Capital Improvement Plan and Development Impact Fee Study

North Ada County Fire and Rescue District

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EXECUTIVE SUMMARY

The North Ada County Fire and Rescue District ("The Fire District") retained TischlerBiseGalena to prepare a Capital Improvement Plan and Development Impact Fee Study in order to meet the new demands generated by new development within the district. This report presents the methodology and calculation used to generate current levels of service and updated maximum supportable impact fees. It is intended to serve as supporting documentation for the evaluation and update of the Fire District's impact fees.

The purpose of this study is to demonstrate the Fire District's compliance with Idaho Statutes as authorized by the Idaho Legislature. Consistent with the authorization, it is the intent of the Fire District to: (Idaho Code 67-8202(1-4))

1. Collect impact fees to ensure that adequate public facilities are available to serve new growth and development;
2. Promote orderly growth and development by establishing uniform standards by which local governments may require that those who benefit from new growth and development pay a proportionate share of the cost of new public facilities needed to serve new growth and development;
3. Establish minimum standards for the adoption of development impact fee ordinances by government entities;
4. Ensure that those who benefit from new growth and development are required to pay no more than their proportionate share of the cost of public facilities needed to serve new growth and development and to prevent duplicate and ad hoc development requirements;

Impact fees are one-time payments used to construct system improvements needed to accommodate new development. An impact fee represents new growth's fair share of capital facility needs. By law, impact fees can only be used for capital improvements, not operating or maintenance costs. Impact fees are subject to legal standards, which require fulfillment of three key elements: need, benefit and proportionality.

- First, to justify a fee for public facilities, it must be demonstrated that new development will create a need for capital improvements.
- Second, new development must derive a benefit from the payment of the fees (i.e., in the form of public facilities constructed within a reasonable timeframe).
- Third, the fee paid by a particular type of development should not exceed its proportional share of the capital cost for system improvements.

TischlerBiseGalena evaluated possible methodologies and documented appropriate demand indicators by type of development for the levels of service and fees. Local demographic data and improvement costs were used to identify specific capital costs attributable to growth. This report includes summary tables indicating the specific factors, referred to as level of service standards, used to derive the impact fees.

Fee Methodology

A summary of impact fee components is provided below:

Figure 1. Summary of Impact Fee Methodology

Fee Category	Service Area	Cost Recovery	Incremental Expansion	Plan-Based	Cost Allocation
Fire	Districtwide	Impact Fee Study	Fire Stations, Fire Apparatuses, Fire Equipment		Person & Vehicle Trips

Capital Improvement Plan

The Fire District impact fee contains components for additional station space and vehicles and apparatus. To serve projected growth over the next ten years, the following infrastructure investment is planned:

- 560 square feet of station space
- 1 new piece of apparatus
- 10 new pieces of equipment
- Cost recovery for impact fee study

Maximum Supportable Development Impact Fees

Figure 2 provides a schedule of the maximum supportable development impact fees by type of land use for the Fire District. The fees represent the highest supportable amount for each type of applicable land use, and represents new growth's fair share of the cost for capital facilities. The Fire District 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.

The fees for residential development are to be assessed per housing unit. For nonresidential development, the fees are assessed per square foot of floor area. Nonresidential development categories are consistent with the terminology and definitions contained in the reference book, Trip Generation 11th Edition, published by the Institute of Transportation Engineers. These definitions are provided in Appendix A.

Figure 2. Summary of Maximum Supportable Development Impact Fees

Housing Type	Persons per Housing Unit	Maximum Supportable Fee	Current Fee	Increase/ (Decrease)
Residential (per housing unit)				
Single Family	2.35	**$1,029**	$647	$382
Multifamily	1.58	**$692**	$647	$45

Development Type	Vehicle Trips per KSF	Maximum Supportable Fee	Current Fee	Increase/ (Decrease)
Nonresidential (per square foot)				
Retail	14.06	**$1.24**	$0.32	$0.92
Office	5.42	**$0.48**	$0.32	$0.16
Industrial	2.44	**$0.21**	$0.32	($0.11)
Institutional	5.39	**$0.47**	$0.32	$0.15

DEVELOPMENT IMPACT FEE FRAMEWORK

IDAHO DEVELOPMENT IMPACT FEE ENABLING LEGISLATION

The Enabling Legislation governs how development fees are calculated for municipalities in Idaho. All requirements of the Idaho Development Impact Fee Act have been met in the supporting documentation prepared by TischlerBiseGalena. There are four requirements of the Idaho Act that are not common in the development impact fee enabling legislation of other states. This overview offers further clarification of these unique requirements.

First, as specified in 67-8204(2) of the Idaho Act, "development impact fees shall be calculated on the basis of levels of service for public facilities . . . applicable to existing development as well as new growth and development."

Second, Idaho requires a Capital Improvements Plan (CIP) [see 67-8208]. The CIP requirements are summarized in this report, with detailed documentation provided in the discussion on infrastructure.

Third, the Idaho Act also requires documentation of any existing deficiencies in the types of infrastructure to be funded by development impact fees [see 67-8208(1)(a)]. The intent of this requirement is to prevent charging new development to cure existing deficiencies. In the context of development impact fees for the Fire District, the term "deficiencies" means a shortage or inadequacy of current system improvements when measured against the levels of service to be applied to new development. It does not mean a shortage or inadequacy when measured against some "hoped for" level of service.

TischlerBiseGalena used the current infrastructure cost per service unit (i.e., existing standards), or future levels of service where appropriate, multiplied by the projected increase in service units over an appropriate planning timeframe, to yield the cost of growth-related system improvements. The relationship between these three variables can be reduced to a mathematical formula, expressed as A x B = C. In section 67-8204(16), the Idaho Act simply reorganizes this formula, stating the cost per service unit (i.e., development impact fee) may not exceed the cost of growth-related system improvements divided by the number of projected service units attributable to new development (i.e., A = C ÷ B). By using existing infrastructure standards to determine the need for growth-related capital improvements, the Fire District ensures the same level-of-service standards are applicable to existing and new development. Using existing infrastructure standards also means there are no existing deficiencies in the current system that must be corrected from non-development impact fee funding.

Fourth, Idaho requires a proportionate share determination [see 67-8207]. Basically, local government must consider various types of applicable credits and/or other revenues that may reduce the capital costs attributable to new development. The development impact fee methodologies and the cash flow analysis have addressed the need for credits to avoid potential double payment for growth-related infrastructure.

SUMMARY OF CAPITAL IMPROVEMENT PLAN AND DEVELOPMENT IMPACT FEES

Development impact fees can be calculated by any one of several legitimate methods. The choice of a particular method depends primarily on the service characteristics and planning requirements for each facility type. Each method has advantages and disadvantages, and to some extent can be interchangeable, because each allocates facility costs in proportion to the needs created by development.

Reduced to its simplest terms, the process of calculating development 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. The following paragraphs discuss three basic methods for calculating development impact fees, and how each method can be applied.

