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Memorandum

To	George Meservey, Director of Planning & Community Development Michael Domenica, PE, Program Manager
CC	Betsy Shreve, AICP, AECOM Project Director Aaron Weieneth, AICP, AECOM Paula Winchell, AECOM
Subject	**Town of Orleans, MA** **Water Quality and Wastewater Planning** **Task Number 1.b – Downtown Planning** **Technical Memorandum on Downtown Future Growth Scenarios, Strategies to Limit Growth, Draft Regulations to Obtain Zero Interest Financing, and Implications for Wastewater Loading Impacts and Other Community Impacts in the Downtown – Final**
Project Number	60476644
From	Thomas Parece, P.E., AECOM Project Manager
Date	May 4, 2016

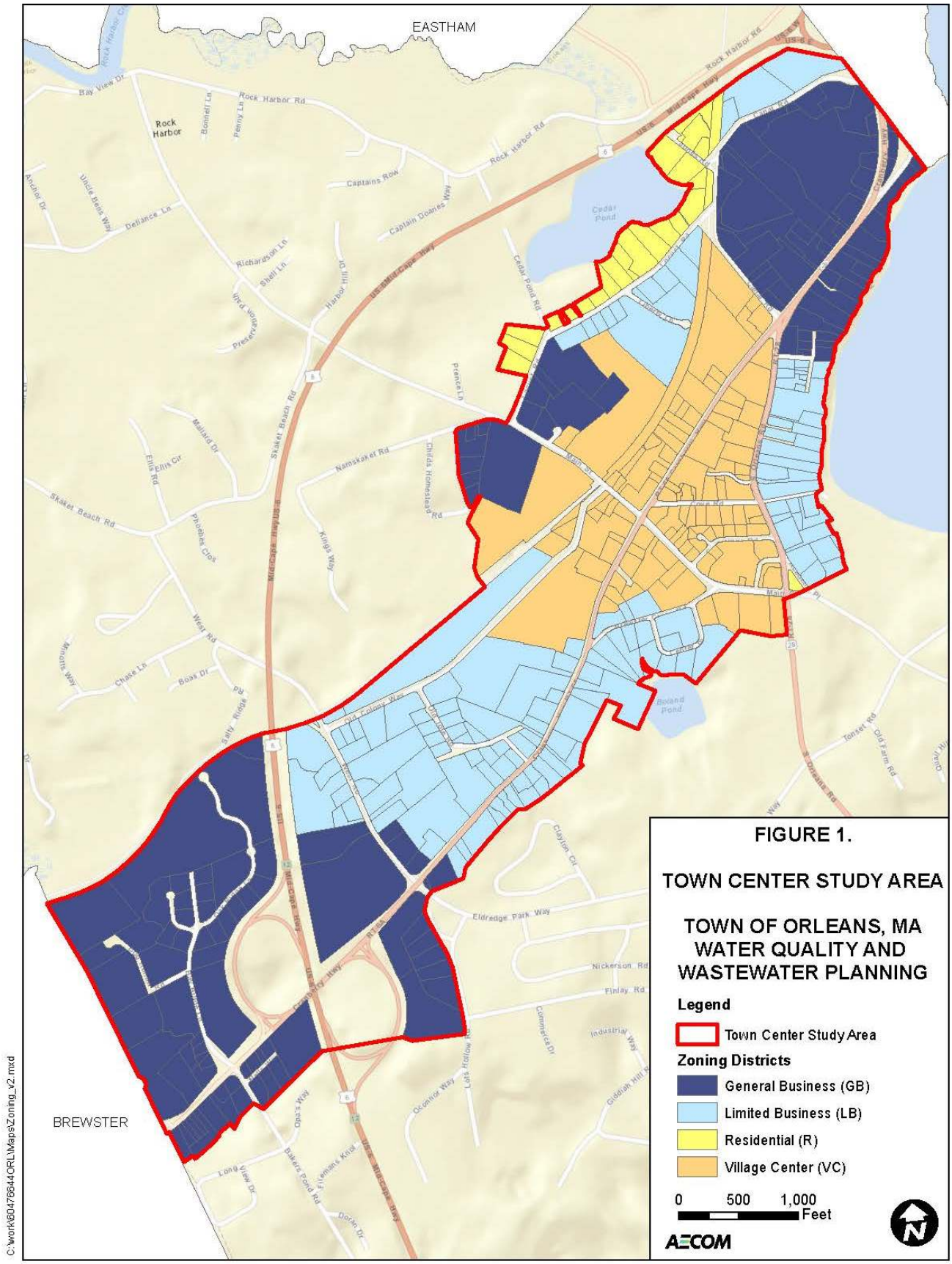
1. Background

This Technical Memorandum presents the methodology and results of future build-out scenarios for the Town Center Study Area, as well as strategies to manage growth, draft regulations to obtain zero Interest financing through the Massachusetts Department of Environmental Protection Clean Water State Revolving Fund (MassDEP CWSRF) program, and implications for wastewater loading impacts and other community impacts in the Town Center Study Area.

2. Introduction

The goal of the Downtown Planning task of the Town of Orleans Water Quality and Wastewater Planning project is to conduct planning and engineering services for development of a Town Center plan that will support water quality and wastewater planning on a sub-watershed basis. The area addressed in this task is the Town Center Study Area, which includes the business districts along the Route 6A corridor as well as some residential use (see Figure 1).

This Technical Memorandum presents the results of the following subtasks: (a) future buildout scenarios for the Town Center Study Area; (b) wastewater flows and loads associated with the future build-out scenarios; (c) discussion of coordination of growth in a manner consistent with the Orleans Comprehensive Plan, and (d) draft regulations and guidance to obtain zero interest financing through the MassDEP CWSRF program.


EASTHAM
BREWSTER
Rock Harbor
Rock Harbor Rd
Bay View Dr
Bonnell Ln
Penny Ln
Captains Row
Captain Doanes Way
Anchor Dr
Uncle Bens Way
Defiance Ln
Richardson Ln
Shell Ln
Harbor Hill Dr
Cedar Pond
Cedar Pond Rd
Mid-Cape Hwy
US-6
Skaket Beach Rd
Namskaket Rd
Childs Homestead Rd
Mallard Dr
Ellis Cir
Ellis Rd
Phoebes Close
Kings Way
West Rd
Chase Ln
Boas Dr
Wilcotts Way
Sally Ridge Rd
Old Colony Way
Orchard
Roland Pond
Tonset Rd
Old Farm Rd
Claydon Cir
Eldredge Park Way
Nickerson Rd
Finlay Rd
Commerce Dr
Industrial Way
Lots Hollow Rd
O'Connor Way
Giddiah Hill Rd
Ops's Way
Bakers Pond Rd
Fishermans Knoll
Long View Dr
Dorian Dr
FIGURE 1.
TOWN CENTER STUDY AREA
TOWN OF ORLEANS, MA
WATER QUALITY AND
WASTEWATER PLANNING
Legend
Town Center Study Area
Zoning Districts
General Business (GB)
Limited Business (LB)
Residential (R)
Village Center (VC)
0 500 1,000
Feet
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3. Future Build-out Scenarios

A range of future build-out scenarios for the Town Center Study Area was developed based on input received from the two Downtown Planning Workshops held on December 15, 2015 and February 4, 2016; consideration of market demand conditions; and coordination with the Town. Five future build-out scenarios were developed over the course of the project. Ultimately, the following three scenarios were selected for water quality and wastewater planning purposes:

- Scenario 1 – Full Build-out Under Current Zoning without Wastewater Limitation;
- Scenario 2 – Growth Scenario to Reflect Vision to Increase Residential Density in the Town Center; and
- Scenario 3 – 2050 Planning Horizon.

