

Metro South Chamber of Commerce

Metro South Economic Development Opportunities from Sewer Infrastructure



Final Report

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1 Introduction

1.1 Background and Purpose

Economic development and infrastructure are closely linked, and in some cases, a lack of proper infrastructure can act as a constraint to development. Throughout Massachusetts, the provision of sewer infrastructure is inconsistent, with smaller cities and towns often lacking sewer connections which can inhibit business and residential development opportunities.

Whereas the city of Brockton operates a large Advanced Water Reclamation Facility (AWRF) to handle local sewer needs, surrounding towns in the Metro South area largely rely on septic systems for their wastewater disposal. The lack of sewer infrastructure in these surrounding towns limits commercial and industrial development potential. To boost local economic development, these towns, including Avon, Easton, East Bridgewater, and West Bridgewater, are interested in gaining access to sewer infrastructure. But this form of infrastructure can be costly and environmentally challenging for individual towns.

Based on the physical capacity of the AWRF to treat sewerage, towns like these are interested in establishing sewer sharing agreements and new physical sewer pipeline connections with the city of Brockton. On the one hand, relative to the AWRF's total capacity, the sewer needs of these surrounding towns are relatively modest, and our study demonstrates the potential to implement and advance smaller-scale sharing agreements. On the other hand, Brockton's AWRF is constrained by the flow (discharge) allowable by the U.S. Environmental Protection Agency (EPA) and based on the latest 12-month data available, about 93 percent of capacity is being used. This means that there is not a large amount of excess capacity, and the region may need to explore other options to expand sewer infrastructure to realize its economic development opportunities.

Businesses, regional economic development groups, and town officials have been interested in establishing sewer connections for many years. In 2015, the Metro South Chamber of Commerce commissioned the UMass Donahue Institute to develop an investigative analysis into the potential for a regional sewer authority. The report concluded that there are numerous economic development opportunities, cost reductions, and environmental benefits that could come from regional sewer expansion. Despite these optimistic findings, there has been little development in sewer capacity sharing in the region. Brockton has generally resisted sewer capacity sharing agreements due to limited excess capacity at its facility and concerns that the expansion into other towns would limit its own development and growth potential.

Given this context, the purpose of this study is to provide updated analysis of the regional economic development opportunities from sewer capacity sharing or expansion in the Metro South region. Critical to this analysis is an understanding about the current capacity and usage of the AWRF as well as wastewater flow demand in the surrounding towns. The focus of the study findings is driven by an assessment of the development opportunities sewer capacity could create in terms of new building area and jobs, as well as the

regional economic impacts associated with the agreements. This study focuses on four commercial and industrial development areas in adjacent towns that could benefit from establishing sewer sharing connections with Brockton and/or access to other sewer infrastructure:

- Avon Industrial Park
- Easton Industrial Park
- East Bridgewater – North Bedford Street Sewer District
- West Bridgewater – Route 28 commercial zone

2 Sewer Treatment Capacity and Demand

2.1 Brockton AWRF Capacity and Current Use

Brockton’s AWRF is currently permitted for a 12-month rolling average of 18 million gallons per day (MGD) and used 16.8 MGD (93 percent) in the latest 12-month period of data. Since 2008, the city has only exceeded that permitted amount once, in 2018 (see Table 1). On average over the past 15 years, the city has used 16 MGD, leaving 2 MGD in excess capacity.

Table 1 Brockton Sewer Usage Compared to Permitted Flow

Date	12 Month Rolling Average Flow (MGD)	Difference from Permitted Flow (18 MGD)
12/08	17.8	0.2
11/09	17.3	0.7
11/10	16.2	1.8
10/11	14.3	3.7
11/11	14.9	3.1
11/12	13.4	4.6
11/13	15.1	2.9
11/14	15.1	2.9
11/15	16.5	1.5
11/16	13.8	4.2
11/17	16.4	1.6
11/18	19.1	-1.1
11/19	17	1
11/20	15.8	2.2
5/22*	16.8	1.2
Average	16.0	2.0

* Covers the period of 2021

Source: Brockton Flow Information Updates, US EPA data provided by MassDEP

Brockton’s AWRF is capable of treating 20.5 MGD of flow and has applied in the past to expand its allowable discharge flows from 18 MGD to match its physical treatment capacity. However, all indications from MassDEP and the city of Brockton are that it’s unlikely that EPA will approve additional flow as they are stringent about this environmental impact and its potential implications to the Taunton River watershed. In discussions with Brockton’s DPW, it’s also understood that the city has some hesitancy to pursue new intermunicipal agreements (IMAs) for sewer sharing as planned and potential future growth in the city (including significant downtown redevelopment current underway) could lead to flow amounts that (over time) reach allowable limits.

