



CITY OF BEAUFORT
1911 BOUNDARY STREET
BEAUFORT MUNICIPAL COMPLEX
BEAUFORT, SOUTH CAROLINA 29902
(843) 525-7070
CITY COUNCIL WORKSESSION AGENDA
November 19, 2019

**NOTE: IF YOU HAVE SPECIAL NEEDS DUE TO A PHYSICAL CHALLENGE,
PLEASE CALL IVETTE BURGESS 525-7070 FOR ADDITIONAL
INFORMATION**

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STATEMENT OF MEDIA NOTIFICATION

"In accordance with South Carolina Code of Laws, 1976, Section 30-4-80(d), as amended, all local media was duly notified of the time, date, place and agenda of this meeting."

WORKSESSION - City Hall, Planning Conference Room, 1st Floor - 5:00 PM

I. CALL TO ORDER

A. Billy Keyserling, Mayor

II. PRESENTATION

A. Commercial Corridor Code Study - Kickoff/Purpose

III. DISCUSSION ITEMS

- A. Development Fire Impact Fees
- B. Bridges Preparatory School Senior Project
- C. Monument Signs in the Boundary Street Development District

IV. EXECUTIVE SESSION

- A. Pursuant to Title 30, Chapter 4, Section (70) (a) (1) of the South Carolina Code of Law: Discussion regarding appointments to City Boards and Commissions.

V. ADJOURN



CITY OF BEAUFORT

DEPARTMENT REQUEST FOR CITY COUNCIL AGENDA ITEM

TO: CITY COUNCIL **DATE:** 11/15/2019
FROM: MKSK
AGENDA ITEM
TITLE: Commercial Corridor Code Study - Kickoff/Purpose
MEETING
DATE: 11/19/2019
DEPARTMENT: Community and Economic Development

BACKGROUND INFORMATION:

MKSK is here to evaluate the existing development patterns and the city's planning documents for areas along Boundary Street, Robert Smalls Parkway, Ribaut Road, and Sea Island Parkway. They will also audit the code to identify regulations, language or locations where they see potential barriers to future development.

PLACED ON AGENDA FOR:

REMARKS:

ATTACHMENTS:

Description	Type	Upload Date
MKSK Contract	Exhibit	11/15/2019
Draft Schedule	Exhibit	11/15/2019

October 31, 2019

David S. Prichard, Director
Community and Economic Development
City of Beaufort
1911 Boundary Street
Beaufort, SC 29902

MKSK

504 Rhett Street
Suite 204
Greenville, SC 29601

Dear Mr. Prichard,

The City of Beaufort has requested a proposal for two distinct, though related, services:

- The first is to evaluate and provide planning, design, and zoning recommendations for selected areas along Boundary Street, Robert Smalls Parkway, Ribaut Road, and Sea Island Parkway; and
- The second is to create a series of educational and training modules for staff presentation (and for MKSK facilitation, if desired).

I will lead this effort from the MKSK South Carolina office. I have a decade of consulting experience, primarily in small to mid-sized communities in the Southeast. Many of my projects have focused on downtown and commercial corridor revitalization, with a focus on the physical, economic, and regulatory aspects of this process. In addition to my work in 2018, I bring additional local knowledge of Beaufort, having worked closely with the City and its partners on several planning projects in the City's Historic Downtown.

Brad Strader, one of our lead planners, will be assisting me in this effort. Brad brings thirty-plus years of experience working on corridor plans, redevelopment, zoning ordinances and form-based codes. His experience includes several projects in the South Carolina Lowcountry. Brad has facilitated over 200 training programs for state APA chapters, municipal leagues, the American Planning Association, Alliance for Innovation, and others.

Based on our conversations and our previous work for the City of Beaufort, we propose the following scope of work:

A. Commercial Corridor Code Evaluation and Recommendations

We will evaluate the existing development patterns and the recommendations in the City's planning documents for areas along Boundary Street, Robert Smalls Parkway, Ribaut Road, and Sea Island Parkway. We will also audit the code to identify regulations, language or locations where we see potential barriers to future development. Following discussions with City staff and officials, we will then identify changes to the code or district maps that would help address those issues.

1. Review of the current Vision Plan and existing code documents. Once we have conducted this review, we will have a conference call with you to discuss our impressions, target sites for evaluation, and logistics for a corridor workshop.
2. Visit the city to tour the corridors and meet with stakeholders. Over this two-day period, we would meet with city staff, officials, developers and others to gain their

Exhibit A: Training Modules Survey

12 of the 22 topics listed below will be chosen based on popularity for the City of Beaufort's training modules to be held throughout the next year.

Please check the boxes of the SIX topics you like most like to be covered in the training modules.

Please ~~draw a line through~~ SIX topics you do not think it worthwhile to have training modules on.

Zoning

- ☐ Difference between the Zoning Ordinance and the Comprehensive Plan
- ☒ How to use the Zoning Ordinance
- ☐ Rezoning criteria
- ☐ Special zoning techniques (overlays, form-based code)
- ☐ Site Plan Review basics
- ☒ Tips for decision-making and public hearings
- ☒ Role of Planning Commission vs. City Council vs. other actors
- ☐ Zoning variances / planned unit developments / impact fees / provisional uses

Planning

- ☒ Purpose of the Comprehensive Plan
- ☐ Transportation planning best practices
- ☐ Using design guidelines
- ☒ South Carolina Planning Law requirements
- ☐ Understanding the developer perspective
- ☒ Creating capital improvement programs

Special Topics

- ☐ Coastal resiliency
- ☐ Green infrastructure / Sustainable design
- ☐ Workforce housing
- ☐ Parking
- ☐ Effective communication and negotiation techniques
- ☐ Managing risk
- ☐ Open data
- ☐ Placemaking

MKSK

Authorization

Client (Signature)

Date

Client (Name and Title)

Brad Strader for MKSK, Inc.

Date

Draft Schedule for MKSK Site Visit

Tuesday, November 19-Wednesday, November 20, 2019

Day One: Tuesday, November 19

10:00 am: Team Arrives
10:30 am: Project Area Driving/Walking Tour
12:00 pm: Lunch with Client
1:30 pm: Meeting 1: City Staff
3:00 pm: Meeting 2A: _____
Meeting 2B: _____
5:00 pm: City Council Workshop

Day Two: Wednesday, November 20

9:00 am: Meeting 3A: _____
Meeting 3B: _____
10:30 am: Meeting 4A: _____
Meeting 4B: _____
12:00 pm: Lunch
1:00 pm: Meeting 5A: _____
Meeting 5B: _____
2:30 pm: Meeting 6A: _____
Meeting 6B: _____
4:00 pm: Debrief with Client (*can include staff and/or additional stakeholders*)



CITY OF BEAUFORT

DEPARTMENT REQUEST FOR CITY COUNCIL AGENDA ITEM

TO: CITY COUNCIL **DATE:** 10/28/2019
FROM: Reece Bertholf, Fire Chief
AGENDA ITEM
TITLE: Development Fire Impact Fees
MEETING
DATE: 11/19/2019
DEPARTMENT: City Clerk

BACKGROUND INFORMATION:

PLACED ON AGENDA FOR:

REMARKS:

ATTACHMENTS:

Description	Type	Upload Date
Executive Summary	Backup Material	11/15/2019
Impact Fee Study	Backup Material	11/15/2019
Draft Ordinance	Backup Material	11/15/2019



Fire Department Development Impact Fee Ordinance - Executive Summary

The Impact Fee Ordinance presented reflects the 8/15/2019 Development Impact Fee Study and Capital Improvement Plan. The ordinance was developed using verbiage and format as applicable from existing Beaufort City ordinances as well as ordinances from Fort Mill, Tega Cay, and Mount Pleasant. These were used as primary references for development of our ordinance. The study and ordinance are consistent with the requirements set forth by South Carolina Code 6.1.910. Documentation from the Institute of Transportation Engineers (ITE) was also referenced as the standard technical resource for calculation of service units.

Links for reference (link may have to be copied into a browser)

SC Code 6.1.910

<https://www.scstatehouse.gov/code/statmast.php>

Fort Mill Development Impact Fee Ordinance

https://fortmillsc.gov/vertical/Sites/%7B894D93CD-8531-44A3-AD075FA5073B2BDF%7D/uploads/Impact_Fee_Ordinance.pdf

Tega Cay Development Impact Fee Ordinance under Chapter 2, Article V, Division 4

<https://www.tegacaysc.org/DocumentCenter/View/12495/Tega-Cay-SC-Impact-Fees>

Mount Pleasant Development Impact Fee Ordinance

<https://www.tompssc.com/DocumentCenter/View/27047/Impact-Fees-Chpt-154-Amendment-08-2018>



IMPACT FEE STUDY

City of Beaufort /Town of Port Royal

Draft 8/15/2019

Developmental Impact fees are vital to the City of Beaufort and Town of Port Royal. Impact fees will ensure our organization can sustain the current level of fire service into areas of growth and infill.

Contributors

Reece Bertholf, MBA
John C. Robinson MBA/MPA, EFO
Tim Ogden, MPA, CBO
Ross Vezin MBA/MPA

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Draft

Abstract

The following impact fee study is consistent with the requirements set forth by South Carolina Code 6.1.9. The imposition of developmental Fire Impact fees by the municipalities of the Town of Port Royal and the City of Beaufort are needed to ensure that fire services are maintained at the current level of service as our communities grow. The capital needs of the municipal fire service are defined in the Beaufort/Port Royal Capital Improvement Plan and supported by the Comprehensive Plans of both municipalities. This study discusses exemptions from impact fees as defined in the code, to include exemptions for affordable housing. Fee calculations are based on a consumption-driven approach and using the International Transportation Engineers (ITE) guidance to calculate Cost per Person and Cost per Employee. Cost per Person is a normalized unit of measure applied to residential uses. Beaufort/Port Royal developmental impact fees for residential uses are calculated by multiplying the Cost per Person (\$305.43), times the number of service units. Cost per Employee (\$592.34) is a normalized unit of measure applied to non-residential uses. Fee are calculated by multiplying the service units by the employee space ratio, then multiplying the sum by the Cost per Employee. The study goes on to explain eligible fee uses, municipal responsibilities such as capital improvement plan updates, comprehensive plan updates and financial reporting requirements.

Introduction

Impact fees commonly provide a means for orderly development by mitigating the negative impacts of new growth, while passing the costs associated with new development onto developers, rather than existing taxpayers. Impact fees are most useful in communities that are experiencing rapid growth and have significant land available for development. As communities grow, the demands placed on surrounding infrastructure continue to increase. Eventually, these demands will require additional capacity improvements to maintain appropriate levels of public service. The proposed impact fees comply with provisions of the South Carolina Development Impact Fee Act in support of the Beaufort/Port Royal Fire Department. The City of Beaufort and Town of Port Royal work together to provide fire protection and emergency medical response services for both municipalities.

Demands of growing communities placed on surrounding infrastructure necessitate additional capacity improvements to maintain adequate service delivery. Traditionally, elected officials rely on rising property taxes in addition to federal, state or county funding to pay for future year capital improvements. However, decreases in outside governmental funding, increases in construction costs for replacing and expanding public facilities, and rising resistance to increased property taxes have led many local governments to consider other funding mechanisms for implementing needed improvements.

Impact fees represent financial payments made from a developer to the local government for funding certain off-site capital improvements needed to accommodate future growth. Fees may be collected for many different public facilities and services; including transportation, water, sewer, municipal facilities and equipment, stormwater, police and fire protection, and parks and recreation. They generally provide a means for orderly development by mitigating the

negative impacts of new growth, while passing costs onto new developments rather than existing taxpayers.

Two factors control the legality of collecting impact fees. First, local governments must have authority to impose the fees as a condition of development approval. Second, the design and implementation of impact fee requirements must be fair, logically applied, and reasonable. In addition, impact fees must not violate a developer's right to due process or be discriminatory.

The State of South Carolina grants specific powers to cities and counties to collect development impact fees pursuant to the rules and regulations set forth in the South Carolina Development Impact Fee Act (Code of Laws of South Carolina, Section 6-1-910 et seq.). A copy of the State enabling legislation is included in Appendix A of this report. To date, ten counties, cities, and towns — Beaufort County, Dorchester County, York County, City of Charleston, City of Myrtle Beach, City of Rock Hill, Town of Hilton Head, Town of Fort Mill, and Town of Summerville, Town of Mount Pleasant — enforce their development impact fee ordinances in accordance with the rules and regulations established under the enabling legislation. It is crucial to identify that differences in CIP's and populations, produce different factors driving the final fee calculations.

Comparison of Fire Impact Fees

Beaufort / Port Royal Fire Department proposed developmental Fire Impact fee:

Residential \$305.00

Non-Residential \$592.34

Beaufort County fire impact fees are calculated by dwelling unit (DU) / exceptional dwelling unit (EDU) by fire district as follows:

Lady's Island Fire District	\$633 per DU/EDU
Sheldon Fire District	\$181 per DU/EDU
Bluffton Fire District	\$481 per DU/EDU
<u>Burton Fire District</u>	<u>\$479 per DU/EDU</u>
Daufuskie Fire District	\$751 per DU/EDU

Beaufort County's current developmental impact fees procedures are found in Beaufort County, South Carolina – Code of Ordinances / Chapter 82.

Mount Pleasant SC has calculated the maximum fire impact fee for a single-family dwelling as \$204.24 and the maximum fire impact fee for a hotel as \$00.53 per square foot. Tega Cay SC has calculated the maximum fire impact fee for a single-family dwelling as \$1682.00 and the maximum fire impact fee for a hotel as \$2699 per 1000 sq. feet.

Process

The process to create a development fire impact fee study began with analysis of the requirements as stated in South Carolina Code Title 6 Chapter 1 Article 9. The first step in the process was for the City of Beaufort and the Town of Port Royal to sign resolutions (Appendix B) directing the Metropolitan Planning Commission to conduct the study (SC Code 6.1.950). After consideration of the study, the Metropolitan Planning Commission may recommend an impact fee ordinance to be presented for council action.

Comprehensive Plan

Generally, a governmental entity must have an adopted comprehensive plan to enact impact fees; however, certain provisions in State law allow counties, cities and towns that have

not adopted a comprehensive plan to impose development impact fees. The City of Beaufort and Town of Port Royal have current Comprehensive Plans. Beaufort/Port Royal Fire Department has a current Capital Improvement Plan which will support the local impact fee system (Appendix C).

Developmental Impact Fee Exemptions

Consistent with state law, the developmental fire impact fee ordinance may authorize exemptions for construction projects which do not change the land use category or increase the number of service units. Projects include rebuilding, remodeling, repairing or replacing an existing structure; residential additions; construction trailers and temporary offices; neighborhood amenities (playgrounds, tennis courts, clubhouses, etc.), and affordable housing units which meet minimum eligibility requirements.

Affordable Housing

All counties, cities and towns are required to provide estimates of the effect of impact fees on the availability of affordable housing before imposing impact fees on residential dwelling units. Based on these findings' certain single-family dwellings, portions of planned unit developments, as well as other residential living structures may be exempt from impact fees when all or part of the project is determined to create affordable housing. Permits for single family dwellings or portions of developments which qualify as affordable housing within the municipal boundaries of the City of Beaufort and Town of Port Royal will be exempt from Beaufort/Port Royal Fire service developmental impact fees.

The state impact fee law, SC Code Section 6-1-920, defines affordable housing as "housing affordable to families whose incomes do not exceed eighty percent of the median family income (MFI) for the service area or areas within the jurisdiction of the governmental

entity.” The United States Census Bureau defines median income as “the amount which divides the income distribution into two equal groups, half having income above that amount, and half having income below that amount. Mean income (average) is the amount obtained by dividing the total aggregate income of a group by the number of units in that group. The means and medians for households and families are based on all households and families. Means and medians for people are based on people 15 years old and over with income.” According to the American Fact Finder 2017 from the U.S. Census Bureau, the MFI for the City of Beaufort is \$47,452, +/- \$5,777 and the MFI of the Town of Port Royal is \$55,660 +/- \$8,820. In comparison, the MFI for Beaufort County SC is \$60,603 +/- \$1,522. An average of the City of Beaufort and Town of Port Royal MFI is \$51,556.00.

The Act does not offer a preferred methodology to examine the household’s whose income does not exceed 80 percent of the median income. Therefore, the analysis uses the US Housing and Urban Development’s (HUD) criteria that housing cost should be 30% or less of a household’s MFI. The cost of housing is “moderately burdensome” if its cost burden is over 30 percent and “severely burdensome” if the ratio is over 50 percent.

Affordable Housing Exemptions

Because all or part of any development project may be exempt from Beaufort/Port Royal developmental fire impact fees, the following sets forth the administrative standards of what constitutes affordable housing and the procedures for exemption from the fees. Median family income shall be determined once a year utilizing the following procedure: the most recently available US Census figures shall act as the base year. Each subsequent year will be adjusted once annually thereafter during the first month of the calendar year

based upon the previous year's published Consumer Price Index increase, until the next US Census data is published, and this procedure is replicated.

In keeping with SC state law and HUD recommendation, the Beaufort/Port Royal developmental impact fee will use the following processes and formulas to determine if project qualify as affordable housing:

Rental Properties

MFI X 80% X 30% /12 = maximum monthly rent

MFI (Median Family Income) - \$51,556 This is an average of the U.S. Census Bureau MFI's published for the City of Beaufort and the Town of Port Royal

80% - The required MFI reduction as defined by the SC State impact fee law, SC Code Section 6-1-920

30% - The US Housing and Urban Development's (HUD) criteria that housing cost should be 30% or less of a household's MFI.

- Example: \$51,556 MFI x 80% x 30% / 12 = \$1031.12 maximum per month rent cost.

Properties for Sale (Mortgage)

Qualifying dwelling units will be equal to or less than 30% of 80% of the gross median family monthly income as reflected in the sales price using the Fannie Mae Foundation Mortgage Calculator (or comparable methodology) assuming a 10% down payment and a specified interest rate. The specified interest rate shall be determined by selecting the lowest 30-year fixed mortgage rate reported by area lending institutions as of the first week of January for any given year and shall remain so for the balance of the year. Total monthly

payments must account for required additions to principal and interest such as homeowners taxes, insurance, utilities estimate, and basic upkeep.

Dwelling units of which the monthly mortgage payments of the dwelling unit do not exceed:

$MFI \times 80\% \times 30\% / 12 - \text{expenses} = \text{maximum monthly principle and interest}$

- MFI (Median Family Income) - \$51,556 This is an average of the U.S. Census Bureau MFI's published for the City of Beaufort and the Town of Port Royal
- 80% - The required MFI reduction as defined by the SC State impact fee law, SC Code Section 6-1-920
- 30% - The US Housing and Urban Development's (HUD) criteria that housing cost should be 30% or less of a household's MFI.

Expenses

Assumes \$100 per month insurance, \$100 per month taxes, \$200 per month utilities and upkeep.

Example:

$\$51,556 \text{ MFI} \times 80\% \times 30\% / 12 - 400 = \631.12 maximum monthly mortgage principle and interest payment.

- A 30-year mortgage at 7% and 10% down payment calculates to a purchase price of \$105,400.00 to meet \$631.12 monthly principle and interest payment

and \$400 per month expenses. This excludes consideration of closing costs and other unknown expenses.

Eligible Fee Uses

Eligible costs may include design, acquisition, engineering and financing attributable to those improvements recommended in the local capital improvements plan that qualify for impact fee funding. Revenues collected by a county, city or town may not be used for administrative or operating costs associated with imposing the impact fee. All revenues from impact fees must be maintained in an interest-bearing account prior to expenditure on recommended improvements. Monies must be returned to the owner of record of the property for which the impact fee was collected if they are not spent within three years of the date which they are scheduled to be encumbered in the local capital improvements plan. All refunds to private landowners must include the pro rata portion of interest earned while on deposit in the impact fee account.

Municipal Responsibilities

The City of Beaufort and Town of Port Royal are responsible for preparing and publishing an annual report describing the amount of impact fees collected, appropriated and spent during the preceding year for each service area in which impact fees were collected. Subsequent to adoption of a development impact fee ordinance, the Metropolitan Planning Commission will be required to review and update the impact fee study report, capital improvement plan, housing affordability analysis, and development impact fee ordinance. These updates must occur at least once every five years. Pursuant to State Law, the City of Beaufort and Town of Port Royal are not empowered to recommend additional projects eligible for impact fee funding or charge higher maximum allowable impact fees until the development impact fee study and capital improvements plan have been updated. SC Code of Law 6-1-920 defines

capital equipment and vehicles, with and individual unit purchase price of not less the one hundred thousand dollars including, but not limited to, equipment and vehicles used in the delivery of public safety services, emergency preparedness services, collection and disposal of solid waste, and storm water management and control.

The fire impact fees will be calculated for the applicant at the beginning of the permit application process or as requested and will be paid prior to issuance of the building permit. Fire Impact fees collected will be deposited in a Trust Fund created for Beaufort/Port Royal Fire Department. Impact fee funds may be used to implement one or more projects specified in the Beaufort/Port Royal Fire Department Capital Improvements Program (CIP), for the principal payment on bonds used to fund expanded or new capital facilities, for capital equipment or capital facilities purchases or facility or equipment leasing, as reflected in the CIP.

The City of Beaufort and Town of Port Royal Finance Officers will produce annual reports for presentation to their respective Councils, summarizing where impact fees have been collected and the projects that have been funded with these monies as part of the overall annual budget process.

Analysis Period

A twenty-year planning horizon is a reasonable period pursuant to Section 6-1-960(B)(7) of the South Carolina Development Impact Fee Act.

Demographic Data

According to the U.S. Census Bureau, as of July 1, 2017, the population estimate for the City of Beaufort was 13,729 and the population estimate for the Town of Port Royal was 12,886. Current employment estimate for the city is 7,935 and 5,463 in the town (United States Department of Commerce, 2019).

~~Population growth projections from the years 2000–2030 (83,134) and employment (51,526) estimates for 2015 and future year population (105,196) and employment forecasts (81,150) for 2035 were calculated using both local and regional data sets.~~

Average persons per household statistics used in the study were based on information published by the US Census Bureau, American Community Survey, One Year Estimate, 2017 for various dwelling unit categories. Employee space ratios used in the study were based on information published by the Institute of Transportation Engineers' (ITE) in the ninth edition Trip Generation. Information from both sources is summarized by the ITE in Appendix D.

Methodology for Fire Protection Impact Fee Calculation

The fire protection development impact fee assumes a consumption-driven approach. This approach charges new residential and non-residential development the cost of replacing existing capacity on a one-for-one basis, assuming constant current service delivery standards, and expansion of services and infrastructure to areas impacted.

Replacement value

Total replacement costs were determined using fee simple land values, site development costs, facility replacement costs, vehicle and equipment replacement costs, and related professional services.

The replacement value (system-wide) was calculated in two steps. First, total replacement value was multiplied by the proportionate share of calls of service received from residential and non-residential structures. Second, the resulting replacement values for

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residential and non-residential uses were divided by current population or employment estimates to determine the cost per capita or cost per employee for replacing fire protection facilities and equipment currently serving the study area.

Replacement value of capital assets and equipment, apparatus, and equipment total \$16,065,000.00 per Beaufort/Port Royal CIP 2018 (Appendix C). The Beaufort/Port Royal Fire Department responded to 3595 emergency calls for service in calendar year 2018. 1820 (50.6%) calls for service to residential uses and 1775 (49.4%) calls for service to non-residential uses. The proportionate share between residential and non-residential used to rebuild fire protection facilities and purchase eligible equipment is as follows:

$$\text{Residential Uses} = 50.6\% \text{ of } \$16,065,000.00 = \$8,128,890$$

$$\text{Non-Residential Uses} = 49.4\% \text{ of } \$16,065,000.00 = \$7,936,110$$

Cost per Person (residential impact fee calculation)

Cost per Person represents the burden to each existing resident within the municipal boundaries should the Beaufort/Port Royal Fire Department find the need to construct, rebuild, or remodel fire facilities or replace eligible equipment to maintain or improve the current service delivery standard. Total replacement cost attributable to City/Town residents for residential uses is \$8,128,890 per the Beaufort/Port Royal Fire Department 2018 Capital Improvement plan. The population estimate from July 1, 2018 published by the US Census Bureau, American Community Survey, for the city and town combined is 26,615 residents.

$$\text{Cost per Person} = \frac{\text{Total replacement Cost Attributable to Residents } (\$8,128,890)}{\text{Population Estimate (26,615)}}$$

$$\text{Cost per Person} = \$305.43$$

Impact fee for Residential uses is calculated using the ITE Land use chart as follows:

$$\text{Residential Fire Impact Fee} = (\text{SU}) \times (\text{CPP})$$

Number of dwelling units * Cost per Person = Impact Fee

Where:

SU (Service Unit) = The amount of net new service units generated by the proposed development. The service unit variable is calculated per Service Unit as annotated by each land use category.

CPP (COST PER PERSON) = The cost per person for providing fire protection services. The cost per person is \$305.43.

Exp. 10 unit apartment building

10 units * \$305.43 = fee of \$3,054.43

1 single family home = 1 * \$305.43 = fee of \$305.43

Cost per Employee (non-residential impact fee calculation)

Cost per Employee represents the burden to each existing employee in the study area, should the Beaufort/Port Royal Fire Department find the need to construct, rebuild, remodel fire facilities, or replace eligible equipment to maintain or improve the current service delivery standard. Employee Estimates per the 2017 American Community Survey data from the United States Census Bureau.

