



MBTA Communities Multifamily Mandate Guidelines  
*Recommendations Working Paper – DRAFT DOCUMENT IN DEVELOPMENT*  
Prepared by the Metropolitan Area Planning Council  
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## Introduction

In January 2021, the Massachusetts legislature adopted an Economic Development Bond Bill (H5250) containing significant provisions to help ease the state’s housing supply crunch. The “Housing Choices” sections of the bill, championed by Governor Baker, will streamline residential zoning and permitting, make it easier for municipalities to expand and diversify their housing stock and reducing meritless anti-housing lawsuits. Of particular significance, Section 18 of the bill requires each municipality in the MBTA district to provide by-right zoning options for multifamily housing near transit stations. Cities and towns that don’t comply with the new multifamily mandate won’t be eligible for a variety of state grant programs. This could make it a potentially powerful tool to enable multifamily housing production near transit in communities that have little such housing and have not thus far taken steps to change that. Implemented well, it could advance important goals related to housing production as well as racial equity and sustainable transportation.

This working paper presents MAPC’s analysis and recommendations relevant to the implementation of this new law.

## Legislation

Section 18 of H5250 creates a new section (Section 3A) within the state’s Zoning Enabling Act, MGL Chapter 40A. The full extent of Section 3A is as follows:

Section 3A. (a)(1) An MBTA community shall have a zoning ordinance or by-law that provides for at least 1 district of reasonable size in which multi-family housing is permitted as of right; provided, however, that such multi-family housing shall be without age restrictions and shall be suitable for families with children. For the purposes of this section, a district of reasonable size shall: (i) have a minimum gross density of 15 units per acre, subject to any further limitations imposed by section 40 of chapter 131 and title 5 of the state environmental code established pursuant to section 13 of chapter 21A; and (ii) be located not more than 0.5 miles from a commuter rail station, subway station, ferry terminal or bus station, if applicable.

(b) An MBTA community that fails to comply with this section shall not be eligible for funds from: (i) the Housing Choice Initiative as described by the governor in a message to the general court dated December 11, 2017; (ii) the Local Capital Projects Fund established in section 2EEEE of chapter 29; or (iii) the MassWorks infrastructure program established in section 63 of chapter 23A.

(c) The department [EOHED], in consultation with the Massachusetts Bay Transportation Authority and the Massachusetts Department of Transportation, shall promulgate guidelines to determine if an MBTA community is in compliance with this section.

EOHED is currently in the process of developing draft guidelines, which are, according to the most recent information, expected to be available at the end of 2021 or the beginning of 2022.

### Policy Imperatives

While Section 3A was created as part of the Housing Choice package aimed at increasing housing production and reducing the state's housing supply-demand mismatch, it also exists in the context of other important public policy imperatives. It was adopted by the legislature days after the release of a Clean Energy and Climate Plan that set ambitious goals for reduction of transportation-related GHG emissions—goals that can only be achieved through reduced driving and increased transit use; and it will be implemented as part of a broader long-overdue racial reckoning that requires examining how every public agency and program can redress past inequities and advance racial justice in ways both large and small. These three policy imperatives—housing production, GHG emissions, and racial equity—must be considered in equal measure during implementation of the legislation.

- In order to support a growing workforce and changing population, MAPC estimates that Eastern Massachusetts may need 100,000–130,000 multifamily housing units over the next 10 years. In 2017, Governor Baker set a goal for production of 135,000 housing units before 2025. Current zoning capacity for multifamily housing is insufficient to make progress towards these estimates or to meet need. The goal of Housing Choice is to expand housing opportunity and diversity by making it easier to zone for and permit residential development, especially residential types other than single family homes. The implementation of the MBTA mandate should help advance this goal by setting a target for how much zoning capacity should increase in transit areas, and structuring specific requirements around that target.

Implementation of the mandate should also account for the fact that some municipalities have much more land available near transit stations and therefore have greater capacity to accommodate new development. If the goal of the program is to produce the maximum number of units, it should leverage the high availability of land in communities with multiple station areas. To be fair, it should also acknowledge that some communities have very little developable land near transit station areas.

- The 2008 Global Warming Solutions Act set ambitious GHG reduction goals, and the Clean Energy and Climate Plan Transportation prepared by EOEEA (and released days before the adoption of H5250) established even more aggressive goals. Transportation emissions—mostly passenger vehicles and light trucks—amount to ~30% of the state's GHG emissions. Achieving rapid progress toward GHG reduction goals will require a combination of strategies designed to increase transit usage and reduce driving, especially in the years before complete auto fleet electrification.

Prior MAPC research has demonstrated that, absent any major changes in land use or roadway pricing, VMT for personal vehicles is projected to increase by more than 21% between 2010 and 2030. If VMT growth continues unabated, vehicle emissions could rise even as the fuel economy improves, and rapidly increasing vehicle demand for renewable electricity will make it harder to transition other sectors to renewables. A reduction in VMT has other benefits as well: less congestion, more livable communities, and safer streets. For all these reasons, guidelines that focus growth in areas with high levels of transit access will yield beneficial transportation and climate impacts.

Recent MAPC research demonstrates the importance of land use and pricing as key strategies to mitigating growth in vehicle miles traveled (VMT). There is abundant evidence that well-designed transit-oriented development (TOD) results in less driving, higher transit ridership, more walking and biking, and stronger local economies. The legislature's decision to apply the multifamily mandate only to MBTA-served communities demonstrates their understanding of this relationship and their intent to advance transportation sustainability through the mandate. Implementation can help to achieve this imperative by requiring higher levels of zoned capacity and ensuing production in areas with high quality transit.

- Zoning, as well as redlining and racial covenants, is one of the public institutions responsible for the profound racial segregation existing in Massachusetts and elsewhere across the country today. Zoning has been used to intentionally exclude people of color and continues to be used today to preserve exclusive communities that are not open to lower-income households, renters, families with children, and other groups. Among the 175 MBTA municipalities in the legislation, there are 75 where fewer than 25% of the housing stock is multifamily, and in dozens of communities the multifamily share is less than 15%. While the basic premise of Section 18 is to counteract exclusive zoning, the Legislature's reference to "families with children" indicates a specific objective to create opportunities for protected classes that continue to be zoned out. State Representative Chynah Tyler [highlighted this issue at a forum on school segregation](#), where she cited the legislation as a tool to "combat the intentional policies that prevent affordable housing production and ultimately perpetuate segregation of schools."

While no single policy or program has the power to undo decades of racially-motivated zoning, every new public policy must affirmatively redress the racist and exclusionary impacts of past (and current) policies and create meaningful opportunities for racial and economic integration. Implementation of the mandate can do this by ensuring that exclusive communities are providing capacity for units sufficient to close the opportunity gap, by incentivizing the production of rental and affordable units, and by establishing measures to prevent displacement in housing-insecure neighborhoods.

In addition to these policy imperatives, there are also practical concerns with regard to the mandate and its implementation. A one-size-fits-all approach won't work for the diversity of MBTA communities, but a subjective approach or one that requires custom analysis for each district will be too onerous and prone to municipalities "gaming" the system.

### **Reasonable Size**

Section 3A requires all 175 MBTA communities to have "at least 1 district of reasonable size in which multi-family housing is permitted as of right," but it does not specify how to define "reasonable size." It is MAPC's understanding that various options have been proposed: acreage of the district, total capacity including existing units, a tiered requirement based on type of transit service (bus, subway, commuter rail), or some combinations of these. Unfortunately, none of these approaches take into account particular local opportunities or constraints, nor do they explicitly advance key imperatives related to climate and racial equity described above.

If the goal of the mandate is to help achieve a substantial share of Governor Baker's 135,000 new unit goal, reasonable size should determine *how many new units* can be accommodated in qualifying districts.

**MAPC recommends that "reasonable size" should be determined based on the total net yield of the districts.** Each municipality can be provided with a net yield target and be required to demonstrate that their qualifying district(s) provide capacity for at least that many units. The calculation of net yield for each district would have to account for constraints, development finance feasibility, existing units, and redevelopment potential; as described later in this working paper, the data resources and technical tools exist to do this analysis using a largely standardized approach.

In order to be comparable across communities, the net yield target should be set as a percent of the existing housing stock and should be adjusted to accommodate the locally-specific constraints and opportunities that exist across the diversity of MBTA communities. MAPC recommends that EOHED establish a baseline target for net yield that is sufficient to achieve a desired share of overall housing need in the coming years. For example, the program could seek to create capacity for 65% of the Governor's 135,000 unit goal, equivalent to approximately 90,000 units or 5% of the existing housing stock across the entire MBTA district.

