sq Ft	3.93	2.47	1.59	629
150	Warehousing	1,000 Sq Ft	1.74	5.05	0.34	2,941
254	Assisted Living	bed	2.60	4.24	0.61	na
320	Motel	room	3.35	25.17	0.13	na
520	Elementary School	1,000 Sq Ft	19.52	21.00	0.93	1,075
530	High School	1,000 Sq Ft	14.07	22.25	0.63	1,587
540	Community College	student	1.15	14.61	0.08	na
550	University/College	student	1.56	8.89	0.18	na
565	Day Care	student	4.09	21.38	0.19	na
610	Hospital	1,000 Sq Ft	10.72	3.79	2.83	353
620	Nursing Home	bed	3.06	2.91	1.05	na
710	General Office (average size)	1,000 Sq Ft	9.74	3.28	2.97	337
760	Research & Dev Center	1,000 Sq Ft	11.26	3.29	3.42	292
770	Business Park	1,000 Sq Ft	12.44	4.04	3.08	325
820	Shopping Center (average size)	1,000 Sq Ft	37.75	16.11	2.34	427

1. Trip Generation, Institute of Transportation Engineers, 10th Edition (2017).

Adjustment for Pass-By Trips

For retail/commercial land uses, the trip adjustment factor is less than 50 percent because these types of development attract vehicles as they pass by on arterial and collector roads. For example, when someone stops at a convenience store on the way home from work, the convenience store is not the primary destination. For the average shopping center, ITE data indicate 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.

Average Weekday Vehicle Trip Estimates

Shown in Figure T5 are 2021 base year average weekday vehicle trip (AWVT) estimates based on the demand indicators for residential and nonresidential land uses discussed in the previous sections multiplied by base year development estimates. For residential development, the table displays AWVT factors per housing unit. For nonresidential development, the table displays AWVT factors per 1,000 square feet of floor area. For example, existing single-family development generates approximately 59,725 AWVT (11.20 average weekday vehicle trip ends per housing unit X 65 percent trip adjustment factor X 8,204 single-family housing units), and existing retail/commercial development generates approximately 4,279 AWVT (37.75 average weekday vehicle trip ends per 1,000 square feet X 33 percent trip adjustment factor X 343 KSF).

Figure T5: Average Weekday Vehicle Trip Estimates (AWVT)

Development Type	*ITE Code*	*Dev Unit*	*Weekday VTE*	*Trip Adj*	*2021 Dev Units*	*2021 Veh Trips*
Single Family	210	HU	11.20	65%	8,204	59,725
Multi-Family	220	HU	6.90	65%	726	3,256
Commercial	820	KSF	37.75	33%	343	4,279
Office & Institutional	710	KSF	9.74	50%	560	2,725
Industrial	140	KSF	3.93	50%	312	614

National Average Trip Length

To calculate the Transportation impact fees, it is necessary to determine the average trip length on the Town of Erie's arterial network. To do this, the analysis uses national trip generation rates and average trip lengths from the 2017 National Household Travel Survey.

Figure T6: National Average Trip Lengths

Land Use	National Avg Trip Length (miles)
Residential	12.32
Industrial	7.70
Commercial/Retail	7.90
Office and Other	7.70
Institutional	7.70

Source: U.S. Department of Transportation, Federal Highway Administration, 2017 National Household Transportation Survey, adjusted for land use.

Expected Vehicle Miles Traveled

The national average trip length should be adjusted to reflect actual local demand on the Town's arterial network. To do this, TischlerBise determines expected VMT on Erie's principal and minor arterial network by multiplying the national average trip lengths by average weekday vehicle trips. Based on this analysis, existing development in the Town generate an expected 834,707 VMT.

Figure T7: Expected Vehicle Miles Traveled

Land Use	Avg Weekday Vehicle Trips[1]	National Avg Trip Length	Expected VMT[3]
Single Family	59,725	12.32	735,813
Multi-Family	3,256	12.32	40,115
Commercial	4,279	7.70	32,948
Industrial	614	7.90	4,848
Office	2,725	7.70	20,982
Total			834,707

1. Average weekday vehicle trips calculated specific for the Town of Erie.
2. 2017 National Household Transportation Survey.
3. TischlerBise calculation, Average Weekday Vehicle Trips X National Average Trip Length.

Local Adjustment Factor

Expected VMT reflects anticipated travel demand on the entire principal and minor arterial network; therefore, it is necessary to calibrate expected demand to the local arterial system. To calibrate expected demand on the local arterial system, actual travel demand, based on local traffic counts obtained from the Town (See Appendix C), is compared to expected travel demand. The ratio between actual VMT and expected VMT provides the local adjustment factor used to adjust national average trip lengths by type of land use.

Figure T8: Local Adjustment Factor

Local Adjustment Factor	
Actual VMT on Arterials[1]	186,670
Expected VMT	834,707
Actual to Expected VMT	0.22

1. TischlerBise analysis of trip counts obtained from Town of Erie.

Local Trip Lengths

Shown below, TischlerBise applies the local adjustment factor to the national average trip lengths to calculate the local trip lengths. The analysis will use the local trip lengths shown below to calculate vehicle miles traveled.

FigureT9: Local Trip Lengths

Land Use	National Avg Trip Length (miles)	Local Adjustment	Local Trip Length
Residential	12.32	0.25	3.08
Industrial	7.70	0.25	1.92
Commercial/Retail	7.90	0.25	1.97
Office and Other	7.70	0.25	1.92
Institutional	7.70	0.25	1.92

Source: 2017 NHTS and TischlerBise analysis; local adjustment from Figure R7.

Town of Erie VMT Factors

Shown below are the demand indicators for residential and nonresidential land uses related to vehicle miles traveled (VMT). For residential development, the table displays VMT per housing unit. For nonresidential development, the table displays VMT generated per 1,000 square feet of floor area.

