City of Fredericksburg, Virginia

City Council

AGENDA

Council Chambers

715 Princess Anne Street

Fredericksburg, Virginia 22401

Hon. Mary Katherine Greenlaw, Mayor
Hon. Charlie L. Frye, Jr., Vice-Mayor, Ward Four
Hon. Kerry P. Devine, At-Large
Hon. Matthew J. Kelly, At-Large
Hon. Jason N. Graham, Ward One
Hon. Jonathan A. Gerlach, Ward Two
Hon. Timothy P. Duffy, Ph.D., Ward Three

Tuesday, February 22, 2022
Council Chambers
5:30 PM

Agenda

1. **Call To Order**

2. **Topics**

   A. FOG (Fats/Oils/Grease) Program & Utilities Update – Public Works

   B. Discussion Of Capital Impacts Report By Tischler Bice – Planning

      Documents:

      CAPITAL IMPACTS WS.PDF

   C. Redistricting

3. **Adjournment**

City of Fredericksburg, Virginia

MEMORANDUM

TO: Timothy J. Baroody, City Manager
FROM: Chuck Johnston, Community Planning & Building Director; Mike Craig, Senior Planner
DATE: February 16, 2022 for February 22 Council Work Session
RE: Work Session Disucssion Item: Capital Impacts Study

Issue

Status of Draft Capital Impacts Study.

Recommendation

Discuss draft study. Request City Attorney to work with Planning staff to develop capital impact proffer/condition policy to be presented to Council in June 2022, based on FY23 budget.

Discussion

The various sections of Virginia Code §15.2-2303 and §15.2-2286 enable localities in the Commonwealth to receive, respectively, voluntary cash rezoning proffers and special use cash conditions to offset the capital impacts of a development proposal. Such cash contributions are to be used for additional facility capacity, and other costs directly related thereto, to serve the prospective development. Finally, the facilities are to be part of a jurisdiction's Capital Improvement Plan.

The City contracted with the fiscal/economic/planning firm, TischlerBise, to provide an estimate of the capital impact of new development. The lead author for TischlerBise on the study is Julie Herlands, who will be present at the Work Session. The focus of the study are the school and Fire/EMS capital costs, specifically: a new school, new buses, a new fire station, expansion of Fire Station 1, and related apparatus. The capital costs of other facilities in the CIP were not included in the analysis as these facilities would not primarily address capacity issues.

Based on the City's FY22 CIP, TischlerBise identified the following capital impact amounts:

Development Type		***Public School***	***Fire & EMS***	***Total***
Single Family House		$ 11,937	$ 701	$ 12,098
SF Attached/Townhouse		$ 16,429	$ 595	$ 17,021
Multifamily		$ 11,812	$ 519	$ 12,331
Multifamily, Age Restricted		$ 0	$ 519	$ 519
Retail	per 1,000 sq ft	NA	$ 479	$ 479
Office/Inst'l	per 1,000 sq ft	NA	$ 597	$ 597
Industrial	per 1,000 sq ft	NA	$ 354	$ 354

The full draft report is attached and includes more detail. The report will remain a draft until a FY23 CIP budget is adopted by City Council. The FY22 CIP estimated the cost of a new school as $41 million and the new fire station as $10 million. Current estimates have increased these expected costs by 50%.

Capital Impacts Study

City of Fredericksburg, Virginia

[Schools and Fire Capital Impacts]

Submitted to:

City of Fredericksburg, Virginia

DRAFT

February 16, 2022

Prepared by:

TischlerBise
FISCAL | ECONOMIC | PLANNING

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February 2022 (draft)

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CAPITAL IMPACTS STUDY
City of Fredericksburg, Virginia

CONTENTS

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EXECUTIVE SUMMARY

Overview

TischlerBise has been retained by the City of Fredericksburg, Virginia, to analyze capital impacts and potential funding through cash proffers and/or special use conditions to meet the demands for public facilities generated by new development in the City. TischlerBise evaluated capital impacts for two categories of public capital improvements: (1) Public Schools and (2) Fire and EMS.

Capital impact amounts calculated herein represent a one-time monetary commitment to offset the impact on public facilities (for the categories included in the study). Capital impact contributions may take the form of a cash proffer contribution or special use condition. Further detail on specific cash proffer requirements is included in Appendix B.

Funds collected from capital impact contributions are used to construct capital improvements to maintain levels of service for new development. Funds can only be used for **capital** improvements that provide **additional capacity**, not operations or maintenance. Capital impact amounts represent new growth's fair share of capital facility needs and are calculated using level of service standards to account for infrastructure that may currently have excess capacity. Capital impact amounts cannot be used to correct existing deficiencies and are calculated as such. However, since capital impact contributions do not apply to "by-right" development, only a portion of the impacts from new growth can be mitigated with a capital impact contribution program. Capital impact contributions are a small part of an overall funding strategy and should not be regarded as a total solution for infrastructure financing needs. Therefore, other strategies and revenue sources are needed to offset the impact to infrastructure from new growth.

TischlerBise evaluated possible methodologies and documented appropriate demand indicators by type of development for each type of capital impact for the City of Fredericksburg. The formula used to calculate each capital impact amount is diagrammed in a flow chart at the beginning of each chapter. Specific capital costs have been identified using local data and current dollars (2021). Because capital impacts reflect a point in time, the calculations and study should be updated periodically (typically 3 to 5 years). Costs reflect the direct impact of new development on the need for new facilities and infrastructure and do not reflect secondary or indirect impacts.

Capital impacts are calculated to conform to three key elements: need, benefit, and proportionality.

First, to justify a capital impact for public facilities, it must be demonstrated that new development/rezonings will create a need for capital improvements.

Second, development paying a capital impact contribution should derive a benefit from the payment of the capital impact contribution (i.e., in the form of public facilities constructed within a reasonable timeframe).

Third, the capital impact amount to be paid by a particular type of development (land use) should not exceed its proportional share of the capital cost for system improvements. The use of household sizes and jobs per 1,000 square feet ensures this requirement is met.

For each type of capital impact, the report includes a summary table indicating the specific factors used to derive the amounts. These factors are referred to as "Level of Service" (LOS) standards. Public Schools are based on residential demand only; Fire/EMS is based on demand from both residential and nonresidential development.

The value of each capital impact amount outlined in this report reflects the actual impact (cost) to the City by new residential and nonresidential development, and as such, each represents the maximum capital impact generated for each public facility category by type of land use. The capital impact amounts should not be interpreted as conveying a suggestion or recommendation as to the value any particular capital impact amount ought to be set should the City Council choose to establish and adopt a policy guiding the acceptance of capital impact contributions. Rather, the actual costs included in the study provide a starting point for potential capital impact contribution amounts.

Summary of Capital Impact Calculations

The capital impact amounts calculated for the City of Fredericksburg represent the highest amount feasible for each type of applicable land use, or *maximum* amounts, which represents new growth's fair share of the cost for the respective capital facilities.

A summary of components and methodologies in the analysis for each infrastructure category is provided below in Figure 1.

Figure 1. Summary of City of Fredericksburg Capital Impact Methodologies

Type of Public Facility	Components	Cost Allocation
Fredericksburg City Public Schools	▪ Schools ▪ Buses	Public School Students from Residential Development
Fredericksburg Fire Department	▪ Station Space ▪ Vehicles/Apparatus	Residential and Nonresidential Development

For **Public Schools** capital impacts, components include public school buildings and buses and are based on current levels of service calculated based on capacity. Public Schools capital impacts only apply to residential development. School capital impact amounts are provided for an average housing unit by type of unit (i.e., single family detached, single family attached, and multifamily (non-age restricted)) as well as by size (bedroom count) of housing units. This allows for a more "progressive" schedule where smaller units within each category tend to have fewer students per unit and thus a lower capital impact amount. (See summary in Figure 2.)

Fire/EMS capital impacts include fire stations and vehicles/apparatus. Fire/EMS capital impacts are calculated for both residential and nonresidential development based on planned levels of service household sizes and size of housing units. (See summary in Figure 2.)

Maximum Capital Impact Amounts

Figure 2 provides a summary of the *maximum capital impact amounts* by type of land use for the City of Fredericksburg. The capital impact amounts represent new growth's fair share of the cost for capital facilities included in the analysis. Please see applicable chapter for detail on factors, values, and calculations used to calculate the capital impact amounts shown in Figure 2.

The capital impacts for residential development are per housing unit with the option of implementing by *size of unit* (based on bedroom count). For nonresidential development, the capital impacts are shown per 1,000 square feet of floor area for all uses except lodging, which is shown per room.

Figure 2. Summary of Maximum Capital Impact Amounts by Land Use

			Public Schools	Fire & EMS	TOTAL Capital Impact
Residential	***Development Unit***	***Number of Bedrooms***	***Per Development Unit***		
Single Family	Housing Unit	0-2	$5,414	$446	**$5,860**
Single Family	Housing Unit	3	$9,382	$592	**$9,974**
Single Family	Housing Unit	4	$16,386	$772	**$17,158**
Single Family	Housing Unit	5+	$16,975	$870	**$17,845**
Single Family	***Housing Unit***	***Avg***	***$11,397***	***$701***	***$12,098***
SF Attached/Townhouse	Housing Unit	0-2	$17,528	$440	**$17,968**
SF Attached/Townhouse	Housing Unit	3+	$15,805	$633	**$16,438**
SF Attached/Townhouse	***Housing Unit***	***Avg***	***$16,429***	***$592***	***$17,021***
Multifamily/Other	***Housing Unit***	***Avg***	***$11,812***	***$519***	***$12,331***
Multifamily Age Restricted	***Housing Unit***	***Avg***	***$0***	***$519***	***$519***

Nonresidential	***Development Unit***	***Per Development Unit***		
Retail	1,000 sq. ft.	n/a	$479	***$479***
Office, Institutional, and Other Services	1,000 sq. ft.	n/a	$597	***$597***
Industrial	1,000 sq. ft.	n/a	$354	***$354***
Lodging	Room	n/a	$154	***$154***

INTRODUCTION TO CAPITAL IMPACTS

Methodologies

Any one of several legitimate methods may be used to calculate capital impact amounts. The choice of a particular method depends primarily on the service characteristics and planning requirements for the facility type being addressed. Each method has advantages and disadvantages in a particular situation, 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 capital impact amounts involves two main steps: (1) determining the cost of development-related capital improvements (for additional capacity) and (2) allocating those costs equitably to various types of development. In practice, though, the calculation of capital impacts can be complex because of the variables involved in defining the relationship between development and the need for facilities. The following paragraphs discuss three basic methods for calculating capital impact amounts and how those methods can be applied.

Plan-Based Calculation. The plan-based method allocates costs for a specified set of improvements to a specified amount of development. The improvements are identified by a facility plan and growth/future development is determined through planning documents and projections. In this method, the total cost of relevant facilities is divided by total future 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).

Incremental Expansion Calculation. The incremental expansion method documents current levels of service (LOS) for each type of public facility, based on an existing service standard (such as square feet per student). 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. Level of service standards are determined in a manner similar to the current replacement cost approach used by property insurance companies. However, in contrast to insurance practices, the capital impact revenues would not be for renewal and/or replacement of existing facilities. Rather, 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.

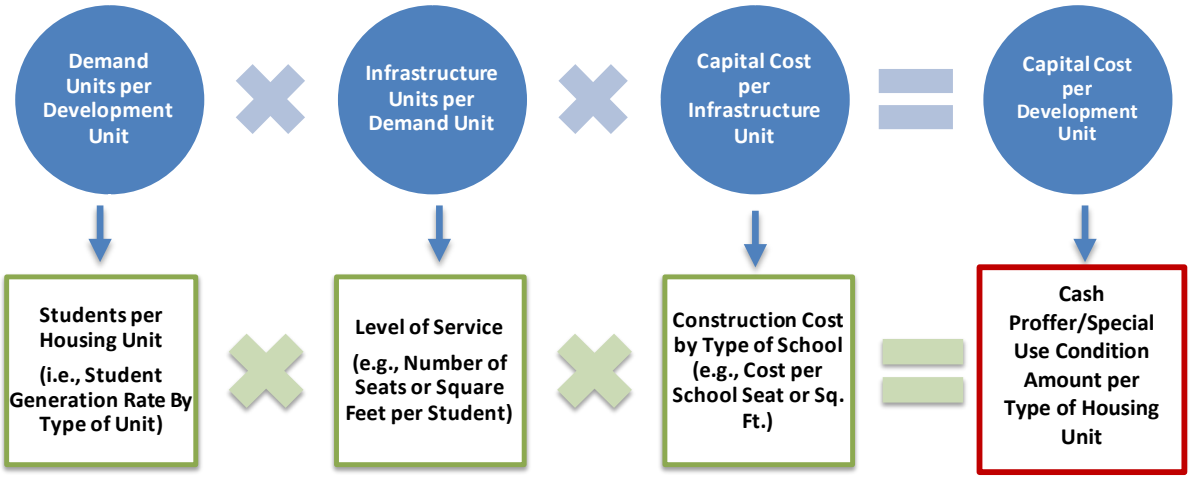
Cost Recovery or Buy-In Calculation. The rationale for the cost recovery approach is that new development is paying for its share of the useful life and remaining capacity of facilities already built or land already purchased from which new growth will benefit. This methodology is often used for systems that were oversized such as utilities.

Generic Capital Impact Calculation

In contrast to development exactions, which are typically referred to as project-level improvements, capital impacts fund growth-related infrastructure that will benefit multiple development projects, or the entire jurisdiction. The basic steps in a generic capital impact formula are illustrated in Figure 3.

The first step (see the left box) is to determine an appropriate demand indicator, or demand unit, for the particular type of infrastructure. The demand/service indicator measures the number of demand units for each unit of development. For example, an appropriate indicator of the demand for schools is growth in student enrollment and the increase in enrollment can be estimated from the average number of students per housing unit. The second step in the generic formula is shown in the next circle. Infrastructure units per demand unit are typically called **level of service (LOS) standards**. In keeping with the school example, a common LOS standard is square feet per student. The third step in the generic formula is the cost of various infrastructure units. To complete the school example, this part of the formula would establish the cost per square foot for school construction. The product of each component in the formula is the capital cost amount per development unit (e.g., per housing unit or per 1,000 square feet of nonresidential space).

