Mapping Child Care and Early Education Capacity to Needs in Massachusetts

Authors

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UMass Boston

UMass Boston Early Education Cost and Usage Simulator Project (CUSP)

The UMass Boston Early Education CUSP is led by a multidisciplinary team that designed a simulator to produce current, relevant, accurate, and responsive estimates about the key impacts of proposed legislation to expand access to affordable, quality child care and early education. One of the simulator's valuable features is that it can generate estimates for a range of policy parameters and provisions. The team's publications aim to provide essential information to guide policymaking on child care and early education affordability, quality, and access in Massachusetts.

Updates and additional information about this project may be found at **blogs.umb.edu/earlyed/2024/06/26/cusp**.

About the Authors

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Christa Kelleher, PhD, serves as research and policy director of UMass Boston's Center for Women in Politics and Public Policy. She enjoys building and managing diverse teams to conduct collaborative applied research on public leadership and a range of public policy issues. Among other projects, she has directed studies on women's economic status, the midwifery workforce, women in construction, gender parity in higher education leadership, the early care and education workforce, and pay equity.

Randy Albelda, PhD, is professor emerita of economics at the University of Massachusetts Boston. Her research covers a broad range of economic policies affecting women's economic status, especially for low-income workers in the United States, with particular attention to the intersection of public supports and earnings. Albelda has worked with various local, state, and national groups on policies that promote gender, racial, and income equality. She co-developed a paid family and medical leave simulator with Alan Clayton-Matthews in conjunction with the Institute for Women's Policy Research.

Anne Douglass, PhD, is professor of early childhood education policy and founding executive director of the Early Education Leaders Institute (formerly Institute for Early Education Leadership and Innovation) at the University of Massachusetts Boston. She is an expert on the early care and education workforce, leadership, and quality improvement, and she brings years of experience leading innovations to equitably increase early educator access to higher education and professional development. She also has 20 years of experience as an early educator. She is the author of *Leading for Change in Early Care and Education: Cultivating Leadership from Within;* has been published in a wide range of journals, books, and news media; and presents nationally and internationally to academic, policy, and professional audiences.

Laurie Nsiah-Jefferson, PhD, MPH, MA, is director of the Center for Women in Politics and Public Policy at UMass Boston and graduate program director of the Gender, Leadership, and Public Policy graduate certificate program. She is committed to equity and inclusion in her work as a faculty member, executive leader, and researcher. An expert on the intersection of race, class, and gender in health, health care, and social policy, she is extremely well versed in the tools and applications of diversity, equity, inclusion, and anti-racism in multiple spheres and venues. She has held faculty and senior scientist positions at the Heller School for Social Policy and Management at Brandeis University, where she was affiliated with the Institute for Child, Youth and Family Policy, the Institute on Assets and Social Policy, and the Sillerman Center for the Advancement of Philanthropy.

ACKNOWLEDGEMENTS

INTRODUCTION

Massachusetts has made notable strides in expanding access to affordable, quality, licensed child care and early education in recent years. Ongoing robust state investment in the Commonwealth Cares for Children Grant Program, activities of the Healey-Driscoll Inter-Agency Early Education and Child Care Task Force, and increased income eligibility for child care financial assistance to families with moderate incomes, among other initiatives, all help address persistent barriers to quality education and care at a price families can afford.
Yet the supply of licensed child care for infants, toddlers, and preschool children remains a formidable challenge to meeting the child care and early education needs of families across the state. Availability of child care and early education matters to parents and caregivers.
As stated in 2025 Findings from the Massachusetts Early Childhood Needs Assessment: "Almost universally, caregivers identified availability as their number one priority when looking for a child care setting." In Massachusetts, "caregivers expressed a preference for child care arrangements that were proximal to their home or work." [1]

This brief offers geographic analyses to show where estimated demand for child care and early education capacity exceeds current capacity and to inform efforts to expand capacity.

METHODS

What is the UMass Boston Early Education Cost and Usage Simulator Project (CUSP)?

Through UMass Boston's Early Education Cost and Usage Simulator Project (CUSP), a multi-disciplinary team of researchers examines key impacts of expanding financial assistance to families for child care and early education. The team has developed and uses a statistical model that simulates parents' decisions about care usage to estimate current usage, how much more licensed care might be needed with increased access to financial assistance, and what employment and income changes may take place with increased utilization of affordable licensed quality child care and early education. Since fall 2023, the team has released several policy briefs including *Estimating the Impacts of Legislation to Expand Affordable Quality Child Care* and *Early Education in Massachusetts and Building a Foundation for Racial and Ethnic Equity*. These and other CUSP publications are available along with full technical documentation of the CUSP model.

This brief addresses the following question(s):

- Which areas of Massachusetts generally have sufficient capacity to meet estimated demand for licensed child care and early education currently, and which do not?

- Where are the greatest gaps between estimated demand and capacity at full implementation of Massachusetts' policy expanding family financial assistance for child care?

Why This Approach to Geographic Analysis?

Most existing geographic analyses of the limited supply of licensed child care and early education (such as child care deserts) in Massachusetts are not based on estimated demand but on the current total number of all children relative to the current number of child care slots, often presented by age group.[2]

Given that with the CUSP model, it is possible to take this more nuanced approach since the model accounts for families' preferred use of licensed child care when made more affordable for parents and families. Of course some families will prefer to have family, friends, and neighbors care for their children. This is particularly the case for infants given access to paid family and medical leave in Massachusetts and documented evidence of preference for family/friend/neighbor care for infants. Yet, as demonstrated in the team's previous briefs and other scholarship in the field, there is strong evidence that families utilize licensed care when it is affordable and accessible.[3]

Furthermore, as explained in the Technical Appendix, to make the enrollment to capacity comparison meaningful, enrollment is expressed in full-time equivalents (FTEs). A child who uses 25 or more hours of care a week is counted as one FTE and a child who uses less than 25 hours of care a week is counted as one-half an FTE.

What Does this Brief Cover?

To generate the maps, graphs, and tables in this brief, the team primarily utilized estimated enrollment demand from the UMass Boston CUSP model for licensed child care and early education by geographic region and compared that to current licensed capacity for infants, toddlers, and preschoolers.

The table below provides a snapshot of what is included in this brief. To address different conditions and geographies, various data sources were used and different types of maps, graphs, and tables were prepared for the fullest possible analysis to inform capacity-expansion efforts.

Table 1. Data Visual Purpose and Geography

Visual Type	Purpose	Geography
Map	Areas where estimated demand is met or not met relative to licensed capacity based on current implementation.	PUMA Gateway Cities
Graph	Number of current full-time enrollment (FTE) slots and number of FTE estimated slots under full implementation of financial assistance.	EEC Licensing Region
Table	Areas where estimated demand is met or not met relative to effective licensed capacity based on current implementation.	EEC Licensing Region

Definitions

PUMA: Public Use Microdata Area(s). A geographic area defined as non-overlapping, statistical geographic areas that partition each state or equivalent entity into geographic areas containing no fewer than 100,000 people each. There are 52 PUMAs in Massachusetts. Boston is comprised of five PUMAs. Refer to Figure 1 to see the PUMAs map for Massachusetts and Appendix for the Boston PUMAs.

Gateway Cities: According to MassINC, "Gateway Cities are midsize urban centers that anchor regional economies around the state" and the Massachusetts Legislature identifies 26 Gateway Cities in the Commonwealth.

Massachusetts Department of Early Care and Education (EEC) Licensing Regions: EEC's five regions include Western, Central, Northeast, Southeast and Cape, and Metro Boston.

Current Implementation: Reflects the present situation under the current implementation of family financial assistance for child care showing where demand for education and care may exceed actual licensed capacity.

Full Implementation: Compares full implementation of the Massachusetts law and regulations expanding child care financial assistance eligibility up to 85 percent of State Median Income (SMI) with no family paying more than 7% of their income above the poverty line threshold toward child care with current levels of licensed capacity. Regulation changes codify the state's Fiscal Year 2025 budget changes to the program and achieve a key priority of the Healey-Driscoll Administration's Gateway to Pre-K agenda–raising income eligibility for child care financial assistance from 50% of state median income to 85% of state median income.

Current Effective Capacity: The number of full-time equivalent (FTE) licensed center and family child care (FCC) slots adjusted for current capacity utilization. In simpler terms, current usable capacity is the number of licensed center and FCC slots.[4]

Estimated Geographic Distribution of Demand Across Massachusetts

As will be seen in the following maps, the geographic provision for child care and early education does not match the geographic demand for child care. To illustrate the mismatch between effective capacity and estimated demand, the team developed the categories in Table 2 which are used in the maps to show where there is unevenness under current implementation.