Cost per Employee =
$$\frac{\text{Total replacement Cost Attributable to Non- Residents } (\$7,936,110)}{\text{Employee Estimate } (13,398)}$$

Cost per Employee calculation = \$592.34

Cost per Employee multiplied by the employee space ratio for the appropriate land use category, the product then multiplied by the unit of measure or per 1,000 GSF. (Institute of Transportation Engineers' Trip Generation, Ninth Edition.)

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Impact fee for Non-Residential uses will be calculated using the following formula as applied to the ITE's Land Use Category Chart:

Cost per Employee (\$592.34) * Employee Space Ratio * unit of measure = fee

a. Non-Residential Development

Non-Residential Fire Impact Fee = (#SU) x (ESR) x (CPE)

Where:

SU = The amount of net new service units generated by the proposed development. The service unit variable is calculated per Service Unit as annotated by each land use category.

ESR = Average employee space ratio developed using information published in the Institute of Transportation Engineers *Trip Generation, Ninth Edition*

CPR (Cost per Employee) = The cost per employee for providing fire protection. The cost per employee is \$592.34.

Exp. 50 room Hotel

$$\begin{aligned} \$592.34 * .57 &= \$337.63 & \$337.63 * 50 \text{ rooms} &= \$16,881.50 \end{aligned}$$

Impact Fee Schedule for Fire Protection Facilities and Equipment

Land Use Category	Service Units	Persons per Household	Employee Space Ratio	Cost per Person	Cost per Employee	Impact Fee per Service unit
Residential Uses						
Single Family (Attached or Detached)	d.u.	2.69	—	\$305.43	—	\$305.43
Mobile Home	d.u.	3.66	—	\$305.43	—	\$305.43
Multifamily (>2 Dwelling Units)	d.u.	1.25	—	\$305.43	—	\$305.43
Non-Residential Uses						
Hotel / Motel Uses						
Hotel	room	—	0.57	—	\$592.34	\$337.64
Business Hotel	room	—	0.1	—	\$592.34	\$59.23
Motel	room	—	0.71	—	\$592.34	\$420.56
Recreational Uses						
Golf Course	hole	—	1.74	—	\$592.34	\$1,030.68
Movie Theater (w/ Matinee)	1,000 s.f.	—	1.1	—	\$592.34	\$651.58
Institutional Uses						
Elementary School	1,000 s.f.	—	0.98	—	\$592.34	\$580.50
Middle/Junior High School	1,000 s.f.	—	0.84	—	\$592.34	\$497.57
High School	1,000 s.f.	—	0.65	—	\$592.34	\$385.02
Junior/Community College	1,000 s.f.	—	1.77	—	\$592.34	\$1,048.45
University/College	student	—	0.19	—	\$592.34	\$112.55
Daycare	1,000 s.f.	—	2.77	—	\$592.34	\$1,640.79
Library	1,000 s.f.	—	1.07	—	\$592.34	\$633.81
Medical Uses						
Hospital	bed	—	2.88	—	\$592.34	\$1,705.95
Nursing Home	bed	—	0.84	—	\$592.34	\$497.57
Clinic	1,000 s.f.	—	3.93	—	\$592.34	\$2,327.91
Medical/Dental Office	1,000 s.f.	—	4.05	—	\$592.34	\$2,398.99

Impact Fee Schedule for Fire Protection Facilities and Equipment

Land Use Category	Service Units	Persons per Household	Employee Space Ratio	Cost per Person	Cost per Employee	Impact Fee per Service unit
General Office Uses						
< 50,000 s.f.	1,000 s.f.	—	4.14	—	\$592.34	\$2,452.30
50,001 – 100,000 s.f.	1,000 s.f.	—	3.72	—	\$592.34	\$2,203.52
100,001 – 150,000 s.f.	1,000 s.f.	—	3.55	—	\$592.34	\$2,102.82
150,001 – 200,000 s.f.	1,000 s.f.	—	3.44	—	\$592.34	\$2,037.66
> 200,001 s.f.	1,000 s.f.	—	3.26	—	\$592.34	\$1,931.04
Office Park Uses						
< 50,000 s.f.	1,000 s.f.	—	3.7	—	\$592.34	\$2,191.67
50,001 – 100,000 s.f.	1,000 s.f.	—	4.96	—	\$592.34	\$2,938.03
100,001 s.f. – 150,000 s.f.	1,000 s.f.	—	4.18	—	\$592.34	\$2,476.00
150,001 – 200,000 s.f.	1,000 s.f.	—	3.82	—	\$592.34	\$2,262.75
200,001 – 250,000 s.f.	1,000 s.f.	—	3.62	—	\$592.34	\$2,144.29
250,001 – 300,000 s.f.	1,000 s.f.	—	3.48	—	\$592.34	\$2,061.36
300,001 – 350,000 s.f.	1,000 s.f.	—	3.38	—	\$592.34	\$2,002.12
350,001 – 400,000 s.f.	1,000 s.f.	—	3.3	—	\$592.34	\$1,954.74
> 400,001 s.f.	1,000 s.f.	—	3.17	—	\$592.34	\$1,877.73
Business Park Uses						
< 100,000 s.f.	1,000 s.f.	—	2.44	—	\$592.34	\$1,445.32
100,001 s.f. – 150,000 s.f.	1,000 s.f.	—	2.79	—	\$592.34	\$1,652.64
150,001 – 200,000 s.f.	1,000 s.f.	—	2.95	—	\$592.34	\$1,747.41
200,001 – 250,000 s.f.	1,000 s.f.	—	3.03	—	\$592.34	\$1,794.80
250,001 – 300,000 s.f.	1,000 s.f.	—	3.09	—	\$592.34	\$1,830.34
300,001 – 350,000 s.f.	1,000 s.f.	—	3.12	—	\$592.34	\$1,848.11
350,001 – 400,000 s.f.	1,000 s.f.	—	3.15	—	\$592.34	\$1,865.88
> 400,001 s.f.	1,000 s.f.	—	3.2	—	\$592.34	\$1,895.50

Impact Fee Schedule for Fire Protection Facilities and Equipment

Land Use Category	Service Units	Persons per Household	Employee Space Ratio	Cost per Person	Cost per Employee	Impact Fee per Service unit
General Retail Uses						
< 50,000 s.f.	1,000 s.f.	—	2.86	—	\$592.34	\$1,694.10
50,001 – 100,000 s.f.	1,000 s.f.	—	2.5	—	\$592.34	\$1,480.86
100,001 s.f. – 150,000 s.f.	1,000 s.f.	—	2.22	—	\$592.34	\$1,315.00
150,001 – 200,000 s.f.	1,000 s.f.	—	2.22	—	\$592.34	\$1,315.00
200,001 – 300,000 s.f.	1,000 s.f.	—	2.22	—	\$592.34	\$1,315.00
300,001 – 400,000 s.f.	1,000 s.f.	—	2.22	—	\$592.34	\$1,315.00
> 400,001 s.f.	1,000 s.f.	—	2.22	—	\$592.34	\$1,315.00
Specific Retail Uses						
Supermarket	1,000 s.f.	—	1.1	—	\$592.34	\$651.58
Building Materials/ Lumber Store	1,000 s.f.	—	1.41	—	\$592.34	\$835.21
Free Standing Discount Store	1,000 s.f.	—	1.98	—	\$592.34	\$1,172.84
Nursery/Garden Center	1,000 s.f.	—	3.12	—	\$592.34	\$1,848.11
New Car Sales Center	1,000 s.f.	—	1.53	—	\$592.34	\$906.29
Tire Store	1,000 s.f.	—	1.21	—	\$592.34	\$716.74
Furniture Store	1,000 s.f.	—	0.42	—	\$592.34	\$248.78
Industrial Uses						
General Light Industrial	1,000 s.f.	—	2.31	—	\$592.34	\$1,368.31
General Heavy Industrial	1,000 s.f.	—	1.83	—	\$592.34	\$1,083.99
Industrial Park	1,000 s.f.	—	2.04	—	\$592.34	\$1,208.38
Warehousing	1,000 s.f.	—	0.92	—	\$592.34	\$544.96
Mini-Warehouse	1,000 s.f.	—	0.04	—	\$592.34	\$23.69
Specific Service Uses						
Drive-In Bank	1,000 s.f.	—	4.79	—	\$592.34	\$2,837.33
High-Turnover Sit-Down Restaurant	1,000 s.f.	—	5.64	—	\$592.34	\$3,340.82
Fast Food w/ Drive Through	1,000 s.f.	—	5	—	\$592.34	\$2,961.72

Other Available Funding Sources

The City of Beaufort Fire Department does not have any active grants or outside funding sources in excess of \$100,000 for building, apparatus, or other capital items.

Conclusion

Significant growth and development within municipal boundaries of the City of Beaufort and Town of Port Royal is expected to continue, which will likely overburden fire protection services and equipment beyond current service delivery standards or maximum service capacities. Therefore, it is appropriate to implement a developmental impact fee program to mitigate a proportionate share of the anticipated future deficiencies associated with new growth.

Appendix A Enabling Legislation

South Carolina Code of Laws, Title 6, Article 9, Section 910

TITLE 6. Local Government – Provisions Applicable to Special Purpose Districts and Other Political Subdivisions

ARTICLE 9. Development Impact Fees

SECTION 6-1-910. Short title.

This article may be cited as the "South Carolina Development Impact Fee Act".

HISTORY: 1999 Act No. 118, Section 1.

SECTION 6-1-920. Definitions.

As used in this article:

- (1) "Affordable housing" means housing affordable to families whose incomes do not exceed eighty percent of the median income for the service area or areas within the jurisdiction of the governmental entity.
- (2) "Capital improvements" means improvements with a useful life of five years or more, by new construction or other action, which increase or increased the service capacity of a public facility.
- (3) "Capital improvements plan" means a plan that identifies capital improvements for which development Previous impact fees may be used as a funding source.
- (4) "Connection charges" and "hookup charges" mean charges for the actual cost of connecting a property to a public water or public sewer system, limited to labor and materials involved in making pipe connections, installation of water meters, and other actual costs.
- (5) "Developer" means an individual or corporation, partnership, or other entity undertaking development.
- (6) "Development" means construction or installation of a new building or structure, or a change in use of a building or structure, any of which creates additional demand and need for public facilities. A building or structure shall include, but not be limited to, modular buildings and manufactured housing. "Development" does not include alterations made to existing single-family homes.
- (7) "Development approval" means a document from a governmental entity which authorizes the commencement of a development.

(8) "Development impact fee" or "impact fee" means a payment of money imposed as a condition of development approval to pay a proportionate share of the cost of system improvements needed to serve the people utilizing the improvements. The term does not include:

- (a) a charge or fee to pay the administrative, plan review, or inspection costs associated with permits required for development;
- (b) connection or hookup charges;
- (c) amounts collected from a developer in a transaction in which the governmental entity has incurred expenses in constructing capital improvements for the development if the owner or developer has agreed to be financially responsible for the construction or installation of the capital improvements;
- (d) fees authorized by Article 3 of this chapter.

(9) "Development permit" means a permit issued for construction on or development of land when no subsequent building permit issued pursuant to Chapter 9 of Title 6 is required.

(10) "Fee payor" means the individual or legal entity that pays or is required to pay a development impact fee.

(11) "Governmental entity" means a county, as provided in Chapter 9, Title 4, and a municipality, as defined in Section 5-1-20.

(12) "Incidental benefits" are benefits which accrue to a property as a secondary result or as a minor consequence of the provision of public facilities to another property.

(13) "Land use assumptions" means a description of the service area and projections of land uses, densities, intensities, and population in the service area over at least a ten-year period.

(14) "Level of service" means a measure of the relationship between service capacity and service demand for public facilities.

(15) "Local planning commission" means the entity created pursuant to Article 1, Chapter 29, Title 6.

(16) "Project" means a particular development on an identified parcel of land.

(17) "Proportionate share" means that portion of the cost of system improvements determined pursuant to Section 6-1-990 which reasonably relates to the service demands and needs of the project.

(18) "Public facilities" means:

- (a) water supply production, treatment, laboratory, engineering, administration, storage, and transmission facilities;
- (b) wastewater collection, treatment, laboratory, engineering, administration, and disposal facilities;
- (c) solid waste and recycling collection, treatment, and disposal facilities;
- (d) roads, streets, and bridges including, but not limited to, rights-of-way and traffic signals;
- (e) storm water transmission, retention, detention, treatment, and disposal facilities and flood control facilities;
- (f) public safety facilities, including law enforcement, fire, emergency medical and rescue, and street lighting facilities;
- (g) capital equipment and vehicles, with an individual unit purchase price of not less than one hundred thousand dollars including, but not limited to, equipment and vehicles used in the delivery of public safety services, emergency preparedness services, collection and disposal of solid waste, and storm water management and control;
- (h) parks, libraries, and recreational facilities;
- (i) public education facilities for grades K-12 including, but not limited to, schools, offices, classrooms, parking areas, playgrounds, libraries, cafeterias, gymnasiums, health and music rooms, computer and science laboratories, and other facilities considered necessary for the proper public education of the state's children.

(19) "Service area" means, based on sound planning or engineering principles, or both, a defined geographic area in which specific public facilities provide service to development within the area defined. Provided, however, that no provision in this article may be interpreted to alter, enlarge, or reduce the service area or boundaries of a political subdivision which is authorized or set by law.

(20) "Service unit" means a standardized measure of consumption, use, generation, or discharge attributable to an individual unit of development calculated in accordance with generally accepted engineering or planning standards for a particular category of capital improvements.

(21) "System improvements" means capital improvements to public facilities which are designed to provide service to a service area.

(22) "System improvement costs" means costs incurred for construction or reconstruction of system improvements, including design, acquisition, engineering, and other costs attributable to

the improvements, and also including the costs of providing additional public facilities needed to serve new growth and development. System improvement costs do not include:

- (a) construction, acquisition, or expansion of public facilities other than capital improvements identified in the capital improvements plan;
- (b) repair, operation, or maintenance of existing or new capital improvements;
- (c) upgrading, updating, expanding, or replacing existing capital improvements to serve existing development in order to meet stricter safety, efficiency, environmental, or regulatory standards;
- (d) upgrading, updating, expanding, or replacing existing capital improvements to provide better service to existing development;
- (e) administrative and operating costs of the governmental entity; or
- (f) principal payments and interest or other finance charges on bonds or other indebtedness except financial obligations issued by or on behalf of the governmental entity to finance capital improvements identified in the capital improvements plan.

HISTORY: 1999 Act No. 118, Section 1; 2016 Act No. 229 (H.4416), Section 2, eff June 3, 2016.

Effect of Amendment

2016 Act No. 229, Section 2, added (18)(i), relating to certain public education facilities.

SECTION 6-1-930. Developmental impact fee.

(A)(1) Only a governmental entity that has a comprehensive plan, as provided in Chapter 29 of this title, and which complies with the requirements of this article may impose a development impact fee. If a governmental entity has not adopted a comprehensive plan but has adopted a capital improvements plan which substantially complies with the requirements of Section 6-1-960(B), then it may impose a development impact fee. A governmental entity may not impose an impact fee, regardless of how it is designated, except as provided in this article. However, a special purpose district or public service district which (a) provides fire protection services or recreation services, (b) was created by act of the General Assembly prior to 1973, and (c) had the power to impose development impact fees prior to the effective date of this section is not prohibited from imposing development impact fees.

(2) Before imposing a development impact fee on residential units, a governmental entity shall prepare a report which estimates the effect of recovering capital costs through impact fees on the availability of affordable housing within the political jurisdiction of the governmental entity.

(B)(1) An impact fee may be imposed and collected by the governmental entity only upon the passage of an ordinance approved by a positive majority, as defined in Article 3 of this chapter.

(2) The amount of the development impact fee must be based on actual improvement costs or reasonable estimates of the costs, supported by sound engineering studies.

(3) An ordinance authorizing the imposition of a development impact fee must:

(a) establish a procedure for timely processing of applications for determinations by the governmental entity of development impact fees applicable to all property subject to impact fees and for the timely processing of applications for individual assessment of development impact fees, credits, or reimbursements allowed or paid under this article;

(b) include a description of acceptable levels of service for system improvements; and

(c) provide for the termination of the impact fee.

(C) A governmental entity shall prepare and publish an annual report describing the amount of all impact fees collected, appropriated, or spent during the preceding year by category of public facility and service area.

(D) Payment of an impact fee may result in an incidental benefit to property owners or developers within the service area other than the fee payor, except that an impact fee that results in benefits to property owners or developers within the service area, other than the fee payor, in an amount which is greater than incidental benefits is prohibited.

HISTORY: 1999 Act No. 118, § 1.

SECTION 6-1-940. Amount of impact fee.

A governmental entity imposing an impact fee must provide in the impact fee ordinance the amount of impact fee due for each unit of development in a project for which an individual building permit or certificate of occupancy is issued. The governmental entity is bound by the amount of impact fee specified in the ordinance and may not charge higher or additional impact fees for the same purpose unless the number of service units increases or the scope of the development changes and the amount of additional impact fees is limited to the amount attributable to the additional service units or change in scope of the development. The impact fee ordinance must:

(1) include an explanation of the calculation of the impact fee, including an explanation of the factors considered pursuant to this article;

(2) specify the system improvements for which the impact fee is intended to be used;

(3) inform the developer that he may pay a project's proportionate share of system improvement costs by payment of impact fees according to the fee schedule as full and complete payment of the developer's proportionate share of system improvements costs;

(4) inform the fee payor that:

(a) he may negotiate and contract for facilities or services with the governmental entity in lieu of the development impact fee as defined in Section 6-1-1050;

(b) he has the right of appeal, as provided in Section 6-1-1030;

(c) the impact fee must be paid no earlier than the time of issuance of the building permit or issuance of a development permit if no building permit is required.

HISTORY: 1999 Act No. 118, § 1.

SECTION 6-1-950. Procedure for adoption of ordinance imposing impact fees.

(A) The governing body of a governmental entity begins the process for adoption of an ordinance imposing an impact fee by enacting a resolution directing the local planning commission to conduct the studies and to recommend an impact fee ordinance, developed in accordance with the requirements of this article. Under no circumstances may the governing body of a governmental entity impose an impact fee for any public facility which has been paid for entirely by the developer.

(B) Upon receipt of the resolution enacted pursuant to subsection (A), the local planning commission shall develop, within the time designated in the resolution, and make recommendations to the governmental entity for a capital improvements plan and impact fees by service unit. The local planning commission shall prepare and adopt its recommendations in the same manner and using the same procedures as those used for developing recommendations for a comprehensive plan as provided in Article 3, Chapter 29, Title 6, except as otherwise provided in this article. The commission shall review and update the capital improvements plan and impact fees in the same manner and on the same review cycle as the governmental entity's comprehensive plan or elements of it.

HISTORY: 1999 Act No. 118, § 1.

SECTION 6-1-960. Recommended capital improvements plan; notice; contents of plan.

(A) The local planning commission shall recommend to the governmental entity a capital improvements plan which may be adopted by the governmental entity by ordinance. The recommendations of the commission are not binding on the governmental entity, which may amend or alter the plan. After reasonable public notice, a public hearing must be held before final action to adopt the ordinance approving the capital improvements plan. The notice must be published not less than thirty days before the time of the hearing in at least one newspaper of general circulation in the county. The notice must advise the public of the time and place of the

hearing, that a copy of the capital improvements plan is available for public inspection in the offices of the governmental entity, and that members of the public will be given an opportunity to be heard.

(B) The capital improvements plan must contain:

(1) a general description of all existing public facilities, and their existing deficiencies, within the service area or areas of the governmental entity, a reasonable estimate of all costs, and a plan to develop the funding resources, including existing sources of revenues, related to curing the existing deficiencies including, but not limited to, the upgrading, updating, improving, expanding, or replacing of these facilities to meet existing needs and usage;

(2) an analysis of the total capacity, the level of current usage, and commitments for usage of capacity of existing public facilities, which must be prepared by a qualified professional using generally accepted principles and professional standards;

(3) a description of the land use assumptions;

(4) a definitive table establishing the specific service unit for each category of system improvements and an equivalency or conversion table establishing the ratio of a service unit to various types of land uses, including residential, commercial, agricultural, and industrial, as appropriate;

(5) a description of all system improvements and their costs necessitated by and attributable to new development in the service area, based on the approved land use assumptions, to provide a level of service not to exceed the level of service currently existing in the community or service area, unless a different or higher level of service is required by law, court order, or safety consideration;

(6) the total number of service units necessitated by and attributable to new development within the service area based on the land use assumptions and calculated in accordance with generally accepted engineering or planning criteria;

(7) the projected demand for system improvements required by new service units projected over a reasonable period of time not to exceed twenty years;

(8) identification of all sources and levels of funding available to the governmental entity for the financing of the system improvements; and

(9) a schedule setting forth estimated dates for commencing and completing construction of all improvements identified in the capital improvements plan.

(C) Changes in the capital improvements plan must be approved in the same manner as approval of the original plan.

HISTORY: 1999 Act No. 118, § 1.

SECTION 6-1-970. Exemptions from impact fees.

The following structures or activities are exempt from impact fees:

- (1) rebuilding the same amount of floor space of a structure that was destroyed by fire or other catastrophe;
- (2) remodeling or repairing a structure that does not result in an increase in the number of service units;
- (3) replacing a residential unit, including a manufactured home, with another residential unit on the same lot, if the number of service units does not increase;
- (4) placing a construction trailer or office on a lot during the period of construction on the lot;
- (5) constructing an addition on a residential structure which does not increase the number of service units;
- (6) adding uses that are typically accessory to residential uses, such as a tennis court or a clubhouse, unless it is demonstrated clearly that the use creates a significant impact on the system's capacity;
- (7) all or part of a particular development project if:
 - (a) the project is determined to create affordable housing; and
 - (b) the exempt development's proportionate share of system improvements is funded through a revenue source other than development impact fees;
- (8) constructing a new elementary, middle, or secondary school; and
- (9) constructing a new volunteer fire department.

HISTORY: 1999 Act No. 118, § 1; 2016 Act No. 229 (H.4416), § 1, eff June 3, 2016.

Effect of Amendment

2016 Act No. 229, § 1, added (8) and (9), relating to certain schools and volunteer fire departments.

SECTION 6-1-980. Calculation of impact fees.

(A) The impact fee for each service unit may not exceed the amount determined by dividing the costs of the capital improvements by the total number of projected service units that potentially could use the capital improvement. If the number of new service units projected over a

reasonable period of time is less than the total number of new service units shown by the approved land use assumptions at full development of the service area, the maximum impact fee for each service unit must be calculated by dividing the costs of the part of the capital improvements necessitated by and attributable to the projected new service units by the total projected new service units.

(B) An impact fee must be calculated in accordance with generally accepted accounting principles.

HISTORY: 1999 Act No. 118, § 1.

SECTION 6-1-990. Maximum impact fee; proportionate share of costs of improvements to serve new development.

(A) The impact fee imposed upon a fee payor may not exceed a proportionate share of the costs incurred by the governmental entity in providing system improvements to serve the new development. The proportionate share is the cost attributable to the development after the governmental entity reduces the amount to be imposed by the following factors:

(1) appropriate credit, offset, or contribution of money, dedication of land, or construction of system improvements; and

(2) all other sources of funding the system improvements including funds obtained from economic development incentives or grants secured which are not required to be repaid.

(B) In determining the proportionate share of the cost of system improvements to be paid, the governmental entity imposing the impact fee must consider the:

(1) cost of existing system improvements resulting from new development within the service area or areas;

(2) means by which existing system improvements have been financed;

(3) extent to which the new development contributes to the cost of system improvements;

(4) extent to which the new development is required to contribute to the cost of existing system improvements in the future;

(5) extent to which the new development is required to provide system improvements, without charge to other properties within the service area or areas;

(6) time and price differentials inherent in a fair comparison of fees paid at different times; and

(7) availability of other sources of funding system improvements including, but not limited to, user charges, general tax levies, intergovernmental transfers, and special taxation.

HISTORY: 1999 Act No. 118, § 1.

SECTION 6-1-1000. Fair compensation or reimbursement of developers for costs, dedication of land or oversize facilities.

A developer required to pay a development impact fee may not be required to pay more than his proportionate share of the costs of the project, including the payment of money or contribution or dedication of land, or to oversize his facilities for use of others outside of the project without fair compensation or reimbursement.

HISTORY: 1999 Act No. 118, § 1.

SECTION 6-1-1010. Accounting; expenditures.

(A) Revenues from all development impact fees must be maintained in one or more interest-bearing accounts. Accounting records must be maintained for each category of system improvements and the service area in which the fees are collected. Interest earned on development impact fees must be considered funds of the account on which it is earned and must be subject to all restrictions placed on the use of impact fees pursuant to the provisions of this article.

(B) Expenditures of development impact fees must be made only for the category of system improvements and within or for the benefit of the service area for which the impact fee was imposed as shown by the capital improvements plan and as authorized in this article. Impact fees may not be used for:

- (1) a purpose other than system improvement costs to create additional improvements to serve new growth;
- (2) a category of system improvements other than that for which they were collected; or
- (3) the benefit of service areas other than the area for which they were imposed.

HISTORY: 1999 Act No. 118, § 1.

