

**TOWN OF JAMESTOWN RHODE ISLAND
DEPARTMENT OF PUBLIC WORKS**

**WATER DISTRICT
BUILD-OUT ANALYSIS**

Prepared for:

Town of Jamestown
Department of Public Works
93 Narragansett Avenue
Jamestown, RI 02835

Prepared by:



Pare Corporation
8 Blackstone Valley Place
Lincoln, RI 02865

DRAFT FINAL DRAFT

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Section 1 – Introduction

1.1 Project Purpose and Scope

This build-out analysis report has been prepared to reflect the most recent residential and commercial geographic information system (GIS) data that was used to determine the maximum potential future population growth over time under the current rules and regulations for the Town of Jamestown water district community.

The objective of this build-out analysis report is to get a sense of what the maximum potential future calculated population will be so that the Town of Jamestown can plan long-range goals for the water district community.

The last build-out analysis was conducted by the Town of Jamestown in the summer of 2010.

1.2 Assumptions and Considerations

The Town of Jamestown’s build-out analysis was conducted with the following assumptions and considerations:

1. The analysis is limited to the current limits of the water district, both the Rural District and the Urban District, where water mains currently exist. The analysis does not include any property north of the current Urban District. The limits of the Urban and Rural Districts are shown on Figure 1-1.
2. Existing dwellings in the Rural District that are connected to a private well will install a new well rather than tie into the water system, in the event that their current well becomes insufficient.
- ~~1.3.~~ Current zoning regulations are intact.
- ~~2.4.~~ The accessory dwelling units (ADUs) were determined based on any residential lot size in the water district greater than or equal to 20,000 square feet.
- ~~3.5.~~ Average household size is 2.34 persons per household for 2017 through 2021 (based on 2022 U.S. Census Bureau Data - American Community Survey (ACS)).
- ~~4.6.~~ An average of 15% of the land will be used for roads and infrastructure in subdivided residential area (this percentage was average for Jamestown subdivisions).
- ~~5.7.~~ Wetland property protected under the Wetlands Protection Act, enforced by regulations administered by the Rhode Island Department of Environmental Management (RIDEM), and shown on the Rhode Island Geographic Information Systems (RIGIS), will not be built upon.
- ~~6.~~ Extensions and connections into the Town of Jamestown’s water system are consistent with current regulations of the Board of Water and Sewer Commissioners.
- 8.



Figure 1-1: Public Water and Sewer Service Area



7.9. New residential development from urban and rural vacant lots were based on single family homes and ADUs throughout the entire water district. Developable sub-divided lots were calculated based on the minimum lot size for each vacant lot.

8.10. All dwelling units are constructed to be occupied year-round ~~and not seasonal~~.

9.11. Governmental demand will remain unchanged through build-out.

10.12. The assessors data used in this analysis is from October 2022.

1.3 Definitions

The following definitions may be useful in interpreting the build-out analysis:

Vacant - All land, urban or rural, that does not have any structures valued over \$10,000 and includes but is not limited to undeveloped residential and commercial lands, water bodies, agricultural land, recreation land, and open space lands.

Developable Land – All land that is currently not protected from development through deed restrictions, easements, or open space zoning and does not contain natural characteristics which would prohibit development (the presence of wetlands or constraints due to soil type).

Non-Vacant Developable Sub-Dividable Properties – Properties that have structures worth more than \$10,000 and have land in excess of two-times that required by zoning for the minimum lot size.

Accessory Dwelling Units – In January 2023, Rhode Island General Law 45-24, as amended and titled, “An Act Relating to Towns and Cities – Zoning Ordinances”, allows the owner to build an ADU on any lot with a total area of 20,000 square feet or more for which the primary use is residential and where the proposed ADU is located within the existing footprint of the primary structure or existing secondary attached or detached structure and does not expand the footprint of the structure.

Persons Per Household (PPH) – Equals the total 2022 population of Jamestown divided by the total occupied housing units (statistics from the 2022 U.S. Census Bureau-ACS).

Commercial – All commercial property and property which is partly commercial and partly residential. The commercial zones include commercial downtown (CD), commercial limited (CL), and commercial waterfront (CW). CD is Jamestown’s central business district. CL is the zone of Jamestown that transitions from strictly residential to commercial use areas. CW is the district that is intended to encourage water-dependent land uses.



Section 2 – Build-Out Analysis

The tables that follow show the results of residential and commercial build-out analysis, including projected future population growth within the service area, projected numbers of units, and total potential connections to the Town’s water service for water use projections. A build-out analysis reflects the greatest potential growth under the current regulatory framework (zoning and subdivision regulations). Other factors such as environmental and economic conditions influence land development and will ultimately influence the rate of population growth.