Effluent Discharge and Groundwater Recharge

Another possible pathway to expand capacity is to create effluent discharge beds to handle higher levels of flows. According to Brockton and a 2017

technical memorandum by Tighe & Bond , for every 1 MGD of flow, there needs to be approximately a 5.7 acre site for groundwater recharge. The 2017 study for Brockton explored the potential to find land sites that could be used as discharge beds which would align with a flow increase of 2.5 MGD (reaching AWRF's 20.5 MGD capacity). According to that technical memo,

“permitting is regulated at the state level through the Massachusetts Department of Environmental Protection (MassDEP) under the Groundwater Discharge Permit Program (314 CMR 5.0). Finding additional effluent disposal options could allow the AWRF to handle flows up to the average day design flow of 20.5 million gallons per day (MGD). The NPDES permit currently limits the average day discharge to 18.0 MGD.

Groundwater recharge entails distributing AWRF effluent over a land area and allowing the effluent to infiltrate into the ground. Successful groundwater recharge requires a large dedicated land area and suitable conditions for the water to infiltrate through the unsaturated zone and be assimilated into the underlying aquifer.”

The 2017 study identified multiple sites of approximately 5 to 15 acres that met various criteria as good candidates for discharge beds and suggested the City and town partners investigate the sites further for potential options. As noted by Brockton, these discharge beds do not need to physically be in Brockton (and sites were explored in West Bridgewater) so a potential path forward would be via sites in adjacent towns seeking sewer connections.

2.2 Regional Sewer Demand

Relative to the Brockton's usage and capacity, the sewer demand connected to specific development opportunities in surrounding towns is relatively modest.

- According to the 2013 Community Wastewater Needs report, Avon Industrial Park along with a few other businesses on Bodwell Street, use 0.100 MGD of wastewater flow. While the industrial park is effectively built-out given the current site limitations, access to sewer would open up opportunities for expansion such as transitioning to a different mix of commercial/office users and adding multiple story buildings. This expansion, along with the potential to develop other land across the street near the existing IKEA and Home Depot, would increase wastewater flow demand. In 2013, Avon completed a feasibility study for a localized sewer district to serve Avon Industrial Park (in place of a capacity sharing agreement). The proposed facility would accommodate up to about 0.250 MGD.
- Easton Industrial Park's current average daily wastewater flow is about 0.032 MGD. The town is interested in a sewer capacity of up to 0.100 MGD from Brockton's AWRF to support expansion and new business opportunities in the industrial park.
- A sewer sharing agreement between the Brockton and East Bridgewater is currently being finalized to support the North Bedford Street Sewer District. The agreement stipulates that East Bridgewater will receive up to 0.075 MGD in wastewater flow to support its planned development opportunities in the sewer district.

- Similar data are not available for West Bridgewater as the commercial zone in West Bridgewater is not included in the Community Wastewater Needs report. However, the report uses 600 GPD per acre as an estimate when data are not available. Based on this assumption, the commercial district along Route 28 identified by West Bridgewater as a possible future sewer district totals about 58 acres and thus would need about 0.030 MGD of wastewater flow.

In total, the four commercial and industrial areas identified in this study would require up to 0.455 MGD to support current business activity as well as future expansion. In 13 of the last 15 years, Brockton's AWRF had enough excess capacity to support this amount of wastewater flow. On average, the facility has an excess capacity over four times this amount of flow (2 MGD).