SECTION 6-1-1020. Refunds of impact fees.

(A) An impact fee must be refunded to the owner of record of property on which a development impact fee has been paid if:

- (1) the impact fees have not been expended within three years of the date they were scheduled to be expended on a first-in, first-out basis; or
- (2) a building permit or permit for installation of a manufactured home is denied.

(B) When the right to a refund exists, the governmental entity shall send a refund to the owner of record within ninety days after it is determined by the entity that a refund is due.

(C) A refund must include the pro rata portion of interest earned while on deposit in the impact fee account.

(D) A person entitled to a refund has standing to sue for a refund pursuant to this article if there has not been a timely payment of a refund pursuant to subsection (B) of this section.

HISTORY: 1999 Act No. 118, § 1.

SECTION 6-1-1030. Appeals.

(A) A governmental entity which adopts a development impact fee ordinance shall provide for administrative appeals by the developer or fee payor.

(B) A fee payor may pay a development impact fee under protest. A fee payor making the payment is not estopped from exercising the right of appeal provided in this article, nor is the fee payor estopped from receiving a refund of an amount considered to have been illegally collected. Instead of making a payment of an impact fee under protest, a fee payor, at his option, may post a bond or submit an irrevocable letter of credit for the amount of impact fees due, pending the outcome of an appeal.

(C) A governmental entity which adopts a development impact fee ordinance shall provide for mediation by a qualified independent party, upon voluntary agreement by both the fee payor and the governmental entity, to address a disagreement related to the impact fee for proposed development. Participation in mediation does not preclude the fee payor from pursuing other remedies provided for in this section or otherwise available by law.

HISTORY: 1999 Act No. 118, § 1.

SECTION 6-1-1040. Collection of development impact fees.

A governmental entity may provide in a development impact fee ordinance the method for collection of development impact fees including, but not limited to:

- (1) additions to the fee for reasonable interest and penalties for nonpayment or late payment;
- (2) withholding of the certificate of occupancy, or building permit if no certificate of occupancy is required, until the development impact fee is paid;
- (3) withholding of utility services until the development impact fee is paid; and
- (4) imposing liens for failure to pay timely a development impact fee.

HISTORY: 1999 Act No. 118, § 1.

SECTION 6-1-1050. Permissible agreements for payments or construction or installation of improvements by fee payors and developers; credits and reimbursements.

A fee payor and developer may enter into an agreement with a governmental entity, including an agreement entered into pursuant to the South Carolina Local Government Development Agreement Act, providing for payments instead of impact fees for facilities or services. That agreement may provide for the construction or installation of system improvements by the fee payor or developer and for credits or reimbursements for costs incurred by a fee payor or developer including interproject transfers of credits or reimbursement for project improvements which are used or shared by more than one development project. An impact fee may not be imposed on a fee payor or developer who has entered into an agreement as described in this section.

HISTORY: 1999 Act No. 118, § 1.

SECTION 6-1-1060. Article shall not affect existing laws.

(A) The provisions of this article do not repeal existing laws authorizing a governmental entity to impose fees or require contributions or property dedications for capital improvements. A development impact fee adopted in accordance with existing laws before the enactment of this article is not affected until termination of the development impact fee. A subsequent change or reenactment of the development impact fee must comply with the provisions of this article. Requirements for developers to pay in whole or in part for system improvements may be imposed by governmental entities only by way of impact fees imposed pursuant to the ordinance.

(B) Notwithstanding another provision of this article, property for which a valid building permit or certificate of occupancy has been issued or construction has commenced before the effective date of a development impact fee ordinance is not subject to additional development impact fees.

HISTORY: 1999 Act No. 118, § 1.

SECTION 6-1-1070. Shared funding among units of government; agreements.

(A) If the proposed system improvements include the improvement of public facilities under the jurisdiction of another unit of government including, but not limited to, a special purpose district that does not provide water and wastewater utilities, a school district, and a public service district, an agreement between the governmental entity and other unit of government must specify the reasonable share of funding by each unit. The governmental entity authorized to impose impact fees may not assume more than its reasonable share of funding joint improvements, nor may another unit of government which is not authorized to impose impact fees do so unless the expenditure is pursuant to an agreement under Section 6-1-1050 of this section.

(B) A governmental entity may enter into an agreement with another unit of government including, but not limited to, a special purpose district that does not provide water and

wastewater utilities, a school district, and a public service district, that has the responsibility of providing the service for which an impact fee may be imposed. The determination of the amount of the impact fee for the contracting governmental entity must be made in the same manner and is subject to the same procedures and limitations as provided in this article. The agreement must provide for the collection of the impact fee by the governmental entity and for the expenditure of the impact fee by another unit of government including, but not limited to, a special purpose district that does not provide water and wastewater utilities, a school district, and a public services district unless otherwise provided by contract.

HISTORY: 1999 Act No. 118, § 1.

SECTION 6-1-1080. Exemptions; water or wastewater utilities.

The provisions of this chapter do not apply to a development impact fee for water or wastewater utilities, or both, imposed by a city, county, commissioners of public works, special purpose district, or nonprofit corporation organized pursuant to Chapter 35 or 36 of Title 33, except that in order to impose a development impact fee for water or wastewater utilities, or both, the city, county, commissioners of public works, special purpose district or nonprofit corporation organized pursuant to Chapter 35 or 36 of Title 33 must:

- (1) have a capital improvements plan before imposition of the development impact fee; and
- (2) prepare a report to be made public before imposition of the development impact fee, which shall include, but not be limited to, an explanation of the basis, use, calculation, and method of collection of the development impact fee; and
- (3) enact the fee in accordance with the requirements of Article 3 of this chapter.

HISTORY: 1999 Act No. 118, § 1.

SECTION 6-1-1090. Annexations by municipalities.

A county development impact fee ordinance imposed in an area which is annexed by a municipality is not affected by this article until the development impact fee terminates, unless the municipality assumes any liability which is to be paid with the impact fee revenue.

HISTORY: 1999 Act No. 118, § 1.

SECTION 6-1-2000. Taxation or revenue authority by political subdivisions.

This article shall not create, grant, or confer any new or additional taxing or revenue raising authority to a political subdivision which was not specifically granted to that entity by a previous act of the General Assembly.

HISTORY: 1999 Act No. 118, § 1.

Appendix B

Resolution**A JOINT RESOLUTION OF THE CITY OF BEAUFORT AND TOWN OF PORT ROYAL TO BEGIN THE PROCESS FOR ADOPTION OF AN ORDINANCE IMPOSING A FIRE FACILITIES AND EQUIPMENT DEVELOPMENT IMPACT FEE**

WHEREAS, the City of Beaufort Comprehensive Plan -Vision Beaufort 2009 Comprehensive Plan - contains, on pages 239 and 241 a section outlining a capital improvement plan for fire facilities and equipment needs of the Beaufort-Port Royal Fire Department (Beaufort's Portions); and,

WHEREAS, the Town of Port Royal comprehensive plan shows commitment to regional cooperation on Level of Service Standards (LOS) on page 23; and,

WHEREAS, The City of Beaufort and Town of Port Royal signed an Intergovernmental Agreement on May 10th, 2017 memorializing a contractual agreement for provision of fire service and shared costs between the two governments; and,

WHEREAS, certain fire districts throughout Beaufort County have heretofore imposed capital improvements fire development impact fees to assist in the funding of capital improvements; and,

WHEREAS, as the Beaufort-Port Royal Fire Department continues to expand and improve its response to new construction and development, the City and Town Council's believe that such new development should assist in the funding of capital improvements to enable such services; and,

WHEREAS, the joint councils of the City of Beaufort and Town of Port Royal believe collectively that it is in the best interest of their citizens to enact a Fire Facilities and Equipment Development Impact Fee on construction and development, to assist in the funding of this capital improvements plan; and,

WHEREAS, Section 6-1-950 (A) of the South Carolina Code of Laws provides that, in order to begin the process for adoption of an ordinance imposing an impact fee, the governing body must first enact a resolution directing the local planning commission to recommend a capital improvement plan and impact fee ordinance; and,


WHEREAS, the joint Councils of the City of Beaufort and Town of Port Royal wish to direct the Metropolitan Planning Commission to conduct a study and to recommend a Fire Facilities and Equipment Development Impact Fee ordinance per this statute:

NOW, THEREFORE, BE IT RESOLVED, by the City Council of Beaufort, South Carolina and Town Council of Port Royal, South Carolina that the Metropolitan Planning Commission is hereby directed to conduct such study as it deems necessary and appropriate within 45 days of this Resolution, and to recommend to the City and Town Councils a Fire Facilities and Equipment Development Impact Fee ordinance in accordance with the requirements of state law.

IN WITNESS THEREOF, I hereunto set my hand and caused the Seal of the City of Beaufort to be affixed this 13th day of November 2018.


BILLY KEYSERLING, MAYOR

ATTEST


IVETTE BURGESS, CITY CLERK



A JOINT RESOLUTION of THE CITY OF BEAUFORT AND TOWN OF PORT ROYAL

A RESOLUTION TO BEGIN THE PROCESS FOR ADOPTION OF AN ORDINANCE IMPOSING A FIRE FACILITIES AND EQUIPMENT DEVELOPMENT IMPACT FEE

WHEREAS, the City of Beaufort Comprehensive Plan -Vision Beaufort 2009 Comprehensive Plan - contains, on pages 239 and 241 a section outlining a capital improvement plan for fire facilities and equipment needs of the Beaufort-Port Royal Fire Department (Beaufort's Portions); and,

WHEREAS, the Town of Port Royal comprehensive plan shows commitment to regional cooperation on Level of Service Standards (LOS) on page 25; and,

WHEREAS, The City of Beaufort and Town of Port Royal signed an Intergovernmental Agreement on May 10th, 2017 memorializing a contractual agreement for provision of fire service and shared costs between the two governments; and,

WHEREAS, certain fire districts throughout Beaufort County have heretofore imposed capital improvements fire development impact fees to assist in the funding of capital improvements; and,

WHEREAS, as the Beaufort-Port Royal Fire Department continues to expand and improve its response to new construction and development, the City and Town Council's believe that such new development should assist in the funding of capital improvements to enable such services; and,

WHEREAS, the joint councils of the City of Beaufort and Town of Port Royal believe collectively that it is in the best interest of their citizens to enact a Fire Facilities and Equipment Development Impact Fee on construction and development, to assist in the funding of this capital improvements plan; and,

WHEREAS, Section 6-1-950 (A) of the South Carolina Code of Laws provides that, in order to begin the process for adoption of an ordinance imposing an impact fee, the governing body must first enact a resolution directing the local planning commission to recommend a capital improvement plan and impact fee ordinance; and,

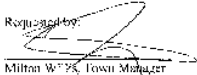
Resolution 8-2018

WHEREAS, the Joint Councils of the City of Beaufort and Town of Port Royal wish to direct the Metropolitan Planning Commission to conduct a study and to recommend a Fire Facilities and Equipment Development Impact Fee ordinance per this statute:

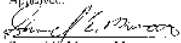
NOW, THEREFORE, BE IT RESOLVED, by the City Council of Beaufort, South Carolina and Town Council of Port Royal, South Carolina that the Metropolitan Planning Commission is hereby directed to conduct such study as it seems necessary and appropriate within 45 days of this Resolution, and to recommend to the City and Town Councils a Fire Facilities and Equipment Development Impact Fee ordinance in accordance with the requirements of state law.

Resolved by the Mayor and Council of Port Royal this 14th day of November, 2018.

Requested by:


Milton W. Mc, Town Manager

Approved:


Samuel E. Murray, Mayor

Attest:


Brooke D. Pious, Municipal Clerk

Appendix C

City of Beaufort – Town of Port Royal,

South Carolina

Fire Department

Proposed Impact Fee Eligible

Capital Improvement Plan

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Introduction

What are Impact Fees?

As communities grow, the demands placed on surrounding infrastructure continue to increase. Eventually, these demands will require additional capacity improvements to maintain appropriate levels of public service.

Impact fees represent financial payments made from a developer to the local government to offset the costs of certain off-site capital improvements needed to facilitate future growth. Fees may be collected for many different public facilities and services, including: transportation, municipal facilities (such as public services, planning, building, engineering, and general administration), stormwater, police and fire protection, and recreation.

Impact fees commonly provide a means for orderly development by mitigating the negative impacts of new growth, while passing the costs associated with new development onto developers, rather than existing taxpayers. Impact fees are most useful in communities that are experiencing rapid growth and have significant land available for development.

The City of Beaufort and Town of Port Royal, who work together to provide fire protection and emergency medical first response services to the two municipalities, are in the process of updating their development impact fees for, fire protection, on all new development (residential and non-residential; exempting low income housing) within their respective municipal limits.

Basis for Impact Fees

The State of South Carolina grants cities and counties the authority to collect impact fees on new development pursuant to the rules and regulations set forth in the South Carolina Development Impact Fee Act (Section 6-1-910 et seq. of the SC Code of Laws). As part of the process for developing an impact fee program, a city or county must prepare and adopt the following:

- An impact fee study report that documents existing conditions, future capital needs, replacement and implementation costs. The study also identifies the maximum allowable impact fees (by category) which may be charged in accordance with the rules and requirements of the Act.
- A report that estimates the effect of impact fees on the availability and affordability of housing.
- A development impact fee ordinance.
- A Capital Improvements Plan (CIP) that identifies capital improvements, equipment, and vehicles that qualify for impact fee funding. Eligible costs may include design, engineering, acquisition, financing, and construction costs. (Administrative and operating costs are not eligible for impact fee funding).

FIRE PROTECTION

Project: Engine/Pumper Trucks

Description: Designed to be the main firefighting/pumping unit on the scene of a fire. These trucks are designed to house a 1,500 gpm pump, a 750 – 1000 gallon water tank, ground ladders, small equipment, and hose. These trucks are also designed to carry medical equipment for Basic Life Support (BLS) as EMT's are assigned to each Engine. Strategic Plans are in place to move these apparatus to Advanced Life Support (ALS) units by July 1 of 2021. The Fire Department currently has six (3) frontline units that fall into this category and two (3) additional in reserve.

Justification: To maintain the current level of fire protection and emergency services, the fire protection development impact fee assumes a consumption-driven approach. This approach charges new residential and non-residential development the cost of replacing existing capacity on a one-for-one basis, assuming constant current service delivery standards. It is anticipated that growth will require additional equipment to maintain response time and ISO rating.

Estimated Cost: \$850,000 each in 2018

Timeline: As needed beginning FY 2019

Possible Funding: Development Impact Fees, General Fund, Lease, Lease-Purchase Agreement, Grants, Hospitality Tax, Accommodations Tax



FIRE PROTECTION

Project: Ladder Truck

Description: Designed to provide access to upper levels of a structure using the 75 - 110-foot aerial ladder affixed to the top of the truck. These units are also equipped with a pump and water tank and can provide firefighting capabilities through hose or from an elevated nozzle on the tip of the ladder. These units carry a larger complement of ground ladders, saws, vehicle extrication equipment, and tools. The Fire Department currently has one (1) frontline unit and one (1) in reserve.

Justification: To maintain the current level of fire protection and emergency services, the fire protection development impact fee assumes a consumption-driven approach. This approach charges new residential and non-residential development the cost of replacing existing capacity on a one-for-one basis, assuming constant current service delivery standards. It is anticipated that growth will require additional to maintain response time and ISO rating.

Estimated Cost: \$1.2 – \$1.4 million in 2018

Timeline: As needed beginning FY 2019

Possible Funding: Development Impact Fees, General Fund, Lease, Lease-Purchase Agreement, Grants, Hospitality Tax, Accommodations Tax



FIRE PROTECTION

Project:	Quick Response Vehicles/Limited Firefighting Capability (QRV-F)
Description:	Commercial vehicle chassis with emergency capabilities. The Fire Department responds on all medical calls within municipal limits regardless of severity. Patient care and stabilization is provided. Beaufort County Emergency Medical Services (EMS) provides the ambulance for transport to a hospital if needed. Our QRV's provide a smaller option for response and provide minimal firefighting/rescue capability. The department currently has one (1) in frontline service and one (1) in reserve.
Justification:	To maintain the current level of fire protection and emergency services, the fire protection development impact fee assumes a consumption-driven approach. This approach charges new residential and non-residential development the cost of replacing existing capacity on a one-for-one basis, assuming constant current service delivery standards.
Estimated Cost:	\$185,000 each in 2018
Timeline:	As needed beginning FY 2019
Possible Funding:	Development Impact Fees, General Fund, Lease, Lease- Purchase Agreement, Grants, Hospitality Tax, Accommodations Tax



FIRE PROTECTION

Project:	Quick Response Vehicles/Service Companies (QRV-S)
Description:	Commercial vehicle chassis with emergency capabilities. The QRV-S fulfill the same function as a ladder company in the ISO grading schedule and significantly contribute to the department's ISO class 1 rating. The Fire Department strategically places these vehicles in the response area to respond to fires with additional equipment not carried on engine companies. The Department currently has two (2) in frontline service and zero (0) in reserve.
Justification:	To maintain the current level of fire protection and emergency services, the fire protection development impact fee assumes a consumption-driven approach. This approach charges new residential and non-residential

development the cost of replacing existing capacity on a one-for-one basis, assuming constant current service delivery standards.

Estimated Cost: \$385,000 each in 2018

Timeline: As needed beginning FY 2019

Possible Funding: Development Impact Fees, General Fund, Lease, Lease-Purchase Agreement, Grants, Hospitality Tax, Accommodations Tax



FIRE PROTECTION

Project: Quick Response Vehicles/Command Vehicle (QRV-C)

Description: Commercial vehicle chassis with emergency capabilities. The QRV-C provide Chief level command and control to the fire department and

significantly contribute to the department's ISO class 1 rating by placing a Chief Officer on every scene. The Fire Department strategically places these vehicles in the response area to respond to fires with additional equipment not carried on engine companies. The Department currently has one (1) in frontline service and zero (0) in reserve.

Justification: To maintain the current level of fire protection and emergency services, the fire protection development impact fee assumes a consumption-driven approach. This approach charges new residential and non-residential development the cost of replacing existing capacity on a one-for-one basis, assuming constant current service delivery standards. The department is currently a 1-battalion department but with sufficient growth will become a 2-battalion department in the planning horizon.

Estimated Cost: \$125,000 each in 2018

Timeline: As needed beginning FY 2019

Possible Funding: Development Impact Fees, General Fund, Lease, Lease-Purchase Agreement, Grants, Hospitality Tax, Accommodations Tax



FIRE PROTECTION

Project: Renovation and Redesign of Fire Station Number 1 (CHQ)

Description: Redesign with necessary renovations of the existing 9,631 square foot facility to update the 34-year-old facility and come in line with the Civic Master Plan. The department has conducted user charette's and determined the best use of the existing footprint is to redesign the existing structure to accommodate a segregation of operations and administration on opposite sides of the building. Also, a concept has been developed to create a public space on the street side of the building that will meet the civic master plan vision.

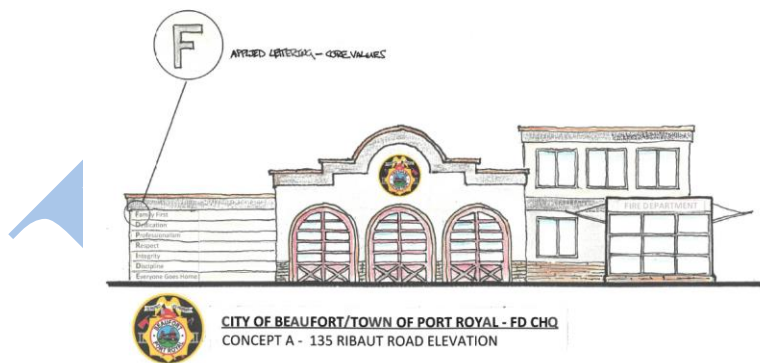
Justification: To maintain the current level of fire protection and emergency services, the fire protection development impact fee assumes a consumption-driven approach. This approach charges new residential and non-residential development the cost of replacing existing capacity on a one-for-one basis,

assuming constant current service delivery standards. Station 1 is currently the oldest station that houses an engine company, a Battalion Chief, the maintenance equipment, reserve and retired apparatus, and the fire administration. Station 1 is centrally located to the service area and has seen an increase in call volume over the past several years. As commercial density increases in the area with the Boundary Street re-development district, need will increase.

Estimated Cost: TBD, estimated at \$2,950,000

Timeline: Contingent on funding

Possible Funding: Development Impact Fees, General Fund, Grants, General Obligation Bonds, Hospitality Tax, Accommodations Tax



FIRE PROTECTION

Project: Fire Station Construction Number 5 (north area/City of Beaufort)

Description: As the northern part of the City of Beaufort develops industry, the demands on service increases. To meet the new fire protection demands and provide the same level of existing services, a fifth station in this area

is anticipated to be needed. ISO requires a fire station within 5 road miles of properties in order to retain the rating of the department.

Justification: To maintain the current level of fire protection and emergency services, the fire protection development impact fee assumes a consumption-driven approach. This approach charges new residential and non-residential development the cost of replacing existing capacity on a one-for-one basis, assuming constant current service delivery standards. To maintain level of service, response time, ISO rating, and proper distance all due to growth, an eighth station would be required.

Estimated Cost: TBD, estimated at \$3,950,000

Timeline: Contingent on funding

Possible Funding: Development Impact Fees, General Fund, Grants, General Obligation Bonds, Hospitality Tax, Accommodations Tax

Beaufort Commerce Park
196 Acres | 79 Hectares
US Highway 21 and SC Highway 116 | Lobeco SC 29906

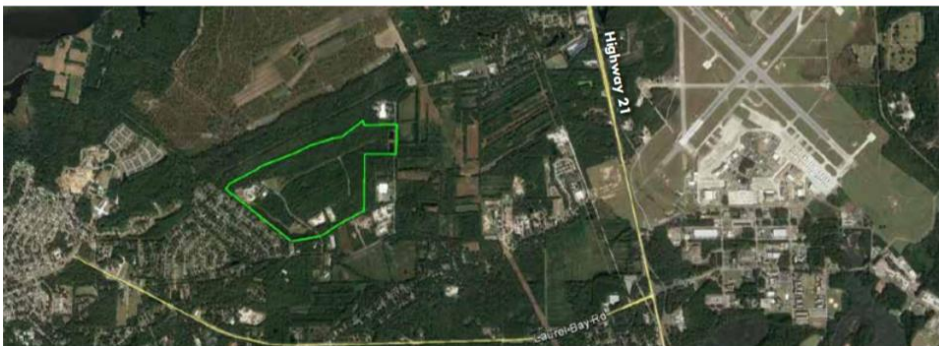


TABLE OF CURRENT ASSETS WITH REPLACEMENT COST or MARKET VALUE
of > \$100,000

TYPE	ASSET NUMBER	YEAR	<u>REPLACEMENT YEAR</u>	REPLACEMENT COST
ENGINE/PUMPER				
	E4107	1988	<u>2008</u>	\$850,000
	E9260	1995	<u>2015</u>	\$850,000
	E9783	1996	<u>2016</u>	\$850,000
	E8944	2007	<u>2027</u>	\$850,000
	E4083	2011	<u>2031</u>	\$850,000
	E7587	2014	<u>2034</u>	\$850,000
Ladder Truck				
	T2445	2001	<u>2021</u>	\$1,400,000
	L8795	2016	<u>2036</u>	\$1,400,000
QRV-F				
	S9665	2011	<u>2031</u>	\$185,000
	S6011	2011	<u>2031</u>	\$185,000
QRV-S				
	U9341	2001	<u>2021</u>	\$385,000
	U0655	2005	<u>2025</u>	\$385,000
QRV-C				
	B3416	2017	<u>2037</u>	\$125,000
<u>Total</u>				<u>\$9,165,000</u>

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TYPE	ASSET <u>#NUMBER</u>	YEAR	<u>Replacement/ Refurb. Year</u>	Market Value	Project Cost
FIRE STATION					
	Station 1 (CHQ)	1984	<u>2004-2009</u>	\$795,000	\$2,950,000
	Station 2	2015	<u>2035-2040</u>	\$2,027,000	
*1/2 Value of Bldg	Station 3	1996	<u>2016-2021</u>	\$1,744,100	
	Station 4	2018	<u>2038-2043</u>	\$2,638,000	
	Construction 1	TBD	<u>Build + 20-25</u>	N/A	\$3,950,000
<u>Total</u>					<u>\$6,900,000</u>

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<u>Capital Rolling Stock Replacement Cost</u>	<u>\$9,165,000</u>
<u>Capital Infrastructure Replacement/Renovation Cost</u>	<u>\$6,900,000</u>
<u>Total Capital Improvement projection</u>	<u>\$16,065,000</u>

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Appendix D

United States Census Bureau 2018 Quick Facts for Beaufort City, South Carolina

United States Census Bureau 2018 Quick Facts for Town of Port Royal, South Carolina

City of Beaufort**Housing**

Owner-occupied housing unit rate, 2013-2017	56.8%
Median value of owner-occupied housing units, 2013-2017	\$210,700
Median selected monthly owner costs -with a mortgage, 2013-2017	\$1,594
Median selected monthly owner costs -without a mortgage, 2013-2017	\$513
Median gross rent, 2013-2017	\$859

Families & Living Arrangements

Households, 2013-2017	4,901
Persons per household, 2013-2017	2.51

Town of Port Royal**Housing**

Owner-occupied housing unit rate, 2013-2017	33.7%
Median value of owner-occupied housing units, 2013-2017	\$211,500
Median selected monthly owner costs -with a mortgage, 2013-2017	\$1,390
Median selected monthly owner costs -without a mortgage, 2013-2017	\$438
Median gross rent, 2013-2017	\$1,101

Families & Living Arrangements

Households, 2013-2017	3,478
Persons per household, 2013-2017	2.48

STATE OF SOUTH CAROLINA
CITY OF BEAUFORT

AN ORDINANCE AMENDING THE CODE OF ORDINANCES FOR THE CITY OF BEAUFORT; CHAPTER __, SO AS TO ADD A NEW DIVISION TO BE NUMBERED DIVISION __, DEVELOPMENT IMPACT FEES; PROVIDING FOR THE ADOPTION OF DEVELOPMENT IMPACT FEES FOR THE CITY OF BEAUFORT; PROVIDING FOR THE ADMINISTRATION AND ENFORCEMENT THEREOF; AND OTHER MATTERS RELATED THERETO

Pursuant to the authority granted by the Constitution and the General Assembly of the State of South Carolina, BE IT ORDAINED BY THE CITY COUNCIL FOR THE CITY OF BEAUFORT:

SECTION I. The Code of Ordinances for the City of Beaufort Chapter __; is hereby amended by adding a division, to be numbered Division __, Development Impact Fees; which division shall read as follows:

DIVISION __. DEVELOPMENT FIRE IMPACT FEES

Title

This ordinance shall be referred to as the “Development Fire Impact Fee Ordinance for the City of Beaufort South Carolina.”