There are many advantages to such an approach: With a yield target for each municipality, communities would have a single number to plan towards, with some degree of flexibility in regard to acreage, density, distribution, and details of the zoning. They would not be required to meet a multi-part standard that includes acreage, total capacity, and net yield. Meanwhile, the state would be able to determine at the outset how much as-of-right housing capacity will result from full compliance, rather than it being an outcome of hundreds of zoning decisions made over the course of many years. A net yield standard is also suitable for a phased approach, starting low and increasing at regular intervals over time. This could make it more palatable for communities to comply.

**MAPC recommends a formula-based approach to setting net yield targets for each municipality.** To advance the three imperatives identified above while also accommodating local conditions and obligations, this baseline target can be adjusted up or down for each community based on three factors:

- Total land area available for development or redevelopment near transit
- Transit accessibility
- Level of housing exclusion

Municipalities with lots of land area near transit, high levels of accessibility, and exclusive housing would be required to provide more net yield (as a percent of existing stock) when compared to those with little land area, low transit access, and/or diverse housing stock. To implement this approach, each of the three factors (land, accessibility, exclusion) would have one or more metrics combined to create a relative (percentile) score based on that municipality's position relative to all other MBTA communities. The scores would be combined and applied to the baseline net yield requirement to determine an adjusted net yield for each municipality.

**MAPC recommends policy decisions guide the design of the proposed formula.** The technical details of a formula are not solely determinative of the outcome. Its application requires explicit policy decisions about the following

- The total target capacity for all Section 18 districts (baseline net yield)
- The weights given to each factor (land availability, transit accessibility, level of housing exclusion)
- The desired range between the highest and lowest net yield percentage
- Transit proximity requirements (and therefore the land eligible for rezoning)
- The specific variables and metrics used to understand each factor (land availability, transit accessibility, level of housing exclusion)

**MAPC recommends “reasonable size” be defined differently for MBTA-adjacent municipalities than for those that have a station.** The legislation applies to 88 municipalities that have a subway, light rail, or commuter rail station (or land within a half mile of such a station) as well as 87 municipalities that are in the MBTA district but do not have a station or land near one. The mandate clearly applies to all these municipalities. However, effectively advancing transit-oriented development in MBTA-adjacent municipalities is challenging. MAPC recommends that a different approach is needed to define “reasonable size” for MBTA adjacent municipalities, and is still evaluating how to approach the calculations in these municipalities.

#### **Reasonable Size Target Formula: Proof of Concept**

MAPC has prepared a proof-of-concept for the scoring and target setting to demonstrate the feasibility and utility of such an approach. The proof of concept focuses on those municipalities that have land within a half mile of a station. It is presented below, along with ideas for how the data inputs and statistical methods could be refined if the state chooses to adopt such an approach. As described above, a formula approach to setting net yield targets would incorporate three factors:

- Land availability
- Transit accessibility
- Housing exclusion

A normalized score is developed for each factor for each municipality. The scores are adjusted based on policy decisions about the relative weights applied to each factor and the desired ‘spread’ across municipal targets (the range between the highest and lowest requirements). The scores are then combined to produce a composite adjustment factor. This factor is applied to the baseline net yield (percent) to produce an adjusted net yield. The resulting target can be expressed in either percentage terms (percent of existing housing units) or absolute terms (number of units.) The following sections describe the creation and combination of these scores.

#### *Land area available for development or redevelopment*

The availability of land is a fundamental opportunity or constraint for housing production. MAPC proposes that *communities with large amounts of land where new housing could be built should have relatively higher targets than municipalities with small amounts of land area near transit.* Therefore, one factor should be based on the acreage of potentially developable land, near transit or in other suitable areas.

The determination of what land counts as “constrained” and what is “potentially developable” is a policy decision to be made as the formula is established. At the very least, the land area metric

should account for “absolute” constraints: those that render development infeasible or impractical, and which can’t be modified through local regulatory action. These absolute constraints include environmental factors such as wetlands, flood zones, and steep slopes, as well as permanently protected open space, cemeteries, roadways, and public utilities or facilities. All of these constraints can be mapped statewide using data currently available from MassGIS. The guidelines could also allow for the land area calculations to include other areas where there is a public policy interest in discouraging or preventing development. For example, sites with subsidized housing units; sites vulnerable to future sea level rise or flooding beyond what is currently mapped; or unprotected sites with mapped sensitive environmental resources could all be excluded from the developable land area. While not yet published by MassGIS, information about these other factors is available or could be standardized.

It is MAPC’s position that the presence of existing development—including residential uses—should not categorically exclude parcels from the calculation of “developable land.” In addition to vacant and unconstrained areas, developable land should include infill parcels, nonresidential land that could be redeveloped, municipal land that could be repurposed for housing, and residential areas that could be rezoned to allow higher density.

Another key element of this factor will be a definition of what constitutes “near transit.” It is MAPC’s position that qualifying districts should be within a reasonable walking distance of transit stations, preferably less than a half mile/10-minute walk. However, the lack of adequate pedestrian infrastructure is not an absolute constraint, since new connections can be created. Therefore, we recommend that the basis for the land area calculation be the entire municipal area within a 0.5-mile buffer of qualifying transit stations (including stations in adjacent municipalities).

For the proof of concept, MAPC selected all area within 0.5 miles of a transit station area (subway, commuter rail, silver line) and removed the following features:

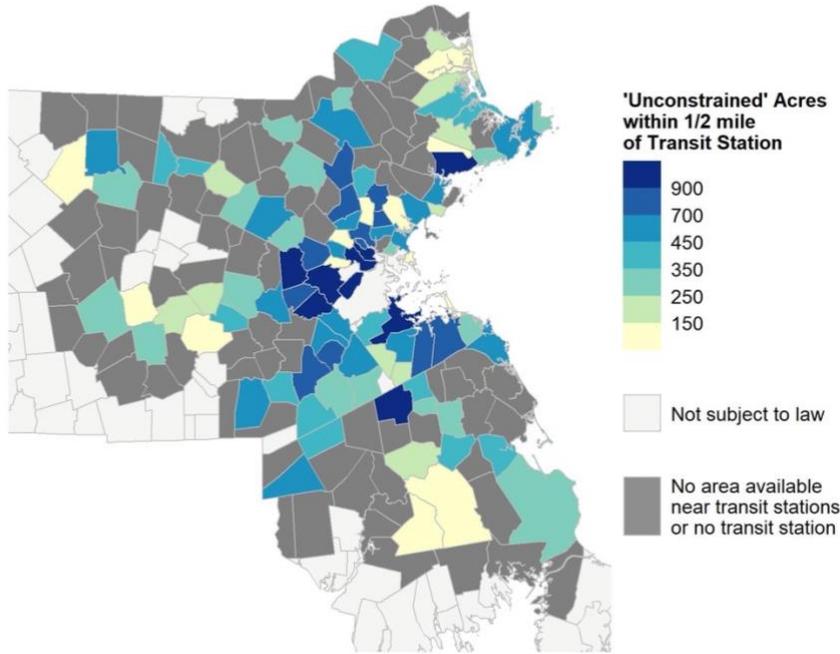
- Water bodies
- Permanently protected open space
- Parcels with water supply or sewer easements
- Roadways and land owned by Mass Highway
- Land classified as “undevelopable” by the local assessor
- Parcels classified as hospitals, religious facilities, educational institutions, libraries
- Parcels classified as correctional facilities or public safety facilities
- Parcels used for gas, electric, telecommunication, or other utilities
- Parcels classified as farms, nurseries, pasture, or recreational facilities
- Other parcels with land use classifications determined to be prohibitive of development

A full list of the constraints and sources is available upon request. However, it is worth reiterating that this selection is used only for the proof of concept, and the specific constraints used for the formula should be a policy discussion.

The map below shows the sum of potentially developable land area in transit station areas. This total includes land area that is within 0.5 miles of a station area in a nearby municipality.

