

# **DRAFT REPORT**

## **COST- JUSTIFIED WATER AND SEWER SYSTEM DEVELOPMENT FEES REPORT**

**CITY OF BESSEMER CITY**

**GASTON COUNTY, NC**

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## EXECUTIVE SUMMARY and PURPOSE STATEMENT

### Executive Summary:

The North Carolina General Assembly passed House Bill 436 (HB 436) in July 2017 amending Chapter 162A of the General Statutes by adding “Article 8, System Development Fees.” This amendment was enacted as “An Act to Provide for Uniform Authority to Implement System Development Fees for Public Water and Sewer Systems in North Carolina and to Clarify the Applicable Statute of Limitations” which requires compliance with designated calculation methodology.

In response to the HB 436, the City of Bessemer City has retained McGill Associates (McGill) to complete a system development fee analysis. The City of Bessemer City’s development fee is dependent on a combination of existing system capacity and planned capital improvements to expand capacity. The development fee, in accordance with HB 436 rules for an Equivalent Residential Unit (ERU) for water and sewer, was calculated to be \$4,211. ERU is defined as the water and sewer capacities required to serve the most typical user type, which is a three-bedroom single-family dwelling.

The fee for other types of development can be calculated by applying the cost of capacity per gallon of flow per day to the water demands for various uses as defined by NC Administrative Code 15A NCAC 18C .0409 and 15A NCAC 02T .0114 using the following table:

**Table 0.0.1 – System Development Fee Calculation: Cost per Gallon per Day (\$/GPD)**

Bessemer City System Development Fees: Cost per Gallon per Day Calculation		Cost of Capacity \$/ GPD
Item	Cost-Justified System Development Fee Calculation	
1	Water System	\$ 7.90
2	Sewer System	\$ 2.92

## **Purpose Statement:**

This report documents the results of the approach, methodology and calculations for establishing system development fees in accordance with North Carolina General Statute 162A, Article 8 “System Development Fees”. Through HB 436, the General Assembly of North Carolina established a uniform approach and associated methodology required for local governmental units to calculate and implement System Development Fees (SDF) for public water and sewer systems. The SDF must be determined by a qualified engineer or financial professional using industry standard practices. A copy of HB 436 is included in the Appendix.

The existing fees that were collected beginning October 1<sup>st</sup>, 2017 for the purpose of offsetting capital costs of facilities that serve new development (typically defined as impact fees, capital recovery fees, capacity charges, etc.) are required to be conformed to HB 436 no later than July 1, 2018 in order to become valid. Fees that remain non-conforming after July 1, 2018 are considered invalid and revenues collected are at risk to be refunded.

The City of Bessemer City retained McGill to review and make recommendations for revisions as necessary to conform water and sewer system SDFs with HB 436. The approach, methodology and calculations are based on American Water Works Association (AWWA) Manual of Water Supply Practices – M1, Principles of Water Rates, Fees, and Charges, Seventh Edition.

McGill is qualified in engineering disciplines and financial analysis and has the expertise and experience to determine system development fees. The firm has a long history of working with cities, towns, counties, and special districts to provide professional advice on the development of fees, water and sewer master plans, capital improvement programs and asset management plans.

Bessemer City has made significant investments in its water and sewer system capital assets that provide capacity that is, and will be, available for new development. The City also desires to use System Development Fees to recover a portion of the costs associated with providing capacity.

The overall result of this effort will be establishing the maximum cost-justified System Development Fees allowable under HB 436. Bessemer City may elect to implement fees of lesser value; however, any adjustment must be calculated on a cost per unit volume basis.

This report does not constitute a recommendation of any SDF amount. The City Council has full authority to charge any amount, up to the maximum, provided it is applied to the relative demands of new development proportionally.

System Development Fees are defined as a charge imposed on each new customer or development that generally offsets the incremental cost of replacing existing and/or constructing new capital assets to provide capacity that will continue to meet the demands placed on the system by each new customer or development. Since water system capacity must, without exception, exceed customer demands, the major infrastructure components providing this capacity, such as water treatment plants, reservoirs, wells, pump stations, etc., must be planned and constructed well in advance and in large enough increments to keep pace with anticipated demand on the available system capacity.

AWWA methodology cites legal consideration for determining SDF. A Rational Nexus, or reasonable relationship, must be established between the fee charged and the cost associated with providing capacity to new customers. The Rational Nexus Test consists of three elements: 1) a review of available planning documents to verify general alignment between capacity demands driven by projected development patterns and planned capital improvements that will be needed to provide the required capacity; 2) a determination of the proportionate share of costs to be borne by new development through appropriate methodology and calculation and 3) establishing a reasonable apportionment of the cost to new development in relation to the benefits the new development will reasonably receive through appropriate methodology and calculations.

The first element of the Rational Nexus Test was determined to be favorable based on a review of the City's projected population, available water and sewer capacities, and capital improvements plan.

NC State Demographer reports the 2010 population at 5,340, and 2018 population at 5,508. These data points translate into a growth rate of approximately 0.4% per year. Population growth projections are typically viewed as a general indication of future water and sewer system demands; however, changes in customer base (types of users) may shift future system demands above or below the rate of population growth. With no anticipated changes in customer use patterns, a 1% annual increase in water and sewer system demand is a reasonable and conservative projection. Based on the projected system demands through 2040, there is no need to include capacity-related projects in the Capital Improvements plan.

Corresponding projections for water and sewer system demand and available capacities are presented in Table 1.0.2.

**Table 1.0.2 – Bessemer City System Capacity Availability Projection (MGD)**

Bessemer City System Capacity Availability Projection (MGD)				
Item	Existing Water and Sewer System Infrastructure	Year 2018	Year 2030	Year 2040
W1	Water Capacity	3.000	3.000	3.000
W2	Water Demand	1.103	1.231	1.359
	Available Water Capacity	1.897	1.769	1.641
S1	Sewer Capacity	1.000	1.000	1.000
S2	Sewer Flow	0.388	0.433	0.478
	Available Sewer Capacity	0.612	0.567	0.522

The City’s Capital Improvements Plan includes a number of replacements due to age and serviceability, and therefore does not include assets that are capacity-related. The current facilities will allow water and sewer capacity to keep pace with demands over the long-term.

Planned capacity-related capital projects are therefore in general alignment with projected capacity needs which demonstrates a rational nexus between the projection of development-driven demands and planned capacity-related capital projects that will address these demand projections.

The remaining elements of the Rational Nexus Test are 2) determining proportionate share of costs to be borne by new development and 3) establishing a reasonable cost to new development in relation to the benefits received by the new development. These elements will be determined through appropriate methodology and calculations in the following sections.