Table 2. Estimated Demand Relative to Current Capacity (Current Capacity Utilization)

Category	Numerical Range
Meets demand	Capacity Utilization Rate ≤ .85
Close to demand	.85 < Capacity Utilization Rate ≤ 1
Moderate shortfall	1 < Capacity Utilization Rate ≤ 1.25
Severe shortfall	1.25 < Capacity Utilization Rate ≤ 1.5
Extreme shortfall	Capacity Utilization Rate > 1.5

ANALYSIS

Figure 1. Massachusetts Public Use Microdata Areas (PUMAs) and Gateway Cities

Legend:
— PUMA boundaries
✳ Gateway Cities

Source: UMass Boston Early Education Cost and Usage Simulator (CUSP) Project - March 2026
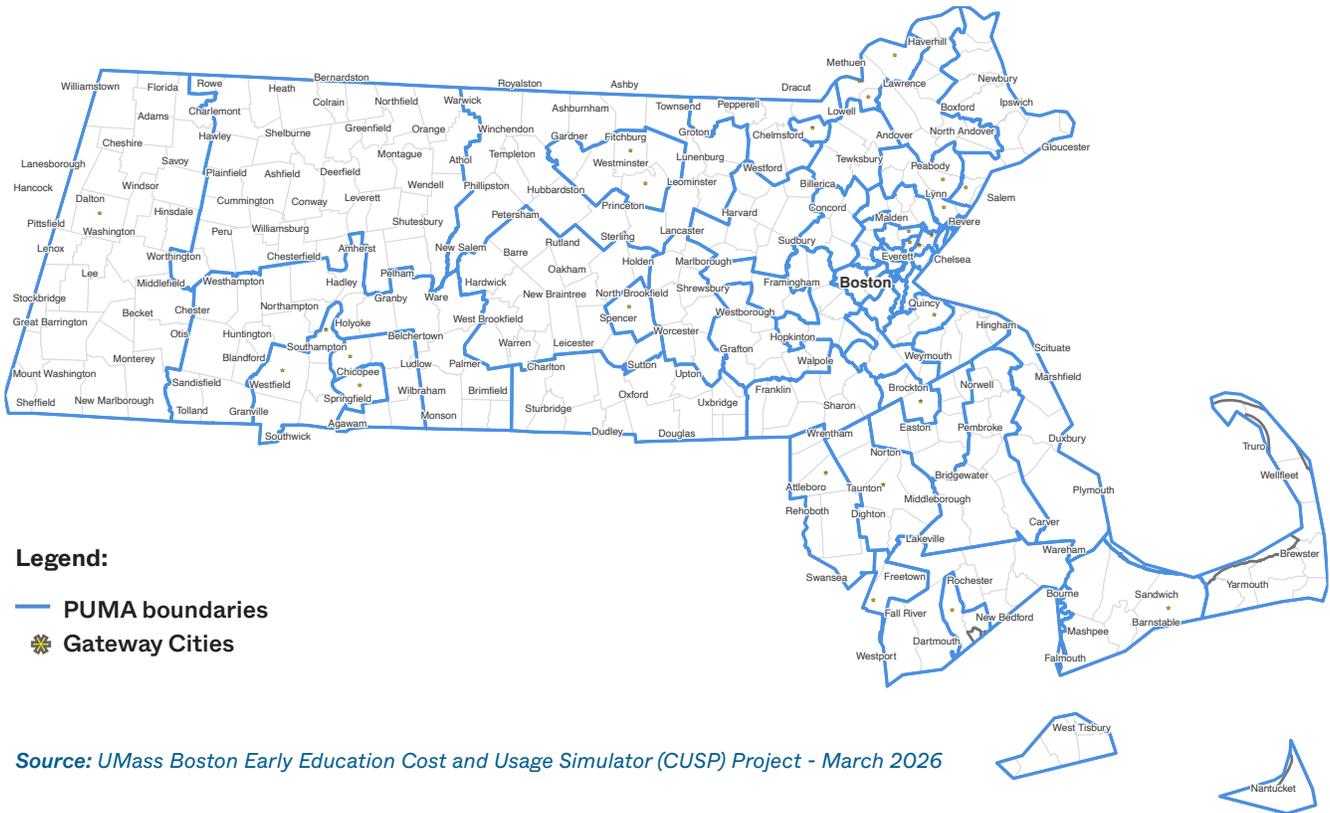
Figure 2. Estimated Demand for Infant, Toddler, and Preschool Early Education and Care Relative to Current Capacity for Center and Family Child Care Providers Combined, by Massachusetts PUMA

Estimated Demand Relative to Current Capacity

- **Meets demand (<= 0.85)**
- **Close to demand (0.85–<=1.00)**
- **Moderate shortfall (1.00–<=1.25)**
- **Severe shortfall (1.25–<=1.50)**
- **Extreme shortfall (>1.50)**
- ✳ **Gateway City**

Source: UMass Boston Early Education Cost and Usage Simulator (CUSP) Project - March 2026
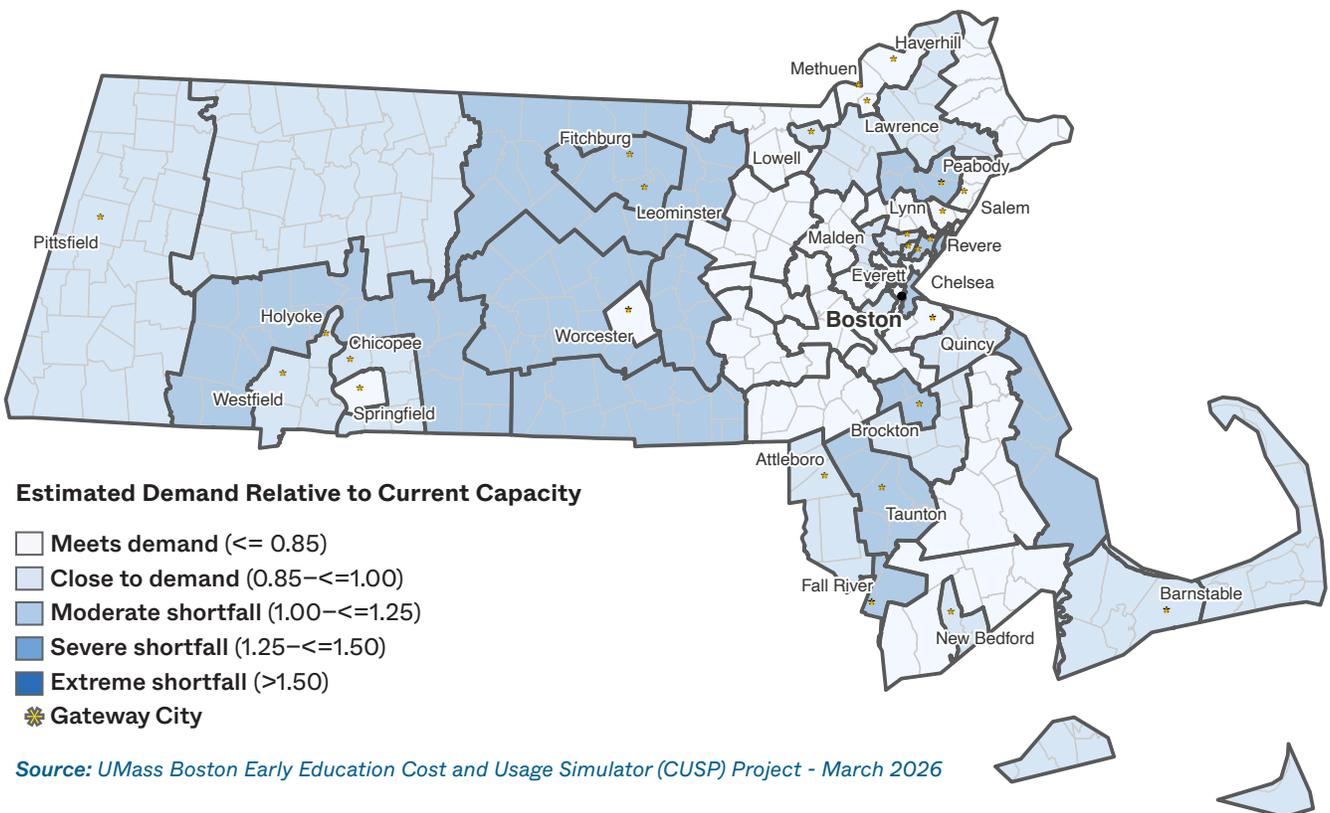
Figure 3. Estimated Demand for Infant Care Relative to Current Center Capacity, by Massachusetts PUMAs

Estimated Demand Relative to Current Capacity

☐ **Meets demand** (<= 0.85)
☐ **Close to demand** (0.85−<=1.00)
☐ **Moderate shortfall** (1.00−<=1.25)
☐ **Severe shortfall** (1.25−<=1.50)
☐ **Extreme shortfall** (>1.50)
✳ **Gateway City**

Source: UMass Boston Early Education Cost and Usage Simulator (CUSP) Project - March 2026
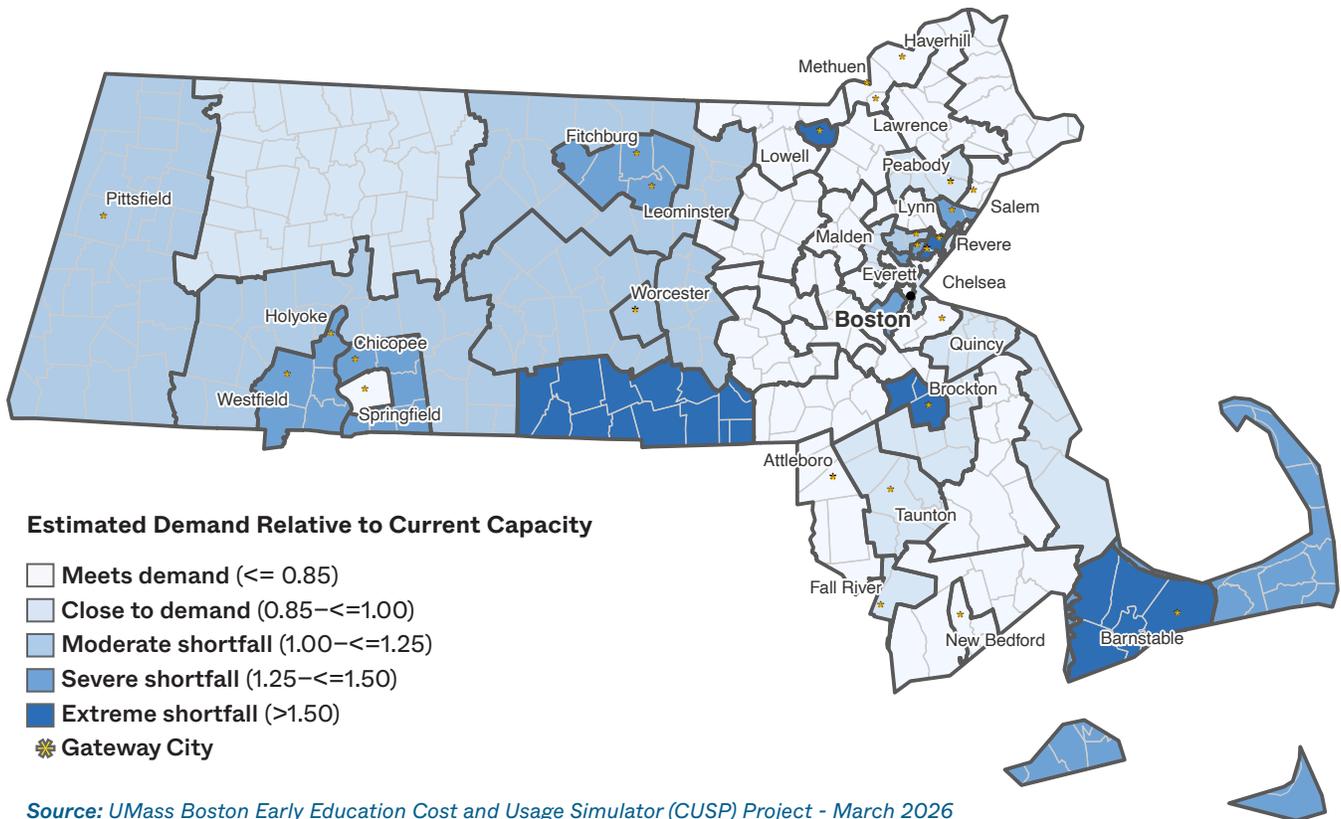
Figure 4. Estimated Demand for Toddler Education and Care Relative to Current Center Capacity, by Massachusetts PUMAs