- **Cost Recovery or Buy-In Fee Calculation.** The rationale for the cost recovery approach 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 systems that were oversized such as sewer and water facilities.
- **Incremental Expansion Fee Calculation.** The incremental expansion method documents the current level of service (LOS) for each type of public facility in both quantitative and qualitative measures, based on an existing service standard (such as park acres per person). This approach ensures that there are no existing infrastructure deficiencies or surplus capacity in infrastructure. 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, with LOS standards based on current conditions in the community.
- **Plan-Based Fee Calculation.** The plan-based method allocates costs for a specified set of improvements to a specified amount of development. Facility plans identify needed improvements and land use plans identify development. In this method, the total cost of relevant facilities is divided by total demand to calculate a cost per unit of demand. Then, the cost per unit of demand is multiplied by the amount of demand per unit of development (e.g., housing units or square feet of building area) in each category to arrive at a cost per specific unit of development (e.g., single family detached unit).
- **Credits.** Regardless of the methodology, a consideration of "credits" is integral to the development of a legally valid impact fee methodology. There are two types of "credits," each with specific and distinct characteristics. The first is a credit due to possible double payment situations. This could occur when contributions are made by the property owner toward the capital costs of the public facility covered by the impact fee. This type of credit is integrated into the impact fee calculation. The second is a credit toward the payment of a fee for dedication of public sites or improvements provided by the developer and for which the impact fee is imposed. This type of credit is addressed in the administration and implementation of a facility fee program.

DEVELOPMENT IMPACT FEE ANALYSIS

The Fire District's development impact fee includes three components: station space, vehicles/apparatus, and equipment. TischlerBiseGalena recommends a *plan-based* approach, based on current capital expansion plans. Per the Idaho Act, capital improvements are limited to those improvements that have a certain lifespan. As specified in 67-8203(3) of the Idaho Act, "'Capital improvements' means improvements with a useful life of ten (10) years or more, by new construction or other action, which increase the service capacity of a public facility." The residential portion of the fee is derived from the product of persons per housing unit (by type of unit) multiplied by the net capital cost per person. The nonresidential portion is derived from the product of nonresidential vehicle trips per 1,000 square feet of nonresidential space multiplied by the net capital cost per vehicle trip.

PROPORTIONATE SHARE

Both residential and nonresidential developments increase the demand for fire and rescue services and facilities. To calculate the proportional share between residential and nonresidential demand on service and facilities, calls for service data is analyzed. Show in the top of Figure 3, 77 percent of calls are to residential locations, 17 percent to nonresidential locations, and 6 percent are classified as traffic calls. Base year vehicle trips are used to assign traffic calls to residential and nonresidential land uses. This results in 60 additional residential calls (70,075 residential vehicle trips / 123,296 total vehicle trips X 105 traffic calls for service) and 45 additional nonresidential calls (53,221 nonresidential vehicle trips / 123,296 total vehicle trips X 105 traffic calls for service). After this adjustment 81 percent of calls are attributed to resident development, and 19 percent are attributed to nonresidential development. These percentages are used to attribute facilities to respective demand units.

Figure 3. North Ada County Fire & Rescue Annual Calls for Service

Land Use	Districtwide Calls for Service	% of Total
Residential	1,436	77%
Nonresidential	313	17%
Traffic	105	6%
Total	1,854	100%

Land Use	Base Year Vehicle Trips	% of Total
Residential	70,075	57%
Nonresidential	53,221	43%
Total	123,296	100%

Land Use	Adj. Calls for Service	% of Total
Residential	1,496	**81%**
Nonresidential	358	**19%**
Total	1,854	100%

Source: Ada County CAD & ACCESS NFIRS Reports

SERVICE UNITS

Figure 4 displays the service units for residential and nonresidential land uses. For residential development, the service units are persons per housing unit by type of unit. For nonresidential development, the service units are average day nonresidential vehicle trips. Further detail on the service units can be found in Appendix B. Demographic Assumptions.

Figure 4. North Ada County Fire & Rescue District Service Units

Type of Unit	Persons Per Housing Unit*
Single Family	2.35
Multi-Family	1.58

Nonresidential Development (per 1,000 Sq. Ft.)

Type	Trips per 1,000 Sq. Ft. **	Trip Rate Adjustment	Adjusted Trips per 1,000 Sq. Ft.
Retail	37.01	38%	14.06
Office	10.84	50%	5.42
Industrial	4.87	50%	2.44
Institutional	10.77	50%	5.39

**Derived from the U.S. Census Bureau American Community Survey*
*** ITE Trip Generation Rates, 11th Edition (2021)*

NORTH ADA COUNTY FIRE AND RESCUE DISTRICT LEVEL OF SERVICE ANALYSIS

The following section details the level of service calculations for the Fire District.

STATION SPACE

As shown in Figure 5, the Fire District currently operates three stations, which total 23,585 square feet. The existing level of service for residential development is 896 square feet per 1,000 persons. The nonresidential level of service is 84 square feet per 1,000 vehicle trips. This is determined by multiplying the total square footage by the proportionate share factors (81 percent for residential development and 19 percent for nonresidential development), and then dividing the respective totals by the current service units (21,322 persons and 53,221 nonresidential vehicle trips) and multiplying by 1,000.

Figure 5. Existing Level of Service for Station Space

Fire Stations	Square Feet
Station 16 - Glenwood	8,183
Station 18 - Chinden	10,307
Station 20 - Hidden Springs	5,095
Total	**23,585**

Level-of-Service Standards	Residential	Nonresidential
Proportionate Share	81%	19%
Share of Square Feet	19,104	4,481
2022 Population/Nonres. Vehicle Trips	21,322	53,221
Square Feet per 1,000 Persons/Vehicle Trips	**896**	**84**

VEHICLES/APPARATUS

As shown in Figure 6, the Fire District currently has 8 pieces of apparatus. The existing level of service for residential development is 0.304 pieces of apparatus for every 1,000 persons. The nonresidential level of service is 0.029 pieces of apparatus per 1,000 vehicle trips. This is determined by multiplying the total apparatus inventory by the proportionate share factors (81 percent for residential development and 19 percent for nonresidential development), and then dividing the respective totals by the current service units (21,322 persons for residential and 53,221 nonresidential vehicle trips) and multiplying by 1,000.

Figure 6. Existing Level of Service for Vehicles and Apparatus

Apparatuses	Units
Engines	3
Brush Truck	2
Tender	1
Kawasaki Mule	2
Total	**8**

Level-of-Service Standards	Residential	Nonresidential
Proportionate Share	81%	19%
Share of Units	6.5	1.5
2022 Population/Nonres. Vehicle Trips	21,322	53,221
Units per 1,000 Persons/Vehicle Trips	**0.304**	**0.029**

EQUIPMENT

As shown in Figure 7, the Fire District currently has 15 pieces of equipment. The existing level of service for residential development is 0.570 pieces of equipment for every 1,000 persons. The nonresidential level of service is 0.054 pieces of equipment per 1,000 vehicle trips. This is determined by multiplying the total equipment inventory by the proportionate share factors (81 percent for residential development and 19 percent for nonresidential development), and then dividing the respective totals by the current service units (21,322 persons for residential and 53,221 nonresidential vehicle trips) and multiplying by 1,000.

