

### Key data sources

*Assessors Parcels:* Parcel boundaries and property assessment information (land use type, square footage, ownership, assessed value, etc) was drawn from MassGIS “Level 3” parcels which use standardized information provided by the town’s assessor.

*Zoning Boundaries:* Data on zoning boundaries was provided by town staff. MAPC reviewed the town’s zoning by-law and other pertinent regulatory documents to determine the dimensional requirements, permitted uses, and parking requirements associated with each zone.

*Environmental Resources:* MassGIS provided data on the distribution of wetlands, riverfront areas, flood zones, water resource protection areas, steep slopes, historical sites, contamination, protected open space, and other environmental resources that can constrain development potential.

*Recent & Proposed Development:* MAPC compiled information about recent and planned development from a variety of sources, including the town’s Co-Urbanize site and MAPC’s Development Database (an inventory of development activity across the region.) MAPC also analyzed property assessment data from other MetroWest municipalities to characterize the different types of recent (last 15 years) commercial development in the subregion.

*Population and Employment Projections:* Base-case population, housing demand, and employment projections are based on MAPC’s 2014 population and housing projections and the employment projections prepared for the recently-adopted Regional Transportation Plan.

### Model Functions

The land use model operates in four basic steps:

1. Calculate the developable area of each parcel, after subtracting wetlands and accounting for other constraints;
2. Apply land use assumptions to each parcel and calculate total development potential and net increase over existing square footage;
3. Allocate a specified amount of housing and commercial growth based on development potential, location, constraints, and other factors;
4. Calculate the town-wide impacts of the projected development on a variety of metrics.

*Developable area* is the parcel area minus wetlands, water bodies, and protected open space. The percent of lot area also constrained by riverfront area, water resource protection areas, steep slopes, and flood zones is also calculated and is used as a discounting factor to arrive at an effective lot area against which density assumptions are applied in the next step.

*Land Use Assumptions* can take the form of a specific building template (e.g., a 40,000 square foot retail building) or a more generalized “place type” representing the likely mix of development types in a given zone (e.g., 40% retail, 30% office, 30% industrial.) Each building template has a required lot area that must be satisfied, and the place types have a density value (either units per acre or floor area ratio, depending on the land use type) which is applied to the parcels effective lot area to determine development potential. The initial place types were based on the town’s zoning bylaw; additional place types were created to represent different styles of development that could be permitted. It is also possible to assume “no development” where appropriate (cemeteries, certain town-owned parcels) or to discount development potential based on local knowledge.

*Growth Allocations* are based on a suitability analysis that scores each parcel based on its development capacity, environmental constraints, value of existing development, and location. This ranking is the basis for allocation of projected housing units and commercial square footage. The initial assumptions for growth are based on MAPC projections. Housing growth assumptions are in terms of single family and multi family units needed by the year 2030 (initially set at 1,100 single family units and 1,000 units in multifamily housing.) Economic growth is estimated as a percent of total MetroWest job growth that is expected to locate in Ashland (initially set at 4.0% of 15,000 jobs over the period 2010 – 2030.) These overall growth assumptions are modified for both of the alternative scenarios.

*Town-Wide Impacts* are calculated based on multipliers applied to the allocated growth, taking into account the characteristics of the assumed land use (e.g., assessed value per square foot of floor area for retail development.) These metrics also take into account current trends (such as the rate of increase in per-pupil expenditure) and projections (such as demographic shifts.) Estimation methods for each of the indicators is described below.

- *Tax Revenue* is a function of assessed value and tax rate. For each building template and place type used in the land use modeling, there is an estimate of future assessed value per square foot of built floor area, based on values for similar recent developments (since 2000) in Ashland and the MetroWest subregion. The total allocated floor area is multiplied by the assessed value per square foot for that type of development, and the existing assessed building value (if any) is subtracted to yield net change in assessed building value. Current year tax rates are applied to the change in value to estimate the net change in tax revenue. Two items are worth noting: first, the model does not assume any change in the assessed value of the underlying land; only the change in building value is estimated. Second, the dollar figures all relate to *assessed value*, which may differ substantially from market value; however, since the focus of the analysis is on future year tax generation and not on sales price, the assessed value is the relevant measure. All tax revenue estimates are in FY 2013 real dollars.
- *Projected Enrollment* is based on MAPC population projections for the town, adjusted to reflect the different housing production forecasts in each scenario. First, the ratio between the “school-age population” (age 5 – 19) and the public school enrollment is calculated. (In Ashland’s case, enrollment in the public school system is approximately 83% of the

population age 5 – 19.) This same ratio is applied to the same age groups in MAPC's Stronger Region projections for 2030 to result in a base-case estimate of school enrollment for that year. For alternative scenarios, enrollment is adjusted up or down to reflect housing production rates higher or lower than the base case, using locally-derived factors for school age residents per housing unit. These factors are calculated for two different housing types (single family & multifamily) and two householder ages (over/under age 55.) If an alternative scenario entails 100 fewer single family housing units than the base case, the enrollment projections would be reduced by 73 students (100 single family homes \* 0.88 school-age residents per single family unit with householder under age 55 \* 0.83 Ashland Public School students per school age residents = 73 students)

- *Public School Expenditures* are calculated based on projected enrollment (described above) multiplied by projected per-pupil expenditures. MAPC's analysis of Ashland Public School funding estimates that since the year 2000 per-pupil expenditures in Ashland have seen annual increases of 3%, in nominal dollars. This rate of increase (which can be easily modified in the model) is carried forward to the year 2030 and the resulting per-pupil expenditure is applied to projected enrollment.
- *Resident Workers* are projected using a method similar to public school enrollment. Initial estimates are based on MAPC's population projections, with an age-specific labor force participation rate applied to the working age population to derive the number of resident workers. For alternative scenarios, the projected number of workers per household for 2030 is applied to the increase or decrease in housing units relative to the base case, and the future year estimates of resident workers are adjusted accordingly.
- *Water Demand* projections are based on estimated water consumption rates specific to certain residential and commercial land uses, based on literature research and Massachusetts water conservation standards.
- *Trip Generation* is based on rates derived from professional literature for various types of residential and commercial land uses.