3 Site-Level Economic Opportunity

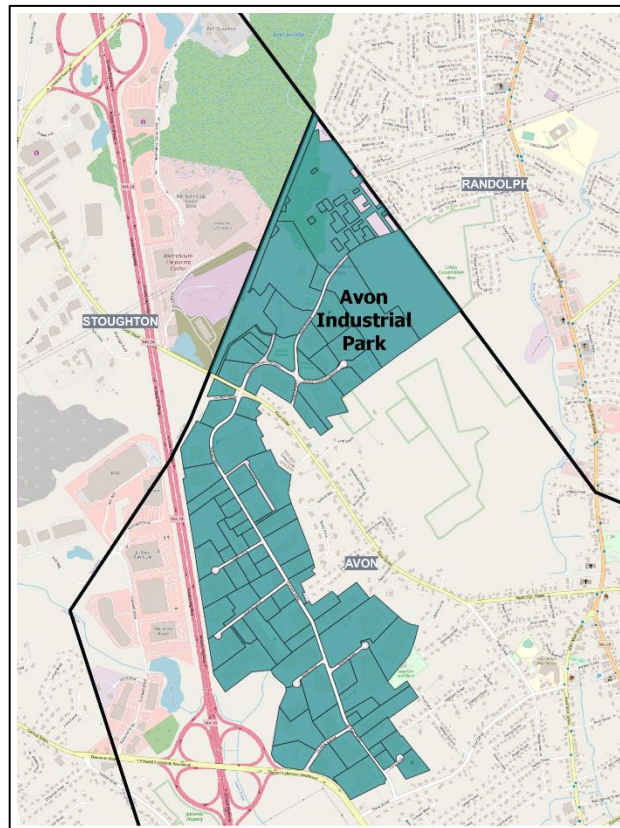
This section of the report provides detailed assessments of the economic development opportunities in the four identified industrial parks and commercial districts that could benefit from access to sewer infrastructure. In each case, we apply a bottoms-up approach that examines and estimates the parcel level (or land area) development opportunity and converts that into building square feet (SF) by use and then jobs. These specific development areas are then aggregated (by industry and use) as inputs to a regional economic impact analysis to quantify the Metro South region economic opportunities of expanded sewer infrastructure in terms of jobs, wages and business output.

3.1 Avon Industrial Park

Existing Conditions

The industrial park on Bodwell Street borders Stoughton and Randolph. The park currently hosts over 80 properties (see Figure 1 Avon Industrial Park MapFigure 1). Businesses in the park include manufacturing, construction, research, distribution, retail, technology and non-profit organizations.

Figure 1 Avon Industrial Park Map



Source: Cambridge Econometrics using assessor's data and Avon Feasibility Study

Building Development Opportunity

The industrial park currently includes about 3.3 million SF of commercial and industrial buildings. An estimated 50 percent of these buildings could add an extra story in the next 50 years, adding 1.6 million SF. Scaling this estimate to a shorter time scale, we estimate about 450,000 SF could be added in the next 12-15 years.

Jobs To estimate the number of new jobs supported by this expansion, we use the 500 SF per employee estimates for industrial parks from the Institute of Transportation Engineering (ITE). We then apply this estimate to the additional square footage estimate (450,000), yielding an estimated 900 additional jobs in the park which would likely be spread across industry sectors include office, light industrial, warehousing and other mixed business uses.

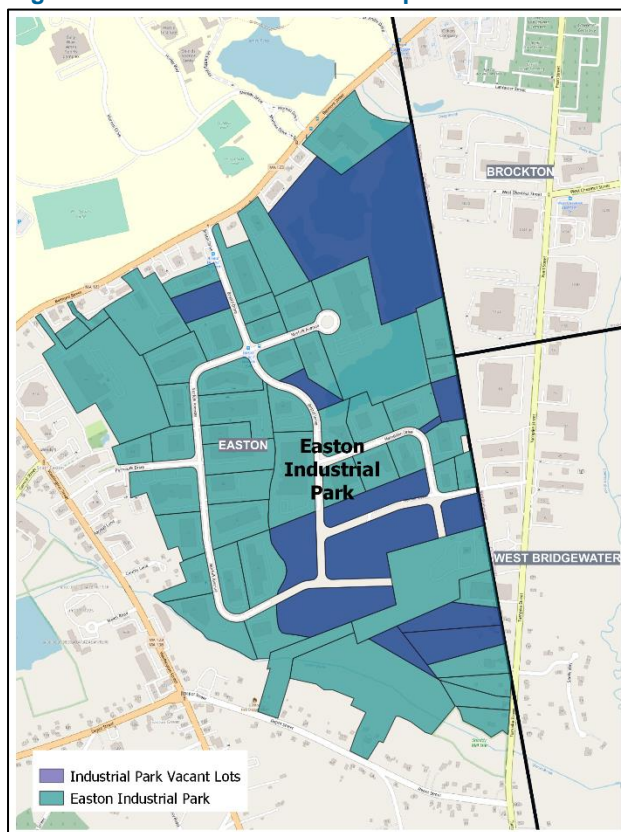
3.2 Easton Industrial Park

Existing Conditions

Easton Industrial Park encompasses over 200 acres of industrially zoned parcels on the border with Brockton and West Bridgewater. A portion of the park land development is constrained by ponds and wetlands. As seen in Figure 2, some parcels remain vacant. In non-vacant parcels, buildings are an average of 7,955 square feet per acre of land with some opportunities for building and business expansion on some sites. Like most of the town, the industrial park relies on private on-site subsurface septic for wastewater disposal.