Three methods for calculating SDF meet the definition of HB 436 and will satisfy the Rational Nexus Test:

### **Buy-In Method**

The Buy-In Method is used where existing system capacity is available to provide service to new development. New customers essentially “buy” their proportionate share of system capacity from the current customer base (“system owners”) at the current cost or value of the existing facilities. HB 436 requires appropriate adjustments to be made to the replacement cost such as “debt credits, grants, and other generally accepted valuation adjustments.”

### **Incremental Cost Method**

The Incremental Cost (or Marginal Cost) Method is used to assign new development the incremental cost of capital assets required for preserving and/or providing additional system capacity. This method should include supporting details that identify construction costs, scheduling, financing, funding source(s), etc., tied to a capital improvements plan (CIP), utilities master plan, and/or other approved planning document(s) that cover a planning horizon of 10 to 20 years. HB 436 requires a revenue credit to be applied “against the projected aggregate cost of water or sewer capital improvements.”

### **Combined Method**

The Combined Approach is a combination of the Buy-In and Incremental Cost Methods. It is used where existing assets provide some system capacity to accommodate new development and applicable capital plan(s) also identify significant capital investment proposed to add infrastructure required to address future growth and capacity needs.

### 3.0

## CALCULATION of SYSTEM DEVELOPMENT FEES

The *Buy-In Method* is the appropriate approach to calculating Bessemer City’s system development fees. Based on future capacity needs projected from historical increases in population, existing system capacity is available to meet the immediate needs for new customers and is adequate to provide service to new development throughout the 20-year planning period. Therefore, the buy-in method will be used to calculate System Development Fees.

### 3.1 Existing System Capacity Availability

Water and sewer system design capacities are determined using average day demands and incorporate appropriate peaking factors and wet weather flows that will adequately address maximum flow conditions that occur during high water use and inflow/infiltration conditions. The water and sewer systems have current available capacities as follows:

**Table 3.1.1– Bessemer City Water and Sewer Systems Available Capacity**

Bessemer City Water and Sewer System Available Capacity				
Item	System Capacity - Million Gallons Per Day (MGD)	Design Capacity	Average Day	Available Capacity
1	Water System	3.000	1.103	1.897
2	Sewer System	1.000	0.388	0.612
Source: North Carolina DWR Local Water Supply Plan 2018				

### 3.2 Buy-In Calculation

**After demonstrating that capacity is available, the value per gallon is calculated to determine the cost per gallon that will be applied to reimburse existing customers for constructing and maintaining available capacity in advance.**

The preferred AWWA valuation approach is “replacement cost new less depreciation” (RCNLD). This approach is based on the premise that System Development Fees reflect the value of providing any given amount of new capacity at the cost of constructing the assets at the time the new customer is connected. This fairly compensates existing customers for carrying the costs of constructing and maintaining capacity built into the system in advance of when the new customers connect.

Replacement cost in the RCNLD calculation used the RS Means Historical Cost Index. RS Means has been publishing a construction cost index for over 70 years, collecting data from all facets of



the industry to accurately track costs directly related to building and construction. This allows the present value (replacement cost new) of capital construction projects to be calculated on data provided by a very reliable, long-time industry leader. Depreciation assigned by the City's fixed asset inventory uses the straight-line method, typically based on 10 to 50-year assignments of useful life for major capital assets, to represent a general decline in value over time.

Replacement Cost New (RCN) is therefore determined by applying the RS Means index to the original cost then deducting the accumulated depreciation to reach RCNLD.

Assets included in the buy-in valuation are those that provide the available capacity of the system, are "owned" by the ratepayers, and therefore provide a benefit to all customers. Typically, these assets are water supply, treatment, pump stations, storage, transmission and distribution mains, wastewater treatment, lift stations and collection systems.

Assets contributed by or paid for by others, including grants, loan principal forgiveness and capital assets contributed by developers are deducted from the calculation since these costs were not "paid" by the existing customers. Non-capacity related assets such as vehicles, computers and software are also excluded from the calculation.

**Table 3.2.1– Water System Cost per GPD of Existing Utility Assets Providing Available Capacity**

Bessemer City System Development Fee Buy-In Valuation				
Item	System Asset Description	RCNLD	Excluded	Amount Eligible
Water System Assets				
W1	Land	\$ 618,427	\$ -	\$ 618,427
W2	Water System Infrastructure	\$ 24,782,236	\$ 52,935	\$ 24,729,301
W3	Vehicles and Equipment	\$ 163,743	\$ 163,743	\$ -
Subtotal - Water System Assets		\$ 25,564,406	\$ 216,678	\$ 25,347,728
Less Revenue Credit: Outstanding Debt Principal				\$ (1,636,289)
Equals: Net Water System Value				\$ 23,711,439
Divide by: Water System Capacity (MGD)				3.000
Equals: Unit Valuation of Water System (\$/MGD)				\$ 7,903,813
Divide by: 1,000,000 gallons (\$/GPD)				\$ 7.90

**Table 3.2.2– Sewer System Cost per GPD of Existing Utility Assets Providing Available Capacity**

Bessemer City System Development Fee Buy-In Valuation				
Item	System Asset Description	RCNLD	Excluded	Amount Eligible
	Sewer System Assets			
W1	Land	\$ 329,896	\$ -	\$ 329,896
W2	Sewer System Infrastructure	\$ 9,015,692	\$ 782,500	\$ 8,233,192
W3	Vehicles and Equipment	\$ 179,780	\$ 179,780	\$ -
	Subtotal - Sewer System Assets	\$ 9,525,368	\$ 962,280	\$ 8,563,088
	Less Revenue Credit: Outstanding Debt Principal			\$ (1,269,779)
	Equals: Net Sewer System Value			\$ 7,293,310
	Divide by: Sewer System Capacity (MGD)			2.500
	Equals: Unit Valuation of Sewer System (\$/MGD)			\$ 2,917,324
	Divide by: 1,000,000 gallons (\$/GPD)			\$ 2.92

### 3.3 Valuation Adjustments

The above system valuations include applicable credit adjustments for revenues anticipated from user charges, donated infrastructure, grants and funding from other (non-rate payer) sources.

HB 436 requires revenue credits to be applied to existing debt that was issued to construct water and sewer system assets that provide capacity for potential customers and are repaid by retail rates and charges. To ensure that repayment for this debt is not collected twice from new customers; once through the SDF and again through retail rates and charges, the remaining outstanding debt principal amount is required to be applied as a credit against the projected aggregate cost of the capital improvements in the SDF calculation. Contributed capital provided by new development in excess of the development’s proportionate share of connecting facilities, shall also be credited. Contributed capital is identified as part of fixed asset review and included in the summary of assets excluded in the buy-in valuation calculation.