Figure T10: Town of Erie VMT Factors

Development Type	*ITE Code*	*Dev Unit*	*Weekday VTE*	*Trip Adj*	*Local Trip Length*	*Weekday VMT*
Single Family	210	HU	11.20	65%	3.08	22.42
Multi-Family	220	HU	6.90	65%	3.08	13.81
Commercial	820	KSF	37.75	33%	1.97	24.60
Office & Institutional	710	KSF	9.74	50%	1.92	9.37
Industrial	140	KSF	3.93	50%	1.92	3.78

Arterial Network Capacity and Usage

As shown in Appendix C, the Town of Erie provided an inventory of arterial road segments, including segment lengths, lane quantities, and average daily traffic (ADT) counts. Multiplying each segment's length by the number of lanes yields the number of lane miles per segment, and multiplying the traffic counts and segment lengths provides the average weekday vehicle miles traveled (VMT). The Town' arterial network consists of 34.80 lane miles.

Shown below, Figure T11 documents the capacity of the Town of Erie's arterial network. Based on the *Town of Erie Master Transportation Plan*. The Town's *Master Transportation Plan* suggests a mile segment of an arterial road should maintain a daily volume ranging from 8,000 vehicles per lane for a principal arterial. Applying this capacity to the Town's arterial network shown in Appendix C generates arterial capacity of 278,400 vehicle miles of capacity (VMC).

As previously noted, current daily volume on Erie's arterial network is 186,670 VMT. The resulting VMC to VMT ratio is 1.49 (278,400 VMC / 186,670 VMT). The baseline VMC / VMT ratio for any incremental expansion method is 1.0 (i.e., VMC = VMT); therefore, the current ratio of 1.49 exceeds the current LOS ensuring new capacity built with impact fees will not exceed the current LOS.

Figure T11: Arterial Network Capacity and Usage

Arterial Capacity Ratio	
Total Principal Arterial Lane Miles	34.80
Capacity per Lane Mile[1]	8,000
Vehicle Miles of Capacity	278,400
Vehicle Miles of Travel	186,670
VMC / VMT Ratio	1.49

1. Erie Transportation Master Plan.

Road Improvements

The Town of Erie provided a list of growth-related arterial projects it intends to construct within the next 10 years. Based on the eligible cost of the potential arterial projects (total cost less State and other funding sources), planned improvements total $41.8 million. From this amount is deducted the current unencumbered impact fee balance ($6.4 million), which results in a net cost to the Town of $35.4 million. When the planned lane miles (19.60) is compared to the net Town cost, the weighted average cost per lane mile is $1,807,563.

Figure T12: Planned Road Improvements

Year	Future Capacity Projects	Length	Lanes	Lane Miles	Estimated Cost
Short-Term	CLR Shoulders - SH52 to Cheesman	2.50	1.00	2.50	$2,222,000
Short-Term	CLR - Erie Parkway to Telleen (Including Underpass)	0.60	1.00	0.60	$8,750,000
Short-Term	Arapahoe Road - Beasley to 111th	0.25	3.00	0.75	$1,050,000
Short-Term	WCR 5 - Glacier Drive to WCR 6	1.00	3.00	3.00	$3,400,000
Mid-Term	Arapahoe Road - 111th to 119th	1.00	3.00	3.00	$3,657,667
Mid-Term	Erie Parkway - 109th to 111th Improvements	0.25	3.00	0.75	$1,000,000
Mid-Term	119th Widening - Erie Parkway to SH7	1.00	3.00	3.00	$7,377,500
Mid-Term	CLR- Bonnell Ave to Arapahoe Rd	1.00	3.00	3.00	$8,853,000
Mid to Long-Term	WCR 5 - WCR 6 to WCR 4	1.00	3.00	3.00	$5,559,250
	Total	**8.60**	**23.00**	**19.60**	**$41,869,417**
				Less current impact fee balance	**$6,441,189**
				Net Town Cost	**$35,428,228**
				Cost per Lane Mile	**$1,807,563**

Projected Travel Demand and Costs

The travel demand model inputs above (Figures T10 and T11) are used to derive level of service in Vehicle Miles of Travel and future needs of lane miles. A Vehicle Mile of Travel (VMT) is a measurement unit equal to one vehicle traveling one mile. Growth-related arterial road needs are based on the actual LOS capacity of 8,000 VMC per lane mile versus the existing VMT per lane mile (5,364), to account of the excess capacity

in the network (see Figure T11). This results in a growth-related need for 12.94 lane miles. If existing VMC were used as the LOS, the need would be 19.3 lane miles.

Figure T13: Travel Demand Model

VMC Per Lane Mile	8,000
VMT per Lane Mile	5,364

Erie, Colorado	Base 2021	1 2022	2 2023	3 2024	4 2025	5 2026	10 2031	10-Year Increase
Single Family Units	8,204	8,672	9,139	9,607	10,074	10,542	12,880	4,676
Multi-Family Units	726	767	809	850	892	933	1,140	414
Commercial	343	322	331	341	351	362	416	73
Industrial	312	576	594	611	630	649	746	434
Office & Other Services	560	354	364	375	387	398	458	-102
Single Family Trips	59,725	63,132	66,532	69,939	73,339	76,746	93,766	34,041
Multi-Family Trips	3,256	3,440	3,628	3,812	4,001	4,185	5,113	1,857
Residential Trips	62,981	66,572	70,160	73,751	77,339	80,930	98,879	35,898
Commercial Trips	4,279	4,007	4,127	4,251	4,378	4,510	5,186	907
Industrial Trips	614	1,132	1,166	1,201	1,237	1,275	1,466	852
Office & Institutional Trips	2,725	2,807	2,891	2,978	3,067	3,159	3,633	908
Nonresidential Trips	7,618	7,946	8,184	8,430	8,683	8,943	10,285	2,667
Total Vehicle Trips	**133,580**	**141,090**	**148,505**	**155,932**	**163,361**	**170,804**	**208,044**	**74,463**
Vehicle Miles Traveled	**186,834**	**197,281**	**207,583**	**217,905**	**228,232**	**238,580**	**290,374**	**103,540**
New Arterial Lane Miles		1.3	1.3	1.3	1.3	1.3	1.3	**12.94**
New Arterial Cost		$2,360,436	$2,327,629	$2,332,186	$2,333,348	$2,338,077	$2,322,068	**$23,394,299**
Arterial Lane Miles	**34.83**	**36.78**	**38.70**	**40.62**	**42.55**	**44.48**	**54.13**	**19.3**

Multiplying the growth-related demand for new arterial lane miles by the average cost per lane mile shown above in Figure T12 results in a 10-year cost of $23.3 million (12.94 lane miles X $1,807,563 per lane mile). When this growth-related demand ($23,394,299) is compared to the increase in VMT (103,540), the cost per VMT is $225.95.