The build-out analysis is shown in detail on the spreadsheets and GIS figures provided in Appendix A. The tables presented below are a summary of the data and calculations provided in Appendix A.

2.1 Residential

The current minimum lot size for residential urban and rural single family property development are as follows:

Zone	Minimum Lot size (Square Feet)
R-8	8,000
R-20	20,000
R-40	40,000
RR-80	80,000

2.1.1 Vacant Property

The vacant developable properties were determined by creating a subset of the assessors’ data which met the following criteria:

1. Were within the Rural or Urban water districts; and
2. Were zoned residential; and
3. Were vacant and developable;

Existing conforming and non-conforming lots are included in the totals for “Developable Vacant Lots”.

New Lots that could be created from existing conforming vacant lots (i.e., lots that were at least 2 times the size of the minimum lot size allowed by zoning), are included under “Potential New Lots by Subdivision”.

Table 1 – Residential Vacant Developable Properties (Single Family Lot Sizes)

Property Type	Developable Vacant Lots	Potential New Lots by Subdivision	Total Vacant and New Lots
Rural Vacant Residential	36	36	72
Urban Vacant Residential	23	4	27
Totals	59	40	99



2.1.2 Non-Vacant Property

The non-vacant subdividable properties were determined by creating a subset of the assessors' data which met the following criteria:

1. Were within the Rural or Urban water districts; and
2. Were zoned residential; and
3. Had an existing structure; and
4. Were at least 2 times the size of the minimum lot size allowed by zoning.

The analysis also takes into consideration the estimated 15% of land required for each lot needed for roads and infrastructure.

Table 2 – Residential Non-Vacant Developable Properties (Single Family Lot Sizes)

Property Type	Potential New Lots by Subdivision
Rural Non-Vacant Residential	188
Urban Non-Vacant Residential	99
Totals	287

2.1.3 Accessory Dwelling Units (ADUs)

The number of possible existing accessory dwelling units (ADUs) were determined by creating a subset of the assessors' data which met the following criteria and are included under "ADUs from Existing Lots":

1. Were within the Rural or Urban water districts; and
2. Were zoned residential; and
3. Had a lot size greater than or equal to 20,000 square feet.

Vacant and Non-Vacant Lots that could be subdivided (as summarized above) and met the above criteria, are included below under "New ADUs from New Lots"

Table 3 – Existing and Potential ADUs

<u>Property Type</u>	<u>ADUs from Existing Lots</u>	<u>New ADUs from New Lots</u>	<u>Total ADUs</u>
Rural ADU Residential	275	224	499
Urban ADU Residential	283	40	323
Total ADUs	558	264	822

It should be noted that the total ADUs in this analysis includes the ADUs as a result of this build-out analysis, but also includes the ADUs that are possible from existing lots.



2.1.4 Summary of Residential Property Build-Out

The following table summarizes the total potential residential build-out in the rural and urban districts.

Table 4 – Residential Property Build-Out Summary

<u>Property Type</u>	<u>Lots</u>
Developable Vacant Lots	59
Potential New Lots by Subdivision - From Vacant Lots	40
Potential New Lots by Subdivision of Non-Vacant Lots	287
Potential New ADUs from New Lots	264
ADUs from Existing Lots	558
Total Vacant Lots, Potential New Lots + ADUs	1,208

2.2 Commercial

The current minimum lot size for commercial urban and rural single family property development are as follows:

Zone	Minimum Lot size (Square Feet)
CL	8,000
CD	5,000
CW	8,000*

* The CW zone lot size represents Multi-Family Use Minimum Lot Size.

2.2.1 Vacant

The vacant developable properties were determined by creating a subset of the assessors' data which met the following criteria:

1. Were within the Rural or Urban water districts; and
2. Were zoned commercial; and
3. Were vacant and developable;

Existing conforming and non-conforming lots are included in the totals for “Developable Vacant Lots”.

New Lots that could be created from existing conforming vacant lots (i.e., lots that were at least 2 times the size of the minimum lot size allowed by zoning), are included under “Potential New Lots by Subdivision”.

Vacant lots that could be subdivided (i.e., were at least 2 times the size of the minimum lot size allowed by zoning) are also included below.



Table 5 – Commercial Vacant Developable Properties

Property Type	Developable Vacant Lots	Potential New Lots by Subdivision	Total Vacant and New Lots
Urban Vacant Commercial	0	0	0
Totals	0	0	0

2.2.2 Non-Vacant Property

The non-vacant subdividable commercial properties were determined by creating a subset of the assessors' data which met the following criteria:

1. Were zoned commercial; and
2. Had an existing structure; and
3. Were at least 2 times the size of the minimum lot size allowed by zoning.