Figure 3. Generic Capital Impact Formula



Credits

A general requirement common to capital impact methodologies is the evaluation of *credits*. Two types of credits should be considered, **future revenue credits** and **site-specific credits**. Future revenue credits are necessary to avoid potential double payment situations arising from a one-time capital impact payment plus the payment of other revenues that may also fund the same growth-related capital improvements.

Future revenue credits are dependent upon the capital impact methodology used in the cost analysis. The incremental expansion methodology is best suited for public facilities that will be expanded incrementally in the future. Because new development will provide front-end funding of infrastructure, there is a potential for double payment of capital costs due to future principal payments on existing debt for public facilities. That is, because new development that may pay a capital impact will also pay taxes to retire debt for the same type of infrastructure, a credit is included in the capital impact calculation to account for this. (A credit is not necessary for interest payments if interest costs are not included in the capital impacts.) For the City of Fredericksburg, a future revenue credit is necessary and is calculated for Schools capital impacts, due to outstanding debt for previous capacity expansion projects. Detail is provided in this report in the applicable chapter.

The plan-based methodology is also used in this study. When using a plan-based method, it is important to determine if new development will contribute toward the cost of future public facilities. For the City of Fredericksburg, this type of credit is necessary for the Schools and Fire/EMS capital

impacts, due to future debt for planned capacity expansion projects. Detail is provided in this report in the applicable chapter.

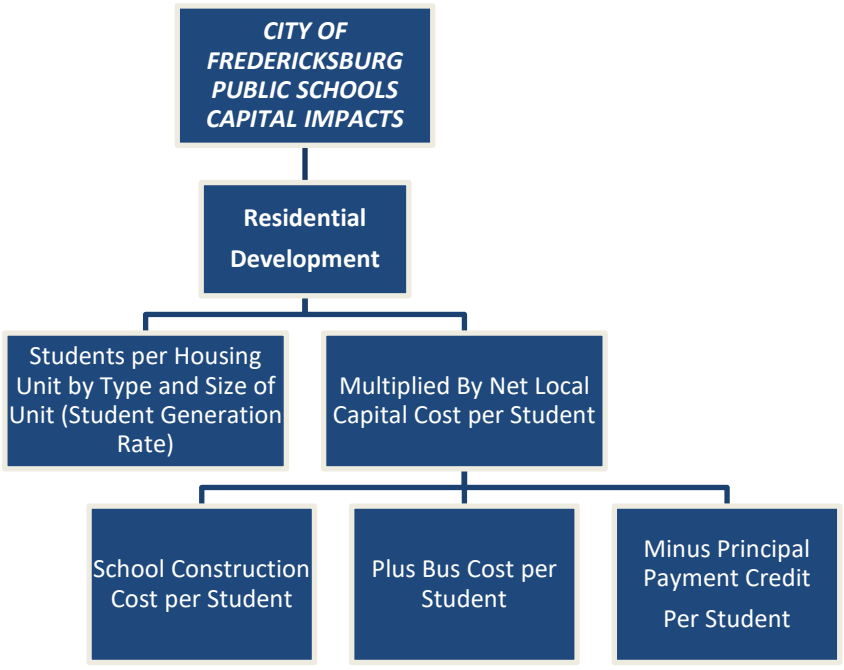
The second type of credit is a **site-specific credit** for system improvements that have been included in the capital impact calculations. A site-specific credit is handled during implementation and would reduce the capital impact amount due to contributions of improvements or land that mitigate new development's impact on the infrastructure needs covered in the capital impact program. Policies and procedures related to site-specific credits for system improvements should be addressed in the policy that establishes the City Capital Impact program. However, the general concept is that applicants may be eligible for site-specific credits or reimbursements *only if they provide system improvements that have been included in the capital impact calculations*. Project improvements normally required as part of the development approval process would not be eligible for credits against capital impacts.

PUBLIC SCHOOLS FACILITIES CAPITAL IMPACTS

Methodology

Public Schools Facilities capital impact methodology is based on the need for future public school capacity due to growth and is calculated using the current average City of Fredericksburg public school student generation rates (by type and size of unit), level of service standards, and local costs. The capital impact amount is determined using incremental expansion methodology, and costs are allocated 100 percent to residential development. Figure 4 illustrates the methodology used to calculate the capital impact. It is intended to read like an outline, with lower levels providing a more detailed breakdown of the infrastructure components. Schools' capital impact is derived from the product of students per housing unit (by type and size of unit) multiplied by the net capital cost per student. The boxes in the next level down indicate detail on the components. A credit for future principal payments on existing General Obligation and other debt is included.

Figure 4. Fredericksburg Public Schools Capital Impact Methodology Diagram



Public School Capacity Needs

Recent public school enrollment projections were provided by Fredericksburg City Public Schools (FCPS) from Crabtree and the Weldon Cooper Center. The enrollment projections do not include a comprehensive residential growth projection but do consider the potential for enrollment growth from new residential development. See the footnote to the following figure for Weldon Cooper Center's projection methodologies. A recommended projection is provided below reflecting an average between Weldon Cooper Center's projections 1 and 2, which integrates an assumption of decreased enrollment due to COVID-19. Note: Multifamily units shown below reflect non-age restricted units.

Figure 5. FCPS Public School Enrollment Projections

											Five-Year Increments>>>			
	Base Year	1	2	3	4	5	6	7	8	9	10	15	20	
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2037	2042	**Net Increase**
Housing Units														
Single Family Detached	5,034	5,053	5,072	5,092	5,112	5,132	5,153	5,174	5,195	5,217	5,239	5,325	5,416	**382**
Single Family Attached	1,208	1,246	1,285	1,324	1,364	1,405	1,446	1,488	1,531	1,574	1,618	1,790	1,972	**764**
Multifamily Non-Age Restricted	5,155	5,297	5,419	5,543	5,669	5,797	5,927	6,060	6,194	6,331	6,469	7,013	7,588	**2,433**
Total	**11,397**	**11,596**	**11,776**	**11,959**	**12,145**	**12,334**	**12,526**	**12,722**	**12,920**	**13,122**	**13,326**	**14,128**	**14,976**	**3,579**
K-12 Enrollment Projections	*SY 21-22*	*SY 22-23*	*SY 23-24*	*SY 24-25*	*SY 25-26*	*SY 26-27*	*SY 27-28*	*SY 28-29*	*SY 29-30*	*SY 30-31*	*SY 31-32*	*SY 36-37*	*SY 41-42*	
Actual Enrollment (Fall)	3,547													
Crabtree Projection	3,499	*3,599*	*3,678*	*3,739*	*3,778*	*3,802*	*3,847*	*3,913*	*3,998*	*4,081*				
Weldon Cooper Center Projection 1 ^	3,494	*3,582*	*3,642*	*3,724*	*3,763*	*3,780*	*3,830*	*3,928*	*4,021*	*4,131*				
Weldon Cooper Center Projection 2 ^	3,659	*3,741*	*3,782*	*3,839*	*3,879*	*3,892*	*3,942*	*4,035*	*4,142*	*4,240*				
Weldon Cooper Center Projection 3 ^	3,747	*3,806*	*3,829*	*3,888*	*3,938*	*3,943*	*3,990*	*4,082*	*4,189*	*4,274*				
Projected FCPS Enrollment**	**3,547**	**3,662**	**3,712**	**3,782**	**3,821**	**3,836**	**3,886**	**3,982**	**4,082**	**4,186**	**4,250**	**4,501**	**4,767**	**1,220**

^ From Weldon Cooper Center: "Projection 1 assumes that students who were expected to enroll but didn't last year will not enroll this fall, while projection 2 assumes half will and projection 3 assumes all students expected last year will enroll this fall. The projections all show a fairly similar trend of the enrollment growth prior to 2020 continuing, although at a slightly slower rate. Growth prior to 2020 was driven primarily by a stable number of births in the region and more families moving into the division. After 2026 the projections expect enrollment growth to accelerate, driven by larger entering Kindergarten classes. This growth is based on projected births, which assumes that the currently low fertility rates will not decline further. Provided that fertility rates do not decline, the increase in the region's childbearing age population during this decade will cause the number of births in the region to increase. The main limitation to these projections is that they are not able to account for changes in the amount of development in the city, the projections essentially assume that construction rates over the past few years will continue. Fredericksburg's past enrollment growth rates have typically been closely tied to the amount of home construction in the city, which has been somewhat cyclical.

*** Projections through 2031 reflect an average of Projections 1 and 2 from Weldon Cooper Center (given alignment with actual enrollment in Fall 2021); remaining years TischlerBise (growth from housing added to previous year).*

Figure 6 provides detail on projected enrollment for FCPS, existing capacity, and utilization (enrollment divided by capacity). As shown, capacity is projected to reach 95 percent within the next three years and reach 100 percent within seven years.

Figure 6. Fredericksburg Public Schools Projected Enrollment, Capacity, and Utilization

	Base Year	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
	SY 21-22	*SY 22-23*	*SY 23-24*	*SY 24-25*	*SY 25-26*	*SY 26-27*	*SY 27-28*	*SY 28-29*	*SY 29-30*	*SY 30-31*	*SY 31-32*
Projected Enrollment	3,547	3,662	3,712	3,782	3,821	3,836	3,886	3,982	4,082	4,186	4,250
Capacity*	3,994	3,994	3,994	3,994	3,994	3,994	3,994	3,994	3,994	3,994	3,994
Utilization^	*89%*	*92%*	*93%*	*95%*	*96%*	*96%*	*97%*	***100%***	***102%***	***105%***	***106%***

** Existing capacity as of SY21-22.*

^ TischlerBise highlighting at 100% or greater. Does not reflect Fredericksburg City Public Schools or City of Fredericksburg policy or direction on utilization threshold.

Public School Students per Housing Unit

Fredericksburg City Public Schools (FCPS) provided geocoded student data by school and grade level. TischlerBise used the Commissioner of the Revenue tax parcel file to match student data with housing unit type and the universe of estimated housing units by type to derive student generation rates for FCPS. The term "student generation rate" refers to the number of public school students per housing unit in the City of Fredericksburg. (Public school students are a subset of school-age children, which includes students in private schools and home-schooled children. *Data reflect public school students only*.

Student generation rates are calculated for three housing unit types, given demographic characteristics and potential for future development in the City: (1) single family detached (includes manufactured homes); (2) single family attached (townhouse); and (3) multifamily. Rates are provided for three school levels: (1) Elementary School (grades K-5); (2) Middle School (grades 6-8), and (3) High School (grades 9-12). (Pre-K is not included in the student generation rates as it is not universally provided.)

Figure 7. FCPS Estimated Student Generation Rates by Type of Unit

STUDENTS in Housing Units from School Data File

	Mercer Elem	*Lafayette Elem*	*Walker Grant Middle*	*Monroe High*	*Total K-12*	*OWG [Pre-K/Spec]*	*Grand Total*
Single Family Detached	177	385	334	471	1,367	34	1,401
Single Family Attached	154	83	102	144	483	17	500
Multifamily	548	288	305	372	1,513	80	1,593
	879	756	741	987	3,363	131	3,494
Unknown Type of Housing	17	49	42	57	165	4	169
TOTAL STUDENTS	896	805	783	1,044	3,528	135	3,663

HOUSING UNITS 2021

Single Family Detached	5,034
Single Family Attached	1,208
Multifamily (Non-Age Restricted)	5,155
Subtotal (Non-Age Restricted)	**11,397**
Multifamily Age Restricted	596
Grand Total	11,993

STUDENT GENERATION RATES

Summary (Rounded)	**Elementary**	**Middle**	**High**	**Total K-12**
Single Family Detached	0.112	0.066	0.094	0.272
Single Family Attached	0.196	0.084	0.119	0.400
Multifamily (Non-Age Restricted)	0.162	0.059	0.072	0.294

Sources: Fredericksburg City Schools data; City of Fredericksburg, Commissioner of Revenue data; TischlerBise.

Given data from the City tax parcel file and the student data file, rates by type of unit and bedroom count can be derived for single family detached and single family attached units. (Data on bedroom count for multifamily units are not available in the tax parcel file.)

A summary of Student Generation Rates is provided in Figure 8. Detail is provided in the Appendix.

Figure 8. Estimated FCPS Student Generation Rates by Type and Size of Unit Summary

		Elementary	Middle	High	Total K-12
Single Family Detached					
	0-2 Bedrooms	0.057	0.033	0.041	0.131
	3 Bedrooms	0.096	0.054	0.075	0.224
	4 Bedrooms	0.161	0.092	0.137	0.390
	5+ Bedrooms	0.132	0.112	0.155	0.398
	Average	**0.112**	**0.066**	**0.094**	**0.272**
Single Family Attached					
	0-2 Bedrooms	0.222	0.082	0.123	0.428
	3+ Bdrms	0.180	0.086	0.117	0.383
	Average	**0.196**	**0.084**	**0.119**	**0.400**
Multifamily					
	All Sizes	**0.162**	**0.059**	**0.072**	**0.294**

Public School Facilities Level of Service Standards

This section provides current inventories of elementary, middle, and high schools in Fredericksburg Public City Schools (FPCS). The data contained in these tables determine Level of Service (LOS) infrastructure standards for school buildings and sites on which the capital impacts are based. Levels of service are shown based on two sets of figures—current enrollment and capacity—with the highlighted factor indicating the level of service on which the capital impacts are based.

Elementary Schools

As indicated in Figure 9, the elementary schools have a total of 240,651 square feet of floor area on 60.2 acres. Total enrollment from fall 2021 is 1,724 and a school capacity of 1,950. Utilization is calculated by dividing enrollment by school capacity. In Fredericksburg elementary schools for the most recent school year (2021-22), current overall average utilization is at 88 percent.

Levels of service are shown at the bottom of Figure 9. Level of service standards are calculated by dividing the amount of infrastructure by total enrollment and capacity.

Capacity is used to conservatively determine level of service, reflecting the point at which no excess capacity exists in the system. The current level of service for elementary schools is 123 square feet per student (240,651 square feet / 1,950 students) and .03 acres per student. By using the lower level of service to calculate capital impact costs, the City is not committing to achieving a higher level of service to serve new development than that is provided today. The shaded area reflects the levels of service standards used in the capital impact calculation.