All of the future build-out and planning horizon scenarios utilized the same underlying approach and assumptions as used for "Scenario 0 – Town Center Study Area Updated Build-out" as a starting point. Please refer to *Water Quality and Wastewater Planning Task Number 1.b – Downtown Planning Technical Memorandum on Updated Downtown Build-Out Analysis and Land Use/Market Conditions and Development Constraints* (revised May 4, 2016) for detail on Scenario 0, as well as summary information for the two Downtown Planning Workshops.

A description of each future build-out scenario, including additional assumptions that were used, is provided below. The residential and non-residential results for all future build-out scenarios are presented in Table 1.

a. Scenario 1 – Full Build-out Under Current Zoning without Wastewater Limitation

Scenario 1 utilizes the same underlying approach and assumptions as used for Scenario 0, except the on-site wastewater limitation (e.g. Title 5 sizing and setback requirements, Title 5 and the Town's Nutrient Management Regulations wastewater flow limits) that was applied for Scenario 0 is eliminated due to the assumed future provision of sewer to the Town Center Study Area. As a result, additional land area is available for future development and higher densities can be achieved.

b. Scenario 2 – Growth Scenario to Reflect Vision to Increase Residential Density in the Town Center

Scenario 2 utilizes results from Scenario 1 as a starting point and incorporates changes to increase residential density in the Town Center. In addition to a currently proposed large-scale mixed use development in the Village Center, several trends – low vacancy rates, high housing costs, decreasing household size and aging population – point to the need to expand the variety of housing options in the community. It appears there may be a need for maintenance-free homes in close proximity to services that could serve an older population looking for smaller units, less maintenance, and less driving. There also appears to be a need for lower-priced homes that could serve a young workforce population. The Downtown Planning Workshops also indicated strong support to expand the variety of housing in the town center. The following additional assumptions were applied to reflect increased mixed use and residential density in portions of the Town Center Study Area and a modest decrease in maximum non-residential development, which aligns with the key takeaways from the Downtown Planning Workshops.

Table 1. Orleans Town Center Study Area Future Build-out Scenario Results by Sub-watershed

Sub-watershed	Scenario 1[1]		Scenario 2[1]		Scenario 3[1]			
					Option 3a[1]		Option 3b[1]	
	Residential (dwelling units)	Non-Residential (s.f.)	Residential (dwelling units)	Non-Residential (s.f.)	Residential (dwelling units)	Non-Residential (s.f.)	Residential (dwelling units)	Non-Residential (s.f.)
Town Cove	448	1,328,796	545	820,417	296	768,828	322	781,796
Boat Meadow River	8	-	8	-	6	-	6	-
Rock Harbor Stream	2	-	2	-	1	-	1	-
Cedar Pond	181	987,366	276	431,436	154	365,687	167	382,215
Rock Harbor Main	390	191,769	436	83,439	389	80,856	394	81,505
Boland Pond	5	34,635	24	20,594	8	18,839	10	19,281
Little Namskaket	163	635,984	163	289,074	139	253,627	142	262,538
Namskaket Main	22	217,306	22	113,067	14	101,294	15	104,253
Namskaket Stream	26	169,582	26	91,892	14	70,946	15	76,211
Total	*1,245*	*3,565,437*	*1,502*	*1,849,919*	*1,021*	*1,660,078*	*1,073*	*1,707,800*

Notes:
1. Scenario descriptions:
- Scenario 1: Full Build-out Under Current Zoning without Wastewater Limitation
- Scenario 2: Growth Scenario to Reflect Vision to Increase Residential Density in the Town Center
- Scenario 3: 2050 Planning Horizon
  - Option 3a: Historical Growth Rate
  - Option 3b: Modified Growth Rate with Consideration of Vision, Market Conditions, and Provision of Sewer

- Downtown Core Parcels

  - Assume 48 parcels in the "Downtown Core" area (i.e. vicinity of the Main Street / Route 6A intersection) could support a future mixed use based on application of the following ratios, which were derived from values provided by the Town for a proposed large-scale mixed use development in the Village Center district:

    - Residential use: 9 dwelling units / acre; and

    - Non-residential: 9,000 square feet (s.f.) / acre.

    The Downtown Core parcels were selected in coordination with the Town as an area desired to support increased residential density and are identified in Figure 2.

  - Assume a zoning change is made for the Downtown Core parcels to eliminate the minimum lot area requirement of 60,000 s.f. of buildable upland for apartment development.

- Select Route 6A Parcels

  - Assume 15 parcels with frontage on Route 6A between West Road and Canal Road and a lot size of 40,000 s.f. or greater of buildable upland could support a future residential use with a density of up to 9 units / acre. The Route 6A parcels are identified in Figure 2.

  - Assume zoning changes are made for the select Route 6A parcels to reduce the minimum lot area requirement from 60,000 s.f. to 40,000 s.f. of buildable upland for apartment development and increase the allowable density from 6 units / acre to 9 units / acre.

  - Assume up to 1,500 s.f. of non-residential use on each parcel to help maintain continuity in the Town Center and avoid creating dead spots with no non-residential use.

- Other Town Center Study Area Parcels (i.e. excluding Downtown Core and select Route 6A parcels)

  - Residential dwelling unit values from Scenario 1 are used for each parcel.

  - Apply a non-residential density cap of 7,000 s.f. / acre to reflect a decrease in overall non-residential development compared to Scenario 1 and to reflect implementation of land use controls as described in the MassDEP CWSRF Zero Percent Financing section in this Technical Memorandum.

For all study area parcels with existing residential and non-residential densities that exceed the build-out ratios reported above, it is assumed those densities are grandfathered / remain in the future.