Figure 7. Existing Level of Service for Equipment

Equipment Type	Units
Radio	5
SCBA	10
Total	**15**

Level-of-Service Standards	Residential	Nonresidential
Proportionate Share	81%	19%
Share of Units	12.2	2.9
2022 Population/Nonres. Vehicle Trips	21,322	53,221
Units per 1,000 Persons/Vehicle Trips	**0.570**	**0.054**

PLANNED GROWTH-RELATED INFRASTRUCTURE IMPROVEMENTS

The following section details the future capital plans to accommodate growth.

FIRE STATIONS

The Fire District currently plans on expanding the Hidden Springs fire station. Shown in Figure 8, the Fire District estimates adding approximately 560 square feet, with an estimated cost of $800,000, would be sufficient through the year 2032.

The cost per residential and nonresidential service unit is determined by multiplying the planned square footage by the proportionate share factors (81 percent for residential and 19 percent for nonresidential), and then dividing the respective totals by the projected increase in service units through the year 2032 (3,642 persons and 4,277 nonresidential vehicle trips). When the resulting residential and nonresidential levels of service (125 square feet per 1,000 persons and 25 square feet per 1,000 nonresidential trips) are compared to the cost per square foot ($1,429), the resulting cost per service units are $179 per person and $36 per nonresidential vehicle trip.

To ensure new development is not paying to elevate the level of service in the Fire District, the current level of service is compared to the station expansion for future growth. For example, listed in Figure 5, the existing level of service per 1,000 persons is 896 square feet, compared to 125 square feet per 1,000 persons for the impact fee calculation.

Figure 8. Planned Fire Station Infrastructure and Cost per Service Unit

Fire Stations	Square Feet	Replacement Cost
Hidden Spring Station Expansion	560	$800,000
Total	**560**	**$800,000**

Level-of-Service Standards	**Residential**	**Nonresidential**
Proportionate Share	81%	19%
Share of Square Feet	454	106
2032 Population/Nonres. Vehicle Trips	3,642	4,277
Square Feet per 1,000 Persons/Vehicle Trips	**125**	**25**

Cost Analysis	**Residential**	**Nonresidential**
Square Feet per 1,000 Persons/Vehicle Trips	125	25
Average Cost per Square Foot	$1,429	$1,429
Capital Cost per Person/Vehicle Trip	**$179**	**$36**

VEHICLES/APPARATUS

To compliment the planned additional station, the Fire District plans on purchasing one additional piece of apparatus. Shown in Figure 9, the estimated cost of the apparatus is $1,050,000. Similar to the planned station, the Fire District estimates the apparatus will be sufficient through the year 2032.

In Figure 9, the cost per residential and nonresidential service unit is determined by multiplying the planned vehicle/apparatus by the proportionate share factors (81 percent for residential and 19 percent for nonresidential), and then dividing the respective totals by the projected increase in service units through the year 2032 (3,642 persons and 4,277 nonresidential vehicle trips). When the resulting residential and nonresidential levels of service (0.222 units per 1,000 persons and 0.044 units per 1,000 nonresidential trips) are compared to the cost for the apparatus ($1,050,000), the resulting cost per service units are $233 per person and $46 per nonresidential vehicle trip.

To ensure new development is not paying to elevate the level of service in the Fire District the current level of service is compared to the fleet expansion for future growth. For example, previously in Figure 6, the existing level of service per 1,000 persons is 0.304 vehicles/apparatus, compared to 0.222 vehicles/apparatus per 1,000 persons for the impact fee calculation.

Figure 9. Planned Vehicles/Apparatus and Cost per Service Unit

Apparatuses	Units	Current Cost per Unit	Total Replacement Cost
Engine	1	$1,050,000	$1,050,000
Total	**1**		**$1,050,000**

Level-of-Service Standards	Residential	Nonresidential
Proportionate Share	81%	19%
Share of Units	0.8	0.2
2032 Population/Nonres. Vehicle Trips	3,642	4,277
Units per 1,000 Persons/Vehicle Trips	**0.222**	**0.044**

Cost Analysis	Residential	Nonresidential
Units per 1,000 Persons/Vehicle Trips	0.222	0.044
Average Cost per Unit	$1,050,000	$1,050,000
Capital Cost per Person/Vehicle Trip	**$233**	**$46**

EQUIPMENT

To facilitate the addition of growth-related personnel, the Fire District plans on purchasing 10 additional pieces of equipment: 4 self-contained breathing apparatus (SCBA) and 6 additional radios. Shown in Figure 10, the estimated cost of the equipment is $86,400. Similar to the planned station, the Fire District estimates the equipment will be sufficient through the year 2032. Although the planned equipment LOS is higher than the current equipment LOS, this increase is in response to growth requiring more staffing in the district and thus more equipment. Because of this the planned LOS is used in this analysis.

In Figure 10 the cost per residential and nonresidential service unit is determined by multiplying the planned equipment by the proportionate share factors (81 percent for residential and 19 percent for nonresidential), and then dividing the respective totals by the projected increase in service units through the year 2032 (3,642 persons and 4,277 nonresidential vehicle trips). When the resulting residential and nonresidential levels of service (2.224 equipment units per 1,000 persons and 0.444 equipment units per

1,000 nonresidential trip) are compared to the weighted average cost per piece of equipment ($86,400), the resulting cost per service units are $19 per person and $4 per nonresidential vehicle trip.

Figure 10. Planned Equipment and Cost per Service Unit

Equipment Type	Units	Current Cost per Unit	Total Replacement
Radio	6	$8,600	$51,600
SCBA	4	$8,700	$34,800
Total	**10**		**$86,400**

Level-of-Service Standards	Residential	Nonresidential
Proportionate Share	81%	19%
Share of Units	8.1	1.9
2032 Population/Nonres. Vehicle Trips	3,642	4,277
Units per 1,000 Persons/Vehicle Trips	**2.224**	**0.444**

Cost Analysis	Residential	Nonresidential
Units per 1,000 Persons/Vehicle Trips	2.224	0.444
Average Cost per Unit	$8,640	$8,640
Capital Cost per Person/Vehicle Trip	**$19**	**$4**

Cost to Prepare Development Impact Fee Report

The cost to prepare the Capital Improvement Plan and Development Impact Fee Report totals $19,720. The Fire District will need to update its report every five years. Based on this cost, proportionate share, and five-year projections of new residential and nonresidential development from Appendix B. Demographic Assumptions, the cost is $7 per person and $2 per nonresidential vehicle trip.

Figure 11. Cost to Prepare Development Impact Fee Report

Share of Study Cost	Residential Share	Nonresidential Share
$19,720	81%	19%

Residential Growth Share	Five-Year Population Increase	Capital Cost per Person
100%	2,434	$7

Nonresidential Growth Share	Five-Year Veh. Trip Increase	Capital Cost per Trip
100%	1,931	$2

CREDITS

Specified in Idaho Code 67-8209(2), local governments must consider historical, available, and alternative sources of funding for system improvements. Currently, there are no dedicated revenues being collected by the Fire District to fund growth-related projects for facilities besides impact fees. Furthermore, the maximum supportable impact fees are constructed to offset all growth-related capital costs for facilities. Evidence is given in this report that the projected capital costs from new development will be entirely offset by the development impact fees. Thus, no general tax dollars are assumed to be used to fund growth-related capital costs, requiring no further revenue credits.