Figure T14: Arterial Cost per VMT

Cost Factors	
Growth-Related Arterial Needs	12.94
Growth-Related Road Improvements	$23,394,299
VMT Increase	103,540
Growth-Related Road Improvements	**$225.95**

In addition to the planned arterial projects, the Town also plans to make several intersection improvements, as well as one bridge improvement. The Town's share of these planned projects totals $15.4 million. Since these projects will correct some existing deficiencies as well as benefit new development, TischlerBise has allocated the costs of these projects to total VMT in 2031, to ensure that existing and future development is treated equally. When the total cost ($15.4 million) is compared to projected VMT in 2031 (290,374), the cost per VMT is $53.17.

Figure T15: Planned Intersection/Bridge Projects

Year	Future Intersection/Bridge Capacity Projects	Estimated Cost
Short-Term	287 and Erie Parkway Intersection Improvements	$250,000
Short-Term	Erie's Contribution for SH-7 and 119th Intersection	$2,600,000
Short-Term	Town Center - South Roundabout	$4,840,000
Short-Term	Cheesman and CLR - Signal	$750,000
Short to Mid-Term	Bridge over CLR (just north of CW Bixler - (Replacement for widening)	$7,000,000
	Total	**$15,440,000**
	2031 VMT	**290,374**
	Cost per VMT	**$53.17**

Transportation Impact Fees

Infrastructure components and cost factors are summarized in the upper portion of Figure T16. The cost VMT is $279.12. Transportation impact fees for residential development are assessed according to VMT generated per housing unit. Transportation impact fees for nonresidential development are assessed according to VMT generated per 1,000 square feet of floor area.

The fees represent the highest amount supportable for each type of housing unit, which represents new growth's fair share of the cost for capital facilities. The Town may adopt fees that are less than the amounts shown. However, a reduction in impact fee revenue will necessitate an increase in other revenues, a decrease in planned capital expenditures, and/or a decrease in levels of service.

Figure T16: Transportation Impact Fees

Fee Component	Cost per VMT
Road Improvements	$225.95
Intersection/Bridge Improvements	$53.17
Total	**$279.12**

Residential Development	Fees per Unit			
Development Type	***Avg Wkdy VMT per Unit***	***Proposed Fees***	***Current Fees***	***Difference***
Single-Family	20.06	**$5,598**	**$6,231**	**($633.00)**
Multi-Family	12.36	**$3,449**	**$5,024**	**($1,575.00)**

Nonresidential Development	Fees per 1,000 Square Feet			
Development Type	***Avg Wkdy VMT per 1,000 Sq Ft***	***Proposed Fees***	***Current Fees***	***Difference***
Commercial	22.01	**$4,973**	**$7,560**	**($2,587.00)**
Office & Institutional	8.39	**$1,895**	**$3,272**	**($1,377.00)**
Industrial	3.38	**$765**	**$1,132**	**($367.00)**

Revenue from Transportation Impact Fee

Revenue from the Transportation Impact Fee is estimated in Figure T17. There is projected to be 5,533 new housing units and 404,916 square feet of nonresidential development in Erie by 2031. To find the revenue from each development type, the fee is multiplied by the growth for each land use. Overall, the projected revenue from the Transportation impact fee totals approximately $31 million. Expenditures total approximately $38.8 million, requiring revenue of $7.8 million from other sources (General Fund).

Figure T17: Estimated Revenue from Transportation Impact Fee

		Single Family	*Multifamily*	*Commercial*	*Office*	*Industrial*
		$5,598 per unit	*$3,449 per unit*	*$4,973 per 1,000 Sq. Ft.*	*$1,895 per 1,000 Sq. Ft.*	*$765 per 1,000 Sq. Ft.*
Year		Housing Units		1,000 Square Feet		
Base	2021	8,930	1,928	343	560	312
Year 1	2022	9,439	1,972	354	576	322
Year 2	2023	9,948	2,016	364	594	331
Year 3	2024	10,457	2,060	375	611	341
Year 4	2025	10,966	2,105	387	630	351
Year 5	2026	11,475	2,149	398	649	362
Year 6	2027	11,984	2,193	410	668	373
Year 7	2028	12,493	2,237	422	688	384
Year 8	2029	13,002	2,282	435	709	396
Year 9	2030	13,511	2,326	448	730	407
Year 10	2031	14,020	2,370	458	746	416
Ten Year Increase		5,090	443	114	186	104
Projected Revenue		$28,493,820	$1,526,557	$569,133	$353,281	$79,593
					Pojected Revenue:	$31,022,384
					Total Expenditures:	$38,834,299
					General Fund Share:	$7,811,915

Fee Reduction in Town Center Area and Old Town Erie

Mixed-use suburban areas like the Town Center area of Erie tend to have distinct demographic profiles and physical traits that reduce vehicle trips, such as higher internal capture, design characteristics that promote walking and biking. A recent report "documents that vibrant downtown and high density mixed-use areas are associated with lower greenhouse gas emissions from driving… seemingly unrelated efforts, such as fighting crime and improving urban schools, actually make for good environmental policy, as these

efforts enable people to live in higher density, more compact neighborhoods where people are comfortable driving less and walking and transit more."[1]

Downtown and high density, mixed-use areas have more diverse travel options including public transportation and muscle-powered mobility. For example, a study titled *Trip Generation Rates for Urban Infill Land Uses in California* documented auto trips averaged approximately 50% of the modal share, compared to 90% or higher auto dependency in most metropolitan areas.[2] Lower dependency on private vehicles reduces the need for street capacity and supports an impact fee reduction for new development in the Erie Town Center/downtown area.

The report *Driving and the Built Environment* found a strong link between development patterns and vehicle miles of travel, encouraging mixing of land uses to reduce vehicle trip rates and reduce trip lengths.[3] Recommended reductions up to 24% for transit service and pedestrian/bicycle friendliness is recommended for nonresidential development in a 2005 study titled *Crediting Low-Traffic Developments*.[4] However, the detailed methodology in this study requires extensive data on average weekday bus stops within a quarter mile of the study area, intersection density, and the completeness of sidewalk and bike networks. The Old Town Erie and Town Center Service Area boundaries area shown in yellow below in Figure T18 and T19.