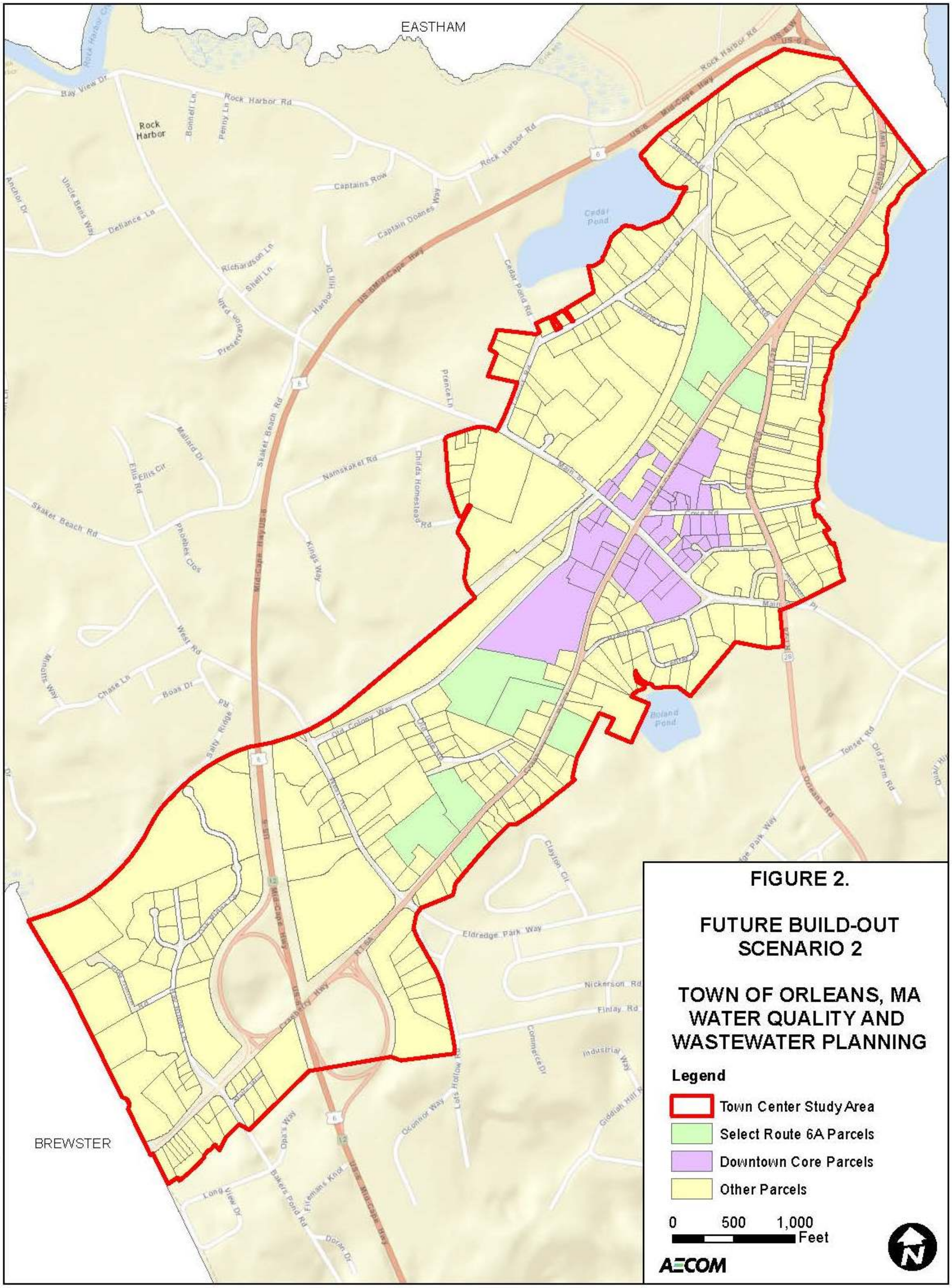

FIGURE 2.

FUTURE BUILD-OUT SCENARIO 2

TOWN OF ORLEANS, MA WATER QUALITY AND WASTEWATER PLANNING

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c. Scenario 3 – 2050 Planning Horizon

Scenario 3 utilizes the 2015 Existing Conditions results for the Town Center Study Area (as presented in *Water Quality and Wastewater Planning Task Number 1.b – Downtown Planning Technical Memorandum on Updated Downtown Build-Out Analysis and Land Use/Market Conditions and Development Constraints, March 2016*) as a starting point and applies residential and non-residential growth rates for a 2050 planning horizon. The growth rates are applied at the study area-wide level and not by individual parcel.

The planning horizon was determined based on an assumed 2020 construction date of a new wastewater facility and a 30 year estimated useful life. This scenario includes two options:

- Scenario Option 3a: Historical Growth Rate; and
- Scenario Option 3b: Modified Growth Rate with Consideration of Vision, Market Conditions, and Provision of Sewer.

Each scenario option is described below.

Scenario Option 3a: Historical Growth Rate

An annual compounded historical growth rate of 0.34 percent is applied to residential (dwelling units) development from the year 2015 through 2050. This historical growth rate was determined using U.S. Census 2000 and 2010 Decennial Census data on housing units for the Orleans Census Designated Place geography. An estimated 120 dwelling units associated with a currently proposed large-scale development in the Village Center district are also added to account for the assumed implementation of the development by 2050.

An annual compounded historical growth rate of 0.34 percent is applied to non-residential (s.f.) development from the year 2015 through 2050. This historical growth rate was determined using net leasable area (i.e. actual square feet of a building that may be leased or rented to a tenant) data for Fiscal Year 2006 and 2016 for the Town of Orleans, as provided by the Town Assessor. It is just a coincidence that the historical growth rate non-residential development is the same as the rate for residential.

Scenario Option 3b: Modified Growth Rate with Consideration of Vision, Market Conditions, and Provision of Sewer

An annual compounded historical growth rate of 0.50 percent is applied to residential (dwelling units) development from the year 2015 through 2050. This higher growth rate (compared to the 0.34 percent for Scenario Option 3a) is applied to account for anticipated accelerated growth due to provision of sewer in the Town Center Study Area and to reflect market conditions and the Town Center Vision for increased residential density. An estimated 120 dwelling units associated with a currently proposed large-scale development in the Village Center district are also added to account for the assumed implementation of the development by 2050.

For non-residential (s.f.) development, it is expected that the demand for non-residential space would run in a similar trajectory to the growth of the year-round and seasonal housing units in the Orleans Primary Trade Area, as defined in the *Orleans Town Center Economic Analysis Primer* (included as an appendix in *Water Quality and Wastewater Planning Task Number 1.b – Downtown Planning Technical Memorandum on Updated Downtown Build-Out Analysis and Land Use/Market Conditions and Development Constraints, March 2016*). With a vacancy rate of 4 percent, there is no evidence of an over-supply of non-residential space; however, there does not seem to be a large deficit either.