INPUT VARIABLES AND MAXIMUM DEVELOPMENT IMPACT FEES

Cost factors for fire station space, fire apparatus, fire equipment, and professional services are summarized at the top of Figure 12. The residential impact fees are calculated by multiplying the $438 cost per person by the service unit ratios (persons per housing unit) for each housing type. Nonresidential development fees are calculated by multiplying the $88 per nonresidential vehicle trip by the average weekday vehicle trips per 1,000 square feet ratios and the trip adjustment factors for each development type, and then dividing by 1,000.

Figure 12. North Ada County Fire and Rescue District Maximum Supportable Impact Fees

Fee Component	Cost per Person	Cost per Vehicle Trip
Fire Stations	$179	$36
Fire Apparatuses	$233	$46
Fire Equipment	$19	$4
Impact Fee Study	$7	$2
Gross Total	$438	$88
Net Total	**$438**	**$88**

Residential

Housing Type	Persons per Housing Unit	Maximum Supportable Fee	Current Fee	Increase/ (Decrease)
Residential (per housing unit)				
Single Family	2.35	**$1,029**	$647	$382
Multifamily	1.58	**$692**	$647	$45

Nonresidential

Development Type	Vehicle Trips per KSF	Maximum Supportable Fee	Current Fee	Increase/ (Decrease)
Nonresidential (per square foot)				
Retail	14.06	**$1.24**	$0.32	$0.92
Office	5.42	**$0.48**	$0.32	$0.16
Industrial	2.44	**$0.21**	$0.32	($0.11)
Institutional	5.39	**$0.47**	$0.32	$0.15

REVENUE PROJECTIONS FROM MAXIMUM SUPPORTABLE IMPACT FEES

Potential development impact fee revenues are summarized in Figure 13, assuming implementation of the fees at the maximum supportable level as indicated in this report. Based on the land use assumptions detailed in the Appendix, over the next ten years the fire development impact fees are projected to generate approximately $2 million. At the bottom of the figure, the estimated revenues are compared to the estimated growth-related capital costs. As shown, the projected revenue mitigates all growth-related capital cost. Note: the small remaining amount is the result of rounding in the analysis.

Figure 13. Projected Revenue from Maximum Supportable Impact Fees

Infrastructure Costs for Fire & Rescue Facilities

	Total Cost	Growth Cost
Fire Stations	$800,000	$800,000
Fire Apparatuses	$1,050,000	$1,050,000
Fire Equipment	$86,400	$86,400
Impact Fee Study	$39,440	$39,440
Total Expenditures	**$1,975,840**	**$1,975,840**

Projected Development Impact Fee Revenue

Year		Single Family $1,029 per unit	Multifamily $692 per unit	Retail $1.24 per SF	Office $0.48 per SF	Industrial $0.21 per SF	Institutional $0.47 per SF
		Housing Units	Housing Units	KSF	KSF	KSF	KSF
Base	2022	8,153	1,366	3,052	276	2,107	681
1	2023	8,419	1,410	3,072	281	2,125	689
2	2024	8,685	1,455	3,091	286	2,144	697
3	2025	8,951	1,499	3,110	291	2,162	705
4	2026	9,017	1,510	3,129	297	2,181	713
5	2027	9,084	1,521	3,149	302	2,199	720
6	2028	9,151	1,533	3,168	307	2,217	728
7	2029	9,217	1,544	3,187	312	2,236	736
8	2030	9,284	1,555	3,206	317	2,254	744
9	2031	9,415	1,577	3,236	325	2,283	756
10	2032	9,546	1,599	3,266	333	2,311	769
Ten-Year Increase		1,393	233	213	57	204	88
Projected Revenue		$1,432,955	$161,397	$264,340	$27,381	$42,881	$41,228

Projected Revenue =>	**$1,970,000**
Projected Expenditures =>	**$1,976,000**
Non-Impact Fee Funding =>	**$6,000**

CAPITAL IMPROVEMENT PLAN

The following section provides a summary of the Capital Improvement Plans depicting growth-related capital demands and costs on which the impact fees are based. First, Figure 14 lists the projected growth over the next ten years in the district. Overall, there is a 17 percent increase in residential development (3,642 new residents and 1,626 new housing units) and a 12 percent increase in nonresidential development (1,210 new jobs and 562,000 square feet of development).

Figure 14. Ten-Year Projected Residential and Nonresidential Growth

		5-Year Increment						
NAC Fire & Rescue District	**Base Year 2022**	***1* 2023**	***2* 2024**	***3* 2025**	***4* 2026**	***5* 2027**	***10* 2032**	**Total Increase**
Population	21,322	22,017	22,713	23,408	23,582	23,756	24,964	**3,642**
Housing Units								
Single Family	8,153	8,419	8,685	8,951	9,017	9,084	9,546	**1,393**
Multifamily	1,366	1,410	1,455	1,499	1,510	1,521	1,599	**233**
Total Housing Units	9,519	9,829	10,140	10,450	10,528	10,606	11,145	**1,626**
Jobs								
Retail	3,643	3,684	3,725	3,766	3,807	3,847	4,096	**453**
Office	1,496	1,512	1,529	1,546	1,563	1,580	1,681	**186**
Industrial	2,580	2,609	2,638	2,667	2,696	2,725	2,901	**321**
Institutional	2,017	2,040	2,063	2,085	2,108	2,130	2,268	**251**
Total Jobs	9,736	9,846	9,955	10,064	10,173	10,282	10,946	**1,210**
Nonresidential Floor Area (1,000 sq. ft.)								
Retail	3,052	3,072	3,091	3,110	3,129	3,149	3,266	**213**
Office	276	281	286	291	297	302	333	**57**
Industrial	2,107	2,125	2,144	2,162	2,181	2,199	2,311	**204**
Institutional	681	689	697	705	713	720	769	**88**
Total Floor Area	6,116	6,167	6,218	6,268	6,319	6,370	6,678	**562**
Vehicle Trips								
Single Family Trips	65,382	67,514	69,647	71,779	72,313	72,847	76,550	**11,167**
Multifamily Trips	4,693	4,846	4,999	5,152	5,191	5,229	5,495	**802**
Residential Subtotal	*70,075*	*72,361*	*74,646*	*76,931*	*77,504*	*78,076*	*82,044*	***11,969***
Retail Trips	42,929	43,199	43,470	43,741	44,011	44,282	45,927	**2,998**
Office Trips	1,496	1,524	1,552	1,580	1,608	1,636	1,805	**309**
Industrial Trips	5,130	5,175	5,220	5,265	5,310	5,354	5,627	**497**
Institutional Trips	3,666	3,709	3,752	3,794	3,837	3,880	4,139	**472**
Nonresidential Subtotal	*53,221*	*53,607*	*53,993*	*54,379*	*54,765*	*55,152*	*57,498*	***4,277***
Total Vehicle Trips	123,296	125,968	128,639	131,310	132,269	133,228	139,542	**16,246**

Source: COMPASS (Community Planning Association of Southwest Idaho) Traffic Analysis Zone Model; TischlerBise analysis; Institute of Transportation Engineers, Trip Generation, 2021

The Idaho Development Fee Act requires Capital Improvement Plans to be updated regularly, at least once every five years (Idaho Code 67-8208(2)). This report projects revenue and fees based on 10-year forecast in an effort to provide the public and elected officials with illustrative guidance of probable growth

demands based on current trends however, per Idaho Code, it is expected that an update to the Capital Improvement Plan included in this study will occur within five years.