Estimated Demand Relative to Current Capacity

☐ **Meets demand** (<= 0.85)
☐ **Close to demand** (0.85−<=1.00)
☐ **Moderate shortfall** (1.00−<=1.25)
☐ **Severe shortfall** (1.25−<=1.50)
☐ **Extreme shortfall** (>1.50)
✳ **Gateway City**

Source: UMass Boston Early Education Cost and Usage Simulator (CUSP) Project - March 2026

Figure 5. Estimated Infant, Toddler and Preschool Demand at Full Implementation Versus Effective Capacity of Center and Family Child Care Providers, by Massachusetts EEC Region

Percentages are effective capacity as a percent of estimated demand.

	Western	Central	Northeastern	Southeastern	Metro Boston
	58.8%	69.7%	73.9%	66.0%	70.5%

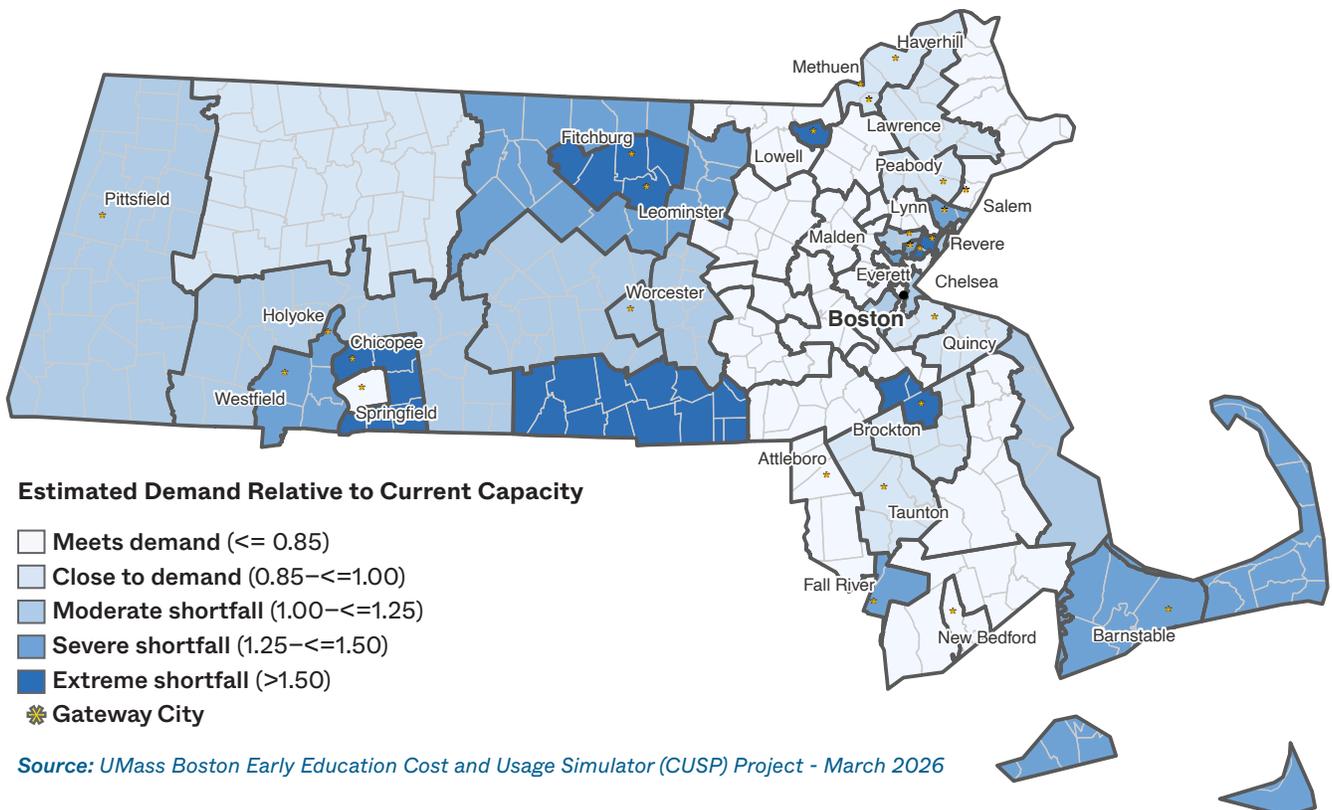■ Estimated demand   ■ Effective capacity

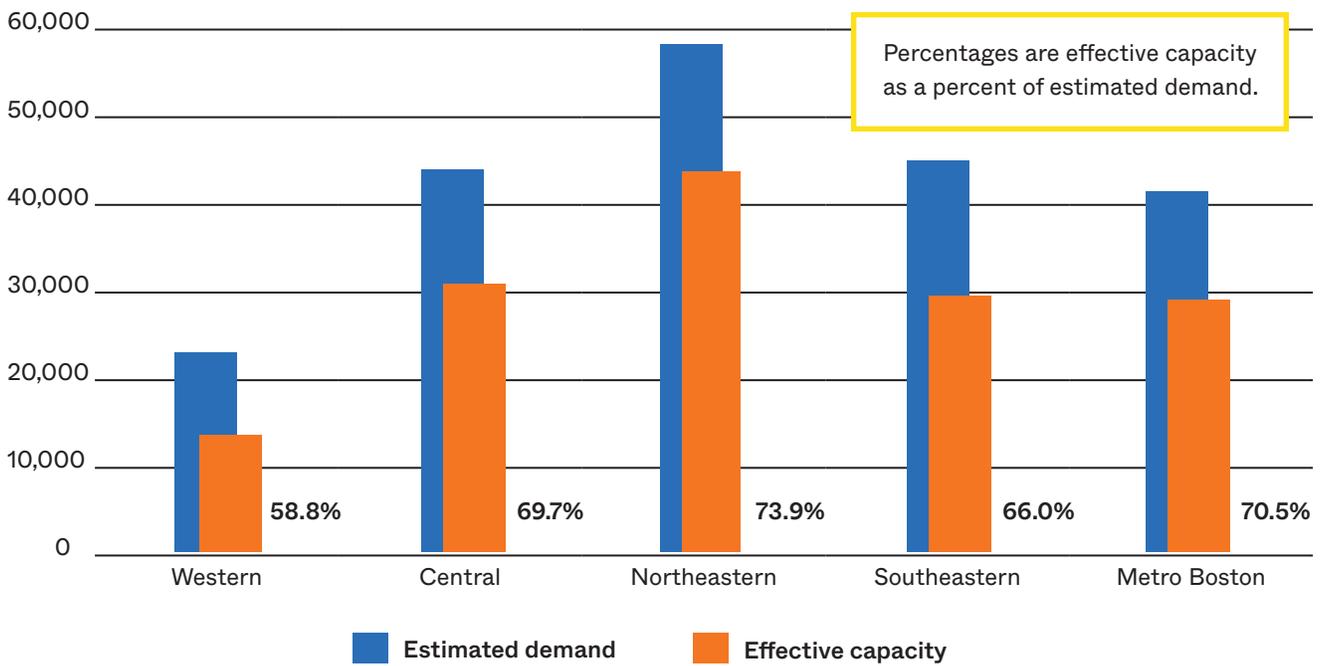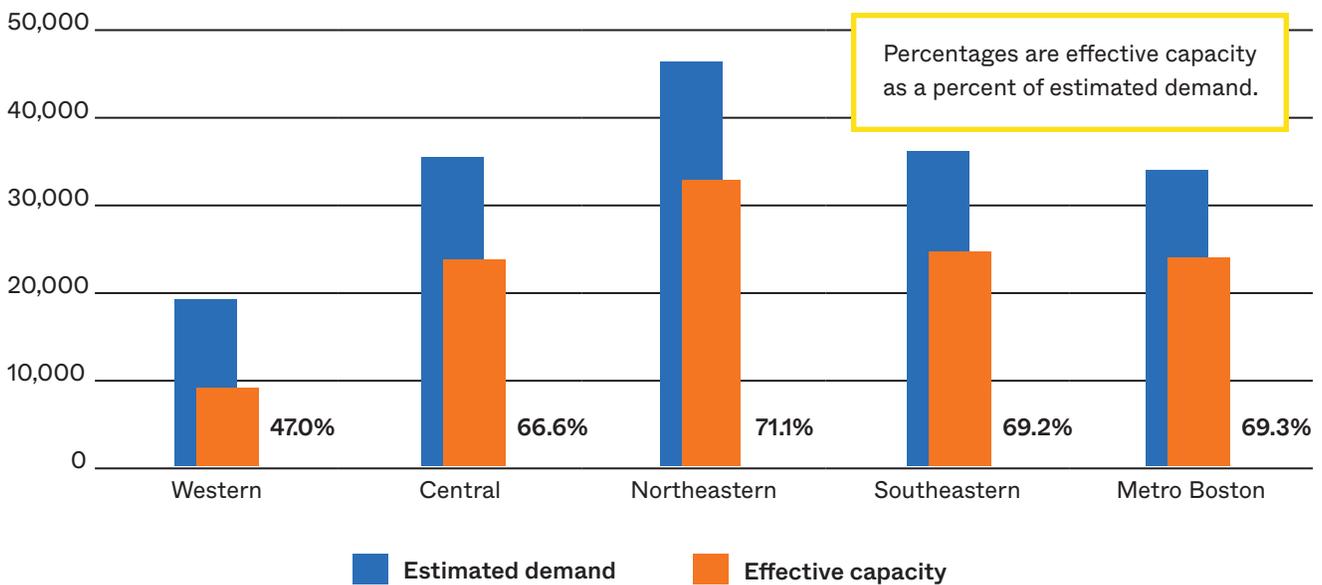**Figure 6.** Estimated Infant, Toddler, and Preschool Demand at Full Implementation Versus Effective Capacity of Centers, by Massachusetts EEC Region