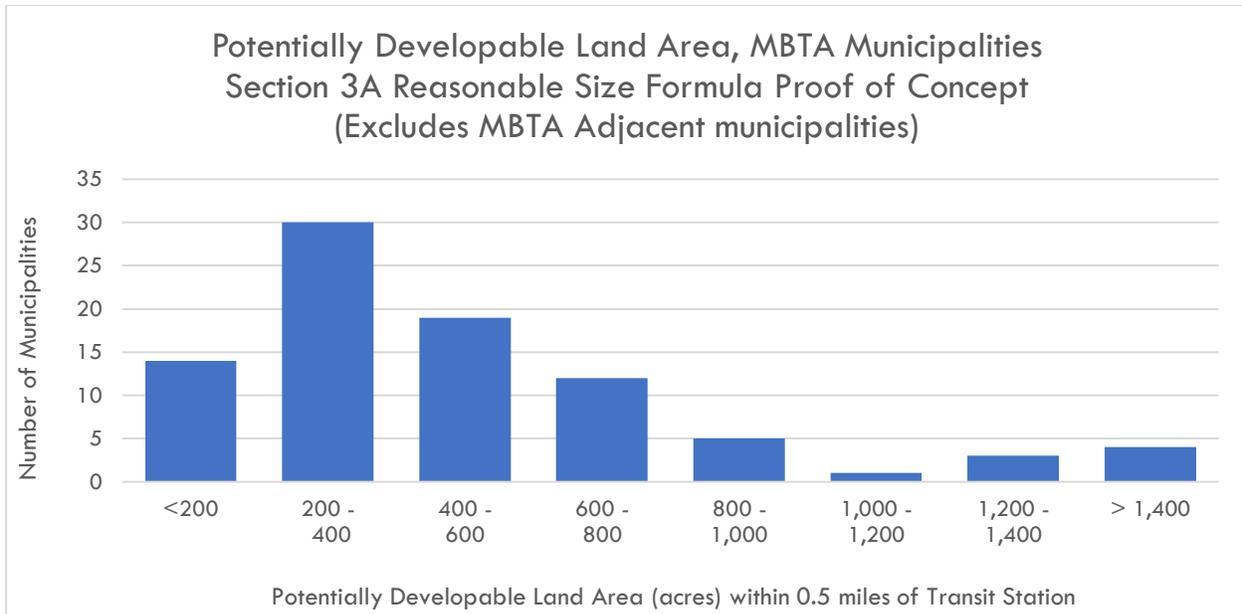
## Potentially Developable Land Near Transit

Excludes water, protected open space, roads and utilities, other constraints



Data source: MAPC  
175 Municipalities, (excluding Boston) which fall under the MBTA's service area highlighted. Boston is not subject to this law

The chart below shows the distribution of values for the 88 municipalities with land in a transit station area. The mean value is 504 acres, though the distribution has a long tail—by our count there are more than a dozen municipalities with more than 1,000 acres of land potentially available for development and redevelopment. Meanwhile, more than a dozen communities have fewer than 200 acres of potentially developable land—in some cases less than 50 acres. This chart demonstrates that based on land area alone, there is a wide range of opportunities for housing development across MBTA communities.



### *Housing Exclusivity*

In addition to increasing housing production overall, Section 3A is clearly intended to remedy the lack of housing diversity—specifically the lack of multifamily housing, and especially in places where it is currently prohibited by zoning and has been for some time. MAPC proposes that *municipalities with a more exclusive housing stock should have relatively higher targets than communities with a diversity of housing*. Therefore, one factor in the reasonable size formula should account for the diversity of existing stock.

There are many different aspects of housing diversity and exclusivity. The type of structure (single family vs. multifamily), the tenure (ownership vs. rental), the cost, physical accessibility, age of structure, bedroom counts, and other factors are all critical elements in housing diversity.<sup>1</sup> By definition, Section 3A is principally focused on the availability of multifamily housing stock (while also attending to the need for family-sized units)- Changes in zoning are under the direct control of municipal government and directly effect on the availability of housing other than single family homes. Other elements, such as cost and tenure, are influenced more by regional market conditions and are therefore less influenced by this mandate.

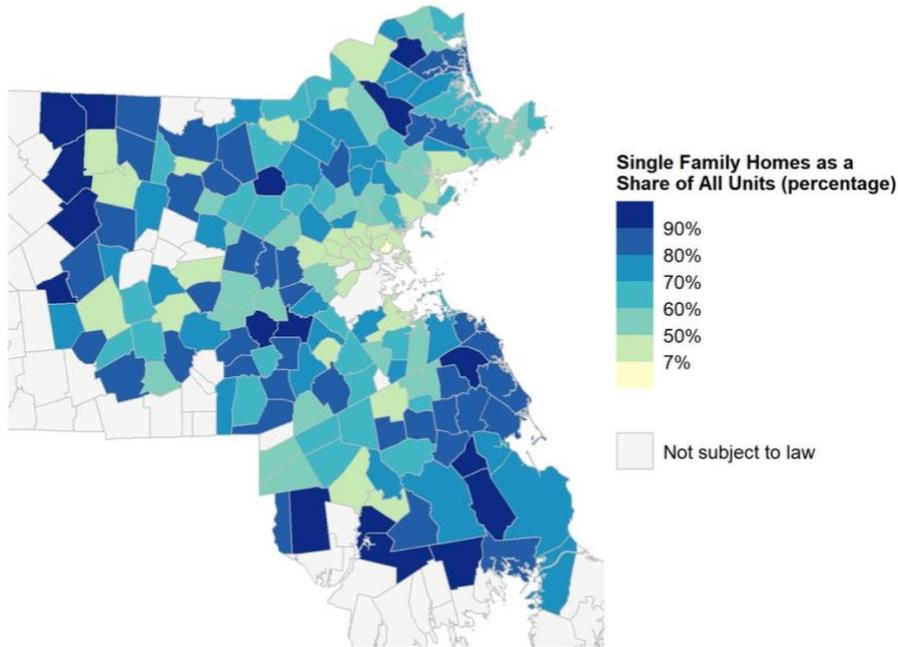
For these reasons, and for simplicity’s sake, our proof of concept uses the percent of single-family homes as the measure of housing exclusivity for communities subject to the mandate. This information can be drawn from the American Community Survey (ACS), as well as from local assessor data. However, due to the unreliability and inconsistency of unit counts in assessor data, MAPC has chosen to use ACS data drawn from surveys conducted during 2015 – 2019. This information can be easily updated over time as necessary.

The map below shows the share of units that are in single-family detached structures.

<sup>1</sup> MAPC’s Housing Submarket Typology parses all these different factors to identify seven distinct submarkets in the region. <https://housing-submarkets.mapc.org/>

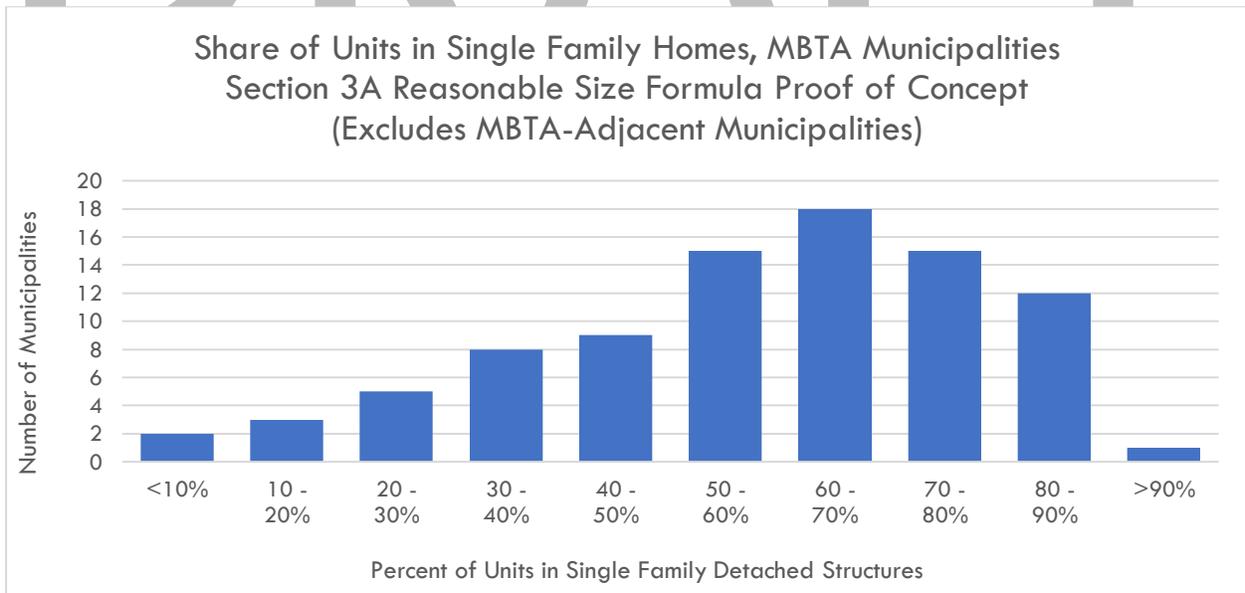
## Share of Housing in Single Family Homes