Easton has proposed an Intermunicipal Agreement (IMA) to establish a sewer connection with the town of Brockton for up to 0.1 MGD. The proposal includes a possible sewer collection system in the Industrial Park that would send wastewater flow to the Brockton system via Pearl Street to the Coweaset Brook Pump Station. According to the Easton Industrial Park Study in 2014, the connection with Brockton’s wastewater system was estimated to cost \$11.57 million.

Figure 2 Easton Industrial Park Map



Source: Cambridge Econometrics using assessor’s data and documents provided by the town of Easton

Building Development Opportunity

Ten parcels in the Industrial Park have been identified to have development, redevelopment, or growth potential. Together, these parcels total in 48 acres of land and have existing structures totaling 163,038 SF. Multiplying the total acres with development potential (48) by the average building size per acre (7,955 SF) and subtracting the existing building square footage (163,038) yields an estimated 219,984 SF of potential new building development for new or expanded businesses.

Jobs

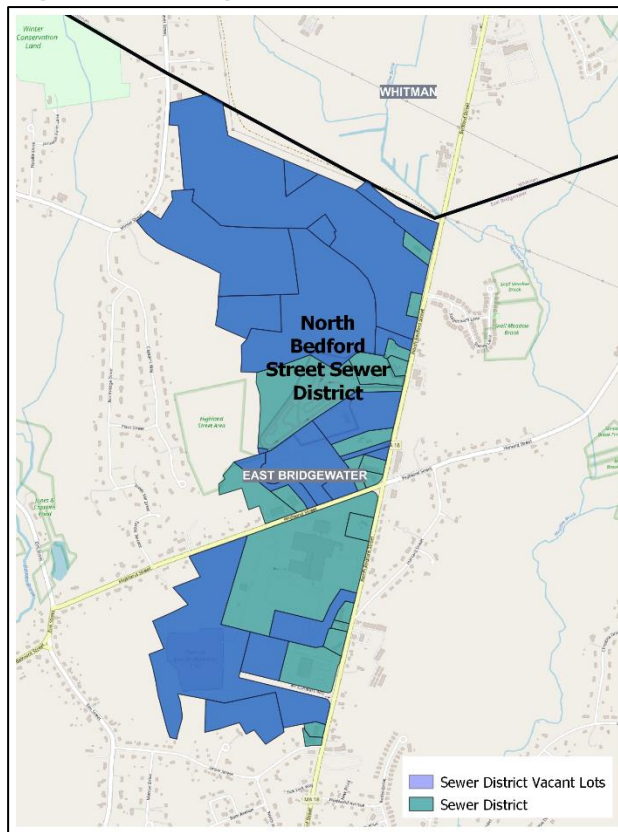
Additional employment at the Easton Industrial Park can be estimated based on the potential new SF of development, the assumed mix of uses, and the approximate SF per employee for different business uses. Working from the ITE study and experiences from other industrial parks, we estimate SF per employee of 2,200 for warehousing and 850 SF per employee for light industrial. Next, maintaining consistent shares of building SF for warehousing versus light industrial as current industrial park uses results in 11 percent warehousing and 89 percent non-warehousing/light industrial. Based on this information, we estimate approximately 240 additional jobs that could be supported by a sewer infrastructure expansion connection in Easton Industrial Park. Most of these jobs (96 percent) would be in light industrial while the remaining 4 percent would be in warehousing.

3.3 East Bridgewater - North Bedford Street Sewer District

The North Bedford Street Sewer District in East Bridgewater includes over 350 acres of land along Route 18 (see Figure 3). Municipal sewer is not currently available to any of the businesses in the district, so businesses in the area rely on septic for wastewater needs. Soil and groundwater conditions in the town are generally not conducive to septic, leading to high rates of septic failure and posing an obstacle to commercial development.

To remedy the issue, East Bridgewater completed a sewer sharing agreement with the city of Brockton for 75,000 GPD of wastewater flow. The agreement was approved by the city and town, and East Bridgewater is negotiating development agreements with landowners in the area. If the development agreements are approved, the town hopes to begin construction in early 2023. East Bridgewater would be solely responsible for the costs associated with the sewer expansion and connection project, as well as repair and upkeep to infrastructure.

Figure 3 East Bridgewater Sewer District Map



Source: Cambridge Econometrics using assessor data and documents provided by the town of East Bridgewater

Building Development Opportunity

The wastewater infrastructure in the new sewer district is expected to support industrial, medical, and residential uses. About 37 acres are planned for industrial uses. To estimate the future square footage of industrial buildings in the area, we use the average SF of buildings per acre from the Easton Industrial Park as a reference (about 8,000 SF per acre). Applying this to the 37 acres yields an estimated 300,000 additional SF of buildings.