Percentages are effective capacity as a percent of estimated demand.

	Western	Central	Northeastern	Southeastern	Metro Boston
	47.0%	66.6%	71.1%	69.2%	69.3%

■ Estimated demand   ■ Effective capacity

DISCUSSION/MAIN FINDINGS

CUSP estimates of current demand are calibrated to the statewide current usage, so that overall there are no gaps. In comparing the actual capacity of center and family child care providers to estimated current demand for infants, toddlers, and preschool-age children, there is generally capacity to meet demand needs across the Commonwealth, as depicted in Figure 2. While the ability to meet current demand is uneven, there are no severe or extreme shortfalls. Severe and extreme shortfalls occur in areas in which the estimated demand is considerably higher than the available slots, meaning families are finding alternative ways to care for their children than licensed care.

However, because the model adjusts for a host of demographic characteristics and because center and family child care providers are not distributed evenly across the state, the CUSP model is able to identify regions of the state in which the current estimated center demand might exceed the actual capacity. As the maps depicted in Figures 3 and 4 show, there is much uneven provision of center care for infants and toddlers based on current estimated demand.

- The areas facing moderate shortfalls for all ages are concentrated in PUMAs located in the Western, Central, and Southeastern EEC regions.

- There are five PUMAs that are currently facing extreme shortfalls of center infant care and six with severe shortfalls of toddler care.

- Three PUMAs, one that includes Lowell, another that includes Revere, Chelsea, and Winthrop, and a third that includes Brockton, Stoughton and Avon have extreme shortfalls in center infant and toddler care.

- There are 7 PUMAs with severe shortfalls in infant care and seven with severe shortfalls in toddler care. Four of those have a shortfall in both (the PUMAs that include: Martha's Vineyard and Nantucket and outer Cape towns; Somerville and Everett; Lynn, Swampscott and Nahant; and Westfield and Holyoke).

There are three PUMAs facing extreme shortfalls in preschool care (Lowell; Revere, Chelsea and Winthrop; and Leominster, Fitchburg and Gardiner) and none with a severe shortage (Figure 8 in Appendix).

Not surprisingly, as the graphs in Figures 5 and 6 depict, at full implementation, no EEC region can meet the demand for child care and early education at their effective capacity.

- The region best equipped to meet the needs–the Northeast region–would presently only be able to accommodate about three-quarters of all infants, toddlers, and preschoolers.

- The region with the largest gap is the Western region with only 59% of effective capacity.

- Research shows there is a higher demand for center-based care than other forms of informal care when formal care is affordable and accessible, and that is reflected in the CUSP model. That is why the gap between effective capacity and the demand at full implementation in center-based care (Figure 6) is higher than the gap that includes center-based and family child care. Seventy-one percent of the estimated demand for FTE care slots in centers can currently be accommodated in the Northeast region at full implementation, while only 47 percent can be served at current effective capacity in the Western region and 69% in the Southeast region.

- The number of slots needed for all age groups under full implementation is largest in the Northeast region (just over 15,000) reflecting the larger population (Table 4 in Appendix).

- By age group, the highest need as a percent of effective capacity for center-based care will be among toddlers (Figure 10 in Appendix).

As the Commonwealth continues to expand funding for child care and early education, it will be important to make sure resources flow to the right areas and type of care to meet the needs of all families. This brief provides some information on which specific areas (PUMAs) those resources are most needed now, especially for infant and toddler care. Two PUMAs stand out as having the most severe needs for all ages: Lowell and the PUMA that includes Revere, Chelsea and Winthrop. The brief also finds that no region in the state can currently meet the demand for licensed care under full implementation of financial assistance. At best, 74 percent of those in the Northeast region will be served. Further there will need to be more resources for center care, especially for toddlers across the state.

APPENDIX

Figure 7. Boston Public Use Microdata Areas (PUMAs)
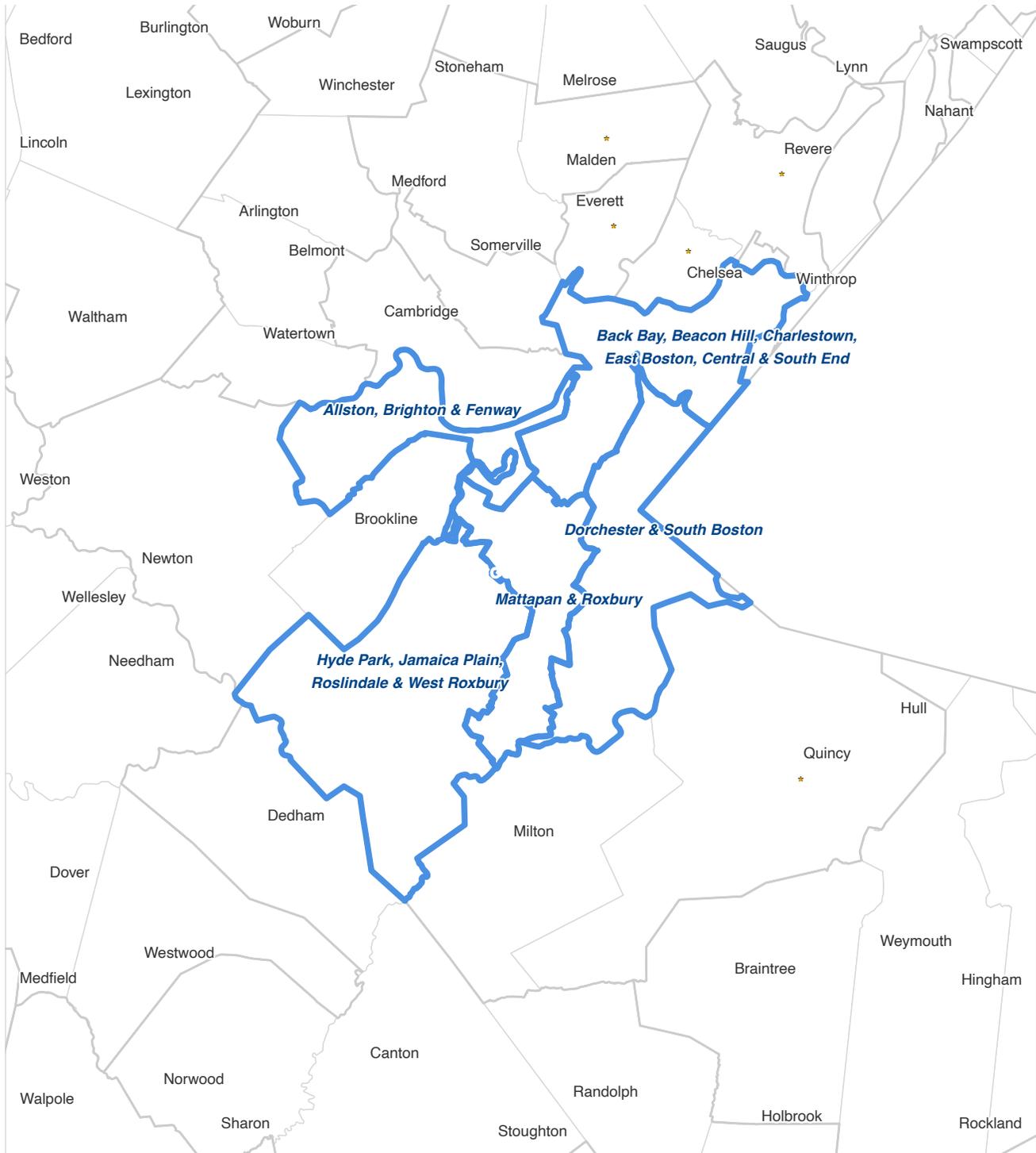
Source: UMass Boston Early Education Cost and Usage Simulator (CUSP) Project - March 2026

Figure 8. Estimated Demand for Preschool Education and Care Relative to Current Center Capacity, by Massachusetts PUMAs

Estimated Demand Relative to Current Capacity

- Meets demand (<= 0.85)
- Close to demand (0.85–<=1.00)
- Moderate shortfall (1.00–<=1.25)
- Severe shortfall (1.25–<=1.50)
- Extreme shortfall (>1.50)
- ✳ Gateway City

Source: UMass Boston Early Education Cost and Usage Simulator (CUSP) Project - March 2026

Figure 9. Estimated Infant Demand at Full Implementation Versus Effective Capacity of Center and Family Child Care Providers, by Massachusetts EEC Region

Percentages are effective capacity as a percent of estimated demand.