Authority

This ordinance is adopted pursuant to and in compliance with the authority of the South Carolina Development Impact Fee Act, Code of Laws of South Carolina, Title 6, Article 9, Chapter 1 (the “Act”), and is to be interpreted in accordance with such Act , or as it may be amended in the future.

Findings

The City of Beaufort Council hereby declares that:

- (a) Fire protection, municipal fire department facilities and fire department equipment are vital and necessary to the health, safety, welfare, and prosperity of the city and its citizens. Substantial growth and new construction is taking place within the municipality and is anticipated to continue. This growth creates substantial need for new infrastructure capacity. Meeting these needs is very costly; however, failure to do so will result in an inadequate system of facilities and equipment to accommodate anticipated demand. This would make the City of Beaufort a less desirable place to live and do business and be detrimental to the health, safety, welfare, and prosperity of the city and its citizens.
- (b) To the extent that future growth and new construction in the city places demands on

fire protection which should be met by shifting a portion of the capital costs for providing new capacity to serve new development, which creates, in whole or in part, these demands and needs.

- (c) By Joint Resolutions adopted on November 13, 2018, and November 14, 2018, the City of Beaufort and Town of Port Royal Councils directed the Metropolitan Planning Commission to conduct the necessary studies and a recommended development impact fee ordinance in accordance with the requirements of the Act.
- (d) The Metropolitan Planning Commission recommended to Joint Councils a *Developmental Fire Impact Fee Study Report for Beaufort/Port Royal Fire Department* dated 8/15/2019, a *Beaufort/Port Royal Capital Improvements Plan* with projects eligible for impact fee funding dated [REDACTED], which have been adopted by the City Council, as modified.
- (e) This ordinance is enacted to implement the findings and recommendations of the *Development Fire Impact Fee Study Report for Beaufort/Port Royal Fire Department* and endorse the list of capital projects eligible for impact fee funding in the *Beaufort/Port Royal Fire Department Capital Improvement Plan*.
- (f) The impact fees prescribed in this ordinance are equitable, do not impose an unfair or disproportionate burden on developers and new construction, and are in the best interests of the general welfare of City of Beaufort and its citizens.
- (g) New facilities or equipment eligible for development impact fee funding will benefit all new development or redevelopment in city limits. Therefore, it is appropriate to treat the entire city as one service area for calculating, collecting, and spending development impact fees.
- (h) This ordinance provides the procedures for timely processing of applications for determination of appropriate development impact fees applicable to all development inside city limits subject to the impact fees, and for the timely processing of applications for individual assessment of development impact fees, credits, or reimbursements allowed or paid.
- (i) Property for which a valid building permit has been issued prior to the effective date of this ordinance shall not be subject to new or updated development impact fees.

Definitions

The following definitions apply within this ordinance consistent with the provisions set forth in the South Carolina Development Impact fee Act, or as it may be amended in the future. Where terms are not defined, the definitions used in the City of Beaufort Code of Ordinances shall apply.

- (a) Affordable Housing. Housing that is affordable to families whose incomes do not

exceed eighty (80%) percent of the median income for the service zone established for the City of Beaufort.

- (b) Building Permit. A permit issued by the city permitting the construction of a building or structure within city limits.
- (c) Capital Improvement. Improvements with a useful life of five years or more, by new construction or other action, which increase the service capacity of any public facility.
- (d) Capital Improvements Plan (CIP). A multi-year planning tool used to identify capital projects. The Plan also identifies capital improvements for which impact fees may be used as a funding source.
- (e) Certificate of Occupancy. A certificate allowing the occupancy or use of a building and certifying that the structure or use has been constructed or will be used in compliance with the City of Beaufort Code of Ordinances and all other applicable regulations.
- (f) Credits. Impact fee deductions allowed to a fee payor for eligible off-site capital improvements funded by the fee payor or other allowance.
- (g) Developer. An individual, corporation, partnership, or other legal entity undertaking new development.
- (h) Development. Construction or installation of a new building or structure, or a change in use of an existing building or structure, any of which creates additional demand and need for public facilities (i.e., parks and recreation, fire protection, municipal facilities and equipment, or transportation). A building or structure shall include, but not be limited to, modular buildings and manufactured housing. Development does not include alterations made to existing single-family homes.
- (i) Development Impact Fee. A financial payment made by a developer to a local government for funding certain off-site capital improvements identified to accommodate future growth. Development impact fees (or "impact fees") are collected by the municipality for, fire protection, fire department facilities, and fire department equipment.
- (j) Fee Payor. A developer that pays or is required to pay a development impact fee.
- (k) Fire Impact Fee. A payment of money imposed as a condition of approval to pay a proportionate share of the cost for improvements to the fire protection system identified to serve new development.
- (l) Level of service. Means a measure of the relationship between service capacity and service demand for public facilities.

- (m) Public Facilities. Public facilities for the purpose of this ordinance shall include fire protection facilities and equipment and/or construction of capital improvements identified in the *Beaufort/Port Royal Fire Department Capital Improvements Plan* and the *Development Impact Fee Study Report for the Beaufort/Port Royal Fire Department*.
- (1) Capital equipment and vehicles, with an individual unit purchase price of not less than \$100,000 dollars including but not limited to, equipment and vehicles used in the delivery of public safety services or emergency preparedness services.
- (n) Square Feet (s.f.). As referred to in Appendix A *Impact Fee Schedule for Fire Protection Facilities and Equipment* of this ordinance, means the sum (in square feet) of the area of each floor level, including cellars, basements, mezzanines, penthouses, corridors, lobbies, stores and offices, that are within the principal outside faces of exterior walls, not including architectural setbacks or projections. Included are all areas that have floor surfaces with clear standing head room (measured 6 foot, 6 inches minimum) regardless of their use. If a ground-level area of a building, or part thereof, within the principal outside faces of the exterior walls is not enclosed, this square footage definition considers it part of the overall square footage for the building. However, unroofed areas and unenclosed roofed-over spaces, except those contained within the principle outside faces of exterior walls, should be excluded from the area measurement. The area of any parking garage within a building shall not be included in the area measurement.
- (o) System Improvement. A capital improvement to a public facility which is designed to provide service to a service area.
- (p) System Improvement Costs. The costs incurred for construction and reconstruction of system improvements, including design, acquisition, engineering, and other costs attributable to the improvements including the cost of providing additional public facilities needed to serve new growth and development. System improvement costs do not include:
- (1) Construction, acquisition, or expansion of public facilities other than capital improvements eligible for impact fee funding that are identified in the *Beaufort/Port Royal Fire Department Capital Improvement plan*;
 - (2) Repair, operation, or maintenance of existing or new capital improvements;
 - (3) Upgrading, updating, expanding, or replacing existing capital improvements to serve existing development in order to meet stricter safety, efficiency, environmental, or regulatory standards;
 - (4) Upgrading, updating, expanding, or replacing existing capital improvements to provide better service to existing development;

- (5) Administrative and operating costs of the governmental entity; or
- (6) Principal payments and interest or other finance charges on bonds or other indebtedness except financial obligations issued by or on behalf of the governmental entity to finance capital improvements eligible for impact fee funding that are identified in the *Beaufort/Port Royal Fire Department Capital Improvement Plan*.

Supporting Documentation

This ordinance is based upon the conclusions and recommendations presented in the *Beaufort/Port Royal Development Fire Impact Fee Study*, prepared with the provisions set forth in the Act and adopted by joint resolutions from the City of Beaufort and Town of Port Royal councils. These documents are and shall remain on file in the City of Beaufort Planning Department and are hereby incorporated into this ordinance by reference.

All developmental fire impact fees collected pursuant to this ordinance shall be used to implement any or all of the public facilities deemed eligible for impact fee funding identified in the *Beaufort/Port Royal Fire Department Capital Improvement Plan*.

Jurisdiction

A development impact fee shall apply to all new development or redevelopment located within city limits.

Application and Exemptions

The provisions of the ordinance shall apply to all new development or redevelopment within city limits for which a building permit or development approval is required except for the following:

- (a) Rebuilding the same amount of floor space of a structure that was destroyed by fire or other natural catastrophe;
- (b) Remodeling or repairing a structure with the same land use that does not result in an increase in the number of service units or place new demand on fire protection;
- (c) Replacing a residential unit, including a manufactured home, with another residential unit on the same lot, if the number of service units does not change;
- (d) Placing a construction trailer or temporary office on a lot during the period of construction on the same lot;
- (e) Construction of an addition to a residential structure that does not increase the service

units;

- (f) Adding uses that are typically accessory to residential uses, such as a tennis court or a clubhouse, unless it is demonstrated clearly that the use creates new fire protection, municipal facilities and equipment, or the transportation system; and
- (g) All or part of a particular development project determined to create affordable housing.

Provisions for Affordable Housing

Because all or part of any development project may be exempt from development fire impact fees for affordable housing, the following sets forth the administrative standards for determining what constitutes affordable housing and the procedures for exemption from one or more development impact fees.

(a) Median Household Income

Affordable housing is based upon eighty percent (80%) of the median household income for residents living within the City of Beaufort. Median household income shall be determined once a year utilizing the following procedure:

- (1) The most recently available figures from the US Census Bureau American Community Survey will serve as the base year for this evaluation;
- (2) Each subsequent year will be adjusted once annually thereafter during January of the calendar year based upon the previous year's published Consumer Price Index (CPI) increase, until the next US Census Bureau data set is published, and this procedure is replicated.

(b) Maximum Expenditure

The maximum expenditure for housing costs shall correspond to the Fannie Mae Foundation Mortgage Calculator multiplier of thirty percent (30%) of gross household income based upon eighty percent (80%) of median household income is:

- (1) Multifamily rental dwelling units of which the gross monthly rent cost does not exceed thirty percent (30%) of eighty percent (80%) of the gross median household monthly income.
 - $\text{maximum monthly rent} = \text{MFI} \times 80\% \times 30\% / 12$
 - $\$1031.12 \text{ max month rent} = \$51,556 \text{ MFI} \times 80\% \times 30\% / 12$
 - MFI (Median Family Income) - \$51,556 This is an average of the U.S. Census Bureau MFI's published for the City of Beaufort and the Town of Port Royal.
 - 80% - The required MFI reduction as defined by the SC State impact fee

law, SC Code Section 6-1-920

- 30% - The US Housing and Urban Development's (HUD) criteria that housing cost should be 30% or less of a household's MFI.

(2) Fee simple ownership dwelling units of which the cost of homeownership for the dwelling unit do not exceed thirty percent (30%) of eighty percent (80%) of the gross median household monthly income as reflected in the sales price using the Fannie Mae Foundation Mortgage Calculator (or comparable methodology) assuming a 10% down payment and a specified interest rate. The specified interest rate shall be determined by selecting the lowest 30-year fixed mortgage rate reported by area lending institutions as of the first week of January for any given year and shall remain so for the balance of the year.

- maximum monthly principle and interest (MMPI) = $MFI \times 80\% \times 30\% / 12 - \text{expenses}$
- \$631.12 MMPI = $\$51,556 \text{ MFI} \times 80\% \times 30\% / 12 - 400$
- A 30-year mortgage at 7% and 10% down payment calculates to a purchase price of \$105,400.00 to meet \$631.12 MMPI.
 - MMPI – Maximum monthly Principle and Interest Payment
 - MFI (Median Family Income) - \$51,556 This is an average of the U.S. Census Bureau MFI's published for the City of Beaufort and the Town of Port Royal
 - 80% - The required MFI reduction as defined by the SC State impact fee law, SC Code Section 6-1-920
 - 30% - The US Housing and Urban Development's (HUD) criteria that housing cost should be 30% or less of a household's MFI.
 - Expenses - \$100 per month insurance, \$100 per month taxes, \$200 per month utilities and upkeep.

(c) Procedures for Exemption from Development Impact Fees

(1) A developer seeking exemption from development fire impact fees for the construction of affordable multifamily rental dwelling units, must provide a Rent Control Agreement, approved by the City of Beaufort Planning department, restricting the monthly rental cost of each affordable housing unit for a period of

six (6) years in accordance with the maximum expenditure, prior to issuance of the building permit.

- (2) A developer seeking exemption from developmental fire impact fees for the construction of affordable simple ownership dwellings, must provide a letter, approved by the City of Beaufort Planning department, restricting the sale price of the housing unit.

Credit for Redevelopment

- (a) Properties with existing structures may receive fire impact fee credit for structures to be redeveloped or replaced.
 - (1) The permit applicant is responsible to notify the planning department of the request for fire impact fee credit prior to presenting application for building permit or development permit and provide documentation necessary to properly assess the impact fee potential of the existing structure.
 - (2) The structure shall be evaluated in the present state to determine the developmental impact fee as if that structure was being built at the time of building permit application.
 - (3) The fee calculated for the existing structure will be credited towards to the developmental fire impact fee calculated for the new development building permit.
 - (4) Impact fee credit applied for existing structures shall not result in a developmental fire impact fee of less than Zero.

Determination of Fees

(a) General Provisions

- (1) The City Planning Department shall determine, assess and collect all development impact fees administered within the city limits.
- (2) Upon the effective date of this ordinance, development impact fees shall be charged to new development or redevelopment in accordance with the procedures set forth in this ordinance. The fees to be collected for a development will be determined at the time of application for a building permit. If the development is one that does not require a building permit, the impact fee for the development will be determined at the time of development approval. No building permit or development approval shall be issued for any development requiring the payment of development impact fees until the fees have been assessed by and remitted to the City of Beaufort Planning Department, or in the case of affordable housing exemptions, the appropriate financial guarantees have been filed with the Planning Department.

Payment of such fees shall not relieve the developer from obligations to comply with any other applicable city ordinances, regulations, or requirements including, but not limited to, the “Zoning,” “Subdivisions,” or “Buildings and Building Regulations” Chapters of the City of Beaufort Code of Ordinances prior to receiving a Certificate of Occupancy.

- (3) All monies paid by the fee payor pursuant to this ordinance shall be identified as development fire impact fees and promptly deposited in the developmental fire impact fee trust fund described in this ordinance.
- (4) For the purpose of calculating development impact fees, the land use types assumed in the Development Fire Impact Fee Schedule of this ordinance (i.e., Appendix A) shall be defined in accordance with the definitions contained in the Institute of Transportation Engineers' *Trip Generation Manual*, Ninth Edition (see *Beaufort Port Royal Fire Department Development Impact Fee Study, Appendix B*).
- (5) Payment of development impact fees according to the Development Fire Impact Fee Schedule (i.e., Appendix A), or independent impact fee calculation reviewed and approved by the City Planning Director, shall constitute full and complete payment of the new development's proportionate share of fire service costs.
- (6) A developer may negotiate and contract with the city to provide facilities or services in lieu of payment of development impact fees in accordance with Section 6-1-1050 of the Act.

(b) Fire Protection Impact Fees

(1) Fire Protection Impact Fee Formula

Fire protection impact fees collected within city limits shall be in accordance with one of the following formulas:

a. Residential Development

Residential Fire Impact Fee = (SU) x (CPP)

Where:

SU (Service Unit) = The amount of net new service units generated by the proposed development. The service unit variable is calculated per Service Unit as annotated by each land use category

CPP (COST PER PERSON) = The cost per person for providing fire protection services based on information presented in the *Beaufort/Port Royal Fire Department Development Impact Fee*

Study. The cost per person is \$305.43.

b. Non-Residential Development

$$\text{Non-Residential Fire Impact Fee} = (\#SU) \times (ESR) \times (CPE)$$

Where:

SU = The amount of net new service units generated by the proposed development. The service unit variable is calculated per Service Unit as annotated by each land use category.

ESR = Average employee space ratio developed using information published in the Institute of Transportation Engineers *Trip Generation, Ninth Edition* (see *Beaufort/Port Royal Fire Department Development Impact Fee Study, Appendix A*).

CPR (Cost per Employee) = The cost per employee for providing fire protection services is based on information presented in the *Beaufort/Port Royal Fire Department Development Impact Fee Study*. The cost per employee is \$592.34.

(2) Determining Fire Protection Impact Fees

The amount of fire protection impact fees attributable to a specific development shall be determined through the following process:

- a. Verify the use and number of new service units for which the building permit is being sought;
- b. For residential development, determine whether any of the proposed residential dwelling units qualify for exemption of fire protection impact fees as "affordable housing" and, if so, the number and type of such units;
- c. Determine the applicable land use type and impact fee per service unit set forth in Appendix A of this ordinance; and
- d. For residential uses multiply the number of non-exempt service units for the specified land use category by the cost per person.

For non-residential uses multiply the number of service units for the specified land use category by the employee space ratio, and then multiply the product by the cost per employee.

(3) Independent Fire Protection Impact Fee Calculation

In the event that a fee payor or city staff contend that the land use for which the building permit is being sought is not within those land uses identified in Appendix A, or if the fee payor contends that the Appendix A calculations are not accurate for its intended use, then the City Planning Director, or its designee, shall make a determination as to the most comparable land use category to assume for calculating fire protection impact fees. If the fee payor disagrees with the determination of the City Planning Director or if the city otherwise deems it appropriate, an independent impact fee calculation may be performed to quantify the fair share of system improvement costs attributable to the development. Preparation of an independent impact fee calculation will immediately halt the building permit application process until such time that the necessary calculation is deemed complete by the City Planning Director. If an independent calculation is requested, it must accompany the building permit application and be prepared in accordance with the following provisions:

- a. Independent calculations for the determination of fire protection impact fees must be performed by a certified professional engineer, architect, landscape architect, planner or other duly qualified and licensed professional approved by the City Planning Director.
- b. The independent calculation shall be subject to review and approval by the City Planning Director, or its designee. In the event that the City Planning Director elects to contract with a third party to review the independent calculation, the cost of this review shall be borne by the applicant based on the cost of the third-party review, plus a ten percent (10%) administrative fee.
- c. The City Planning Director shall either approve or provide in writing the reasons for disapproval of the independent calculation study within thirty (30) days of its submittal for review.
- d. Prior to commencing the study, the developer's hired professional and the City Planning Director, or its designee, shall agree upon the relevant factors and values that will be utilized in the independent calculation of impact fee.
- e. The independent impact fee calculation shall be based on one of the following formulas:

Residential Development

$$\text{Residential Fire Impact Fee} = (\text{SU}) \times (\text{CPP})$$

Where:

SU (Service Unit) = The amount of net new service units generated by the proposed development. The service unit variable is calculated per Service Unit as annotated by each land use category

CPP (COST PER PERSON) = The cost per person for providing fire protection services based on information presented in the *Beaufort/Port Royal Fire Department Development Impact Fee Study*. The cost per person is \$305.43.

Non-Residential Development

Non-Residential Fire Impact Fee = (#SU) x (ESR) x (CPE)

Where:

SU = The amount of net new service units generated by the proposed development. The service unit variable is calculated per Service Unit as annotated by each land use category.

ESR = Average employee space ratio developed using information published in the Institute of Transportation Engineers *Trip Generation, Ninth Edition* (see *Beaufort/Port Royal Fire Department Development Impact Fee Study, Appendix A*).

CPR (Cost per Employee) = The cost per employee for providing fire protection services is based on information presented in the *Beaufort/Port Royal Fire Department Development Impact Fee Study*. The cost per employee is \$592.34.

Impact Fee Trust Funds

Development impact fees collected pursuant to this ordinance shall be kept separate from other revenue of the city. There shall be one trust fund established solely for development fire impact fee funds. All development impact fees collected shall be properly identified by property address noted on the approved building permit and by the appropriate trust account.

Any funds on deposit not immediately necessary for expenditure shall be maintained in an interest-bearing account prior to expenditure on recommended projects. Interest earned on development impact fees in deposit must be considered revenue to the trust fund account for which income is earned and must be subject to all restrictions placed on the use of development impact fees pursuant to this ordinance.

Limitation on Expenditures of Funds Collected

(a) Eligible System Improvement Costs

Funds from development impact fee trust accounts shall be expended only for the

public facilities and system improvements identified as eligible for impact fee funding in the *Beaufort/Port Royal Fire Department Capital Improvement plan*, incorporated herein by reference. No funds shall be used for administrative or operating costs associated with imposing any of the development impact fees. Eligible components of a public fire department facility may include, but are not limited to, the following:

- (1) Design and construction plan preparation;
- (2) Construction of new facilities, structures, or amenities that provide additional capacity;
- (3) Purchase of new equipment (>\$100,000 purchase price) that provide additional capacity.
- (4) Principal payments, interest and other finance charges on bonds or other indebtedness issued by or on behalf of the city for financing any or all public fire department facilities.

(b) Rational Nexus Test

The City Finance Director, or its designee, shall make an annual report to the City Council and publish this report for access by the general citizenry showing where development fire impact fees have been collected and what projects have been funded with these revenues. The Council shall consider this report and whether the fees are being spent for the benefit of new developments within city limits. If the Council determines that this is not the case, then it shall adjust the *Beaufort/Port Royal Fire Department Capital Improvement plan*, and other projected capital expenditures to correct the condition.

(c) Expenditure of Funds

Development impact fee funds shall be expended in the order in which they were collected. The disbursement of such funds shall require approval of the City Council, upon recommendation of the City Manager or its designee.

(d) Reimbursement

Impact fee funds not obligated for expenditure within three (3) years of the date that they are scheduled to be expended in the *Beaufort/Port Royal Fire Department Capital Improvement plan*, shall be returned, with actual interest earned, to the record owner of the property for which the fees were collected, on a first-in, first-out basis.

Credits / Reimbursements

(a) General Provisions

- (1) A developer shall be entitled to a credit against development impact fees assessed

pursuant to this ordinance for city-approved monetary or in-kind contributions toward some or all expenditures included in the *Beaufort/Port Royal Fire Department Capital Improvement plan*, that are eligible for impact fee funding.

- (2) Development impact fees shall not be imposed on a fee payor or developer who has entered into an agreement with the city for certain contribution, payment, construction, or dedication of land up to the cash value of the specific improvements identified within the agreement. Any difference between total development impact fees due for the development and the cash value of the executed agreement remain eligible for collection pursuant to the rules and requirements of this ordinance.
- (3) A fee payor shall be reimbursed for contributions of land or facilities that exceed his proportionate share of the cost of public facilities when such excess contribution is made at the request of the city.

(b) Application for Credit Agreement

- (1) The determination of the amount of any credit shall be undertaken through submission of an Application for Credit Agreement, which shall be submitted through the City Planning Department for review by the City Planning Director, or its designee.
- (2) The Application for Credit Agreement shall include the following information:
 - a. The following documentation must be provided if the proposed application involves a credit for any cash contribution:
 - 1. A certified copy of the development approval in which the contribution was agreed; and
 - 2. Proof of payment (if already made); or
 - 3. Proposed method of payment (if not already made).
 - b. The following documentation must be provided if the proposed application involves credit for dedication of land:
 - 1. A drawing and legal description of the land;
 - 2. The appraised fair market value of the land at the date a building permit application is sought for the land use(s), prepared by a professional Real Estate Appraiser who is a member of the member Appraisal Institute (MAL) or who is a member of Senior Residential Appraisers (SRA); and
 - 3. A certified copy of the development permit in which the land was agreed to be dedicated (if applicable).