2015 -2019 American Community Survey



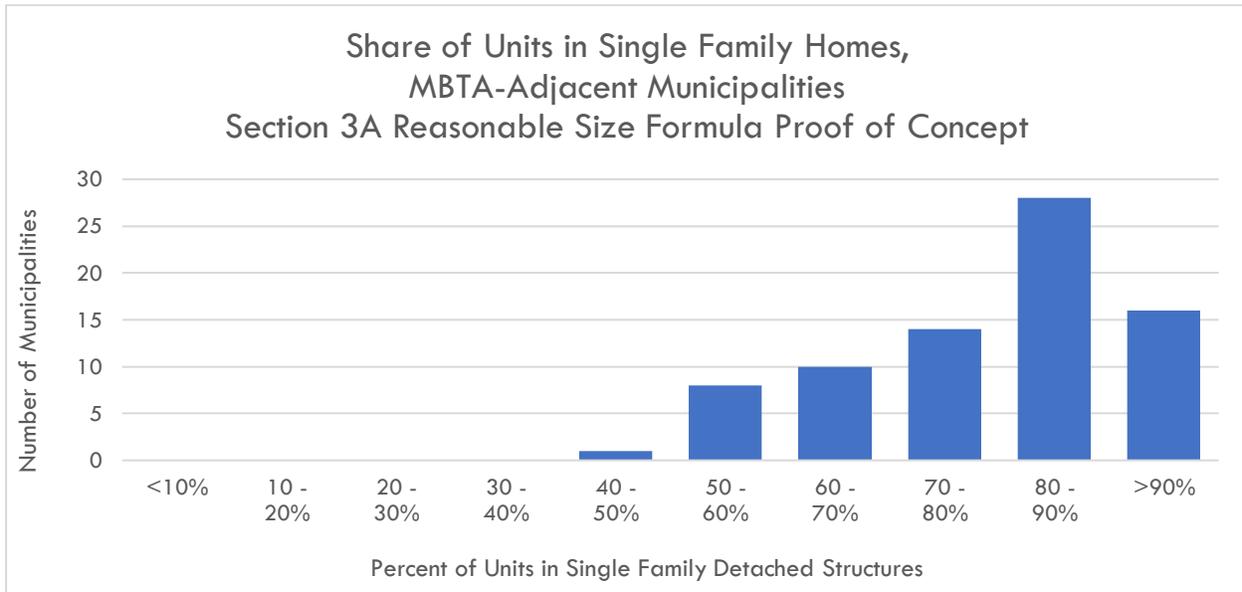
Data source: ACS 2015-19 Table DP04  
175 Municipalities, (excluding Boston) which fall under the MBTA's service area highlighted.  
Boston is not subject to this law

The chart below shows the distribution only for the 88 municipalities that have land within a 0.5 mile of an MBTA station. The mean value is 58%, with a standard deviation of 20%.



Information about housing stock is available for municipalities without a transit station area. The chart below shows the distribution of values for the 87 MBTA-adjacent municipalities. Housing

stock in these communities is even more skewed toward single-family homes. For these municipalities, the average is 79% with a standard deviation of 13%.



#### *Transit Accessibility*

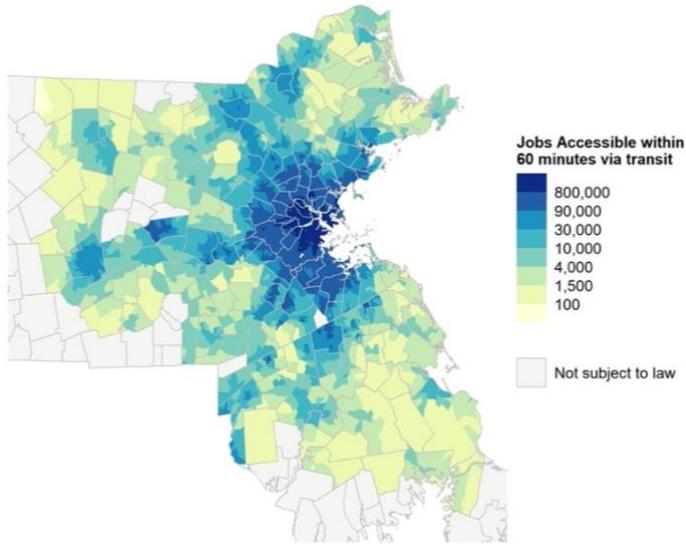
The decision to require zoning for multifamily housing in the MBTA district and specifically near transit stations indicates the legislature’s intent to promote transit-oriented development and thereby reduce congestion and GHG emissions. MAPC proposes that *communities with lots of transit access to jobs and other opportunities should have relatively higher targets than municipalities where transit provides connections to fewer destinations.*

Differences in transit utility can be quantified in terms of “transit accessibility,” often measured as the number of jobs accessible within a specified travel time. There is abundant research demonstrating that higher levels of transit accessibility to jobs are associated with lower car ownership, less VMT, and lower GHG emissions. While not ideal, total jobs is a valid proxy for other important destinations and opportunities, including services, schools, medical care, and social networks.

There are a variety of data sources related to transit accessibility to jobs. The [University of Minnesota \(UMN\) Accessibility Observatory](#) publishes estimates of transit accessibility to jobs during peak at the block group level. These estimates are based on travel time during peak commute times, and account for transit schedules, transfers, walking time, and employment data. Similar information is also available from the [EPA Smart Location Database](#) (Access to Jobs and Workers via Transit tool). Furthermore, transit accessibility scores can be readily calculated by tools such as [Conveyal](#), already in use by MAPC and MassDOT. With Conveyal, the state could customize and maintain its own accessibility measure for the scoring program.

For this proof of concept, MAPC utilized the UMN Accessibility Observatory Dataset. Specifically, we used the number of jobs accessible within 60 minutes via transit. The input data, produced at the census block group level, are depicted in the map below. Transit accessibility to jobs is highest near the Inner Core, along frequent commuter rail lines, and near major suburban job centers and commercial corridors.

### Transit Accessibility to Jobs, by Block Group

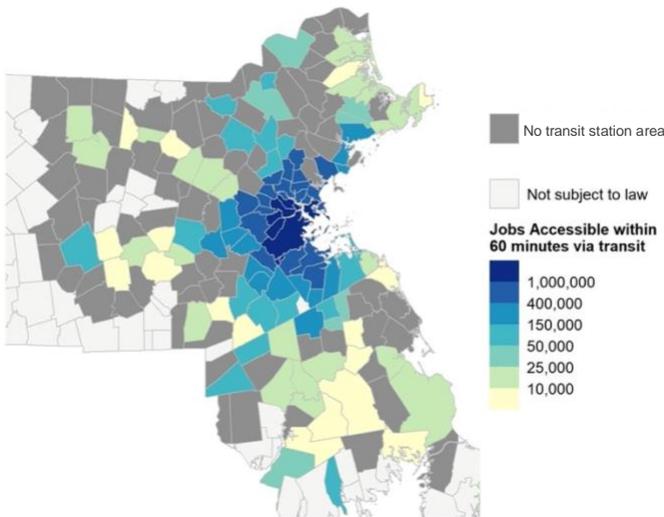


Data source: University of Minnesota, Accessibility Observatory  
175 Municipalities, (excluding Boston) which fall under the MBTA's service area highlighted.  
Boston is not subject to this law

For this proof of concept, the score for each municipality is based on the maximum accessibility value in any of the transit station areas within the municipality. The results are shown in the map below. Values are not calculated for MBTA-adjacent municipalities without a station area<sup>2</sup>.