### 3.4 Cost per Unit Volume

Dollar valued that can be applied uniformly to all potential customer.

This measure becomes the starting point for determining the maximum cost-justified system development fee. Fees for different types of customers are based on this cost of capacity multiplied by the amount of capacity needed to serve each type or class of customer.

## 4.0 SERVICE UNIT CALCULATIONS: EQUIVALENT RESIDENTIAL UNITS

HB 436 requires SDF calculations to be applied to various categories of customer demands based on service units or ERU's. An ERU is defined as the water and sewer capacities required to serve the most typical user type which is a three-bedroom single-family dwelling. North Carolina Division of Water Resources (DWR) design standards for constructing water and sewer systems, NC Administrative Code 15A NCAC 18C .0409 and 15A NCAC 02T .0114 respectively, establish daily flow requirements based the type of service connection. An ERU can therefore be defined as 360 gallons per day for water and 360 gallons per day for sewer.

**Table 4.0.1– System Development Fees: Equivalent Residential Unit, Water and Sewer**

Bessemer City System Development Fees: Equivalent Residential Unit Calculation				
Item	Cost-Justified System Development Fee Calculation	Cost of Capacity \$ / GPD	Customer Demand GPD	Cost per Unit Capacity
1	Water System	\$ 7.90	400	\$ 3,160
2	Sewer System	\$ 2.92	360	\$ 1,051
	Total ERU			\$ 4,211

## **5.0 APPLICATION of SYSTEM DEVELOPMENT FEES and SERVICE UNIT EQUIVALENCY**

NC Administrative Code 15A NCAC 18C .0409 and 15A NCAC 02T .0114, included in the Appendix, further define other service connection types and the associated water system demands and sewer system flows on a per gallon per day basis. Therefore, these tables serve as an equivalency or conversion for use in determining applicable SDF for various categories of demand.

The following are examples of the maximum water and sewer System Development Fees that would apply for new development that is likely to occur in Bessemer City over the next 5 years. These are only examples and are not intended to be applied to any specific or potential development. Details of the calculations are included in the Appendix.

Development Type	Total System Development Fee
Residential Dwelling Unit – 2 bedrooms	\$ 3,861.00
Residential Dwelling Unit – 3 bedrooms	\$ 4,211.00
Residential Dwelling Unit – 4 bedrooms	\$ 5,573.00
Church without Kitchen, Day Care or Camp	\$ 4,869.00
General Business and Office – 20 employees	\$ 5,410.00
Restaurant, Full Service – 60 seats	\$25,968.00
Convenience Store, with food preparation – 2,500 SF	\$16,230.00
Stores and Shopping Center without food service – 25,000 SF	\$27,050.00

McGill has calculated costs for water and sewer system capacity on a per gallon per day basis for the City of Bessemer City. This calculation was performed using the Buy-in Method to account for the City's long-term availability of existing capacity. This calculation resulted in a development fee ceiling of \$4,211 for an ERU. An ERU is defined as the water and sewer capacities required to serve the most typical user type which is a three-bedroom single-family dwelling. The fee for other types of development can be calculated by applying the calculated cost of capacity per gallon of flow per day to the service demands for various uses as defined by NC Administrative Code 15A NCAC 18C .0409 and 15A NCAC 02T .0114.

Using NC Administrative Code 15A NCAC 18C .0409 and 15A NCAC 02T .0114 ensures that the same standard used to plan, design, construct and finance capital assets is applied as the same cost recovery basis to be applied to new development.

#### **Appendix**

House Bill 436

NC Administrative Code 15A NCAC 18C .0409

NC Administrative Code 15A NCAC 02T .0114

North Carolina Office of State Budget and Management 2018 Municipal Population Estimates

System Development Fee Usage Calculator: Example Calculations for New Development

RS Means Historical Cost Index

**APPENDIX**

DRAFT

GENERAL ASSEMBLY OF NORTH CAROLINA  
SESSION 2017

SESSION LAW 2017-138  
HOUSE BILL 436

AN ACT TO PROVIDE FOR UNIFORM AUTHORITY TO IMPLEMENT SYSTEM DEVELOPMENT FEES FOR PUBLIC WATER AND SEWER SYSTEMS IN NORTH CAROLINA AND TO CLARIFY THE APPLICABLE STATUTE OF LIMITATIONS.

The General Assembly of North Carolina enacts:

**SECTION 1.** Chapter 162A of the General Statutes is amended by adding a new Article to read:

"Article 8.

"System Development Fees.

**"§ 162A-200. Short title.**

This Article shall be known and may be cited as the "Public Water and Sewer System Development Fee Act."

**"§ 162A-201. Definitions.**

The following definitions apply in this Article:

- (1) Capital improvement. – A planned facility or expansion of capacity of an existing facility other than a capital rehabilitation project necessitated by and attributable to new development.
- (2) Capital rehabilitation project. – Any repair, maintenance, modernization, upgrade, update, replacement, or correction of deficiencies of a facility, including any expansion or other undertaking to increase the preexisting level of service for existing development.
- (3) Existing development. – Land subdivisions, structures, and land uses in existence at the start of the written analysis process required by G.S. 162A-205, no more than one year prior to the adoption of a system development fee.
- (4) Facility. – A water supply, treatment, storage, or distribution facility, or a wastewater collection, treatment, or disposal facility, including for reuse or reclamation of water, owned or operated, or to be owned or operated, by a local governmental unit and land associated with such facility.
- (5) Local governmental unit. – Any political subdivision of the State that owns or operates a facility, including those owned or operated pursuant to local act of the General Assembly or pursuant to Part 2 of Article 2 of Chapter 130A, Article 15 of Chapter 153A, Article 16 of Chapter 160A, or Articles 1, 4, 5, 5A, or 6 of Chapter 162A of the General Statutes.
- (6) New development. – Any of the following occurring after the date a local government begins the written analysis process required by G.S. 162A-205, no more than one year prior to the adoption of a system development fee, which increases the capacity necessary to serve that development:
  - a. The subdivision of land.