Figure 9. Fredericksburg Public City Schools: Elementary Schools Level of Service

ELEMENTARY SCHOOLS (K-5) ***Inventory, Enrollment, and Levels of Service*** *Facility*	*Site Acreage*	*Building Square Feet*	*Portables Classrooms*	*Official 2021 (Sept) Enrollment*	*Capacity*	*Current Utilization*
Hugh Mercer Elementary School	38.6	142,891	9	924	940	98%
Lafayette Elementary School	21.5	97,760	2	800	1,010	79%
TOTALS	**60.2**	**240,651**	**11.0**	**1,724**	**1,950**	**88%**

Elementary School Levels of Service	*Demand Units (Students)*	*Acres per Student*	*Building SF per Student*	*Portables per Student*
LOS based on Current Enrollment	1,724	0.034	139	0.0063
LOS based on Capacity	**1,950**	**0.030**	**123**	**0.0056**

Sources: City of Fredericksburg (Property Records); Fredericksburg Public Schools

Middle School

As indicated in Figure 10, the FCPS middle school (Walker-Grant) has a total of 103,590 square feet of floor area on 21.5 acres. Total enrollment at the school from fall 2021 is 785 and a school capacity of 880. Utilization is calculated by dividing enrollment by school capacity. In the Fredericksburg middle school, current overall average utilization is at 89 percent.

Levels of service are shown at the bottom of Figure 10. Level of service standards are calculated by dividing the amount of infrastructure by total enrollment and capacity.

Capacity is used to conservatively determine level of service, reflecting the point at which no excess capacity exists in the system. The current level of service for the middle school is 117 square feet per student (103,590 square feet / 880 students) and .024 acres per student. By using the lower level of service to calculate the capital impacts, the City is not committing to achieving a higher level of service to serve new development than that is provided today. The shaded area reflects the levels of service standards used in the capital impact calculation.

Figure 10. Fredericksburg Public City Schools: Middle School Level of Service

MIDDLE SCHOOL (Grades 6-8)						
Inventory, Enrollment, and Utilization	*Site*	*Building*	*Portables*	*Official 2021 (Sept)*		*Current*
Facility	*Acreage*	*Square Feet*	*Classrooms*	*Enrollment*	*Capacity*	*Utilization*
Walker-Grant Middle School	21.5	103,590	2	785	880	89%
TOTALS	**21.5**	**103,590**	**2**	**785**	**880**	**89%**

Middle School Levels of Service	*Demand Units (Students)*	*Acres per Student*	*Building SF per Student*	*Portables per Student*
LOS based on Current Enrollment	785	0.027	131	0.0025
LOS based on Capacity	**880**	**0.024**	**117**	**0.0022**

Source: City of Fredericksburg; Fredericksburg Public Schools

High School

Level of service factors for the Fredericksburg City High School is shown in Figure 11. The FCPS high school (James Monroe) has a total of 198,000 square feet of floor area on 23.7 acres. Total enrollment at the school from fall 2021 is 1,038 and a school capacity of 1,164. Utilization is calculated by dividing enrollment by school capacity. In the Fredericksburg high school, current overall average utilization is at 89 percent.

Levels of service are shown at the bottom of Figure 11. Level of service standards are calculated by dividing the amount of infrastructure by total enrollment and capacity.

Capacity is used to conservatively determine level of service, reflecting the point at which no excess capacity exists in the system. The current level of service for the high school is 170 square feet per student (198,000 square feet / 1,164 students) and .020 acres per student. By using the lower level of service to calculate the capital impacts, the City is not committing to achieving a higher level of service to serve new development than that is provided today. The shaded area reflects the levels of service standards used in the capital impact calculation.

Figure 11. Fredericksburg Public City Schools: High School Level of Service

HIGH SCHOOL (Grades 9-12) ***Inventory, Enrollment, and Utilization*** *Facility*	*Site Acreage*	*Building Square Feet*	*Portables Classrooms*	*Official 2021 (Sept) Enrollment*	*Capacity*	*Current Utilization*
James Monroe High School	23.7	198,000	0	1,038	1,164	89%
TOTALS	**23.7**	**198,000**	**0**	**1,038**	**1,164**	**89%**

High School Levels of Service	*Demand Units (Students)*	*Acres per Student*	*Building SF per Student*	*Portables per Student*
LOS based on Current Enrollment	1,038	0.022	190	0.0000
LOS based on Capacity	**1,164**	**0.020**	**170**	**0.0000**

Source: City of Fredericksburg; Fredericksburg Public Schools

Public School Construction Costs

TischlerBise obtained the estimated cost for new school construction from the City of Fredericksburg as indicated in the City's FY22 Capital Improvements Plan. The cost estimate reflects factors for an elementary or middle school. A summary of the factors is shown in Figure 12.

Figure 12. Elementary and Middle School Facility Factors

Elementary and Middle School Summary

Current Elementary and Middle School Sq. Ft.	344,241
Current Elementary and Middle School Capacity	2,830
Average Elementary and Middle School Sq.Ft. per Student	122
Average Elementary and Middle School Capacity per School	940

As shown in Figure 13, the average current cost per student is $43,617, or $358 per square foot—estimated based on the assumption of a school with a capacity of 940 and 122 square feet per student from elementary and middle school average levels of service (as shown in Figure 12).

Figure 13. Public School Construction Costs

School	*Estimated Construction Cost (2021$)*	*Seats*	*Cost Per Seat*	*Square Feet per Seat (Avg Elem & MS)*	*Cost Per Sq. Ft.*
New School Construction*	$41,000,000	940	$43,617	122	$358
TOTAL	**$41,000,000**	**940**	**$43,617**	**122**	**$358**

** Cost estimate includes planning, engineering, site selection, and construction; (averages reflect elementary and middle school)*
Source: City of Fredericksburg FY2022 Capital Improvements Plan; Fredericksburg City Public Schools.

Land Costs

Costs for land acquisition are not included as a separate cost factor in the capital impact calculation.

Bus Costs

Buses are another infrastructure component to be included in the capital impacts. New buses will need to be purchased by the City to accommodate increased enrollment. Total current value of the fleet is estimated at approximately $6.2 million, which equates to a current cost of $1,744 per student (based on K-12 enrollment). Levels of service and costs are provided below in Figure 14 for the fleet.

Figure 14. Buses Levels of Service and Costs

	Number of Units	*Cost/Vehicle*	*Total Cost*
FCPS Buses	57	$108,500	$6,184,500
TOTAL	**57**	**$108,500**	**$6,184,500**

Fredericksburg Public Schools K-12 Enrollment (2021-22)	3,547
Buses/Vehicles per Student	0.016
Cost per Student	**$1,744**

Source: Fredericksburg City Public Schools

Capital Impact Study Cost

Included in the capital impact amount is the cost for preparation of the Schools portion of the Capital Impacts Study. This is calculated based on the projected growth in enrollment in the City over the next six years, reflecting the CIP timeframe and an appropriate period of time before the capital impacts should be updated to reflect changes in development, capital improvement projects, and levels of service. The cost per student of $67 is derived by dividing the consultant cost by the projected increase in enrollment over six years. See below.

Figure 15. Capital impact Study (Schools Portion)

Schools Consultant Fee	$22,704
Projected Increase in Enrollment (6 yrs)	339
Cost per student	$67

Credit for Future Principal Payments on School Improvements

Because the City has existing debt for school capacity expansions and plans to issue debt for future school construction, TischlerBise recommends a credit for future principal payments. City of Fredericksburg Finance staff provided the amount of projected outstanding education-related debt and principal payment schedules for existing debt. Projected outstanding debt (principal only) totals approximately $36 million for schools. (Only credits for principal payments are included because interest costs are not included in the capital impact costs.)

Additional debt is anticipated to be issued for a new school construction. TischlerBise projected future debt service payments based on an assumed debt issuance of $34.5 million at 3 percent interest over 30 years per direction from the City.

Credit calculations based on principal payments to be made by the City on outstanding and future public school debt is shown in the following two figures. A credit is necessary since new residential units that pay school capital impact contributions will also contribute to future principal payments on school debt through property taxes. Credits are calculated on a per student basis to reflect the proportionate share of debt service per development unit, which is based on demand specific to the land use receiving the credit (i.e., for schools, the land use is a housing unit). It is not linked to property value, which would shift the capital impact approach away from a land use regulation toward a tax. To account for the time value of money, annual principal payments per student are discounted using a net present value formula based on a discount rate of 3 percent, which reflects the estimated interest rate for City-issued debt.[1]

The combined credit amount of $9,164 is subtracted from the gross capital cost per student to derive a net capital cost per student for school facilities (see Figure 17).

[1] Applying the discount rate (interest rate) accounts for the time value of money; in other words, it determines the value today of the credit per demand unit when the debt is retired in the future. That is, a certain amount of money today will have different buying power than the same amount of money in the future because there is an opportunity to earn interest on the money and because inflation will increase prices.

Figure 16. Credit for Future Principal Payments on Existing and Future Debt

Fiscal Year	*Existing Principal Payments*	*Projected Principal Payments*	*TOTAL*	*Total Students [1]*	***Credit per Student***
FY22	$1,846,589		$1,846,589	3,547	**$521**
FY23	$1,955,228		$1,955,228	3,662	**$534**
FY24	$2,080,228	$725,164	$2,805,392	3,712	**$756**
FY25	$2,205,228	$746,919	$2,952,147	3,782	**$781**
FY26	$2,340,228	$769,327	$3,109,555	3,821	**$814**
FY27	$2,475,228	$792,407	$3,267,635	3,836	**$852**
FY28	$2,615,228	$816,179	$3,431,407	3,886	**$883**
FY29	$2,760,228	$840,664	$3,600,892	3,982	**$904**
FY30	$2,920,228	$865,884	$3,786,112	4,082	**$928**
FY31	$0	$891,861	$891,861	4,186	**$213**
FY32	$0	$918,617	$918,617	4,250	**$216**
FY33	$0	$946,175	$946,175	4,299	**$220**
FY34	$0	$974,560	$974,560	4,349	**$224**
FY35	$0	$1,003,797	$1,003,797	4,399	**$228**
FY36	$0	$1,033,911	$1,033,911	4,449	**$232**
FY37	$0	$1,064,928	$1,064,928	4,501	**$237**
FY38	$0	$1,096,876	$1,096,876	4,553	**$241**
FY39	$0	$1,129,783	$1,129,783	4,606	**$245**
FY40	$0	$1,163,676	$1,163,676	4,659	**$250**
FY41	$0	$1,198,586	$1,198,586	4,712	**$254**
FY42	$0	$1,234,544	$1,234,544	4,767	**$259**
FY43	$0	$1,271,580	$1,271,580	4,822	**$264**
FY44	$0	$1,309,728	$1,309,728	4,878	**$269**
FY45	$0	$1,349,019	$1,349,019	4,934	**$273**
FY46	$0	$1,389,490	$1,389,490	4,991	**$278**
FY47	$0	$1,431,175	$1,431,175	5,049	**$283**
FY48	$0	$1,474,110	$1,474,110	5,107	**$289**
FY49	$0	$1,518,333	$1,518,333	5,166	**$294**
FY50	$0	$1,563,883	$1,563,883	5,226	**$299**
FY51	$0	$1,610,800	$1,610,800	5,286	**$305**
FY52	$0	$1,659,124	$1,659,124	5,347	**$310**
FY53	$0	$1,708,898	$1,708,898	5,409	**$316**
	$21,198,412	$34,500,000	$51,896,595		**$12,972**
				Discount Rate	3.0%
				Net Present Value [2]	**$9,164**

[1] See Appendix for enrollment projections.

[2] To account for the time value of money, total credit per student is discounted using a net present value formula assuming the average interest rate from current debt as shown.

Source: City of Fredericksburg; TischlerBise

Public Schools Capital Impact Input Variables

Factors used to derive the school capital impact are summarized in Figure 17. Capital impacts for public schools are based on student generation rates (i.e., public school students per housing unit) and are only requested of residential development. (For further discussion on student generation rates see the Appendix.) Level of service standards are based on current costs per student for public school buildings, buses, and the Capital Impact Study as discussed in the previous sections and summarized below. The credit for future principal payments is subtracted from the gross capital cost per student to derive the net capital cost per student.

Figure 17. Public Schools Capital Impact Input Variables

INPUT VARIABLES:	Fredericksburg City Schools			
	School Level			
Public School Students Per Housing Unit (2021-22)				***TOTAL***
(Averages)	*Elementary*	*Middle*	*High*	
Single Family Detached	0.112	0.066	0.094	0.272
Single Family Attached	0.196	0.084	0.119	0.400
Multifamily (Non-Age Restricted)	0.162	0.059	0.072	0.294
Current Level of Service Standards				
	Elementary	*Middle*	*High*	
Building Square Feet Per Student	123	117	170	
Total Cost Per Square Foot	$358	$358	$358	
Total Building Construction Cost Per Student	$43,975	$41,829	$60,778	
Buses per Student	0.016	0.016	0.016	
Cost per Bus	$108,500	$108,500	$108,500	
Bus Cost Per Student	$1,744	$1,744	$1,744	
Consultant Study Cost Per Student	$67	$67	$67	
Total Gross Capital Cost Per Student	**$45,786**	**$43,640**	**$62,589**	
Local Share of Capacity Cost	100%	100%	100%	
Total Gross Local Capital Cost Per Student	**$45,786**	**$43,640**	**$62,589**	
Principal Payment Credit Per Student	**($9,164)**	**($9,164)**	**($9,164)**	
Total Net Local Capital Cost Per Student	**$36,622**	**$34,476**	**$53,425**	

Maximum Allowable Capital Impact Amounts for Public Schools

Figure 18 shows the schedule of maximum supportable capital impact amounts for Public Schools in the City of Fredericksburg for average-sized units. (Capital impacts per housing unit by bedroom count are shown below in Figure 19.)

The amounts are calculated by multiplying the student generation rate by the net capital cost per student for each type of school by type of housing and then added together to derive the total Public Schools capital impact amount. For example, for a single family detached unit, the elementary portion of the capital impact is calculated by multiplying the student generation rate of .112 by the net capital cost per elementary student of $36,622, which results in $4,101 (truncated) per single family detached housing unit. This is repeated for the other school levels of the capital impact amount. All portions are added together to calculate the total capital impact amount by type of residential unit (i.e., for single family detached, $4,101 + $2,275 + $5,021 = $11,397.) The calculation is repeated for each type of residential unit.