[1] Matthew Holian and Matthew Kahn. Impact of Center City Economic and Cultural Vibrancy on Greenhouse Gas Emissions from Transportation. Mineta Transportation Institute, Report 11-13, 2012.

[2] James M. Daisa and Terry Parker, ITE Journal, 2009.

[3] Transportation Research Board Special Report 298, Washington, DC: 2009.

[4] Nelson / Nygaard Consulting Associates.

Figure T18: Old Town Erie Transportation Impact Fee Service Area

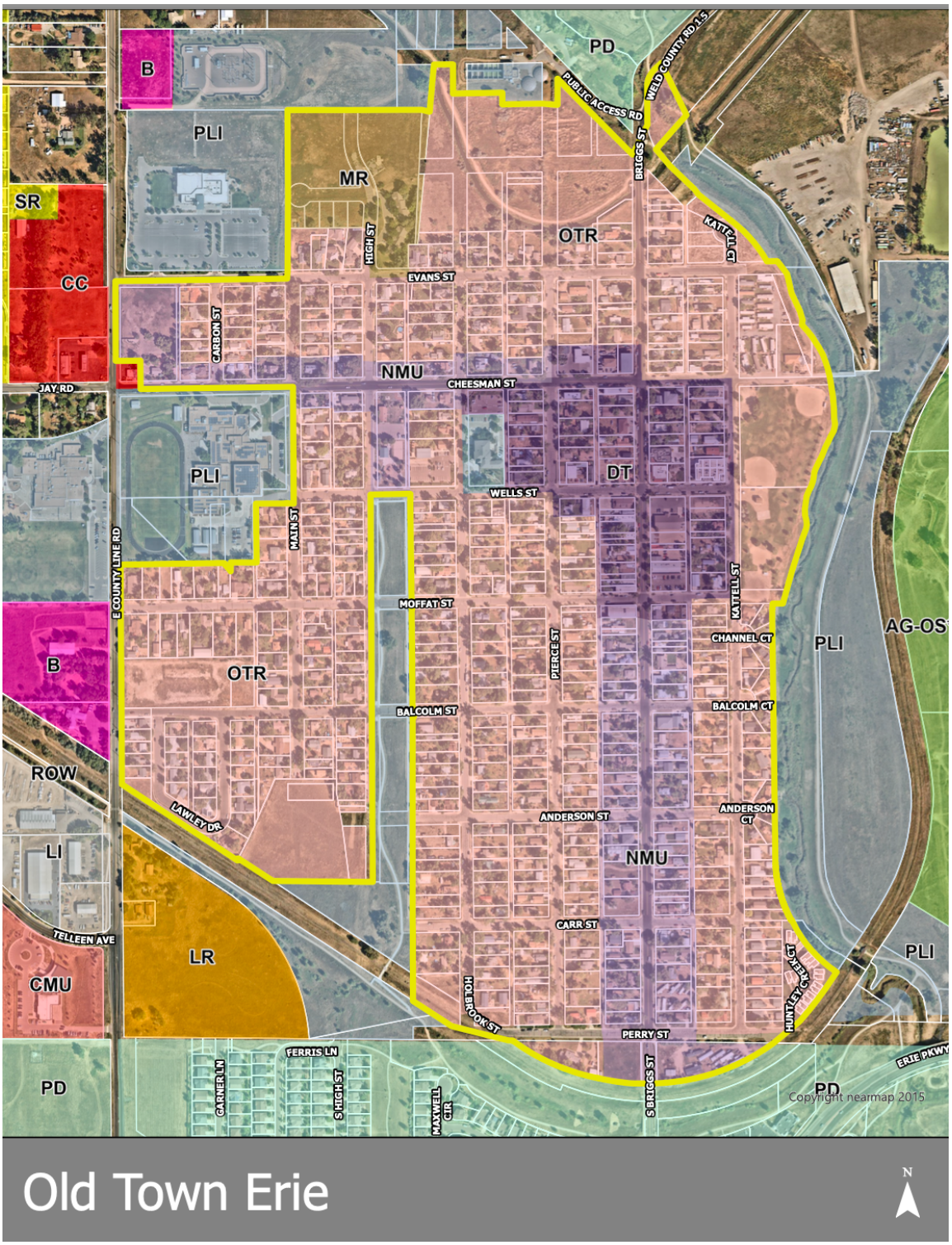
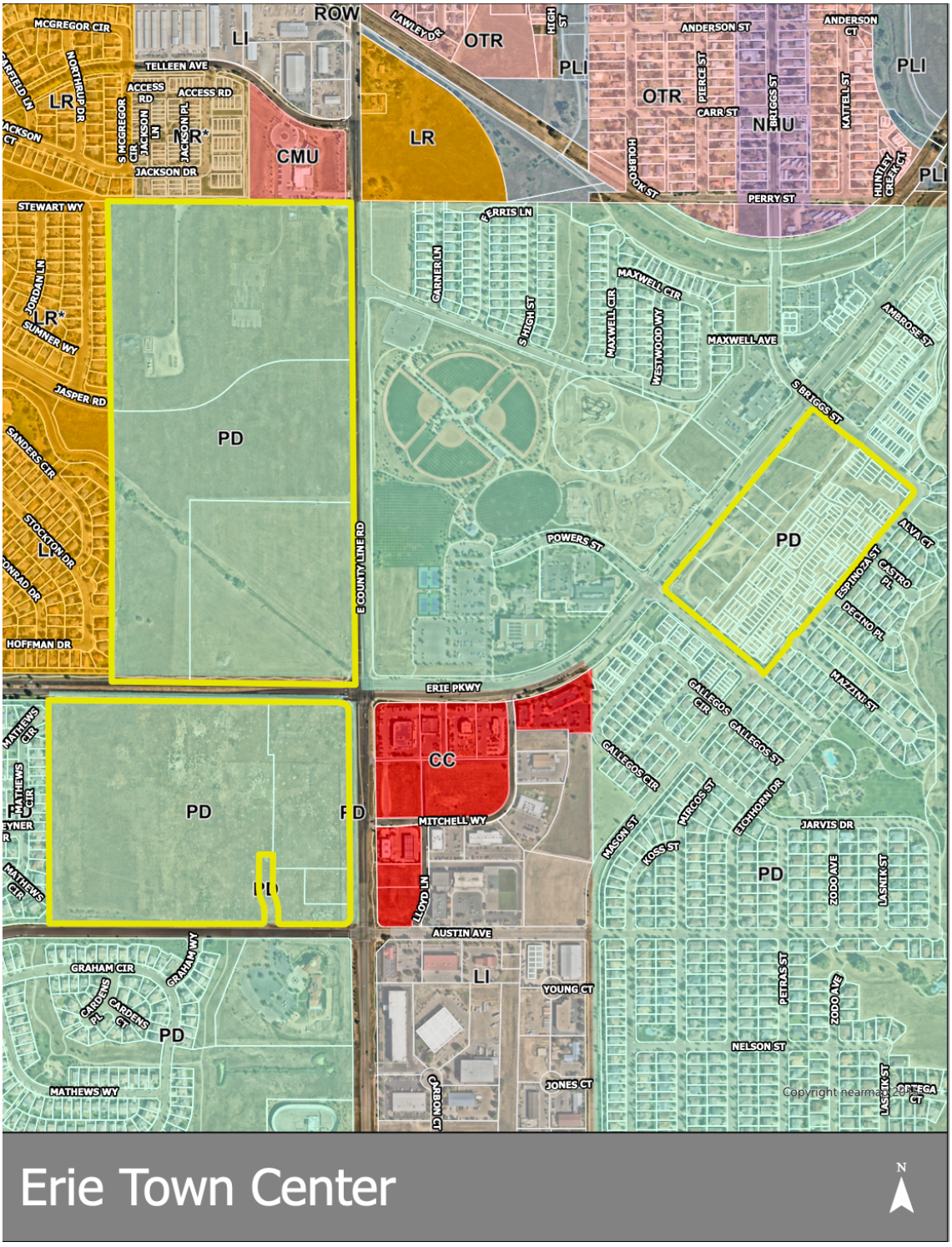