- b. The construction, reconstruction, redevelopment, conversion, structural alteration, relocation, or enlargement of any structure which increases the number of service units.
  - c. Any use or extension of the use of land which increases the number of service units.
- (7) Service. – Water or sewer service, or water and sewer service, provided by a local governmental unit.
- (8) Service unit. – A unit of measure, typically an equivalent residential unit, calculated in accordance with generally accepted engineering or planning standards.
- (9) System development fee. – A charge or assessment for service imposed with respect to new development to fund costs of capital improvements necessitated by and attributable to such new development, to recoup costs of existing facilities which serve such new development, or a combination of those costs, as provided in this Article. The term includes amortized charges, lump-sum charges, and any other fee that functions as described by this definition regardless of terminology. The term does not include any of the following:
- a. A charge or fee to pay the administrative, plan review, or inspection costs associated with permits required for development.
  - b. Tap or hookup charges for the purpose of reimbursing the local governmental unit for the actual cost of connecting the service unit to the system.
  - c. Availability charges.
  - d. Dedication of capital improvements on-site, adjacent, or ancillary to a development absent a written agreement providing for credit or reimbursement to the developer pursuant to G.S. 153A-280, 153A-451, 160A-320, 160A-499 or Part 3A of Article 18, Chapter 153A or Part 3D of Article 19, Chapter 160A of the General Statutes.
  - e. Reimbursement to the local governmental unit for its expenses in constructing or providing for water or sewer utility capital improvements adjacent or ancillary to the development if the owner or developer has agreed to be financially responsible for such expenses; however, such reimbursement shall be credited to any system development fee charged as set forth in G.S. 162A-207(c).
- (10) System development fee analysis. – An analysis meeting the requirements of G.S. 162A-205.

**"§ 162A-202. Reserved.**

**"§ 162A-203. Authorization of system development fee.**

(a) A local governmental unit may adopt a system development fee for water or sewer service only in accordance with the conditions and limitations of this Article.

(b) A system development fee adopted by a local governmental unit under any lawful authority other than this Article and in effect on October 1, 2017, shall be conformed to the requirements of this Article not later than July 1, 2018.

**"§ 162A-204. Reserved.**

**"§ 162A-205. Supporting analysis.**

A system development fee shall be calculated based on a written analysis, which may constitute or be included in a capital improvements plan, that:



- (1) Is prepared by a financial professional or a licensed professional engineer qualified by experience and training or education to employ generally accepted accounting, engineering, and planning methodologies to calculate system development fees for public water and sewer systems.
- (2) Documents in reasonable detail the facts and data used in the analysis and their sufficiency and reliability.
- (3) Employs generally accepted accounting, engineering, and planning methodologies, including the buy-in, incremental cost or marginal cost, and combined cost methods for each service, setting forth appropriate analysis as to the consideration and selection of a method appropriate to the circumstances and adapted as necessary to satisfy all requirements of this Article.
- (4) Documents and demonstrates the reliable application of the methodologies to the facts and data, including all reasoning, analysis, and interim calculations underlying each identifiable component of the system development fee and the aggregate thereof.
- (5) Identifies all assumptions and limiting conditions affecting the analysis and demonstrates that they do not materially undermine the reliability of conclusions reached.
- (6) Calculates a final system development fee per service unit of new development and includes an equivalency or conversion table for use in determining the fees applicable for various categories of demand.
- (7) Covers a planning horizon of not less than 10 years nor more than 20 years.
- (8) Is adopted by resolution or ordinance of the local governmental unit in accordance with G.S. 162A-209.

**"§ 162A-206. Reserved.**

**"§ 162A-207. Minimum requirements.**

(a) Maximum. – A system development fee shall not exceed that calculated based on the system development fee analysis.

(b) Revenue Credit. – In applying the incremental cost or marginal cost, or the combined cost, method to calculate a system development fee with respect to water or sewer capital improvements, the system development fee analysis must include as part of that methodology a credit against the projected aggregate cost of water or sewer capital improvements. That credit shall be determined based upon generally accepted calculations and shall reflect a deduction of either the outstanding debt principal or the present value of projected water and sewer revenues received by the local governmental unit for the capital improvements necessitated by and attributable to such new development, anticipated over the course of the planning horizon. In no case shall the credit be less than twenty-five percent (25%) of the aggregate cost of capital improvements.

(c) Construction or Contributions Credit. – In calculating the system development fee with respect to new development, the local governmental unit shall credit the value of costs in excess of the development's proportionate share of connecting facilities required to be oversized for use of others outside of the development. No credit shall be applied, however, for water or sewer capital improvements on-site or to connect new development to water or sewer facilities.

**"§ 162A-208. Reserved.**

**"§ 162A-209. Adoption and periodic review.**

(a) For not less than 45 days prior to considering the adoption of a system development fee analysis, the local governmental unit shall post the analysis on its Web site and solicit and furnish a means to submit written comments, which shall be considered by the preparer of the analysis for possible modifications or revisions.



(b) After expiration of the period for posting, the governing body of the local governmental unit shall conduct a public hearing prior to considering adoption of the analysis with any modifications or revisions.

(c) The local governmental unit shall publish the system development fee in its annual budget or rate plan or ordinance. The local governmental unit shall update the system development fee analysis at least every five years.

**"§ 162A-210. Reserved.**

**"§ 162A-211. Use and administration of revenue.**

(a) Revenue from system development fees calculated using the incremental cost method or marginal cost method, exclusively or as part of the combined cost method, shall be expended only to pay:

- (1) Costs of constructing capital improvements including, and limited to, any of the following:
  - a. Construction contract prices.
  - b. Surveying and engineering fees.
  - c. Land acquisition cost.
  - d. Principal and interest on bonds, notes, or other obligations issued by or on behalf of the local governmental unit to finance any costs for an item listed in sub-subdivisions a. through c. of this subdivision.
- (2) Professional fees incurred by the local governmental unit for preparation of the system development fee analysis.
- (3) If no capital improvements are planned for construction within five years or the foregoing costs are otherwise paid or provided for, then principal and interest on bonds, notes, or other obligations issued by or on behalf of a local governmental unit to finance the construction or acquisition of existing capital improvements.

(b) Revenue from system development fees calculated using the buy-in method may be expended for previously completed capital improvements for which capacity exists and for capital rehabilitation projects. The basis for the buy-in calculation for previously completed capital improvements shall be determined by using a generally accepted method of valuing the actual or replacement costs of the capital improvement for which the buy-in fee is being collected less depreciation, debt credits, grants, and other generally accepted valuation adjustments.

(c) A local governmental unit may pledge a system development fee as security for the payment of debt service on a bond, note, or other obligation subject to compliance with the foregoing limitations.

(d) System development fee revenues shall be accounted for by means of a capital reserve fund established pursuant to Part 2 of Article 3 of Chapter 159 of the General Statutes and limited as to expenditure of funds in accordance with this section.

**"§ 162A-212. Reserved.**

**"§ 162A-213. Time for collection of system development fees.**

For new development involving the subdivision of land, the system development fee shall be collected by a local governmental unit either at the time of plat recordation or when water or sewer service for the subdivision or other development is committed by the local governmental unit. For all other new development, the local governmental unit shall collect the system development fee at the time of application for connection of the individual unit of development to the service or facilities.

