MEMORANDUM

City Explained, Inc.

To: Mr. Gary Anderson
Director of Planning, Town of Manchester

— And —

Ms. Anna Underwood
Planner, Town Planning & Urban Design Collaborative, LLC

From: Mr. Matt Noonkester
Principal, City Explained, Inc.

RE: Manchester NEXT, Plan of Conservation and Development,
Potential Impacts: Build-Out Analysis

Date: July 19, 2023

The Town of Manchester and its consultant team completed a potential impacts, build-out analysis to accompany the new Plan of Conservation and Development (POCD), Manchester NEXT. The analysis contemplated hypothetical alternative development scenarios for four focus areas highlighted in the document: Spencer Street Corridor, Depot Square-Hop River Innovation Park, Midtown Wellness District, and Buckland Hills. A comparison of two scenarios for each location — existing conditions and proposed conditions — was used to quantify potential net development yields attributable to the proposed condition, which served as the "demand factor" for evaluating new impacts to supporting infrastructure. Measured impacts and study conclusions from the potential impacts, build-out analysis influenced recommendations presented for Manchester NEXT.

The paragraphs that follow summarize the data, analysis, and tools used for the potential impacts, build-out analysis in Manchester. Tables that follow the memorandum provide a general comparison of high-level impacts associated with the existing and proposed conditions contemplated for each focus area. The potential impacts, build-out analysis memorandum is accompanied by the data and tools created to support the analysis as project deliverables. The impact worksheets are available to town staff for testing new ideas in the future, or they can be used to monitor conditions in the four focus areas for programming future year infrastructure needs.

Study Area

Large portions of the town's planning jurisdiction are built-out and assumed to remain relatively unchanged for the foreseeable future: conservation areas, established neighborhoods, civic buildings or grounds, and industrial areas. Therefore, the potential impacts, build-out analysis was limited in scope to only the four focus areas highlighted for Manchester NEXT. The limits of each focus area and illustrative concepts depicting the proposed condition for each focus area are provided in the newly-adopted Manchester NEXT, Plan of Conservation and Development document (see pages 180 through 207).

Analysis Period

The potential impacts, build-out analysis assumed full build-out of each focus area in accordance with the proposed illustrative concepts prepared for Manchester NEXT regardless of time horizon. Some elements of the illustrative concepts may be implemented immediately while others may take decades to realize because of market demands, landowner interests, or developer fit.

Analysis Tools

The potential impacts, build-out analysis relied upon two analysis tools to calculate future year development potential and approximate high-level impacts associated with the existing and proposed site conditions. The first tool, CommunityViz, is an extension of ESRI's ArcGIS desktop software that facilitates the visualization and comparison of alternative development scenarios. It was originally created by the Orton Family Foundation, a non-profit group that focuses on technology and tools for more informed community decision-making. The software includes a two-dimensional map and a data analysis component. Generally speaking, it adds the functionality of a spatial spreadsheet to ArcGIS for Desktop software, similar to how a spreadsheet program like Microsoft Excel handles numerical data. Dynamic calculations embedded in the spatial spreadsheet were controlled by user-written formulas that changed value as referenced input values changed.

Output from CommunityViz was opened in Microsoft Excel and used to calculate potential impacts associated with the current and proposed site conditions. Each impact category was represented by a different worksheet (tab) in the file. Generation rates for each infrastructure category were reviewed by town staff or their service partners during the five-day Planapalooza event held in May 2022 to support Manchester NEXT. National data from the consultant was used when localized data was not available. Notes specific to each infrastructure category are included with the summary tables included with the memorandum.

Alternative Development Scenarios

The potential impacts, build-out analysis assumed two different conditions (scenarios) for each focus area: an existing conditions inventory and proposed site conditions at full build-out of the focus areas in accordance with the illustrative concepts created for Manchester NEXT. A summary of each development scenario is provided below. A side-by-side comparison of the two conditions (scenarios) for each focus area is provided in the different summary tables included with the memorandum.

Existing Development Inventory

An inventory of existing conditions in each of the focus areas was captured using geographic information system (GIS) data, tabular data from the market analysis created to support Manchester NEXT, windshield surveys, and a building height survey (number of stories) performed with GoogleEarth software. A summary of existing development in each focus area is provided in Tables A.1-4 at the end of the memorandum.