- c. The following documentation must be provided if the proposed application involves credit for construction:
1. The proposed construction documents of the specific construction project prepared and certified by a duly qualified and licensed engineer in the State of South Carolina;
 2. The projected costs for the suggested improvements, which shall be based on local information for similar improvements, along with the construction schedule for the completion of said improvements. Such estimated cost shall include construction or reconstruction of the project, the cost of labor and materials, the cost of all lands, property, rights, easements, and franchises acquired, financing charges, interest prior to and during construction and for one (1) year after completion of construction, costs of plans and specifications, surveys of estimates of costs and revenues, costs of professional services, and all of the expenses necessary or incidental to determining the feasibility or practicability of such construction or reconstruction.
- (3) Within fourteen (14) days of receipt of the proposed Application for Credit Agreement, the City Planning Director, or its designee, shall determine if the application is complete. If it is determined that the proposed agreement is not complete, the City Planning Director shall send written notification to the applicant outlining the deficiencies. The City Planning Director shall take no further action on the proposed Application for Credit Agreement until all such deficiencies have been corrected or otherwise settled.
- (4) Once the City Planning Director determines that the proposed Application for Credit Agreement is complete, it shall be reviewed within thirty (30) days by a committee of designated staff composed of the City Manager, City Finance Director, City Fire Chief, City Building Official, and City Engineer (together known as the Credit Review Committee).
- (5) If the Application for Credit Agreement is approved by the Credit Review Committee, a Credit Agreement shall be prepared and signed by the applicant and the City Manager. It shall specifically outline the contribution, payment, construction, or land dedication, the time by which it shall be complete, dedicated, or paid, and any extensions thereof, and the dollar credit the applicant shall receive for the contribution, payment, or construction against development impact fees. The agreement may also include provisions for rescinding the credit and issuing stop work orders if the dedication and/or work and/or construction are not timely accomplished.
- (6) A fee payor affected by the decision of the Credit Review Committee regarding credits may appeal such decision pursuant to the Appeal Process as outlined in

this ordinance.

Penalties

City Council shall have the following remedies, which may be exercised individually or collectively, for collecting development impact fees. The failure to pursue any remedy at any time shall not be deemed as a waiver of city rights to pursue any remedy at such other time as may be deemed appropriate.

- (a) Interest and Penalties. The City may, at its discretion, add to the amount of calculated development impact fees due prior to award of a Certificate of Occupancy, reasonable interest and penalties for non-payment or late payment of required funds. Penalties for unpaid development impact fees shall be administered consistent with City of Beaufort Code of Ordinances.
- (b) Withholding Certificate of Occupancy. The City may withhold a Certificate of Occupancy until full and complete payment has been made by the developer of development impact fees due for the development.
- (c) Withholding Utility Service. The City may withhold the provision of utility services to a development until the required development impact fees have been paid in full.
- (d) Lien. The City may impose a lien on the developer's property for failure of the developer to pay required development impact fees in full.
- (e) Other. The City may pursue the collection of the development impact fees, including interest, by way of civil process in _____.

Appeal Process

A developer shall have the following rights for appeal of development impact fees imposed by the city on their development pursuant only to this ordinance:

- (a) Administrative Appeal
 - (1) A developer may file an administrative appeal with the City Manager regarding the payment of development impact fees, independent calculation of impact fees, or credits or reimbursements by filing a written Notice of Appeal. Said Notice shall be filed within thirty (30) days of the decision sought to be appealed. The filing of an appeal will immediately halt the building permit application process, unless the developer posts a bond or submits an irrevocable letter of credit for the full amount of the development impact fees as calculated by the city to be due. All Notices of Appeal shall include a full explanation of the reasons for the appeal, specifying the grounds therefore, and containing any documentation that the developer desires to be considered. The appeal shall contain the name and address of the developer filing the appeal and shall state their capacity to act as a representative or agent if they are not the owner of the property to which impact

fees or credits pertain.

- (2) Within thirty (30) days following receipt of the written Notice of Appeal, the City Manager will review the Appellant's written report, supporting documentation and departmental staff reports. The thirty (30) day review period may be extended if additional information is needed from the Appellant in order to render a decision. Upon completion of the administrative review, the City Manager will provide a written response to the Appellant constituting a final administrative determination.
- (3) Any person desiring to appeal the final administrative determination of the City Manager regarding payment of development impact fees or credits shall file a written Notice of Appeal to the City Council. Said Notice of Appeal to City Council shall be filed with the City Clerk of Council within fifteen (15) days following receipt of the final administrative determination. Receipt shall be construed to have occurred when the final administrative decision is deposited in the United States mail postage prepaid to the person whose name and address is identified in the original Notice of Appeal.
- (4) The City Clerk of Council will schedule all impact fee appeals for the first City Council meeting following ten (10) days from receipt of the Written Notice of Appeal to the City Council. Postponements of the City Council appeal date may be granted by the City Manager if they are requested in writing at least ten (10) days in advance of the scheduled City Council meeting date.
- (5) When an Appeal is scheduled for oral presentation before the City Council, the Appellant and city staff shall each be given ten (10) minutes at the oral argument to present the Appeal and to discuss the submitted written record.

(b) Payment Under Protest

A fee payer may pay development impact fees under protest. Payment under protest does not preclude the developer from filing an administrative appeal nor is the fee payer stopped from receiving a refund of an amount considered to have been collected illegally. A fee payor, at his option, may also post a bond or submit an irrevocable letter of credit for the amount of development impact fees due instead of making a cash payment under protest, pending the outcome of an appeal.

(c) Mediation

City Council shall provide for mediation by a qualified independent party, upon voluntary agreement by both the developer and the City, to address a disagreement related to development impact fees calculated by the City. Neither a request for, nor participation in, mediation shall preclude a fee payor from pursuing other developer rights or remedies otherwise available by law.

Refunds

(a) General Provisions

Funds not obligated for expenditure within three (3) years of the date that they are scheduled to be expended in the *Beaufort/Port Royal Fire Department Capital Improvement Plan* shall be refunded to the record owner of property for which the impact fees were paid, with actual interest earned, on a first-in, first-out basis. For the purpose of determining whether fees have been spent or encumbered, the first money placed in a trust fund account shall be deemed to the first money taken out of that account when withdrawals have been made.

(b) Refund Process

- (1) The owner of property eligible for a refund of one or more development impact fee payments shall submit to the City Planning Director a notarized sworn statement that the person is the current owner of the property for which a refund is due, a certified copy of the latest recorded deed, and a copy of the most recent ad valorem tax bill for the property.
- (2) When a right to a refund exists, the city shall send a refund to the current owner of record within ninety (90) days after it is determined by City Council that a refund is due.
- (3) All refunds shall include the pro rata portion of the interest earned while on deposit in the specific development impact fee trust account.
- (4) A record owner of property for which one or more development impact fee refunds are due has standing to sue for such refund pursuant to Section 6-1-1020(D) of the Act if there has not been a good-faith effort towards a timely payment of a refund pursuant to this section.

Review

- (a) City Council shall be responsible for preparing and publishing an annual report describing the amount of development impact fees collected, appropriated, and spent during the preceding fiscal year.
- (b) Metropolitan Planning Commission shall be responsible for a holistic review and update of the *Developmental Fire Impact Fee Study for the Beaufort/Port Royal Fire Department*, *The Beaufort/Port Royal Fire Department Capital Improvement Plan*, and the Affordable Housing Analysis in support of both, in the same manner and on the same review cycle as the City of Beaufort Comprehensive Plan.

Termination of Development Impact Fees

Development impact fees for the City of Beaufort shall be terminated within Twenty (20) years after the effective date of this ordinance, or when sufficient fees have been

collected to fund all of the projects eligible for development impact fee funding that are identified in the *Beaufort/Port Royal Fire Department Capital Improvement Plan*, whichever shall first occur, unless:

- (a) City Council adopts a revised *Developmental Fire Impact Fee Study for the Beaufort/Port Royal Fire Department* or amends *The Beaufort/Port Royal Fire Department Capital Improvement* for a subsequent amount of time; or
- (b) City Council adopts and updated *Developmental Fire Impact Fee Study for the Beaufort/Port Royal Fire Department*, pursuant to the substantive and procedural requirements set forth in the South Carolina Development Impact Fee Act, as amended.

Liberal Construction

The provisions of this ordinance shall be liberally construed to effectively carry out its purpose in the interest of further promoting and protecting public health, safety, welfare, and convenience.

SECTION II. Severability. If any section, subsection, sentence, clause, phrase or portion of this ordinance is, for any reason, held invalid or unconstitutional by any court, such section, subsection, sentence, clause, phrase or portion of this ordinance shall be deemed to be a separate, distinct, and independent provision and such holding shall not affect the validity of the remaining provisions of this ordinance nor impair or nullify the remainder of these provisions which shall continue in full force and effect.

If the application of any provision of this ordinance to any new development is declared to be invalid by a decision of any court, the intent of City Council is that such decision shall be limited only to the specific new development expressly involved in the controversy, action, or proceeding in which such decision of invalidity was rendered. Such decision shall not affect, impair, or nullify this ordinance as a whole or the application of any provision of this ordinance to any other new development.

Conflicting Ordinances. All ordinances or parts of ordinances in conflict with the provisions of this ordinance are hereby repealed.

Effective Date. This ordinance shall be effective from and after -----.

SIGNED AND SEALED:



CITY OF BEAUFORT

DEPARTMENT REQUEST FOR CITY COUNCIL AGENDA ITEM

TO: CITY COUNCIL **DATE:** 11/15/2019
FROM: David Prichard
AGENDA ITEM
TITLE: Bridges Preparatory School Senior Project
MEETING
DATE: 11/19/2019
DEPARTMENT: Community and Economic Development

BACKGROUND INFORMATION:

At the November 12 work session, Bridges Academy Senior Class presented ideas for a botanical garden at the corner of Boundary St. and Pigeon Point Rd.

Items for discussion:

1. Does the City want to allow the project on city property and to be responsible for maintenance and upkeep?
2. If yes, where does the city want to allow the botanical garden? Near Bellamy Curve or somewhere else?

PLACED ON AGENDA FOR: Discussion

REMARKS:

ATTACHMENTS:

Description	Type	Upload Date
Aerial Photo from Open Land Trust	Cover Memo	11/15/2019
Title to Real Estate for Easternmost Lot	Exhibit	11/15/2019
Title to Real Estate for Corner Lot	Exhibit	11/15/2019



CALHOUN ST
CHARLES ST

SANDELL LN

BARNWELL BLF

From the Open Land Trust designating that the yellow properties are owned by the City of Beaufort and the green are owned by Open Land Trust.

NEWCASTLE ST

CONGRESS ST

PIGEON POINT RD

BOUNDARY ST

WEST ST

GREENE ST

SCOTT ST

CARTERET ST

State of South Carolina,

COUNTY OF BEAUFORT

33106

1078

Form 14—Title to Real Estate

57890

Revised 1976

KNOW ALL MEN BY THESE PRESENTS, THAT

BEAUFORT COUNTY OPEN LAND TRUST

in the State aforesaid _____ for and _____ in consideration of the sum of
Ten and no/100-----(\$10.00)-----DOLLARS,

to _____ it _____ in hand paid at and before the sealing of these presents by _____
THE CITY OF BEAUFORT
Post Office Drawer 1167, Beaufort, South Carolina 29901

in the State aforesaid _____ the receipt whereof is hereby
acknowledged, have granted, bargained, sold and released, and by these Presents do grant, bargain, sell and
release unto the said City of Beaufort, its successors and/or assigns, forever, the following
described real property, to wit:

ALL that certain piece, parcel or lot of land, with improvements thereon, situate, lying and being in the City of Beaufort, County of Beaufort and State of South Carolina, being the Eastern one hundred (100') feet of Lots 32 and 33 according to a Plat of River Addition made by H. C. Pollitzer dated April 14, 1913, and recorded in the Office of the RMC for Beaufort County, South Carolina in Plat Book 2 at Page 25. Said property is bounded on the North by property of Barnwell Estates as shown on said plat; on the East by a park; on the South by Boundary Street; and on the West by the remaining portion of Lots 32 and 33.

This real property is conveyed by the Grantor and accepted by the Grantee for the creation of a passive vista park. No structure may be erected.

This property may not be converted to other than public outdoor recreation uses (whether by transfer, sale, or in any other manner) without the express written approval of the South Carolina Department of Parks, Recreation and Tourism Commission. The South Carolina Department of Parks, Recreation and Tourism Commission shall approve such conversion only if it finds such conversion to be in accord with the then existing comprehensive statewide outdoor recreation plan and only upon such conditions as it deems necessary to assure the substitution of other recreation properties of at least equal fair market value and of reasonable equivalent usefulness and location.

District 120, Map 4, Parcel 32A

BEAUFORT COUNTY TAX MAP REFERENCE

Dist	Map	Submap	Parcel	Block
120	4		32A	

This is the same real property acquired by the Grantor herein by deed from Beaufort Auto Parts, Inc., dated June 15, 1989 and recorded June 16, 1989 in the Office of the RMC for Beaufort County, South Carolina in Deed Book 530 at Page 2441.

This deed prepared by Noel M. Seeburg, Jr., Esquire. of the law firm of Harvey & Battey, P. A., 1001 Craven Street, Beaufort, South Carolina.

TOGETHER with all and singular, the Rights, Members, Hereditaments and Appurtenances to the said Premises belonging, or in anywise incident or appertaining.

TO HAVE AND TO HOLD, all and singular, the said Premises before mentioned unto the said

City of Beaufort, its successors and

~~XXXXXX~~ Assigns forever.

AND ^{es} it do hereby bind itself and its successors and ~~XXXX~~ assigns
Executors and Administrators, to warrant and forever defend, all and singular, the said Premises unto the said
City of Beaufort, its successors and assigns 1080

~~XXXXXXXXXXXX~~ against it and its successors and assigns ~~XXXX~~, and all persons whomso-
ever lawfully claiming, or to claim the same or any part thereof.

WITNESS its Hand and Seal, this 20th day of September
in the year of our Lord one thousand nine hundred and Eighty-Nine and in the two hundred and
Fourteenth year of the Sovereignty and Independence of the United States of America.

SIGNED, SEALED AND DELIVERED
IN THE PRESENCE OF

Ganette Polk Heck
Janet T. Rouse

BEAUFORT COUNTY OPEN LAND TRUST (L. S.)

By: John W. Broz (L. S.)
John W. Broz, President

By: Sally Pringle (L.S.)
Sally Pringle, Secretary

The State of South Carolina.

Beaufort County.

PERSONALLY appeared before me Janet T. Rouse

and made oath that she saw the within named Beaufort County Open Land Trust by
John W. Broz, its President and Sally Pringle, its Secretary
sign, seal, and as its act and deed, deliver the within written Deed,

and that she with Ganette Polk Heck

witnessed the execution thereof.

SWORN to before me, this 20th

day of September A.D. 19 89

Ganette Polk Heck (SEAL)

Notary Public of South Carolina

My Commission Expires: 12/15/90

Janet T. Rouse

State of South Carolina,

COUNTY OF BEAUFORT

Beaufort County Open Land Trust

BEAUFORT COUNTY
PROPERTY
23 SEP 25 PM 4 03

TO

City of Beaufort

TITLE TO REAL ESTATE

1081

Filed 25th day
of September A.D. 19 89
at 4:03 o'clock P M.

and recorded in Book 537

Page 1078, Fee \$ 400

Harvey & Batty
Beaufort Clerk Court C.P. & S.

County, S.C.

Recorded this 3 day

of Oct, 19 89

in Book 1 Page 611

Fee \$ 400
Harvey & Batty
Beaufort County, S.C.

State of South Carolina,

COUNTY OF BEAUFORT

2515

31039

KNOW ALL MEN BY THESE PRESENTS, THAT

I, LOUISE G. CHEATHAM, formerly known as Louise G. Carson

in the State aforesaid _____ for and _____ in consideration of the sum of
One Hundred Fifteen Thousand and no/100-----(\$115,000.00)----- DOLLARS,

to _____ me _____ in hand paid at and before the sealing of these presents by _____

THE CITY OF BEAUFORT

in the State aforesaid _____ the receipt whereof is hereby
acknowledged, have granted, bargained, sold and released, and by these Presents do grant, bargain, sell and
release unto the said The City of Beaufort, its successors and assigns, forever, the following
described real property, to wit:

SEE ATTACHED EXHIBIT A FOR PROPERTY DESCRIPTION

This deed prepared by Noel M. Seeburg, Jr., Esquire, of the law firm of
Harvey & Battey, P.A., 1001 Craven Street, Beaufort, South Carolina 29902.

TOGETHER with all and singular, the Rights, Members, Hereditaments and Appurtenances to the said
Premises belonging, or in anywise incident or appertaining.

TO HAVE AND TO HOLD, all and singular, the said Premises before mentioned unto the said

The City of Beaufort, its successors and assigns

XXXXXXXXXXXX
Helds and Assigns forever.

EXHIBIT A

PROPERTY DESCRIPTION

ALL those certain pieces, parcels or lots of land, with all improvements thereon, situate, lying and being in the City of Beaufort, County of Beaufort, State of South Carolina, shown as Lots 30 and 31 and a portion of Lots 32 and 33 on a plat of River Addition made by H. C. Pollitzer, C.E., dated April 14, 1913 and recorded in the office of the Register of Mesne Conveyance for Beaufort County, South Carolina in Book 2 of Plats, at page 25. Said lots are contiguous and form a rectangle measuring TWO HUNDRED (200') feet on its Northern and Southern sides and ONE HUNDRED (100') feet on its Eastern and Western sides. Said parcel is bounded North by other lots in said subdivision, east by property conveyed to A. P. Williams by deed dated August 16, 1956, and recorded in Deed Book 81 at page 537 in the Office of the Register of Mesne Conveyance for Beaufort County, South Carolina; South by Boundary Street and West by Pigeon Point Road.

This is a part of the property, a one-half interest of which was devised to Louise G. Carson Cheatham by will of Ruth G. Owens. See devise and descent filed in Beaufort County Probate Court 1983-388 on November 28, 1983. The remaining one-half interest was acquired by the Grantee by deed from Josie B. Randall, formerly Josie B. King, dated August 13, 1947, and recorded in Deed Book 65 at Page 599 of the Beaufort County Records.

This real property is conveyed by the Grantor and accepted by the Grantee subject to the following conditions:

Grantee shall not erect any new structures upon the property and if the Grantee attempts to convey the property or ceases to use it, either with its present improvements or as open land, the Grantor, her heirs, devisees, executors or assigns shall have the right to repurchase the property from the Grantee for the consideration paid by the Grantee.

This property may not be converted to other than public outdoor recreation uses (whether by transfer, sale, or in any other manner) without the express written approval of the South Carolina Department of Parks, Recreation and Tourism Commission. The South Carolina Department of Parks, Recreation and Tourism Commission shall approve such conversion only if it finds such conversion to be in accord with the then existing comprehensive statewide outdoor recreation plan and only upon such conditions as it deems necessary to assure the substitution of other recreation properties of at least equal fair market value and of reasonable equivalent usefulness and location.

BEAUFORT COUNTY TAX MAP REFERENCE

Lot	Block	Parcel	Block
120	4	31	

AND I do hereby bind myself and my Heirs, and assigns
Executors and Administrators, to warrant and forever defend, all and singular, the said Premises unto the said
The City of Beaufort, its successors and assigns

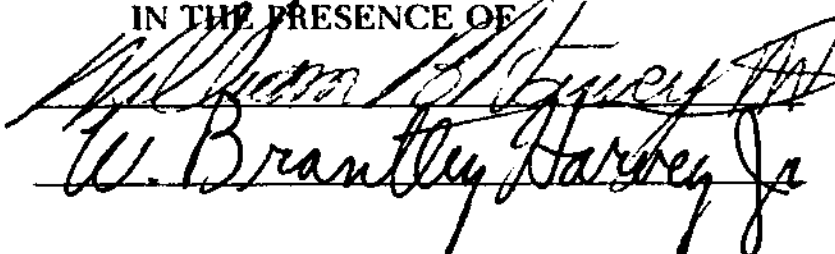
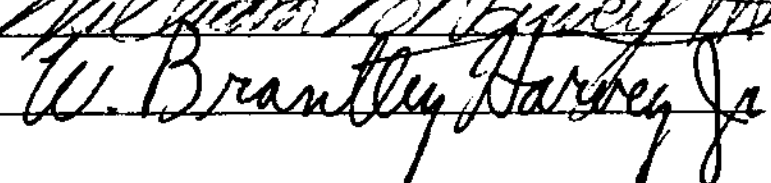
2518

~~Heirs and assigns~~ against me and my Heirs, and all persons whomso-
ever, lawfully claiming, or to claim the same or any part thereof.

WITNESS my Hand and Seal, this 25th day of August

in the year of our Lord one thousand nine hundred and Eighty-Nine and in the two hundred and
Fourteenth year of the Sovereignty and Independence of the United States of America.

SIGNED, SEALED AND DELIVERED
IN THE PRESENCE OF

 Louise G. Cheatham (L. S.)
Louise G. Cheatham
 (L. S.)

The State of South Carolina,

Beaufort County.

PERSONALLY appeared before me  W. Brantley Harvey, Jr.

and made oath that s/he saw the within named Louise G. Cheatham

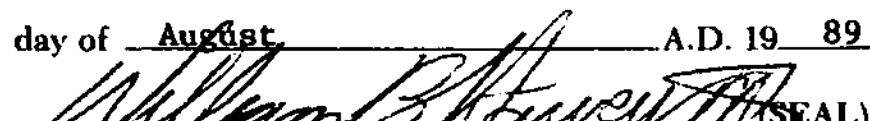
sign, seal, and as her act and deed, deliver the within written Deed,

and that s/he with William B. Harvey, III

witnessed the execution thereof.

SWORN to before me, this 25th

day of August A.D. 19 89

 (SEAL)
Notary Public of South Carolina
My Commission Expires:



HARVEY & BATEY, P.A. P464089
NMS/Jr

Estate of South Carolina,
COUNTY OF BEAUFORT

Louise G. Cheatham

TO

The City of Beaufort

TITLE TO REAL ESTATE

Filed 30th day

of Aug A.D. 19 89
at 3:36 o'clock P M.

and recorded in Book 535

Page 2515 Re: S. C. 103
James A. Stricklin

R. M. C. or Clerk Court C.P. & G. S.
Beaufort County, S.C.

Recorded this 7th day
of Sept, 19 89

in Book V Page 548

Fee, \$

Mary Ann Gray Lewis
Auditor Beaufort County, S. C.

SHARLEN, EVANS & CO. BEAUFORT, S. C.

BEAUFORT COUNTY
RECORDED
09 AUG 30 PM 3 36

2519



CITY OF BEAUFORT

DEPARTMENT REQUEST FOR CITY COUNCIL AGENDA ITEM

TO: CITY COUNCIL **DATE:** 11/15/2019
FROM: David Prichard
AGENDA ITEM
TITLE: Monument Signs in the Boundary Street Development District
MEETING
DATE: 11/19/2019
DEPARTMENT: Community and Economic Development

BACKGROUND INFORMATION:

Back in July, David Burre came to work session to ask if Council would consider modifying the sign requirements along Boundary Street. The City Manager granted temporary approval of a sign for Los Gallos restaurant while the city considered the issue.

The Beaufort Development Code § 6.5.1. (July 10, 2018) allows monument signs in T5 to be a maximum of 10 sq. ft. The maximum allowable height is 8 feet. However, monument signs are not allowed for new buildings in the Boundary Street Redevelopment District.

A legal nonconforming sign shall lose legal status if:

- The sign is relocated or replaced
- The structure, design, or size of the sign is altered in any way
- A tenant vacates a building, in which case all existing signs shall be removed within 30 days.

Items for discussion:

- Should monument signs be allowed for new buildings in the Boundary Street Redevelopment District?
- If yes, is 10 square feet an appropriate maximum size?

PLACED ON AGENDA FOR:

REMARKS:

ATTACHMENTS:

Description	Type	Upload Date
APA Street Graphics and the Law Chapter 4	Backup Material	11/15/2019

CHAPTER 4

UNITED STATES SIGN COUNCIL BEST PRACTICE STANDARDS FOR COMMERCIAL ON-PREMISE SIGNS

In 1996, the United States Sign Council (USSC) and its research arm, the United States Sign Council Foundation, began studying the legibility and traffic safety implications of roadside on-premise signs across varied speed and roadside complexity conditions. Prior to 1996, very little research existed relative to the design and safety characteristics of this type of sign. Traffic engineers, seeking to develop a directional sign system to be used by motorists on local and interstate highways, had promulgated earlier academic research. Although useful as a starting point, the data had little relevance to the distinct qualities of private roadside signs. By virtue of their diversity and placement on private property, on-premise signs exist as a totally separate class of motorist-oriented communication, encompassing distinct unique design challenges and traffic safety implications.

Since 1996 the United States Sign Council Foundation, in partnership with traffic engineers, human factors researchers, and statistical analysts of the Pennsylvania Transportation Institute (PTI) of the Pennsylvania State University, has published a series of research studies. The results from this work now provide a distinct and objective scientific basis for understanding the manner in which motorists receive and respond to the information content of the private roadside sign system. The research and corresponding analysis afford designers and regulators of signs insight into the legibility, size, and placement characteristics necessary for effective roadside communication. Concurrent with the work of the Pennsylvania State University research teams, other researchers, including teams studying the impact of sign systems serving the needs of an aging population on traffic safety, have arrived at conclusions essentially confirming the sign legibility and placement parameters discovered by the Pennsylvania State University researchers.