Region	Percentage
Western	56.4%
Central	69.4%
Northeastern	73.0%
Southeastern	63.6%
Metro Boston	67.0%

■ Estimated demand ■ Effective capacity

Figure 10. Estimated Toddler Demand at Full Implementation Versus Effective Capacity of Center and Family Child Care Providers, by Massachusetts EEC Region

Percentages are effective capacity as a percent of estimated demand.

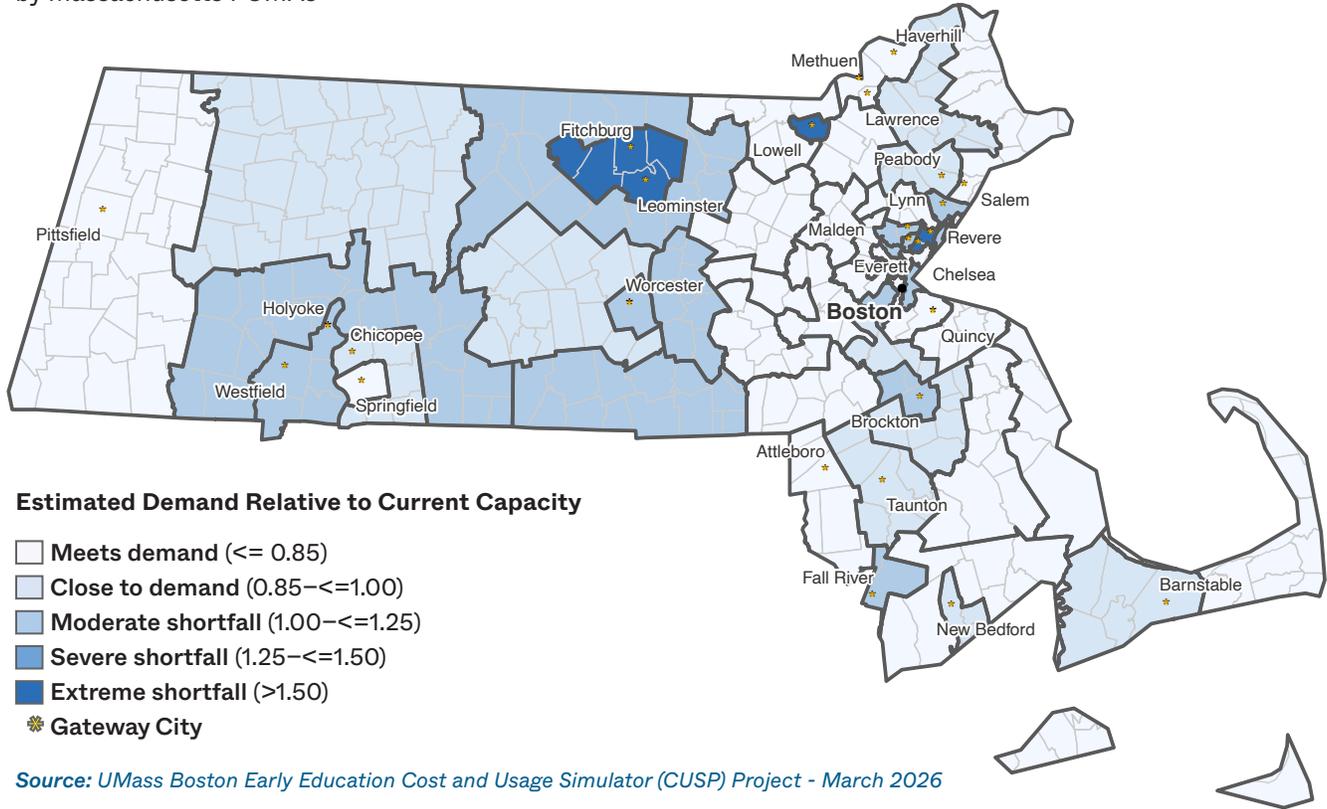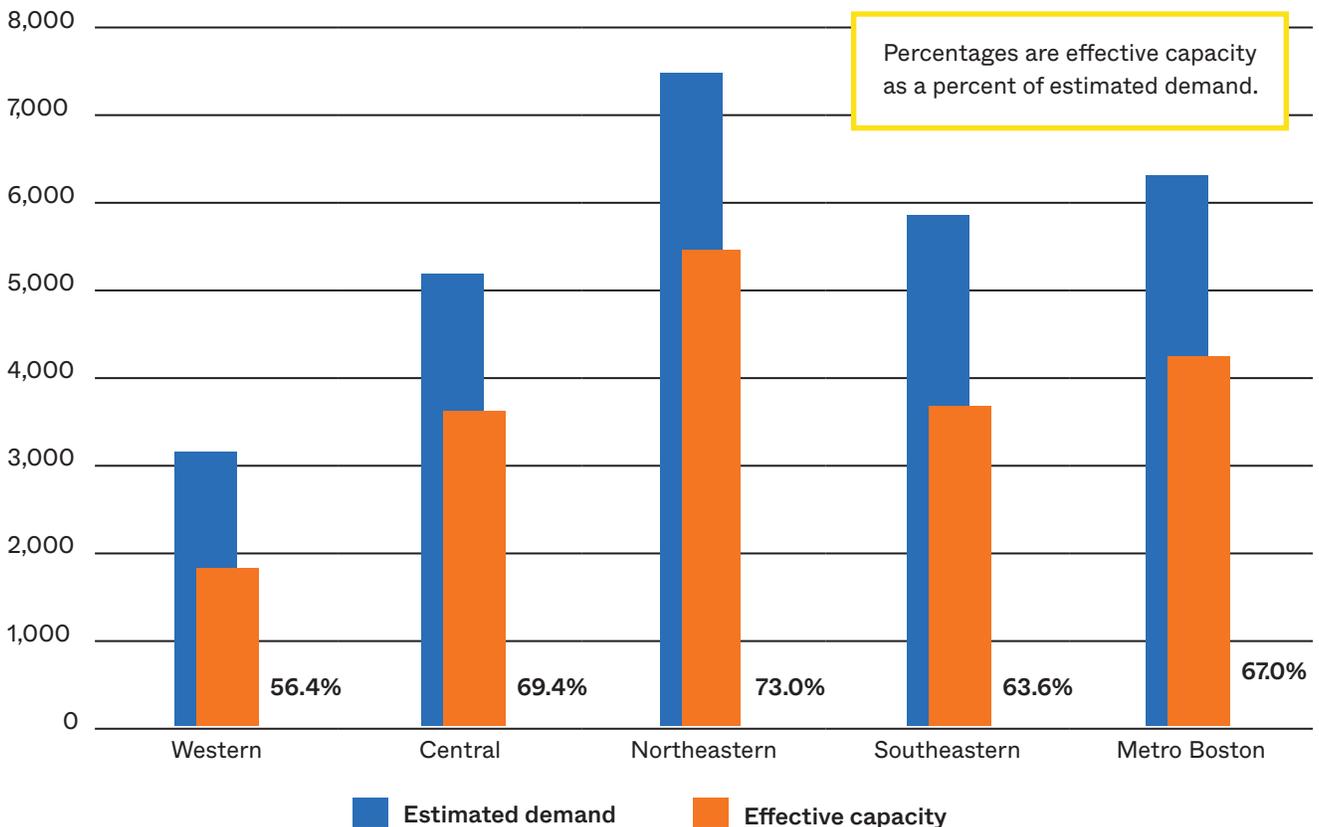|	Western	Central	Northeastern	Southeastern	Metro Boston
	52.3%	63.6%	69.4%	55.2%	66.9%

■ Estimated demand　　■ Effective capacity

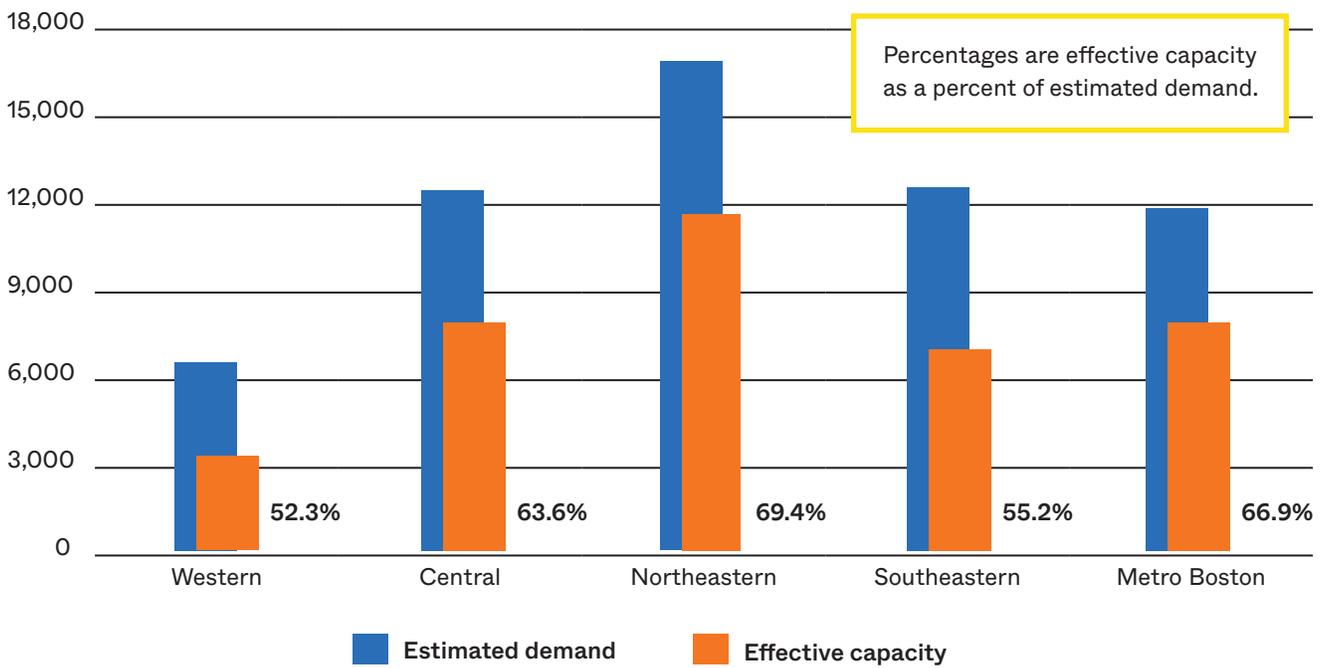**Figure 11.** Estimated Preschool Demand at Full Implementation Versus Effective Capacity of Center and Family Child Care Providers, by Massachusetts EEC Region