Figure T19: Town Center Transportation Impact Fee Service Area



Mixed Use Development with Local-Serving Retail

Large-scale, mixed-use developments exhibit lower vehicular trips because of "internal capture" (i.e., many daily destinations do not require travel outside the study area). For example, a study titled *Internalizing Travel by Mixing Land Uses* examined 20 mixed-use communities in South Florida, documenting internal capture rates up to 57 percent with an average of 25 percent.[5] In addition to a percent reduction for the jobs-housing balance in downtown Erie, credit can be given for local-serving retail. Urban, transit-oriented development offers coffee shops, restaurants, general retail stores and services that reduce the need for vehicular trips outside the area.[6]

Urban Development Pattern

Urban and high density, mixed-use suburban areas with grid streets and small blocks offer a variety of routes that encourage walking and biking. Interesting streetscapes with human-scale design features encourage people to walk and bike farther in urban areas, while lowering our perception of distance.[7] Also, vehicle congestion in many urban centers tends to minimize travel time differences across modes, especially when public transit is provided in separate rights-of-way or given priority signaling at intersections.

Trip Reduction Recommendation

Consistent with the literature summarized above, a recent analysis of mixed-use developments in six regions of the United States found an average 29% reduction in trip generation as a function of "D" variables, including: density, diversity, design, destination accessibility, distance to transit, demographics, and development scale.[8] Because mixed-use development located in the Town Center/downtown area will put less strain on the external street network, trip generation rates should be less than standalone suburban development. Therefore, TischlerBise recommends a 29% reduction in street impact fees for all types of new development in Town Center area.

The recommended Transportation impact fee for the Old Town Erie and Town Center Service Areas is shown in Figure T20.

[5] Reid Ewing, Eric Dumbaugh, and Mike Brown. Transportation Research Record 1780, 2003.

[6] Brian S. Bochner, Kevin G. Hooper, and Benjamin R. Sperry, Improving Estimation of Internal Trip Capture for Mixed-Use Development, ITE Journal, 2010.

[7] Alan Jacobs, 2001. Great Streets. MIT Press.

[8] Reid Ewing, Michael Greenwald, Ming Zhang, Jerry Walters, Mark Feldman, Robert Cervero, Lawrence Frank, and John Thomas. Traffic Generated by Mixed-Use Developments: Six-Region Study Using Consistent Built Environmental Measures. Journal of Urban Planning and Development, 2011.

Figure T20: Old Town Erie and Town Center Area Transportation Impact Fee

Fee Component	Cost per VMT
Road Improvements	$225.95
Intersection/Bridge Improvements	$53.17
Total	**$279.12**

Residential Development	Fees per Unit			
Development Type	***Avg Wkdy VMT per Unit***	***Proposed Fees***	***Current Fees***	***Difference***
Single-Family	14.24	**$3,975**	**$6,231**	**($2,256.00)**
Multi-Family	8.77	**$2,449**	**$5,024**	**($2,575.00)**

Nonresidential Development	Fees per 1,000 Square Feet			
Development Type	***Avg Wkdy VMT per 1,000 Sq Ft***	***Proposed Fees***	***Current Fees***	***Difference***
Commercial	15.63	**$3,531**	**$7,560**	**($4,029.00)**
Office & Institutional	5.95	**$1,345**	**$3,272**	**($1,927.00)**
Industrial	2.40	**$543**	**$1,132**	**($589.00)**

Implementation and Administration

Impact fees should be periodically evaluated and updated to reflect recent data. If cost estimates or demand indicators change significantly, the Town should redo the fee calculations.

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

Credits and Reimbursements

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

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

Service Area

An impact fee service area is a region in which a defined set of improvements provide benefit to an identifiable amount of new development. Within a service area, all new development of a type (single-family, commercial, etc.) is assessed at the same development impact fee rate. Land use assumptions and development impact fees are each defined in terms of this geography, so that capital facility demand, projects needed to meet that demand, and capital facility cost are all quantified in the same terms. Development impact fee revenue collected within a service area is required to be spent within that service area.

Implementation of a large number of small service areas is problematic. Administration is complicated and, because funds collected within the service area must be spent within that area multiple service areas may make it impossible to accumulate sufficient revenue to fund any projects within the time allowed.