There appears to be only quite modest market opportunity under current conditions. As noted in the *Economic Analysis Primer*, there are no large, glaring retail gaps and there does not appear to be any sales leakage in the restaurant category. Supply seems close to meeting demand in most categories. There may be some additional opportunity for medical and other professional services, especially if some seasonal homeowners convert to year-round residents or spend more time at their Cape home.

Based on housing unit information for the Primary Trade Area communities included in the Cape Cod Commission's 2012 *Cape Wide Buildout Analysis to Support Regional Wastewater Planning*, and assuming buildout conditions would be reached by 2050, it was determined there would be approximately a 16 percent increase in Primary Trade Area housing units by 2050. This 16 percent increase is applied to the 2015 existing conditions non-residential (s.f.) value for the Town Center Study Area to arrive at an estimated non-residential (s.f.) value for 2050.

In order to develop build-out results for Scenario Options 3a and 3b on a sub-watershed level, the study area-wide results for additional dwelling units and additional non-residential square footage from Scenario Options 3a and 3b are compared to the respective build-out results from Scenario 2. This comparison results in residential and non-residential percentages, which represent the proportion of the Scenario 2 full build-out that is expected to occur within the 2050 planning horizon represented by Scenario 3. To generate the residential (dwelling units) and non-residential (s.f.) results for Scenario Options 3a and 3b by sub-watershed, the results from Scenario 2 are multiplied by these percentages for residential and non-residential growth, respectively.

4. Build-out Scenario to Reflect Proposed Amendment to the Town of Orleans Zoning By-Laws

In March 2016, the Orleans Planning Board held a Public Hearing to accept public comments on a proposed Village Center District-wide amendment to Section 164-31 Apartment Development of the Zoning By-laws. The proposed amendment (reflecting comments that were received at the Public Hearing) would do the following:

- Allow apartment density of 14 units per acre (3,000 s.f. contiguous buildable upland area per dwelling unit) in the Village Center District without the current requirement of also providing a similar amount of commercial space;
- Reduce the minimum lot area requirement in the Village Center District from 60,000 s.f. of contiguous buildable upland to 20,000 s.f.;
- Set forth a set of criteria for granting approval of an apartment project; and
- Require Architectural and Site Plan approval prior to granting a Special Permit.

This proposed amendment is included in Appendix A.

To account for this proposed amendment, AECOM conducted an assessment of a new scenario that reflects the proposed zoning changes in the Village Center District. The following assumptions were applied to estimate a dwelling unit buildout value for this scenario:

- For parcels in the Village Center District with at least 20,000 s.f. contiguous buildable upland (i.e. proposed minimum lot size requirement for apartment development):
  - Deduct area for existing building footprint/s;
  - Deduct area needed for required parking (1 space per each 250 s.f. of gross floor area; 300 s.f. per space);

- Apply 3,000 s.f. / unit density to the remaining net usable area to arrive at the number of new dwelling units;

- Assume no future additional non-residential development (i.e. all remaining net usable area used for dwelling units); and

- Maintain the assumption that non-conforming Village Center District uses (e.g. single family homes) and tax-exempt properties would not support future dwelling units.

  The following two non-residential Village Center District parcels were excluded, since they are viewed as providing unique services: Snows Home and Garden (22 Main Street) and Mid-Cape Home Centers (15 Main Street). It was assumed there would continue to be a demand for these services in the future, and that the land use for each parcel would not support future residential use.

- For parcels in the Village Center District with less than 20,000 s.f. contiguous buildable upland (i.e. cannot support apartment development) and parcels located outside the Village Center District:

  - Proceed with results used for "Scenario 1 – Full Buildout Under Current Zoning without Wastewater Limitation"

This approach results in a buildout value of 1,539 dwelling units for the Town Center Study Area, compared to 1,502 dwelling units for "Scenario 2 – Growth Scenario to Reflect Vision to Increase Residential Density in the Town Center", or approximately 2.5% more units. Consequently, it was determined that Scenario 2 reflects the intent of the proposed zoning amendment to increase residential density in the Village Center District, and the results for Scenario 2 can be referenced when considering what the proposed zoning amendment (or a variation of it) could allow.

5. Selection of Preferred Future Build-out Scenario

The Orleans Planning Board issued a memorandum to the Orleans Board of Selectmen on February 26, 2016 regarding downtown growth and development. In the memorandum, the Planning Board states that based on the outcome of the Downtown Planning Workshops, it is their opinion that there is general consensus regarding the future of the downtown area as expressed in the Town Center and Village Center Vision Statements that were reviewed. The memorandum includes the following guiding principles:

- The Town currently is zoned for more commercial space than is necessary to meet current or future needs;

- More housing units are needed to support a diverse workforce and provide housing alternatives for older residents;

- Future commercial development or redevelopment should be focused in commercial nodes generally defined as Skaket Corners, the Village Center, and the area near the Orleans Rotary;

- Areas between nodes of development should contain mixed uses, with greater emphasis on housing than commercial activity;

- Additional density allowances for dwelling units may be needed in order to obtain the desired housing units; and

- A healthy local economy is vitally important to the overall community.

The memorandum also states that the Planning Board agrees that the future needs of the Town are best met under the future build-out Scenario Option 3.b, which reflects higher residential density in the Village Center. This memorandum is included in Appendix B.

6. Wastewater Flows and Loads Associated with Future Build-out Scenarios

Wastewater flows associated with the future build-out scenarios are estimated for Scenario 1 and Scenario 2 using the following approach:

- Residential dwelling unit wastewater flows are generated by applying a factor of 49.5 gpd per bedroom. This reflects the existing average year-round residential wastewater generation rate, which was derived using historic parcel water use data for 2014 and 2015 and assessor's data.. This approach is consistent with guidance included in *TR-16 Guides for the Design of Wastewater Treatment Works* (New England Interstate Water Pollution Control Commission, 2011), which states that existing wastewater flow and/or water consumption data should be used as a basis for sewer design when available. Accessory dwelling units and apartments are assumed to have one bedroom within parcels with residential only state class codes (i.e. single family, condominiums, etc.) and an average of 1.5 bedrooms within parcels with mixed use state class codes (i.e. commercial condominiums, small retail, and other mixed-residential/commercial). If a mixed use parcel could only support a maximum of a one bedroom unit due to site constraints, this value is used to generate wastewater flows; and

- Non-residential wastewater flows are generated based on the existing average wastewater generation rate (gpd/non-residential square foot) and assessor's data for the individual parcel, which was derived using historic parcel water use data for 2014 and 2015. As noted above, use of historic water consumption data is consistent with industry design standards.