Additionally, about 112 acres will be developed as part of a medical campus. Some of these parcels have existing medical facilities while others are undeveloped. To estimate the future building area on these parcels, we calculate the SF per acre on developed parcels and apply that to undeveloped areas. To account for the expansion opportunity as a result of sewer infrastructure, we multiply these estimates by 150 percent. Ultimately, we estimate that these 112 acres could host an estimated 470,000 SF of new buildings, in addition to the 170,000 SF of existing structures.

Jobs

We estimate new job growth based on the expected square footage of development. Like Easton, we use SF per employee estimates of 2,200 and 850 for warehousing and light industrial, respectively. To estimate future industrial uses, we applied a simplifying assumption that the additional 300,000 SF for industrial purposes is divided evenly among warehousing and light industrial, resulting in approximately 67 new jobs in warehousing and 175 in light industrial. For medical facilities, we use the Department of Energy's SF for employee estimate of 486. Dividing the additional square footage for medical facilities (470,000) by this estimate yields about 970 new jobs. In total, the sewer connection is estimated to have the potential to generate and sustain over 1,200 jobs in the district.

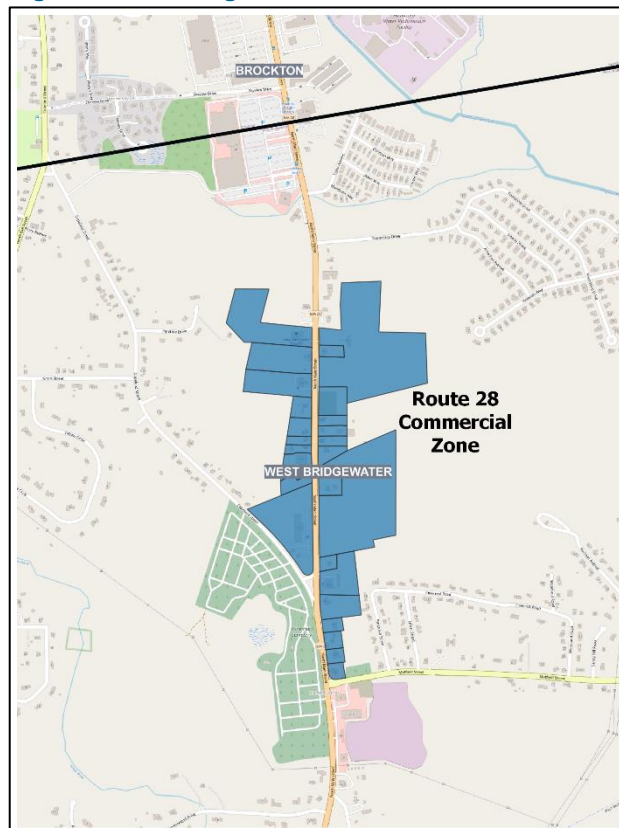
The sewer district will also host a large housing development. The development will include 240 housing units with a total of about 560 bedrooms, adding an estimated 590 new residents to the area. As a result of this project, we estimate an additional 330 construction jobs will be supported while the building is underway (direct, non-permanent jobs, not including indirect and induced impacts).

3.4 West Bridgewater Route 28 Commercial Zone

Like many towns in the area, the vast majority (95 percent) of West Bridgewater depends on private septic for wastewater disposal.¹ However, some parcels just to the south of the AWRF already have a sewer connection. These parcels include some residential homes, two manufactured housing parks, as well as some businesses, including a McDonald’s Restaurant and Shaw’s shopping center.

West Bridgewater has identified a commercially zoned corridor along Route 28 that could benefit from sewer infrastructure. This area is located just south of the currently sewered area and about a mile from the AWRF (see Figure 4). The expansion would extend south to Copeland Street or as far down as Matfield Street. Examining the relevant parcels in detail reveals a total of 58 acres which could be developed with sewer expansion. Businesses along this stretch encompass various commercial, industrial, and retail uses, including auto shops, restaurants, convenient stores.

