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Water and Wastewater Capacity Charge Study And Capital Improvements Program

Prepared for:
Covington, Louisiana

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Prepared by:

4701 Sangamore Road
Suite S240
Bethesda, MD 20816
301.320.6900
www.TischlerBise.com

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INTRODUCTION TO CAPACITY CHARGES

The City of Covington, Louisiana retained TischlerBise to develop capacity charges for water and wastewater infrastructure. This document provides written analysis for the City of Covington to:

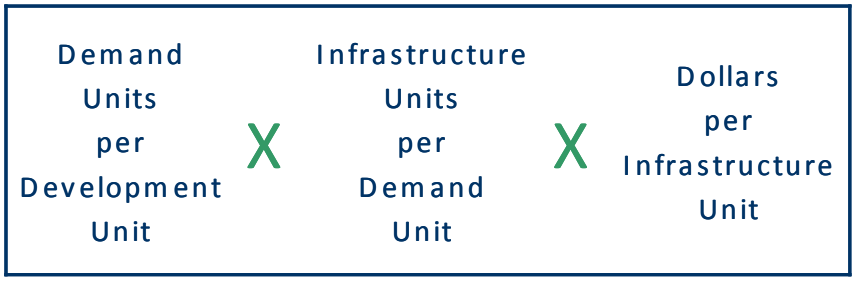
1. Ensure adequate public facilities are available to serve new growth and development; and
2. Promote cost-effective growth and establish uniform standards by which Covington may require payment for a proportionate share of the cost of system improvements needed to serve development.

Capacity charges are one-time payments used to construct system improvements, identified through facility planning, needed to accommodate new development. A capacity charge represents new growth's proportionate share of capital facility needs. Capacity charges do have limitations, and should not be regarded as the total solution for infrastructure financing needs. Rather, they should be considered one component of a comprehensive portfolio to ensure adequate provision of public facilities with the goal of maintaining current levels of service in a community. By law, capacity charges can only be used for capital improvements, not operating, maintenance, or rehabilitation costs. Also, capacity charges cannot be used to repair infrastructure or correct existing deficiencies.

CONCEPTUAL CAPACITY CHARGE CALCULATION

In contrast to project-level improvements, capacity charges fund growth-related infrastructure that will benefit multiple development projects, or the entire jurisdiction (usually referred to as system improvements). The basic steps in a conceptual capacity charge formula are illustrated in Figure 1. The first step (see the left box) is to determine an appropriate demand indicator, or service unit, for the particular type of infrastructure. The demand/service indicator measures the number of demand or service units for each unit of development. For example, an appropriate indicator of the demand for parks is population growth and the increase in population can be estimated from the average number of persons per housing unit. The second step in the capacity charge formula is shown in the middle box below. Infrastructure units per demand unit are typically called level-of-service (LOS) standards. In keeping with the park example, a common LOS standard is park acreage per thousand people. The third step in the capacity charge formula, as illustrated in the right box, is the cost of various infrastructure units. To complete the park example, this part of the formula would establish the cost per acre for land acquisition and/or park improvements.

Figure 1 – Typical Capacity Charge Formula



General Methodologies

There are three general methods for calculating capacity charges. The choice of a particular method depends primarily on the timing of infrastructure construction (past, concurrent, or future) and service characteristics of the facility type being addressed. Each method has advantages and disadvantages in a particular situation, and can be used simultaneously for different cost components. For example, a jurisdiction might use bond financing to oversize a wastewater treatment plant (recoupment method) and identify future wastewater mains to geographic expansion of the service area (plan-based method).

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

Recoupment Method (past improvements)

The rationale for recoupment, often called cost recovery, is that new development is paying for its share of the useful life and remaining capacity of facilities already built, or land already purchased, from which new growth will benefit. This methodology is often used for utility systems that must provide adequate capacity before new development can take place.

Incremental Expansion Method (concurrent improvements)

The incremental expansion method documents current level-of-service (LOS) standards for each type of public facility, using both quantitative and qualitative measures. This approach ensures that there are no existing infrastructure deficiencies or surplus capacity in infrastructure. New development is only paying its proportionate share for growth-related infrastructure. LOS standards are determined in a manner similar to the current replacement cost approach used by property insurance companies. However, in contrast to insurance practices, the fee revenues would not be for renewal and/or replacement of existing facilities. Rather, revenue will be used to expand or provide additional facilities, as needed, to accommodate new development. An incremental expansion method is best suited for public facilities that will be expanded in regular increments, concurrent with new development.

Plan-Based Method (future improvements)

The plan-based method allocates costs for a specified set of improvements to a specified amount of development. Improvements are typically identified in a long-range facility plan and development potential is identified by a land use plan. There are two options for determining the cost per demand unit: 1) total cost of a public facility can be divided by total demand units, or 2) the growth share of the public facility cost can be divided by the net increase in demand units over the planning timeframe.

Credits

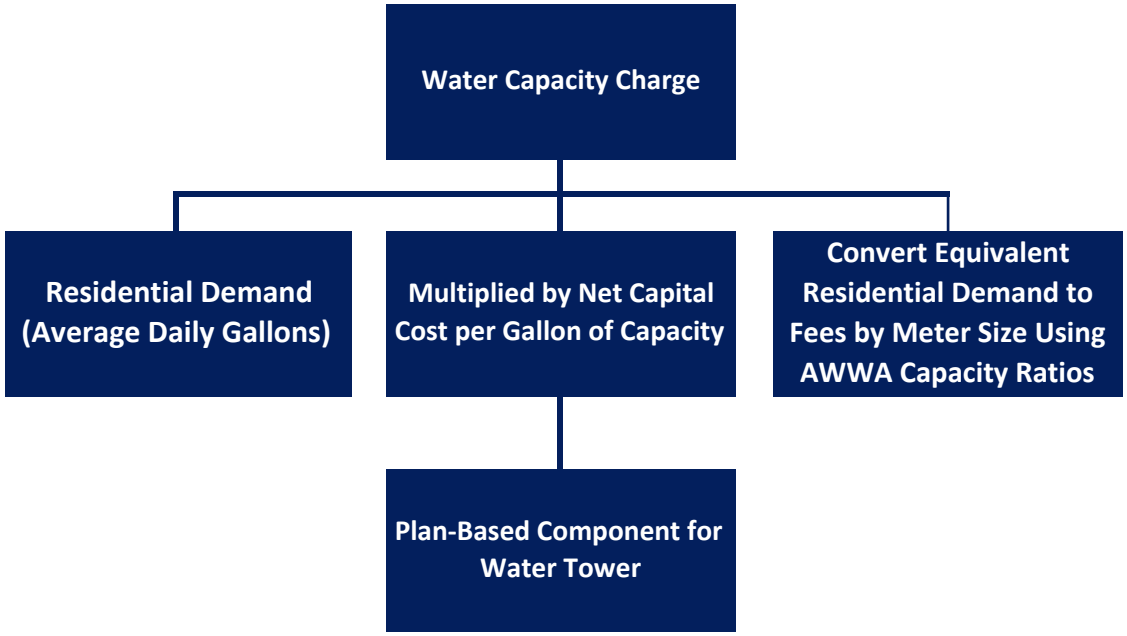
Regardless of the methodology, a consideration of credits is integral to the development of a legally defensible capacity charge methodology. There are two types of credits with specific characteristics, both of which should be addressed in capacity charge studies. The first is a revenue credit due to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

WATER CAPACITY CHARGES

METHODOLOGY

The City of Covington provides water service to its residents and businesses through its water facilities and water distribution system. Covington's water capacity charge, as seen in Figure 2, utilizes a plan-based approach for the water tower with infrastructure costs allocated to both residential and nonresidential development based on consumption—gallons per day per person for residential and gallons per day per residential connection for nonresidential development.