The analysis also takes into consideration the estimated 15% of land required for each lot needed for roads and infrastructure.

Table 6 – Commercial Non-Vacant Developable Properties

Property Type	Potential New Lots by Subdivision
Urban Non-Vacant Commercial	78
Totals	78

2.2.3 Summary of Commercial Property Build-Out

The following table summarizes the total potential commercial build-out in the rural and urban districts.

Table 7 – Commercial Property Build-Out Summary

<u>Property Type</u>	<u>Lots</u>
Developable Vacant Lots	0
Potential New Lots by Subdivision	78
Total Vacant Lots, Potential New Lots + ADUs	78



Section 3 – Water System Impacts

3.1 Water Service Connections

Based on the analysis in Section 2, below is a summary of the potential number of new units at full build-out. For this analysis, it is assumed that each new lot or ADU will result in 1 new water service connection.

Table 8 – Residential and Commercial Property Build-Out Summary

<u>Property Type</u>	<u>Lots</u>
Total Residential Vacant Lots, Potential New Lots + ADUs	1,208
Total Commercial Vacant Lots, Potential New Lots	78
Total Additional Residential and Commercial Lots at Build-Out	1,286

The increase in the number of new residential and commercial lots will have a corresponding increase in the number of new water service connections.

Table 9 – Potential New Residential and Commercial Connections

<u>Property Type</u>	<u>Connections</u>
Current Residential Connections	1,420
Potential New Residential Connections	1,208
Potential Total Residential Connections at Build-Out	2,628
Current Commercial Connections	96
Potential New Commercial Lots	78
Potential New Commercial Connections ¹	156
Potential Total Commercial Connections at Build-Out	252
Total Residential and Commercial Connections at Build-Out	2,880

¹ Commercial zoning allows 2 units per lot by right. As such, the number of connections is calculated by multiplying the number of new lots by 2 connections per lot.



3.2 Water Service Population

3.2.1 Residential Service Area Population

The increase in the number of connections will result in an increase in residential service area population over the course of the entire build-out timeframe, as shown in the following Table:

Table 10 – Residential Service Area Population Build-Out Summary

Current Residential Service Area Population	3,323
Potential New Residential Connections from Vacant and New Lots	386
Potential New Residential Connections from ADUs	822
Potential New Residential Population at Build-Out *	3,369
Potential Total Residential Service Area Population at Build-Out	6,692
Percentage Increase at Build-Out	101%

* Average household size is 2.34 persons per household (Based on 2022 US Census Bureau Data-ACS).
ADUs are estimated to be 3 persons per ADU.

3.3 Current and Projected Water Demand

3.3.1 Residential Demand

Table 11 – Residential Current and Projected Residential Demand

<u>Demand</u>	<u>Gallons/Day</u>	<u>Gallons/Year</u>
Average Daily Demand (FY 2022)	130,987	47,810,255
Additional Daily Demand at Build-Out *	132,748 7	48,453,040
Average Daily Demand at Build-Out *	263,735	96,263,295
Maximum Daily Demand (FY 2022) **	261,974	
Maximum Daily Demand at Build-Out **	527,470	

* FY 2022 usage of 39.4 gallons per capita per day

** Estimated Maximum Daily Demand = Average Daily Demand x 2.0 gpd = gallons per day



3.3.2 Commercial Demand

Table 123 – Commercial Current and Projected Demand

Number of Commercial Users		
Current Commercial Users (FY 2022)	96	
Potential New Commercial Connections	156	
Commercial Connections at Build-Out	252	
Commercial Demand		
<u>Demand</u>	<u>Gallons/Day</u>	<u>Gallons/Year</u>
Commercial Demand (FY 2022)	11,536	4,210,786
Average Commercial Demand Per Existing User	120	43,862
Average Commercial Demand Per New User *	92	33,652
Additional Commercial Demand at Build-Out	14,383	5,249,640
Total Commercial Demand at Build-Out	25,919	9,460,426

* New commercial demand assumes residential units constructed in the Commercial zone, with 2 units per lot. As such, a residential demand of 92 gpd/connection is used instead of the commercial demand of 120 gpd/connection.