Full Build-Out, Proposed Condition

Full build-out of each focus area was approximated using development programs provided by the consultant responsible for creating the illustrative concepts. Information was provided in Microsoft Excel

and manually input into the potential impacts, build-out analysis worksheets. A summary of proposed development in each focus area is provided in Tables A.1-4 at the end of the memorandum.

Future Year Impacts

Future year impacts to supporting infrastructure anticipated at full build-out of the focus areas were calculated assuming the proposed development programs provided by members of the consultant team. Impacts summarized in the tables at the end of the memorandum represent net new (additional) demand for the infrastructure categories. This is the absolute change or demand (as appropriate) that should be accommodated for in the future to keep pace with new (re)development.

The potential impacts, build-out analysis reported measured impacts for ten categories:

- new residents;
- new employees;
- new students;
- new police officers;
- new fire fighters;
- new library space;
- new park space;
- new water demand;
- new sewer demand; and
- new solid waste demand.

Summary tables for the ten categories organized by focus area location are included at the end of the memorandum.

Findings and Conclusions

Anticipating new infrastructure needs for the town's planning jurisdiction is essential to planning, programming, and funding new capacity for the future. The potential impacts, build-out analysis created to support Manchester NEXT confirms additional facilities and resources will be needed to support infill development and redevelopment in the focus areas assuming full build-out of the illustrative concepts in each location. In total, the four focus areas generate a need for the following to keep pace with growth and development in the future:

- new residents: 3,802.00 residents;
- new employees: 4,825.00 employees;
- new students: 568.00 students;
- new police officers: 8.00 police officers;
- new fire fighters: 8.00 fire fighters;
- new library space: 5,095.00 square feet;
- new park space: 43.60 acres;
- new water demand: 0.61 million gallons per day;
- new sewer demand: 0.51 million gallons per day; and
- new solid waste demand: 3,122.00 tons per year.

The timing, location, and intensity of new infrastructure needed to support the demands noted above could be impacted by different service areas, available capacity in existing systems, topographic conditions, or response time needs associated with the different infrastructure categories. In some cases, single investments by the service provider could meet demands generated by two or more focus areas. In other cases, the physical distance (or conditions) between focus areas could necessitate multiple investments to meet demands.

Direct coordination with the different service providers, and the officials that influence development patterns and intensities in and around Manchester, will be critical to ensuring capacity (supply) keeps pace with new development (demand) in the focus areas. Town leaders should communicate with service providers, including internal departments, on future year needs associated with the focus area studies within one year of Manchester NEXT adoption. Coordination activities may include, but are not be limited to, sharing illustrative concepts and data with service providers so they understand where future demands for service may be concentrated, 2) town participation in master plans or feasibility studies completed by the different service providers to better coordinate local demand and regional supply considerations, or 3) discussions with service providers to communicate preferred design applications or travel mode priorities in the focus areas.

Technical Appendix

Data tables and calculations that support the potential impacts, build-out analysis for the four focus areas are attached to the memorandum.

Table A.1 – Buckland Hills, Development Program by Growth Scenario (Build-Out Condition)

Growth Scenario	Single-Family Detached	Single-Family Attached	Stacked Multifamily	General Retail	General Office	Industrial	Institutional
	d.u.	d.u.	d.u.	s.f.	s.f.	s.f.	s.f.
0 Baseline Conditions (2022)	0	0	0	1,886,034	0	0	0
1 Planapalooza Vision & Concept for the Focus Area	0	0	459	2,076,225	255,812	32,109	104,774

Notes:

Statistics for Scenario 0 were compiled from data published by the U.S. Census Bureau, Town of Manchester, and GIS data inventory or analysis using ArcGIS software .

Statistics for Scenario 1 were complied from site plan concepts and associated development programs prepared by Town Planning and Urban Design Collaborative, LLC during the Planapalooza event for the 2022 Conservation and Development Plan. The full development program for Scenario 1 reflects existing development from Scenario 0 plus development yield statistics reported by TPUDC. Hotel rooms are included in the General Retail square feet statistic assuming 350 square feet per hotel room.

Table A.2 – Depot Square, Development Program by Growth Scenario (Build-Out Condition)

Growth Scenario	Single-Family Detached	Single-Family Attached	Stacked Multifamily	General Retail	General Office	Industrial	Institutional
	d.u.	d.u.	d.u.	s.f.	s.f.	s.f.	s.f.
0 Baseline Conditions (2022)	4	16	110	97,150	40,252	1,175,752	92,036
1 Planapalooza Vision & Concept for the Focus Area	9	248	549	188,883	300,625	1,213,341	124,145

Notes:

Statistics for Scenario 0 were compiled from data published by the U.S. Census Bureau, Town of Manchester, and GIS data inventory or analysis using ArcGIS software .