**"§ 162A-214. Reserved.**

**"§ 162A-215. Narrow construction.**

Notwithstanding G.S. 153A-4 and G.S. 160A-4, in any judicial action interpreting this Article, all powers conferred by this Article shall be narrowly construed to ensure that system development fees do not unduly burden new development."

**SECTION 2.** G.S. 130A-64 reads as rewritten:

**"§ 130A-64. Service charges and rates.**

(a) A sanitary district board shall apply service charges and rates based upon the exact benefits derived. These service charges and rates shall be sufficient to provide funds for the maintenance, adequate depreciation and operation of the work of the district. If reasonable, the service charges and rates may include an amount sufficient to pay the principal and interest maturing on the outstanding bonds and, to the extent not otherwise provided for, bond anticipation notes of the district. Any surplus from operating revenues shall be set aside as a separate fund to be applied to the payment of interest on or to the retirement of bonds or bond anticipation notes. The sanitary district board may modify and adjust these service charges and rates.

(b) The district board may require system development fees only in accordance with Article 8 of Chapter 162A of the General Statutes."

**SECTION 3.** G.S. 153A-277 reads as rewritten:

**"§ 153A-277. Authority to fix and enforce rates.**

(a) A county may establish and revise from time to time schedules of rents, rates, fees, charges, and penalties for the use of or the services furnished or to be furnished by a public enterprise. Schedules of rents, rates, fees, charges, and penalties may vary for the same class of service in different areas of the county and may vary according to classes of service, and different schedules may be adopted for services provided outside of the county. A county may include a fee relating to subsurface discharge wastewater management systems and services on the property tax bill for the real property where the system for which the fee is imposed is located.

...

(a2) A county may require system development fees only in accordance with Article 8 of Chapter 162A of the General Statutes.

...."

**SECTION 4.(a)** G.S. 160A-314 reads as rewritten:

**"§ 160A-314. Authority to fix and enforce rates.**

(a) A city may establish and revise from time to time schedules of rents, rates, fees, charges, and penalties for the use of or the services furnished or to be furnished by any public enterprise. Schedules of rents, rates, fees, charges, and penalties may vary according to classes of service, and different schedules may be adopted for services provided outside the corporate limits of the city.

...

(e) A city may require system development fees only in accordance with Article 8 of Chapter 162A of the General Statutes."

**SECTION 4.(b)** G.S. 160A-317 is amended by adding a new subsection to read:

"(a4) System Development Fees. – A city may require system development fees only in accordance with Article 8 of Chapter 162A of the General Statutes."

**SECTION 5.(a)** G.S. 162A-6(a) is amended by adding a new subdivision to read:

"(9a) To impose and require system development fees only in accordance with Article 8 of this Chapter."

**SECTION 5.(b)** G.S. 162A-9 is amended by adding a new subsection to read:

"(a5) An authority may require system development fees only in accordance with Article 8 of this Chapter."

**SECTION 6.(a)** G.S. 162A-36(a) is amended by adding a new subdivision to read:



"(8a) To impose and require system development fees only in accordance with Article 8 of this Chapter."

**SECTION 6.(b)** G.S. 162A-49 reads as rewritten:

**"§ 162A-49. Rates and charges for services.**

(a) The district board may fix, and may revise from time to time, rents, rates, fees and other charges for the use of land for the services furnished or to be furnished by any water system or sewerage system or both. Such rents, rates, fees and charges shall not be subject to supervision or regulation by any bureau, board, commission, or other agency of the State or of any political subdivision. Any such rents, rates, fees and charges pledged to the payment of revenue bonds of the district shall be fixed and revised so that the revenues of the water system or sewerage system or both, together with any other available funds, shall be sufficient at all times to pay the cost of maintaining, repairing and operating the water system or the sewerage system or both, the revenues of which are pledged to the payment of such revenue bonds, including reserves for such purposes, and to pay the interest on and the principal of such revenue bonds as the same shall become due and payable and to provide reserves therefor. If any such rents, rates, fees and charges are pledged to the payment of any general obligation bonds issued under this Article, such rents, rates, fees and charges shall be fixed and revised so as to comply with the requirements of such pledge. The district board may provide methods for collection of such rents, rates, fees and charges and measures for enforcement of collection thereof, including penalties and the denial or discontinuance of service.

(b) The district board may require system development fees only in accordance with Article 8 of this Chapter."

**SECTION 7.(a)** G.S. 162A-69 is amended by adding a new subdivision to read:

"(8a) To impose and require system development fees only in accordance with Article 8 of this Chapter."

**SECTION 7.(b)** G.S. 162A-72 reads as rewritten:

**"§ 162A-72. Rates and charges for services.**

(a) The district board may fix, and may revise from time to time, rents, rates, fees and other charges for the use of and for the services furnished or to be furnished by any sewerage system. Such rents, rates, fees and charges shall not be subject to supervision or regulation by any bureau, board, commission, or other agency of the State or of any political subdivision. Any such rents, rates, fees and charges pledged to the payment of revenue bonds of the district shall be fixed and revised so that the revenues of the sewerage system, together with any other available funds, shall be sufficient at all times to pay the cost of maintaining, repairing and operating the sewerage system the revenues of which are pledged to the payment of such revenue bonds, including reserves for such purposes, and to pay the interest on and the principal of such revenue bonds as the same shall become due and payable and to provide reserves therefor. If any such rents, rates, fees and charges are pledged to the payment of any general obligation bonds issued under this Article, such rents, rates, fees and charges shall be fixed and revised so as to comply with the requirements of such pledge. The district board may provide methods for collection of such rents, rates, fees and charges and measures for enforcement of collection thereof, including penalties and the denial or discontinuance of service.

(b) The district board may require system development fees only in accordance with Article 8 of this Chapter."

**SECTION 8.** G.S. 162A-85.13 is amended by adding a new subsection to read:

"(a1) The district board may require system development fees only in accordance with Article 8 of this Chapter."

**SECTION 9.** G.S. 162A-88 reads as rewritten:

**"§ 162A-88. District is a municipal corporation.**

(a) The inhabitants of a county water and sewer district created pursuant to this Article are a body corporate and politic by the name specified by the board of commissioners. Under that name they are vested with all the property and rights of property belonging to the corporation; have perpetual succession; may sue and be sued; may contract and be contracted with; may acquire and hold any property, real and personal, devised, sold, or in any manner conveyed, dedicated to, or otherwise acquired by them, and from time to time may hold, invest, sell, or dispose of the same; may have a common seal and alter and renew it at will; may establish, revise and collect rates, fees or other charges and penalties for the use of or the services furnished or to be furnished by any sanitary sewer system, water system or sanitary sewer and water system of the district; and may exercise those powers conferred on them by this Article.

(b) The district board may require system development fees only in accordance with Article 8 of this Chapter."