3.3.3 Governmental Demand

Table 134 – Governmental Current and Projected Demand

Commercial Demand		
<u>Demand</u>	<u>Gallons/Day</u>	<u>Gallons/Year</u>
Governmental Demand (FY 2022)	5,109	1,864,804
Additional Governmental Demand at Build-Out	0	0
Total Governmental Demand at Build-Out	5,109	1,864,804



3.4 Comparison of Capacity and Demand

Table 145 – Comparison of Capacity and Demand (gallons per day)

Total Demands (gallons per day)		
<u>Demand Type</u>	<u>Current Demand</u>	<u>Demand at Build-Out</u>
Residential Average Daily Demand	130,987	263,735
Commercial Daily Demand	11,536	25,919
Governmental Daily Demand	5,109	5,109
Total Average Daily Demand	147,632	294,763
Maximum Daily Demand *	295,265	589,526
Capacity (gallons per day)		
North Pond Capacity	185,000	
Well JR-1 Capacity **	24,000 to 48,000	
JWD System Capacity (North Pond & Well JR-1)	209,000 to 233,000	
Water Treatment Facility Capacity	500,000	

* Estimated Maximum Daily Demand = Average Daily Demand x 2.0

** Well JR-1 is only used when the JWD water treatment plant is operating and has a daily permitted max flow of 50,000 GPD.



3.5 Build-Out Over Time

The information below outlines the current annual population growth as projected by the Town of Jamestown that was used by Pare for future water use projections. These projections were also the basis for use in the 5-year and 20-year water use planning projections in the latest 5-year update to the Jamestown Water Supply System Management Plan (WSSMP).

Annual estimates include that each year there will be approximately 4.0 vacant lots and 5.5 sub-dividable lots are used for new home construction which includes condominiums in the commercial zone. As a result, yearly estimates suggest that the Jamestown population will grow by 23 people (2.34 persons per household) with the development of vacant and non-vacant developable sub-dividable properties.

Annual ADUs are estimated based on 12 new dwelling units will be constructed with half of the dwelling units being one-bedroom and the other half of the dwelling units being two-bedroom. Each year estimates that the Jamestown population will grow by 36 people (two people per bedroom) with the construction of ADUs alone. In total, each year there is an estimated population growth of 59 people in Jamestown. The table below depicts the build-out over time based on this information.

Commercial water usage for the 5-year and 20-year planning periods were projected to increase by five (5) new commercial connections each year.

Table 156 – Projected Residential Population Growth from New Development

<u>Year</u>	<u>Vacant Lots</u>	<u>Subdividable Lots</u>	<u>ADUs</u>	<u>Total</u>
1-Year	4.0 (9)	5.5 (13)	12 (36)	21.5 (58)
5-Year	20 (47)	28 (64)	60 (180)	108 (291)
20-Year	80 (187)	110 (257)	240 (720)	430 (1,165)
Full Build-Out	99 (232)	287 (672)	822 (2,466)	1,208 (3,369)
Time to Full Build-Out	25 years	52 years	69 years	--

* Values in parenthesis estimate the population growth for each housing category.



3.6 Bedroom Count Analysis

As an alternate analysis, Pare has ~~calculated~~ determined that the current housing stock could support an additional 5,219 people (based on the number of existing bedrooms) for a potential total of 8,542 people. Jamestown is currently experiencing an influx of population in the summer months which is evident in their peak summer demand. ~~the potential build-out of population based on the number of bedrooms in the service area. It is understood that there are currently 4,271 bedrooms in the service area. At 2 persons per bedroom, this would equate to a population of 8,542 from the existing housing alone.~~

This calculation is based on our understanding that there are currently 4,271 bedrooms in the service area and an estimated occupancy of 2 persons per bedroom. This is a theoretical upper limit of population based on the number of existing bedrooms and does not account for the feasibility or likelihood of such an increase.

Table 167 – Residential Service Area Population – Existing Housing

Current Residential Service Area Population <u>(based on Census data) *</u>	3,323
Potential New Residential Population	5,219
Potential Total Residential Service Area Population <u>(based on Bedroom Count)from Existing Housing</u>	8,542
Percentage Increase in Population	157%

* Census data includes only full-time residents; seasonal population is greater.





Section 4 – Conclusions

Currently, water from the Jamestown production sources (North Pond and Well JR-1) can produce a maximum of approximately 233,000 gallons per day. As a result, the current water system can meet the average daily demand (ADD) of 147,632 GPD of flow.

However, the current system does not produce enough water to meet the maximum daily demand (MDD) of 295,265 GPD of flow. There are currently seasonal flows during the summer months where population is at its peak and these flows can be as high as 350,000 GPD, which far exceeds the current system capacity.

Using the data forecasted in the tables above, the average daily demand at final build-out (294,763 GPD) suggests that the JWD system capacity will not have enough water to support the average daily demand at full build-out within the existing geographic area analyzed in this report.

~~JWD should continue their efforts to increase supply and reduce waste in the system to address the projected deficits noted in this analysis.~~

Based on the limitations of supply and the projected growth, it would not be prudent to consider any expansion of the water district, without developing additional supply and/or managing demand in a significant way. Strategies for increasing supply and managing demand can be found in the Water Supply System Management Plan (WSSMP).



APPENDICES