Figure 4 West Bridgewater Route 28 Commercial Zone Map



Source: Cambridge Econometrics using assessor data and area description provided by David Gagne, the town administrator of West Bridgewater

¹ CDM Smith and Weston & Sampson, 2013. Community Wastewater Needs Report

Building Development Opportunity

To estimate the scale of building development opportunities in this potential sewer district, we apply the average building area per acre from existing buildings (about 3,600 SF) to the acres that could be developed. With sewer infrastructure, this area could experience a greater density of uses. To account for this growth, we scale the current SF per acre by 150 percent. This calculation yields a total square footage of about 317,000, including about 234,000 square feet of new area.

The current distribution of the existing building area across business uses is as follows:

- Retail – 85 percent
- Light industrial – 11 percent
- Restaurant – 5 percent

Jobs

Assuming that the new development follows the same distribution across existing uses (e.g., 85 percent retail) and applying industry averages of SF per job in light industrial (850 SF), retail (750 SF)², and for restaurants (100 SF)³ results in approximately 30 new jobs in light industrial, 264 in retail, and 109 in restaurants. In total, the sewer connection and subsequent economic development is estimated to generate and support over 400 jobs in this commercial and industrial district.

² This is an average of the Institute for Transportation's square foot per employee estimates for Specialty Retail, Discount Store, and Hardware Store.

³ This is an average of the Institute for Transportation's square foot per employee estimates for Quality Restaurant (Sit Down), High Turnover (Sit Down), Fast Food without Drive Thru, and Fast Food with Drive Thru.

4 Regional Economic Impacts

The development opportunities compiled in the previous section represent direct economic impact potential of sewer expansion for the Metro South region (in towns adjacent to Brockton). In this section, we estimate the region-wide economic development opportunities stemming from those direct impacts. This analysis incorporates a broader view of economic opportunity reflecting multiplier effects of spending by new/expanded businesses and the wage and income spending from job growth.

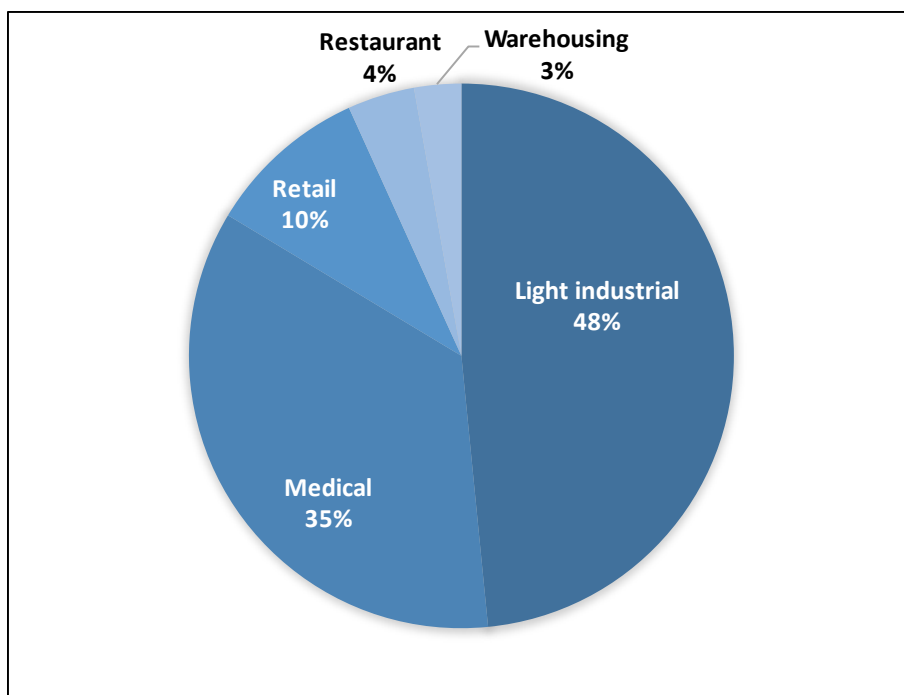
To estimate the potential regional economic gains for the Metro South region that could result from sewer infrastructure capacity and connections, we applied the RIMS II input-output model from the U.S. Bureau of Economic Analysis.⁴ The model is customized to the southeastern counties of Massachusetts and provides estimates for direct, indirect, induced, and total impacts.

- **Direct** impacts reflect the increase in jobs and associated business activity as a direct result of potential sewer connections (as profiled above for Avon, Easton, East Bridgewater and West Bridgewater)
- **Indirect** impacts stem from the increased demand for supply chain components and inputs
- **Induced** impacts arise as workers spend their additional earning on goods and services in the economy
- **Total** impacts are the sum of all three impact categories, with total impacts divided by direct representing the ‘multiplier’ effect

The development potential of the industrial parks and commercial districts studied in relation to sewer infrastructure expansion is estimated to generate approximately 2,800 new jobs through direct impacts. Based on existing industrial and commercial uses, the expanded business and job opportunities in these four areas are split between light industrial (almost half), medical services (about 35 percent) along with retail, warehousing and restaurant (see Figure 5).