**SECTION 10.(a)** G.S. 1-52(15) reads as rewritten:

"(15) For the recovery of taxes paid as provided in ~~G.S. 105-381~~.G.S. 105-381 or for the recovery of an unlawful fee, charge, or exaction collected by a county, municipality, or other unit of local government for water or sewer service or water and sewer service."

**SECTION 10.(b)** This section is to clarify and not alter G.S. 1-52.

**SECTION 11.** Sections 1 through 9 of this act become effective October 1, 2017, and apply to system development fees imposed on or after that date. Section 10 of this act, being a clarifying amendment, has retroactive effect and applies to claims accrued or pending prior to and after the date that section becomes law. Nothing in this act provides retroactive authority for any system development fee, or any similar fee for water or sewer services to be furnished, collected by a local governmental unit prior to October 1, 2017. The remainder of this act is effective when it becomes law and applies to claims accrued or pending prior to and after that date.

In the General Assembly read three times and ratified this the 29<sup>th</sup> day of June, 2017.

s/ Daniel J. Forest  
President of the Senate

s/ Tim Moore  
Speaker of the House of Representatives

s/ Roy Cooper  
Governor

Approved 4:13 p.m. this 20<sup>th</sup> day of July, 2017



**15A NCAC 18C .0409 SERVICE CONNECTIONS**

(a) Local Water Supply Plan. Units of local government which are operating under a local water supply plan in accordance with G.S. 143-355(l) shall not be limited in the number of service connections.

(b) No local water supply plan. A public water system which does not have a local water supply plan as stated in Paragraph (a) shall limit its number of service connections as follows:

- (1) A public water system shall meet the daily flow requirements specified in Table 1:

Table 1: Daily Flow Requirements

Type of Service Connection	Daily Flow for Design
Residential	400 gallon/connection
Mobile Home Parks	250 gallon/connection
Campgrounds and Travel Trailer Parks	100 gallon/space
Marina	10 gallon/boat slip
Marina with bathhouse	30 gallon/boat slip
Rest Homes and Nursing Homes	
with laundry	120 gallon/bed
without laundry	60 gallon/bed
Schools	15 gallon/student
Day Care Facilities	15 gallon/student
Construction, work, or summer camps	60 gallon/person
Business, office, factory (exclusive of industrial use)	
without showers	25 gallon/person/shift
with showers	35 gallon/person/shift
Hospitals	300 gallon/bed

or;

- (2) A public water system serving different types of service connections shall meet the maximum daily demand calculated as follows:
  - (A) Where records of the previous year are available that reflect daily usage, the average of the two highest consecutive days of record of the water treated shall be the value used to determine if there is capacity to serve additional service connections (unusual events such as massive line breaks or line flushings shall not be considered).
  - (B) Where complete daily records of water treated are not available, the public water system shall multiply the daily average use based on the amount of water treated during the previous year of record by the appropriate factor to determine maximum daily demand, as follows:
    - (i) A system serving a population of 10,000 or less shall multiply the daily average use by 2.5; or
    - (ii) A system serving a population greater than 10,000 shall multiply the daily average use by 2.0.

*History Note:* Authority G.S. 130A-315; 103A-317; P.L. 93-523; Eff. July 1, 1994.

**15A NCAC 02T .0114 WASTEWATER DESIGN FLOW RATES**

(a) This Rule shall be used to determine wastewater flow rates for all systems covered by this Subchapter unless alternate criteria are provided by a program specific rule and for flow used for the purposes of 15A NCAC 02H .0105. These are minimum design daily flow rates for normal use and occupancy situations. Higher flow rates may be required where usage and occupancy are atypical, including, those in Paragraph (e) of this Rule. Wastewater flow calculations must take hours of operation and anticipated maximum occupancies/usage into account when calculating peak flows for design.

(b) In determining the volume of sewage from dwelling units, the flow rate shall be 120 gallons per day per bedroom. The minimum volume of sewage from each dwelling unit shall be 240 gallons per day and each additional bedroom above two bedrooms shall increase the volume by 120 gallons per day. Each bedroom or any other room or addition that can reasonably be expected to function as a bedroom shall be considered a bedroom for design purposes. When the occupancy of a dwelling unit exceeds two persons per bedroom, the volume of sewage shall be determined by the maximum occupancy at a rate of 60 gallons per person per day.

(c) The following table shall be used to determine the minimum allowable design daily flow of wastewater facilities. Design flow rates for establishments not identified below shall be determined using available flow data, water-using fixtures, occupancy or operation patterns, and other measured data.

Type of Establishments	Daily Flow For Design
Barber and beauty shops	
Barber Shops	50 gal/chair
Beauty Shops	125 gal/booth or bowl
Businesses, offices and factories	
General business and office facilities	25 gal/employee/shift
Factories, excluding industrial waste	25 gal/employee/shift
Factories or businesses with showers or food preparation	35 gal/employee/shift
Warehouse	100 gal/loading bay
Warehouse – self storage (not including caretaker residence)	1 gal/unit
Churches	
Churches without kitchens, day care or camps	3 gal/seat
Churches with kitchen	5 gal/seat
Churches providing day care or camps	25 gal/person (child & employee)
Fire, rescue and emergency response facilities	
Fire or rescue stations without on site staff	25 gal/person
Fire or rescue stations with on-site staff	50 gal/person/shift
Food and drink facilities	
Banquet, dining hall	30 gal/seat
Bars, cocktail lounges	20 gal/seat
Caterers	50 gal/100 sq ft floor space
Restaurant, full Service	40 gal/seat
Restaurant, single service articles	20 gal/seat
Restaurant, drive-in	50 gal/car space
Restaurant, carry out only	50 gal/100 sq ft floor space
Institutions, dining halls	5 gal/meal
Deli	40 gal/100 sq ft floor space
Bakery	10 gal/100 sq ft floor space
Meat department, butcher shop or fish market	75 gal/100 sq ft floor space
Specialty food stand or kiosk	50 gal/100 sq ft floor space
Hotels and Motels	
Hotels, motels and bed & breakfast facilities, without in-room cooking facilities	120 gal/room
Hotels and motels, with in-room cooking facilities	175 gal/room
Resort hotels	200 gal/room
Cottages, cabins	200 gal/unit
Self service laundry facilities	500 gal/machine
Medical, dental, veterinary facilities	
Medical or dental offices	250 gal/practitioner/shift