As part of our analysis of the Town and the type of facilities and improvements included in the development impact fee calculation, TischlerBise has determined that a Townwide service area is appropriate for the Town of Erie for all impact fees.

Appendix A: Land Use Assumptions

Population and Housing Characteristics

Impact fees often use standardized per capita measures to derive proportionate share fee amounts. Namely, persons per housing unit (PPHU) or persons per household (PPHH). The U.S. Census Bureau defines a household as a housing unit that is occupied by year-round residents. Therefore, with a PPHH approach any housing units unoccupied would be left out of estimation processes, and thus requiring the use of seasonal or peak population. When PPHU is used in the fee calculations, infrastructure standards are derived using year-round population. Based on current housing data, TischlerBise recommends that fees for residential development in the Town of Erie be imposed according to the persons per housing unit method.

The current level of PPHU will be held constant over the projection period in order to derive fees for maintaining the current level of service (LOS). Based on housing characteristics, TischlerBise recommends using two housing unit categories for the impact fee study: (1) Single Family and (2) Multifamily. Figure A1 shows the current level of PPHU for Erie by housing unit category.

Figure A1. Persons per Housing Unit

Summary by Type of Housing	Persons	House-holds	Persons per Household	Housing Units	Persons Per Housing Unit	Housing Mix
Single Family	21,871	7,157	3.06	7,254	**3.02**	92%
Multifamily	1,059	615	1.72	642	**1.65**	8%
Subtotal	22,930	7,772	2.95	7,896	**2.90**	*Vacancy*
Group Quarters	35.00					*Rate*
TOTAL	22,965	7,772		7,896		1.6%

Source: 2013-2018 American Community Survey 5-year Estimates, U.S. Census Bureau

Single Family units have a size of 3.02 persons per unit and multifamily units have an average housing unit size of 1.65 persons per unit. Additionally, Single Family and Multifamily units in Erie account for 92% and 8% respectively of current housing stock. There is a total vacancy rate of 1.6% in Erie.

Population and Housing Unit Projections

To project future housing characteristics TischlerBise has used past housing permit data obtained from the Town of Erie from 2016-2020. Using the housing permit data, current PPHU and housing mix, TischlerBise can estimate the Town's population over the next 10 years.

Between 2021 and 2031, according to the housing projections obtained from the past housing permit data, Erie will experience a population growth of 16,102. With this information TischlerBise has projected the yearly totals and 10-year increase in population and housing. Figure A2 presents this information.

Figure A2. Population and Housing

Erie, CO	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	10-Year
	Base Yr	1	2	3	4	5	6	7	8	9	10	Increase
Population[1]												
Single Family Units	26,969	28,506	30,043	31,580	33,117	34,655	36,192	37,729	39,266	40,803	42,340	15,372
Multifamily Units	3,180	3,253	3,326	3,399	3,473	3,546	3,619	3,692	3,765	3,838	3,911	730
Total	30,149	31,759	33,369	34,980	36,590	38,200	39,810	41,420	43,031	44,641	46,251	16,102
Housing Units												
Single Family Units	8,930	9,439	9,948	10,457	10,966	11,475	11,984	12,493	13,002	13,511	14,020	5,090
Multifamily Units	1,928	1,972	2,016	2,060	2,105	2,149	2,193	2,237	2,282	2,326	2,370	443
Total	10,858	11,411	11,964	12,517	13,071	13,624	14,177	14,730	15,284	15,837	16,390	5,533

1. Population projections are based on housing unit projections maintaining the current Single family and Multifamily PPHU.

2. Housing unit projectons are based on a average increase of 509 SF units per year, to maintain current housing mix this results in an additional 44 Multifamily units per year.

Over the next 10 years Erie's population is expected to increase by 16,102 persons. Maintaining the current level of PPHU and housing mix; TischlerBise can project that over the same period Erie will add 5,090 single family housing units and 443 multifamily housing units. In totality the residential projections show that 5,533 housing units will be added over the coming 10 years.

In the same way that residential projections are needed to calculate the proportion of fee allocated to increased residential demand, estimating and projecting nonresidential use is essential to accurately estimating fees. The next section will focus on estimating current nonresidential demographics and projecting future nonresidential development.

Current Employment and Nonresidential Floor Area

Using Esri Business Analyst, an Arc GIS software, TischlerBise has found the 2020 employment total for Erie to be 2,875 jobs. In order to utilize this information for the purpose of impact fee estimation, TischlerBise has categorized all NAICS defined industries into three sectors: Commercial, Industrial, and Office. Figure A3 shows employment by sector in the Town of Erie.

Figure A3. Current Employment by Sector

Development Type	2020 Jobs[1]	Share of Total Jobs
Commercial[2]	781	27%
Industrial[3]	482	17%
Office/Institutional[4]	1,612	56%
Total	2,875	100%

1. Esri Business Analyst Online, 2020.

2. Major sectors include Retail Trade; Accommodation and Food Services.

3. Major sectors include Manufacturing; Wholesale Trade.

4. Major sectors include Educational Services; Health Care & Social Assistance

As a share of the total employment, Office/Institutional accounts for the most jobs, then Commercial, and finally Industrial. Using this information TischlerBise can estimate the base year nonresidential floor area. In estimating nonresidential floor area, factors are provided by the Institute of Transportation Engineers (ITE) to calculate floor area per employee. Figure A4 contains the factors provided by the ITE.

Figure A4. ITE Factors

ITE Code	Land Use / Size	Demand Unit	Wkdy Trip Ends Per Dmd Unit[1]	Wkdy Trip Ends Per Employee[1]	Employees Per Dmd Unit	Sq Ft Per Employee
820	Shopping Center (average size)	1,000 Sq Ft	37.75	16.11	2.34	427
140	Manufacturing	1,000 Sq Ft	3.93	2.47	1.59	629
710	General Office (average size)	1,000 Sq Ft	9.74	3.28	2.97	337

'1. Trip Generation, Institute of Transportation Engineers, 10th Edition (2017).

Knowing the square feet per employee and current Erie employment, TischlerBise can estimate the current nonresidential floor area for the Town of Erie. Figure A5 demonstrates this calculation.