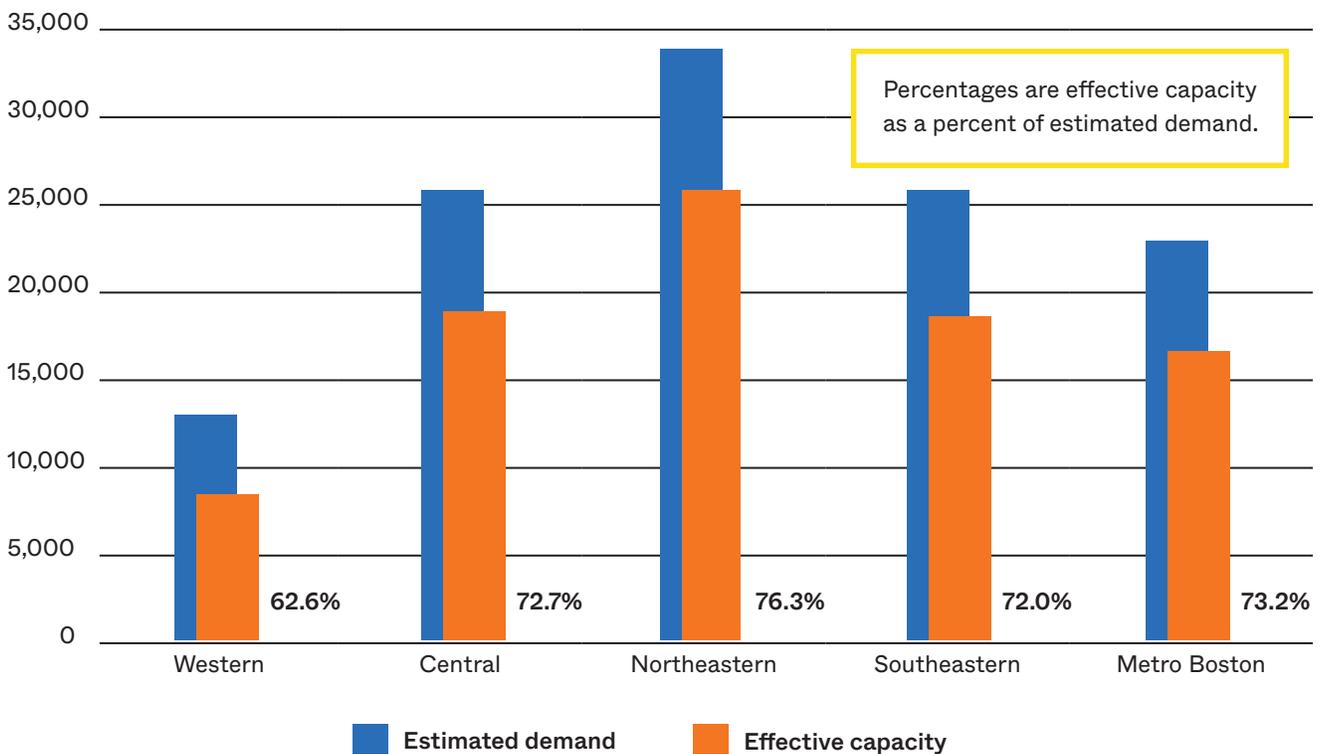Percentages are effective capacity as a percent of estimated demand.

	Western	Central	Northeastern	Southeastern	Metro Boston
	62.6%	72.7%	76.3%	72.0%	73.2%

■ Estimated demand　　■ Effective capacity

Table 3. Effective Capacity and Estimated Demand for Center and Family Child Care Providers by Age and EEC Region

	Effective Capacity					Estimated Demand at Full Implementation				
	Western	Central	Northeastern	Southeastern	Metro Boston	Western	Central	Northeastern	Southeastern	Metro Boston
CENTER + FAMILY CHILD CARE PROVIDERS										
All infants, toddlers, and preschoolers	13,410	30,217	42,842	29,278	28,719	22,800	43,370	57,986	44,330	40,773
All infants	1,785	3,598	5,442	3,697	4,203	3,166	5,184	7,452	5,819	6,272
All toddlers	3,391	7,907	11,755	6,988	7,936	6,489	12,441	16,929	12,671	11,856
All preschoolers	8,234	18,712	25,645	18,593	16,580	13,146	25,746	33,606	25,840	22,646
CENTER ONLY										
Center infants, toddlers, and preschoolers	9,076	23,668	33,037	25,061	23,627	19,300	35,535	46,452	36,204	34,127
Center infants	921	2,586	3,776	2,781	2,829	2,417	3,931	5,492	4,068	4,529
Center todders	1,777	5,447	7,768	5,454	6,047	5,213	9,501	12,222	9,643	9,435
Center preschoolers	6,379	15,635	21,493	16,825	14,751	11,670	22,103	28,739	22,494	20,163
FAMILY CHILD CARE										
Family care infants, toddlers, and preschoolers	4,339	6,561	9,777	4,220	5,101	3,500	7,836	11,534	8,127	6,647
Family care infants	877	1,045	1,703	915	1,375	749	1,253	1,960	1,752	1,743
Family care toddlers	1,603	2,441	3,935	1,532	1,894	1,276	2,940	4,708	3,029	2,421
Family care preschoolers	1,859	3,074	4,139	1,774	1,832	1,476	3,644	4,867	3,347	2,483

Note: EEC is Massachusetts Department of Early Education and Care; Estimated Demand is by FTE (full-time enrollment) slots

Table 4. Number of Full-Time Enrollment Slots Needed and Percent Effective Capacity to Estimated Demand at Full Implementation by Age and EEC Region for Center Providers

	Number of Slots Needed at Full Implementation					Percent Effective Capacity Enrollment of Estimated Demand at Full Implementation				
	Western	Central	Northeastern	Southeastern	Metro Boston	Western	Central	Northeastern	Southeastern	Metro Boston
CENTER + FAMILY CHILD CARE PROVIDERS										
All infants, toddlers, and preschoolers	9,390	13,153	15,144	15,052	12,054	58.8%	69.7%	73.9%	66.0%	70.4%
All infants	1,381	1,586	2,010	2,122	2,069	56.4%	69.4%	73.0%	63.5%	67.0%
All toddlers	3,098	4,534	5,174	5,683	3,920	52.3%	63.6%	69.4%	55.2%	66.9%
All preschoolers	4,911	7,034	7,961	7,247	6,065	62.6%	72.7%	76.3%	72.0%	73.2%
CENTER ONLY										
Center infants, toddlers, and preschoolers	10,224	11,866	13,415	11,143	10,499	47.0%	66.6%	71.1%	69.2%	69.2%
Center infants	1,496	1,345	1,716	1,286	1,700	38.1%	65.8%	68.8%	68.4%	62.5%
Center todders	3,436	4,054	4,453	4,188	3,387	34.1%	57.3%	63.6%	56.6%	64.1%
Center preschoolers	5,291	6,467	7,245	5,668	5,412	54.7%	70.7%	74.8%	74.8%	73.2%

Note: *EEC is Massachusetts Department of Early Education and Care; Estimated Demand is by FTE (full-time enrollment) slots*

TECHNICAL APPENDIX

DETAILED METHODOLOGY

The Full-Time Equivalent (FTE) Measure and Current Capacity Utilization Rates

To make the enrollment to capacity comparison meaningful, enrollment is expressed in full-time equivalents (FTEs). A child who uses 25 or more hours of care a week is counted as one FTE and a child who uses less than 25 hours of care a week is counted as one-half an FTE. The 25-hour cutoff is used by EEC in their survey of provider enrollment to define enrollment in terms of full-time and part-time children and so is a convenient choice for the full-time/part-time threshold. The implicit assumption is that the typical full-time child "takes up" a slot or "seat" for a day, but that a slot could be used for two typical part-time children during the day.

This simple measure of FTEs seems to be reasonable. According to this definition of FTE enrollment, using actual enrollments as reported by EEC for March 2025, 90 percent of large and small group center providers in March 2025 had capacity utilization rates less than or equal to 100 percent, 95 percent of providers had capacity utilization rates of 107 percent or less, and only 1 percent had capacity utilization rates greater than 128 percent. The overall capacity utilization rate was 73 percent. Capacity utilization rates greater than 100 percent are not feasible as this would mean that enrollment exceeds licensed capacity. The small proportion of providers that have calculated capacity utilization rates exceeding 100 percent simply reflects the crudeness of the FTE measure. Nonetheless, the measure is useful and far better assuming full-time and part-time enrollment use the same capacity.