For Scenario 3 (Planning Horizon Options 3a and 3b), wastewater flow is developed using the following approach:

- In order to generate Scenario Options 3a and 3b wastewater flows at the study area-wide level, the residential and non-residential wastewater flows developed for Scenario 2 are multiplied by the respective residential and non-residential percentages described above. These percentages represent the proportion of the Scenario 2 full build-out that is expected to occur within the 2050 planning horizon represented by Scenario 3, which is then applied to the wastewater flow generation.

Septage and infiltration/inflow (I/I) flows are then added to arrive at a total flow value for each future build-out scenario. Based on a previous study, the existing Tri-Town Septage Treatment Facility has averaged in the order of 9 million gallons of septage annually over the past several years. The sewering of some parts of the Town will obviously decrease septage generation within Orleans. In addition, some permanent loss of market might be expected from some of the communities proximate to the Yarmouth-Dennis facility, as it expands operations to fill the void left by the closure of the existing Tri-Town Septage Treatment Facility. AECOM has conservatively prorated the existing Tri-Town Septage Treatment Facility receiving rates on a town-by-town basis to what they might be expected to be in the future and has arrived at a projected "high-end" septage loading of 6 million gallons annually, or 16,000 gpd. While this rate will depend on how the Town chooses to operate the proposed Overland Way WWTF, this is considered a reasonable assumption with which to estimate loadings to the facility.

In addition to the wastewater flow from properties served, flow contributions from I/I must also be considered to account for wet weather intrusions typical of sewers systems over time. Assuming an I/I rate for existing sewers of 300 gpd per inch diameter mile (gpd/idm), a system length of approximately 36,000 linear feet, and an average pipe size of 10-inch diameter, the amount of flow attributed to I/I is estimated to be about 22,500 gpd.

Influent pollutant loadings are a function of concentration and flow. In the absence of actual sewage data, the pollutant concentrations of raw sewerage are based on the higher end of textbook ranges to reflect that this will be a new collection system with a mix of both residential and non-residential l wastewater. Septage concentrations were based on data obtained from Tri-Town Septage Treatment Facility. Blended pollutant concentrations for the combined sewage and septage filtrate stream were based on flow weighted averages of the two sources.

WWTF effluent loads, again a function of flow and concentration, are based on a worst case scenario of effluent concentrations being at expected permit requirements. The expected permit limits are 30 milligram/liter (mg/l) for biochemical oxygen demand (BOD) and total suspended solids (TSS), and 10 mg/l for total nitrogen (TN).

The wastewater flows and loads results for each future scenario are presented in Table 2.

Table 2. Orleans Town Center Study Area Future Wastewater Flows and Loads

Parameter	Scenario 1[1]	Scenario 2[1]	Scenario 3[1]	
			Option 3a[1]	Option 3b[1]
Wastewater Flow (gpd)	337,013	233,730	183,150	190,815
Septage Flow (gpd)	16,000	16,000	16,000	16,000
I/I Flow (gpd)	22,501	22,501	22,501	22,501
Total Flow (gpd)	375,514	275,231	221,651	229,316
BOD Loading (lbs/d)	1,002	727	592	612
TSS Loading (lbs/d)	940	681	555	574
TN Loading (lbs/d)	188	136	111	115
Effluent BOD Load (lbs/d)	94	68	55	57
Effluent TSS Load (lbs/d)	94	68	55	57
Effluent TN Load (lbs/d)	31	23	18	19
Waste Biosolids (lbs/d)	1,018	863	788	799

Notes:
1. Scenario descriptions:
- Scenario 1: Full Build-out Under Current Zoning without Wastewater Limitation
- Scenario 2: Growth Scenario to Reflect Vision to Increase Residential Density in the Town Center
- Scenario 3: 2050 Planning Horizon
  - Option 3a: Historical Growth Rate
  - Option 3b: Modified Growth Rate with Consideration of Vision, Market Conditions, and Provision of Sewer

7. Coordination of Future Growth with the Orleans Comprehensive Plan

a. Strategies to Manage Growth Consistent with the Orleans Comprehensive Plan

As noted in the 2006 Orleans Comprehensive Plan, growth and development continue to create challenges for the Town, including increased traffic congestion and nitrogen pollution of local waters. Per the Comprehensive Plan, the Town's growth policy is to "ensure that future growth is at a level and in such a manner that will have no or minimal adverse effect upon semi-rural character and environmental integrity of the Town." The Comprehensive Plan also states that future business activities should be oriented primarily in village areas and strip commercial development prevented. This approach is consistent with the growth policy of the 2012 Cape Cod Commission Regional Policy Plan, which is to "guide growth toward areas that are

adequately supported by infrastructure and away from areas that must be protected for ecological, historical, or other reasons."

High septic system replacement costs and Title 5 restrictions currently limit the ability of the Town to direct future growth to the Village Center and the two major commercial nodes (Skaket Corners and the Orleans Rotary area). Also, businesses with high sewage volume are significantly constrained from locating in the downtown area, as any business generating in excess of 15,000 gpd of wastewater would require an advanced septic treatment facility, which comes with additional costs and regulatory requirements.

The proposed sewering of the Town Center Study Area will aid in attainment of the Town's growth policy by eliminating current on-site wastewater limitations and enabling denser development and redevelopment within the three commercial nodes targeted to receive future growth. The sewering will also eliminate nitrogen loading from wastewater in the Study Area and aid in restoring the health of local water bodies.

Potential growth must be managed in light of other demands that new growth would place on the Town in terms of other utilities, traffic and transportation, and services (police, fire, etc.). Relevant goals from the Comprehensive Plan related to the additional demands posed by potential future growth are summarized in Table 3.

Table 3. Goals from the Orleans Comprehensive Plan Related to Additional Demands from Future Growth

Comprehensive Plan Element	Goal
Community Facilities and Services	To provide high quality facilities to meet the community and regional needs consistent with the goals and policies established in the Orleans Comprehensive Plan and the Regional Policy Plan.
	To provide safe and adequate drinking water for the residents and businesses of Orleans.
Health and Human Services	To protect and improve the quality of life of all Orleans residents by supporting and encouraging a comprehensive range of health and human services which will be accessible to all.
Transportation	To establish and maintain a multi-modal transportation system for present and future year-round and seasonal needs. The system should be safe, convenient, accessible, effective, and economical and should be consistent with the Town's historic, scenic, natural resource, land use development and growth management policies.
	To allow for less dependence on private automobiles by integrating a variety of transportation modes and by promoting alternatives which reduce travel, such as telecommunications and home occupations.
	To assure convenient access to and safety in the downtown area.

b. Improvements Needed to Support the Preferred Build-out Scenario

As noted in the previous section, future growth associated with the preferred build-out scenario will result in additional demands to utilities, transportation network, and community facilities and services in the downtown area. Meeting these demands will need to be coordinated with the goals and policies included in the Town's Comprehensive Plan. The primary infrastructure improvement in the Town Center Study Area required to support the preferred build-out scenario is provision of a wastewater collection system and treatment facility. Without this wastewater infrastructure in place, the desired density and type of development in the Study area as reflected in the preferred build-out scenario (Scenario Option 3b) could not be achieved.