Capital Improvement Plan

A summary of the Fire District's capital improvement plan is shown below in Figure 15. As shown, the following additional infrastructure is needed to maintain current levels of service over the next ten years: 560 square feet of station space with an estimated cost of $800,000; one piece of apparatus with an estimated cost of $1,050,000; 10 pieces of equipment with an estimated cost of $60,300; two impact fee program updates with an estimated cost of $40,000.

Figure 15. North Ada County Fire & Rescue District Capital Improvement Plan

Type of Capital Improvement	Units	10-Year Need	Total Cost
Facilities			
Hidden Spring Station Expansion	Sq. Ft.	560	$800,000
Vehicles/Apparatus			
New Engine	Units	1	$1,050,000
Equipment			
Radio	Units	6	$51,600
SCBA	Units	4	$34,800
Professional Services			
Development Impact Fee Study	Updates	2	$39,440
		Total Costs over the Next 10 Years	$1,975,840

Funding Sources for Capital Improvements

In determining the proportionate share of capital costs attributable to new development, the Idaho Development Fee Act states that local governments must consider historical, available, and alternative sources of funding for system improvements (Idaho Code 67-8209(2)). Currently, there are no dedicated revenues being collected by the Fire District to fund growth-related projects besides impact fees.

Furthermore, the maximum supportable impact fees are constructed to offset all growth-related capital costs to the Fire District for facilities. Evidence is given in Figure 16 that the projected capital costs from new development will be entirely offset by the development impact fees. Thus, no general tax dollars are assumed to be used to fund growth-related capital costs, requiring no revenue credits.

Potential development impact fee revenues are summarized in Figure 16, assuming implementation of the fees at the maximum supportable level as indicated in this report. Based on the land use assumptions detailed in the Appendix, over the next ten years the fire development impact fees are projected to generate approximately $2 million. At the bottom of the figure, the estimated revenues are compared to the estimated growth-related capital costs. As shown, the projected revenue mitigates all growth-related capital cost. Note: the small remaining amount is the result of rounding in the analysis.

Figure 16. Projected Development Impact Fee Revenue

Projected Development Impact Fee Revenue

Year		Single Family $1,029 per unit	Multifamily $692 per unit	Retail $1.24 per SF	Office $0.48 per SF	Industrial $0.21 per SF	Institutional $0.47 per SF
		Housing Units	Housing Units	KSF	KSF	KSF	KSF
Base	2022	8,153	1,366	3,052	276	2,107	681
1	2023	8,419	1,410	3,072	281	2,125	689
2	2024	8,685	1,455	3,091	286	2,144	697
3	2025	8,951	1,499	3,110	291	2,162	705
4	2026	9,017	1,510	3,129	297	2,181	713
5	2027	9,084	1,521	3,149	302	2,199	720
6	2028	9,151	1,533	3,168	307	2,217	728
7	2029	9,217	1,544	3,187	312	2,236	736
8	2030	9,284	1,555	3,206	317	2,254	744
9	2031	9,415	1,577	3,236	325	2,283	756
10	2032	9,546	1,599	3,266	333	2,311	769
Ten-Year Increase		1,393	233	213	57	204	88
Projected Revenue		$1,432,955	$161,397	$264,340	$27,381	$42,881	$41,228
						Projected Revenue =>	**$1,970,000**
						Projected Expenditures =>	**$1,976,000**
						Non-Impact Fee Funding =>	**$6,000**

PROPORTIONATE SHARE ANALYSIS

Development impact fees for the Fire District are based on reasonable and fair formulas or methods. The fees do not exceed a proportionate share of the costs incurred or to be incurred by the Fire District in the provision of system improvements to serve new development. The Fire District will fund non-growth-related improvements with non-development impact fee funds as it has in the past. Specified in the Idaho Development Impact Fee Act (Idaho Code 67-8207), several factors must be evaluated in the development impact fee study and are discussed below.

1) The development impact fees for the Fire District are based on new growth's share of the costs of previously built projects along with planned public facilities as provided by the Fire District. Projects are included in the Fire District's capital improvements plan and will be included in annual capital budgets.
2) Estimated development impact fee revenue was based on the maximum supportable development impact fees for the one, districtwide service area; results are shown in the cash flow analyses in this report. Development impact fee revenue will entirely fund growth-related improvements.
3) TischlerBiseGalena has evaluated the extent to which new development may contribute to the cost of public facilities. The development impact fees will replace the current dedicated revenues for applicable public facilities. Also, the report has shown that all applicable growth-related public facility costs will be entirely funded by impact fees, thus no credit is necessary for general tax dollar funding.
4) The Fire District will evaluate the extent to which newly developed properties are entitled to a credit for system improvements that have been provided by property owners or developers. These "site-specific" credits will be available for system improvements identified in the annual capital budget and long-term Capital Improvements Plans. Administrative procedures for site-specific credits should be addressed in the development impact fee ordinance.
5) Extraordinary costs, if any, in servicing newly developed properties should be addressed through administrative procedures that allow independent studies to be submitted to the Fire District. These procedures should be addressed in the development impact fee ordinance. One service area represented by the Fire District's geographic boundary is appropriate for the fees herein.
6) The time-price differential inherent in fair comparisons of amounts paid at different times has been addressed. All costs in the development impact fee calculations are given in current dollars with no assumed inflation rate over time. Necessary cost adjustments can be made as part of the annual evaluation and update of development impact fees.

IMPLEMENTATION AND ADMINISTRATION

The Idaho Development Impact Fee Act (hereafter referred to as the Idaho Act) requires jurisdictions to form a Development Impact Fee Advisory Committee. The committee must have at least five members with a minimum of two members active in the business of real estate, building, or development. The committee acts in an advisory capacity and is tasked to do the following:

- Assist the governmental entity in adopting land use assumptions;
- Review the capital improvements plan, and proposed amendments, and file written comments;
- Monitor and evaluate implementation of the capital improvements plan;
- File periodic reports, at least annually, with respect to the capital improvements plan and report to the governmental entity any perceived inequities in implementing the plan or imposing the development impact fees; and
- Advise the governmental entity of the need to update or revise land use assumptions, the capital improvements plan, and development impact fees.

Per the above, the City of Eagle and Ada County have established Development Impact Fee Advisory Committees ("DIFAC"). TischlerBiseGalena and District staff met with the DIFAC during the process and provided information on land use assumptions, level of service and cost assumptions, and draft development impact fee schedules. This report reflects comments and feedback received from the DIFAC.

The Fire District must develop and adopt a capital improvements plan ("CIP") that includes those improvements for which fees were developed. The Idaho Act defines a capital improvement as an "improvement with a useful life of ten years or more, by new construction or other action, which increases the service capacity of a public facility." Requirements for the CIP are outlined in Idaho Code 67-8208. Certain procedural requirements must be followed for adoption of the CIP and the development impact fee ordinance. Requirements are described in detail in Idaho Code 67-8206. The Fire District has a CIP that meets the above requirements.