Statistics for Scenario 1 were complied from site plan concepts and associated development programs prepared by Town Planning and Urban Design Collaborative, LLC during the Planapalooza event for the 2022 Conservation and Development Plan. The full development program for Scenario 1 reflects existing development from Scenario 0 plus development yield statistics reported by TPUDC.

Table A.3 – Midtown, Development Program by Growth Scenario (Build-Out Condition)

Growth Scenario	Single-Family Detached	Single-Family Attached	Stacked Multifamily	General Retail	General Office	Industrial	Institutional
	d.u.	d.u.	d.u.	s.f.	s.f.	s.f.	s.f.
0 Baseline Conditions (2022)	6	0	0	107,921	55,245	0	554,066
1 Planapalooza Vision & Concept for the Focus Area	6	45	33	192,140	81,041	0	554,066

Notes:

Statistics for Scenario 0 were compiled from data published by the U.S. Census Bureau, Town of Manchester, and GIS data inventory or analysis using ArcGIS software .

Statistics for Scenario 1 were complied from site plan concepts and associated development programs prepared by Town Planning and Urban Design Collaborative, LLC during the Planapalooza event for the 2022 Conservation and Development Plan. The full development program for Scenario 1 reflects existing development from Scenario 0 plus development yield statistics reported by TPUDC. Hotel rooms are included in the General Retail square feet statistic assuming 350 square feet per hotel room.

Table A.4 – Spencer Street, Development Program by Growth Scenario (Build-Out Condition)

Growth Scenario	Single-Family Detached	Single-Family Attached	Stacked Multifamily	General Retail	General Office	Industrial	Institutional
	d.u.	d.u.	d.u.	s.f.	s.f.	s.f.	s.f.
0 Baseline Conditions (2022)	8	0	126	316,925	29,567	94,599	0
1 Planapalooza Vision & Concept for the Focus Area	141	192	739	532,732	175,572	94,599	0

Notes:

Statistics for Scenario 0 were compiled from data published by the U.S. Census Bureau, Town of Manchester, and GIS data inventory or analysis using ArcGIS software .

Statistics for Scenario 1 were complied from site plan concepts and associated development programs prepared by Town Planning and Urban Design Collaborative, LLC during the Planapalooza event for the 2022 Conservation and Development Plan. The full development program for Scenario 1 reflects existing development from Scenario 0 plus development yield statistics reported by TPUDC.

Table B.1 – Buckland Hills, Total Residents by Growth Scenario (Build-Out Condition)

Growth Scenario	Single-Family Detached	Single-Family Attached	Stacked Multifamily	Categories Combined
	residents	residents	residents	residents
0 Baseline Conditions (2022)	0	0	0	0
1 Planapalooza Vision & Concept for the Focus Area	0	0	763	763

Notes:

Household Sizes Assumed for the Analysis:

Single-Family Detached	→	2.04	per household
Single-Family Attached	→	2.04	per household
Stacked Multifamily	→	1.66	per household

Table B.2 – Depot Square, Total Residents by Growth Scenario (Build-Out Condition)

Growth Scenario	Single-Family Detached	Single-Family Attached	Stacked Multifamily	Categories Combined
	residents	residents	residents	residents
0 Baseline Conditions (2022)	8	33	183	224
1 Planapalooza Vision & Concept for the Focus Area	18	505	912	1,435

Notes:

Household Sizes Assumed for the Analysis:

Single-Family Detached	→	2.04	per household
Single-Family Attached	→	2.04	per household
Stacked Multifamily	→	1.66	per household

Table B.3 – Midtown, Total Residents by Growth Scenario (Build-Out Condition)

Growth Scenario	Single-Family Detached	Single-Family Attached	Stacked Multifamily	Categories Combined
	residents	residents	residents	residents
0 Baseline Conditions (2022)	12	0	0	12
1 Planapalooza Vision & Concept for the Focus Area	12	92	55	159

Notes:

Household Sizes Assumed for the Analysis:

Single-Family Detached	→	2.04	per household
Single-Family Attached	→	2.04	per household
Stacked Multifamily	→	1.66	per household

Table B.4 – Spencer Street, Total Residents by Growth Scenario (Build-Out Condition)