Figure 18. City of Fredericksburg Maximum Supportable Schools Capital impacts

MAXIMUM SCHOOL CAPITAL IMPACT AMOUNTS (AVERAGE SIZE): Fredericksburg City Public Schools				
Capital Impact Per Housing Unit (Weighted Average)	*Elementary*	*Middle*	*High*	***TOTAL***
Single Family Detached	$4,101	$2,275	$5,021	**$11,397**
Single Family Attached	$7,177	$2,895	$6,357	**$16,429**
Multifamily (Non-Age Restricted)	$5,932	$2,034	$3,846	**$11,812**

Figure 19 provides the capital impact schedule per housing unit by housing unit size (number of bedrooms per unit). Student generation rates by bedroom count are provided at the top of the figure (see the Appendix for calculation details). This number is multiplied by the net capital cost per school level to derive the capital impact per level per unit by size of housing unit.

For a single family unit up to 2 bedrooms, the maximum capital impact amount is $5,414; a single family with 3 bedrooms, the maximum amount is $9,382; with 4 bedrooms, the maximum amount is $16,386; and for 5 or more bedrooms, the maximum amount is $16,975. Two size categories are provided for single family attached/townhouse units; bedroom count information is not available for multifamily units, therefore the average amount is provided.

Figure 19. City of Fredericksburg Maximum Allowable Public Schools Capital Impact Amounts Per Housing Unit by Bedroom Count

MAXIMUM SCHOOL CAPITAL IMPACT AMOUNTS (BY BEDROOM COUNT): Fredericksburg City Public Schools

Public School Students Per Housing Unit (2021-22) (By Bedroom Count)

		Elementary	*Middle*	*High*	***TOTAL***
Single Family Detached	0-2 Bedrooms	0.057	0.033	0.041	0.131
	3 Bedrooms	0.096	0.054	0.075	0.224
	4 Bedrooms	0.161	0.092	0.137	0.390
	5+ Bedrooms	0.132	0.112	0.155	0.398
	Average	***0.112***	***0.066***	***0.094***	***0.272***
Single Family Attached	0-2 Bedrooms	0.222	0.082	0.123	0.428
	3+ Bdrms	0.180	0.086	0.117	0.383
	Average	***0.196***	***0.084***	***0.119***	***0.400***
Multifamily (Non-Age Restricted)	*All Sizes*	***0.162***	***0.059***	***0.072***	***0.294***

	Elementary	*Middle*	*High*	
Net Local Capital Cost Per Student	**$36,622**	**$34,476**	**$53,425**	

School Capital Impacts Per Housing Unit (By Bedroom Count)

		Elementary	*Middle*	*High*	***TOTAL***
Single Family Detached	0-2 Bedrooms	$2,087	$1,137	$2,190	**$5,414**
	3 Bedrooms	$3,515	$1,861	$4,006	**$9,382**
	4 Bedrooms	$5,896	$3,171	$7,319	**$16,386**
	5+ Bedrooms	$4,834	$3,861	$8,280	**$16,975**
	Average	***$4,101***	***$2,275***	***$5,021***	***$11,397***
Single Family Attached	0-2 Bedrooms	$8,130	$2,827	$6,571	**$17,528**
	3+ Bdrms	$6,591	$2,964	$6,250	**$15,805**
	Average	***$7,177***	***$2,895***	***$6,357***	***$16,429***
Multifamily (Non-Age Restricted)	*All Sizes*	***$5,932***	***$2,034***	***$3,846***	***$11,812***

Capital Plans for Schools

Fredericksburg City Public Schools (FCPS) has identified a need for future capacity at all school levels over the next nine years. The anticipated capital improvement plan is as follows:

- Build a new elementary or middle school to address capacity issues, which will add capacity for both elementary and middle school levels.
- Expand capacity at the high school level.

Service Area

TischlerBise recommends a citywide collection and expenditure zone. Construction of new schools or additions will free up space at existing schools thus providing relief in other parts of the district. Adjustments to school district boundaries on an occasional basis maximize capacities at respective schools (as has been done by FCPS in recent years).

FIRE AND EMS CAPITAL IMPACTS

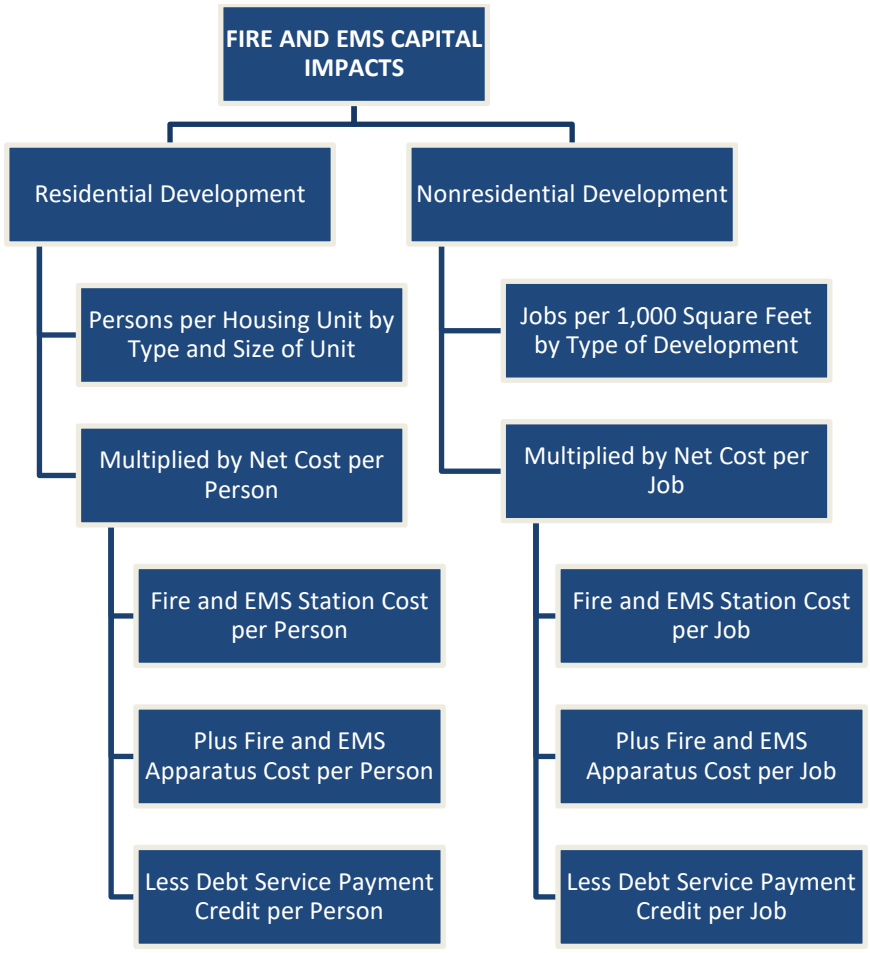
Methodology

Fredericksburg Fire Department capital impact costs are calculated using the plan-based methodology. Components include:

- Fire Stations
- Fire and EMS Apparatus

Capital impacts are calculated on a per capita basis for residential development and a per job basis for nonresidential development. Figure 20 illustrates the methodology used to determine the capital impact amount. 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 and size) multiplied by the net cost per person. The nonresidential portion is derived from the product of jobs per 1,000 square feet of nonresidential space multiplied by the net cost per job.

Figure 20. Fire & EMS Capital Impact Methodology Diagram



Cost Allocation for Fire and EMS Facilities

The City of Fredericksburg Fire Department provided Fire and EMS calls for service data from October 2020 to October 2021 with type of land use identified. The calls for service data is grouped into residential and nonresidential land use categories with the resulting percentage distribution used to allocate demand for Fire facilities to category of development. Shown in Figure 21, residential land uses accounted for an average of 60 percent of calls for service, while nonresidential land uses accounted for 40 percent.

Figure 21. Fire Calls for Service and Proportionate Share Factors

	Oct 2020-Oct 2021	
	# of Calls	*% by Land Use*
Residential	2,540	60%
Nonresidential	1,662	40%
Subtotal to Known Addresses	**4,202**	**100%**
Unknown	874	
Traffic	858	
Subtotal Other	**1,732**	
Grand Total	**5,934**	

Fire Station Level of Service and Cost Factors

The City currently has two fire stations serving existing development with no excess capacity in the current stations.

- Fire Station 1: 6,808 square feet
- Fire Station 2: 9,014 square feet

The City plans to build a new station within the next five to ten years to serve growth. It is anticipated that the new station will replace and expand Station 2, resulting in two stations serving the City.

Planned level of service for fire stations is shown in Figure 22 and is allocated to land use categories based on proportionate share percentages from calls for service analysis as discussed above. Of 28,000 square feet (planned to be built within the next six years), 16,800 square feet (60 percent) is allocated to residential growth and 11,200 square feet (40 percent) is allocated to nonresidential growth.

Allocated Fire station square footage is divided by projected City population and jobs in 2042—reflecting planned capacity that is projected to serve 20 years of growth. The resulting level of service for Fire stations is 0.44 square feet of Fire station space per capita and 0.43 square feet per job.

Estimated costs for Fire Station construction are from the City of Fredericksburg CIP. Fire Station 1 expansion and renovation is estimated at $3.94 million for an average cost per square foot of $360. The planned new fire station is estimated at $613 per square foot.

The cost per person or cost per job is derived by multiplying square feet per demand unit by the weighted average cost per square foot. For example, the residential cost per person is $226 (0.44 square feet per person x $514 per square foot = $226 per person (rounded)).

Figure 22. Fire Station Planned Level of Service and Cost Factors

Facility	Square Feet	Cost per Square Foot^	Total Cost
Fire Station 1 (Existing plus Expanded Space)	11,000	$360	$3,960,000
Planned New Fire Station	17,000	$613	$10,425,000
TOTAL	**28,000**	$514	**$14,385,000**

** Anticipated to replace and expand current Station 2 (currently 9,014 sq. ft.)*

^ City of Fredericksburg FY22 CIP

Level-of-Service Standards	**Residential**	**Nonresidential**	**Total**
Proportionate Share	60%	40%	100.0%
Share of Facility Square Feet	16,800	11,200	28,000
Demand Unit	Person	Job	
Number of Demand Units 2042	38,588	26,260	
Square Feet per Demand Unit	**0.44**	**0.43**	

Cost Analysis	**Residential**	**Nonresidential**
Square Feet per Demand Unit	0.44	0.43
Cost per Square Foot	$514	$514
Cost Per Demand Unit	**$226**	**$221**

Fire and EMS Apparatus Level of Service and Cost Factors

Level of service standards and cost factors for Fire and EMS apparatus are provided in this section. Figure 23 provides current and planned inventory, values, and level of service for Fire and EMS apparatus. Future growth in the City will require an expansion of the department's fleet to serve new development to maintain current levels of service. Current cost for the inventory serving existing and projected future City population and employment base totals approximately $11.6 million.

Planned level of service for Fire and EMS apparatus is allocated to land use categories based on proportionate share percentages from calls for service analysis as discussed above, with 60 percent allocated to residential development and 40 percent allocated to nonresidential development.

Allocated Fire and EMS apparatus is divided by projected City population and jobs in 2042— reflecting capacity projected to serve 20 years of growth. (Note, the capital impact calculation reflects the cost for the initial vehicle purchase to expand capacity and does not cover costs to replace vehicles.) The resulting level of service for Fire and EMS apparatus is 0.34 units per 1,000 persons and .34 units per 1,000 jobs.

Estimated costs for Fire and EMS apparatus from the City of Fredericksburg Fire Department are shown in Figure 23. The cost per person or cost per job is calculated by multiplying number of units per demand unit by the weighted average cost per unit. For example, the residential cost per person is $180 (0.34 units per 1,000 persons x $527,955 = $180 per person (rounded).

Figure 23. Fire and EMS Apparatus Planned Inventory, Values, and Level of Service

	NUMBER OF UNITS				
Type of Vehicle	Current	Planned	Total	Current Avg. Cost ($) Per Unit	Current Value ($) Total
Engine	3	1	4	$750,000	$3,000,000
Ladder	1		1	$1,500,000	$1,500,000
Tower	1		1	$1,325,000	$1,325,000
Ambulances (Medics, Rescues)	5	1	6	$325,000	$1,950,000
SUVs/Trucks	8		8	$55,000	$440,000
Haz-Mat Equipment	4		4	$850,000	$3,400,000
TOTAL	**22**	**2**	**24**	**$527,955**	**$11,615,000**

Level-of-Service Standards	**Residential**	**Nonresidential**	**Total**
Proportionate Share	60%	40%	100.0%
Share of Units	13	9	22
Demand Unit	Person	Job	
Number of Demand Units 2042	38,588	26,260	
Unit per 1000 Demand Units	**0.34**	**0.34**	

Cost Analysis	**Residential**	**Nonresidential**
Units per 1,000 Demand Unit	0.34	0.34
Cost per Unit	$527,955	$527,955
Cost Per Demand Unit	**$180**	**$180**

Credit for Future Principal Payments for New Fire Station

The City plans to issue debt to partially finance the renovation and new construction of Fire stations (estimated at a combined amount of $13,215,080). Therefore, TischlerBise recommends a credit for future principal payments on projected future debt to avoid double payment from development that may pay a capital impact contribution and will also pay property taxes to retire the debt. Only principal payments are credited because interest costs are not included in the capital impact calculation.