Figure A5. Current Nonresidential Floor Area

Development Type	2020 Jobs[1]	Share of Total Jobs	Square Feet per Employee[2]	2020 Estimated Floor Area[3]	Jobs per 1,000 Sq Ft[2]
Commercial[4]	781	27%	427	333,487	2.34
Industrial[5]	482	17%	629	303,178	1.59
Office/Institutional[6]	1,612	56%	337	543,244	2.97
Total	2,875	100%		1,179,909	

1. Esri Business Analyst Online, 2020.
2. Trip Generation, Institute of Transportation Engineers, 10th Edition (2017).
3. TischlerBise calculation.
4. Major sectors include Retail Trade; Accommodation and Food Services.
5. Major sectors include Manufacturing; Wholesale Trade.
6. Major sectors include Educational Services; Health Care & Social Assistance.

The estimated current total nonresidential floor area for the Town of Erie is 1,179,909 square feet or 1,179.9 KSF. A majority of current nonresidential floor space is allocated to Office uses. With the 2020 estimated floor area and square feet per employee TischlerBise can project the increase in floor area over the next 10 years.

Employment and Nonresidential Floor Area Projections

To project employment TischlerBise has utilized employment projections from the DRCOG that are subdivided by TAZ ID zone. The zones selected for the Town of Erie match those from table 5 of the 2018 Erie Transportation Plan. The DRCOG data shows an annual employment growth rate of 3% between 2020 and 2030 for the Town of Erie. Proceeding with this information, TischlerBise can estimate the employment growth over the next 10 years for each sector in the Town of Erie.

Figure A6. 10-Year Employment Projection

Job Projections[1]	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	10-Year
	Base Yr	1	2	3	4	5	6	7	8	9	10	Increase
Commercial	804	829	853	879	905	933	960	989	1,019	1,050	1,072	268
Industrial	496	511	527	542	559	576	593	611	629	648	662	165
Office	1,660	1,710	1,761	1,814	1,869	1,925	1,982	2,042	2,103	2,166	2,214	553
Total	2,961	3,050	3,142	3,236	3,333	3,433	3,536	3,642	3,751	3,863	3,948	987

1. Employment projections based on DRCOG employment projections by TAZ ID zone for the Town of Erie, CO.

In the next ten years Erie is expected to add a total of 987 jobs with 268 in the Commercial sector, 165 in the Industrial sector, and 553 in the Office sector. As a percentage of the total growth Commercial accounts for 27% of new growth, Industrial 17% of new growth, and Office 56% of new growth. With this information, TischlerBise can project the growth in nonresidential floor area for the Town of Erie. Figure A7 depicts the yearly KSF by sector and the 10-year growth.

Figure A7. 10-Year KSF Projection

Nonresidential	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	10-Year
KSF Projections[1]	Base Yr	1	2	3	4	5	6	7	8	9	10	Increase
Commercial	343	354	364	375	387	398	410	422	435	448	458	114
Industrial	312	322	331	341	351	362	373	384	396	407	416	104
Office	560	576	594	611	630	649	668	688	709	730	746	186
Total	1,215	1,252	1,289	1,328	1,368	1,409	1,451	1,495	1,539	1,586	1,620	405

1. Nonresidential Floor Area is calculated by multiplying an ITE (Institute of Transportation Engineers) floor area per employee (Sq.Ft.) estimate and that year's employees in their respective industry.

Over the next 10 years Erie will add 406 KSF given the DRCOG employment growth. As a percentage of the 10-year growth in KSF Commercial accounts for 28%, Industrial accounts for 26%, and Office accounts for 46%.

Appendix B: Land Use Definitions

Residential Development

As discussed below, residential development categories are based on data from the U.S. Census Bureau, American Community Survey. Erie will collect development fees from all new residential units. One-time development fees are determined by site capacity (i.e., number of residential units). This category also contains mobile homes and recreational vehicles

Single-Family: Single-Family detached is a one-unit structure detached from any other house, that is, with open space on all four sides. Such structures are considered detached even if they have an adjoining shed or garage. A one-family house that contains a business is considered detached as long as the building has open space on all four sides. Also included in the definition is Single family attached (townhouse), which is a one-unit structure that has one or more walls extending from ground to roof separating it from adjoining structures. In row houses (sometimes called townhouses), double houses, or houses attached to nonresidential structures, each house is a separate, attached structure if the dividing or common wall goes from ground to roof.

Multi-Family: 2+ units (duplexes and apartments) are units in structures containing two or more housing units, further categorized as units in structures with "2, 3 or 4, 5 to 9, 10 to 19, 20 to 49, and 50 or more apartments."

Nonresidential Development

The proposed general nonresidential development categories (defined below using 2017 ITE Land Use Code) can be used for all new construction within Erie. Nonresidential development categories represent general groups of land uses that share similar average weekday vehicle trip generation rates and employment densities (i.e., jobs per thousand square feet of floor area).

Land Use: 820 Shopping Center Description. A shopping center is an integrated group of commercial establishments that is planned, developed, owned, and managed as a unit. A shopping center's composition is related to its market area in terms of size, location, and type of store. A shopping center also provides on-site parking facilities sufficient to serve its own parking demands. Factory outlet center (Land Use 823) is a related use.

Land Use: 710 General Office Building Description. A general office building houses multiple tenants; it is a location where affairs of businesses, commercial or industrial organizations, or professional persons or firms are conducted. An office building or buildings may contain a mixture of tenants including professional services, insurance companies, investment brokers, and tenant services, such as a bank or savings and loan institution, a restaurant, or cafeteria and service retail facilities. A general office building with a gross floor area of 5,000 square feet or less is classified as a small office building (Land Use 712). Corporate headquarters building (Land Use 714), single tenant office building (Land Use 715), office park

(Land Use 750), research and development center (Land Use 760), and business park (Land Use 770) are additional related uses. If information is known about individual buildings, it is suggested that the general office building category be used rather than office parks when estimating trip generation for one or more office buildings in a single development. The office park category is more general and should be used when a breakdown of individual or different uses is not known. If the general office building category is used and if additional buildings, such as banks, restaurants, or retail stores are included in the development, the development should be treated as a multiuse project. On the other hand, if the office park category is used, internal trips are already reflected in the data and do not need to be considered. When the buildings are interrelated (defined by shared parking facilities or the ability to easily walk between buildings) or house one tenant, it is suggested that the total area or employment of all the buildings be used for calculating the trip generation. When the individual buildings are isolated and not related to one another, it is suggested that trip generation be calculated for each building separately and then summed.