⁴ See <https://apps.bea.gov/regional/rims/rimsii/> (configured for the counties of Bristol, Norfolk and Plymouth counties)

Figure 5 Additional jobs from direct impacts by type



Source: Cambridge Econometrics

As this increase in labor demand catalyzes spending in other sectors, another 2,400 jobs would be added to the region through indirect and induced impacts. In addition to jobs, the sewer expansion would lead to increased business output (sales) and earnings for regional workers. As seen in Table 2, as a result of this economic development opportunity, the region could see a \$1.6 billion increase in output. Wage earnings for regional workers could increase by \$327 million.

In total, expanding the sewer infrastructure and connections in these areas could lead to an estimated 5,100 new regional jobs. This economic development potential is projected for roughly 2027, about 15 years from now, as it would take time to develop expanded sewer infrastructure and connections, market sites for development, attract new businesses, etc. Of note, this estimate does not include the short-term economic gains of constructing expanded sewer infrastructure, which could result in additional construction and engineering-related economic activity.

Table 2 Regional economic impacts of sewer infrastructure expansion

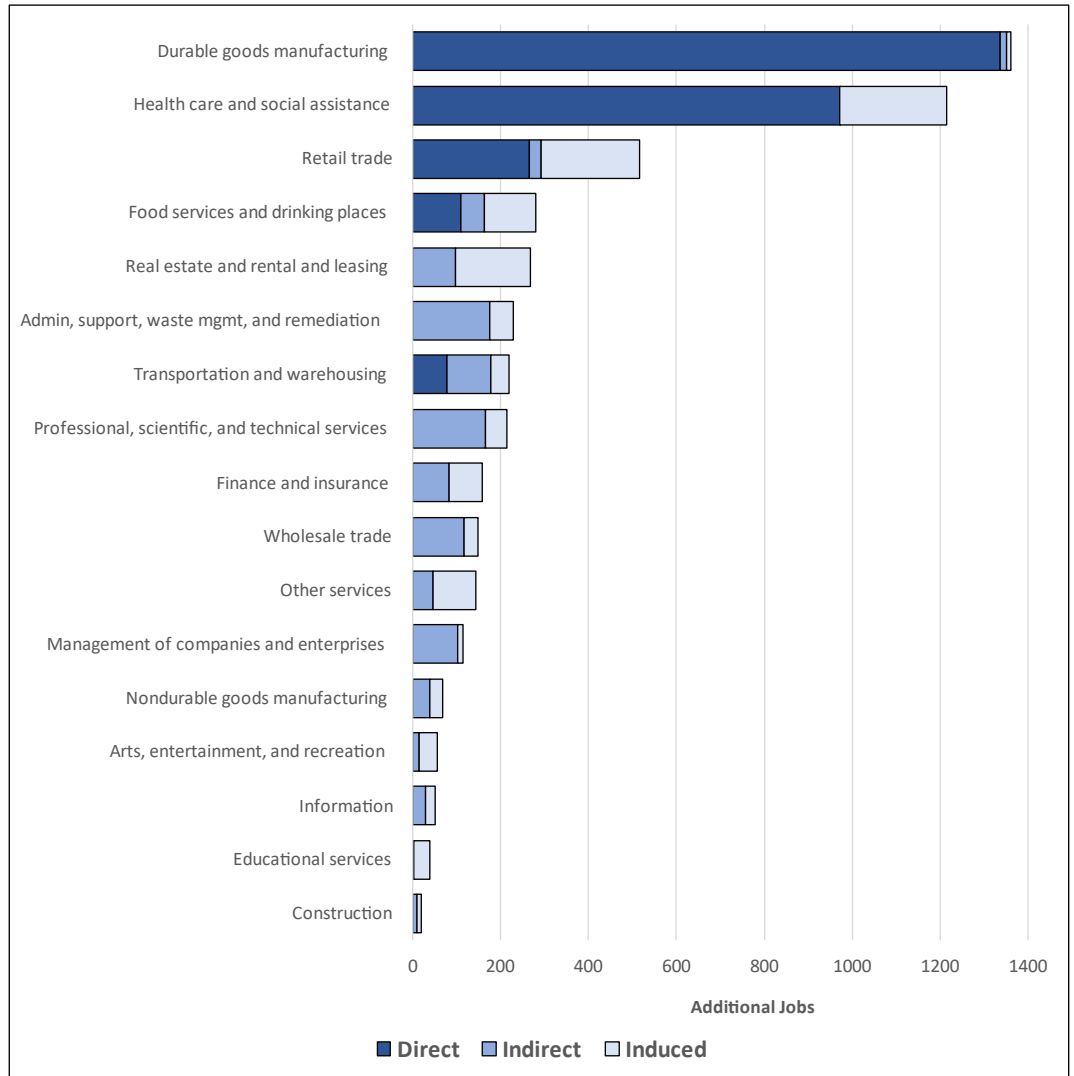
	Jobs	Output (millions)	Earnings (millions)
Direct	2,760	\$1,007	\$194
Indirect	1,090	\$324	\$76
Induced	1,296	\$252	\$57
Total	5,146	\$1,583.4	\$327.3