Figure 24. Credit for Future Principal Payments on Future Fire and EMS Debt

		60.0%	40%			CREDIT	
Fiscal Year	*Projected Principal Payments*	*Residential Share*	*Nonresidential Share*	*Population*	*Jobs*	***Per Person***	***Per Job***
FY23	$277,771	$166,663	$111,108	29,690	25,282	$5.61	$4.39
FY24	$286,104	$171,663	$114,442	30,165	25,333	$5.69	$4.52
FY25	$294,687	$176,812	$117,875	30,648	25,383	$5.77	$4.64
FY26	$303,528	$182,117	$121,411	31,138	25,434	$5.85	$4.77
FY27	$312,634	$187,580	$125,054	31,636	25,485	$5.93	$4.91
FY28	$322,013	$193,208	$128,805	32,142	25,536	$6.01	$5.04
FY29	$331,673	$199,004	$132,669	32,657	25,587	$6.09	$5.19
FY30	$341,624	$204,974	$136,649	33,179	25,638	$6.18	$5.33
FY31	$351,872	$211,123	$140,749	33,710	25,689	$6.26	$5.48
FY32	$362,428	$217,457	$144,971	34,249	25,741	$6.35	$5.63
FY33	$373,301	$223,981	$149,321	34,660	25,792	$6.46	$5.79
FY34	$384,500	$230,700	$153,800	35,076	25,844	$6.58	$5.95
FY35	$396,035	$237,621	$158,414	35,497	25,896	$6.69	$6.12
FY36	$407,916	$244,750	$163,167	35,923	25,947	$6.81	$6.29
FY37	$420,154	$252,092	$168,062	36,354	25,999	$6.93	$6.46
FY38	$432,758	$259,655	$173,103	36,790	26,051	$7.06	$6.64
FY39	$445,741	$267,445	$178,296	37,232	26,103	$7.18	$6.83
FY40	$459,113	$275,468	$183,645	37,679	26,156	$7.31	$7.02
FY41	$472,887	$283,732	$189,155	38,131	26,208	$7.44	$7.22
FY42	$487,073	$292,244	$194,829	38,588	26,260	$7.57	$7.42
FY43	$501,686	$301,011	$200,674	39,051	26,313	$7.71	$7.63
FY44	$516,736	$310,042	$206,694	39,520	26,365	$7.85	$7.84
FY45	$532,238	$319,343	$212,895	39,994	26,418	$7.98	$8.06
FY46	$548,205	$328,923	$219,282	40,474	26,471	$8.13	$8.28
FY47	$564,652	$338,791	$225,861	40,960	26,524	$8.27	$8.52
FY48	$581,591	$348,955	$232,636	41,451	26,577	$8.42	$8.75
FY49	$599,039	$359,423	$239,616	41,949	26,630	$8.57	$9.00
FY50	$617,010	$370,206	$246,804	42,452	26,683	$8.72	$9.25
FY51	$635,520	$381,312	$254,208	42,962	26,737	$8.88	$9.51
FY52	$654,586	$392,752	$261,834	43,477	26,790	$9.03	$9.77
	$13,215,080	$7,929,048	$5,286,032			$213.35	$202.26
					Discount Rate	3.00%	3.00%
					Net Present Value [2]	**$134**	**$124**

[1] See Appendix for development projections.

[2] To account for the time value of money, amount to be credited is discounted using a net present value formula assuming the average interest rate from current debt as shown.

Source: City of Fredericksburg; TischlerBise

Fire and EMS Input Variables and Capital impacts

Maximum Fire and EMS capital impact amounts by land use type are shown below in Figure 25. Capital impact amounts are based on household size for residential development (i.e., persons per housing unit by type and size (see the Appendix for household size calculation details) and jobs per 1,000 square feet for nonresidential development. For residential development, the total net cost per person is multiplied by the household size to calculate the proposed amount (e.g., for a Single Family Detached 0-2 bedroom unit: $272 per person x 1.64 persons per housing unit = $446 per unit (truncated)). For nonresidential development, the total cost per job is multiplied by jobs per 1,000 square feet to calculate the proposed capital impact amount per 1,000 square feet.

Figure 25. Fire and EMS Input Variables and Maximum Capital Impact Amounts by Land Use

Capital Component	Cost per Person	Cost per Job
Fire and Rescue Station	$226.00	$221.00
Fire and Rescue Apparatus and Vehicles	$180.00	$180.00
TOTAL GROSS COST	**$406.00**	**$401.00**
Debt Service Credit	($134.00)	($124.00)
TOTAL NET COST	**$272.00**	**$277.00**

Residential (Per Unit)

Unit Type	Size of Unit	Persons per Housing Unit	Capital Impact per Housing Unit
Single Family Detached	0-2 Bedrooms	1.64	**$446**
	3 Bedrooms	2.18	**$592**
	4 Bedrooms	2.84	**$772**
	5+ Bedrooms	3.20	**$870**
	Average	*2.58*	***$701***
Single Family Attached	0-2 Bedrooms	1.62	**$440**
	3+ Bedrooms	2.33	**$633**
	Average	*2.18*	***$592***
Multifamily	*All Sizes*	*1.91*	***$519***

Nonresidential Development

Land Use Type	Demand Unit	Empl. Per Demand Unit	Capital Impact per Demand Unit
Retail	1,000 sq. ft.	1.73	***$479***
Office, Institutional, and Other Services	1,000 sq. ft.	2.16	***$597***
Industrial	1,000 sq. ft.	1.28	***$354***
Lodging	Room	0.56	***$154***

Service Area

The City of Fredericksburg Fire Department operates as a citywide integrated system with multiple responders per call as well as future capacity improvements being needed at all stations. Therefore, it is recommended that a citywide service area be used

APPENDIX A: LAND USE ASSUMPTIONS

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CITY OF FREDERICKSBURG CAPITAL IMPACT STUDY
DRAFT // January 20, 2022

Overview

This section documents the demographic data and land use projections to be used in the Capital Impacts Study for the City of Fredericksburg. It should be noted that this study is being conducted during the COVID-19 pandemic (March 2020 to current) with some source data collected during this time frame. Data collection from sources such as the U.S. Census Bureau and the Weldon Cooper Center have continued despite the challenges of the pandemic. In addition, residential and nonresidential growth has continued in the City of Fredericksburg.

The following section includes discussion and findings on:

- Household Sizes
- Student Generation Rates
- Current population and housing unit estimates
- Residential projections
- Current employment and nonresidential floor area estimates
- Nonresidential projections

Furthermore, detail is provided on household size and student generation rates in several ways:

- Averages by type of housing unit
- Average by number of bedrooms/square foot of unit

The factors are anticipated to be used to calculate final capital impact amounts in two ways: (1) by type of housing unit and (2) by size of housing unit

Household Size

Capital impact calculations often use per capita standards and persons per housing unit or persons per household to derive proportionate-share fee amounts. (A household is a housing unit that is occupied by year-round residents.) When persons per housing unit are used in the fee calculations, infrastructure standards are derived using year-round population. When persons per household are used in the fee calculations, the capital impact methodology assumes all housing units will be occupied, thus requiring seasonal or peak population to be used when deriving infrastructure standards.

TischlerBise recommends that capital impacts for residential development in the City of Fredericksburg be calculated according to the number of year-round residents per housing unit. As shown below dwellings with a single unit per structure (detached, attached, and mobile homes) averaged 2.53 persons per unit. Dwellings in structures with multifamily units averaged 1.91 year-round residents per unit.

Figure 26. Persons per Housing Unit

Type of Unit	Persons	Housing Units	Hsg Unit %	Persons Per Housing Unit (rounded)
Single Family*	15,080	5,967	51%	2.53
MultiFamily/Other	10,979	5,758	49%	1.91
Total	**26,059**	**11,725**		**2.22**

** Includes single family detached, single family attached, and manufactured homes*
Source: U.S. Census Bureau 2015-2019 American Community Survey 5-Yr Estimates

We evaluated population in housing units in the City using U.S. Census American Community Survey (ACS) 5-Year 2015-2019 Public Use Microdata Sample (PUMS) data. This data is used to derive number of persons per housing unit by type of unit as well as by size of unit (using number of bedrooms per unit). Because PUMS data are only available for areas of roughly 100,000 persons, the City of Fredericksburg is included in the Census Public Use Microdata Area (PUMA) catchment area for both the City and Stafford County. Data is first analyzed for the PUMA and then calibrated to conditions in Fredericksburg.

A series of figures is provided below showing household size by type of unit—first by bedroom count and then by square footage. Square footage data is from the City of Fredericksburg tax parcel file. TischlerBise determined the average size of a housing unit by type of unit and number of bedrooms. Those averages were then plotted to determine the relationship between number of persons in a unit and size of the unit (expressed in square feet). These factors can then be used to derive capital impact amounts scaled to the type and size of a unit.

Single Family Detached Units

Figure 27. Persons per Housing Unit by Number of Bedrooms: Single Family Detached Units

				Recommended Multipliers (2)
Single Family Detached	*Persons (1)*	*Housing Units (1)*	*Unadjusted Multipliers PPHU*	*Persons per Housing Unit*
0-2 Bedrooms	284	156	1.82	1.65
3 Bedrooms	1,875	767	2.44	2.22
4 Bedrooms	2,753	929	2.96	2.69
5+ Bedrooms	1,616	444	3.64	3.30
GRAND TOTAL	6,528	2,296	2.84	2.58

(1) American Community Survey, Public Use Microdata Sample unweighted data for VA PUMA 51115 (2015-19 Census).
(2) Recommended multipliers are scaled to make the average value by type and size of single family detached housing for PUMA 51115 match the average value (scaled to SFD) derived for the City of Fredericksburg from American Community Survey 2015-2019 (5-year ACS) data.

Figure 28. Average Unit Size (Square Feet) by Number of Bedrooms: Single Family Detached Units

Single Family Detached Summary by Bedroom Count and Average Size

	# of Units	Average Sq. Ft.	Average Sq. Ft. (rounded)
0-2 Bedrooms	907	1,160	*1,200*
3 Bedrooms	2,198	1,684	*1,700*
4 Bedrooms	1,580	2,596	*2,600*
5+ Bedrooms	349	3,325	*3,300*
Total/Average	5,034	1,990	*2,000*

Source: City of Fredericksburg Tax Parcel file (2021); TischlerBise analysis

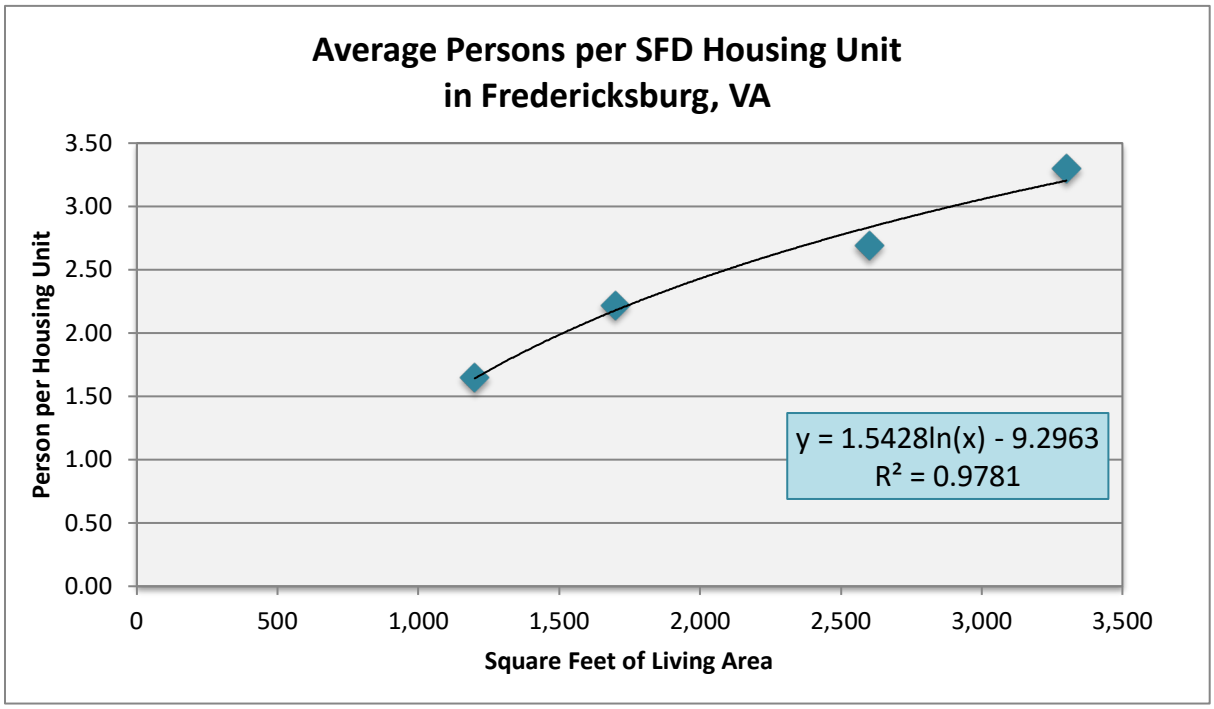
Based on the above information, the relationship among household size, bedroom count, and square feet per unit can be determined. For example, a unit between 1,201 and 1,700 square feet has an estimated household size of 2.18.

Figure 29. Persons per Housing Unit by Unit Size (Square Feet): Single Family Detached Units

Single Family Detached Units: Household Size by Size of Unit

Unit size is from City of Fredericksburg tax parcel data. Average persons per housing unit by bedroom range are derived from and calibrated to 2019 ACS PUMS data for the area that includes the City of Fredericksburg.

Actual Averages per Hsg Unit			*Fitted-Curve Values*	
Bedrooms	*Square Feet (Avg)*	*Persons*	*Sq Ft Range*	*Persons*
0-2	1,200	1.65	1200 or less	1.64
3	1,700	2.22	1201 to 1700	2.18
4	2,600	2.69	1701 to 2600	2.84
5+	3,300	3.30	2601 to 3300	3.20
			3301 or more	3.50



Single Family Attached Units

Figure 30. Persons per Housing Unit by Number of Bedrooms: Single Family Attached Units

				Recommended Multipliers (2)
Single Family Attached	*Persons (1)*	*Housing Units (1)*	*Unadjusted Multipliers PPHU*	*Persons per Housing Unit*
0-2 Bedrooms	118	66	1.79	1.62
3+ Bedrooms	627	244	2.57	2.33
GRAND TOTAL	745	310	2.40	2.18

(1) American Community Survey, Public Use Microdata Sample unweighted data for VA PUMA 51115 (2015-19 Census).
(2) Recommended multipliers are scaled to make the average value by type and size of single family detached housing for PUMA 51115 match the average value (scaled to SFA) derived for the City of Fredericksburg from American Community Survey 2015-2019 (5-year ACS) data.