The USSC and PTI collaborative research work comprises 10 distinct volumes:

1. *Sign Visibility: Research and Traffic Safety Overview* (1996)
2. *Sign Legibility: The Impact of Color and Illumination on Typical On-Premise Sign Font Legibility* (1998)
3. *Real World On-Premise Sign Visibility: The Impact of the Driving Task on Sign Detection and Legibility* (2002)
4. *Sign Visibility: Effects of Traffic Characteristics and Mounting Height* (2003)

5. *Environmental Impact of On-Premise Sign Lighting, with Respect to Potential Light Trespass, Sky Glow, and Glare* (2004)
6. *Relative Visibility of Internally and Externally Illuminated On-Premise Signs* (2004)
7. *On-Premise Signs: Determination of Parallel Sign Legibility and Letter Heights* (2006)
8. *Internally Illuminated Sign Lighting: Effects on Visibility and Traffic Safety* (2009)
9. *Internal vs. External On-Premise Sign Lighting: Visibility and Safety in the Real World* (2009)
10. *On-Premise Sign Lighting: Terms, Definitions, Measurement* (2010)

These volumes, along with the corroborating research provided by other researchers, form the basis for the USSC Best Practices Standards for the design of roadside on-premise signs in dynamic motorist-oriented environments.

OVERVIEW: SEEING AND READING ROADSIDE ON-PREMISE SIGNS

The viewing of a roadside sign by a motorist involves a complex series of sequentially occurring events, both mental and physical. They can include:

- message acquisition and processing (i.e., seeing and understanding the sign);

- intervals of eye movement alternating between the sign and the road environment (i.e., glances to and from the sign and road); and
- active maneuvering of the vehicle itself as required in response to the stimulus provided by the sign (i.e., planning to drive onto the site where the sign stands or deciding to bypass the business).

Further complicating this process is the dynamic that takes place when a driver sees a sign (referred to as the *viewing task*). The driver must look through the constricted view provided by the windshield of a moving vehicle, with the distance between the driver and the sign quickly diminishing. At 40 miles per hour, for example, the rate at which the viewing distance decreases is 58 feet per second; at 60 miles per hour, it becomes an impressive 88 feet per second. Because of this rapidly decreasing window of viewing opportunity, roadside sign design becomes highly challenging and critical to traffic safety. In addition, it necessitates the development of scientific standards for on-premise sign legibility, size, placement, and height in order to achieve effective roadside communication and maintain traffic safety.

Research has now been able to quantify the viewing process such that measurement of the time necessary for a motorist to view and react to a roadside sign while driving at a specified rate of speed can be calculated. Using this time frame, known as viewer reaction time, and the amount of distance from the sign represented by that time frame, the optimal sign size required to transmit the message and to allow sufficient time for detection, comprehension, and maneuvering can be calculated.

The message content of the sign, usually composed of letterforms and symbols, sets the initial parameter for determining sign size. Once message content has been established and its length and complexity considered, a recommended sign size can be calculated by assigning numerical values to the following:

- Viewer Reaction Time
- Viewer Reaction Distance
- Letter Height
- Copy Area
- Negative Space

Each of these determinants is explained in detail below, along with the methodology for calculating their individual values. The size of the sign, then, can be computed either by

summing these five determining values or by inserting them into the algebraic equation developed by USSC for that purpose. The result derived by using either method is the USSC standard for minimum recommended sign size under dynamic roadside conditions.

DETERMINING SIGN SIZE USING VIEWER REACTION TIME

Viewer reaction time is a measurement of the total viewing and reaction time available to a driver reading a sign. It consists of four identifiable elements, each of which can be measured in components of elapsed time. They are:

1. Detection of the sign, noting it as a separate entity in a field of roadside objects
2. The message scan (namely, focusing one's vision on the message on the sign)
3. The reorientation scan (namely, refocusing one's view to the road environment at known intervals)
4. Driving maneuvers as required in response to the message

DETECTION

Detection of a specific sign as a recognizable element of the roadside landscape is a direct function of its conspicuity, or its ability to stand out from other objects within the field of view. The degree of conspicuity depends on a number of factors, including size, color, design, and placement, but even more specifically, the amount of contrast between the sign and its surrounding environment. Without some degree of conspicuity, a sign may lack detectability and cease to be a source of effective roadside identity or wayfinding communication.

Detection and Complexity of Driver and Sign Environment

Research has shown that detection is inversely related to the complexity of both the driving task and the landscape. In other words, as complexity increases for either or both the driving task and the visual environment, detection of any specific object within that landscape is likely to decrease. The more complex the landscape (e.g., city centers or multi-lane commercial corridors), the longer the time frame in the viewing cycle necessary and, therefore, the more conspicuous

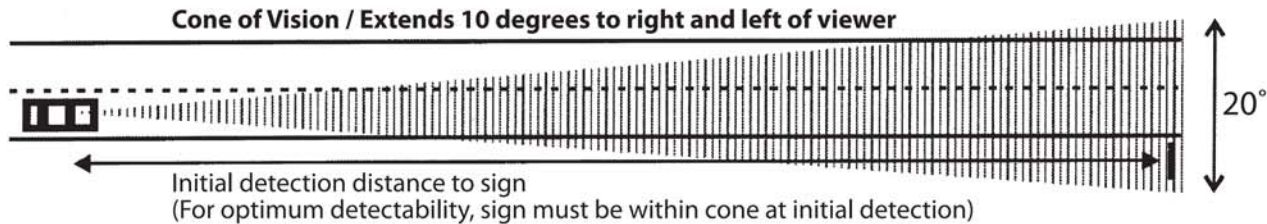


Figure 4.1. The relationship between cone of vision and the ability of a driver to detect a sign

signs need to be for drivers to specifically identify them as signs and the message they convey.

In this context, the effect of illumination can also have a profound effect on how clearly a driver can detect the presence of the sign and its message, with the research verifying a pronounced increase in detection after dark for internally illuminated signs over similar signs viewed under daylight conditions.

Detection and Sign Orientation

Detectability is also a function of sign orientation, or the relative angle of view between the sign and the driver. This angle has been shown to be at an optimum level when signs are positioned perpendicular to the driver and, at initial detection, within a cone of vision extending 10 degrees to either side of the driver. As confirmed by the research, drivers have a much easier time seeing a sign when it is oriented in a way that provides a “head-on” or perpendicular view as opposed to a parallel- or side-oriented view.

Lateral Offset or Setback and the Cone of Vision

Lateral offset, or setback, is the distance in feet at which the sign is offset to the right or left of the driver’s eye position. It is critical to detectability because it determines the position of the sign either inside or outside the cone of vision at initial detection (Figure 4.1).

To ensure that drivers have the greatest opportunity to see a sign and its message, the sign should be located as close to the roadside as possible, so that the lateral offset is kept to a minimum. This usually means placement of the leading edge of a freestanding sign at the front property line and placement of wall signs on the sides of a building as close to the side of the building that faces oncoming traffic as is practical. Arbitrarily imposed setback requirements increasing lateral offset beyond these parameters are generally counterproductive to sign detection because they increase the distance of

the sign from the driver’s eye position, even if it is within the cone of vision.

It is important to note as well that roadside geometry affects any lateral offset calculation, which must include the number of road lanes, the width of the shoulder, and, in particular, the width of any utility or future right-of-way easements before the property line is reached, all of which add considerable lateral distance from the driver’s eye position. In some instances in which public easements are large and initial detection distances are short, lateral offset may exceed the cone of vision inclusion even if the sign is placed at the property line. Increasing sign size, and therefore, visual range, is one solution to this detection problem, since as visual range increases, lateral offset is also increased.

Lateral offset from the viewer’s eye position can be calculated through the application of the following equation:

$$L = D (.176)$$

where:

L = distance of 10 degrees of lateral offset (feet)

D = distance from the sign at initial detection (feet)

Thus, if initial detection distance from the sign is 300 feet, 10 degrees of lateral offset would be 52.8 feet. Note that this offset is from the driver’s eye position and not from some variable point, such as the edge of the road, road shoulder, or roadside easement.

Vertical Offset or Sign Height

Various researchers have recommended sign height limits of between five to eight degrees vertically from the driver’s eye level to enable sign detection without loss of eye contact with the road. Researchers at PTI have adopted the five-degree vertical limit as a conservative estimate of sign height limits, or vertical offset. Additional research into this aspect of sign detection clearly remains to be done—particularly since sign

**TABLE 4.1: LATERAL AND VERTICAL OFFSETS
AS A FUNCTION OF DISTANCE**

Detetction Distance to Sign (ft)	Lateral Offset 1 (Setback) (ft)	Vertical Offset 2 (Height Limit) (ft)
200	35	21
400	70	38.5
600	106	55.5
800	141	73.5
1000	176	90.5

1. Lateral Offset is at 10 degrees right or left.
2. Vertical Offset is at 5 degrees, plus 3.5 feet.

height is affected not only by the viewer's eye position, but by differences in the topography of the roadside itself. Therefore the five-degree height limit proposed by the PTI research team is offered here only as a minimum guideline for the vertical placement of roadside signs, and not as a USSC standard at this time.

Nonetheless, it can serve to provide some means for optimizing the relationship between sign height, sign detection over both long and short ranges, and motorist safety. Using five degrees of vertical elevation, plus 3.5 feet representing the elevation of the average driver's eye position above the road, a calculation of vertical sign height limits capable of providing comfortable detection over both long and short ranges can be derived from the following equation:

$$H = D (.088) + 3.5$$

where:

H = sign height limit (feet)

D = distance from the sign at initial detection (feet)

Thus, if initial detection distance from the sign were 400 feet, the sign height would be limited to 38.7 feet. Table 4.1 indicates varied lateral and vertical offsets for selected detection ranges.

Conclusions

The USSC Best Practices Standards for sign legibility and size assume that conditions of sign orientation and setback afford the best opportunity for a driver to detect and react to a sign and its message, as described above. In practice, these considerations would be applied to most freestanding and

projecting signs, building signs on walls directly facing the viewer, and roof signs mounted at similar optimum viewing angles within the cone of vision. Detection as a component of viewer reaction time in the USSC standard is calculated at one-half to one second duration, depending on roadside complexity and traffic volume.

FACTORS AFFECTING THE WAY DRIVERS SEE, UNDERSTAND, AND RESPOND TO SIGNS DURING MOVEMENT

The message depicted on a sign establishes the time frame for the driver's viewing process. Short messages and simple typography take less time to read and mentally process than long messages and cursive or decorative typography.

In this context, it should be noted that on-premise signs frequently contain a variety of messages, which may be displayed in a number of different sizes and font configurations. The USSC standard for sign size is related principally to primary messages; namely, those messages providing essential information relative to the activities conducted on the site (e.g., the name of the activity, the nature of the activity or product available, principal or major occupants of the site, and other information of a similar nature). Secondary messages are usually designed to provide ancillary information concerning product features or to denote secondary occupants of the site, as seen on site directories. While clearly useful to drivers and to the marketing programs of the sign user, secondary messages are considered less important to the immediate transfer of information demanded of signs placed in a high-speed, dynamic roadside environment in which a driver's ability to view and react to a sign is calculated in seconds.

Current research on average reading times indicates that signs displaying four to eight words in simple typography can be comfortably read and comprehended in approximately four seconds, yielding a reading time, or message scan, of one-half second per word. Since words are defined as containing five letters, this time frame can be further refined to one-tenth of a second per letter, which is the USSC computational standard for what it refers to as the *message scan*. Please note that although it is true that sign copy is read by reference to the words comprising the message, the USSC method achieves greater precision in the calculation process by referring to the individual letters making up the words, which minimizes any potential skewing effects of large or small words.

Additionally, symbols—such as directional arrows, or universally recognized logos or icons displayed on the sign—are considered equivalent to one word or five letters, yielding a reading or scan time of one-half second per symbol. Although reading time for universally recognized symbols has been shown to be at least equal to the reading time per word, it is not known to what extent this reading time increases when unfamiliar symbols or icons are used. Understandably, a driver would require more time for interpretation and processing if the symbols are not familiar. Therefore, the USSC standard for computation is based on the use of universally recognizable symbols only.

In addition to the reading time, research based on eye-movement studies indicates that motorists feel compelled to glance back at the road for at least one-half second for every 2.5 seconds of reading time. Within complex driving environments, the USSC Best Practices Standards increases this reorientation with the road from one-half second to one second to account for the heightened difficulty a driver faces when reacting to a sign.

The Driving Maneuver

When a driver detects a sign indicating a sought-after location, the driver will respond by executing some maneuver. Depending on the number of lanes of traffic, traffic volume, and complexity of the driving environment, potential reactions may include signaling, deceleration, braking, changing lanes, and turning either right or left to gain access to the desired location.

The time interval needed to complete the driving maneuver may or may not be included in the computation of viewer reaction time, depending on whether such maneuver must be made before (pre-sign) or after (post-sign) the sign is passed. Generally, since on-premise identity signs are designed to mark the specific location of a given business or institutional entity, driving maneuvers necessary for entry into that location must be executed before passing the sign. The driving maneuver component, then, will be included as part of viewer reaction time.

On the other hand, signs containing directional or way-finding information, or other signs (such as projecting signs in crowded cityscapes) not directing ingress to the location of the sign, do not necessarily require any driving maneuver to be made until after the sign is passed. In these instances, the driving maneuver is not incorporated as part of viewer reaction time. The USSC standard for the driving maneuver varies from four to six seconds depending on roadside complexity and traffic volume.

The computation table (Table 4.2) is designed to provide a reasonably accurate assessment of the minimum viewer reaction time for a motorist to view an individual sign with at least the 20/40 visual acuity necessary to maintain a driving license. Because of the significant variations that can exist in individual sign design and placement, motorist response, and the roadside environment in which the sign is placed, the table is intended as a guideline only and not as a substitute for actual field observation.

TABLE 4.2. COMPUTATION OF VIEWER REACTION TIME

Task	Driving Environment		
	Simple	Complex ¹	Multilane ²
Detection	0.5 sec	1 sec	1 sec
Message Scan	0.1 sec/letter	0.1 sec/letter	0.1 sec/letter
	0.5 sec/symbol	0.5 sec/symbol	0.5 sec/symbol
Reorientation Scan	0.02 sec/letter	0.04 sec/letter	0.04 sec/letter
	0.1 sec/symbol	0.2 sec/symbol	0.2 sec/symbol
Maneuver	4 sec	5 sec	6 sec

1 Developed town or city commercial areas; single or multilane travel under 35 mph.

2 Developed urban/suburban commercial areas; multilane travel over 35 mph.

TABLE 4.3. AVERAGE VIEWER REACTION TIME

Road Conditions	Maneuver	
	Pre-Sign (sec)	Post-Sign (sec)
Simple	8	4
Complex	10	5
Multilane	11	5

Viewer Reaction Time: Average Standard

Although Table 4.2 (p. 29) provides a useful guideline for the viewer reaction time ascribed to a particular sign, it can also be used to approximate a broad average for a variety of signs within a particular landscape. This average viewer reaction time is helpful in preparing sign size limits where drivers find themselves in a medium- to high-traffic environment. Assuming a message content of six words (30 letters) on a typical sign, the USSC standard viewer reaction time average in simple environments is eight seconds for a maneuver before the sign (pre-sign) and four seconds for a maneuver after the sign (post-sign). In complex or multilane environments, the pre-sign maneuver average rises to 10 or 11 seconds, respectively, and the post-sign maneuver average rises to 5 or 6 seconds. Table 4.3 details these average viewer reaction time values through the range of traffic conditions.

**Viewer Reaction Distance:
Converting Time to Distance**

Viewer reaction distance represents the distance in lineal feet that a viewer will cover at a given rate of speed during the viewer reaction time interval. Essentially, viewer reaction distance represents the same visual dynamic as viewer reaction time, except it is expressed in lineal feet instead of seconds of elapsed time.

Viewer reaction distance is essential to the determination of sign legibility and size. The distance between the viewer and the sign at the point of initial detection determines the letter height necessary for the viewer to acquire and understand the message. By converting viewer reaction time to viewer reaction distance, a rela-

tively precise calculation of initial detection distance can be established.

Viewer reaction distance, expressed in feet, can be calculated by first converting travel speed from miles per hour to feet per second using a multiplier of 1.47.

$$FPS = (MPH) 1.47$$

where:

FPS = feet per second (travel speed)

MPH = miles per hour (travel speed)

Viewer reaction distance is then calculated by multiplying feet per second by viewer reaction time:

$$VRD = (FPS) (VRT)$$

where:

VRD = Viewer Reaction Distance (feet)

FPS = feet per second (travel speed)

VRT = Viewer Reaction Time (seconds)

**SIGN FACTORS AFFECTING A DRIVER'S
PERCEPTION OF A SIGN**

The overall legibility of a sign is a function of the height, color, and font characteristics of the letters making up its message component. For the publication *Sign Legibility: The Impact of Color and Illumination* (1998), researchers conducted test-track studies of individual signs, using subjects in all age groups, to determine the effect that different conditions of daylight and darkness have on detecting and reading signs of varying colors. In order to simulate real-world conditions, two letterforms, Helvetica and Clarendon, were chosen for the study, as they best represent the two general letterform families used in the English language: sans-serif Gothic style (Helvetica) and serif Roman style (Clarendon) (Figure 4.2). The research produced a definitive understanding of the legibility of letterforms under many color and illumination conditions, as well as an understanding of the letter heights necessary for legibility over varying distances from the observer.

Using this research not only as a benchmark for the specific letterforms studied, but also as a reasonable basis for extrapolation to other similarly configured letterforms, the USSC developed a Standard Legibility Index. By means of the index, the height of letters necessary to



Figure 4.2. Helvetica and Clarendon letterforms

TABLE 4.4. THE UNITED STATES SIGN COUNCIL STANDARD LEGIBILITY INDEX

Illumination*	Letter Style	Letter Color	Background Color	Legibility Index	
				Upper and Lower Case	ALL CAPS
External	Helvetica	Black	White	29	25
External	Helvetica	Yellow	Green	26	22
External	Helvetica	White	Black	26	22
External	Clarendon	Black	White	28	24
External	Clarendon	Yellow	Green	31	26
External	Clarendon	White	Black	24	20
Internal Translucent	Helvetica	Black	White	29	25
Internal Translucent	Helvetica	Yellow	Green	37	31
Internal Translucent	Clarendon	Black	White	31	26
Internal Translucent	Clarendon	Yellow	Green	37	31
Internal Opaque	Helvetica	White	Black	34	29
Internal Opaque	Helvetica	Yellow	Green	37	31
Internal Opaque	Clarendon	White	Black	36	30
Internal Opaque	Clarendon	Yellow	Green	37	28
Neon	Helvetica	Red	Black	29	25
Neon	Helvetica	White	Black	38	32

* Illumination variations: (1) external light source, (2) internal light source with fully translucent background, (3) internal light source with translucent letters and opaque background, and (4) exposed neon tube.

provide legibility from a given distance can be calculated (Table 4.4).

The Standard Legibility Index is a numerical value representing the distance in feet for every inch of capital letter height at which a sign may be read. The index also reflects the 15 percent increase in letter height required when all upper-case letters (all caps) are used instead of upper- and lower-case letters with initial caps, a difference in recognition distance documented in earlier studies by the researchers at PTI.

The following equation is used to calculate letter height for perpendicular signs:

$$LH = VRD/LI$$

where:

LH = Letter Height (inches)

VRD = Vehicle Reaction Distance (feet)

LI = Legibility Index

To determine the legibility index figure for any given viewing distance, select the combination of illumination, letter style, letter color, and background color that most closely approximates those features on the sign being evaluated. Then, divide the viewer reaction distance by the appropriate legibility index value. The result is the letter height in inches for the initial capital letter in upper- and lower-case configurations, or for every letter in an all-caps configuration.

Average Standard Legibility

In addition to the specific legibility ranges provided by the chart, an average value can be used in some situations. For instance, if a committee wishes to set code limits for average size ranges for a community sign system, or to set letter height and size limits for a highway or community wayfinding system, an average index value of 30 may be used. However, it must be understood that this is an average only and, as such, may fall short of meeting the legibility needs of any specific sign or environment.



Figure 4.3. Copy area

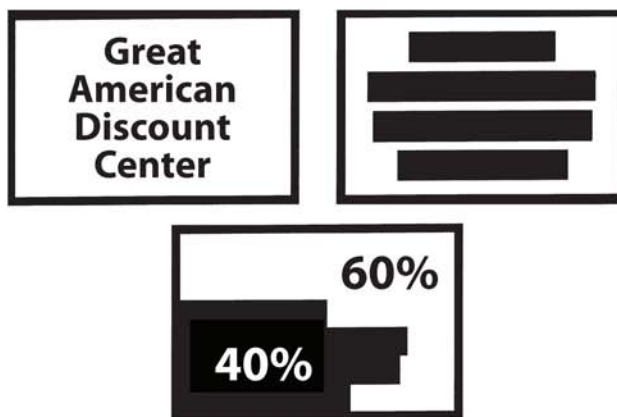


Figure 4.4. Relationship between copy area and negative space

Environmental Adjustments

In *Real World On-Premise Sign Visibility, The Impact of the Driving Task on Sign Detection and Legibility* (2002), a marked difference was documented between legibility index results obtained from the relatively distraction-free test-track environment (as detailed in Table 4.4, p. 31), and observations taken from real-world driving situations involving increased levels of driver workload in complex or congested environments. Both the research team at PTI, as well as a similar team studying the impact of the driving task on sign legibility (Chrysler et al. 2001), arrived at the same conclusion—the driving task, particularly in environments involving a high degree of visual stimuli, produces a significant reduction in the basic test-track legibility index values.

This reduction, or legibility index deterioration, is a manifestation of delayed detection caused by increased driver workload and is clearly measurable as a percentage decrease in the standard legibility index. In a comparison analysis of the test-track values versus values produced from real-world observation, an average decrease of at

least 35 percent of the standard legibility index values was documented, with extreme values as low as seven feet of distance per inch of letter height in highly complex environments. In general, and across a median range of complexity, this decrease can conservatively result in a reduction in the average legibility index value of 30 feet of distance per inch of letter height to 20 feet of distance per inch of letter height, particularly as the complexity of the driver's visual load is increased.

Accordingly, in both moderately to highly congested zones in which demands on driver attention are high, the USSC recommends the application of an adjustment factor designed to bring the standard legibility index values into alignment with the real-world driving conditions encountered by drivers in those zones. The standard legibility index value is multiplied by the adjustment factor, and the product is the adjusted legibility index for the zone. For example, adjustment factors would be applied in moderately congested strip, in-town, or in-city zones, usually characterized by some of the following environmental conditions:

- Moderate pedestrian and/or vehicular activity
- Traffic signal or traffic sign control at major intersections
- Intermittent “stop and go” traffic patterns
- On-street parking
- Posted speeds below 40 MPH
- Tightly spaced retail locations

In areas with these characteristics of moderate congestion, an adjustment factor of 0.83 would be used to calculate the legibility index:

$$\text{Adjusted Moderate Complexity LI} = (\text{Standard LI}) 0.83$$

where:

LI = Legibility Index

Thus, in moderately congested zones, the average legibility index value of 30 would be adjusted to 25 feet per inch of letter height, and individual index values would be adjusted accordingly. In highly congested zones (as characterized below), the average legibility index value would be adjusted from 30 to 20 feet per inch of letter height.

A different adjustment factor would be used for highly congested strip, in-town, or in-city zones. These zones are usually characterized by some of the following environmental conditions:

- High pedestrian and/or vehicular activity
- Traffic signal or traffic sign control at most intersections
- Intermittent “stop and go” traffic patterns
- On-street parking
- Posted speeds below 30 MPH
- Tightly spaced retail locations

An adjustment factor of 0.67 would be used in these cases:

$$\text{Adjusted High Complexity LI} = (\text{Standard LI}) 0.67$$

where:

LI = Legibility Index

Copy Area

The copy area of a sign is that portion of the sign face encompassing the lettering and the space between the letters (letter-space), as well as any symbols, illustrations, or other graphic elements. It is a critical component of effective sign design because it establishes the relationship between the message and the negative space necessary to provide the sign with reasonable legibility over distance.

Figure 4.3 depicts a typical on-premise sign face to the left, and the sign face on the right, with black rectangles covering the copy area, provides a visual of the message layout.

Negative Space

Negative space is the open space surrounding the copy area of a sign. It is essential to legibility, particularly for signs in which the copy is displayed within a background panel.



Conditions:

- Complex driving environment
- Posted traffic speed of 40 MPH
- Sign background: white
- Sign copy: 23 letters, upper and lower case
- Clarendon type: black
- Internally illuminated, translucent face

Figure 4.5. An example of sign size calculation

Negative space should never be less than 60 percent of the copy area on any given background. This requirement for a 40/60 relationship between the copy area and negative space is the minimum USSC standard. It is intended only to establish a measurable baseline for the negative space component of a sign, such that a reasonable expectation of legibility will exist.

The bottom sign panel in Figure 4.4 illustrates how the aggregate copy area makes up 40 percent of the total sign panel area, with the remaining 60 percent forming the negative space area.

PUTTING IT ALL TOGETHER: CALCULATING SIGN AREA

The size of a sign is determined by the size and length of the message and the time required to read and understand it. It can be calculated once the numerical values of the five size determinants—Viewer Reaction Time, Viewer Reaction Distance, Letter Height, Copy Area, and Negative Space—have been established.

The step-by-step process to determine sign size, which is explained below, is useful not only as a calculation method, but also as a means of understanding the elements involved in the calculation.