As an example of other improvements to consider, it is important to plan for the water demand associated with the future development and provide a sufficient water supply. According to the

2014 Asset Management Plan for the Orleans Water Department (Wright-Pierce 2014), the Orleans Water Department maintains eight water supply wells. The eight wells are permitted to withdraw and pump up to maximum flow rate of 5.8 million gallons per day (MGD), but they are limited on an annual basis to a stepped increase to 1.21 MGD in year 20 (i.e. 2032) of the current Water Management Act Permit. The projected average day demand is estimated to increase to 1.18 MGD at residential build-out, as stated in the 2014 Asset Management Plan. According to the 2014 Asset Management Plan, the Town has adequate water supply to meet the increased demand. The Town will need to evaluate the overall water use projected for the Town Center Study Area (accounting for both residential and non-residential use) compared to what was documented in the 2014 Asset Management Plan to confirm if the Town is still anticipated to have adequate water supply to meet future demands.

Implementation of recommendations included in the 2015 Route 6A Orleans RESET report prepared by the Cape Cod Commission could also support attainment of the preferred build-out scenario and Town Center and Village Center Visions that were confirmed during the Downtown Planning task. One relevant recommendation is to update the Town's parking and circulation study to identify areas of need. Demand for parking in the future would be expected to change as a result of redevelopment and increased density in the Village Center. Also, increased traffic associated with future growth could lead to greater traffic congestion issues in the Town. It is anticipated that the Cape Cod Commission is already planning to undertake a more detailed parking and traffic circulation study in the downtown area in 2017.

c. Zoning and Regulatory Changes Needed to Achieve Strategies and Objectives

Focusing development in the specified nodes in the Town Center Study Area will reduce the potential for undesired strip commercial development and other types of development sprawl. Implementation of the Town's proposed amendment to Section 164-31 Apartment Development of the Zoning By-laws (described above) or similar amendment would allow for and encourage the higher residential density that is desired in the Village Center. Components of the zoning changes could include:

- Specification of the affected location/s or districts.
- Confirmation of allowed densities.
- Identification of uses allowed by right or by special permit.
- For uses requiring a special permit, identify the special permit granting authority and provide detail on the information required from the applicant to gain approval of the special permit

The Town could also consider implementing a zoning amendment that requires all (or selected types) new housing developments to contribute to the Town's affordable housing stock.

Also, in order for the Town to be eligible to receive zero percent financing through the MassDEP CWSRF program, the Town must adopt land use controls as described in the following section.

8. MassDEP Clean Water State Revolving Fund (CWSRF) Zero Percent Financing

a. Background on MassDEP CWSRF Program and Zero Percent Financing Requirements

The CWSRF is a federal-state financing mechanism that subsidizes water quality improvement projects that are undertaken by local governments. Many municipalities have utilized this program since its inception in 1991 to finance wastewater management planning. CWSRF loans have a standard term of 20 years and a below-market interest rate of 2 percent. The CWSRF is administered by MassDEP, which conducts a competitive annual project solicitation.

The Massachusetts Legislature has also directed MassDEP, pursuant to M.G.L. c. 29C, § 6, to provide zero percent interest financing to projects that meet the following criteria:

1) The project is primarily intended to remediate or prevent nutrient enrichment of a surface water body or a source of water supply;

2) The applicant is not currently subject, due a violation of a nutrient-related total maximum daily load standard or other nutrient based standard, to a MassDEP enforcement order, administrative consent order or unilateral administrative order, enforcement action by the United States Environmental Protection Agency or subject to a state or federal court order relative to the proposed project;

3) The applicant has a Comprehensive Wastewater Management Plan (CWMP) approved pursuant to regulations adopted by MassDEP;

4) The project has been deemed consistent with the regional water resources management plans if one exists; and

5) The applicant has adopted land use controls, subject to the review and approval of MassDEP in consultation with the Department of Housing and Economic Development and, where applicable, any regional land use regulatory entity, intended to limit wastewater flows to the amount authorized under the land use controls that were in effect as of the date of the Secretary of the Executive Office of Energy and Environmental Affairs approval of the CWMP.

The Town of Orleans is able to meet Criteria 1 through 4 noted above and is actively developing additional controls to manage growth in the Town Center in anticipation of sewers being approved for implementation. This effort is further described below.

b. Draft Regulations to Obtain Zero Percent Financing

In order to be eligible for zero percent financing, the Town needs to demonstrate that wastewater flows shall be limited to the amount authorized as of the date of approval of the Town's Comprehensive Wastewater Management Plan. Flow neutral controls would result in no net increase in wastewater flows as a consequence of changed land uses or increased density allowed if sewers are installed. Land use controls are defined in 310 CMR 44.03 as "local and regional government zoning ordinances and by-laws and health and sewer use regulations for wastewater." These land use controls must be effective before the CWSRF loan may be granted.

Several other communities in Massachusetts have successfully adopted these controls and provide good examples for developing a by-law in Orleans. A draft flow neutral by-law for the Town of Orleans using one of the sample community by-laws as a model is included in Appendix C. The Town of Orleans will need to pass a similar flow neutral by-law to be eligible for zero percent financing.

9. Next Steps

Wastewater flows and biosolids from the future downtown sewering project have been confirmed and a phasing plan for implementation developed. These results are summarized in a separate Technical Memorandum, entitled Technical Memorandum on Management of Future Downtown Wastewater Flows and Biosolids.

Appendix A

Proposed Zoning By-law Amendment

PROPOSED ZONING BYLAW AMENDMENT
Forwarded by the Planning Board for Annual Town Meeting Consideration
Public Hearing held March 29, 2016

Bold underline = new language ~~strikethrough~~ = language removed

ARTICLE ##. AMEND ZONING BYLAWS SECTION 164-31. Apartment Development

To see if the Town will vote to amend Section 164-31 Apartment Development, by amending the section as follows:

§164-31 Apartment Development

A. Applicability. Apartments may be developed only in districts as provided in §164-13. **The Board of Appeals may adopt reasonable administrative fees and technical review fees for petitions for special permits.** A special permit for apartments, shall be granted only in accordance with Subsections B through ~~D~~**E** of this section and only upon these findings being made by the Board of Appeals**:**

(1) By virtue of its sponsorship, financing, or design, the housing will serve an important unmet housing need of the community, such as the need of area residents for year-round housing, and there is enforceable assurance that the housing will continue to meet such need for at least twenty (20) years. **The Board may require a mix of one-bedroom, two-bedroom, and three or more bedroom units to ensure that the project meets community housing needs.**

(2) The housing will not adversely affect business operation on that or other premises within the district or be detrimentally affected by such uses.