Land Use: 140 Manufacturing. A manufacturing facility is an area where the primary activity is the conversion of raw materials or parts into finished products. Size and type of activity may vary substantially from one facility to another. In addition to the actual production of goods, manufacturing facilities generally also have office, warehouse, research, and associated functions.

Appendix C: Arterial Roadway Network

Roadway Name	Termini	Functional Classification	Year of Count	Base ADT Counts	Lanes	Miles	Lane Miles	Base VMT
E Country Line Rd	Oxford Rd to Mineral Rd	Minor Arterial	2013	3,950	2	2.00	4.00	7,900
NE Country Line Rd	Mineral Rd to Buffalo Rd	Minor Arterial	2013	4,650	2	0.80	1.60	3,720
NE Country Line Rd	Buffalo Rd to Kenosha Rd	Minor Arterial	2014	4,000	2	0.40	0.80	1,600
NE Country Line Rd	Kenosha Rd to Country Rd 10 1/2	Minor Arterial	2014	3,750	2	0.20	0.40	750
Jasper Rd	N 107th St to N 119th St	Minor Arterial	2016	2,700	2	1.50	3.00	4,050
Jay Rd	N 119th St to Country Line Rd	Minor Arterial	2016	1,700	2	1.20	2.40	2,040
Country Rd 10 1/2	NE Country Line Rd to Co Rd 3	Minor Arterial	2014	800	2	0.90	1.80	720
Colliers Blvd	Country Rd 10 1/2 to Co Rd 10	Minor Arterial	2014	500	2	0.50	1.00	250
Country Rd 1 1/2	Evans St to Co Rd 3	Minor Arterial	2015	1,000	2	0.90	1.80	900
Co Rd 3	Country Rd 1 1/2 to Co Rd 10	Minor Arterial	2014	1,100	2	0.30	0.60	330
Co Rd 5	Co Rd 12 to Co Rd 10	Minor Arterial	2014	1,300	2	1.00	2.00	1,300
Co Rd 7	Co Rd 10 to Erie Pkwy	Minor Arterial	2016	1,030	2	1.00	2.00	1,030
Erie Pkwy	Co Rd 7 to I25	Principal Arterial	2013	5,300	2	1.00	2.00	5,300
Erie Pkwy	Co Rd 5 to Co Rd 7	Principal Arterial	2016	9,050	2	1.00	2.00	9,050
Co Rd 5	Co Rd 10 to Colliers Pkwy	Principal Arterial	2015	2,650	2	0.70	1.40	1,855
Co Rd 5	Colliers Pkwy to Erie Pkwy	Principal Arterial	2015	3,900	2	0.30	0.60	1,170
Erie Pkwy	Co Rd 5 to Colliers Blvd	Principal Arterial	2015	10,350	4	1.00	4.00	10,350
Colliers Blvd	Colliers Blvd to Co Rd 5	Minor Arterial	2015	1,500	2	1.00	2.00	1,500
Colliers Blvd	Co Rd 10 to Erie Pkwy	Minor Arterial	2015	2,200	2	1.00	2.00	2,200
Erie Pkwy	Montgomery Dr to Co Rd 5	Principal Arterial	2016	11,550	4	1.20	4.80	13,860
Erie Pkwy	S Briggs St to Montgomery Dr	Principal Arterial	2013	8,800	4	0.40	1.60	3,520
Erie Pkwy	Country Line Rd to S Briggs St	Principal Arterial	2016	13,200	4	1.40	5.60	18,480
E Country Line Rd	Jay Rd to Erie Pkwy	Minor Arterial	2013	7,950	2	1.00	2.00	7,950
Erie Pkwy	N 119th St to Country Line Rd	Principal Arterial	2016	9,050	4	1.00	4.00	9,050
E Country Line Rd	Erie Pkwy to Bonnell Ave.	Minor Arterial	2013	10,700	2	0.50	1.00	5,350
N 119th St	Erie Pkwy to Austin Ave.	Minor Arterial	2013	3,700	2	0.20	0.40	740
N 119th St	Tynan Dr to Erie Pkwy	Minor Arterial	2013	2,450	2	0.40	0.80	980
Erie Pkwy	N 111th St to N 119th St	Principal Arterial	2014	10,400	4	1.00	4.00	10,400
Arapahoe Rd	N 107th St to N 111th St	Principal Arterial	2014	13,300	3	0.50	1.50	6,650
119th St	Arapahoe Rd to Erie Pkwy	Minor Arterial	2013	4,900	2	1.50	3.00	7,350
Arapahoe Rd	N 111th St to N 119th St	Principal Arterial	2016	11,150	2	1.00	2.00	11,150
Arapahoe Rd	N 119th St to E Country Line Rd	Minor Arterial	2014	5,200	2	1.00	2.00	5,200
E Country Line Rd	Arapahoe Rd to Bonnell Ave.	Minor Arterial	2014	9,450	2	1.00	2.00	9,450
E Country Line Rd	Arapahoe Rd to E Baseline Dr	Minor Arterial	2013	7,750	2	1.00	2.00	7,750
Mountain View Blvd	Skyline Dr to E Baseline Rd	Minor Arterial	2013	8,300	4	0.50	2.00	4,150
Weld Co Rd 4	Co Rd 5 to Sheridan Pkwy	Minor Arterial	2015	1,450	4	0.50	2.00	725
Co Rd 5	Garfield Rd to Weld Co Rd 4	Minor Arterial	2013	2,300	2	1.00	2.00	2,300
Co Rd 7	Garfield Rd to Weld Co Rd 4	Minor Arterial	2015	800	2	1.00	2.00	800
Co Rd 7	Erie Pkwy to Garfield Rd	Minor Arterial	2016	1,050	2	1.00	2.00	1,050
Co Rd 5	Erie Pkwy to Garfield Rd	Minor Arterial	2015	3,750	2	1.00	2.00	3,750
		All		**208,630**		**34.80**	**84.10**	**186,670**