Figure 31. Average Unit Size (Square Feet) by Number of Bedrooms: Single Family Attached Units

Single Family Attached Summary by Bedroom Count and Average Size

	# of Units	**Average Sq. Ft.**	**Average Sq. Ft. (rounded)**
0-2 Bedrooms	463	1,142	*1,100*
3 +Bedrooms	745	1,974	*2,000*
Total/Average	1,208	1,655	*1,700*

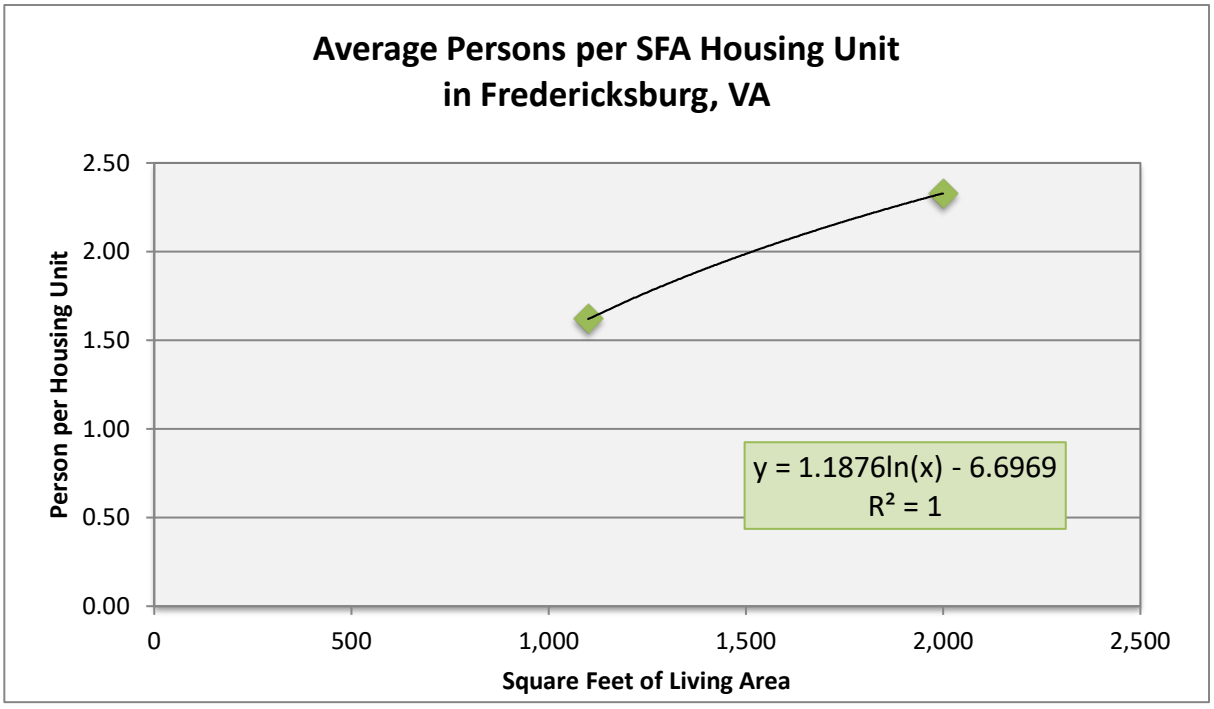
Source: City of Fredericksburg Tax Parcel file (2021); TischlerBise analysis

Figure 32. Persons per Housing Unit by Unit Size (Square Feet): Single Family Attached Units

Single Family Attached Units: Household Size by Size of Unit

Unit size is from City of Fredericksburg tax parcel data. Average persons per housing unit by bedroom range are derived from and calibrated to 2019 ACS PUMS data for the area that includes the City of Fredericksburg.

Actual Averages per Hsg Unit			*Fitted-Curve Values*	
Bedrooms	*Square Feet (Avg)*	*Persons*	*Sq Ft Range*	*Persons*
0-2	1,100	1.62	1100 or less	1.62
3+	2,000	2.33	1101 to 2000	2.33
			2001 or more	2.50



Multifamily Units

Figure 33. Persons per Housing Unit by Number of Bedrooms: Multifamily Units

				Recommended Multipliers (2)
Multifamily	*Persons (1)*	*Housing Units (1)*	*Unadjusted Multipliers PPHU*	*Persons per Housing Unit*
0-1 Bedrooms	163	136	1.20	1.25
2+ Bedrooms	489	221	2.21	2.31
GRAND TOTAL	652	357	1.83	1.91

(1) American Community Survey, Public Use Microdata Sample unweighted data for VA PUMA 51115 (2015-19 Census).
(2) Recommended multipliers are scaled to make the average value by type and size of single family detached housing for PUMA 51115 match the average value derived for the City of Fredericksburg from American Community Survey 2015-2019 (5-year ACS) data.

Unit size data in square feet by bedroom count is not available in the tax parcel data for multifamily units as it is for single family detached and single family attached. Therefore, capital impacts can be provided as an average or by bedroom count.

Residential Estimates and Projections

Current Estimate of Housing Units

The current estimate of housing units in the City of Fredericksburg is from the City tax parcel file and current City apartment listing, provided by the Office of the Commissioner of Revenue. The multifamily unit count reflects apartment and condominium units. Data is as of January 1, 2022.

Figure 34. City of Fredericksburg Current (2022) Housing Unit Estimate

	Jan. 1 Base Year 2022
Housing Units	
Single Family Detached	5,034
Single Family Attached	1,208
Multifamily*	5,751
Total	**11,993**

^ U.S. Census

^^ Weldon Cooper Center (published Jan. 7, 2022)

* Includes Apts, Condos, Age-Restricted Multfamily; detail:	2022
Multifamily Age Restricted	596
Multifamily Non-Age Restricted	5,155
Multifamily Total	**5,751**

Sources: City of Fredericksburg, Commissioner of Revenue data; U.S. Census; Weldon Cooper Center

Current Estimate of Population

Based on the current housing unit estimate and household size factors discussed above, TischlerBise estimates the City's current (January 1, 2022) population at 29,222. The current number of housing units are multiplied by average household sizes, by respective unit to derive the estimate. See Figure 35.

Figure 35. City of Fredericksburg Current (2022) Population Estimate

					Jan. 1
		*4/1/2020^*	*7/1/2020^^*		**Base Year**
		2020	2020	2021	2022
Population	*% alloc.*				
Population in Housing Units	91%	25,476	25,508	26,057	26,606
Group Quarters Population	9%	2,506	2,509	2,563	2,617
Population Total	**100%**	**27,982**	**28,017**	**28,620**	**29,222**

Housing Units	*Wtd Avg*	
Single Family Detached	2.58	5,034
Single Family Attached	2.18	1,208
Multifamily*	1.91	5,751
Total	**2.22**	**11,993**

^ U.S. Census

^^ Weldon Cooper Center (published Jan. 7, 2022)

* Includes Apts, Condos, Age-Restricted Multfamily; detail:	2022
Multifamily Age Restricted	596
Multifamily Non-Age Restricted	5,155
Multifamily Total	**5,751**

Sources: City of Fredericksburg, Commissioner of Revenue data; U.S. Census; Weldon Cooper Center

Student Generation Rates

Fredericksburg City Public Schools (FCPS) provided geocoded student data by school and grade level. TischlerBise used the Commissioner of the Revenue tax parcel file to match student data with housing unit type and the universe of estimated housing units by type to derive the following student generation rates.

Figure 36. FCPS Estimated Student Generation Rates by Type of Unit

STUDENTS in Housing Units from School Data File

	Mercer Elem	*Lafayette Elem*	*Walker Grant Middle*	*Monroe High*	*Total K-12*	*OWG [Pre-K/Spec]*	*Grand Total*
Single Family Detached	177	385	334	471	1,367	34	1,401
Single Family Attached	154	83	102	144	483	17	500
Multifamily	548	288	305	372	1,513	80	1,593
	879	756	741	987	3,363	131	3,494
Unknown Type of Housing	17	49	42	57	165	4	169
TOTAL STUDENTS	896	805	783	1,044	3,528	135	3,663

HOUSING UNITS 2021

Single Family Detached	5,034
Single Family Attached	1,208
Multifamily (Non-Age Restricted)	5,155
Subtotal (Non-Age Restricted)	**11,397**
Multifamily Age Restricted	596
Grand Total	11,993

STUDENT GENERATION RATES

Summary (Rounded)	**Elementary**	**Middle**	**High**	**Total K-12**
Single Family Detached	0.112	0.066	0.094	0.272
Single Family Attached	0.196	0.084	0.119	0.400
Multifamily (Non-Age Restricted)	0.162	0.059	0.072	0.294

Sources: Fredericksburg City Schools data; City of Fredericksburg, Commissioner of Revenue data; TischlerBise.

Given data from the City tax parcel file and the student data file, rates by type of unit and bedroom count can be derived for single family detached and single family attached units. Data on bedroom count for multifamily units are not available in the tax parcel file.

- The first figure (Figure 37) shows students residing in the City by type and size of housing unit in the first three sets of data (yellow-highlighted cells).
- The bottom portion of the figure provides the number of total housing units in the City by type and bedroom count (green-highlighted cells).
- The second figure (Figure 38) shows the student generation rate (number of students / number of total units) for each type and size of housing unit.

Figure 37. FCPS Students and Housing Units

Public School Students by Hsg Type and Bedrooms

Elementary School Students

(Grades K-5)	Bedrooms				
	0-2	*3*	*4*	*5+*	*TOTAL*
Single Family	52	210	254	46	562
	0-2	*3+*			
SF Attached/Townhouse	103	134			237
	All bedrooms				
Multifamily	836				836
TOTAL	991	344	254		1,635

Middle School Students

(Grades 6-8)	Bedrooms				
	0-2	*3*	*4*	*5+*	*TOTAL*
Single Family	30	119	146	39	334
	0-2	*3+*			
SF Attached/Townhouse	38	64			102
	All bedrooms				
Multifamily	305				305
TOTAL	373	183	146	39	741

High School Students

(Grades 9-12)	Bedrooms				
	0-2	*3*	*4*	*5+*	*TOTAL*
Single Family	37	164	216	54	471
	0-2	*3+*			
SF Attached/Townhouse	57	87			144
	All bedrooms				
Multifamily	372				372
TOTAL	466	251	216	54	987
				Grand Total (all grades)	3,363

Housing Units

	Bedrooms				
	0-2	*3*	*4*	*5+*	*TOTAL*
Single Family	907	2,198	1,580	349	5,034
	0-2	*3+*			
SF Attached/Townhouse	463	745			1,208
	All bedrooms				
Multifamily*	5,155				5,155
TOTAL	6,525	2,943	1,580	349	11,397

Source: Cross tabulation by TischlerBise using
City of Fredericksburg tax parcel data and student enrollment data
** Non-age-restricted housing units*

Figure 38. FCPS Estimated Student Generation Rates by Type and Size of Unit

Elementary School Students Per Housing Unit (City of Fredericksburg)

(Grades K-5)	*0-2 Bdrms*	*3 Bdrms*	*4 Bdrms*	*5+ Bdrms*	*Wtd Avg*
Single Family	0.057	0.096	0.161	0.132	0.112
	0-2 Bdrms	*3+ Bdrms*			*Wtd Avg*
SF Attached/Townhouse	0.222	0.180			0.196
	All bedrooms				*Wtd Avg*
Multifamily	0.162				0.162

Middle School Students Per Housing Unit (City of Fredericksburg)

(Grades 6-8)	*0-2 Bdrms*	*3 Bdrms*	*4 Bdrms*	*5+ Bdrms*	*Wtd Avg*
Single Family	0.033	0.054	0.092	0.112	0.066
	0-2 Bdrms	*3+ Bdrms*			*Wtd Avg*
SF Attached/Townhouse	0.082	0.086			0.084
	All bedrooms				*Wtd Avg*
Multifamily	0.059				0.059

High School Students Per Housing Unit (City of Fredericksburg)

(Grades 9-12)	*0-2 Bdrms*	*3 Bdrms*	*4 Bdrms*	*5+ Bdrms*	*Wtd Avg*
Single Family	0.041	0.075	0.137	0.155	0.094
	0-2 Bdrms	*3+ Bdrms*			*Wtd Avg*
SF Attached/Townhouse	0.123	0.117			0.119
	All bedrooms				*Wtd Avg*
Multifamily	0.072				0.072

Total Students Per Housing Unit (City of Fredericksburg)

	0-2 Bdrms	*3 Bdrms*	*4 Bdrms*	*5+ Bdrms*	*Wtd Avg*
Single Family	0.131	0.224	0.390	0.398	0.272
	0-2 Bdrms	*3+ Bdrms*			*Wtd Avg*
SF Attached/Townhouse	0.428	0.383			0.400
	All bedrooms				*Wtd Avg*
Multifamily	0.294				0.294

Source: Cross tabulation by TischlerBise using
City of Fredericksburg tax parcel data and student enrollment data

A summary of the above data is provided in Figure 39.

Figure 39. Estimated FCPS Student Generation Rates by Type and Size of Unit Summary

		Elementary	Middle	High	Total K-12
Single Family Detached					
	0-2 Bedrooms	0.057	0.033	0.041	0.131
	3 Bedrooms	0.096	0.054	0.075	0.224
	4 Bedrooms	0.161	0.092	0.137	0.390
	5+ Bedrooms	0.132	0.112	0.155	0.398
	Average	**0.112**	**0.066**	**0.094**	**0.272**
Single Family Attached					
	0-2 Bedrooms	0.222	0.082	0.123	0.428
	3+ Bdrms	0.180	0.086	0.117	0.383
	Average	**0.196**	**0.084**	**0.119**	**0.400**
Multifamily					
	All Sizes	**0.162**	**0.059**	**0.072**	**0.294**

Residential Projections

TischlerBise reviewed recent building permit data, TischlerBise's previous capital impact study, and projections from Weldon Cooper Center. Weldon Cooper Center projects 1.6 percent annual population growth over the next 10 years and 1.2 percent from years 11 to 20. This results in an annual increase of approximately 190 to 200 units per year over the next 10 years.

Recent housing construction has been approximately 70 percent in multifamily units, which are "lumpier" than single family construction. That is, there may be a spike in one year with less in the next. However, for purposes of the capital impact study, projections are smoothed out and reflect an average annual growth.