### Transit Accessibility to Jobs, by Municipality

Maximum value for all station areas in Municipality

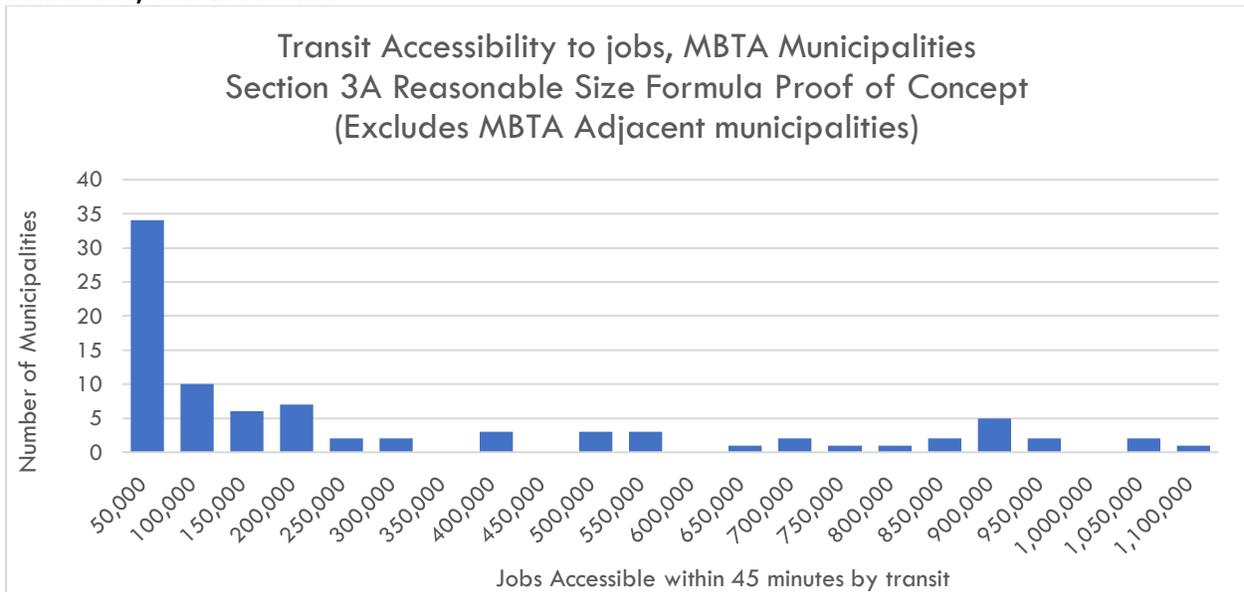


Data source: University of Minnesota, Accessibility Observatory  
175 Municipalities, (excluding Boston) which fall under the MBTA's service area highlighted.  
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In future refinements, this could be calculated as an average of all station areas and could even be weighted by the potentially developable land area within each station area.

<sup>2</sup> Conceivably, a transit accessibility to jobs metric could be calculated for municipalities that have some MBTA or RTA bus service but do not have an land in a station area.

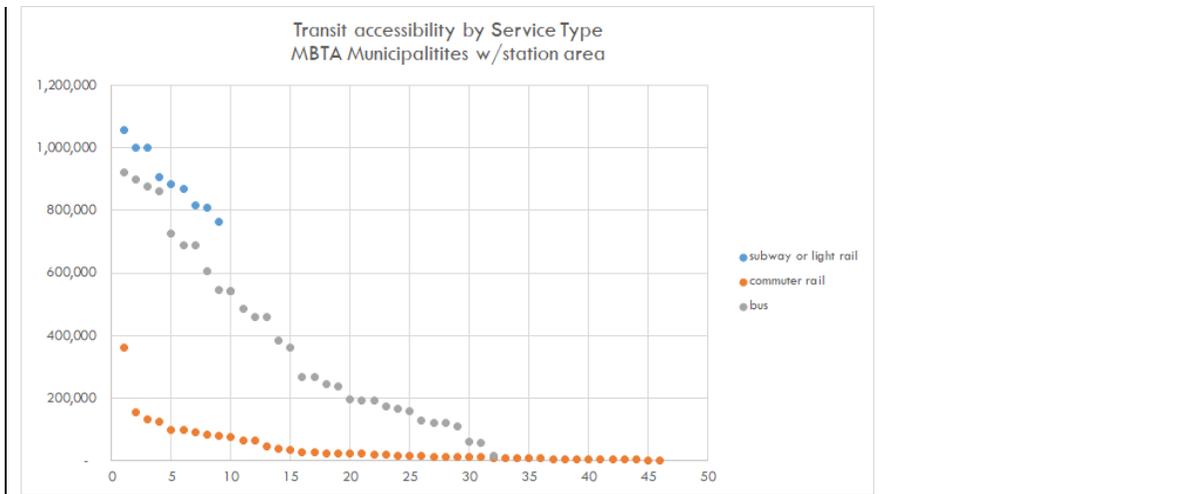
The distribution of the maximum access to jobs measure is shown in the graph below. The average value across municipalities is 260,000 jobs, but that value is strongly influenced by the municipalities with very high values. Half of the municipalities have fewer than 100,000 jobs available within 60 minutes via transit. The very long tail to the graph indicates that there is a wide distribution across the remaining municipalities, up to over 1 million jobs for Cambridge, Somerville, and Brookline.



*Why not just base it on the type of MBTA service they have?*

Some stakeholders have remarked that notions of accessibility are too complicated and asked why the guidance shouldn't simply be based on the type of transit service: subway/light rail, bus, or commuter rail. Conceivably, different standards for "reasonable size" could be applied to these three categories. It is also an easy concept to communicate. Unfortunately, it is neither a good proxy for level of transit service, nor would it be as clear cut in implementation as one would hope.

The chart below demonstrates why service type is not a valid measure of transit quality, if that is defined as providing access to many destinations within a reasonable travel time. While the average values for subway, bus, and commuter rail municipalities are quite different, there is a wide distribution, especially for bus communities. This group overlaps with values for subway communities at the high end, and commuter rail communities at the low end. This is not surprising for a group including both Medford and Hull. Consequently, tiered requirements based on service type won't optimally focus housing capacity in places where people have good transit access to jobs and other services and amenities, or where it will do the most for VMT, GHG, and congestion reduction.



In addition to being a poor proxy for transit quality, service type is not as clear cut as it seems. How will communities be assigned to a service type? Is it the highest tier provided in their municipality? Or the tier that serves the most people, or the greatest land area? What about stations areas that cross municipal borders? Without clear thresholds, the assignment of municipalities may seem arbitrary. Some borderline communities might even dispute their classification, asking to be demoted from subway to bus, or bus to commuter rail, so as to reduce their zoning obligations.

For these reasons, tiered requirements based on service type or other broad categories should be avoided in favor of continuous measurements of indicators with a rational nexus to the legislation and the Commonwealth's other policy imperatives.

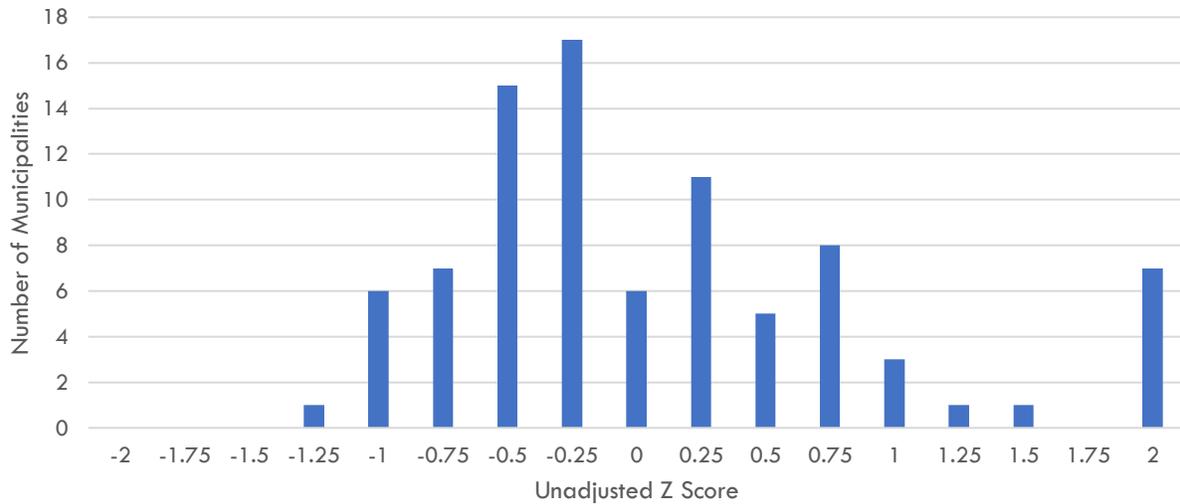
#### *Preparing the Scores*

To combine the data sources described above into a composite score, it is necessary to normalize them. Information about developable area, transit quality, and housing exclusivity are three different measures with different units and ranges. Normalization allows these three indicators to be combined by putting all the results on the same scale.

For this proof of concept, MAPC used z-score normalization. This method describes how much a particular municipality varies from the average, and whether it is high or low. Positive z-scores mean a community was above average on a particular indicator, and negative z-scores indicate the converse. The "average" community has a z-score of zero. For each of the indicators, there were one or two municipalities with extreme values far above or below the mean. This proof of concept limits the range of z-scores to between -2.0 and +2.0; lower or higher values are capped there.