Table 5. Center Capacity Utilization Rates by Age Group, March 2025

Age Group	Average Center Capacity Utilization Rate (%)
Infant	80
Toddler	87
Preschool	80
School Age	54
Overall	73

The table to the left shows capacity utilization rates for center care in March 2025 by age group and the procedure for defining these rates is described later in this section.

Using this FTE measure, the statewide average capacity utilization rate for family providers was 77 percent in March 2025. For family providers, licensed capacity is not distinguished by age group.

Data Sources

1. Enrollment and estimated demand for licensed center care and family child care providers by full-time/part-time status come from the CUSP model. This model estimates weekly hours of child care usage by child using the 2015-2019 PUMS for Massachusetts, a 5% sample of households and the persons who live in them with detailed demographic data on age, sex, race, ethnicity, family relationship, educational attainment, income, and working status. FTE enrollment is aggregated to EEC region and PUMA region totals by age group. Enrollment is calibrated to EEC state totals in the current implementation scenario. The calibration factors from the current implementation scenario are also applied to the full implementation scenario.

2. Capacity for each licensed provider is from EEC. Capacity for each center provider is given by classroom type. Classrooms are either single-age group, for example, infant, toddler, etc., or are licensed for mixed-age groups, for example infant/toddlers, toddlers/preschool, etc. For family child care providers licensed capacity is not distinguished by age group. Capacity is essentially based on area and reflects the number of children who could be served daily on a full-time basis. The data includes the address of the provider which enables aggregating the data to the regions used in the analysis.

3. Enrollment from a monthly survey of providers is from EEC. Enrollment is given by age group and full-time/part-time status combinations. Providers from the two data sources—the capacity dataset and the enrollment dataset—can be linked by the provider's identification code. The month of March 2025 is used in the analysis.[5] The providers in the enrollment survey account for 93 percent of group provider capacity and 89 percent of family child care capacity.

Interpretation of the Results

The current and full implementation scenario enrollments and estimated demand from CUSP represent child care and early education demand under current implementation of financial assistance eligibility up to 50 percent of SMI and full implementation of financial assistance eligibility up to 85 percent of State Median Income (SMI) with no family paying more than 7% of their income above the poverty line threshold toward child care respectively. Enrollment demand from the CUSP model is estimated from behavioral models and is conditional on the demographics of children and their families. The analyses presented in this brief show the extent to which the current geographic distribution of capacity does not correspond with where anticipated demand would be.

Assignment of Children to Classrooms in Center Care Settings

Using the CUSP model, children are enrolled in their region of residence and counted as "not enrolled" if there is not a slot available for them in their region. Children are first assigned to classrooms of their own single age group and then, if all children are not served, children are chosen randomly—one FTE equivalent at a time—from the remaining population seeking to be enrolled and are assigned to the mixed-age group classroom which has the largest remaining capacity available. This mimics a "first-come, first-serve" enrollment process and makes maximal use of the existing capacity. If a child cannot be assigned to a classroom because no capacity is left, then the capacity utilization rate for that age group exceeds 100 percent.

Calculation of Used and Unused Capacity by Age Group in Center Care Settings

Used and unused capacity is calculated after all children seeking enrollment have been accounted for. Both need to be measured to estimate capacity utilization rates by age. The calculation for used capacity for each age group is straightforward. It is simply the count of the children (in FTEs) in classrooms for that age group. Unused capacity by age group for single age group classrooms is also straightforward. It is the count of units of capacity (slots or seats) that are not filled. Unused capacity in mixed-age classrooms is allocated to age groups in proportion to the current March 2025 statewide enrollment by age group. This is a reasonable way to estimate how the unused capacity might have been used if more children had been enrolled.

The total used and unused capacity equals the current capacity by age group and by region. This identity is met for both single-age and mixed-age classrooms.

## Assignment of Children and Capacity in Family Care Settings

For family care providers, licensed capacity is not distinguished by age group. For that reason, assignment of enrollment and the calculation of used and unused capacity is handled in the same manner as in group settings, as if there were a single multi-age group classroom.

Calculation of Capacity Utilization Rates by Age Group

If all children of an age group are "served", that is, are assigned to a spot in center or family child care the capacity utilization rate for that group is simply the ratio of used capacity to available capacity (used plus unused capacity) for that age group. If some children are not enrolled because a slot or seat is not available in their region of residence, the numerator in this ratio is augmented by the number of children not "served" (in FTEs), and the capacity utilization rate exceeds 100 percent.

Figure 12. Supply and Demand for Child Care

Current Implementation   Full Implementation
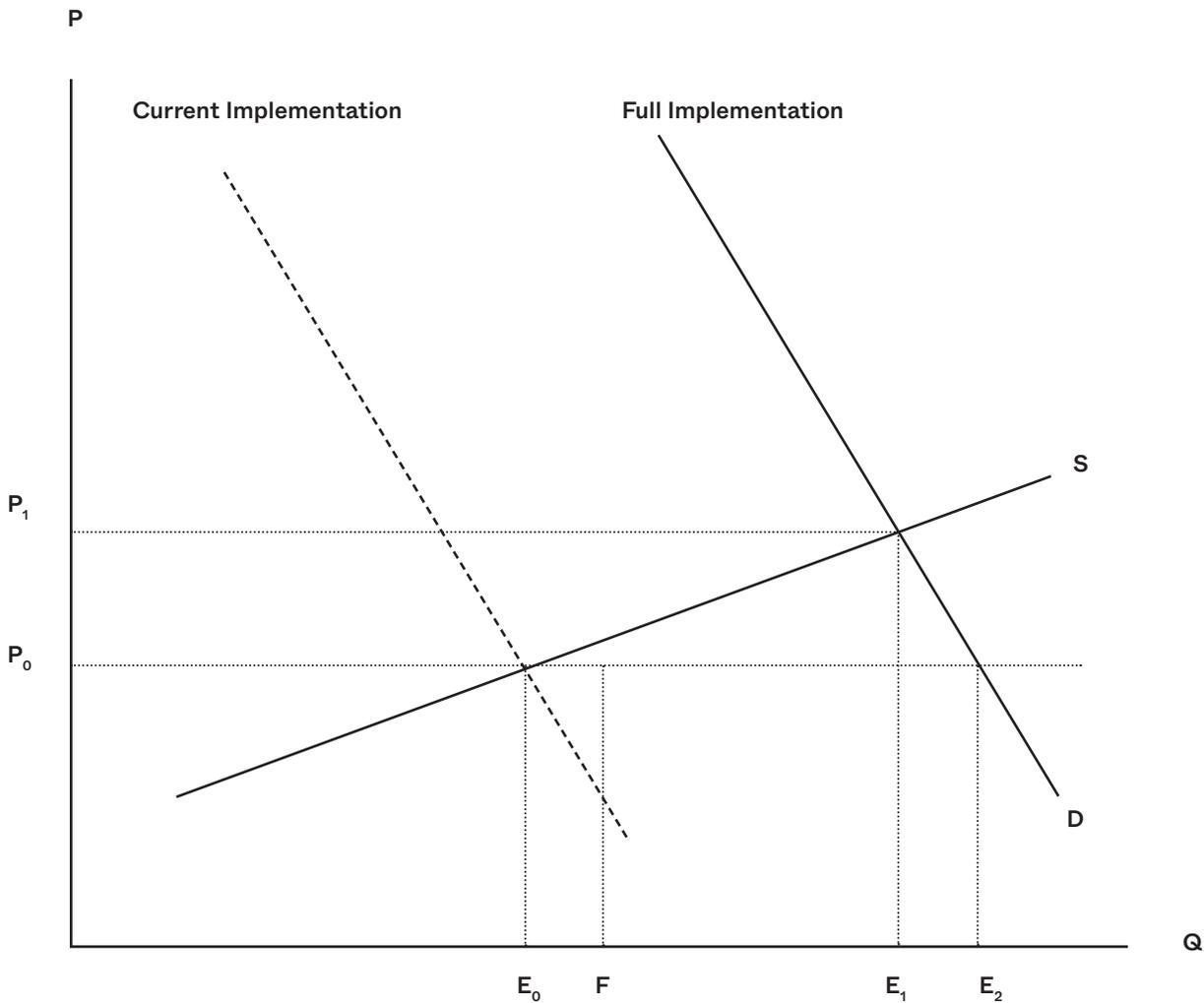
Source: UMass Boston Early Education Cost and Usage Simulator Project (CUSP), March 2026 | Developed by Alan Clayton-Matthews.

Figure 12 illustrates the meaning of several terms used in this report, including the demand for and supply of child care, shortages of child care availability, and the current implementation and full implementation scenarios.

The figure illustrates a generic supply and demand schema commonly used in economic analysis. The solid lines or "schedules" indicate the supply of child care (S), the amount of child care services offered by providers; and the demand for child care (D), the amount of child care services desired by families. The vertical price or P axis measures the "price" of child care, which, for the demand schedule can be interpreted as the price a family pays for a unit of child care–say a week of full-time child care, or for the supply schedule can be interpreted as the cost of providing a unit of child care that a provider incurs. The horizontal or Q axis measures the quantity of child care, say, in person (child) weeks of full-time care, or the number of children served on a full-time equivalent basis in a given week.[6]

As in a generic demand/supply analysis, the demand curve slopes downward. As the price falls, more families wish to enroll their children in child care centers or with family child care providers. The supply curve slopes upward. Additional supply of child care services is offered as the price that providers receive goes up. Equivalently, the cost of providing a unit of child care service rises as the quantity offered increases—higher pay rates are required to obtain the additional professional services needed, rents per unit of space rise to compete with other users of that space, etc.