Figure 2 – Water Capacity Charge Methodology

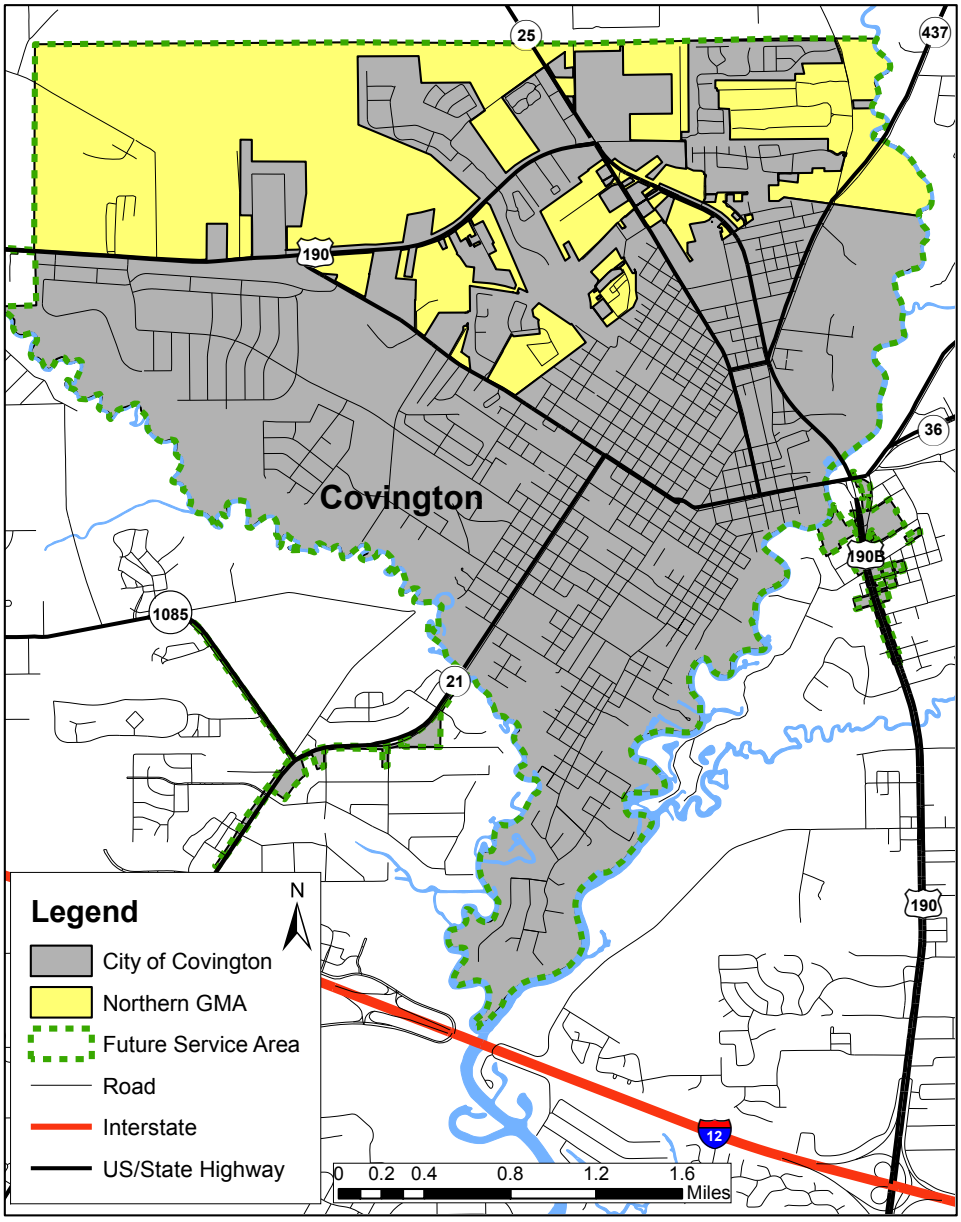


SERVICE AREA

Covington's water system is a single, integrated utility that serves all customers. For the purpose of calculating and imposing water capacity charges, the entire city and northern growth management area[1] are treated as a single service area. Figure 3 outlines the current service area in gray and the future service area is outlined in a green, dashed line. As stated in the *Land Use Assumptions* document (see Appendix), the current service area contains 4,629 acres and 763 acres remain undeveloped within the northern growth management area. Therefore, the future service area for water service is 5,392 acres.

[1] The Growth Management and Revenue Sharing Agreement of 2003 allows for the annexation of land within the Northern Growth Management Area by the City of Covington without opposition from St. Tammany Parish. This is further discussed in the "Northern Growth Management Area" section of the Appendix.

Figure 3 – Map of Existing and Future Service Areas



EXISTING CONDITIONS AND DEFICIENCIES

Capacity charges will not be used to correct existing deficiencies. Covington has two existing water towers, but a new water tower is needed to accommodate future development in the northern growth management area.

Operation and Maintenance

The City of Covington will fund all operation and maintenance costs with utility rate charges. Capacity charge revenue will not be used for operating and maintenance expenses. Capital items are segregated operationally and for accounting purposes.

Consumption Standards

City staff provided one year of water consumption records by customer classification. As shown in Figure 4, average daily water demand indicators for residential and nonresidential customers are derived from average gallons per day divided by connections. Residential demand averages 181 gallons per connection, or 83 gallons per person on an average day. Nonresidential demand averages 660 gallons per connection. 44 percent of Covington's demand for water is attributable to nonresidential development.

Figure 4 – Average Daily Water Demand Indicators

	Avg Gallons per Day*	Connections*	Gallons per Connection per Day	Gallons per Person per Day**
Residential	756,863	4,189	181	83
Nonresidential	590,631	895	660	
Total	1,347,494	5,084		

	Total***	Per Connection
Jobs	18,233	20

* Based on water billing records from August 2013 through July 2014. Historical water billing data provided by the City of Covington.
** Gallons per person per day based on 2.18 persons per detached unit (ACS 2008-2012).
*** From Figure A11.

Future Demand

Projected water demand, shown in Figure 5, is a function of the development projections (Appendix) and the water demand factors discussed above. This analysis assumes all future residential units becoming water customers. To project future water demand from nonresidential development, the capacity charge analysis assumes the current average of 20 jobs for each nonresidential connection will remain constant over time. The water demand projection assumes new residential units will demand 181 gallons per day. Base year consumption is 1.35 million gallons per day (MGD) with projected demand in 2034 of 2.32 MGD – an increase of approximately 0.97 MGD.

Figure 5 – Projected Water Demand

Year		Million Gallons Per Avg Day	Connections	Annual Increase		Cumulative Increase	
				Connections	MGD	Connections	MGD
Base	2014	1.35	5,084				
1	2015	1.38	5,236	152	0.04	152	0.04
2	2016	1.42	5,392	156	0.04	308	0.07
3	2017	1.46	5,553	161	0.04	469	0.11
4	2018	1.50	5,718	165	0.04	634	0.15
5	2019	1.54	5,888	170	0.04	804	0.20
6	2020	1.59	6,063	175	0.04	979	0.24
7	2021	1.63	6,242	180	0.04	1,158	0.28
8	2022	1.67	6,427	185	0.04	1,343	0.33
9	2023	1.72	6,617	190	0.05	1,533	0.37
10	2024	1.77	6,813	196	0.05	1,729	0.42
11	2025	1.81	7,014	201	0.05	1,930	0.47
12	2026	1.86	7,221	207	0.05	2,137	0.52
13	2027	1.92	7,434	213	0.05	2,350	0.57
14	2028	1.97	7,653	219	0.05	2,569	0.62
15	2029	2.02	7,878	225	0.05	2,794	0.68
16	2030	2.08	8,109	232	0.06	3,025	0.73
17	2031	2.14	8,348	238	0.06	3,264	0.79
18	2032	2.19	8,592	245	0.06	3,509	0.85
19	2033	2.25	8,844	252	0.06	3,761	0.91
20	2034	2.32	9,104	259	0.06	4,020	0.97

Source: Based on water billing records from August 2013 through July 2014. Historical water billing data provided by the City of Covington.

WATER FACILITY PLAN – WATER TOWER

As shown in Figure 6, Covington plans to construct a water tower to serve future development in the northern growth management area. City staff expects 100 percent of the demand for the planned water tower will come from future development; therefore, the total cost of the water tower is allocated to future development. To determine the capital cost per gallon of the planned water tower, the capital cost of $1,750,000 is divided by the 20-year increase in water demand of 968,769 gallons. This calculation provides a capital cost per gallon of $1.81 ($1,750,000 / 968,769).