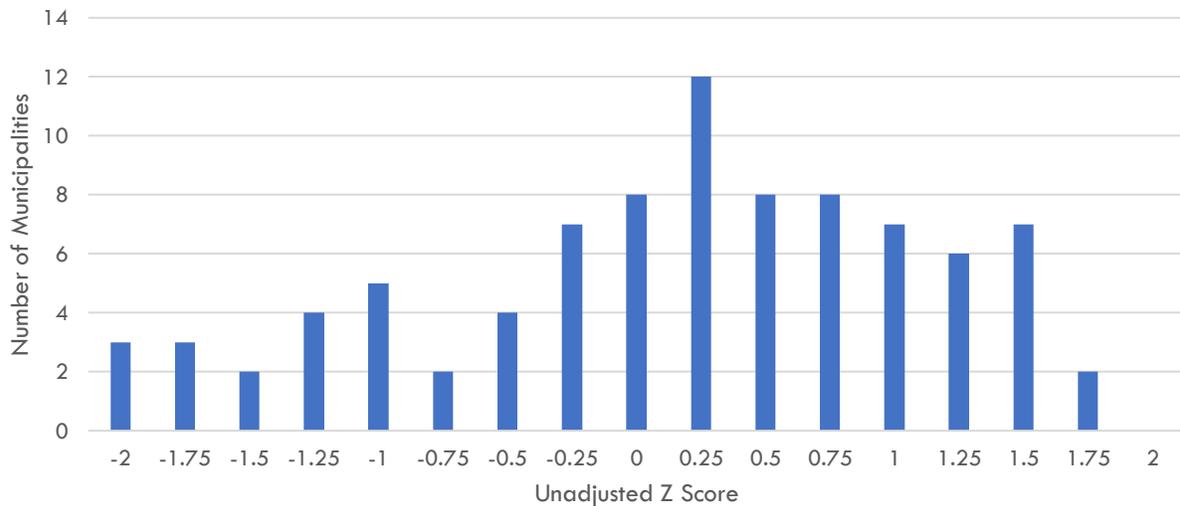
The chart below shows the distribution of z-scores for Potentially Developable Land Area. Most municipalities have a z-score close to zero, but the values skew toward the high end. Seven cities and towns have a score of 2.0, equivalent to more than 1,200 acres of potentially developable land according to the assumptions described above. There are no municipalities with a land area z-score of 1.3.

Potentially Developable Land Area Z-Scores  
Section 3A Reasonable Size Proof of Concept  
(Excludes MBTA Adjacent Municipalities)



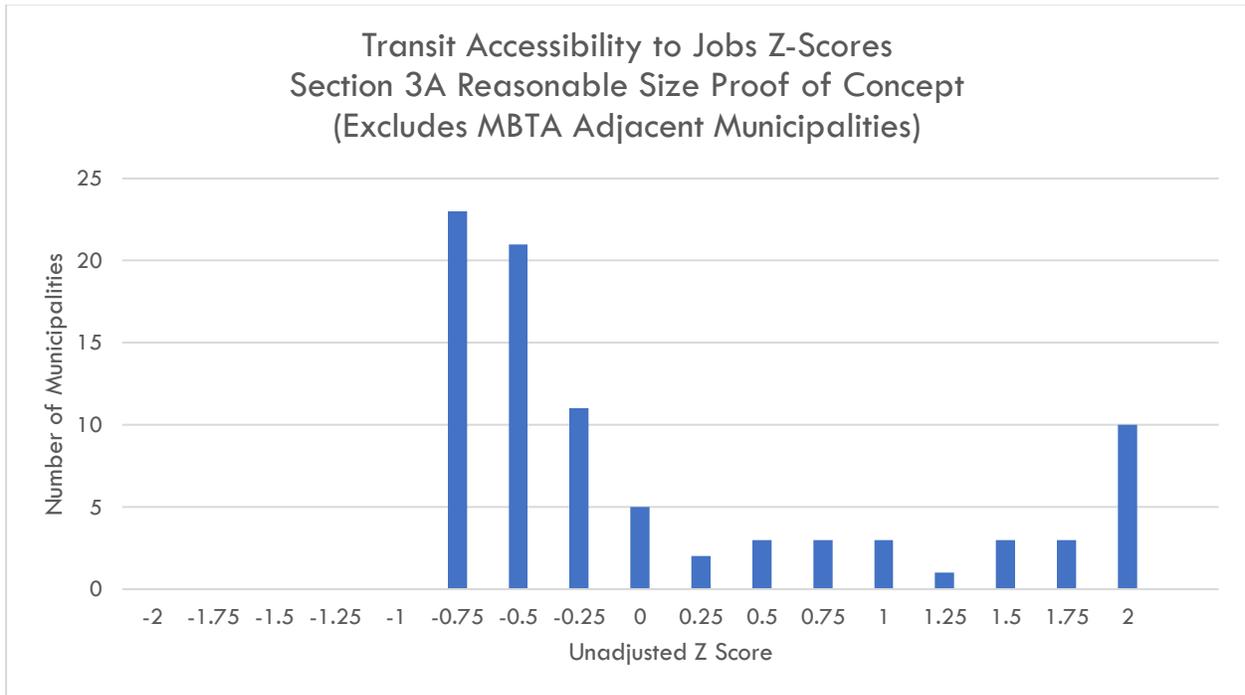
The housing exclusion z-scores are more broadly distributed. Most communities have a value greater than 0. In this case, the distribution skews to lower z-scores. There are 3 municipalities with a calculated z-score of less than -2.0 (capped at -2.0).

Housing Exclusion Z-Scores  
Section 3A Reasonable Size Proof of Concept  
(Excludes MBTA Adjacent Municipalities)



The Transit Access z-score histogram shows that most communities are less than zero, but not by much, and there is a long tail of high values. Five communities have a calculated z-score of

greater than 2.0, indicating extremely high accessibility values; five more have scores between 1.75 and 2.0.

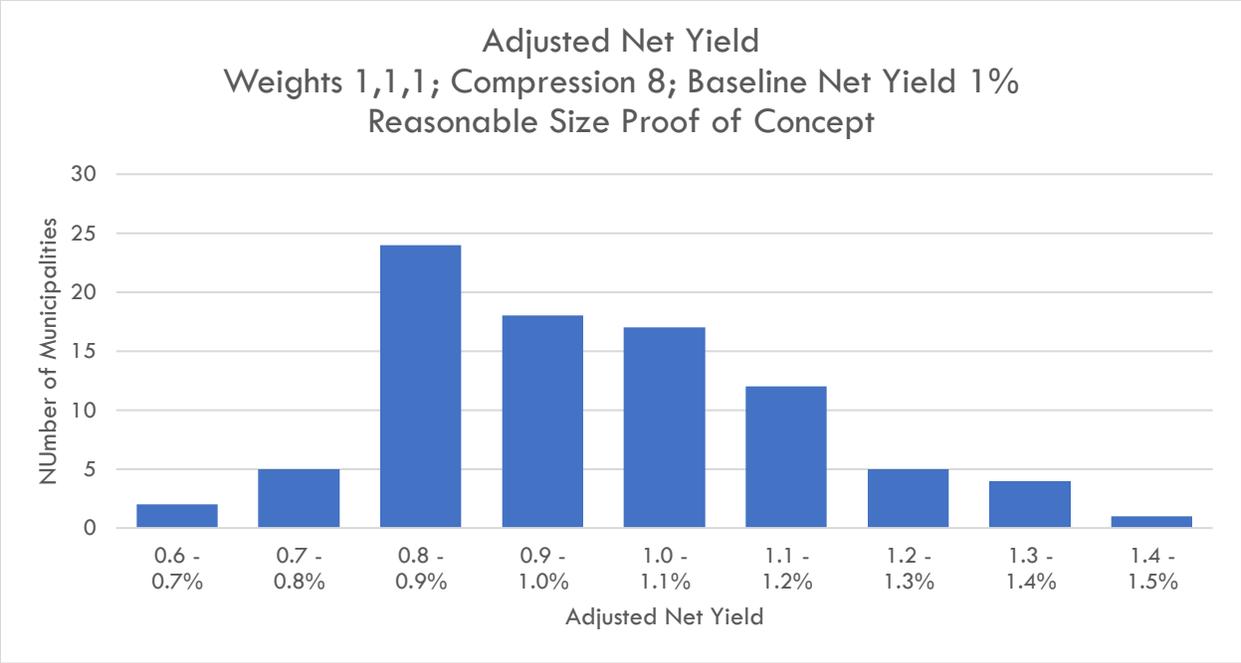


Following the calculation of z-scores, the three measures are weighted to reflect policy priorities. Each factor begins with a weight of 1.0, which can be adjusted between 0 and 2. Each factor is weighted independently and then rebalanced so the average weight is 1. Z-scores are multiplied by the adjusted weights and summed together to create a combined score.

