

**Appendix 5-3**

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**Summary of Procedures Uses to  
Develop Buildout Estimates**

# SUMMARY OF BUILDOUT CALCULATION METHODOLOGY<sup>1</sup>

In 2008 / 2009 a buildout analysis was completed for the purpose of wastewater planning in the Town of Barnstable. On a parcel by parcel basis, projections were made to estimate potential development that may occur at a future time of buildout. For each individual parcel in the Town of Barnstable, the number of residential dwelling units and the non-residential building square footage were estimated for future buildout conditions.

Certain parcels that were considered unlikely to be further developed were tagged for exclusion from the buildout projections. These parcels were assumed to remain at their current level of development, or to remain undeveloped. Excluded parcels included: protected open space, schools, churches, fire / water district parcels, cemeteries, Town beaches, Town facilities such as Town offices, the land fill, the Water Pollution Control Facility and the airport, utility parcels such as electric substations and radio and telephone towers, and parcels located entirely within the VE Velocity Flood Zone.

All calculations that were based on the acreage or square footage of parcels include only the upland portion of the parcel in the area figure. Upland acreage for each parcel was calculated by overlaying parcels with the MassGIS DEP Wetlands layer and subtracting any wetland portion of each parcel from its total area.

## Parcels in Residential Zones

- Existing dwelling units (DUs) were calculated according to the Assessor's landuse code for each parcel (i.e. single family = 1 DU, two family = 2 DUs, etc.)
  - For condominiums and apartment buildings the existing DUs were set to equal the number of existing units / apartments on the parcel.
- Dwelling units (DUs) at buildout for residentially zoned, undeveloped parcels that met the minimum lot size requirement for their zoning district were calculated based on the upland area of the parcel:  $Total\ DUs\ at\ Buildout = \frac{upland\ area}{minimum\ lot\ size\ requirement}$ 
  - Parcels that resulted in more than 4 DUs were recalculated by first subtracting 15% from the upland area to allow for utilities, access, etc.
- Undeveloped residential parcels that had upland area greater than or equal to 5,000 sq.ft. , but less than the minimum lot size requirement were considered grandfathered and were assigned one dwelling unit at buildout.
- Dwelling units (DUs) at buildout for residentially zoned, developed parcels with residential landuse were calculated based on the remaining upland area of the parcel after subtracting area for the existing dwelling units:  $Total\ DUs\ at\ Buildout = \frac{Existing\ DUs + ((upland\ area - (minimum\ lot\ size\ requirement * number\ of\ existing\ DUs))}{minimum\ lot\ size\ requirement}$ 
  - Parcels that resulted in more than 4 DUs were recalculated by first subtracting 15% from the remaining upland area to allow for utilities, access, etc.

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<sup>1</sup> Developed by CWMP Land Use and Projected Buildout Working Group, July 2010

- Existing residential condominiums and apartment buildings were assumed to have no further growth at buildout beyond the existing DUs.
- Dwelling units at buildout for undeveloped, permitted Chapter 40B developments were set to the number of permitted units.
- Parcels with commercial landuses in residential zones were assumed to remain in commercial use at buildout. The commercial building square footage (sq.ft.) at buildout was calculated by multiplying the upland parcel square footage by a Floor Area Ratio (FAR) of 0.15: *Commercial Building sq.ft. at Buildout = 0.15 \* upland parcel sq.ft*
- Parcels with mixed landuses (commercial & residential) in residential zones were assumed to be redeveloped as 100% residential at buildout. Dwelling units (DUs) at buildout were calculated by multiplying the upland parcel square footage by a Floor Area Ratio (FAR) of 0.15 and then converting the resulting building square footage into equivalent dwelling units based on 850 sq.ft. per dwelling unit: *Total DUs at Buildout = (upland parcel sq.ft. \* 0.15) ÷ 850*
- Agricultural and golf course parcels were assumed to be redeveloped for residential use at buildout. Dwelling Units (DUs) at buildout were calculated based on the upland area of the parcel: *Total DUs at Buildout = upland area ÷ minimum lot size requirement*
  - Parcels that resulted in more than 4 DUs were recalculated by first subtracting 15% from the upland area to allow for utilities, access, etc.
- Some exceptions to the above procedures were made for individual parcels in order to better reflect the most likely growth scenario for those parcels. The most notable exception was:
  - Cape Cod Community College: assumed 250 additional DUs at buildout for future dormitories and doubling of existing commercial square footage for future classroom expansion.