Growth Scenario	Single-Family Detached	Single-Family Attached	Stacked Multifamily	Categories Combined
	residents	residents	residents	residents
0 Baseline Conditions (2022)	16	0	209	225
1 Planapalooza Vision & Concept for the Focus Area	287	391	1,228	1,906

Notes:

Household Sizes Assumed for the Analysis:

Single-Family Detached	→	2.04	per household
Single-Family Attached	→	2.04	per household
Stacked Multifamily	→	1.66	per household

Table C.1 − Buckland Hills, Total Employees by Growth Scenario (Build-Out Condition)

Growth Scenario	General Retail	General Office	Industrial	Institutional	Categories Combined
	employees	employees	employees	employees	employees
0 Baseline Conditions (2022)	4,413	0	0	0	4,413
1 Planapalooza Vision & Concept for the Focus Area	4,858	519	51	297	5,725

Notes:

Employee Space Ratios Assumed for the Analysis:

General Retail	→	2.34	per 1,000 square feet of gross floor area
General Office	→	2.03	per 1,000 square feet of gross floor area
Industrial	→	1.59	per 1,000 square feet of gross floor area
Institutional	→	2.83	per 1,000 square feet of gross floor area

Table C.2 − Depot Square, Total Employees by Growth Scenario (Build-Out Condition)

Growth Scenario	General Retail	General Office	Industrial	Institutional	Categories Combined
	employees	employees	employees	employees	employees
0 Baseline Conditions (2022)	227	82	1,869	260	2,438
1 Planapalooza Vision & Concept for the Focus Area	442	610	1,929	351	3,332

Notes:

Employee Space Ratios Assumed for the Analysis:

General Retail	→	2.34	per 1,000 square feet of gross floor area
General Office	→	2.03	per 1,000 square feet of gross floor area
Industrial	→	1.59	per 1,000 square feet of gross floor area
Institutional	→	2.83	per 1,000 square feet of gross floor area

Table C.3 – Midtown, Total Employees by Growth Scenario (Build-Out Condition)

Growth Scenario	General Retail	General Office	Industrial	Institutional	Categories Combined
	employees	employees	employees	employees	employees
0 Baseline Conditions (2022)	253	112	0	0	365
1 Planapalooza Vision & Concept for the Focus Area	450	165	0	1,568	2,183

Notes:

Employee Space Ratios Assumed for the Analysis:

General Retail	→	2.34	per 1,000 square feet of gross floor area
General Office	→	2.03	per 1,000 square feet of gross floor area
Industrial	→	1.59	per 1,000 square feet of gross floor area
Institutional	→	2.83	per 1,000 square feet of gross floor area

Table C.4 – Spencer Street, Total Employees by Growth Scenario (Build-Out Condition)

Growth Scenario	General Retail	General Office	Industrial	Institutional	Categories Combined
	employees	employees	employees	employees	employees
0 Baseline Conditions (2022)	742	60	150	0	952
1 Planapalooza Vision & Concept for the Focus Area	1,247	356	150	0	1,753

Notes:

Employee Space Ratios Assumed for the Analysis:

General Retail	→	2.34	per 1,000 square feet of gross floor area
General Office	→	2.03	per 1,000 square feet of gross floor area
Industrial	→	1.59	per 1,000 square feet of gross floor area
Institutional	→	2.83	per 1,000 square feet of gross floor area

Table D.1 − Buckland Hills, Total Students by Growth Scenario (Build-Out Condition)

	Growth Scenario	Single-Family Detached	Single-Family Attached	Stacked Multifamily	Categories Combined
		students	students	students	students
0	Baseline Conditions (2022)	0	0	0	0
1	Planapalooza Vision & Concept for the Focus Area	0	0	121	121

Notes:

Student Generation Rates Assumed for the Analysis:

Single-Family Detached	→	0.26	per household
Single-Family Attached	→	0.26	per household
Stacked Multifamily	→	0.26	per household

Table D.2 − Depot Square, Total Students by Growth Scenario (Build-Out Condition)

	Growth Scenario	Single-Family Detached	Single-Family Attached	Stacked Multifamily	Categories Combined
		students	students	students	students
0	Baseline Conditions (2022)	1	4	29	34
1	Planapalooza Vision & Concept for the Focus Area	2	65	145	212

Notes:

Student Generation Rates Assumed for the Analysis:

Single-Family Detached	→	0.26	per household
Single-Family Attached	→	0.26	per household
Stacked Multifamily	→	0.26	per household