The average combined score is always near zero. Compression is applied to the combined z scores to control the range of target percentages. For the proof of concept, we simply divide the combined z-score by a compression factor. Higher compression values produce a smaller range and standard deviation; lower compression values yield more spread. The baseline estimates use a compression value of 8, which results in a range where the max is 2.35x the minimum, and the standard deviation is 0.16% of the baseline net yield.

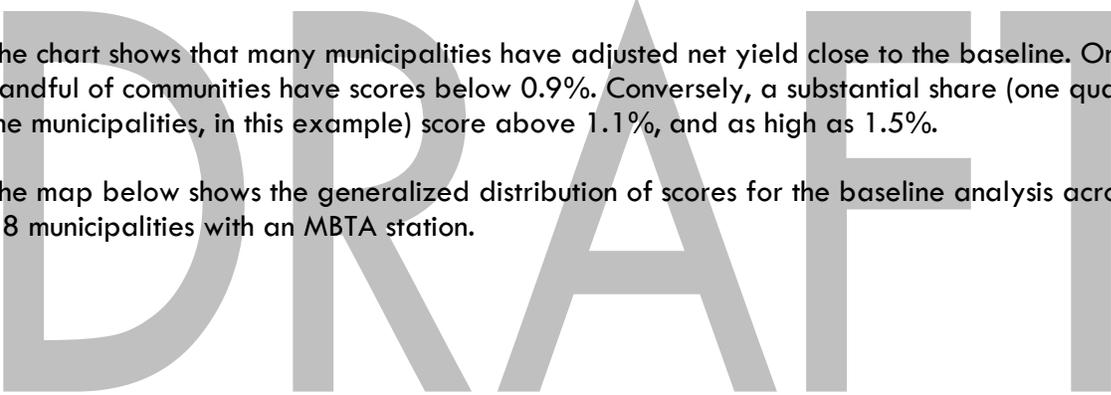
The combined, compressed scores are added to 1 and multiplied by the baseline net yield to produce the adjusted net yield in percentage terms. This can be applied to the applicable housing unit count to produce a net yield in terms of units.

Assuming equal weights, compression of 8, and a baseline net yield of 1%, the adjusted net yield ranges from 0.62% to 1.46%. The chart below shows the distribution of adjusted net yields for this scenario.



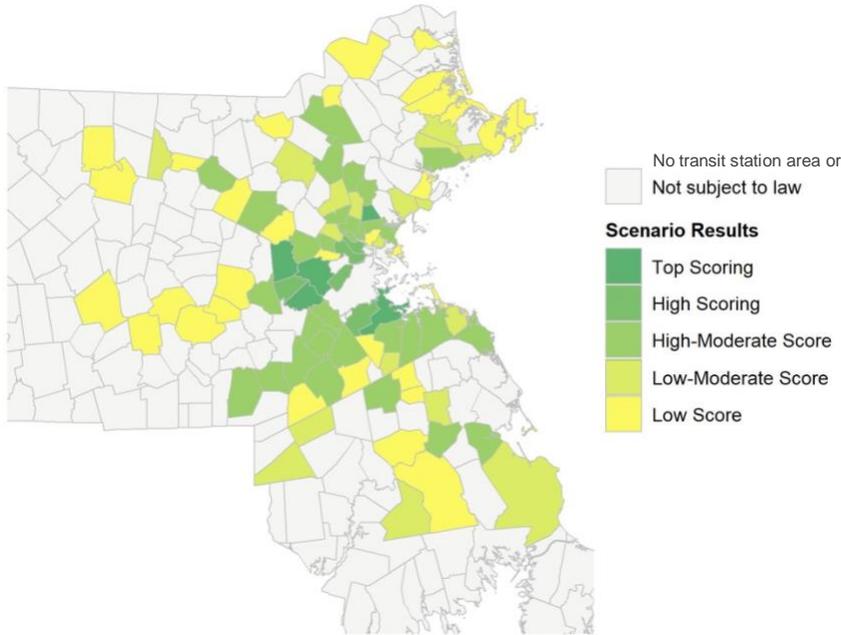
The chart shows that many municipalities have adjusted net yield close to the baseline. Only a handful of communities have scores below 0.9%. Conversely, a substantial share (one quarter of the municipalities, in this example) score above 1.1%, and as high as 1.5%.

The map below shows the generalized distribution of scores for the baseline analysis across the 88 municipalities with an MBTA station.



## Reasonable Size Formula Proof of Concept

Generalized Results: Baseline Assumptions



Data source: MAPC  
175 Municipalities, (excluding Boston) which fall under the  
MBTA's service area highlighted.  
Boston is not subject to this law

### Sensitivity Testing

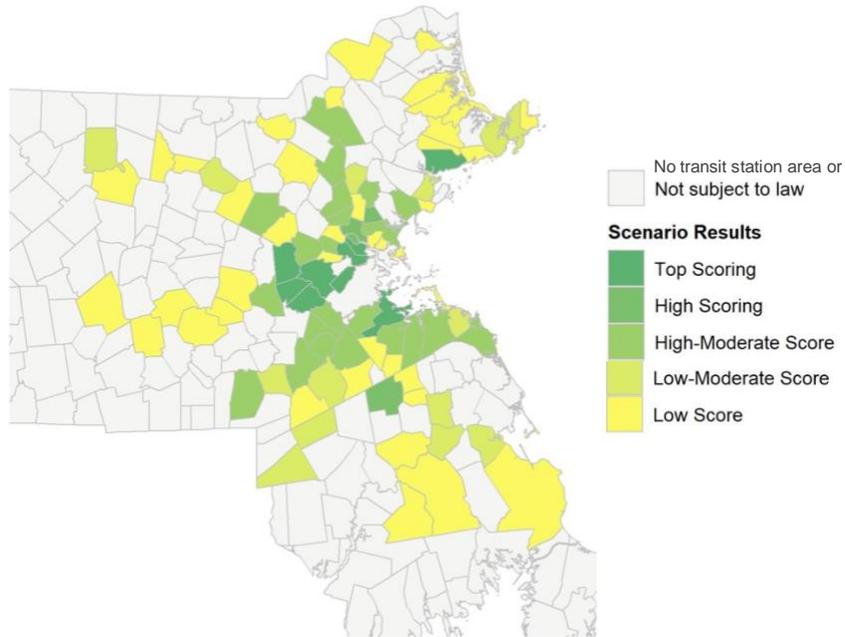
In addition to the core data inputs, the proof of concept results can be adjusted by changing the weights for the three factors, or by modifying the amount of compression. This section describes the results of those tests.

For the first set of tests, we evaluated the impact of weighting each of the factors more heavily. The weights for a given factor were set to a value of 3, and the other weights were left at a value of 1. Effectively, this means that the more heavily weighted factor counts for half of the composite score, and the other two factors each count for one quarter of the score.

The map below shows the impact of setting a weight of 3 for the land area factor. This adjustment produces higher yield requirements for municipalities with multiple station areas, and lower requirements for others with only one station area or portion thereof. Inner Core municipalities such as Arlington and Everett, which have relatively good accessibility via bus service but little in the way of transit station area, see substantial decreases, as do more suburban municipalities with high housing need but only average amounts of land in a station area.