Source: Cambridge Econometrics using BEA’s RIMS II multipliers

Figure 6 summarizes the regional job impacts as a result of new sewer capacity, including direct, indirect, and induced labor impacts. New jobs through direct impacts are primarily in manufacturing, and health care and social assistance sectors, which also host the most overall new jobs. Jobs

created through indirect impacts are spread throughout various sectors, with the largest increases in the administrative, support, waste management, and remediation services and professional, scientific, and technical services sectors. Induced impacts are largest in the health care and social assistance and retail trade sectors.

Figure 6 Direct, indirect, and induced additional jobs by sector



Source: Cambridge Econometrics using BEA's RIMS II multipliers

5 Conclusion

The region could realize significant economic development benefits from expanding sewer access to Avon Industrial Park, Easton Industrial Park, North Bedford Street Sewer District, and the Route 28 commercial zone in West Bridgewater. These industrial and commercial areas would see an increase in about 2,800 jobs from direct impacts. But the entire region, not just these commercial areas, would experience economic development gains from expanded sewer infrastructure. Surrounding areas of the broader Metro South region (including the city of Brockton) would benefit from indirect and induced benefits, generating another 2,400 jobs. The estimated total regional economic development potential of expanding sewer infrastructure to these areas includes:

- Over 5,100 jobs in the Metro South region.
- Job impacts spread across key regional industries including manufacturing, health care, retail trade and local services, professional and business services, and transportation and warehousing.
- Wage earnings in the region would increase by about \$327 million and business output by \$1.6 billion.

One way to provide sewer infrastructure to these four commercial and industrial areas is through regional sewer connections with the AWRF in Brockton. Based on past wastewater flow relative to capacity, the AWRF could likely support the wastewater needs of these four areas. On average, the reclamation facility has an excess capacity about four times larger than the flow required to support these four commercial and industrial areas. While the new IMA with East Bridgewater for up to 75,000 GPD is well on its way, other opportunities in adjacent towns that can directly spur economic development should still be on the table. For example, Easton's 2020 proposed IMA with Brockton calls for up to 100,000 GPD but begins at a much lower volume (32,000 GPD) and is structured as a financial win for Brockton, which should allow for negotiation and win-win outcomes that support regional job growth.

All that said, in the latest 12-month period, the AWRF facility operated at about 93 percent of capacity and has relatively little excess capacity to realize planned and future development and expansion opportunities in currently sewer areas (e.g., redevelopment in downtown Brockton). This makes regional sewer solutions necessary to plan for regional growth.

To assuage these capacity concerns but still realize the economic development potential of sewer infrastructure, surrounding towns could explore other solutions to provide sewerage to commercial and industrial areas. One possible avenue is to create effluent discharge beds that allow AWRF to increase its allowable flow capacity. This solution could provide enough capacity to support development in Brockton as well as sewer connections providing flow to surrounding towns. This option, picking up on the 2017 initial site feasibility study for Brockton, should be further investigated. Alternatively, each town could create localized sewer districts to provide sewer capacity to industrial parks and commercial areas.

Finally, there are funding opportunities that can support these sewer expansion ideas, whether it be for towns building sewer connections, technical investigations of effluent discharge beds, or creating local sewer infrastructure. Most directly, Massachusetts has more capital funding (in 2022) than at anytime in recent memory. The MassWorks program as part of the Community One Stop for Growth⁵ suite of funding programs is probably the most obvious option related to sewer infrastructure. There are also increased levels of federal funding, with one viable option being the public works investment component of U.S. Economic Development Administration funding programs. Local and regional leaders in the Metro South region should proactively seek ways to align promising sewer expansion options to funding opportunities.

⁵ <https://www.mass.gov/guides/community-one-stop-for-growth>