Table D.3 – Midtown, Total Students by Growth Scenario (Build-Out Condition)

	Growth Scenario	Single-Family Detached	Single-Family Attached	Stacked Multifamily	Categories Combined
		students	students	students	students
0	Baseline Conditions (2022)	2	0	0	2
1	Planapalooza Vision & Concept for the Focus Area	2	12	9	23

Notes:

Student Generation Rates Assumed for the Analysis:

Single-Family Detached	→	0.26	per household
Single-Family Attached	→	0.26	per household
Stacked Multifamily	→	0.26	per household

Table D.4 – Spencer Street, Total Students by Growth Scenario (Build-Out Condition)

	Growth Scenario	Single-Family Detached	Single-Family Attached	Stacked Multifamily	Categories Combined
		students	students	students	students
0	Baseline Conditions (2022)	2	0	33	35
1	Planapalooza Vision & Concept for the Focus Area	37	51	195	283

Notes:

Student Generation Rates Assumed for the Analysis:

Single-Family Detached	→	0.26	per household
Single-Family Attached	→	0.26	per household
Stacked Multifamily	→	0.26	per household

Table E.1 − Buckland Hills, Total Police Officers by Growth Scenario (Build-Out Condition)

Growth Scenario	Residents	Sworn Officers
	people	people
0 Baseline Conditions (2022)	0	0.00
1 Planapalooza Vision & Concept for the Focus Area	763	1.00

Notes:

Service Delivery Rate Assumed for the Analysis:

Sworn Officers → 1.96 per 1,000 residents

Table E.2 − Depot Square, Total Police Officers by Growth Scenario (Build-Out Condition)

Growth Scenario	Residents	Sworn Officers
	people	people
0 Baseline Conditions (2022)	224	0.00
1 Planapalooza Vision & Concept for the Focus Area	1,435	3.00

Notes:

Service Delivery Rate Assumed for the Analysis:

Sworn Officers → 1.96 per 1,000 residents

Table E.3 − Midtown, Total Police Officers by Growth Scenario (Build-Out Condition)

Growth Scenario	Residents	Sworn Officers
	people	people
0 Baseline Conditions (2022)	12	0.00
1 Planapalooza Vision & Concept for the Focus Area	159	0.00

Notes:

Service Delivery Rate Assumed for the Analysis:

Sworn Officers → 1.96 per 1,000 residents

Table E.4 − Spencer Street, Total Police Officers by Growth Scenario (Build-Out Condition)

Growth Scenario	Residents	Sworn Officers
	people	people
0 Baseline Conditions (2022)	225	0.00
2 Planapalooza Vision & Concept for the Focus Area	1,906	4.00

Notes:

Service Delivery Rate Assumed for the Analysis:

Sworn Officers → 1.96 per 1,000 residents

Table F.1 − Buckland Hills, Total Library Space by Growth Scenario (Build-Out Condition)

Growth Scenario	Residents	Library Space
	people	square feet
0 Baseline Conditions (2022)	0	0
1 Planapalooza Vision & Concept for the Focus Area	763	1,022

Notes:

Service Delivery Rate Assumed for the Analysis:

Library Facilities → 1.34 square feet per resident

Table F.2 − Depot Square, Total Library Space by Growth Scenario (Build-Out Condition)

Growth Scenario	Residents	Library Space
	people	square feet
0 Baseline Conditions (2022)	224	300
1 Planapalooza Vision & Concept for the Focus Area	1,435	1,923

Notes:

Service Delivery Rate Assumed for the Analysis:

Library Facilities → 1.34 square feet per resident

Table F.3 − Midtown, Total Library Space by Growth Scenario (Build-Out Condition)

Growth Scenario	Residents	Library Space
	people	square feet
0 Baseline Conditions (2022)	12	16
1 Planapalooza Vision & Concept for the Focus Area	159	213

Notes:

Service Delivery Rate Assumed for the Analysis:

Library Facilities → 1.34 square feet per resident

Table F.4 − Spencer Street, Total Library Space by Growth Scenario (Build-Out Condition)

Growth Scenario	Residents	Library Space
	people	square feet
0 Baseline Conditions (2022)	225	301
1 Planapalooza Vision & Concept for the Focus Area	1,906	2,554

Notes:

Service Delivery Rate Assumed for the Analysis:

Library Facilities → 1.34 square feet per resident

Table G.1 − Buckland Hills, Total Park Space by Growth Scenario (Build-Out Condition)

	Growth Scenario	Residents	Park Space
		people	acres
0	Baseline Conditions (2022)	0	0.00
1	Planapalooza Vision & Concept for the Focus Area	763	8.75

Notes:

Service Delivery Rate Assumed for the Analysis:

Park Space → 11.47 acres per 1,000 residents

Table G.2 − Depot Square, Total Park Space by Growth Scenario (Build-Out Condition)

	Growth Scenario	Residents	Park Space
		people	acres
0	Baseline Conditions (2022)	224	2.57
1	Planapalooza Vision & Concept for the Focus Area	1,435	16.46

Notes:

Service Delivery Rate Assumed for the Analysis:

Park Space → 11.47 acres per 1,000 residents

Table G.3 − Midtown, Total Park Space by Growth Scenario (Build-Out Condition)

	Growth Scenario	Residents	Park Space
		people	acres
0	Baseline Conditions (2022)	12	0.14
1	Planapalooza Vision & Concept for the Focus Area	159	1.82

Notes:

Service Delivery Rate Assumed for the Analysis:

Park Space → 11.47 acres per 1,000 residents

Table G.4 − Spencer Street, Total Park Space by Growth Scenario (Build-Out Condition)

	Growth Scenario	Residents	Park Space
		people	acres
0	Baseline Conditions (2022)	225	2.58
1	Planapalooza Vision & Concept for the Focus Area	1,906	21.86

Notes:

Service Delivery Rate Assumed for the Analysis:

Park Space → 11.47 acres per 1,000 residents

Table H.1 – Buckland Hills, Total Water Demand by Growth Scenario (Build-Out Condition)

Growth Scenario	Single-Family Detached	Single-Family Attached	Stacked Multifamily	General Retail	General Office	Industrial	Institutional	Categories Combined
	MGD	MGD	MGD	MGD	MGD	MGD	MGD	MGD
0 Baseline Conditions (2022)	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.09
1 Planapalooza Vision & Concept for the Focus Area	0.00	0.00	0.10	0.10	0.02	0.00	0.01	0.23

Notes:

Water Demand Rates Assumed for the Analysis:

Single-Family Detached	→	260	gallons per dwelling unit per day
Single-Family Attached	→	230	gallons per dwelling unit per day
Stacked Multifamily	→	212	gallons per dwelling unit per day
General Retail	→	0.046	gallons per square foot per day
General Office	→	0.070	gallons per square foot per day
Industrial	→	0.130	gallons per square foot per day
Institutional	→	0.070	gallons per square foot per day

Table H.2 – Depot Square, Total Water Demand by Growth Scenario (Build-Out Condition)

Growth Scenario	Single-Family Detached	Single-Family Attached	Stacked Multifamily	General Retail	General Office	Industrial	Institutional	Categories Combined
	MGD	MGD	MGD	MGD	MGD	MGD	MGD	MGD
0 Baseline Conditions (2022)	0.00	0.00	0.02	0.00	0.00	0.15	0.01	0.18
1 Planapalooza Vision & Concept for the Focus Area	0.00	0.06	0.12	0.01	0.02	0.16	0.01	0.38

Notes:

Water Demand Rates Assumed for the Analysis:

Single-Family Detached	→	260	gallons per dwelling unit per day
Single-Family Attached	→	230	gallons per dwelling unit per day
Stacked Multifamily	→	212	gallons per dwelling unit per day
General Retail	→	0.046	gallons per square foot per day
General Office	→	0.070	gallons per square foot per day
Industrial	→	0.130	gallons per square foot per day
Institutional	→	0.070	gallons per square foot per day

Table H.3 – Midtown, Total Water Demand by Growth Scenario (Build-Out Condition)

Growth Scenario	Single-Family Detached	Single-Family Attached	Stacked Multifamily	General Retail	General Office	Industrial	Institutional	Categories Combined
	MGD	MGD	MGD	MGD	MGD	MGD	MGD	MGD
0 Baseline Conditions (2022)	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04
1 Planapalooza Vision & Concept for the Focus Area	0.00	0.01	0.01	0.01	0.01	0.00	0.04	0.08

Notes:

Water Demand Rates Assumed for the Analysis:

Single-Family Detached	→	260	gallons per dwelling unit per day
Single-Family Attached	→	230	gallons per dwelling unit per day
Stacked Multifamily	→	212	gallons per dwelling unit per day
General Retail	→	0.046	gallons per square foot per day
General Office	→	0.070	gallons per square foot per day
Industrial	→	0.130	gallons per square foot per day
Institutional	→	0.070	gallons per square foot per day

Table H.4 – Spencer Street, Total Water Demand by Growth Scenario (Build-Out Condition)

Growth Scenario	Single-Family Detached	Single-Family Attached	Stacked Multifamily	General Retail	General Office	Industrial	Institutional	Categories Combined
	MGD	MGD	MGD	MGD	MGD	MGD	MGD	MGD
0 Baseline Conditions (2022)	0.00	0.00	0.03	0.01	0.00	0.01	0.00	0.05
1 Planapalooza Vision & Concept for the Focus Area	0.04	0.04	0.16	0.02	0.01	0.01	0.00	0.28

Notes:

Water Demand Rates Assumed for the Analysis:

Single-Family Detached	→	260	gallons per dwelling unit per day
Single-Family Attached	→	230	gallons per dwelling unit per day
Stacked Multifamily	→	212	gallons per dwelling unit per day
General Retail	→	0.046	gallons per square foot per day
General Office	→	0.070	gallons per square foot per day
Industrial	→	0.130	gallons per square foot per day
Institutional	→	0.070	gallons per square foot per day

Table I.1 – Buckland Hills, Total Sewer Demand by Growth Scenario (Build-Out Condition)

Growth Scenario	Single-Family Detached	Single-Family Attached	Stacked Multifamily	General Retail	General Office	Industrial	Institutional	Categories Combined
	MGD	MGD	MGD	MGD	MGD	MGD	MGD	MGD
0 Baseline Conditions (2022)	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.08
1 Planapalooza Vision & Concept for the Focus Area	0.00	0.00	0.08	0.08	0.02	0.00	0.01	0.19

Notes:

Water Demand Rates Assumed for the Analysis:

Single-Family Detached	→	225	gallons per dwelling unit per day
Single-Family Attached	→	200	gallons per dwelling unit per day
Stacked Multifamily	→	185	gallons per dwelling unit per day
General Retail	→	0.040	gallons per square foot per day
General Office	→	0.060	gallons per square foot per day
Industrial	→	0.110	gallons per square foot per day
Institutional	→	0.060	gallons per square foot per day

Table I.2 – Depot Square, Total Sewer Demand by Growth Scenario (Build-Out Condition)

Growth Scenario	Single-Family Detached	Single-Family Attached	Stacked Multifamily	General Retail	General Office	Industrial	Institutional	Categories Combined
	MGD	MGD	MGD	MGD	MGD	MGD	MGD	MGD
0 Baseline Conditions (2022)	0.00	0.00	0.02	0.00	0.00	0.13	0.01	0.16
1 Planapalooza Vision & Concept for the Focus Area	0.00	0.05	0.10	0.01	0.02	0.13	0.01	0.32

Notes:

Water Demand Rates Assumed for the Analysis:

Single-Family Detached	→	225	gallons per dwelling unit per day
Single-Family Attached	→	200	gallons per dwelling unit per day
Stacked Multifamily	→	185	gallons per dwelling unit per day
General Retail	→	0.040	gallons per square foot per day
General Office	→	0.060	gallons per square foot per day
Industrial	→	0.110	gallons per square foot per day
Institutional	→	0.060	gallons per square foot per day

Table I.3 – Midtown, Total Sewer Demand by Growth Scenario (Build-Out Condition)

Growth Scenario	Single-Family Detached	Single-Family Attached	Stacked Multifamily	General Retail	General Office	Industrial	Institutional	Categories Combined
	MGD	MGD	MGD	MGD	MGD	MGD	MGD	MGD
0 Baseline Conditions (2022)	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03
1 Planapalooza Vision & Concept for the Focus Area	0.00	0.01	0.01	0.01	0.00	0.00	0.03	0.06

Notes:

Water Demand Rates Assumed for the Analysis:

Single-Family Detached	→	225	gallons per dwelling unit per day
Single-Family Attached	→	200	gallons per dwelling unit per day
Stacked Multifamily	→	185	gallons per dwelling unit per day
General Retail	→	0.040	gallons per square foot per day
General Office	→	0.060	gallons per square foot per day
Industrial	→	0.110	gallons per square foot per day
Institutional	→	0.060	gallons per square foot per day