The Current Implementation Scenario

The current implementation scenario is illustrated with the dashed demand schedule labeled "current implementation" and a statewide market equilibrium at the current average statewide price P_0 and the current statewide enrollment E_0. Here, P_0 should be interpreted as the average "sticker" or gross price to the family, before taking into account any financial assistance that reduces the effective price to the family.[7] The CUSP model gives a statewide demand equal to statewide current enrollment by calibrating the baseline output of the model so that child care usage by age group is equal to current statewide enrollment.[8]

Total capacity is the number of licensed full-time slots and is a function of physical space of child care providers. It is marked on the horizontal quantity axis as point F. Current statewide enrollment, E_0, implies a capacity utilization rate, E_0/F, of roughly 85%. At this rate, E_0 can be interpreted as "effective" capacity since full capacity utilization may be difficult to achieve given staffing and other constraints, seasonal or fluctuating usage over time, etc. The maps in this report use both 85% and 100% capacity utilization rates as thresholds for categories. The full implementation scenario graphs compare demand to current effective capacity, E_0.

Actual current statewide demand may differ from this "current implementation" demand schedule. Given the size of the waiting list for subsidized child care slots, it is almost certainly higher, but the actual demand is unknown. The upshot is that the current implementation statewide market equilibrium is a fiction, but one that is useful in identifying relative regional disparities between demand and supply at the substate regional level.

Two points are important in understanding both the current implementation scenario and the full implementation scenario:

1. There is not a single market for child care in Massachusetts, but many subregional markets, each with their own supply and demand schedules, and each with different market equilibria, giving different market-clearing prices.

Market equilibrium—an economic technical term—is the point where the demand and supply schedules intersect. At this point, the price is at a level where the demand for child care from families and the supply offered by providers are the same.

The market need not be in equilibrium. The figure shows a situation where, at the price P_0 and the demand and supply schedules D and S, the demand for care exceeds the supply, with a shortage equal to the difference between the quantity demanded, E_2, and the quantity supplied, E_0, as indicated in the figure.

2. The regional demand given by the CUSP model does not reflect the differing market prices between regions but assumes the same average statewide price in each region. It does, however, reflect regional differences in the demographics and composition of the families, including income, working status of adults, and age and number of children.

The first point implies that the affordability and availability of child care can differ markedly between regions. Some rural regions, for example, may have higher costs of providing center-based care because scale economies cannot be achieved as in more dense urban areas. This leads to a higher market price for center care. Or, the demographics of a region may result in fewer family child care providers or center care educators, again leading to higher market-clearing prices. In these higher-cost regions, families choose alternative, lower-cost solutions, such as non-licensed relative care or parental care substitutes. Thus, the market appears to be in equilibrium, but there are actually hidden shortages as families by necessity opt for an affordable solution. Of course, the reverse situation could exist in some regions too, where a region's market price is below the statewide average.

By design, the CUSP model simulates what demand would be in each region, if the region's cost structure were like the statewide average, at a price of P_0. This is a measure of the hidden shortages mentioned above. The relative shortage given by this counterfactual is measured by the capacity utilization rate implied by demand given by the CUSP model relative to the region's current full capacity. Capacity utilization rates close to or below the statewide average represent adequate capacity. Capacity utilization rates above the statewide average indicate a shortage (assuming E_0 is a point of effective capacity), and capacity utilization rates above 100% indicate a severe shortage.

The Full Implementation Scenario

In the full implementation scenario, the CUSP model starts with the current implementation and then simulates full implementation of financial assistance for families with incomes at or below 85% of state median income. In the figure, this shifts the demand curve to the right, say from the current implementation demand curve to the demand curve labeled D. This shift occurs because at the current sticker price P_0, the net cost of child care for newly eligible families has fallen, leading to higher child care usage as some families increase the intensity (hours) of use, or families who were using non-licensed care switch to licensed care, or switch from family child care provider to center care. At price P_0, demand increases from E_0 to E_2, raising the capacity utilization rate from E_0/F to E_2/F, and creating a shortage of E_2-E_0 relative to effective capacity, or E_2-F relative to full capacity.

For the full implementation scenario, two measures of shortages are used:

1. For charts, at the EEC region level, bar graphs represent both the level of demand E_2 and current effective capacity, E_0, giving a visual representation of the shortage.

2. In addition, the ratio of current capacity to demand, E_0/E_2, is expressed as a percentage and overlayed over the chart.

With such excesses of demand, the sticker price of child care will rise, allowing and encouraging providers to add capacity. The new market equilibrium will be at a new effective capacity of E_1 and at a higher market price of P_1. Estimating this outcome would require modeling the price elasticities of demand and supply, which is beyond the scope of this analysis. Nor does this analysis say how or how long it will take the market to move from the current equilibrium given by a price P_0 and effective capacity E_0 to the new equilibrium. It will probably not be a smooth and quick transition along the supply curve S. It is likely that the price will at first rise above P_1 (economists would say the short-run supply curve is inelastic). Aggressive policy to loosen the constraints on supply would speed this transition.

Map Preparation

The maps produced for this report were generated using the R programing language, using a reproducible and systematic spatial analysis workflow. Early education and child care enrollment and licensed capacity data were aggregated and joined to Public Use Microdata Areas (PUMAs) for the Commonwealth of Massachusetts using geographic identifiers. Capacity utilization was calculated as the ratio of enrollment to capacity (enrollment ÷ capacity) for each area. Subsequent results were grouped into relevant categories ranging from "meets demand" to "extreme shortfall" to support policy-relevant interpretations. For added geographic context, municipal boundaries and designated Gateway Cities were overlaid onto the maps while all calculations were performed at the PUMA level to ensure stable and comparable estimates across the Commonwealth of Massachusetts.

Data Limitations

It is important to note several limitations given the data used and analytical approach deployed.

1. The enrollment demand is demand by geography of residence of the child, not by geography of the provider. To the extent that families use local providers—that is, providers within the geographic unit of analysis (PUMA or EEC region), this is less of a problem. But it is possible that many families use providers close to work, rather than close to home. Commuting patterns may cross geographic boundaries, especially at the PUMA level.

2. The methodology for calculating capacity utilization by geography treats the capacity as if it were the capacity of a single regional provider, that is, a single large establishment at one address. Equivalently, the methodology maintains the population of providers spread out within the geography but treats the

families as if they could or would use any provider in the region with available capacity. Either way, the operating assumption does not recognize the time and cost constraints of families placing their children with providers and therefore may underestimate the actual shortages of capacity.

3. Geographic analyses are based on EEC regions and PUMAs but not provided at the municipal level.

4. 2010 PUMA regions were used in the team's analysis. 2020 PUMA regions are available from the Census Bureau but given that the UMass Boston Early Ed Cost and Usage Simulator used the 2015-2019 PUMS data in the development of the model, the geographic analysis was constrained to 2010 PUMA regions.

NOTES

1. Thompson, M., Goldberg, J., & Bumgarner, E. (2025). How do caregivers make decisions about child care? Findings from the Massachusetts Early Childhood Needs Assessment (Part II). MEF Associates & Tufts Interdisciplinary Evaluation Research (TIER). Prepared for the Massachusetts Department of Early Education and Care. https://www.mass.gov/doc/brief-ii-how-do-caregivers-make-decisions-about-child-care/download

2. For instance, last year, the Massachusetts Department of Early Education and Care released Third Sector Intelligence (3Si)'s formal child care access deserts maps in July 2025. In 2018, The Institute for Child, Youth and Family Policy at Brandeis University and the Massachusetts Child Care Research Partnership issued a report based on a "synthesis of five years of geographic and spatial research related to issues of access to federally subsidized child care for low-income working families in Massachusetts."

3. Pilarz, A. R. (2018, October 10). Child care subsidy programs and child care choices: Effects on the number and type of arrangements. Children and Youth Services Review. www.sciencedirect.com/science/article/pii/S0190740918304651

4. Current Capacity Utilization: Also called Current Effective Capacity, is the current EEC enrollment expressed in full-time equivalent units (FTE's).

5. A few providers did not have data for March. In that case, another recent month was used.

6. The specific units of analysis are not important as the figure is simply a device to illustrate the meaning of the terms used in this analysis.

7. In the CUSP model, the family's financial assistance, if they are eligible, is calculated from what their gross expenditures would be, and compared to their income, this determines the family's financial assistance and net child care costs.

8. The baseline CUSP model is described in the documentation for the model. Enrollment, E, is measured in full-time equivalents as described elsewhere in the technical documentation for this report.

About the Early Education Leaders Institute

The Early Education Leaders Institute at the University of Massachusetts Boston provides the leadership development opportunities and infrastructure that early educators need to support thriving children and families. Founded in 2016, we drive systems change by cultivating effective leaders who reflect and represent their communities—through workforce and leadership development, research, and partnerships that strengthen the larger early education ecosystem. We are nationally recognized as a model of excellence, and we make high-quality early care and education a reality for more children and families while supporting the professional growth of a diverse workforce of early educators. Get involved or learn more by visiting **umb.edu/earlyedinstitute**.

About the Center for Women in Politics and Public Policy

The Center for Women in Politics and Public Policy, established in 1994, aims to promote diverse women's leadership to achieve more just, equitable, and responsive public and institutional policies and meaningful inclusion. Through its innovative educational programs, policy-relevant research, and public forums, it works to ensure that the voices, expertise, and experiences of all women are valued and included in civic discourse and the policymaking process. The center collaborates across sectors to build a prosperous economy that increases access and opportunity for all, particularly low-wage workers and women of color. All center initiatives and research utilize an anti-racist approach and explore the intersection of gender, race/ethnicity, class, and other identities on policymaking and politics. The center is part of the McCormack Graduate School of Policy and Global Studies in the College of Liberal Arts at the University of Massachusetts Boston. Visit **umb.edu/cwppp** for more information.