TischlerBiseGalena recommends that development impact fees be updated annually to reflect recent data. One approach is to adjust for inflation in construction costs by means of an index like the RSMeans or Engineering News Record (ENR). This index can be applied against the calculated development impact fee. If cost estimates change significantly, the Fire District should evaluate an adjustment to the CIP and development impact fees.

Idaho's enabling legislation requires an annual development impact fees report that accounts for fees collected and spent during the preceding year (Idaho Code 67-8210). Development impact fees must be deposited in interest-bearing accounts earmarked for the associated capital facilities as outlined in capital improvements plans. Also, fees must be spent within eight years of when they are collected (on a first in, first out basis) unless the local governmental entity identifies in writing (a) a reasonable cause why the fees should be held longer than eight years; and (b) an anticipated date by which the fees will be expended but in no event greater than eleven years from the date they were collected.

Credits must be provided for in accordance with Idaho Code Section 67-8209 regarding site-specific credits or developer reimbursements for system improvements that have been included in the development impact fee calculations. Project improvements normally required as part of the development approval process are not eligible for credits against development impact fees. Specific policies and procedures related to site-specific credits or developer reimbursements for system improvements should be addressed in the ordinance that establishes the Fire District's fees.

The general concept is that developers may be eligible for site-specific credits or reimbursements only if they provide system improvements that have been included in CIP and development impact fee calculations. If a developer constructs a system improvement that was included in the fee calculations, it is necessary to either reimburse the developer or provide a credit against the fees in the area that benefits from the system improvement. The latter option is more difficult to administer because it creates unique fees for specific geographic areas. Based on TischlerBiseGalena's experience, it is better for a reimbursement agreement to be established with the developer that constructs a system improvement. For example, if a developer elects to construct a system improvement, then a reimbursement agreement can be established to payback the developer from future development impact fee revenue. The reimbursement agreement should be based on the actual documented cost of the system improvement, if less than the amount shown in the CIP. However, the reimbursement should not exceed the CIP amount that has been used in the development impact fee calculations.

APPENDIX A. LAND USE DEFINITIONS

- **Single Family:**
    1. 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.
    2. Single family attached (townhouse) 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.
    3. Mobile home includes both occupied and vacant mobile homes, to which no permanent rooms have been added. Mobile homes used only for business purposes or for extra sleeping space and mobile homes for sale on a dealer's lot, at the factory, or in storage are not counted in the housing inventory.
- **Multifamily:**
    1. 2+ units (duplexes and apartments) are units in structures containing two or more housing units, further categorized as units in structures with "2 or more units."
    2. Boat, RV, Van, etc. includes any living quarters occupied as a housing unit that does not fit the other categories (e.g., houseboats, railroad cars, campers, and vans). RVs, boats, vans, and the like are included only if they are occupied as a current place of residence.

Nonresidential development categories used throughout this study are based on land use classifications from the book *Trip Generation* (ITE, 2021). A summary description of each development category is provided below.

- **Retail:** Establishments primarily selling merchandise, eating/drinking places, and entertainment uses. By way of example, *Retail* includes shopping centers, supermarkets, pharmacies, restaurants, bars, nightclubs, automobile dealerships, movie theaters, and lodging (hotel/motel).
- **Office:** Establishments providing management, administrative, professional, or business services. By way of example, *Office* includes banks, business offices.
- **Industrial:** Establishments primarily engaged in the production and transportation of goods. By way of example, *Industrial* includes manufacturing plants, trucking companies, warehousing facilities, utility substations, power generation facilities, and telecommunications buildings.
- **Institutional:** Public and quasi-public buildings providing educational, social assistance, or religious services. By way of example, *Institutional* includes schools, universities, churches, daycare facilities, hospitals, health care facilities, and government buildings.

APPENDIX B. DEMOGRAPHIC ASSUMPTIONS

POPULATION AND HOUSING CHARACTERISTICS

Impact fees often use per capita standards and persons per housing unit or persons per household to derive proportionate share fee amounts. Housing types have varying household sizes and, consequently, a varying demand on District infrastructure and services. Thus, it is important to differentiate between housing types and size.

When persons per housing unit (PPHU) is used in the development impact fee calculations, infrastructure standards are derived using year-round population. In contrast, when persons per household (PPHH) is used in the development impact fee calculations, the fee methodology assumes all housing units will be occupied, thus requiring seasonal or peak population to be used when deriving infrastructure standards. TischlerBise recommends that fees for residential development in NAC Fire & Rescue District be imposed according to persons per housing unit.

Based on housing characteristics, TischlerBise recommends using two housing unit categories for the Impact Fee study: (1) Single Family and (2) Multifamily. Each housing type has different characteristics which results in a different demand on District facilities and services. Figure 17 shows the districtwide US Census American Community Survey 2020 5-Year Estimates data for NAC Fire & Rescue District. Single family units have a PPHU of 2.35 persons and multifamily units have a household size of 1.58 persons. Additionally, there is a housing mix of 86 percent single family and 14 percent multifamily.

The estimates in Figure 17 are for PPHU calculations. Base year population and housing units are estimated with another, more recent data source.

Figure 17. Persons per Housing Unit

Housing Type	Persons	Housing Units	Persons per Housing Unit	Household	Persons per Household	Housing Unit Mix
Single Family [1]	21,100	8,974	**2.35**	8,476	2.49	86%
Multifamily [2]	2,368	1,503	**1.58**	1,449	1.63	14%
Total	23,468	10,477	**2.24**	9,925	2.36	

[1] Includes attached and detached single family homes and mobile homes

[2] Includes all other types

Source: U.S. Census Bureau, 2020 American Community Survey 5-Year Estimates

BASE YEAR HOUSING UNITS AND POPULATION

Base year population is derived from Community Planning Association of Southwest Idaho (COMPASS) traffic analysis zone data. Based off of this data, the base year population estimate for the Fire District is 21,322. PPHU data shown in Figure 17 is used to convert this total population number to a total housing unit number, which is estimated to be 9,519. Then the housing unit mix percentage is applied to this total housing unit estimate to get a breakdown between single and multifamily units.

Figure 18. Base Year Housing Units and Population

NAC Fire & Rescue District	Base Year 2022
Population [1]	21,322
Housing Units [2]	
Single Family	8,153
Multifamily	1,366
Total Housing Units	9,519

[1] Source: COMPASS TAZ Model
[2] Source: U.S. Census ACS 2020; TischlerBise analysis

HOUSING UNIT AND POPULATION PROJECTIONS

The residential projections are based on COMPASS traffic analysis zone data. Over the next ten years, the Fire District is projected to grow by 3,642 residents, a 17 percent increase from the base year. Total housing is projected to grow at the same rate as population. As a result, there is an estimated increase of 1,393 single family and 233 multifamily units over the next ten years.