Table I.4 – Spencer Street, Total Sewer Demand by Growth Scenario (Build-Out Condition)

Growth Scenario	Single-Family Detached	Single-Family Attached	Stacked Multifamily	General Retail	General Office	Industrial	Institutional	Categories Combined
	MGD	MGD	MGD	MGD	MGD	MGD	MGD	MGD
0 Baseline Conditions (2022)	0.00	0.00	0.02	0.01	0.00	0.01	0.00	0.04
1 Planapalooza Vision & Concept for the Focus Area	0.03	0.04	0.14	0.02	0.01	0.01	0.00	0.25

Notes:

Water Demand Rates Assumed for the Analysis:

Single-Family Detached	→	225	gallons per dwelling unit per day
Single-Family Attached	→	200	gallons per dwelling unit per day
Stacked Multifamily	→	185	gallons per dwelling unit per day
General Retail	→	0.040	gallons per square foot per day
General Office	→	0.060	gallons per square foot per day
Industrial	→	0.110	gallons per square foot per day
Institutional	→	0.060	gallons per square foot per day

Table J.1 − Buckland Hills, Total Solid Waste Generated by Growth Scenario (Build-Out Condition)

	Growth Scenario	Residents	Solid Waste
		people	tons per year
0	Baseline Conditions (2022)	0	0
1	Planapalooza Vision & Concept for the Focus Area	763	627

Notes:

Service Delivery Rate Assumed for the Analysis:

Solid Waste Generation → 4.50 pounds per resident per day

Table J.2 − Depot Square, Total Solid Waste Generated by Growth Scenario (Build-Out Condition)

	Growth Scenario	Residents	Solid Waste
		people	tons per year
0	Baseline Conditions (2022)	224	184
1	Planapalooza Vision & Concept for the Focus Area	1,435	1,178

Notes:

Service Delivery Rate Assumed for the Analysis:

Solid Waste Generation → 4.50 pounds per resident per day

Table J.3 − Midtown, Total Solid Waste Generated by Growth Scenario (Build-Out Condition)

	Growth Scenario	Residents	Solid Waste
		people	tons per year
0	Baseline Conditions (2022)	12	10
1	Planapalooza Vision & Concept for the Focus Area	159	131

Notes:

Service Delivery Rate Assumed for the Analysis:

Solid Waste Generation → 4.50 pounds per resident per day

Table J.4 − Spencer Street, Total Solid Waste Generated by Growth Scenario (Build-Out Condition)

	Growth Scenario	Residents	Solid Waste
		people	tons per year
0	Baseline Conditions (2022)	225	185
1	Planapalooza Vision & Concept for the Focus Area	1,906	1,565

Notes:

Service Delivery Rate Assumed for the Analysis:

Solid Waste Generation → 4.50 pounds per resident per day

Table K.1 − Buckland Hills, Total Fire Fighters by Growth Scenario (Build-Out Condition)

	Growth Scenario	Residents	Fire Fighters
		people	people
0	Baseline Conditions (2022)	0	0.00
1	Planapalooza Vision & Concept for the Focus Area	763	1.00

Notes:

Service Delivery Rate Assumed for the Analysis:

Fire Fighters	→	1.86	per 1,000 residents

Table K.2 − Depot Square, Total Fire Fighters by Growth Scenario (Build-Out Condition)

	Growth Scenario	Residents	Fire Fighters
		people	people
0	Baseline Conditions (2022)	224	0.00
1	Planapalooza Vision & Concept for the Focus Area	1,435	3.00

Notes:

Service Delivery Rate Assumed for the Analysis:

Fire Fighters	→	1.86	per 1,000 residents

Table K.3 − Midtown, Total Fire Fighters by Growth Scenario (Build-Out Condition)

	Growth Scenario	Residents	Fire Fighters
		people	people
0	Baseline Conditions (2022)	12	0.00
1	Planapalooza Vision & Concept for the Focus Area	159	0.00

Notes:

Service Delivery Rate Assumed for the Analysis:

Fire Fighters	→	1.86	per 1,000 residents

Table K.4 − Spencer Street, Total Fire Fighters by Growth Scenario (Build-Out Condition)

	Growth Scenario	Residents	Fire Fighters
		people	people
0	Baseline Conditions (2022)	225	0.00
2	Planapalooza Vision & Concept for the Focus Area	1,906	4.00

Notes:

Service Delivery Rate Assumed for the Analysis:

Fire Fighters	→	1.86	per 1,000 residents