## Reasonable Size Formula Proof of Concept

Generalized Results: Developable Area Weight 3x

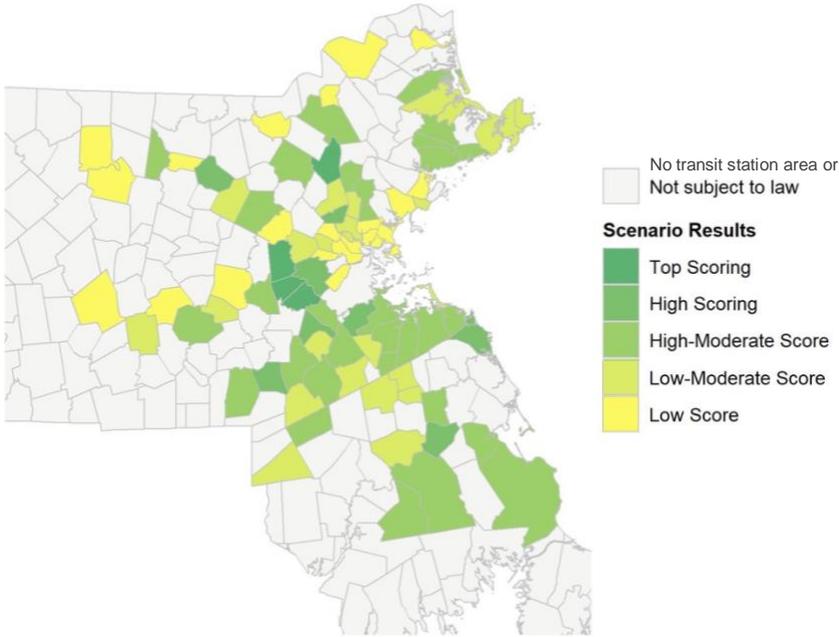


Data source: MAPC  
175 Municipalities, (excluding Boston) which fall under the  
MBTA's service area highlighted.  
Boston is not subject to this law

The map below shows the impact of setting the Housing Exclusion weight at a value of 3. This adjustment has the effect of requiring higher yields in the suburban municipalities with relatively low shares of multifamily housing, and substantial reductions in the yield requirements for many Inner Core municipalities and Regional Urban Centers.

# Reasonable Size Formula Proof of Concept

Generalized Results: Housing Exclusion Weight 3x



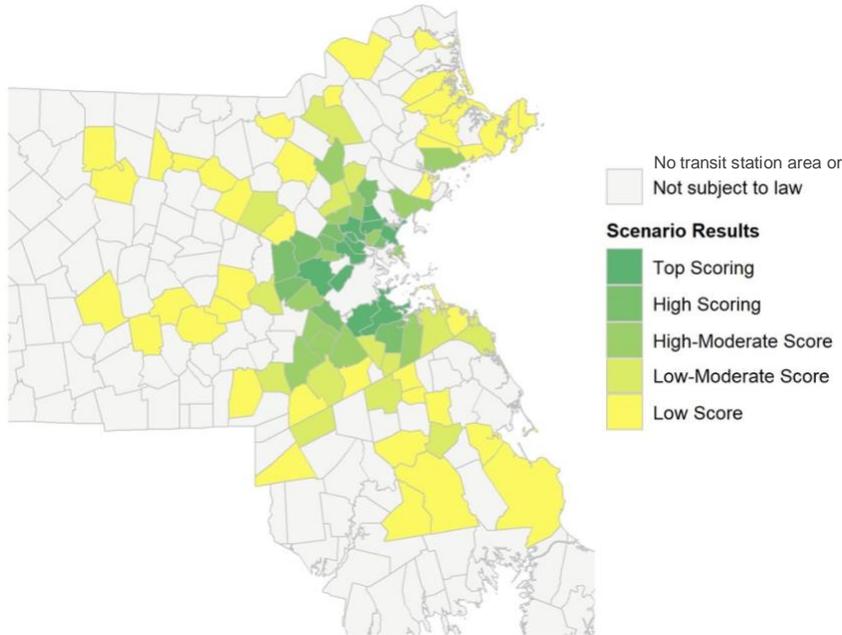
175 Municipalities, (excluding Boston) which fall under the MBTA's service area highlighted. Boston is not subject to this law

The map below shows the effect of setting the transit access weight to a value of 3. In this case, the highest scoring municipalities are in and around the Inner Core, with low scores for most municipalities outside Route 128.

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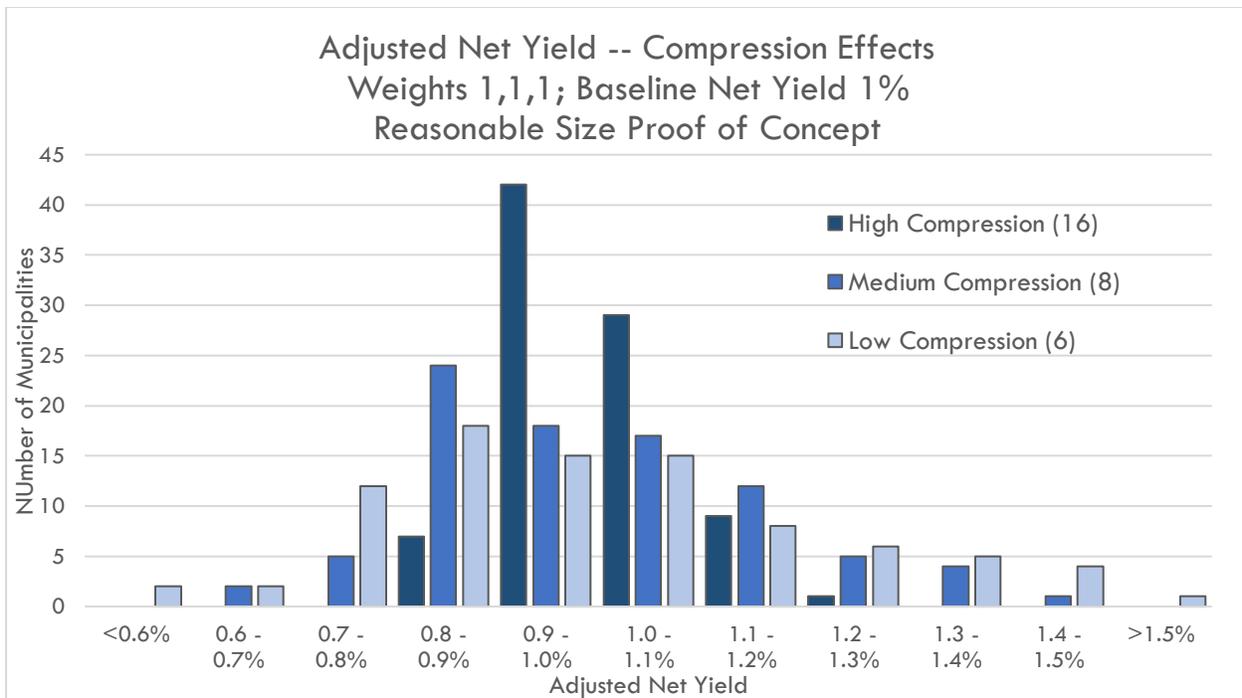
## Reasonable Size Formula Proof of Concept

Generalized Results: Transit Access Weight 3x



*Data source: MAPC  
175 Municipalities, (excluding Boston) which fall under the  
MBTA's service area highlighted.  
Boston is not subject to this law*

In addition to evaluating the effects of different factor weights, we also tested different compression factors, which determine the overall range of the adjusted net yield values. As noted above, the baseline analysis used a compression factor of 8, which produces a spread of 2.35x between the minimum and maximum value. We also tested a value of 6, which produces a wider range of values (max = 3.27x min); and a value of 16, which produces a much smaller range (max only 1.52x min). The results of these three assumptions are shown in the graph below.



Low compression values result in more extreme differences between the highest and lowest net yields. High compression means that the net yields for all communities are more similar. Because the composite net yield skews toward high values, higher compression has a somewhat larger effect on those municipalities with the highest scores.

#### *Conclusions Regarding Formula*

This proof of concept demonstrates that a formula-based approach to setting net yield targets is feasible and produces results that advance multiple policy imperatives. The formula can be implemented using readily available data with a rational nexus to the legislative objectives. Inputs can be further refined and updated over time. The formula can be effectively weighted to advance certain policy priorities over others, and the results can be adjusted to achieve the desired spread between the highest and lowest requirements.

*But this seems so complicated! How can it be explained to municipalities?*

While the technical methods underlying the formula may appear complicated to some stakeholders, it can be communicated in a simplified way that expresses key elements. Examples of messaging for municipal stakeholders might include the following.

- The guidelines require your municipality to zone for a specified number of new units. You don't have to worry about the acreage of your district or determine whether preexisting development would satisfy the requirements.
- The net yield formula is based on three factors relevant to the legislation: the amount of potentially developable land near transit, the level of access provided by transit, and the current availability of multifamily housing in the community. Communities with more land, better transit, and less multifamily housing will have to meet relatively higher requirements.

- Your community's target is based on information *specifically about your community*. You won't be lumped in with other cities and towns that may have more opportunities or obligations.
- The information and calculations behind the formula are transparent and can be updated over time.

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