Figure 6 – Planned Water Tower Standards

	20-Year Demand Increase	*Cost**
Water Tower	968,769	$1,750,000
Capital Cost per Gallon		$1.81

**City of Covington, Department of Engineering.*

WATER CAPACITY CHARGE SCHEDULE

Infrastructure standards and cost factors for water are summarized in the upper portion of Figure 7. The conversion of infrastructure costs per service unit into a cost per development unit is also shown in the table below.

For residential development, the average number of persons per housing unit provides the necessary conversion. Capacity charges for residential development are determined by type of housing unit. For example, a single-family detached unit will pay $328 in water capacity charges based on a cost factor of $1.81 per gallon and an average of 2.18 persons per housing unit who demand 83 gallons per person per day ($1.81 x 2.18 X 83).

Water capacity charges for nonresidential development will be assessed per meter according to the size of the meter. The proposed water capacity charge of $557 for nonresidential development with a one-inch meter is derived from a capital cost of $1.81 per gallon multiplied by the single-family unit daily demand (83 gallons X 2.18 persons per unit) with a weighting factor or 1.7 ($1.81 X 83 X 2.18 X 1.7). Similarly, to calculate the water capacity charge for a nonresidential development with a two-inch meter, the capital cost of $1.81 per gallon is multiplied by the single-family unit daily demand (83 gallons X 2.18 persons per unit) with a weighting factor of 5.3 for a water capacity charge of $1,736 ($1.81 X 83 X 2.18 X 5.3).

Figure 7 – Water Capacity Charge Schedule

	Cost per Gallon
Water Tower	$1.81
Gallons per Day per Person	83

Residential (per unit)

Development Type	Persons per Housing Unit	Proposed Capacity Charge
Single-Family Detached	2.18	$328
Multi-Family	2.04	$306

Nonresidential (per meter)

Meter Size (inches)*	Weighting Factor**	Proposed Capacity Charge
0.75	1.0	$328
1.00	1.7	$557
1.50	3.3	$1,081
2.00	5.3	$1,736
3.00	10.7	$3,504

** Fees for meters larger than three inches will be based on annualized average daily demand and the net capital cost per gallon of capacity.*
*** AWWA, Manual of Water Supply Practices, M6.*

WATER CAPACITY CHARGE REVENUE

Over the next twenty years, water capacity charges should yield approximately $1.75 million for construction of a water tower if implemented at the proposed level. The revenue forecast for water infrastructure improvements is based on the projected increase in water demand from 2014 to 2034. Based on water demand projections shown in Figure 5, water demand in Covington will increase by approximately 970,000 gallons over the next twenty years.

If development occurs at a faster rate than projected, the demand for water infrastructure will increase along with capacity charge revenue. If development occurs at a slower rate than projected, the demand for water infrastructure will decrease and capacity charge revenue will decrease at a similar rate. Anticipated water capacity charge revenue of $1,750,000 over the next twenty years is equal to the projected growth-related cost of water infrastructure. See the Appendix for additional discussion of the development projections that drive the cash flow analysis.

Figure 8 – Projected Water Capacity Charge Revenue

Growth-Related Cost of Water Infrastructure

Water Tower	$1,750,000

Projected Water Capacity Charge Revenue

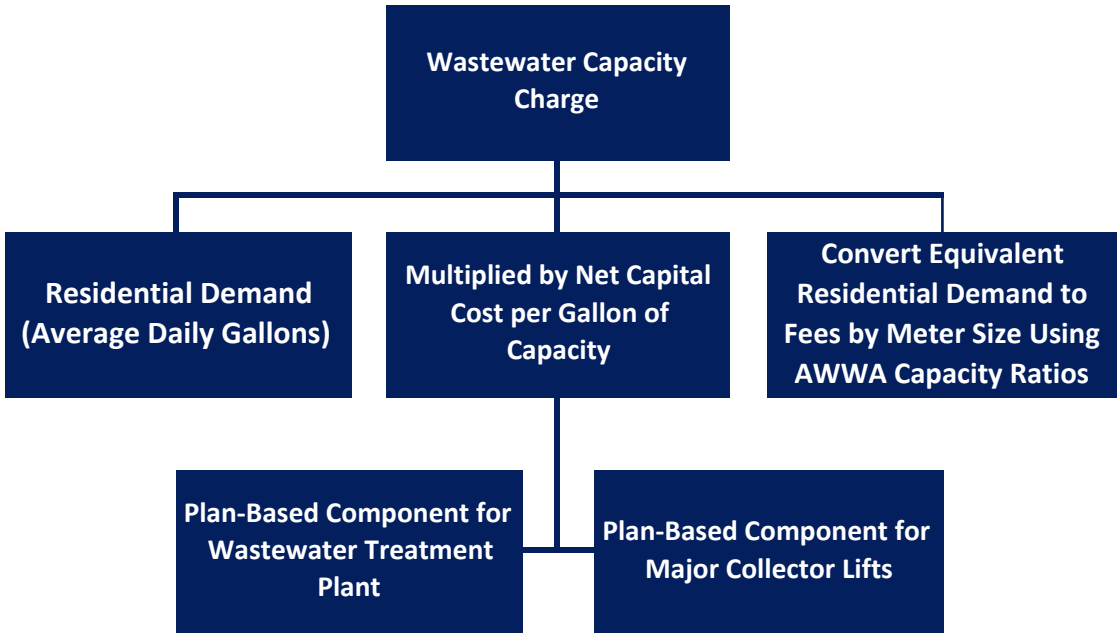
		$1.81 *per Gallon*
Year		*MGD*
Base	2014	1.35
Year 1	2015	1.38
Year 2	2016	1.42
Year 3	2017	1.46
Year 4	2018	1.50
Year 5	2019	1.54
Year 6	2020	1.59
Year 7	2021	1.63
Year 8	2022	1.67
Year 9	2023	1.72
Year 10	2024	1.77
Year 15	2029	2.02
Year 20	2034	2.32
Twenty-Yr Increase		0.97
Projected Revenue (rounded) =>		**$1,750,000**
Other Revenue Needed =>		**$0**

WASTEWATER CAPACITY CHARGES

METHODOLOGY

The City of Covington provides wastewater service to its residents and businesses through its wastewater facilities and wastewater collection system. The wastewater capacity charge for Covington, as seen in Figure 9, utilizes a plan-based approach for expansion of the wastewater treatment plant and construction of major collector lifts with infrastructure costs allocated to both residential and nonresidential development based on consumption—gallons per day per person for residential and gallons per day per residential connection for nonresidential development.

Figure 9 – Wastewater Capacity Charge Methodology



SERVICE AREA

Covington's wastewater system is a single, integrated utility that serves all customers. For the purpose of calculating and imposing wastewater capacity charges, the entire city and northern growth management area[2] are treated as a single service area. Figure 3 outlines the current service area in gray and the future service area is outlined in a green, dashed line. As stated in the *Land Use Assumptions* document (see Appendix), the current service area contains 4,629 acres and 763 acres remain undeveloped within the northern growth management area. Therefore, the future service area is 5,392 acres.

EXISTING CONDITIONS AND DEFICIENCIES

Capacity charges will not be used to correct existing deficiencies. Covington's wastewater system consists of conventional wastewater mains and lift stations to deliver wastewater to the city's treatment plant. In 2014, Covington had a single wastewater treatment plant with a design capacity of 2.60 MGD average daily flow. To meet capacity requirements, Covington plans to make a number of improvements to the wastewater treatment infrastructure. These improvements will be accomplished by increasing capacity at the wastewater treatment plant (WWTP) to accommodate future growth. The expansion of the wastewater treatment plant will increase capacity from 2.6 to 4.1 MGD (average daily flow). Covington will also need to make improvements to the existing collection system by building additional major collector lifts to accommodate growth.

OPERATION AND MAINTENANCE

The City of Covington will fund all operation and maintenance costs with utility rate charges. Capacity charge revenue will not be used for operating and maintenance expenses. Capital items are segregated operationally and for accounting purposes.

CONSUMPTION STANDARDS

City staff provided one year of water consumption records by customer classification. Wastewater billing is based on water consumption, and Covington does not track wastewater flowing into the wastewater treatment plant. Therefore, water consumption is used in this study as a proxy for wastewater demand.