Veterinary offices (not including boarding)	250 gal/practitioner/shift
Veterinary hospitals, kennels, animal boarding facilities	20 gal/pen, cage, kennel or stall
Hospitals, medical	300 gal/bed
Hospitals, mental	150 gal/bed
Convalescent, nursing, rest homes without laundry facilities	60 gal/bed
Convalescent, nursing, rest homes with laundry facilities	120 gal/bed
Residential care facilities	60 gal/person
Parks, recreation, camp grounds, R-V parks and other outdoor activity facilities	
Campgrounds with comfort station, without water or sewer hookups	75 gal/campsite
Campgrounds with water and sewer hookups	100 gal/campsite
Campground dump station facility	50 gal/space
Construction, hunting or work camps with flush toilets	60 gal/person
Construction, hunting or work camps with chemical or portable toilets	40 gal/person
Parks with restroom facilities	250 gal/plumbing fixture
Summer camps without food preparation or laundry facilities	30 gal/person
Summer camps with food preparation and laundry facilities	60 gal/person
Swimming pools, bathhouses and spas	10 gal/person
Public access restrooms	325 gal/plumbing fixture
Schools, preschools and day care	
Day care and preschool facilities	25 gal/person (child & employee)
Schools with cafeteria, gym and showers	15 gal/student
Schools with cafeteria	12 gal/student
Schools without cafeteria, gym or showers	10 gal/student
Boarding schools	60 gal/person (student & employee)
Service stations, car wash facilities	
Service stations, gas stations	250 gal/plumbing fixture
Car wash facilities (if recycling water see Rule .0235)	1200 gal/bay
Sports centers	
Bowling center	50 gal/lane
Fitness, exercise, karate or dance center	50 gal/100 sq ft
Tennis, racquet ball	50 gal/court
Gymnasium	50 gal/100 sq ft
Golf course with only minimal food service	250 gal/plumbing fixture
Country clubs	60 gal/member or patron
Mini golf, putt-putt	250 gal/plumbing fixture
Go-kart, motocross	250 gal/plumbing fixture
Batting cages, driving ranges	250 gal/plumbing fixture
Marinas without bathhouse	10 gal/slip
Marinas with bathhouse	30 gal/slip
Video game arcades, pool halls	250 gal/plumbing fixture
Stadiums, auditoriums, theaters, community centers	5 gal/seat
Stores, shopping centers, malls and flea markets	
Auto, boat, recreational vehicle dealerships/showrooms with restrooms	125 gal/plumbing fixture
Convenience stores, with food preparation	60 gal/100 sq ft
Convenience stores, without food preparation	250 gal/plumbing fixture
Flea markets	30 gal/stall
Shopping centers and malls with food service	130 gal/1000 sq ft
Stores and shopping centers without food service	100 gal/1000 sq ft
Transportation terminals – air, bus, train, ferry, port and dock	5 gal/passenger



(d) Design daily flow rates for proposed non-residential developments where the types of use and occupancy are not known shall be designed for a minimum of 880 gallons per acre or the applicant shall specify an anticipated flow based upon anticipated or potential uses.

(e) Conditions applicable to the use of the above design daily flow rates:

- (1) For restaurants, convenience stores, service stations and public access restroom facilities, higher design daily flow rates shall be required based on higher expected usage where use is increased because of its proximity to highways, malls, beaches, or other similar high use areas.
- (2) Residential property on barrier islands and similar communities located south or east of the Atlantic Intracoastal Waterway used as vacation rental as defined in G.S. 42A-4 shall use 120 gallons per day per habitable room. Habitable room shall mean a room or enclosed floor space used or intended to be used for living or sleeping, excluding kitchens and dining areas, bathrooms, shower rooms, water closet compartments, laundries, pantries, foyers, connecting corridors, closets, and storage spaces.

(f) An adjusted daily sewage flow design rate shall be granted for permitted but not yet tributary connections and future connections tributary to the system upon showing that a sewage system is adequate to meet actual daily wastewater flows from a facility included in Paragraph (b) or (c) of this Rule without causing flow violations at the receiving wastewater treatment plant or capacity related sanitary sewer overflows within the collection system as follows:

- (1) Documented, representative data from that facility or a comparable facility shall be submitted by an authorized signing official in accordance with Rule .0106 of this Section to the Division as follows for all flow reduction request:
  - (A) Dates of flow meter calibrations during the time frame evaluated and indication if any adjustments were necessary.
  - (B) A breakdown of the type of connections (e.g. two bedroom units, three bedroom units) and number of customers for each month of submitted data as applicable. Identification of any non-residential connections including subdivision clubhouses/pools, restaurants, schools, churches and businesses. For each non-residential connection, information as identified in Paragraph (c) of this Rule (e.g. 200 seat church, 40 seat restaurant, 35 person pool bathhouse).
  - (C) Owner of the collection system.
  - (D) Age of the collection system.
  - (E) Analysis of inflow and infiltration within the collection system or receiving treatment plant, as applicable.
  - (F) Where a dedicated wastewater treatment plant serves the specific area and is representative of the residential wastewater usage, at least the 12 most recent consecutive monthly average wastewater flow readings and the daily total wastewater flow readings for the highest average wastewater flow month per customers as reported to the Division.
  - (G) Where daily data from a wastewater treatment plant cannot be utilized or is not representative of the project area: at least 12 months worth of monthly average wastewater flows from the receiving treatment plant shall be evaluated to determine the peak sewage month. Daily wastewater flows shall then be taken from a flow meter installed at the most downstream point of the collection area for the peak month selected that is representative of the project area. Justification for the selected placement of the flow meter shall also be provided.
  - (H) An estimated minimum design daily sewage flow rate shall be taken by calculating the numerical average of the top three daily readings for the highest average flow month. The calculations shall also account for seasonal variations, excessive inflow and infiltration, age and suspected meter reading/recording errors.
- (2) The Division shall evaluate all data submitted but shall also consider other factors in granting, with or without adjustment, or denying a flow reduction request including: applicable weather conditions during the data period (i.e. rainy or drought), other historical monitoring data for the particular facility or other similar facilities available to the Division, the general accuracy of monitoring reports and flow meter readings, and facility usage (i.e., resort area).
- (3) Flow increases shall be required if the calculations in Subparagraph (f)(1) of this Rule yield design flows higher than that specified in Paragraphs (b) or (c) of this Rule.
- (4) The applicant/owner shall retain the letter of any approved adjusted daily design flow rate for the life of the facility and shall transfer such letter to any new system owner.

*History Note: Authority G.S. 143-215.1; 143-215.3(a)(1);  
Eff. September 1, 2006.*

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**Estimates of the Total Population of North Carolina  
Municipalities for July 1, 2018 by Municipality Name**

**Standard Population Estimates**

Municipality	Total Population		Change	
	April 2010	July 2018	Numeric	Percent
Total Municipal Population	5,252,615	5,834,588	581,973	11.1
Bessemer City	5,340	5,508	168	3.1

Source: North Carolina OSBM, Standard Population Estimates, Vintage 2018

DRAFT

# System Development Fee Usage Calculator

## City of Bessemer City, NC

7/1/2020

### EXPAMPLE NEW DEVELOPMENT CALCULATIONS

Look up type of establishment in Column A. Sewer Flow in gallons per day (GPD) appears in Column B. Units defining Customer Water Use appears in Column C.