**Parcels in Commercial Zones**

- Existing commercial building square footage (sq.ft.) was calculated by summing the building “living area” from the Assessment data for each parcel.
  - In cases where a parcel contained multiple buildings, the living area for all buildings on the parcel were summed.
  - The “living area” represents the finished, heated/cooled portion of a building.
- Commercial building square footage (sq.ft.) at buildout for commercially zoned parcels with commercial landuses was calculated by applying a Floor Area Ratio (FAR) to the upland parcel area: *Commercial Building sq.ft. at Buildout = FAR \* upland parcel sq.ft*
  - Floor Area Ratios (FARs) for commercial zoning districts were developed for the purpose of projecting commercial buildout. The FARs used for the buildout projections are listed below.

Zoning District	FAR Used for Buildout
HVB, HD	2.0
HG	0.8

BA Osterville Center, OM, MS, SCROD	0.75
S&D, HB, B, SF, VB-A Marstons Mills Center, BA Centerville, BA Osterville Main Street, TD	0.5
MSOD	0.4
IND, IND LTD	0.35
SD-1, HO	0.3
MB-A1, MB-A2, MB-B	0.25
VB-B West Barnstable	0.2
VB-A Barnstable Village, VB-A on Route 28 in Marstons Mills	Assumed no further growth

In some cases, these FARs are different than what is allowable under the zoning regulations. Because it is unrealistic to expect every parcel to be developed to the maximum allowable FAR., judgment was applied to represent a somewhat more realistic development pattern that might occur. Even so, applying these FARs to every commercial parcel may project a level of buildout that is unlikely to occur in the foreseeable future.

- Commercially zoned parcels with residential landuses were assumed to remain in residential use at buildout. Dwelling units (DUs) at buildout were calculated by multiplying the upland parcel square footage by the Floor Area Ratio (FAR) for the zoning district (see table above) and then converting the resulting building square footage into equivalent dwelling units based on either 1,000 sq.ft. per dwelling unit or 850 sq.ft. per dwelling unit depending on the zoning district as follows:
  - HB, HO, SD, SD-1, VB-B West Barnstable, VB-A Barnstable Village, BA Osterville Center: 1DU = 1,000 sq.ft. building area:  

$$Total\ DUs\ at\ Buildout = (upland\ parcel\ sq.ft. * FAR) \div 1000$$
  - B, SF, MS, HD, HVB, OM, TD, HG, MB-A1, MB-A2, MB-B, IND, IND LTD, VB-A Marstons Mills Center, BA Centerville: 1 DU = 850 sq.ft. building area:  

$$Total\ DUs\ at\ Buildout = (upland\ parcel\ sq.ft. * FAR) \div 850$$
- Parcels with mixed landuses (commercial & residential) in commercial zones were assumed to be redeveloped as 100% residential at buildout. Dwelling units (DUs) at buildout were calculated by multiplying the upland parcel square footage by the Floor Area Ratio (FAR) for the zoning district (see table above) and then converting the resulting building square footage into equivalent dwelling units based on either 1,000 sq.ft. per dwelling unit or 850 sq.ft. per dwelling unit depending on the zoning district as follows:
  - HB, HO, SD, SD-1, VB-B West Barnstable, VB-A Barnstable Village, BA Osterville Center: 1DU = 1,000 sq.ft. building area:  

$$Total\ DUs\ at\ Buildout = (upland\ parcel\ sq.ft. * FAR) \div 1000$$
  - B, SF, MS, HD, HVB, OM, TD, HG, MB-A1, MB-A2, MB-B, IND, IND LTD, VB-A Marstons Mills Center, BA Centerville: 1 DU = 850 sq.ft. building area:  

$$Total\ DUs\ at\ Buildout = (upland\ parcel\ sq.ft. * FAR) \div 850$$

**Data Sources**

- Fiscal Year 2007 Town of Barnstable GIS parcel data and Assessment data.
- Town of Barnstable GIS Zoning map as amended through February 28, 2008.
- MassGIS DEP Wetlands GIS data (April 2007).
- MassGIS FEMA Q3 Flood Zone data (July 1997).
- Locations of existing (as of 2008) accessory affordable apartments, in-law / family apartments, and permitted Chapter 40B units.

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