As shown in Figure 4, average daily water demand indicators for residential and nonresidential customers are derived from average gallons per day divided by connections. Residential demand averages 181 gallons per connection, or 83 gallons per person on an average day. Nonresidential demand averages 660 gallons per connection.

[2] The Growth Management and Revenue Sharing Agreement of 2003 allows for the annexation of land within the Northern Growth Management Area by the City of Covington without opposition from St. Tammany Parish. This is further discussed in the "Northern Growth Management Area" section of the Appendix.

Future Flows

Projected wastewater flow, based on water demand shown in Figure 5, is a function of the development projections (Appendix) and the water demand factors discussed above. This analysis assumes all future residential units becoming wastewater customers. To project future wastewater demand from nonresidential development, the capacity charge analysis assumes the current average of 20 jobs for each nonresidential connection will remain constant over time. The wastewater demand projection assumes new residential units will contribute 181 gallons per day to future wastewater flow. Base year demand is 1.35 million gallons per day (MGD) with projected demand in 2034 of 2.32 MGD – an increase of approximately 0.97 MGD.

Wastewater Facility Plan – Wastewater Treatment Plant

The City of Covington, as directed by a 2005 Pinnacle Engineering report, plans to expand its wastewater treatment plant to accommodate future development. Figure 10 indicates the cost to increase treatment capacity by 1.5 MGD average daily flow is $10 million – a cost of $6.67 per gallon of capacity ($10 million / 1.5 million gallons).

Figure 10 – Wastewater Treatment Plant Cost Standards

	Capacity (Gallons per Day)	*Cost**
Wastewater Treatment Plant	1,500,000	$10,000,000
Capital Cost per Gallon		**$6.67**

**City of Covington, Department of Engineering.*

Wastewater Facility Plan – Major Collector Lifts

The City of Covington also plans to construct major collector lifts in the northern growth management area to accommodate future development. According to city staff, three major collector lifts are needed to service the northern growth management area at a cost of $925,000 per major collector lift. City staff expects 100 percent of the demand for the planned major collector lifts will come from future development; therefore, the total capital cost of $2,775,000 ($925,000 X 3) is allocated to future development. To determine the capital cost per gallon of the planned major collector lifts, the capital cost of $2,775,000 is divided by the 20-year increase in wastewater flows of 968,769 gallons. This calculation provides a capital cost per gallon of $2.86 ($2,775,000 / 968,769).

Figure 11 – Major Collector Lift Cost Standards

	20-Year Demand Increase	*Cost**
Major Collector Lifts (3)	968,769	$2,775,000
Capital Cost per Gallon		**$2.86**

**City of Covington, Department of Engineering.*

WASTEWATER CAPACITY CHARGE SCHEDULE

Infrastructure standards and cost factors for wastewater are summarized in the upper portion of Figure 12. The conversion of infrastructure costs per service unit into a cost per development unit is also shown in the table below.

For residential development, the average number of persons per housing unit provides the necessary conversion. Capacity charges for residential development are determined by type of housing unit. For example, a multi-family unit will pay $1,614 in wastewater capacity charges based on a cost factor of $9.53 per gallon and an average of 2.04 persons per housing unit who demand 83 gallons per person per day ($9.53 x 2.04 X 83).

Wastewater capacity charges for nonresidential development will be assessed per meter according to the size of the meter. The proposed water capacity charge of $1,724 for nonresidential development with a 0.75-inch meter is derived from a capital cost of $9.53 per gallon multiplied by the single-family unit daily demand (83 gallons X 2.18 persons per unit) with a weighting factor or 1.0 ($9.53 X 83 X 2.18 X 1.0). Similarly, to calculate the water capacity charge for a nonresidential development with a 1.5-inch meter, the capital cost of $9.53 per gallon is multiplied by the single-family unit daily demand (83 gallons X 2.18 persons per unit) with a weighting factor of 3.3 for a wastewater capacity charge of $5,690 ($9.53 X 83 X 2.18 X 3.3).

Figure 12 – Wastewater Capacity Charge Schedule

	Cost per Gallon
Wastewater Treatment Plant	$6.67
Major Collector Lifts	$2.86
Total	$9.53
Gallons per Day per Person	83

Residential (per unit)

Development Type	Persons per Housing Unit	Proposed Capacity Charge
Single-Family Detached	2.18	$1,724
Multi-Family	2.04	$1,614

Nonresidential (per meter)

Meter Size (inches)*	Weighting Factor**	Proposed Capacity Charge
0.75	1.0	$1,724
1.00	1.7	$2,931
1.50	3.3	$5,690
2.00	5.3	$9,139
3.00	10.7	$18,451

** Fees for meters larger than three inches will be based on annualized average daily demand and the net capital cost per gallon of capacity.*

***AWWA, Manual of Water Supply Practices, M6.*

WASTEWATER CAPACITY CHARGE REVENUE

Over the next twenty years, wastewater capacity charges should yield approximately $9.2 million for wastewater infrastructure improvements if implemented at the proposed level. The revenue forecast is based on the projected 20-year increase in water demand shown in Figure 5. Because water demand is used as a proxy for wastewater flow, an increase of approximately 970,000 gallons of wastewater is projected over the next twenty years.

If development occurs at a faster rate than projected, the demand for wastewater infrastructure will increase along with capacity charge revenue. If development occurs at a slower rate than projected, the demand for wastewater infrastructure will decrease and capacity charge revenue will decrease at a similar rate. Wastewater capacity charge revenue of $9.2 million is anticipated over the next twenty years. The remaining $3.5 million will need to be funded with other sources of revenue. See the Appendix for additional discussion of the development projections that drive the cash flow analysis.

Figure 13 – Projected Wastewater Capacity Charge Revenue

Twenty-Year Cost of Wastewater Infrastructure

Wastewater Treatment Plant	$10,000,000
Major Lift Station	$2,775,000
Total	$12,775,000

Projected Wastewater Capacity Charge Revenue

		$9.53 *per Gallon*
Year		*MGD*
Base	2014	1.35
Year 1	2015	1.38
Year 2	2016	1.42
Year 3	2017	1.46
Year 4	2018	1.50
Year 5	2019	1.54
Year 6	2020	1.59
Year 7	2021	1.63
Year 8	2022	1.67
Year 9	2023	1.72
Year 10	2024	1.77
Year 15	2029	2.02
Year 20	2034	2.32
	Twenty-Yr Increase	0.97
Projected Revenue (rounded) =>		**$9,230,000**
Other Revenue Needed =>		**$3,545,000**

SUMMARY

CAPACITY CHARGE SCHEDULE

Figure 14 summarizes the proposed capacity charges discussed in the previous sections. The proposed capacity charge of $2,052 for a single-family detached unit is based on the sum of the water capacity charge and the wastewater capacity charge ($328 + $1,724). Similarly, the proposed capacity charge of $1,920 for multi-family unit is the sum of the multi-family water capacity charge ($306) and the multi-family wastewater capacity charge ($1,614).

For nonresidential development constructed with a one-inch meter, the proposed capacity charge is $3,488. Like residential development, the proposed capacity charge is calculated based on the water capacity charge ($557) and the wastewater capacity charge ($2,931).

Figure 14 – Capacity Charge Schedule

Residential (per unit)

Development Type	*Water Capacity Charge*	*Wastewater Capacity Charge*	*Proposed Capacity Charge*
Single-Family Detached	$328	$1,724	**$2,052**
Multi-Family	$306	$1,614	**$1,920**

Nonresidential (per meter)

*Meter Size (inches)**	*Water Capacity Charge*	*Wastewater Capacity Charge*	*Proposed Capacity Charge*
0.75	$328	$1,724	**$2,052**
1.00	$557	$2,931	**$3,488**
1.50	$1,081	$5,690	**$6,771**
2.00	$1,736	$9,139	**$10,875**
3.00	$3,504	$18,451	**$21,955**

**Fees for meters larger than three inches will be based on annualized average day demand and the net capital cost per gallon of capacity for water and wastewater infrastructure.*

20-Year Cash Flow Analysis

Cumulative revenues and expenditures are shown below in Figure 15. Based on the projected increase in water demand shown in Figure 5, proposed capacity charges should yield approximately $11 million in projected revenue. Projects identified in this study total approximately $14.5 million. The City of Covington will need to identify sources of funding to cover the remaining $3.5 million of expenditures not covered by capacity charges.