1. Determine speed of travel (MPH) in feet per second (FPS): (MPH x 1.47).
2. Determine Viewer Reaction Time (VRT).
3. Determine Viewer Reaction Distance (VRT x FPS).
4. Determine Letter Height in inches by reference to the Legibility Index (LI): (VRD/LI).
5. Determine single letter area in square inches: square the letter height to obtain area occupied by the single letter and its adjoining letterspace.
6. Determine single letter area in square feet: single letter area in square inches/144.
7. Determine Copy Area: single letter area in square feet times total number of letters plus area of any symbols in square feet.
8. Determine Negative Space area at 60 percent of Copy Area (Copy Area x 1.5).
9. Add Copy Area to Negative Space area.
10. Result is the area of the sign in square feet.

Figure 4.5 describes the assumed conditions for this sign area calculation.

TABLE 4.5. SIGN SIZE AS FUNCTION OF TRAVEL SPEED AND VIEWER REACTION TIME

MPH	VRT (sec)	Sign Size (sq ft)
25	4	12.5
	5	20
	8	50
	10	78
40	4	32
	5	50
	8	128
	10	200
55	4	60.5
	5	95
	8	242
	1	378

Calculating the Area for a Specific-Use Sign

In addition to the computation method above, the USSC has developed an algebraic equation to determine the area for signs containing letters only, which will provide the same result but will simplify the process. The equation allows for insertion of all of the size determinants, except for negative space, which is fixed at the standard 40/60 ratio. (Note: If numbers are rounded off in the computation process, a very slight difference in result may occur between the computation process and the equation).

$$A_{sign} = 3n/80 [(VRT)(MPH)/LI]^2$$

where:

A_{sign} = area of the sign

Fixed value:

40/60 ratio of letter to negative space

Variable values:

n = number of letters

VRT = Viewer Reaction Time (seconds)

MPH = miles per hour (travel speed)

LI = Legibility Index

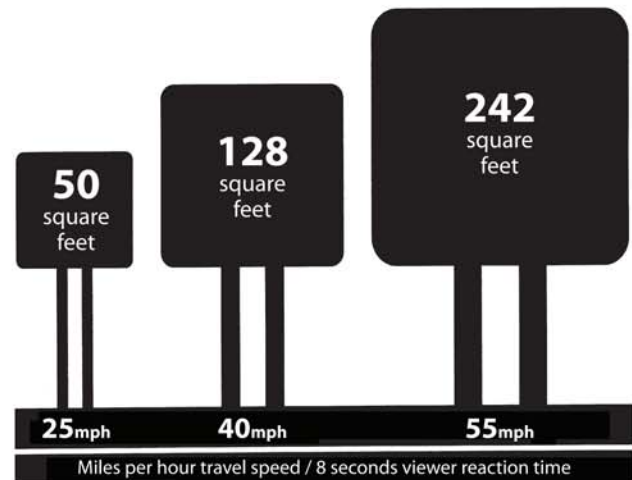


Figure 4.6. Average sign size related to speed of travel and reaction time

Calculating the Area of a General-Use Sign

The specific-use sign equation is used to calculate the size of a sign containing letterforms when the motorist is traveling at a specific rate of speed. To allow for a broader scientific evaluation of sign size and satisfy the minimal legibility requirements across a full range of reaction times and speed zones, the USSC has developed a second equation. This formula fixes the average sign size determinants (number of letters, legibility index, and negative space), leaving only viewer reaction time and the speed of travel as the sole variables. It can be used to ascertain the general size of signs necessary to adequately and safely convey roadside information to motorists traveling at a given rate of speed as well as to establish size parameters for signs across an entire community or road system.

$$A_{sign} = [(VRT)(MPH)]^2/800$$

where:

A_{sign} = area of the sign

Fixed values:

1. 30 letters
2. Legibility Index (LI) of 30
3. 40/60 ratio of letters to negative space

Variable values:

VRT = Viewer Reaction Time (seconds)

MPH = miles per hour (travel speed)

Table 4.5 and Figure 4.6 provide examples of the use of this sign area equation based on different travel speeds and viewer reaction times.

SIGN HEIGHT: MINIMUM STANDARDS FOR VEHICLE-ORIENTED ENVIRONMENTS

For signs providing roadside information in primarily vehicular-oriented environments, the height above grade of the sign or sign copy has a pronounced effect on an approaching motorist's ability to detect and read the message displayed. As is documented in the research publication, *Sign Visibility, Effects of Traffic Characteristics and Mounting Height* (2003), the simple presence of other vehicles on the road (i.e., in front, in an adjacent travel lane, or in travel lanes in the opposite direction) can potentially prevent a driver from detecting a sign. If a sign is situated at or below five feet above grade, other vehicles may block the driver's view, and the sign copy will not be legible (Figure 4.7).

The aforementioned study used analytical algorithms reflecting known patterns of traffic flow and volume, in conjunction with computer-generated simulation software. The research resulted in predictions of the percentage of times that other vehicles blocked the view of an approaching motorist, thus preventing the driver from detecting a low-mounted sign (five feet or less above grade). The percent of blockage was computed as a function of the traffic flow rate, the position of the subject motorist in the traffic stream, and the position and setback of the sign. Oversize vehicles (such as trucks, buses, and recreational vehicles) were not included in the calculations even though their normal presence in the vehicular mix would have, undoubtedly, increased the percentages noted in the study.

The researchers analyzed eight traffic scenarios, based on a four-lane undivided highway and either 35 or 45 miles per hour as the speed of travel. These conditions were chosen to simulate the general characteristics of roadways traversing commercial zones throughout the United States. The signs (assumed to be 10 feet wide) were located at either 10 or 20 feet from the edge of the roadway and on either the right- or left-hand side of the road. The findings clearly establish a quantifiable loss of visibility across the full range of sign placement as traffic flow rates increase. The charts, A through H, document the findings for traffic flow rates ranging from 200 to 1,200 vehicles per hour (Figure 4.8, pp. 36–39).

Based on the research, the USSC minimum height standard for copy on signs placed on roads with character-

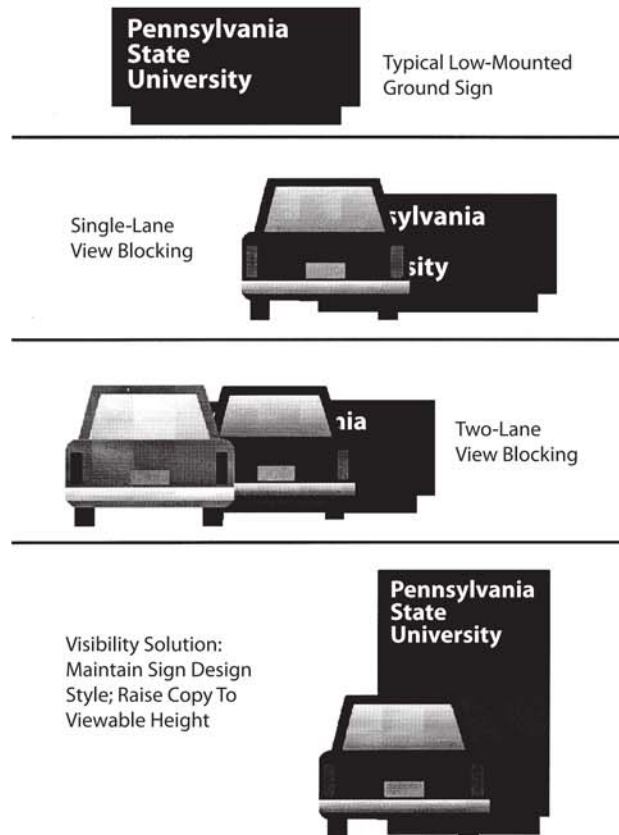
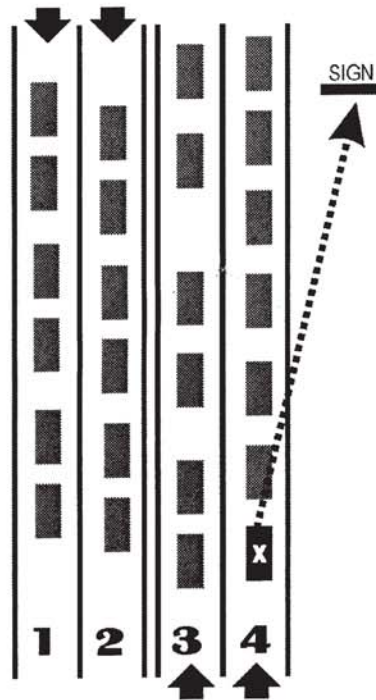


Figure 4.7. Sign-blocking scenarios (schematic)

istics as detailed in the charts is no less than five feet above grade. However, the USSC strongly recommends a minimum height standard for sign copy of no less than seven feet above grade in order to ensure adequate visibility and a reasonable viewer reaction time, considering the blocking potential of other vehicles on the road. The seven-feet-above-grade recommendation is the same as the Federal Highway Administration's standard, as promulgated in the *Manual of Uniform Traffic Control Devices*, for the height above grade of official roadside directional and wayfinding signs utilized along urban roadways in the United States.

As a related issue, the visibility requirement for ground or monument sign copy placement above seven feet above grade may run counter to community sign code regulation that (1) sets overall low maximum height limits, or (2) computes maximum square footage limits on sign size as the simple product of the total height times the total width of the

Figure 4.8. Sign-blocking charts with tables



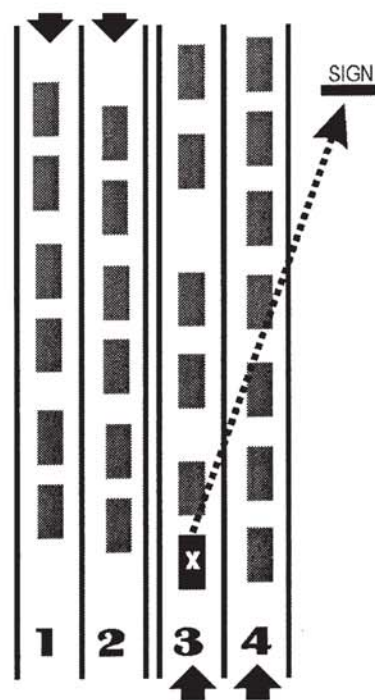
SCHEMATIC A

Speed of Travel: 35 mph
Subject Vehicle: Lane 4/Sign on right

Tables indicate percent of time sign is blocked from view of subject vehicle depending on Flow Rate and sign setback.

Flow Rate represents the number of vehicles traveling in both lanes in one direction for a period of one hour.

SIGN SETBACK AT 10 FEET		SIGN SETBACK AT 20 FEET	
Flow Rate	% Blocking	Flow Rate	% Blocking
200	9	200	6
400	17	400	12
600	25	600	18
800	31	800	23
1000	38	1000	28
1200	43	1200	33



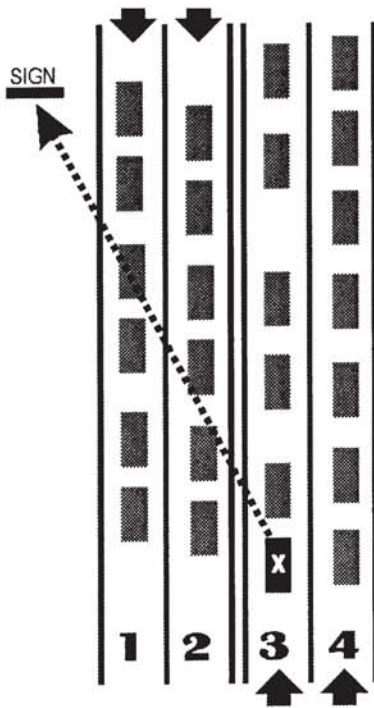
SCHEMATIC B

Speed of Travel: 35 mph
Subject Vehicle: Lane 3/Sign on right

Tables indicate percent of time sign is blocked from view of subject vehicle depending on Flow Rate and sign setback.

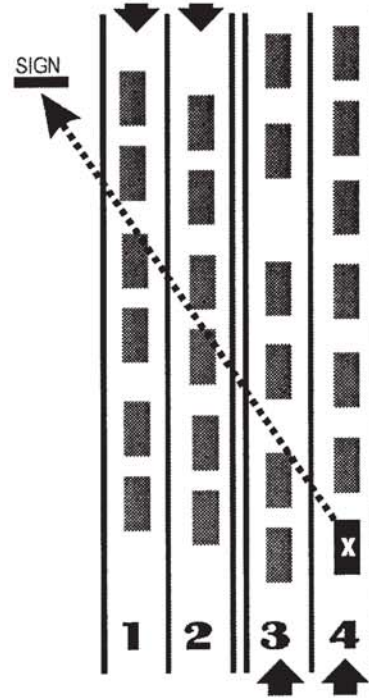
Flow Rate represents the number of vehicles traveling in both lanes in one direction for a period of one hour.

SIGN SETBACK AT 10 FEET		SIGN SETBACK AT 20 FEET	
Flow Rate	% Blocking	Flow Rate	% Blocking
200	17	200	12
400	29	400	24
600	41	600	33
800	50	800	42
1000	58	1000	49
1200	65	1200	56



SCHEMATIC C

Speed of Travel: 35 mph
Subject Vehicle: Lane 3/Sign on left



SCHEMATIC D

Speed of Travel: 35 mph
Subject Vehicle: Lane 4/Sign on left

Tables indicate percent of time sign is blocked from view of subject vehicle depending on Flow Rate and sign setback.

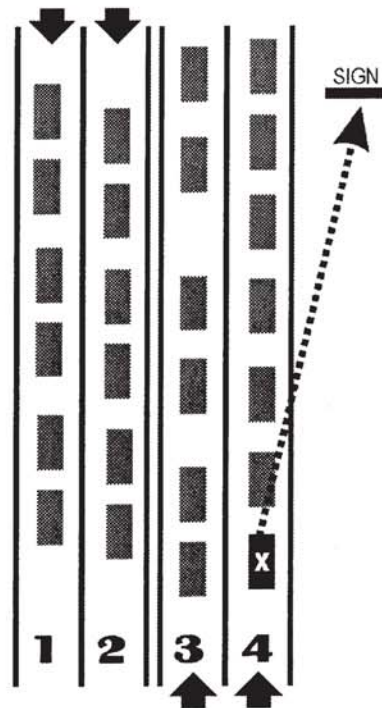
Flow Rate represents the number of vehicles traveling in both lanes in one direction for a period of one hour.

SIGN SETBACK AT 10 FEET		SIGN SETBACK AT 20 FEET	
Flow Rate	% Blocking	Flow Rate	% Blocking
200	19	200	16
400	35	400	30
600	48	600	41
800	58	800	51
1000	66	1000	59
1200	72	1200	65

Tables indicate percent of time sign is blocked from view of subject vehicle depending on Flow Rate and sign setback.

Flow Rate represents the number of vehicles traveling in both lanes in one direction for a period of one hour.

SIGN SETBACK AT 10 FEET		SIGN SETBACK AT 20 FEET	
Flow Rate	% Blocking	Flow Rate	% Blocking
200	23	200	20
400	41	400	36
600	54	600	49
800	65	800	59
1000	73	1000	67
1200	79	1200	74



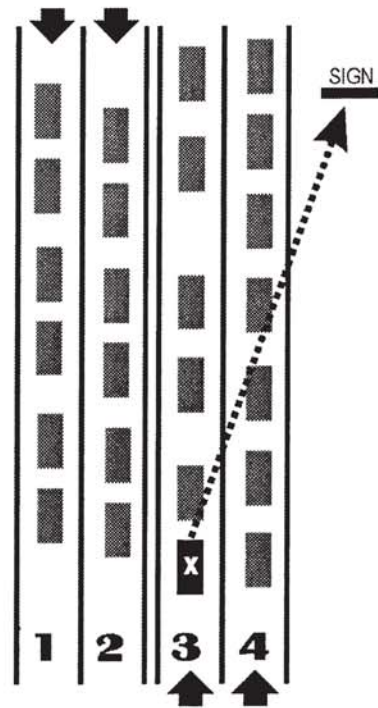
SCHEMATIC E

Speed of Travel: 45 mph
Subject Vehicle: Lane 4/Sign on right

Tables indicate percent of time sign is blocked from view of subject vehicle depending on Flow Rate and sign setback.

Flow Rate represents the number of vehicles traveling in both lanes in one direction for a period of one hour.

SIGN SETBACK AT 10 FEET		SIGN SETBACK AT 20 FEET	
Flow Rate	% Blocking	Flow Rate	% Blocking
200	9	200	6
400	17	400	12
600	24	600	17
800	31	800	23
1000	37	1000	27
1200	42	1200	32



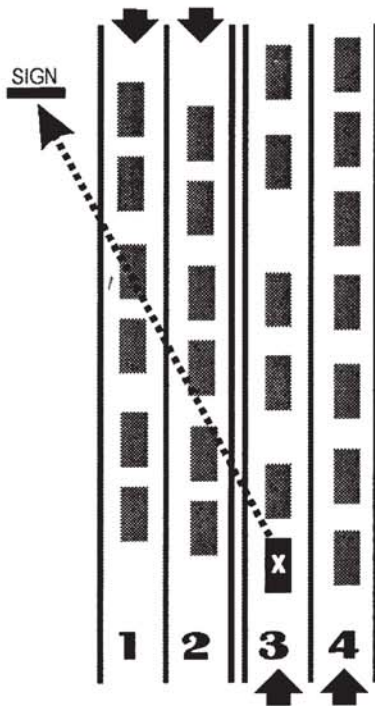
SCHEMATIC F

Speed of Travel: 45 mph
Subject Vehicle: Lane 3/Sign on right

Tables indicate percent of time sign is blocked from view of subject vehicle depending on Flow Rate and sign setback.

Flow Rate represents the number of vehicles traveling in both lanes in one direction for a period of one hour.

SIGN SETBACK AT 10 FEET		SIGN SETBACK AT 20 FEET	
Flow Rate	% Blocking	Flow Rate	% Blocking
200	16	200	12
400	29	400	23
600	40	600	32
800	49	800	41
1000	57	1000	48
1200	64	1200	54



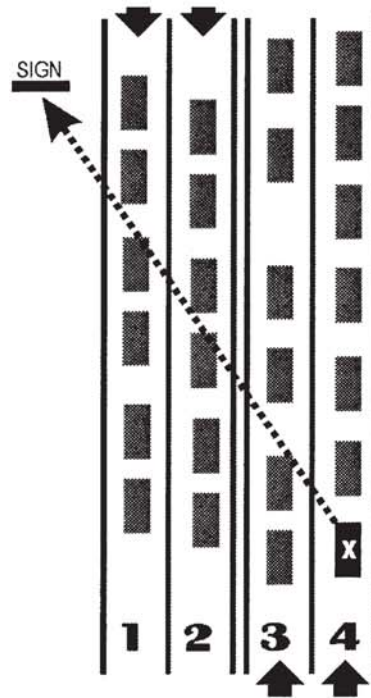
SCHEMATIC G

Speed of Travel: 45 mph
Subject Vehicle: Lane 3/Sign on left

Tables indicate percent of time sign is blocked from view of subject vehicle depending on Flow Rate and sign setback.

Flow Rate represents the number of vehicles traveling in both lanes in one direction for a period of one hour.

SIGN SETBACK AT 10 FEET		SIGN SETBACK AT 20 FEET	
Flow Rate	% Blocking	Flow Rate	% Blocking
200	19	200	16
400	34	400	29
600	46	600	40
800	56	800	49
1000	64	1000	57
1200	70	1200	63



SCHEMATIC H

Speed of Travel: 45 mph
Subject Vehicle: Lane 4/Sign on left

Tables indicate percent of time sign is blocked from view of subject vehicle depending on Flow Rate and sign setback.

Flow Rate represents the number of vehicles traveling in both lanes in one direction for a period of one hour.

SIGN SETBACK AT 10 FEET		SIGN SETBACK AT 20 FEET	
Flow Rate	% Blocking	Flow Rate	% Blocking
200	22	200	19
400	39	400	34
600	52	600	47
800	63	800	57
1000	71	1000	65
1200	77	1200	71

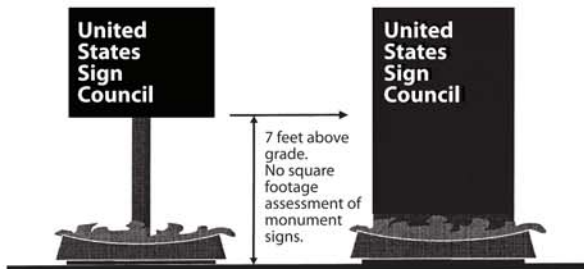


Figure 4.9. Comparison of pole and monument signs

monument structure, regardless of sign copy placement. In either case, a community intent on encouraging the use of monument or monolithic-type ground signs may find its sign regulations to be counterproductive to this aim, as well as to the effective conveyance of roadside information in moderate- to high-density traffic conditions.

To alleviate this condition, the USSC offers the following sign code modification recommendations for use in land-use zones in which the data indicate significant blockage of the copy area of low-mounted or monument signs.

1. Maximum height limits of such signs—as well as maximum height limits for other freestanding signs within the zone—should take into account the recommended lower limit of seven feet above grade for copy placement.
2. No maximum square footage assessment of monument- or monolithic-type ground signs should be imposed below seven feet above grade, provided that no copy is placed within that area (Figure 4.9).

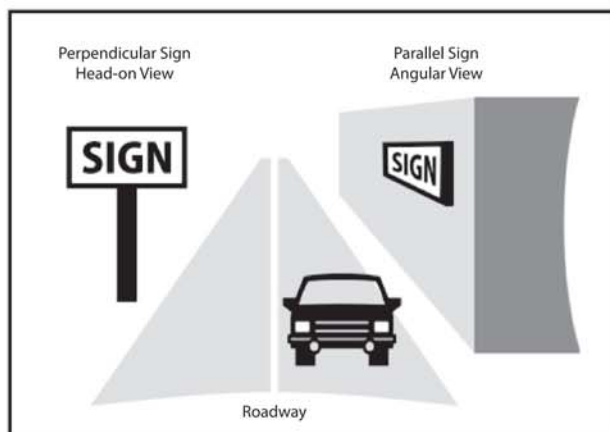


Figure 4.10. Parallel sign and perpendicular sign comparison

PARALLEL SIGNS

On-Premise Signs Guideline Standards (Bertucci 2003) was based on numerous university-level scientific studies conducted by the USSC and its research arm, the United States Sign Council Foundation, aimed at quantifying various aspects of on-premise sign functionality, including sign size, legibility, and height for on-premise signs that are oriented in a perpendicular fashion to the driver. These signs are typically referred to as freestanding signs, pylon signs, monument signs, or projecting signs—any type of sign that is situated alongside a roadway and is installed in a perpendicular fashion to the roadway and facing a driver's line of sight.

Research performed in 2006 extended this inquiry to the subject of “parallel” signs. Parallel signs present unique challenges for the driver. Parallel signs are often called wall signs, building signs, façade signs, or some other name and refer to on-premise signs that are affixed to a building structure and typically presented in an orientation that is parallel to the roadway and the driver's line of sight (instead of perpendicular to it).

On Premise Signs: Determination of Parallel Sign Legibility and Letter Heights (2006) describes the development of and rationale for a mathematical model that calculates letter heights for parallel-mounted on-premise signs. The parallel sign research integrated the original legibility standards described earlier in this chapter, so that the letter heights developed for perpendicular signs form the basis for letter heights on parallel signs with various lateral offsets (the distance from the edge of the roadway to the sign).

The Distinct Characteristics of Parallel Signs

A parallel on-premise sign is harder to read because of its orientation, or tilt, with respect to the driver. This orientation makes it impossible to see the sign face at certain distances and offsets (Figure 4.10). Even when a driver can see the sign face, the sign content is often foreshortened and distorted. A driver must be close to the sign in order to increase the viewing angle to a point where the sign becomes legible. Yet, as a driver approaches the sign, the time available to read the sign becomes shorter, and the sign moves further into the driver's peripheral vision. Therefore, parallel signs must be read using a series of very quick glances at large visual angles during small windows of viewing opportunity. Because of this, the letter heights previously developed for perpendicular signs, where drivers have more time and can take longer straight-ahead glances, do not provide for adequate parallel sign legibility.

Researchers have identified multiple factors that assist in the construction of a comprehensive model for the determination of parallel sign letter heights for signs along typical roadway cross-sections (measured by the number of lanes) and lateral sign offsets:

- **Glance angle:** the maximum angle at which drivers look away from the road to read signs
- **Glance duration:** the length of time drivers look away from the road to read signs
- **Glance frequency:** the number of glances that drivers make at any given sign
- **Sign reading speed:** the road speed at which the driver is moving
- **Observation angle:** the angle, or tilt, at which signs become legible

Glance Angle

As discussed earlier in this chapter, sign detectability and legibility are, among other things, functions of sign orientation, or the relative angle of view between the sign and the driver. This angle is at its optimum level when the sign is positioned perpendicular to the driver and within the driver's cone of vision at the initial point of detection. Parallel signs typically have a large lateral offset, or are setback in a location that is outside the driver's cone of vision, to the left or to the right. This increases the driver's glance angle, and makes it more difficult to detect and read the sign.

Glance Duration

Researchers have found that drivers take their attention away from the forward roadway and glance at signs outside their cone of vision for varying lengths of time. The range for glance duration based on research extends from very short "look away" times to read signs (one-second glances) to glance durations of two seconds or longer.