Figure 40 shows population and housing unit projections through 2042 for the City of Fredericksburg. (Starting in year 5, five-year increments are shown in the figure below, although interim years are projected.) Projected housing unit growth by *type* of housing unit reflects recent trends in the City with multifamily units making up 70 percent of new housing development.[2]

Population and housing unit projections are used for the purpose of having an understanding of the possible future pace of service/facility demands, revenues, and expenditures. As these facility demand factors will vary to the extent that future development varies, there will be virtually no effect on the capital impact calculation.

[2] A subset of multifamily units is assumed as age-restricted units at 10 percent of multifamily units. See Figure 40.

Population and Housing unit projections use a base year data of January 1, 2022. The number of total housing units projected by 2042 is 15,819 with a projected total population of 38,588. The breakdown of population and unit by type is shown in the figure below.

Figure 40. Housing Unit and Population Projections

			Jan. 1					*Five-Year Increments>>>*				
			Base Year	1	2	3	4	5	10	15	20	
			2022	2023	2024	2025	2026	2027	2032	2037	2042	**Net Increase**
Population	*% alloc.*											
Population in Housing Units	91%		26,606	27,031	27,464	27,903	28,350	28,803	31,182	33,099	35,133	**8,527**
Group Quarters Population	9%		2,617	2,659	2,701	2,744	2,788	2,833	3,067	3,255	3,455	**839**
Population Total	**100%**		**29,222**	**29,690**	**30,165**	**30,648**	**31,138**	**31,636**	**34,249**	**36,354**	**38,588**	**9,366**
		% of										
Housing Units	*Wtd Avg*	*Proj.*										
Single Family Detached	2.58	10%	5,034	5,053	5,072	5,092	5,112	5,132	5,239	5,325	5,416	**382**
Single Family Attached	2.18	20%	1,208	1,246	1,285	1,324	1,364	1,405	1,618	1,790	1,972	**764**
Multifamily*	1.91	70%	5,751	5,885	6,021	6,159	6,299	6,441	7,188	7,792	8,431	**2,680**
Total	**2.22**	100%	**11,993**	**12,184**	**12,378**	**12,575**	**12,775**	**12,978**	**14,045**	**14,907**	**15,819**	**3,826**
				192.00	195.00	198.00	201.00	204.00	221.00	177.00	188.00	
Net Increase in Total Units				191	194	197	200	203	220	177	187	
^ U.S. Census												
^^ Weldon Cooper Center (published Jan. 7, 2022)												
* Includes Apts, Condos, Age-Restricted Multfamily; detail:			2022	2022	2022	2022	2022	2022	2022	2022	2022	**Net Increase**
Multifamily Age Restricted		10.0%	596	589	602	616	630	644	719	779	843	**247**
Multifamily Non-Age Restricted			5,155	5,297	5,419	5,543	5,669	5,797	6,469	7,013	7,588	**2,433**
Multifamily Total			**5,751**	**5,885**	**6,021**	**6,159**	**6,299**	**6,441**	**7,188**	**7,792**	**8,431**	**2,680**

Sources: City of Fredericksburg, Commissioner of Revenue data; U.S. Census; Weldon Cooper Center

Public School Enrollment Projections

Recent public school enrollment projections were provided by Fredericksburg City Public Schools (FCPS) from Crabtree and the Weldon Cooper Center. The enrollment projections do not include a comprehensive residential growth projection but do consider the potential for enrollment growth from new residential development. See the footnote to the following figure for Weldon Cooper Center's projection methodologies. A recommended projection is provided below reflecting an average between Weldon Cooper Center's projections 1 and 2, which integrates an assumption of decreased enrollment due to COVID-19. Note: Multifamily units shown below reflect non-age restricted units.

Figure 41. FCPS Public School Enrollment Projections

											Five-Year Increments>>>			
	Base Year	1	2	3	4	5	6	7	8	9	10	15	20	
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2037	2042	**Net Increase**
Housing Units														
Single Family Detached	5,034	5,053	5,072	5,092	5,112	5,132	5,153	5,174	5,195	5,217	5,239	5,325	5,416	**382**
Single Family Attached	1,208	1,246	1,285	1,324	1,364	1,405	1,446	1,488	1,531	1,574	1,618	1,790	1,972	**764**
Multifamily Non-Age Restricted	5,155	5,297	5,419	5,543	5,669	5,797	5,927	6,060	6,194	6,331	6,469	7,013	7,588	**2,433**
Total	**11,397**	**11,596**	**11,776**	**11,959**	**12,145**	**12,334**	**12,526**	**12,722**	**12,920**	**13,122**	**13,326**	**14,128**	**14,976**	**3,579**
K-12 Enrollment Projections	*SY 21-22*	*SY 22-23*	*SY 23-24*	*SY 24-25*	*SY 25-26*	*SY 26-27*	*SY 27-28*	*SY 28-29*	*SY 29-30*	*SY 30-31*	*SY 31-32*	*SY 36-37*	*SY 41-42*	
Actual Enrollment (Fall)	3,547													
Crabtree Projection	3,499	*3,599*	*3,678*	*3,739*	*3,778*	*3,802*	*3,847*	*3,913*	*3,998*	*4,081*				
Weldon Cooper Center Projection 1 ^	3,494	*3,582*	*3,642*	*3,724*	*3,763*	*3,780*	*3,830*	*3,928*	*4,021*	*4,131*				
Weldon Cooper Center Projection 2 ^	3,659	*3,741*	*3,782*	*3,839*	*3,879*	*3,892*	*3,942*	*4,035*	*4,142*	*4,240*				
Weldon Cooper Center Projection 3 ^	3,747	*3,806*	*3,829*	*3,888*	*3,938*	*3,943*	*3,990*	*4,082*	*4,189*	*4,274*				
Projected FCPS Enrollment	**3,547**	**3,662**	**3,712**	**3,782**	**3,821**	**3,836**	**3,886**	**3,982**	**4,082**	**4,186**	**4,250**	**4,501**	**4,767**	**1,220**

^ From Weldon Cooper Center: "Projection 1 assumes that students who were expected to enroll but didn't last year will not enroll this fall, while projection 2 assumes half will and projection 3 assumes all students expected last year will enroll this fall. The projections all show a fairly similar trend of the enrollment growth prior to 2020 continuing, although at a slightly slower rate. Growth prior to 2020 was driven primarily by a stable number of births in the region and more families moving into the division. After 2026 the projections expect enrollment growth to accelerate, driven by larger entering Kindergarten classes. This growth is based on projected births, which assumes that the currently low fertility rates will not decline further. Provided that fertility rates do not decline, the increase in the region's childbearing age population during this decade will cause the number of births in the region to increase. The main limitation to these projections is that they are not able to account for changes in the amount of development in the city, the projections essentially assume that construction rates over the past few years will continue. Fredericksburg's past enrollment growth rates have typically been closely tied to the amount of home construction in the city, which has been somewhat cyclical.

*** Projections through 2031 reflect an average of Projections 1 and 2 from Weldon Cooper Center (given alignment with actual enrollment in Fall 2021); remaining years TischlerBise (growth from housing added to previous year).*

Nonresidential Development Estimates and Projections

Current Nonresidential Estimates

In addition to data on residential development, the calculation of Fire capital impacts requires data on employment (number of jobs) and nonresidential square footage in the City of Fredericksburg.

TischlerBise used a combination of data on nonresidential square footage and employment to determine current nonresidential development in the City. For nonresidential floor area and jobs estimate, TischlerBise used square feet from the Commissioner of Revenue tax parcel data (as of 2021) and job estimate from "City of Fredericksburg Economic Update and Outlook (December 2020)."[3] Since the two data points are from different years, TischlerBise updated both estimates of jobs and nonresidential square footage to current year (2022).

City of Fredericksburg Commissioner of Revenue tax parcel data as of 2021 includes 13,276,163 square feet of retail, office/institutional/other services, and industrial space. Total jobs in 2021 is estimated at 25,181 based on .2 percent[4] increase from the 2020 estimate of 25,131. This results in 527 square feet per job in the City. From there, jobs were estimated for 2022 assuming the .2 percent growth rate and allocated by type based on distribution from 2020 data. Square footage factors by type of nonresidential development were applied to estimate nonresidential square footage in 2022. See Figure 42.

[3] "City of Fredericksburg: Economic Update and Outlook, December 11, 2020," Chmura Economics & Analytics.

[4] "City of Fredericksburg: Economic Update and Outlook, December 11, 2020," Chmura Economics & Analytics.

Figure 42. City of Fredericksburg Nonresidential Floor Area and Jobs Estimate (2022)

				Base Year
		2020*	2021	2022
Nonresidential Sq. Ft.			13,276,163	13,302,715
Projected growth rate>>*			*0.2%*	*0.2%*
Total Jobs			**25,181**	**25,232**
Square Feet per Job			*527*	
Jobs	*% Alloc.**			
Retail	31%	7,886	7,902	7,918
Office, Institutional, and Other Services	60%	15,066	15,096	15,126
Industrial	9%	2,179	2,183	2,188
Total	100%	**25,131**	**25,181**	**25,232**
Nonresidential Sq. Ft.	*SF/Job***			
Retail	578		4,567,053	4,576,187
Office, Institutional, and Other Services	464		7,002,419	7,016,424
Industrial	782		1,706,691	1,710,105
Total	527		**13,276,163**	**13,302,715**

* "City of Fredericksburg: Economic Update and Outlook, December 11, 2020," Chmura Economics & Analytics (Source note: Employment data are derived from the Quarterly Census of Employment and Wages, provided by the Bureau of Labor Statistics and imputed where necessary. Data are updated through 2019Q4 with preliminary estimates updated to 2020Q2.)

** Square feet per job derived from Institute of Transportation Engineers (ITE) data on trips per 1,000 sq. ft. and trips per employee. Averages by type of nonresidential space are calibrated to the weighted average of nonresidential square footage per job from the tax parcel database.

Nonresidential Projections

Projected employment growth and nonresidential development in the City are based on projected growth rates in the "Economic Update and Outlook," which project a .2 percent growth rate over the next ten years. Employment growth is projected at .2 percent and converted to nonresidential square footage using the square feet per job factors shown above. Results are shown below.

Figure 43. City of Fredericksburg Nonresidential Floor Area and Jobs Projections

						Five-Year Increments>>>				
		Base Year	1	2	3	4	5	10	15	20	
		2022	2023	2024	2025	2026	2027	2032	2037	2042	**Net Increase**
Nonresidential Sq. Ft.		13,302,715	13,329,321	13,355,979	13,382,691	13,409,457	13,436,276	13,571,177	13,707,433	13,845,056	**542,341**
Projected growth rate>>*		*0.2%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*	
Total Jobs		**25,232**	**25,282**	**25,333**	**25,383**	**25,434**	**25,485**	**25,741**	**25,999**	**26,260**	**1,029**
Square Feet per Job											
Jobs	*% Alloc.**										
Retail	31%	7,918	7,933	7,949	7,965	7,981	7,997	8,077	8,158	8,240	**323**
Office, Institutional, and Other Services	60%	15,126	15,157	15,187	15,217	15,248	15,278	15,432	15,587	15,743	**617**
Industrial	9%	2,188	2,192	2,196	2,201	2,205	2,210	2,232	2,254	2,277	**89**
Total	100%	**25,232**	**25,282**	**25,333**	**25,383**	**25,434**	**25,485**	**25,741**	**25,999**	**26,260**	**1,029**
Nonresidential Sq. Ft.	*SF/Job***										
Retail	578	4,576,187	4,585,339	4,594,510	4,603,699	4,612,906	4,622,132	4,668,539	4,715,411	4,762,754	**186,567**
Office, Institutional, and Other Services	464	7,016,424	7,030,457	7,044,518	7,058,607	7,072,724	7,086,869	7,158,022	7,229,889	7,302,478	**286,054**
Industrial	782	1,710,105	1,713,525	1,716,952	1,720,386	1,723,827	1,727,274	1,744,616	1,762,132	1,779,824	**69,720**
Total	527	**13,302,715**	**13,329,321**	**13,355,979**	**13,382,691**	**13,409,457**	**13,436,276**	**13,571,177**	**13,707,433**	**13,845,056**	**542,341**

* "City of Fredericksburg: Economic Update and Outlook, December 11, 2020," Chmura Economics & Analytics (Source note: Employment data are derived from the Quarterly Census of Employment and Wages, provided by the Bureau of Labor Statistics and imputed where necessary. Data are updated through 2019Q4 with preliminary estimates updated to 2020Q2.)

** Square feet per job derived from Institute of Transportation Engineers (ITE) data on trips per 1,000 sq. ft. and trips per employee. Averages by type of nonresidential space are calibrated to the weighted average of nonresidential square footage per job from the tax parcel database.

Summary Projections

The following figure provides a summary of the above growth projections.