Figure 15 – Projected Capacity Charge Revenues and Expenditures

Water Infrastructure	
Expenditures	$1,750,000
Projected Revenue	$1,750,000
Other Revenue Needed	$0
Wastewater Infrastructure	
Expenditures	$12,775,000
Projected Revenue	$9,230,000
Other Revenue Needed	$3,545,000
Total	
Total Expenditures	**$14,525,000**
Total Projected Revenue	**$10,980,000**
Total Other Funding Needed	**$3,545,000**

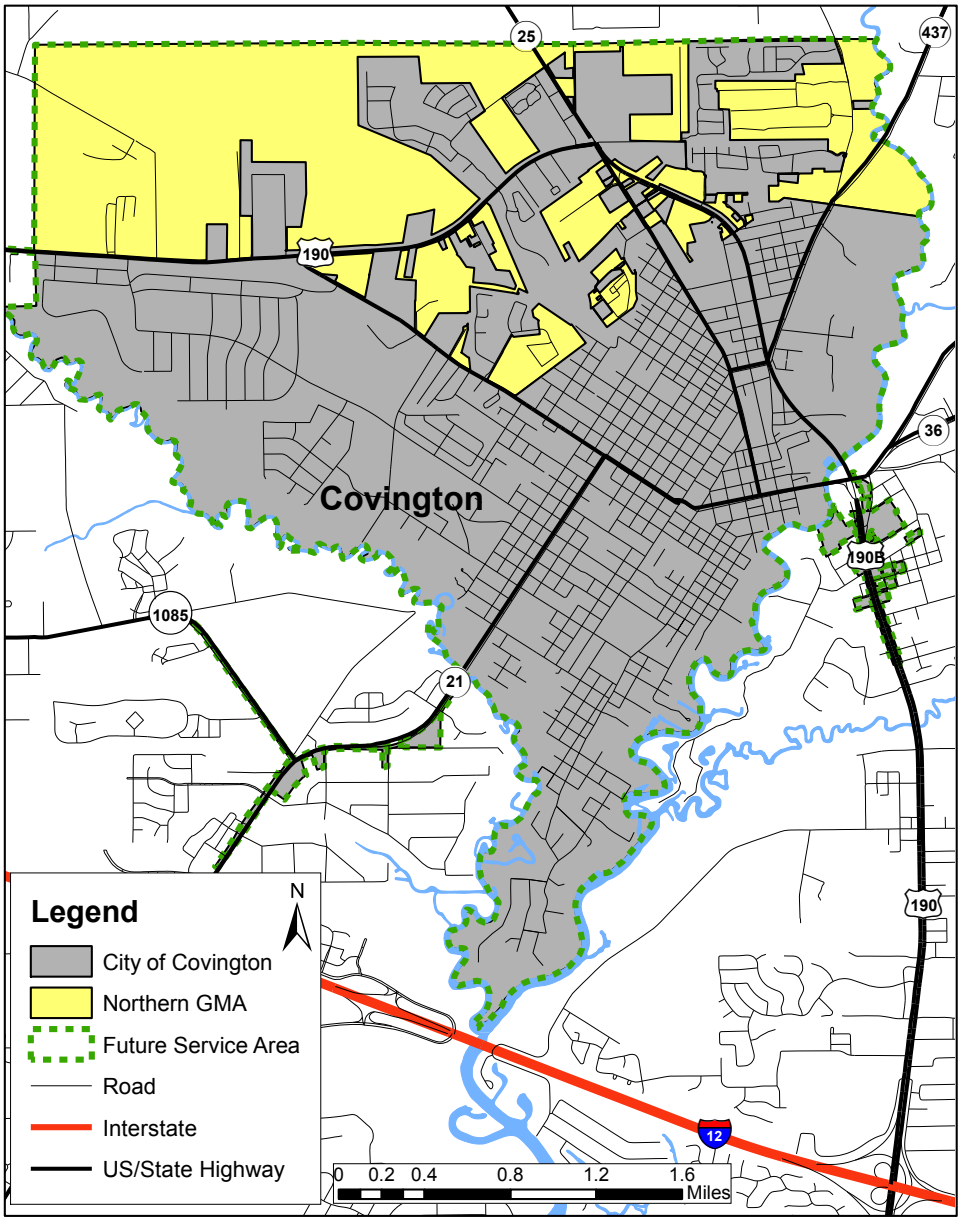
APPENDIX : LAND USE ASSUMPTIONS

INTRODUCTION

Service Area

The estimates and projections of residential and nonresidential development in this *Land Use Assumptions* document are for areas within the boundaries of the City Covington, Louisiana and the Northern Growth Management Area (NGMA) in St. Tammany Parish. Figure A1 below illustrates the boundaries of the City, or existing service area, and NGMA. Combined they form the future service area.

Figure A1 – Map of Future Service Area



As seen in Figure A2 below, the existing service area encompasses 4,629 acres. This includes 815 undeveloped acres within the City of Covington and 923 developed acres in the NGMA. The future service area will include all acreage in the existing service area and the 763 undeveloped acres in the NGMA.

Figure A2 – Existing and Future Service Area Acreage

Type	Covington	NGMA	Total
Developed	2,891	923	3,814
Undeveloped	815	763	1,578
Total	3,706	1,686	5,392

Existing SA	Future SA	Increase
4,629	5,392	763

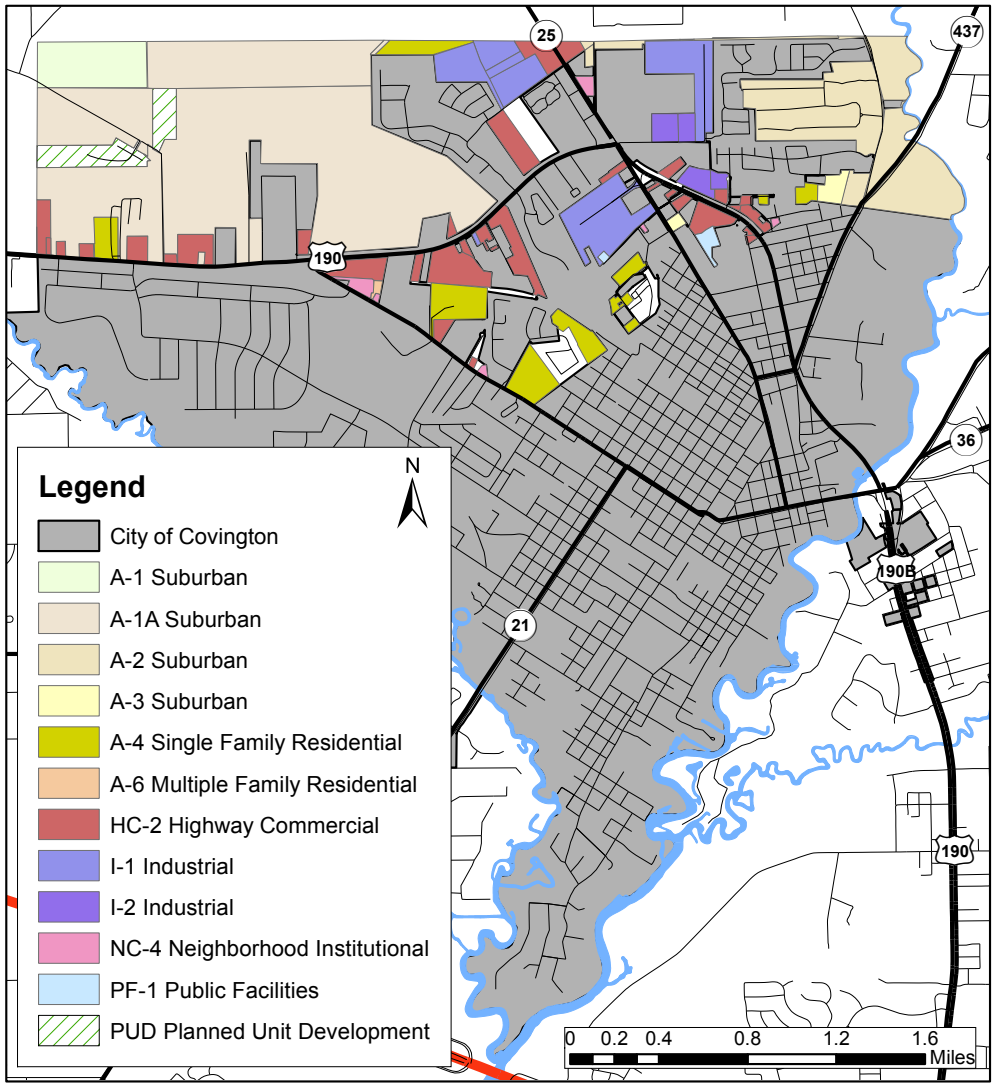
Source: City of Covington.