The USSC Best Practices Standards assumes the following based on research:

- Drivers direct the majority of their visual attention to areas of the roadway that are relevant to the task at hand (i.e., the driving task).
- Drivers look away from the forward roadway to view signs located outside a driver's cone of vision for varying amounts of time.
- The key for parallel sign visibility and legibility is to afford the driver adequate time and distance to see and read a parallel sign within the duration of a typical glance.

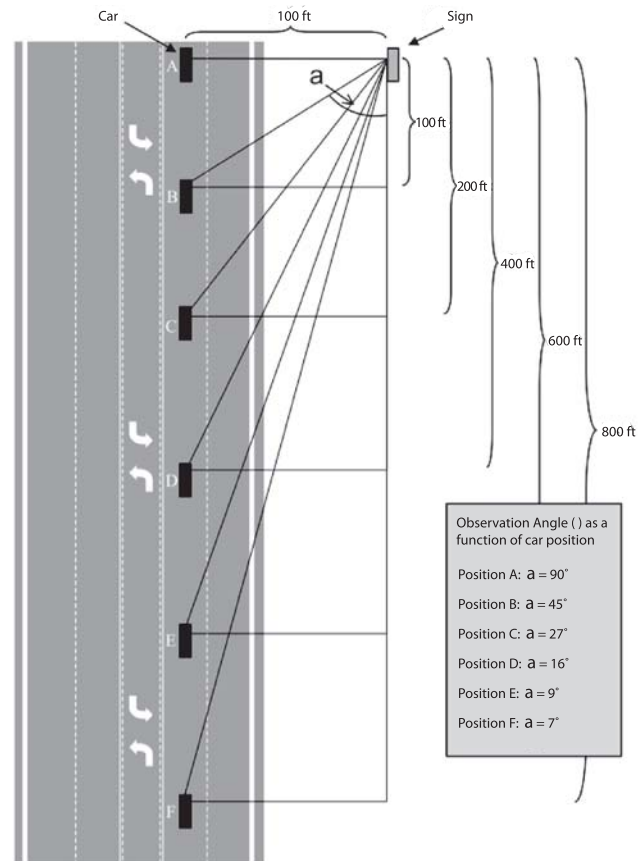


Figure 4.11. Change in observation angle with distance

Glance Frequency

Researchers in the 2006 parallel sign study stated that drivers typically glance at signs along the roadway one or two times. However, the number of glances that a driver can perform regarding a sign is limited by the time and distance available to the driver to perform the viewing function. One example is a driver with a maximum window of seven seconds to detect and read an on-premise parallel sign (see discussion of viewer reaction time, p. 26). If the driver looks at the sign at the first second of the viewer reaction time sequence, glances for a full two seconds, and then looks to the forward roadway for two seconds, only one additional glance for a maximum of two seconds is physically possible before the sign is outside the view of the driver. Therefore, parallel signs need to be visible and legible for drivers generally within a two-glance period.

**TABLE 4.6. WINDOW OF OPPORTUNITY TO READ
PARALLEL SIGNS**

Time in Seconds					
25 MPH Speed Limit					
Offset from the Curb (ft)	Number of Lanes				
	1	2	3	4	5
10	0.94	1.42	1.89	2.36	2.83
20	1.42	1.89	2.36	2.83	3.31
40	2.36	2.83	3.31	3.78	4.25
60	3.31	3.78	4.25	4.72	5.20
80	4.25	4.72	5.20	5.67	6.14
100	5.20	5.67	6.14	6.61	7.09
125	6.38	6.85	7.32	7.79	8.27
150	7.56	8.03	8.50	8.98	9.45
175	8.74	9.21	9.68	10.16	10.63
200	9.92	10.39	10.86	11.34	11.81
45 MPH Speed Limit					
Offset from the Curb (ft)	Number of Lanes				
	1	2	3	4	5
10	0.52	0.79	1.05	1.31	1.57
20	0.79	1.05	1.31	1.57	1.84
40	1.31	1.57	1.84	2.10	2.36
60	1.84	2.10	2.36	2.62	2.89
80	2.36	2.62	2.89	3.15	3.41
100	2.89	3.15	3.41	3.67	3.94
125	3.54	3.81	4.07	4.33	4.59
150	4.20	4.46	4.72	4.99	5.25
175	4.85	5.12	5.38	5.64	5.90
200	5.51	5.77	6.04	6.30	6.56
225	6.17	6.43	6.69	6.95	7.22
250	6.82	7.09	7.35	7.61	7.87
275	7.48	7.74	8.00	8.27	8.53
300	8.14	8.40	8.66	8.92	9.19
325	8.79	9.05	9.32	9.58	9.84
350	9.45	9.71	9.97	10.23	10.50
375	10.10	10.37	10.63	10.89	11.15
400	10.76	11.02	11.28	11.55	11.81

Sign Reading Speed

The USSC Foundation research determined that parallel roadside signs are read in short spurts as the driver looks from the road to the sign and back to the road again. This type of reading task is termed “glance legibility,” and reading speed is a critical factor in the amount of time a driver takes to read a roadside sign. Maximizing sign-reading speed helps minimize the time a driver must look away from the road.

Typical adult text-reading speed, for a book or an electronic monitor, is roughly 250 words per minute, or 4.2 words per second. Research on highway sign reading indicates that it takes drivers between .5 and 2 seconds to read and process a single sign word or unit of information (note that this is two to eight times slower than normal reading speed). A concept known as the “acuity threshold” helps explain some of the disparity between normal reading speed and the time it takes to read a roadside sign. Drivers begin to read signs as soon as they become legible, but the reading task is slower at the acuity threshold, a lower threshold of legibility. Optimum legibility begins at the point of “critical print size,” defined as the smallest letter height necessary for maximum reading speed.

Parallel sign letter size needs to be increased or adjusted upward from the threshold letter height to the critical print size in order to increase reading speed for drivers. It is essential to optimize reading speed for parallel-mounted signs in order to minimize the duration and frequency of glances that drivers must make at these signs and to maximize the time they have for the primary visual driving tasks.

The research shows that drivers read the fastest at two to three times threshold letter height. To ensure adequate letter height across a variety of scenarios and environments, the USSC standards uses a multiplier of three times the threshold height. Utilizing this threshold letter height improves the likelihood that drivers will be able to begin reading signs at the initial 30-degree observation angle.

Observation Angle

As a driver gets closer to a parallel-mounted sign (a typical wall sign or building sign), the driver’s glance angle increases from nearly 0 degrees, when the driver is far down the road, to 90 degrees, when the driver is beside the sign and where the sign is optimally legible (Figure 4.11, p. 41). However, at this glance angle the sign can only be viewed through the passenger and driver’s side windows. Therefore, the driver must either not view the sign and maintain attention on the roadway, or turn at a substantial angle to view the sign.

TABLE 4.7. PARALLEL SIGN HEIGHT LOOKUP TABLE

Offset from the Curb (ft)	Letter Height in Inches				
	Number of Lanes				
	1	2	3	4	5
10	4	6	8	10	12
20	6	8	10	12	14
40	10	12	14	16	18
60	14	16	18	20	22
80	18	20	22	24	26
100	22	24	26	28	30
125	27	29	31	33	35
150	32	34	36	38	40
175	37	39	41	43	45
200	42	44	46	48	50
225	47	49	51	53	55
250	52	54	56	58	60
275	57	59	61	63	65
300	62	64	66	68	70
325	67	69	71	73	75
350	72	74	76	78	80
375	77	79	81	83	85
400	82	84	86	88	90

Researchers find that signs begin to be legible at a “threshold observation angle” somewhere between 0 degrees and 90 degrees. The USSC standard threshold observation angle is 30 degrees, with the optimum parallel sign legibility extending from 30 degrees to 60 degrees. Legibility of the sign message deteriorates above and below these benchmarks. Finally, increasing parallel sign letter height improves driver performance and sign legibility.

Parallel Signs and Letter Size

The minimum distance at which a sign and letters become legible is a function of the time necessary to read the sign or letters and the decisions and maneuvers required to comply with the message. Parallel sign and letter legibility is a function of both time and distance. Table 4.5 (p. 34) presented appropriate letter heights for perpendicular-mounted signs, with an average standard

legibility index for perpendicular signs being 30—that is, a one-inch letter is legible from a viewing distance of up to 30 feet. Table 4.6 shows the window of opportunity available to read parallel-mounted signs.

As discussed earlier, restricted viewing angles curtail parallel sign sight distance. The maximum available legibility distance for a parallel sign is the sight distance between the driver and the sign at the angle where the sign first becomes legible. This distance is calculated using the number of travel lanes, the sign’s lateral offset from the curb, and the threshold observation angle discussed above.

Users should not interpret or apply the USSC standards for parallel sign letter height in a way that prohibits other parallel sign and letter sizes that do not meet the standard. The recommended parallel sign and letter size standard is provided as a guide to be used in a variety of contexts.

The following equations can be used to determine appropriate letter heights for parallel-mounted signs given the number of lanes of travel and the lateral offset of the sign from the curb. Equation #1 uses an average legibility index of 10, based on the standards described earlier in this chapter for perpendicular signs. Equation #2 allows users to input the legibility index that most closely matches their sign conditions and applies the three times threshold constant.

Scenario 1 Example

This example uses the following assumptions: a two-lane roadway; lateral offset of 37 feet from the curb; the user does not know the letter style.

$$\text{Equation \#1: } LH = [(LN \times 10) + LO] / 5$$

where:

LH = Letter Height (inches)

LN = Lanes (number of lanes of traffic)

LO = Lateral Offset from curb (feet)

$$LH = [(2 \times 10) + 37] / 5$$

$$LH = 57 / 5$$

$$LH = 11.4 \text{ inches}$$

Table 4.7 is a parallel sign letter height lookup table for typical roadway cross-sections and lateral sign offsets. When using the equations or the lookup table always use the maximum number of lanes on the primary target road. Figure 4.12 (p. 44) shows additional examples of letter height cal-

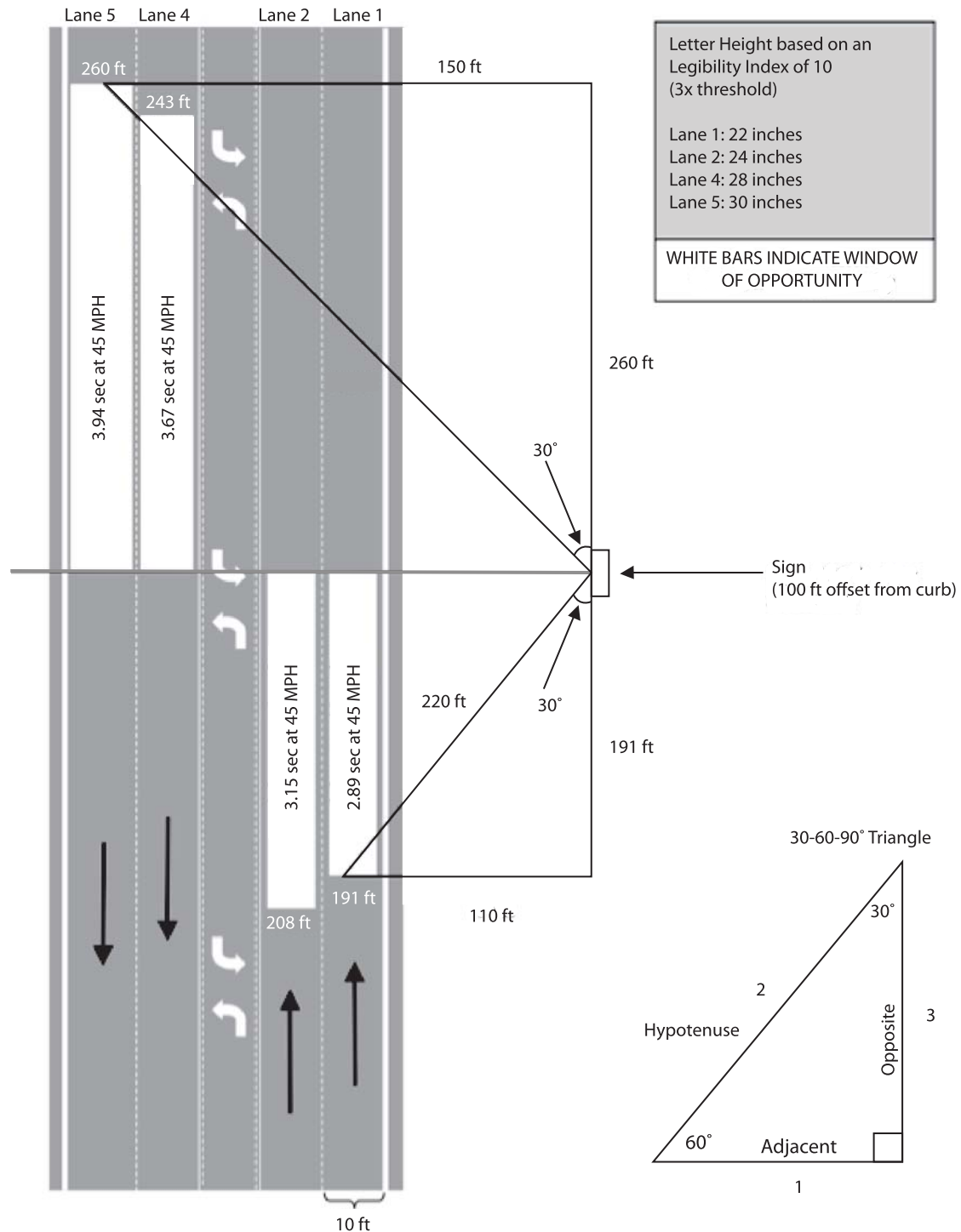


Figure 4.12. Example calculation for letter height model

culations for a parallel sign from different lanes (lateral offset of 100 feet from the curb). This figure also includes the window of opportunity times for each lane based on a travel speed of 45 MPH and the corresponding distance traveled during that time.

Scenario 2 Example

This example is based on the following assumptions: the same roadway and lateral offset characteristics, but the sign is externally illuminated, the lettering is all capital letters in Helvetica, and light letters are on a dark background. Based on these characteristics, the legibility index is 22 (see Table 4.4, p. 31).

Equation #2: $LH = [(LN \times 10) + LO] / (LI / 6)$

$LH = [(2 \times 10) + 37] / (22 / 6)$

$LH = 57 / 3.67$

$LH = 15.5 \text{ inches}$

SIGN ILLUMINATION

The USSC has completed a series of six on-premise sign lighting studies and reports designed to assist in the understanding of how on-premise signs function at night when illuminated, and to address a range of topics about the best type of lighting at night for driver and traffic safety, including the following:

- The environmental impact of on-premise sign lighting
- The best type of sign lighting for driver detection and legibility
- Any effects of real-world environments on detection and legibility results
- The best lighting levels, or brightness, for driver detection and legibility at night
- The best type of sign construction

Testing has shown that on-premise signs are easier for drivers to see (detection) and read (legibility) during the day. Because drivers can see and read signs best during the daytime, sign illumination at night should attempt to reach daytime benchmarks to maximize traffic safety. The functions of on-premise signs are no less critical at night, and their functional value may be even more important for the safety and cognitive abilities of older drivers, whose visual acuity has been shown to deteriorate markedly at night.

On-premise sign lighting standards also reflect the informational transfer and communication aspects that are unique to the on-premise sign medium, as these signs provide a principal means of roadside communication and situational awareness for drivers, in both form and function. It is this place-based orientation that gives on-premise signs their unique character, but which also acts to limit their communicative ability to the relatively short span of time during which they can be seen by any given driver.

Types of Sign Illumination and Sign Construction

On-premise signs can be illuminated at night using a variety of lighting techniques. There are two principal methods for providing sign lighting: *internal illumination* and *external illumination*. An internally illuminated on-premise sign has its lighting element or lighting source contained inside the sign cabinet, letter module, or sign body. Typical lighting elements used for internal illumination include fluorescent lighting, neon tubing, and light-emitting diodes (LEDs).

An externally illuminated on-premise sign has its lighting element or source installed outside the sign and directed toward the sign face, letters, or sign message. Typical external lighting sources include fluorescent lighting, spotlights, floodlights, and gooseneck lamps.

A third method of sign lighting is used less frequently, but it has the longest history. Exposed lighting elements provide unique character to many on-premise signs, and these applications include exposed neon tubing on signs and letters and incandescent or LED-based exposed lamp bulbs on theaters and event signage.

National electrical and fire safety standards exist regarding the fabrication and installation of internally illuminated signs (see the National Electric Code and testing agencies, such as Underwriters Laboratories). By contrast, there are few if any rules for the installation of lighting for externally illuminated on-premise signs, the appropriate placement of external lighting fixtures, and the type of lighting required. Additional information on sign lighting can be found in *On-Premise Sign Lighting: Terms, Definitions, Measurement* (2010).

Measuring Sign Brightness: Luminance and Illuminance

There are two accepted ways to consider and measure the light produced by an object or sign. The first is to measure the brightness, or luminance, of the sign at its face. Luminance is a measure of light output at the source; it is a constant and does not vary with ambient light conditions. Illuminance is a

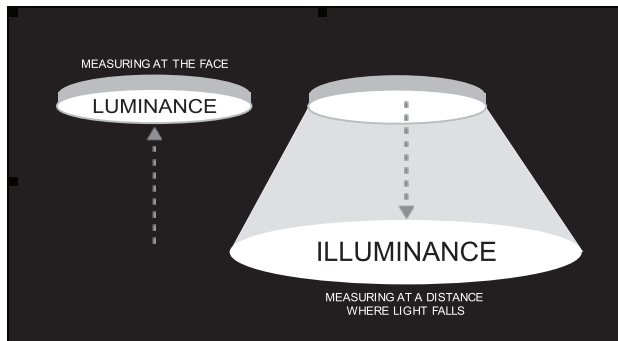


Figure 4.13. Luminance and illuminance

second metric that can be applied to sign lighting. This refers to a projection of light from a sign into surrounding space, such as light cast by a sign onto the property line or ground surface (Figure 4.13). Illuminance diminishes rapidly with distance from a sign, and this reduction in light is measurable at any point from the sign at a rate equal to the square of the distance from the sign.

These basic lighting concepts can be sometimes hard to understand because of two sets of photometric measures: (1) the International System of Units (SI), also known as the metric system, and (2) the English system of units. The dual systems can cause confusion, which is significant, because the systems are not aligned in terms of terminology and measurement equations, although values can be converted from one system to the other using formulas.

For luminance, the SI (metric) unit is candelas per square meter (cd/m^2), and the English unit is foot-lamberts or candelas per square foot (cd/ft^2). One foot-lambert is equal to $3.43 \text{ cd}/\text{m}^2$. Candelas per square meter is often referred to as a nit, which is neither an SI (metric) nor an English term, but it is used frequently to describe sign luminance and to measure sign brightness. For illuminance, the SI (metric) unit is lux (lx) and the English unit is foot-candles. One foot-candle is equal to 10 lux. Table 4.8 provides conversion factors from one system to the other.

The USSC standard for the measurement of on-premise sign illumination is luminance based on the needs of the driver and traffic safety. The standard luminance value for on-premise signs at night has been found to provide optimum legibility and reading sight distances for drivers without any significant impact on environmental light trespass or sky glow. Luminance can further be objectively controlled and measured during the sign design and fabrication processes, and after installation in the field to ensure adherence to the lu-

minance requirements of the standard. The standard does not restrict sign luminance during daylight operation. Electronic signs and other dynamic message signs have LED-powered display surfaces requiring daylight illumination of sufficient luminance to maintain legibility under bright ambient light. These signs may require adjustments to their lighting output during the day in addition to lighting adjustments at night.

Illuminance has only an indirect relevance to on-premise signs. The illuminance of a sign does not relate to the issue of adequate sign brightness for driver detection and legibility. It is a variable lighting measurement dependent on distance from the sign itself. In addition, on-premise signs are not designed to cast light on other objects or spaces or to provide task lighting. Therefore, their illuminance only becomes relevant in terms of the relationship to an environmental concept called “light trespass,” or light falling where it is not wanted or intended. Because research has shown that internally illuminated signs have low initial light levels that fall off rapidly with distance, internally illuminated on-premise signs have virtually no significant light trespass implications. Light trespass is most likely to occur where there is a problem with badly aimed external sign illumination. Communities, in addition to other provisions, may address the issue of light trespass by requiring that the illuminance of signs be restricted to a specific level at property lines when immediately adjacent to residential properties.

Sign Lighting Levels, Environmental Issues, and Energy Conservation

Researchers have investigated the potential consequences of sign lighting. No agreed-upon objective methods exist for measuring “sky glow”—sky brightness caused by artificial light reflecting off the atmosphere—and researchers also do not agree on acceptable levels of sky glow. Moreover, there is not at this time a metric to measure sky glow from a single light source, like a sign, nor any objective standard or measurement technique to establish the effect of on-premise identification sign lighting on sky glow.

In regard to light trespass, researchers found that it is a concept related to sign illuminance and not related to the needs of the driver or traffic safety. In addition, the illuminance of all sign lighting designs measured had a mean vertical illuminance below 3.0 lux (.3 footcandles) at a reasonable distance from the signs—a light level which is not associated with light trespass.

Initiatives involving energy savings achieved through the reduction of sign luminance from optimum levels are not

TABLE 4.8. SI (METRIC) AND ENGLISH CONVERSIONS

	English	Conversion to SI (metric)	SI (metric)
Luminance	foot-lambert (fL or ft-L)	x 3.43	cd/m ²
Illuminance	foot-candle (fc)	x 10	lux (lx)
	SI (metric)	Conversion to English	English
Luminance	cd/m ²	x 0.29	fL or ft-L
Illuminance	lux (lx)	x 0.1	fc

appropriate to sign lighting standards because such reductions may compromise traffic safety. Unlike outdoor lighting in a nighttime landscape, on-premise signs are specifically designed to provide vital wayfinding and information to drivers, and so they must be permitted to maintain illumination levels consistent with optimum legibility and viewer reaction time parameters. Therefore, minimum luminance value for standard sign illumination is structured to comply with these parameters.

Communities historically have had concerns about on-premise sign lighting on properties that are adjacent to residential areas. The USSC sign illumination guideline standards provide a baseline for setting brightness levels for all on-premise signs; adjustments for local circumstances may be made by individual local jurisdictions accordingly.

Best Sign Lighting Method for the Driver

Extensive sign illumination research, conducted under both test and real-world conditions, has shown a marked difference in sign detection and sign legibility between internally illuminated signs and externally illuminated signs.

Legibility

Research has shown that internally illuminated signs have a 70 percent legibility advantage over external sign lighting. Since sign lighting and traffic safety are inextricably intertwined, the use of internally illuminated signs should not be prohibited or curtailed in any zone or district where vehicular traffic is present.

Distance

Research has shown conclusively that viewers can read internally illuminated on-premise signs from a much greater distance than externally illuminated signs. This was first

demonstrated in test research, where reading distances were 40 to 60 percent greater for internally illuminated signs than for externally illuminated signs. In subsequent real-world studies comparing internal and external illumination, the results confirmed that when externally illuminated signs are switched to identical signs using internal illumination, drivers on average read the internally illuminated signs more rapidly and at a greater viewing distance.

Time

In any driving environment where posted speeds are at 25 miles per hour or higher, the time drivers require to process the information that on-premise signs provide is critical and has significant traffic safety implications. In a majority of cases, externally illuminated signs do not allow drivers adequate time to detect and read the signs and execute driving maneuvers. Internally illuminated signs give drivers, on average, an additional two seconds to read the signs and execute driving maneuvers. An alternative way to express this difference is to say an externally illuminated sign must be 40 percent larger than an internally illuminated sign to achieve the same legibility factor, or the speed of traffic must be reduced by 40 percent.

On-Premise Sign Illumination Guideline Standard

The USSC has established a Sign Illumination Guideline Standard for on-premise signs at night based on the results of completed research. This standard ensures that sign lighting meets the needs of drivers in terms of on-premise sign detection and legibility. The USSC standard is based on the luminance of a sign and the measurement of the brightness of a sign at its face. The *Model On-Premise Sign Code* (Bertucci and Crawford 2011, 48) specifies maximum luminance levels for optimum sign detection and legibility:

All illuminated signs comply with the maximum luminance level of seven hundred fifty (750) cd/m^2 or nits at least one-half hour before Apparent Sunset, as determined by the National Oceanic and Atmospheric Administration (NOAA), U.S. Department of Commerce, for the specific geographic location and date. All illuminated signs must comply with this maximum luminance level throughout the night, if the sign is energized, until Apparent Sunrise, as determined by the NOAA, at which time the sign may resume luminance levels appropriate for daylight conditions, when required or appropriate.

This guideline standard does not dictate that all signs should meet a certain luminance level at all times; rather, it sets the highest level for signs, which on-premise sign brightness should not exceed. Because signs with luminance values greater than the standard do not perform better in sign legibility testing, increasing sign brightness beyond the standard does not yield better sign legibility. The vast majority of on-premise signs, using different color combinations and designs, will have luminance values far below the maximum standard for brightness at night.

Because the illuminance measurements of any particular sign will vary based on distance from the sign, drivers are generally traveling continuously along a roadway as they view the sign at changing distances, and on-premise sign viewing distances for best legibility are different for each sign based on a multitude of factors, use of an illuminance standard for on-premise sign brightness does not offer a uniform and easy-to-apply guideline, and is almost impossible to test for from a detection and legibility standpoint for all on-premise signs.