Figure 19. Residential Development Projections

NAC Fire & Rescue District	Base Year 2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Total Increase
Population	21,322	22,017	22,713	23,408	23,582	23,756	23,931	24,105	24,279	24,621	24,964	**3,642**
Percent Increase		*3.3%*	*3.2%*	*3.1%*	*0.7%*	*0.7%*	*0.7%*	*0.7%*	*0.7%*	*1.4%*	*1.4%*	***17.1%***
Housing Units												
Single Family	8,153	8,419	8,685	8,951	9,017	9,084	9,151	9,217	9,284	9,415	9,546	**1,393**
Multifamily	1,366	1,410	1,455	1,499	1,510	1,521	1,533	1,544	1,555	1,577	1,599	**233**
Total Housing Units	9,519	9,829	10,140	10,450	10,528	10,606	10,683	10,761	10,839	10,992	11,145	**1,626**

Source: COMPASS (Community Planning Association of Southwest Idaho) Traffic Analysis Zone Model; TischlerBise analysis

CURRENT EMPLOYMENT AND NONRESIDENTIAL FLOOR AREA

The impact fee study will include nonresidential development as well. Utilizing COMPASS traffic analysis zone data, 2022 total employment in the district is estimated at 9,736 jobs. Idaho State Demographic Community profile data is used to breakdown this job total. As a result, there are an estimated 3,643 retail jobs, 1,496 office jobs, 2,580 industrial jobs, and 2,017 institutional jobs located in the district.

Base year nonresidential floor area estimates are based on GIS Ada County GIS parcel data. There is an estimated total of 6.1 million square feet of nonresidential floor area in the district. Retail industries accounts for the greatest share, with approximately 50 percent. Industrial accounts for 34 percent, and institutional accounts for 11 percent, and office accounts for 5 percent of the total.

Figure 20. Base Year Employment and Nonresidential Floor Area

NAC Fire & Rescue District	Base Year Jobs [1]	% of Total	Base Year Sq. Ft. [2]	% of Total
Retail	3,643	37%	3,052,417	50%
Office	1,496	15%	276,025	5%
Industrial	2,580	27%	2,106,776	34%
Institutional	2,017	21%	680,854	11%
Total	**9,736**	**100%**	**6,116,072**	**100%**

[1] COMPASS (Community Planning Association of Southwest Idaho) Traffic Analysis Zone Model; Idaho State Demographic Community Profile
[2] Source: Ada County GIS parcel data

EMPLOYMENT AND NONRESIDENTIAL FLOOR AREA PROJECTIONS

Job and nonresidential ten-year projections are provided in Figure 22. Job growth is projected using COMPASS traffic analysis zone data. Over the next 10 years there is a projected 1,210-increase in jobs, a 12 percent increase from the base year. Retail development accounts for the greatest share of the increase.

Job growth is converted into nonresidential floor area using the Institution of Transportation Engineers' (ITE) square feet per employee averages shown in Figure 21. For the retail industry the Shopping Center land use factors are used; for office the General Office factors are used; for industrial the Light Industrial factors are used; for Institutional the Hospital factors are used. Over the next ten years, the nonresidential floor area is projected to increase by approximately 562,000 square feet.

Figure 21. Institute of Transportation Engineers (ITE) Employment Density Factors

Employment Industry	ITE Code	Land Use	Demand Unit	Emp per Dmd Unit	Sq. Ft. per Emp
Retail	820	Shopping Center	1,000 Sq Ft	2.12	471
Office	710	General Office	1,000 Sq Ft	3.26	307
Industrial	110	Light Industrial	1,000 Sq Ft	1.57	637
Institutional	610	Hospital	1,000 Sq Ft	2.86	350

Source: *Trip Generation* , Institute of Transportation Engineers, 11th Edition (2021)

Figure 22. Employment and Nonresidential Floor Area Projections

Industry	Base Year 2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Total Increase
Jobs [1]												
Retail	3,643	3,684	3,725	3,766	3,807	3,847	3,888	3,929	3,970	4,033	4,096	**453**
Office	1,496	1,512	1,529	1,546	1,563	1,580	1,596	1,613	1,630	1,656	1,681	**186**
Industrial	2,580	2,609	2,638	2,667	2,696	2,725	2,754	2,783	2,812	2,856	2,901	**321**
Institutional	2,017	2,040	2,063	2,085	2,108	2,130	2,153	2,176	2,198	2,233	2,268	**251**
Total	9,736	9,846	9,955	10,064	10,173	10,282	10,392	10,501	10,610	10,778	10,946	**1,210**
Percent Increase		*1.1%*	*1.1%*	*1.1%*	*1.1%*	*1.1%*	*1.1%*	*1.1%*	*1.0%*	*1.6%*	*1.6%*	***12.4%***
Nonresidential Floor Area (1,000 sq. ft.) [2]												
Retail	3,052	3,072	3,091	3,110	3,129	3,149	3,168	3,187	3,206	3,236	3,266	**213**
Office	276	281	286	291	297	302	307	312	317	325	333	**57**
Industrial	2,107	2,125	2,144	2,162	2,181	2,199	2,217	2,236	2,254	2,283	2,311	**204**
Institutional	681	689	697	705	713	720	728	736	744	756	769	**88**
Total	6,116	6,167	6,218	6,268	6,319	6,370	6,421	6,471	6,522	6,600	6,678	**562**

[1] COMPASS (Community Planning Association of Southwest Idaho) Traffic Analysis Zone Model; TischlerBise analysis
[2] Source: Institute of Transportation Engineers, *Trip Generation* , 2021

FUNCTIONAL POPULATION

Both residential and nonresidential developments increase the demand on District services and facilities. To calculate the proportional share between residential and nonresidential demand on service and 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 district through the 24 hours in a day.

Residents that do not work are assigned 20 hours per day to residential development and 4 hours per day to nonresidential development (annualized averages). Residents that work in the North Ada County Fire & Rescue District are assigned 14 hours to residential development and 10 hours to nonresidential development. Residents that work outside the district are assigned 14 hours to residential development, the remaining hours in the day are assumed to be spent outside of the district working. Inflow commuters are assigned 10 hours to nonresidential development. Based on the most recent functional population data (2019), residential development accounts for 73 percent of the functional population, while nonresidential development accounts for 27 percent.

Figure 23. North Ada County Fire & Rescue District Functional Population

North Ada Fire District (2019)				
Residential			*Demand*	*Person*
Population*	23,489		*Hours/Day*	*Hours*
Residents Not Working		17,992	20	359,840
Employed Residents		5,497		
Employed in Fire District		390	14	5,460
Employed outside Fire District		5,107	14	71,498
			Residential Subtotal	436,798
			Residential Share =>	**73%**
Nonresidential				
Non-working Residents		17,992	4	71,968
Jobs Located in Fire District		8,619		
Residents Employed in District		8,229	10	82,290
Non-Resident Workers (inflow commuters)		390	10	3,900
			Nonresidential Subtotal	158,158
			Nonresidential Share =>	**27%**
			TOTAL	594,956

Source: U.S. Census Bureau, OnTheMap 6.1.1 Application and LEHD Origin-Destination Employment Statistics.

* Source: U.S. Census Bureau, 2019 American Community Survey 5-Year Estimates

VEHICLE TRIP GENERATION

RESIDENTIAL VEHICLE TRIPS BY HOUSING TYPE

A customized trip rate is calculated for the single family and multifamily units in the NAC Fire & Rescue District. In Figure 24, 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 12.53 trip ends and a multifamily unit is estimated to generate 5.37 trip ends on an average weekday.