Northern Growth Management Area

One of three growth management areas surrounding the City of Covington, the northern growth management area (NGMA) is located north of Covington in St. Tammany Parish. Through an agreement with St. Tammany Parish in the Growth Management and Revenue Sharing Agreement of 2003, Covington may annex land within the northern growth management area without opposition from St. Tammany Parish. This agreement defines future growth boundaries and allows the City to better anticipate demands from new development. Because Covington expects further growth in the NGMA, and opposition from St. Tammany Parish regarding annexation has been resolved, the NGMA is included as part of Covington's future water and wastewater service area.

Although land has been annexed from the NGMA into the City of Covington, approximately 763 acres remain undeveloped. These lands are divided into two categories: residential uses and nonresidential uses. Residential uses account for 79% of the total GMA with nonresidential uses accounting for the remaining 21%. With Geographic Information Systems (GIS) data, total acreage for each zoning classification is calculated. Since the land in this GMA is located in St. Tammany Parish, maximum densities from the Parish's Zoning Code are applied to each zone's acreage—with 30% of land reserved for infrastructure—to determine the maximum number of housing units or nonresidential square footage per net acre. Zoning classifications for the NGMA can be seen below in Figure A3.

Figure A3 – Map of Northern Growth Management Area with St. Tammany Parish Zoning



SUMMARY OF GROWTH INDICATORS

TischlerBise has prepared this *Land Use Assumptions* document which details current demographic ***estimates*** and future development ***projections*** for both residential and nonresidential development that will be used in the calculation of the capacity charges. The development projections are used for calculating the level of service to be provided to future development by planned capital projects or existing infrastructure that was oversized in anticipation of new development. The development projections are also used in forecasting the amount and cost of infrastructure required by new development that will be documented in the cash flow analysis.

Capacity charge methodologies are designed to reduce sensitivity to accurate development projections in the determination of the proportionate-share fee amounts. If actual development is slower than projected, capacity charge revenues will also decline, but so will the need for growth-related infrastructure. In contrast, if development is faster than anticipated, the City will receive an increase in

capacity charge revenue, but will also need to accelerate the capital improvements program to keep pace with development.

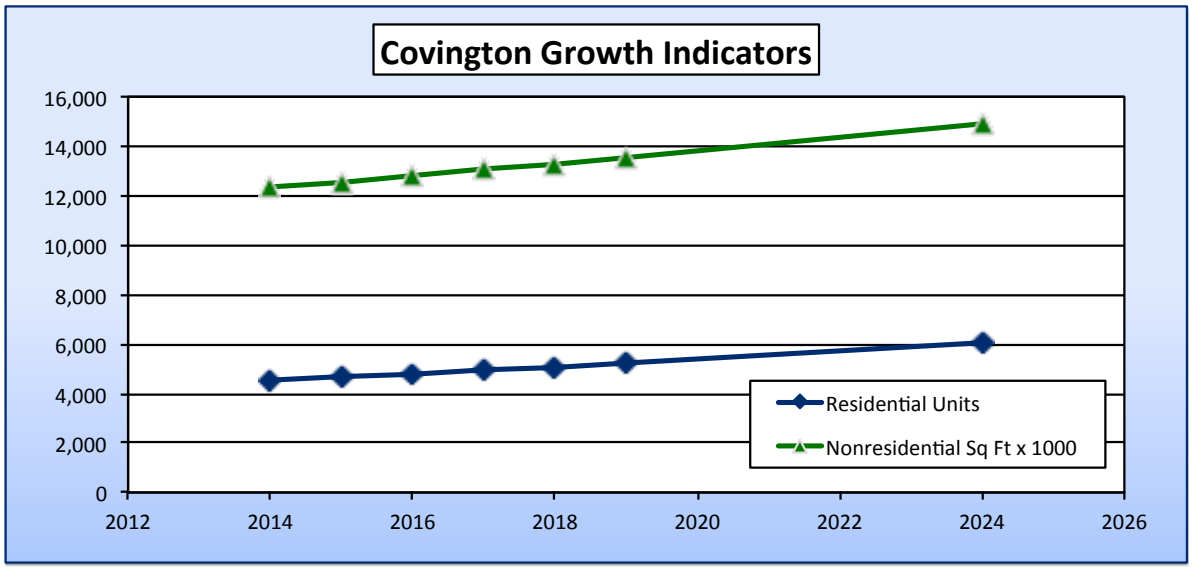
Development projections and growth rates are summarized in Figure A4. Covington-specific base data for the demographic analysis and development projections include 2010 Census calculations of population and housing units and American Community Survey tables. The projected increase in housing units is based on residential new construction permits provided by the City of Covington. Projected housing units were converted to population using the 2012 average of 2.09 year-round residents per housing unit. For housing units, the study assumes a compound annual growth rate of 2.91%.

The projected jobs total is based on 2011 job estimates from the U.S. Census Bureau's OnTheMap web application. Projected jobs within Covington were converted to nonresidential square footage using average square-feet-per-employee multipliers provided by the Institute of Transportation Engineers. For nonresidential development, the study assumes the following compound annual growth rates:

- Commercial: 1.71%
- Office & Other Services: 3.18%
- Institutional: 1.67%
- Industrial: 1.48%

Figure A4 – Development Projections and Growth Rates

	2014	2015	2016	2017	2018	2019	2024	2014 to 2024 Average Annual Increase	2014 to 2024 Average Annual Compound Growth Rate
Residential Units[1,2]	4,540	4,672	4,808	4,948	5,092	5,240	6,048	151	2.91%
Nonresidential Sq Ft x 1000[3]	12,339	12,572	12,811	13,054	13,302	13,555	14,902	256	1.91%



1. City of Covington residential new construction building permits 2011 - September 2014.
2. 2010 Census and 2008-2012 ACS.
3. OnTheMap web application, U.S. Census Bureau, 2011.

RESIDENTIAL DEVELOPMENT

Current estimates and future projections of residential development are detailed in this section, including housing units by type and population.

Current Estimates of Residential Development

The 2010 census did not obtain detailed information using a "long-form" questionnaire. Instead, the U.S. Census Bureau has switched to a continuous monthly mailing of surveys, known as the American Community Survey (ACS), which is limited by sample-size constraints in areas with relatively few residents. For cities like Covington, data on detached housing units are now combined with attached single units (commonly known as townhouses).

According to the U.S. Census Bureau, a household is a housing unit that is occupied by year-round residents. Capacity charges often use per capita standards and persons per housing unit or persons per household to derive proportionate-share fee amounts. When persons per housing unit is used in the fee calculations, infrastructure standards are derived using year-round population. When persons per household is used in the fee calculations, the fee methodology assumes all housing units will be occupied, thus requiring seasonal or peak population to be used when deriving infrastructure standards. TischlerBise recommends that fees for residential development in Covington be imposed according to the number of year-round residents per housing unit.

Census data indicate Covington had 4,069 housing units and 8,768 persons not in group quarters in 2012. As shown in Figure A5, dwellings with a single unit per structure (detached, attached, and mobile homes) averaged 2.18 persons per housing unit. Dwellings in structures with multiple units (including structures with two or more units, boats, RVs, and vans) averaged 2.04 year-round residents per unit.