WATER Calculated Cost per Gallons Per Day (\$/GPD)	\$ 7.90
SEWER Calculated Cost per Gallons Per Day (\$/GPD)	\$ 2.92

ENTER number of units for proposed customer use in yellow boxe(s) column D.

Combined Water and Sewer SDF Calculated in Column K

A Type of Establishment	B GPD	C Design Daily Flow Rates		E Water System			H Sewer System			K Combined System
		Units Defining Customer Use	Enter No. Units	GPD	\$/ GPD	Water Fee	GPD	\$/ GPD	Sewer Fee	
<b>Residential Dwelling Units</b>										
Dwelling Units: Minimum Water 400 GPD, Minimum Sewer 240 GPD	120	Bedroom	2	400	7.90	\$ 3,160	240	2.92	\$ 701	\$ 3,861
Dwelling Units: Minimum Water 400 GPD, Minimum Sewer 240 GPD	120	Bedroom	3	400	7.90	\$ 3,160	360	2.92	\$ 1,051	\$ 4,211
Dwelling Units: Minimum Water 400 GPD, Minimum Sewer 240 GPD	120	Bedroom	4	528	7.90	\$ 4,171	480	2.92	\$ 1,402	\$ 5,573
<b>Businesses, offices and factories</b>										
General business and office facilities	25	Employee per Shift	20	500	7.90	\$ 3,950	500	2.92	\$ 1,460	\$ 5,410
<b>Churches</b>										
Churches without kitchen, day care or camps	3	Seat	150	450	7.90	\$ 3,555	450	2.92	\$ 1,314	\$ 4,869
<b>Food and drink facilities</b>										
Restaurant, full service	40	Seat	60	2,400	7.90	\$ 18,960	2,400	2.92	\$ 7,008	\$ 25,968
<b>Stores, shopping centers, malls and flea markets</b>										
Convenience stores, with food preparation	60	100 sq ft	25	1,500	7.90	\$ 11,850	1,500	2.92	\$ 4,380	\$ 16,230
Stores and shopping centers without food service	100	1,000 sq ft	25	2,500	7.90	\$ 19,750	2,500	2.92	\$ 7,300	\$ 27,050

# Historical Cost Indexes

The table below lists both the RSMMeans® historical cost index based on Jan. 1, 1993 = 100 as well as the computed value of an index based on Jan. 1, 2019 costs. Since the Jan. 1, 2019 figure is estimated, space is left to write in the actual index figures as they become available through the quarterly *RSMMeans Construction Cost Indexes*.

To compute the actual index based on Jan. 1, 2019 = 100, divide the historical cost index for a particular year by the actual Jan. 1, 2019 construction cost index. Space has been left to advance the index figures as the year progresses.

Year	Historical Cost Index Jan. 1, 1993 = 100		Current Index Based on Jan. 1, 2019 = 100		Year	Historical Cost Index Jan. 1, 1993 = 100		Current Index Based on Jan. 1, 2019 = 100		Year	Historical Cost Index Jan. 1, 1993 = 100		Current Index Based on Jan. 1, 2019 = 100	
	Est.	Actual	Est.	Actual		Actual	Est.	Actual	Actual		Est.	Actual		
Oct 2019*					July 2004	143.7	63.2			July 1986	84.2	37.1		
July 2019		232.2			2003	132.0	58.1			1985	82.6	36.3		
April 2019		230.8			2002	128.7	56.6			1984	82.0	36.1		
Jan 2019		229.6	100.0	100.0	2001	125.1	55.0			1983	80.2	35.3		
July 2018		222.9	98.1		2000	120.9	53.2			1982	76.1	33.5		
2017		213.6	94.0		1999	117.6	51.7			1981	70.0	30.8		
2016		207.3	91.2		1998	115.1	50.6			1980	62.9	27.7		
2015		206.2	90.7		1997	112.8	49.6			1979	57.8	25.4		
2014		204.9	90.1		1996	110.2	48.5			1978	53.5	23.5		
2013		201.2	88.5		1995	107.6	47.3			1977	49.5	21.8		
2012		194.6	85.6		1994	104.4	45.9			1976	46.9	20.6		
2011		191.2	84.1		1993	101.7	44.7			1975	44.8	19.7		
2010		183.5	80.7		1992	99.4	43.7			1974	41.4	18.2		
2009		180.1	79.2		1991	96.8	42.6			1973	37.7	16.6		
2008		180.4	79.4		1990	94.3	41.5			1972	34.8	15.3		
2007		169.4	74.5		1989	92.1	40.5			1971	32.1	14.1		
2006		162.0	71.3		1988	89.9	39.5			1970	28.7	12.6		
2005		151.6	66.7		1987	87.7	38.6			1969	26.9	11.8		

## Adjustments to Costs

The "Historical Cost Index" can be used to convert national average building costs at a particular time to the approximate building costs for some other time.

### Time Adjustment Using the Historical Cost Indexes:

$$\frac{\text{Index for Year A}}{\text{Index for Year B}} \times \text{Cost in Year B} = \text{Cost in Year A}$$

### Example:

Estimate and compare construction costs for different years in the same city.

To estimate the national average construction cost of a building in 1970, knowing that it cost \$900,000 in 2019:

INDEX in 1970 = 28.7

INDEX in 2019 = 227.3

$$\frac{\text{INDEX 1970}}{\text{INDEX 2019}} \times \text{Cost 2019} = \text{Cost 1970}$$

$$\frac{28.7}{227.3} \times \$900,000 = .126 \times \$900,000 = \$113,400$$

The construction cost of the building in 1970 was \$113,400.

**Note:** The city cost indexes for Canada can be used to convert U.S. national averages to local costs in Canadian dollars.

### Example:

To estimate and compare the cost of a building in Toronto, ON in 2019 with the known cost of \$600,000 (US\$) in New York, NY in 2019:

INDEX Toronto = 110.1

INDEX New York = 132.1

$$\frac{\text{INDEX Toronto}}{\text{INDEX New York}} \times \text{Cost New York} = \text{Cost Toronto}$$

$$\frac{110.1}{132.1} \times \$600,000 = .834 \times \$600,000 = \$500,076$$

The construction cost of the building in Toronto is \$500,076 (CN\$).

\*Historical Cost Index updates and other resources are provided on the following website:  
<http://info.thegordiangroup.com/RSMMeans.html>