Figure 24. Customized Residential Trip End Rates by Housing Type

		Households by Structure Type[2]			
Tenure by Units in Structure	Vehicles Available[1]	Single Family	Multifamily	Total	Vehicles per HH by
Owner-Occupied	14,699	7,118	107	7,225	2.03
Renter-Occupied	3,875	1,358	1,342	2,700	1.44
Total	18,574	8,476	1,449	9,925	1.87
	Housing Units[3]	8,974	1,503	10,477	

Housing Type	Persons in Households[4]	Trip Ends[5]	Vehicles by Type of Unit	Trip Ends[6]	Average Trip Ends	Local Trip Ends per HH	National Trip Ends per Unit[7]
Single Family	21,100	58,800	16,405	153,526	106,163	**12.53**	9.43
Multifamily	2,368	5,342	2,150	10,208	7,775	**5.37**	4.54
Total	23,468	64,141	18,555	163,734	113,938	**11.48**	

1. Vehicles available by tenure from Table B25046, 2020 American Community Survey 5-Year Estimates.
2. Households by tenure and units in structure from Table B25032, 2020 American Community Survey 5-Year Estimates.
3. Housing units from Table B25024, 2020 American Community Survey 5-Year Estimates.
4. Total population in households from Table B25033, 2020 American Community Survey 5-Year Estimates.
5. Vehicle trips ends based on persons using formulas from Trip Generation (ITE 2021). 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 19 and the equation result multiplied by 19. For multi-family housing (ITE 221), the fitted curve equation is (2.29*persons)-64.48 (ITE 2017).
6. Vehicle trip ends based on vehicles available using formulas from Trip Generation (ITE 2021). For single-family housing (ITE 210), the fitted curve equation is EXP(0.92*LN(vehicles)+2.68). To approximate the average number of vehicles in the ITE studies, vehicles available were divided by 34 and the equation result multiplied by 34. For multi-family housing (ITE 221), the fitted curve equation is (4.77*vehicles)-46.46 (ITE 2021).
7. Trip Generation, Institute of Transportation Engineers, 11th Edition (2021).

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 District residents' work bound trips that are outside of the district. The trip adjustment factor includes two components. According to the National Household Travel Survey, 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", 93 percent of workers travel outside the district for work. In combination, these factors account for 14 percent of additional production trips (0.31 x 0.50 x 0.93 = 0.14). Shown in Figure 25, the total adjustment factor for residential housing units includes attraction trips (50 percent of trip ends) plus the journey-to-work commuting adjustment (14 percent of production trips) for a total of 64 percent.

Figure 25. Residential Trip Adjustment Factor for Commuters

Trip Adjustment Factor for Commuters

Employed Fire District Residents (2019)	5,497
Residents Working in Fire District (2019)	390
Residents Commuting Outside of Fire District for Work	5,107
Percent Commuting Out of Fire District	93%
Additional Production Trips	**14%**

Standard Trip Adjustment Factor	**50%**
Residential Trip Adjustment Factor	**64%**

Source: U.S. Census, OnTheMap Application, 2019

Nonresidential Vehicle Trips

Vehicle trip generation for nonresidential land uses are calculated by using ITE's average daily trip end rates and adjustment factors found in their recently published 11th edition of Trip Generation. To estimate the trip generation in the NAC Fire & Rescue District, the weekday trip end per 1,000 square feet factors listed in Figure 26 are used.

Figure 26. Institute of Transportation Engineers Nonresidential Factors

Employment Industry	ITE Code	Land Use	Demand Unit	Wkdy Trip Ends per Dmd Unit	Wkdy Trip Ends per Employee
Retail	820	Shopping Center	1,000 Sq Ft	37.01	17.42
Office	710	General Office	1,000 Sq Ft	10.84	3.33
Industrial	110	Light Industrial	1,000 Sq Ft	4.87	3.10
Institutional	610	Hospital	1,000 Sq Ft	10.77	3.77

Source: *Trip Generation* , Institute of Transportation Engineers, 11th Edition (2021)

For nonresidential land uses, the standard 50 percent adjustment is applied to office, industrial, and institutional. A lower vehicle trip adjustment factor is used for retail because this type of development

attracts vehicles as they pass-by on arterial and collector roads. For example, when someone stops at a convenience store on their way home from work, the convenience store is not their primary destination.

In Figure 27, the Institute for Transportation Engineers' land use code, daily vehicle trip end rate, and trip adjustment factor is listed for each land use.

Figure 27. Daily Vehicle Trip Factors

Land Use	ITE Codes	Daily Vehicle Trip Ends	Trip Adj. Factor	Daily Vehicle Trips
Residential (per housing unit)				
Single Family	210	12.53	64%	8.02
Multifamily	220	5.37	64%	3.44
Nonresidential (per 1,000 square feet)				
Retail	820	37.01	38%	14.06
Office	710	10.84	50%	5.42
Industrial	110	4.87	50%	2.44
Institutional	610	10.77	50%	5.39

Source: *Trip Generation* , Institute of Transportation Engineers, 11th Edition (2021); National Household Travel Survey, 2009

VEHICLE TRIP PROJECTIONS

The base year vehicle trip totals and vehicle trip projections are calculated by combining the vehicle trip end factors, the trip adjustment factors, and the residential and nonresidential assumptions for housing stock and floor area. Districtwide, residential land uses account for 70,075 vehicle trips and nonresidential land uses account for 53,221 vehicle trips in the base year (Figure 28).

Through 2032, it is projected that daily vehicle trips will increase by 16,246 trips with the majority of the growth being generated by single family (69 percent) and retail (18 percent) development.

Figure 28. Vehicle Trip Projections

Development Type	Base Year 2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Total Increase
Residential Trips												
Single Family	65,382	67,514	69,647	71,779	72,313	72,847	73,381	73,916	74,450	75,500	76,550	**11,167**
Multifamily	4,693	4,846	4,999	5,152	5,191	5,229	5,267	5,306	5,344	5,419	5,495	**802**
Subtotal	70,075	72,361	74,646	76,931	77,504	78,076	78,649	79,221	79,794	80,919	82,044	**11,969**
Nonresidential Trips												
Retail	42,929	43,199	43,470	43,741	44,011	44,282	44,553	44,823	45,094	45,510	45,927	**2,998**
Office	1,496	1,524	1,552	1,580	1,608	1,636	1,664	1,691	1,719	1,762	1,805	**309**
Industrial	5,130	5,175	5,220	5,265	5,310	5,354	5,399	5,444	5,489	5,558	5,627	**497**
Institutional	3,666	3,709	3,752	3,794	3,837	3,880	3,922	3,965	4,008	4,073	4,139	**472**
Subtotal	53,221	53,607	53,993	54,379	54,765	55,152	55,538	55,924	56,310	56,904	57,498	**4,277**
Vehicle Trips												
Grand Total	123,296	125,968	128,639	131,310	132,269	133,228	134,186	135,145	136,103	137,823	139,542	**16,246**

Source: Institute of Transportation Engineers, *Trip Generation* , 11th Edition (2021)