Figure A5 – Persons Per Housing Unit By Type of Housing Unit

2008-2012 American Community Survey

Type	Persons	Households	Housing Units	Persons per Housing Unit
Single Unit[1]	7,303	3,035	3,352	**2.18**
2+ Units[2]	1,465	573	717	**2.04**
Subtotal	8,768	3,608	4,069	**2.15**
Group Quarters	128			
TOTAL	**8,896**	**3,608**	**4,069**	**2.19**

1. Single Unit includes detached, attached, and mobile homes.
2. 2+ Units includes boats, vans and RVs.

Source: Tables B25024, B25032, and B25033.
2008-2012 American Community Survey 5-Year Estimates, U.S. Census Bureau.

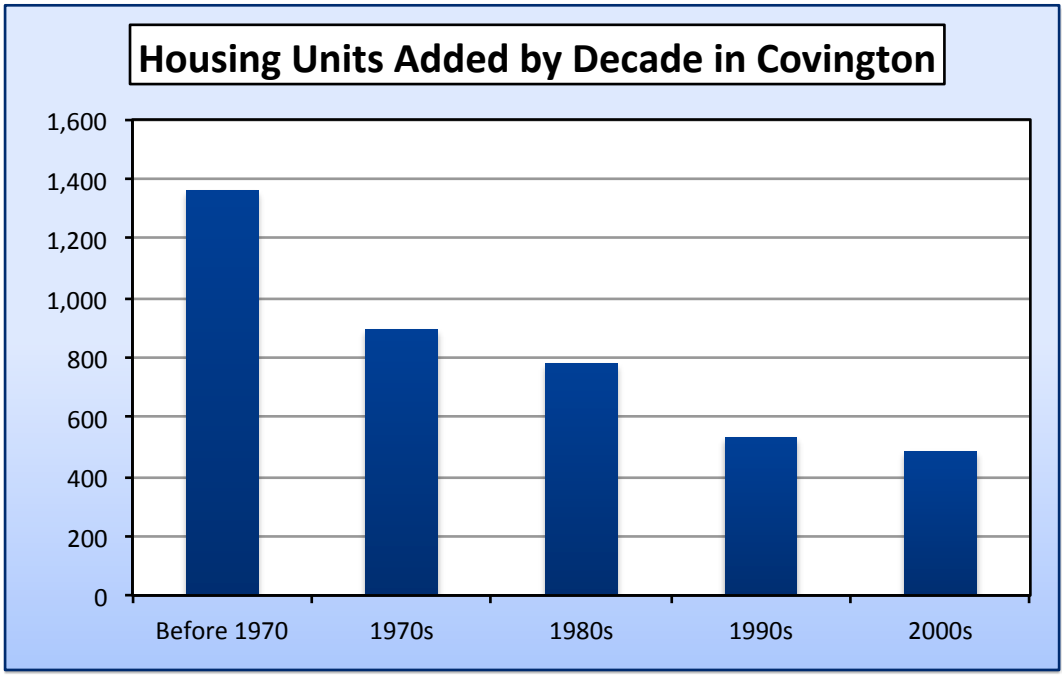
Recent Residential Construction

From 2000-2010 the number of housing units in Covington increased by an average of 48 units per year. The chart at the bottom of Figure A6 indicates the estimated number of housing units added by decade in Covington.

Figure A6 – Housing Units by Decade

2010 Population[1]	8,765
2010 Housing Units[1]	4,048
Total Housing Units in 2000[1]	3,565
New Housing Units	483

From 2000 to 2010, Covington added an average of 48 housing units per year.



1. U.S. Census, 2010, SF1.

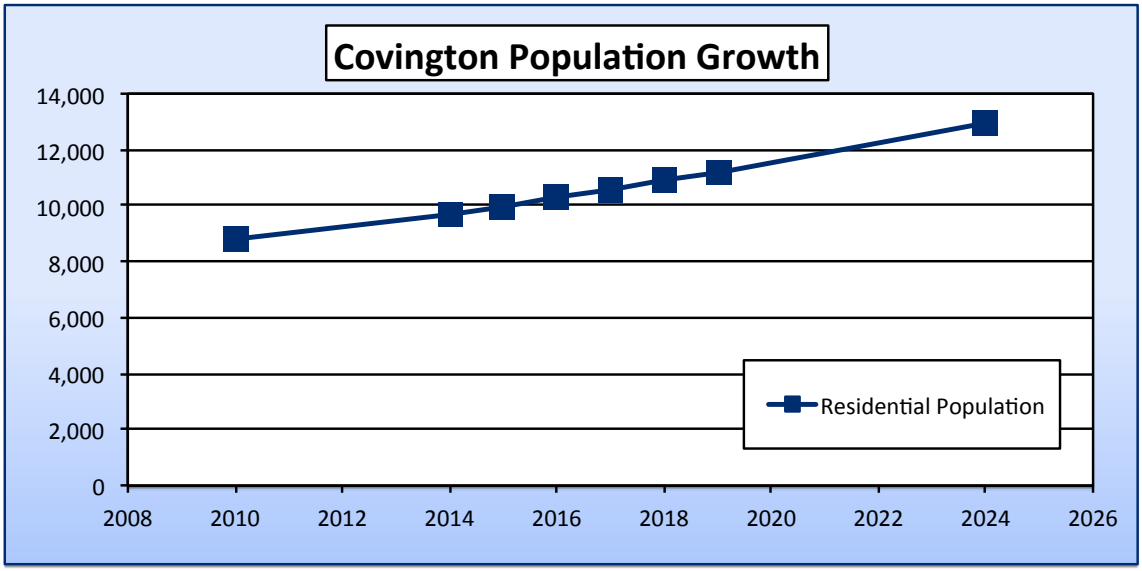
Source for 1990s and earlier is Table B25034, American Community Survey (2008-2012) scaled to equal total housing units in 2000.

Residential Development Forecast

Figure A7 displays total population projections (including persons in group quarters) for Covington based on the 2010 U.S. Census estimate. The projections are tied to housing unit growth with a fixed persons per housing unit ratio of 2.19 – the 2012 ACS average persons per housing unit in Covington. The corresponding population growth rate is 2.91% from 2014 to 2024.

Figure A7 – Total Population Projections

	2010	2014	2015	2016	2017	2018	2019	2024
Population[1]	8,765	9,679	9,968	10,266	10,572	10,887	11,211	12,981



1. 2010 population estimate from 2010 U.S. Census.

Figure A8 shows the projected population and housing units in Covington from 2014 to 2024. The growth rate of 2.91% (derived from 2011 through September of 2014 housing unit growth) is used to estimate housing units through 2024. Total housing unit numbers shaded in yellow are based on annual new housing units provided by the City of Covington added to the 2010 U.S Census housing unit estimate. In 2012, persons per housing unit in Covington equaled 2.19. Next, the annual housing unit increase is multiplied by the persons per housing unit ratio of 2.19 to project population. Projected housing units by type use the 2012 ACS housing unit mix – 82.4% single units and 17.6% units in structures with two or more units.

Figure A8 – Projected Residential Population and Housing Units

	2014	2015	2016	2017	2018	2019	2024
	Base	1	2	3	4	5	10
Population[1]	9,679	9,968	10,266	10,572	10,887	11,211	12,981
Annual Population Increase		289	298	306	315	324	374
Total Housing Units[2]	4,540	4,672	4,808	4,948	5,092	5,240	6,048
Single Family[3]	*3,740*	*3,849*	*3,961*	*4,076*	*4,195*	*4,317*	*4,982*
Multi-Family[3]	*800*	*823*	*847*	*872*	*897*	*923*	*1,066*
Annual Housing Unit Increase		123	132	136	140	144	166

1. 2014 population estimate, Treasurer of the State of Louisiana.
2. 2014 housing unit estimate based on 2010 U.S. Census housing units and 2011-2014 building permits. 2010-2014 growth rate of 2.91% used for projections.
3. Units allocated based on 2008-2012 ACS estimates.

NON-RESIDENTIAL DEVELOPMENT

Jobs by Type of Nonresidential Development

Figure A9 indicates Covington's 2011 job estimate and nonresidential floor area, estimated using square feet per employee multipliers obtained from the Institute of Transportation Engineers (ITE 2012)—Figure A 9 below. The prototype for commercial is an average-size shopping center (ITE 820). For office & other services, the development prototype is an average-sized office (ITE 710). For institutional, the prototype is an elementary school (ITE 520), and the prototype development for industrial jobs is light industrial (ITE 110). General land use types are based on two-digit industry sectors, with the percentage distribution of jobs by type of development from U.S. Census Bureau's OnTheMap web application.