(3) The apartment development contributes to the public convenience or welfare.

(4) The apartment development will not create undue traffic congestion, or unduly impair pedestrian convenience and safety.

(5) The apartment development proposes conditions sufficient to mitigate noise, litter, light pollution and other impacts which may affect neighborhood character.

(6) Architecture and site design are consistent with the requirements of the Architectural Review Committee and Site Plan Review Committee, which shall report to the Board of Appeals in accordance with Sections 164-33 and 164-33.1.

(7) The apartment development is consistent with Town goals and the Orleans Comprehensive Plan.

(8) A copy of any Special Permit application shall be filed with the Planning Board, which shall review and make a recommendation to the Board of Appeals within 30 days of receipt of the application. The Board of Appeals shall consider any such recommendation prior to issuance.

B. **Lot Area and Density**

Lot Area. Minimum lot area for apartment development shall be as follows:

RB, LB, GB Districts:	**60,000 s.f. contiguous buildable upland**
VC District:	**20,000 s.f. contiguous buildable upland**

Minimum Lot Area per dwelling unit (contiguous buildable upland).

RB District:	**14,000 s.f. per dwelling unit**
LB and GB Districts:	**7,000 s.f. per dwelling unit**
VC District:	**3,000 s.f. per dwelling unit**

In mixed residential and commercial developments in the GB, LB, and VC Districts, the area devoted to commercial building and the area for required parking shall be subtracted from the lot area for the purposes of determining the density of residential units.

~~Alternatively,~~ **In such mixed use developments** ~~in each structure~~ in which the floor area devoted to dwellings is less than that devoted to business, minimum lot area shall equal three thousand ~~five hundred~~ (~~3,500~~**3,000**) square feet contiguous buildable upland area per dwelling unit~~, plus the area covered by the building, plus the area required for parking servicing the business use~~.

~~**Lot Area.** Minimum lot area shall equal sixty thousand (60,000) square feet contiguous buildable upland area. Seven Thousand (7,000) square feet of contiguous buildable upland area shall be provided per dwelling unit, except that in the Rural Business District fourteen thousand (14,000) square feet of contiguous buildable upland area shall be provided per dwelling unit.~~

C. Other Dimensional Requirements. The normally applicable district frontage, yard, and building height requirements shall be observed. **The building height provisions of Section 164-19.1. E. may be used for Third Floor Housing in the Village Center District for apartment development.**

D. Design Requirements. No structure shall contain more than ~~twelve (12)~~ **fifteen (15)** dwelling units. No dwelling unit shall have its lowest floor below grade at its entire perimeter.

E. No Special Permit shall be issued by the Zoning Board of Appeals for an apartment or other multi-family housing development where the density exceeds two (2) units per acre of buildable upland area unless the Board of Health certifies that the septic system is designed to achieve an effluent nitrogen concentration of 19 milligrams per liter (mgl) or less, as measured at the discharge.

JUSTIFICATION:

The amendment allows an increase in the number of housing units that may be developed in the Village Center District, consistent with the Orleans Comprehensive Plan and other studies. The Town goal is to encourage a stronger residential component in the Village Center to provide needed housing opportunities and support a healthy local economy. Studies have indicated that business zoned land in the Town exceeds current and future demands, and there is a need to increase residential options in order to attract the kind of development that is desirable.

Any proposed apartment development under this bylaw would require a Special Permit with a public hearing, and the Zoning Board of Appeals would need to make specific findings as to the suitability of any such project before it was approved.

Appendix B

February 26, 2016 Planning Board Memorandum

Town of Orleans

19 School Road Orleans Massachusetts 02653-3699

Telephone (508) 240-3700 – Fax (508) 240-3388

George Meservey

Director of Planning & Community Development

To: Board of Selectmen
From: Planning Board
Subject: AECOM Downtown Planning Workshops
Date: February 26, 2016

Planning Board members attended the December 15 and February 4 Downtown Planning Workshops conducted by AECOM. The Board has spent many years on future planning for the business districts, and we were delighted that the workshops took place. After hearing the presentations and engaging in discussions, it is the Planning Board's opinion that there is general consensus regarding the future of the downtown area as expressed in the Vision Statements provided. The Board further agrees that:

- The Town currently is zoned for more commercial space than is necessary to meet current or future needs.
- More housing units are needed to support a diverse workforce and provide housing alternatives for older residents.
- Future commercial development or redevelopment should be focused in commercial nodes generally defined as Skaket Corners, the Village Center, and the area near the Orleans Rotary.
- Areas between nodes of development should contain mixed uses, with greater emphasis on housing than commercial activity.
- Additional density allowances for dwelling units may be needed in order to obtain the desired housing types.
- A healthy local economy is vitally important to the overall community.

The Planning Board agrees that the future needs of the Town are best met under AECOM's Buildout Scenario 3.b, which includes zoning amendments to allow housing density to increase, consistent with accepted goals for a village center. The Board is committed to considering all options to determine the most appropriate dwelling density for each zoning district.

Appendix C

Draft Flow Neutral By-law for Present and Future Sewer Service Areas

Town of Orleans, Massachusetts

Draft Flow Neutral By-law for Present and Future Sewer Service Areas

Article XX Motion:

That the Town vote to amend Chapter 185 of the Code of Orleans, Board of Health Regulations, by adding a new Article XV, Sections 185-124 through 185-134 as follows:

Article XV Flow Neutral By-law for Present and Future Sewer Service Areas

185-124. Purpose

In order to comply with the terms and conditions of the Town of Orleans' discharge permit, to manage present and future wastewater flows, to meet present and future water quality standards, and to support broader community planning objectives, the Town adopts this Flow Neutral by-law for Present and Future Sewer Service Areas. This by-law shall apply to all present sewer service areas of the Town, and it shall apply to any future sewer service areas to be serviced by existing or new wastewater treatment facilities (WWTFs). Nothing in this by-law shall exempt the owner of a property in a present or future sewer service area from all other applicable statutes, by-laws, rules and regulations.

185-125. Mandatory Sewer Connection and Elimination of Septic Systems in Sewer Service Areas

A. The owner of all houses, buildings or properties used for human occupancy, employment, recreation or other purposes, situated within the Town and abutting on any street, alley or right-of-way in which there is now located or may in the future be located a public sanitary sewer of the Town, is hereby required at the owner's expense to install suitable toilet facilities therein, and to connect such facilities directly with the proper public sewer in accordance with the provisions of this article, within [XX] days after the date of official notice to do so. The connection shall be overseen by a plumber licensed in the Commonwealth of Massachusetts, and the work shall be inspected and approved by the Department of Public Works and Natural Resources before the connection is activated.