Figure 44. City of Fredericksburg Summary of Growth Projections

	Jan. 1	*Projections==>*				*Five-Year Increments>>>*				
	Base Year	1	2	3	4	5	10	15	20	
	2022	2023	2024	2025	2026	2027	2032	2037	2042	**Net Increase**
Population										
Population in Housing Units	26,606	27,031	27,464	27,903	28,350	28,803	31,182	33,099	35,133	**8,527**
Group Quarters Population	2,617	2,659	2,701	2,744	2,788	2,833	3,067	3,255	3,455	**839**
Population Total	**29,222**	**29,690**	**30,165**	**30,648**	**31,138**	**31,636**	**34,249**	**36,354**	**38,588**	**9,366**
Population Growth %	*2.1%*	*1.6%*	*1.6%*	*1.6%*	*1.6%*	*1.6%*	*1.6%*	*1.2%*	*1.2%*	
Single Family Detached	5,034	5,053	5,072	5,092	5,112	5,132	5,239	5,325	5,416	**382**
Single Family Attached	1,208	1,246	1,285	1,324	1,364	1,405	1,618	1,790	1,972	**764**
Multifamily*	5,751	5,885	6,021	6,159	6,299	6,441	7,188	7,792	8,431	**2,680**
Total	**11,993**	**12,184**	**12,378**	**12,575**	**12,775**	**12,978**	**14,045**	**14,907**	**15,819**	**3,826**
Net Increase in Total Units		*191*	*194*	*197*	*200*	*203*	*220*	*177*	*187*	
Average Annual Growth		*1.6%*	*1.6%*	*1.6%*	*1.6%*	*1.6%*	*1.6%*	*1.2%*	*1.2%*	
At-Place Employment	25,232	25,282	25,333	25,383	25,434	25,485	25,741	25,999	26,260	**1,029**
Job Growth %	*0.2%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*	*0.2%*	
Jobs by Type										
Retail	7,918	7,933	7,949	7,965	7,981	7,997	8,077	8,158	8,240	**323**
Office, Institutional, and Other Services	15,126	15,157	15,187	15,217	15,248	15,278	15,432	15,587	15,743	**617**
Industrial	2,188	2,192	2,196	2,201	2,205	2,210	2,232	2,254	2,277	**89**
Total	**25,232**	**25,282**	**25,333**	**25,383**	**25,434**	**25,485**	**25,741**	**25,999**	**26,260**	**1,029**
Jobs to Population Ratio		*0.85*	*0.84*	*0.83*	*0.82*	*0.81*	*0.75*	*0.72*	*0.68*	***0.11***
Nonresidential SF										
Retail	4,576,187	4,585,339	4,594,510	4,603,699	4,612,906	4,622,132	4,668,539	4,715,411	4,762,754	**186,567**
Office, Institutional, and Other Services	7,016,424	7,030,457	7,044,518	7,058,607	7,072,724	7,086,869	7,158,022	7,229,889	7,302,478	**286,054**
Industrial	1,710,105	1,713,525	1,716,952	1,720,386	1,723,827	1,727,274	1,744,616	1,762,132	1,779,824	**69,720**
Total	13,302,715	13,329,321	13,355,979	13,382,691	13,409,457	13,436,276	13,571,177	13,707,433	13,845,056	**542,341**
Enrollment	3,547	3,662	3,712	3,782	3,821	3,836	4,250	4,501	4,767	**1,220**

APPENDIX B: CASH PROFFER BACKGROUND

Definition

A proffer is an offer by a landowner during the rezoning process to mitigate impacts of a rezoning. A form of *conditional zoning*, it applies additional conditions, or requirements, beyond existing requirements and regulations. A proffer can include the acceptance of cash payments to mitigate the impacts of a rezoning, called *cash proffers,* and are allowed under Virginia Code §15.2-2303 and §15.2-2298.

Cash proffers are voluntary one-time payments used to fund capital improvements necessitated by new growth. Cash proffers are akin to *impact fees,* which have been utilized by local governments in various forms for at least fifty years.[5] However, unlike impact fees, cash proffers only apply during the rezoning process and do not apply to "by-right" development. Cash proffers are not to be used to correct existing deficiencies but to provide additional capacity to serve new growth. Because cash proffers do not apply to by-right development and only apply during the rezoning process, only a portion of the impacts from new growth can be mitigated with a cash proffer system. *Cash proffers therefore have limitations for infrastructure funding and should not be regarded as the total solution for capital improvement needs. Rather, they should be considered one component of a comprehensive portfolio to ensure adequate provision of public facilities with the goal of maintaining current levels of service in a community.*

- Cash proffers only apply to rezonings and are not collected on any by-right development.
- Cash proffers can only be used to finance capital infrastructure that provides additional capacity and cannot be used to finance ongoing operations and/or maintenance and rehabilitation costs. Virginia law restricts the infrastructure categories to **public transportation facilities, public safety facilities, public school facilities, and public parks.**[6]
- Cash proffers cannot be deposited in the local government's General Fund. The funds must be accounted for separately and earmarked for the capital expenses for which they were collected.
- Cash proffers cannot be used to correct existing infrastructure deficiencies unless negotiated apart from the cash proffer system presented herein, or if there is a funding plan in place to correct the deficiency for all current residents and businesses in the community.
- Because cash proffers reflect a point in time, the calculations and study should be updated periodically (typically 3 to 5 years). Costs reflect the direct impact of new development on the need for new facilities and infrastructure and do not reflect secondary or indirect impacts.

[5] Other than Transportation Impact Fees, localities in the Commonwealth of Virginia are not authorized to implement impact fees.

[6] See Virginia Code §15.2-2303.4.

Approach

To ensure a reasonable relationship to new development and rezonings in particular, the cash proffer study focuses on three elements: "impact or need," "benefit," and "proportionality."

Demonstrating an Impact. All new development in a community creates additional demands on some, or all, public facilities provided by local government. If the supply of facilities is not increased to satisfy that additional demand, the quality or availability of public services for the entire community will deteriorate. Cash proffers are calculated in a manner to determine what the applicable cost of development-related facilities, to the extent that the need for facilities is a consequence of development that is subject to the cash proffers. In this study, the impact of development on improvement needs is analyzed in terms of quantifiable relationships between various types of development and the demand for specific facilities, based on applicable level-of-service standards.

Demonstrating a Benefit. A sufficient benefit relationship requires that cash proffer funds be segregated from other funds and expended only for the categories for which the proffers were collected. Cash proffers must be expended in a timely manner[7] and the facilities funded by the proffers must benefit the development paying the proffers. However, this does not require that facilities funded with cash proffer revenues be available *exclusively* to development paying the proffers. In other words, existing development may use and benefit from these improvements as well.

Procedures for the earmarking and expenditure of revenues are outlined in Virginia Code (see specifically §15.2303.2(B)). These requirements are intended to ensure that developments benefit from the cash proffers paid. Thus, an adequate showing of benefit must address procedural as well as practical issues.

Demonstrating Proportionality. Proportionality is established through the procedures used to identify development-related facility costs, and in the methods used to calculate the cash proffers for various types of facilities and categories of development. The demand for facilities is measured in terms of relevant and measurable attributes of development. For example, the need for school improvements is measured by the number of public school-age children generated by development.

The above requirements are further reinforced in the Code of Virginia under §15.2-2303.4 (effective July 1, 2016). Specifically, Section 15.2-2303.4(B) states that localities cannot request or accept an *unreasonable* proffer or deny a rezoning application or proffer condition amendment due to applicant's failure or refusal to submit an unreasonable proffer.

[7] Virginia Code §15.2-2303.2(A) states: "*The governing body of any locality accepting cash payments voluntarily proffered on or after July 1, 2005, shall, within twelve (12) years of receiving full payment of all cash proffered pursuant to an approved rezoning application, begin, or cause to begin (i) construction, (ii) site work, (iii) engineering, (iv) right-of-way acquisition, (v) surveying, or (vi) utility relocation on the improvements for which the cash payments were proffered.*"

The implementation of the proffer changes hinges on defining an unreasonable proffer, or more positively, defining a reasonable proffer. The figure below provides further detail on the approach to meet requirements of the law.

REASONABLE PROFFERS

VA Code Section	VA Code Text	Interpretation	How to Meet the Requirement
15.2-2303.4 (C)	*addresses an impact that is specifically attributable to a proposed new residential development or other new residential use applied for*	The demand from the residential land use creates a need for additional capacity in the infrastructure category for which the cash proffer is being requested or offered	Establish a nexus between types of residential development and specific impacts on infrastructure in locality. (E.g., student generation rates by type of housing unit.)
	addresses an impact to an offsite public facility	The need for the capital improvement must be for a system-level facility, provided to a larger geographic area than the project site	Use system-level infrastructure to establish current levels of service in cash proffer calculations.
	the new residential development or new residential use creates a need, or an identifiable portion of a need, for one or more public facility improvements in excess of existing public facility capacity at the time of the rezoning or proffer condition amendment	The impact from the residential development causes a need for additional capacity above what is available to the applicant. The additional capacity can be for a single facility or a portion of a facility improvement. Available capacity is determined by analyzing the current and projected levels of service provided in specific categories of infrastructure in the locality.	Define current levels of service / available capacities in cash proffer analysis and identify when capacities are reached. Identify incremental impact on facilities from residential development in cash proffer analysis.
	each such new residential development or new residential use applied for receives a direct and material benefit from a proffer made with respect to any such public facility improvements.	Entity/applicant paying the cash proffer receives a benefit in the form of a facility or portion of a facility being built or purchased.	Localities use cash proffer funding to build or purchase additional capacity in the infrastructure categories for which a cash proffer is collected. Separate funds established. Collection and expenditure areas may be necessary to ensure “direct” benefit.

Source: TischlerBise

Cash Proffer Implementation Considerations

While cash proffers are voluntary contributions, there are procedures that must be followed per Virginia law and to ensure payers receive benefit from the contribution.

Accounting

Monies received are placed in a separate fund and accounted for separately and expenditures should be indicated in the capital improvement plan. Within twelve (12) years of receiving full payment of committed cash proffers, a locality must begin construction or relevant improvement for which the proffer was made. Localities that do not begin construction or other authorized alternative improvement must pay the amount to the Commonwealth Transportation Board for allocation to the secondary system construction program or the urban system construction program for the locality in which the proffered cash payments were collected (VA § 15.2-2303.2).

Cost Updates

All costs in the capital impact calculations are in current dollars with no assumed inflation over time. Necessary cost adjustments can be made as part of the recommended annual evaluation and update of the capital impact amounts using consumer price index (CPI), Marshall and Swift Building Cost Index, or Engineering News Record (ENR). TischlerBise recommends using ENR or Marshall Swift, which is specific to construction and accounts for geographic differences. The index can be applied against the calculated capital impact amounts. If cost estimates or other factors change significantly, calculations should be revisited. As capital impact calculations are based on a snapshot in time, an adopted policy should be periodically reviewed and updated. A full update is recommended no later than 5 years to reflect changes in development trends, infrastructure capacities, costs, funding formulas, etc.

Implementation by Bedroom Count

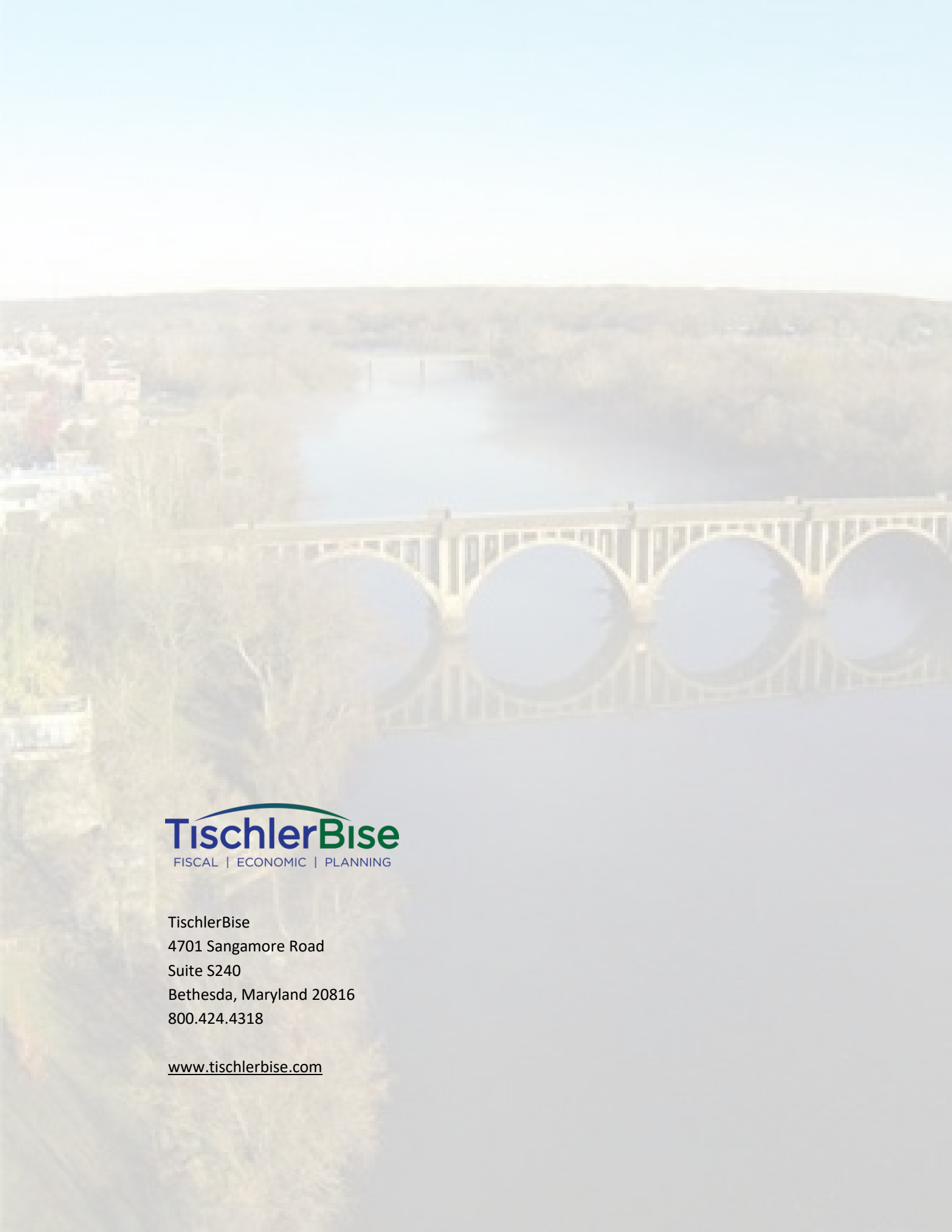
To implement capital impact contributions by bedroom count, rules and criteria should be determined as part of the administrative process. The criteria should be simple and reflect the Census practice of providing basic information as if for a real estate listing. An example of three criteria used to help consistently determine the number of bedrooms: (1) Room has a minimum dimension of at least 8’ x 10’; (2) Room has an exterior window; and (3) Room has private space, such as a door or design feature (like a loft) that separates it from the common area. If possible, City staff should be the one to determine the number of bedrooms as opposed to the applicant.

Independent Analyses

Extraordinary costs, if any, in servicing newly developed properties should be addressed through administrative procedures and policies that allow independent studies to be submitted to the City. Independent studies can also be allowed in certain circumstances when development will generate different amounts of demand than assumed in this study. These procedures should be addressed in the capital impact policy.

Written Policies

Written policies and implementation practices should be established to cover the items identified in this section to provide consistency in the process.



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