As shown below, in 2011 there were 17,099 jobs in Covington and approximately 11.7 million square feet of nonresidential floor area.

Figure A9 – Jobs and Floor Area Estimate

	2011 Jobs[1]	% of Total	Sq Ft per Job[2]	Floor Area
Commercial[3]	2,083	12%	500	1,041,500
Office & Other Services[4]	5,620	33%	301	1,691,605
Institutional[5]	8,313	49%	1,018	8,463,852
Industrial[6]	1,083	6%	433	469,248
Total	**17,099**	**100%**		**11,666,205**

1. 2011 job estimates from the U.S. Census Bureau's OnTheMap web application.
2. Trip Generation, Institute of Transportation Engineers, 9th Edition (2012).
3. Major sectors are Restaurant and Retail.
4. Major sectors are Service and Entertainment.
5. Major sector is Education.
6. Major sector is Production.

Figure A10 – Employee and Building Area Ratios

ITE Code	Land Use / Size	Demand Unit	Wkdy Trip Ends Per Dmd Unit*	Wkdy Trip Ends Per Employee*	Emp Per Dmd Unit**	Sq Ft Per Emp
Commercial / Shopping Center						
820	**Shopping Center (avg size)**	**1,000 Sq Ft**	**42.70**	**na**	**2.00**	**500**
General Office						
710	**General Office (avg size)**	**1,000 Sq Ft**	**11.03**	**3.32**	**3.32**	**301**
Other Nonresidential						
770	Business Park***	1,000 Sq Ft	12.44	4.04	3.08	325
760	Research & Dev Center	1,000 Sq Ft	8.11	2.77	2.93	342
610	Hospital	1,000 Sq Ft	13.22	4.50	2.94	340
565	Day Care	student	4.38	26.73	0.16	na
550	University/College	student	1.71	8.96	0.19	na
540	Community College	student	1.23	15.55	0.08	na
530	High School	1,000 Sq Ft	12.89	19.74	0.65	1,531
520	**Elementary School**	**1,000 Sq Ft**	**15.43**	**15.71**	**0.98**	**1,018**
254	Assisted Living	bed	2.66	3.93	0.68	na
620	Nursing Home	1,000 Sq Ft	7.60	3.26	2.33	429
320	Motel	room	5.63	12.81	0.44	na
110	**Light Industrial**	**1,000 Sq Ft**	**6.97**	**3.02**	**2.31**	**433**
130	Industrial Park	1,000 Sq Ft	6.83	3.34	2.04	489
140	Manufacturing	1,000 Sq Ft	3.82	2.13	1.79	558
150	Warehousing	1,000 Sq Ft	3.56	3.89	0.92	1,093

*Trip Generation, Institute of Transportation Engineers, 9th Edition (2012).

**Employees per demand unit calculated from trip rates, except for shopping center data, which are derived from Development Handbook and Dollars and Cents of Shopping Centers, published by the Urban Land Institute.

***According to ITE, a Business Park is a group of flex-type buildings served by a common roadway system. The tenant space includes a variety of uses with an average mix of 20-30% office/commercial and 70-80% industrial/warehousing.

Nonresidential Development Forecast

Figure A11 displays projected jobs and nonresidential floor area in Covington from 2010 to 2024. Shaded in yellow, the 2010 and 2011 jobs estimates are from OnTheMap – the U.S. Census Bureau's web application. Compound annual growth rates were calculated for each of the four nonresidential jobs types (commercial, office & other services, institutional, and industrial) based on job growth from 2004 through 2011. This time span allows the sharp employment changes due to Hurricane Katrina and the recession to be averaged with the Covington's moderate growth rate. Square footage projections were calculated by multiplying jobs estimates by ITE multipliers.

Figure A11 – Projected Jobs and Nonresidential Floor Area

	2010	2011	2014	2015	2016	2017	2018	2019	2024
Jobs			**Base**	**1**	**2**	**3**	**4**	**5**	**10**
Commercial	1,506	2,083	2,192	2,229	2,267	2,306	2,345	2,385	2,596
Office & Other Services	5,370	5,620	6,173	6,370	6,572	6,781	6,997	7,220	8,443
Institutional	8,159	8,313	8,736	8,882	9,030	9,180	9,334	9,489	10,308
Industrial	944	1,083	1,132	1,149	1,166	1,183	1,201	1,218	1,311
Total Jobs	**15,979**	**17,099**	**18,233**	**18,629**	**19,035**	**19,451**	**19,876**	**20,313**	**22,658**
Annual Job Increase			**387**	**396**	**406**	**416**	**426**	**436**	**492**

	2010	2011	2014	2015	2016	2017	2018	2019	2024
Nonres Sq Ft in 1000s (KSF)			**Base**	**1**	**2**	**3**	**4**	**5**	**10**
Commercial[1]	753	1,042	1,096	1,115	1,134	1,153	1,173	1,193	1,298
Office & Other Services[1]	1,616	1,692	1,858	1,917	1,978	2,041	2,106	2,173	2,541
Institutional[1]	8,307	8,464	8,894	9,043	9,194	9,347	9,503	9,661	10,495
Industrial[1]	409	469	490	498	505	513	520	528	568
Total	**11,085**	**11,666**	**12,339**	**12,572**	**12,811**	**13,054**	**13,302**	**13,555**	**14,902**
Annual Nonres Floor Area Increase (KSF)			**229**	**233**	**238**	**243**	**248**	**253**	**281**

1. Nonresidential square footage calculated by multiplying jobs by ITE multipliers.

DETAILED DEVELOPMENT PROJECTIONS

Demographic data shown in Figure A12 provides key inputs for developing capacity charges in Covington. Cumulative data are shown at the top of the table and projected annual increases by type of development are shown at the bottom of the table.

Figure A12 – Annual Demographic Data

	2014	2015	2016	2017	2018	2019	2024	2029	2034	20-Year
	Base Yr	1	2	3	4	5	10	15	20	Increase
Population	9,679	9,968	10,266	10,572	10,887	11,211	12,981	15,023	17,381	**7,702**
Housing Units										
Single-Family Detached	3,740	3,849	3,961	4,076	4,195	4,317	4,982	5,750	6,637	**2,897**
Multi-Family	800	823	847	872	897	923	1,066	1,230	1,420	**620**
Total Housing Units	**4,540**	**4,672**	**4,808**	**4,948**	**5,092**	**5,240**	**6,048**	**6,980**	**8,056**	**3,516**
Jobs	18,233	18,629	19,035	19,451	19,876	20,313	22,658	25,307	28,303	**10,071**
Nonres Sq Ft in 1,000s (KSF)										
Commercial	1,096	1,115	1,134	1,153	1,173	1,193	1,298	1,413	1,538	**442**
Office & Other Services	1,858	1,917	1,978	2,041	2,106	2,173	2,541	2,972	3,475	**1,617**
Institutional	8,894	9,043	9,194	9,347	9,503	9,661	10,495	11,400	12,383	**3,488**
Industrial	490	498	505	513	520	528	568	612	658	**168**
Total KSF	**12,339**	**12,572**	**12,811**	**13,054**	**13,302**	**13,555**	**14,902**	**16,396**	**18,054**	**5,715**
Avg Sq Ft Per Job	677	675	673	671	669	667	658	648	638	

Annual Increase	**14-15**	**15-16**	**16-17**	**17-18**	**18-19**	**23-24**	**28-29**	**33-34**	**2014-34 Avg Anl**
Population	289	298	306	315	324	374	432	499	**385**
Housing Units	132	136	140	144	148	171	197	228	**176**
Jobs	396	406	416	426	436	492	556	629	**504**
Commercial KSF	19	19	19	20	20	22	24	26	**22**
Office & Other Services KSF	59	61	63	65	67	78	92	107	**81**
Institutional KSF	148	151	153	156	159	172	187	203	**174**
Industrial KSF	7	7	7	8	8	8	9	10	**8**
Total KSF	233	238	243	248	253	281	311	346	**286**