B. Within [XX] days of the property's connection to the public sewer, any septic system or other waste disposal system located on the property shall be decommissioned in accordance with Board of Health regulations.

185-126. Determination of Wastewater Flow in Sewer Service Areas

A. Wastewater flow to the public sewer shall be determined in accordance with either: (1) the provisions set forth in 310 CMR 15; or (2) water meter data provided by the Department of Public Works and Natural Resources as adjusted for seasonal occupancy; or (3) any other method acceptable to MassDEP and the Town of Orleans. Any structure, legally in existence as of [INSERT EFFECTIVE DATE OF ARTICLE], regardless of its flow, may by right maintain that flow or number of bedrooms. Bedroom is defined in 310 CMR 15.002 and the number of bedrooms in the Assessor's records as of [INSERT EFFECTIVE DATE OF ARTICLE] are presumed accurate.

B. The flow allocations for present and future sewer service areas as of [INSERT EFFECTIVE DATE OF ARTICLE] are as follows:

   (1) WWTF serving the Downtown Area: [XXX] gallons per day, subject to approved Amended Comprehensive Wastewater Management Plan; and

   (2) WWTF serving the Meetinghouse Pond Area: [XXX] gallons per day, subject to approved Amended Comprehensive Wastewater Management Plan.

These flows allocations will be adjusted if additional flow or modifications to sewer service areas are made through: (1) approved Amended Comprehensive Wastewater Management Plans or (2) approval from MassDEP.

185-127. Allocation of Available Capacity in Sewer Service Areas

The Department of Public Works Operations Manager shall periodically notify the Board of Selectmen of the available capacity at the Wastewater Treatment Facilities. The Selectmen in consultation with the Planning Board may set priorities for the available capacity.

185-128. Modifications to Existing Parcels or Changes in Use in Sewer Service Areas

A. Single-Family Residences

(1) Existing Development. Modifications of an existing single family dwelling on a parcel of 40,000 square feet or less may increase the total number of bedrooms to four (4) by right. Modifications of existing single family residences on parcels over 40,000 square feet may increase the number of bedrooms to one (1) bedroom per 10,000 square feet of lot area by right.

(2) New Development. A single-family residence may have four (4) bedrooms by right on parcels of 40,000 square feet or less. On parcels greater than 40,000 square feet, a single-family residence may have one (1) bedroom per 10,000 square feet of lot area by right.

(3) Addition of bedrooms, beyond those permitted in Subsection A(1) and (2) above shall require a variance from the Board of Selectmen in accordance with Section 185-129.

B. Multi-Family Residences

(1) Existing Development. Modifications of an existing multi-family residence may increase the number of bedrooms to one (1) bedroom per 10,000 square feet of lot area by right.

(2) New Development. A new multi-family dwelling is allowed one (1) bedroom per 10,000 square feet of lot area by right. In Zoning Districts where up to six (6) units per acre are allowed, up to three (3) bedrooms per permitted unit are allowed by right.

(3) Addition of Bedrooms in multi-family dwellings beyond that which is allowed by right shall require a variance from the Board of Selectmen in accordance with Section 185-129.

C. Non-residential Development

(1) Existing Development.

(a) Modifications or changes of use, including residential to non-residential, that increase flow to a level that is no more than ten (10) percent above that permitted as of [INSERT EFFECTIVE DATE OF ARTICLE] by 310 CMR 15 are allowed by right.

(b) Modifications or changes of use that increase flow more than that allowed by right in Subsection C(1)(a) require a variance from the Board of Selectmen in accordance with Section 185-129.

(2) New Development.

(a) New non-residential development on a vacant parcel with a wastewater flow up to 110 gallons per day per 10,000 square feet of lot area is allowed by right.

(b) New non-residential development on a vacant parcel with a proposed wastewater flow greater than 110 gallons per day per 10,000 square feet shall require a variance from the Board of Selectmen in accordance with Section 185-129.

185-129. Variances in Sewer Service Areas

A. The Board of Selectmen, after a public hearing of which notice has been given by publication (1) in a newspaper of general circulation and (2) posting with the Town Clerk and on the Town website for a period of no less than fourteen (14) days prior to the date of hearing, may grant a variance, provided both Subsection A(1) and (2) below are satisfied:

   (1) Sufficient capacity exists in the affected Wastewater Treatment Facility, as determined by the Department of Public Works Operations Manager. If sufficient capacity does not exist, then no variance shall be issued.

   (2) Should the Department of Public Works Operations Manager determine sufficient capacity exists, the applicant must then demonstrate, through a positive referral from the Board of Health, that a septic system for the total number of bedrooms or non-residential flow requested, meeting the provisions of 310 CMR 15 without significant variances can be sited on the parcel. If the Board of Health does not make a referral within 45 days of receipt of the request, it shall be considered a positive referral.

B. The Board of Selectmen may, at its sole and absolute discretion, issue a variance that in its judgment could be granted without substantially derogating from the intent or purpose of this by-law should the applicant fail to satisfy criteria 185-129A(2) above.

185-130. Rebuilding a Building Because of Casualty Loss in Sewer Service Areas

Relating to Article XV, a property owner may rebuild a structure destroyed by fire, flood, storm or other acts of nature as a matter of right provided that the new structure does not exceed the wastewater flow and number of bedrooms of the structure being replaced

185-131. Mandatory Water Conservation in Sewer Service Areas

The Board of Selectmen may adopt mandatory water conservation measures, after public hearing, consistent with the purposes of this by-law.

185-132. Transferability in Sewer Service Areas

The number of bedrooms or flow on any particular parcel of land cannot be sold, exchanged, transferred, or otherwise used to benefit the number of bedrooms or flow on another parcel or another's right to a sewer connection.

185-133. Severability

If any provision of this by-law is declared invalid or unenforceable, the other provisions shall not be affected thereby but shall continue in full force and effect.

180-134. Violations and Penalties

A. Any person found to be violating any provision of Article XV shall be served by the Town with written notice stating the nature of the violation and providing a reasonable time limit for the satisfactory correction thereof.

B. Any person who shall continue any violation beyond the period permitted in Subsection A shall be guilty of a misdemeanor and subject to a fine in an amount not exceeding fifty dollars ($50) for each violation. Each day in which such a violation shall continue shall be deemed a separate offense.

C. This section shall in no way limit the Town's power and authority to seek other remedies at law that it may have. Any person violating any of the provisions contained herein shall be liable to the Town for any expense, loss or damage occasioned the Town by such violation.